

System Networking Switch Center

User's Guide

Version 8.1

lenovo[®]

Note: Before using this information and the product it supports, read the general information in the *Safety information and Environmental Notices and User Guide* documents on the Lenovo *Documentation CD* and the *Warranty Information* document that comes with the product.

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Contents

Chapter 1. Installing Switch Center.	23
Installation Prerequisites.	.24
System Requirements	.24
Windows System Requirements	.24
Linux System Requirements	.24
Disk Storage Requirements.	.24
Browser Requirements.	.25
Enabling JavaScript in Microsoft Internet Explorer.	.25
Enabling JavaScript in Mozilla Firefox	.25
Switch Configuration Requirements	.25
General Requirements	.26
FTP/SFTP/TFTP Server Requirements	.26
Installing SNSC Manager	.27
Installing Lenovo System Networking Switch Center 8.1 on a Linux System	27
New Installation.	.27
Prerequisite Library for 64-Bit Red Hat Installations	.27
Upgrading the Existing SNSC.	.28
Installing Lenovo System Networking Switch Center 8.1 on a Windows System	28
New Installation.	.28
Upgrading the Existing SNSC.	.28
Verifying Installation	.29
Uninstalling System Networking Switch Center 8.1	.31
Uninstalling System Networking Switch Center 8.1 on Linux	.31
Uninstalling System Networking Switch Center 8.1 on Windows	.31
Chapter 2. Getting Started With SNSC 8.1	33
Logging into Lenovo System Networking Switch Center	.34
Configuring SNSC Installed on a Multi-Homed System	.35
Configuring SNSC on a Windows System	.35
Configuring SNSC on a Linux System	.35
First Steps	.36
Enabling and Disabling Root Users	.36
Enabling the Root User.	.36
Disabling the Root User	.37
Changing the Default Passwords	.37
Changing the Default Administrator Password	.37
Changing the Default Operator Password.	.38
Changing the Default User Password	.38
Changing the Default Root Password	.39
How to Discover Switches	.40
Using Auto Discovery	.40
Auto Discovering Switches in a Subnet Range.	.41
Auto Discovering Switches by IP Address	.43
Using Manual Discovery.	.45
Importing Device Lists from a CSV File	.46
Importing the Device List	.48

Exporting a Discovered List of Switches to a CSV File	50
Troubleshooting Switch Import and Discovery Problems.	50
Troubleshooting Multiple IP Addresses	51
About the SNSC User Interface	52
About the Home Page	52
Health Status Summary Pane	53
Events Summary Pane	55
Running Software Version Summary Pane	55
Panic Dump Summary Pane	55
Save Pending Summary Pane	55
Discovery Time Range Summary Pane	55
About the Device List Page	56
The Domains Pane	56
The Summary Status Pane	56
The Device List Pane	57
Stacked Switches	57
Device List Page – Menu Bar	57
Device Menu	58
Group Operations Menu.	59
Reports Menu	61
Logs Menu.	62
Options Menu	63
Discovery Menu	63
Virtualization Tools Menu	64
Maintenance Menu	64
Help Menu.	65
About the Device Console Page.	65
Device Console - Top Frame	66
Device Console – Feature (or Left) Frame.	66
Device Console – Content (or Right) Frame	66
Device Console Page – Menu Bar	67
Device Console Page – Panel Menu Bar	68
Device List – Go To search option	68
Device List – Favorite Marking and Adding Notes	68
Favorite Marking	68
Adding Notes	69
Removing Notes	70
Changing System Networking Switch Center Configuration	70
Changing the Default General Properties.	70
Changing the Default Health Check Properties	71
Changing the Default Refresh Configuration Parameters	71
Changing the Default Data Collection Configuration Parameters	72
Changing the Default Log File Configuration Parameters	73
Changing the Default DB Data Purge Configuration Parameters.	74
Configuring Authentication	75
Local Authentication	75
TACACS+ Authentication	75
RADIUS Authentication	77
LDAP Authentication	78
Configuring FTP/SFTP/TFTP Server Parameters	79
Modifying Discovery Parameters	79

VM Management Server – Connector Configuration and VMware Infrastructure	
(VI) Client Integration . . . . .	.82
Configuring VM Management Server Connector . . . . .	.82
Integrating System Networking Switch Center with VMware Infrastructure	
(VI) Client Application. . . . .	.83
Launching System Networking Switch Center from VMware Infrastructure	
(VI) Client Application. . . . .	.84
Un-registering System Networking Switch Center from VMware Infrastructure	
(VI) Client Application. . . . .	.85
Dial Home Configuration . . . . .	.86
Configuring Email Parameters . . . . .	.86
Adding Traps for Dial Home . . . . .	.87
Adding Health Status Messages for Dial Home . . . . .	.88
Configuring the Email Message Format . . . . .	.89
How to View Information About Lenovo System Networking Switch Center .	.90
How to View Logs . . . . .	.92
Navigating the Log Files . . . . .	.93
Viewing the Discovery Import Log . . . . .	.93
Viewing the Concurrent Backup Log. . . . .	.94
Viewing the Concurrent Download Log . . . . .	.94
Viewing the Concurrent Reset Log . . . . .	.95
Viewing the Scheduled Backup Log . . . . .	.95
Viewing the Scheduled Download Log. . . . .	.95
Viewing the Scheduled Reset Log . . . . .	.96
Viewing the CLI Push Log File . . . . .	.97
Viewing the DB Log File . . . . .	.97
Viewing the CMI Log . . . . .	.97
Viewing the VSI DB – RESTful Access Log . . . . .	.98
Viewing the Authentication Log . . . . .	.98
Viewing the Sync Config Log File . . . . .	.99
Viewing the VM Server Log . . . . .	.99
Viewing the VMready Deployment Log . . . . .	.99
Advanced Configuration and Tuning	101
Modifying the log.properties Configuration File.	101
Modifying the server_config.properties Configuration File	102
Modifying the backup.properties Configuration File	103
Modifying the config-substitutions.properties Configuration File	103
Modifying the alertseverity.properties Configuration File	103
Modifying the cmi.properties Configuration file.	104
Modifying the security.properties Configuration File	104
Configuring for NIST 800-131a Strict Mode	104
Enabling and Disabling Strict Mode	105
Secure LDAP Configuration	105
How to Manually Set Device Discovery Date	107
How to Configure Discovery Time Range	107
Chapter 3. Viewing Reports . . . . .	.109
How to View the Event List Report	110
How to View the Syslog List Report	111
How to View the SNSC Alerts Report	112

How to View the Switch Version Report	114
How to View the Transceiver Information Report.	116
How to View the VM Data Center Report	117
How to View the VMready VM Report	119
VMready VM Report – VM Groups	120
VMready VM Report – Port Groups.	122
How to Customize Information in Reports.	123
Changing the Column Sort Order	123
Displaying or Hiding Columns	123
Chapter 4. Performing Group Operations	125
How to Deploy Switch Image and Configuration on One or More Switches	126
How to Upgrade Switch Image on One or More Switches	127
How to Backup Switch Image from One or More Switches	128
How to Upgrade Switch Configuration on One or More Switches	129
How to Backup Switch Configuration from One or More Switches	130
How to Download Panic Dump from One or More Switches	131
How to Download Tech Support Dump from One or More Switches.	132
How to View Scheduled Jobs.	132
How to Run CLI Commands on One or More Switches	134
How to Collect Data from One or More Switches on Demand	136
How to Retrieve Switch Version Report from One or More Switches	137
How to Retrieve Transceiver Information Report from One or More Switches	138
How to Retrieve VM Data Center Report from One or More Switches	139
How to Invoke Actions on One or More Switches.	140
How to Manually Set Discovery Date on One or More Switches	141
How to Add/Remove Notes to/from One or More Switches	142
Chapter 5. Monitoring a Switch	143
How to Monitor the Switch	145
About Various Monitor Tabs	146
How to Modify a Statistical Monitoring Page.	147
Changing the Column Sort Order	147
Displaying or Hiding Columns	147
How to View Switch Summary.	148
Viewing Health Status.	148
Viewing Information	149
Viewing Port Status	149
Viewing Port Summary	150
Viewing Events.	151
Viewing Syslog.	152
How to Monitor Switch Statistics	153
Monitoring SNMP Statistics	154
Viewing Information Summary.	156
Monitoring Packet Statistics	157
Monitoring MP CPU Statistics	158
Monitoring STP Statistics	158
Monitoring UFD Statistics	158
Monitoring UFD Information.	159
Monitoring NTP Statistics	159

Monitoring Trunk Groups	161
Monitoring Trunk Group Ports	161
Monitoring Switch Memory Statistics	161
Monitoring TACACS+ Authentication Statistics	162
How to Monitor a Port	164
Monitoring Port—Summary	164
Monitoring Port—Interface Statistics.	164
Monitoring Port—802.1x Statistics.	166
Monitoring Port—IP Statistics	167
Monitoring Port—Authenticator Diagnostics Statistics	167
Monitoring Port—Bridge Statistics	169
Monitoring Port—Ethernet Error Statistics	170
Monitoring Port—Transceiver Information	171
How to Monitor Virtual LAN Statistics	173
Monitoring Virtual LANs—VLAN Membership Information	173
How to Monitor Bridge Statistics	174
Monitoring Bridge—Forwarding Database Information	174
Monitoring Bridge—Forwarding Statistics	174
Monitoring Bridge—Forwarding Database Multicast Information	175
Monitoring Bridge—Base Port Information	175
Monitoring Bridge—CIST Bridge Information.	176
Monitoring Bridge—CIST Port Information.	177
Monitoring Bridge—STP Information	178
How to Monitor LLDP Information	179
Monitoring LLDP Port Information	179
Viewing Remote Devices.	179
Viewing Remote Devices Management Address.	180
Viewing EVB (Edge Virtual Bridging) Local Information	180
Viewing EVB (Edge Virtual Bridging) Remote Information	180
How to Monitor Failover Information	182
Monitoring General Trigger Status	182
Monitoring Trigger Information.	182
Monitoring Monitored Port Status.	183
Monitoring Controlled Port Status.	183
Monitoring Virtual Port Status	183
How to Monitor vLAG Information	184
Monitoring vLAG General Information	184
Monitoring vLAG Instance Information	185
Monitoring vLAG ISL Group Information	185
Monitoring vLAG PDU Statistics	186
Monitoring vLAG IGMP Statistics.	187
Monitoring vLAG ISL Statistics	187
How to Monitor Hotlinks Statistics	189
Monitoring Hot Links Summary	189
Monitoring Hot Links Statistics	189
Monitoring Hot Links Information	190
How to Monitor 802.1x/p Information	191
Monitoring 802.1x General Information	191
Monitoring 802.1p—Priority COSq Information	191

Monitoring Port Priority Information	191
How to Monitor ECP (Edge Control Protocol) Information	192
Viewing ECP (Edge Control Protocol) Channel Information	192
How to Monitor LACP (Link Aggregation Control Protocol) Information	193
Monitoring Port—LACP Statistics	193
Monitoring Port—LACP Aggregator Information	194
Monitoring Port—LACP Port General Information	194
Monitoring Port—LACP Port Administrator Information	196
Monitoring Port—LACP Port Operator Information	197
How to Monitor IP Routing	199
Monitoring IP Routing—IP Interface Statistics	199
Monitoring IP Routing—Interface Information	200
Monitoring IP Routing—TCP Statistics	201
Monitoring IP Routing—TCP Connections	202
Monitoring IP Routing—UDP Statistics	203
Monitoring IP Routing—UDP Information	203
Monitoring IP Routing—IP Statistics	203
Monitoring IP Routing—ICMP In Statistics	205
Monitoring IP Routing—ICMP Out Statistics	206
Monitoring IP Routing—DNS Statistics	207
Monitoring IP Routing—Routes	208
Monitoring IP Routing—Routes Standard	208
Monitoring IP Routing—Routes Statistics	209
Monitoring IP Routing—IPv6 Routes	209
Monitoring IP Routing—ARP	210
Monitoring IP Routing—ARP Statistics	211
Monitoring IP Routing—IPv4 Information	211
Monitoring IP Routing—IPv6 Information	211
Monitoring IP Routing—IPv4 Management Embedded Interface Information	212
Monitoring IP Routing—Gateway Information	212
Monitoring IP Routing—Gateway IPv6 Information	212
Monitoring IP Routing—IP Address Information	213
Monitoring IP Routing—IPv6 Path Maximum Transmission Unit Information	213
How to Monitor BGP Routing	214
Monitoring BGP Routing—BGP Peers Summary	214
Monitoring BGP Routing—BGP Routing Table	215
How to Monitor RIP Routing	216
Monitoring RIP Routing—RIP V2 Statistics	216
Monitoring RIP Routing—RIP Route Information	217
How to Monitor OSPF Routing	218
Monitoring OSPF Routing—General OSPF Statistics	218
Monitoring OSPF Routing—OSPF Area Statistics	221
Monitoring OSPF Routing—OSPF Area Neighbor Statistics	222
Monitoring OSPF Routing—OSPF Area Interface Statistics	223
Monitoring OSPF Routing—OSPF Area Receive Error Statistics	224
Monitoring OSPF Routing—OSPF Area Interface Receive Error Statistics	225
Monitoring OSPF Routing—OSPF Interface Change Statistics	225

Monitoring OSPF Routing—OSPF Interface Transmission Statistics	226
Monitoring OSPF Routing—OSPF Interface Neighbor Statistics	227
Monitoring OSPF Routing—OSPF Area Information	228
Monitoring OSPF Routing—OSPF Interface Information	228
Monitoring OSPF Routing—OSPF Neighbor Interface Information	230
Monitoring OSPF Routing—OSPF Virtual Interface Information.	230
Monitoring OSPF Routing—OSPF Stats2 Information	231
Monitoring OSPF Routing—OSPF Link-State DB Information.	232
Monitoring OSPF Routing—OSPF External Link-State DB Information.	232
Monitoring OSPF Routing—OSPF Summary Range Information	233
Monitoring OSPF Routing—OSPF Routes Information	233
Monitoring OSPF Routing—OSPF Loopback Information	234
How to Monitor OSPFv3 Routing	236
Monitoring OSPFv3 Routing—General Statistics	236
Monitoring OSPFv3 Routing—OSPFv3 Area Statistics	239
Monitoring OSPFv3 Routing—OSPFv3 Area Neighbor Statistics.	240
Monitoring OSPFv3 Routing—OSPFv3 Area Interface Statistics	241
Monitoring OSPFv3 Routing—OSPFv3 Area Error Statistics	241
Monitoring OSPFv3 Routing—OSPFv3 Interface Transmission Statistics	243
Monitoring OSPFv3 Routing—OSPFv3 Interface Neighbor Statistics	244
Monitoring OSPFv3 Routing—OSPFv3 Interface Change Statistics.	245
Monitoring OSPFv3 Routing—OSPFv3 Area Interface Error Statistics	245
Monitoring OSPFv3 Routing—OSPFv3 General Information	246
Monitoring OSPFv3 Routing—OSPFv3 Area Information.	248
Monitoring OSPFv3 Routing—OSPFv3 Interface Information	248
Monitoring OSPFv3 Routing—OSPFv3 Routes Information.	250
Monitoring OSPFv3 Routing—OSPFv3 Neighbor Interface Information	250
Monitoring OSPFv3 Routing—OSPFv3 Virtual Interface Information	251
How to Monitor Multicast Listener Discovery	252
Monitoring MLD—General Statistics	252
Monitoring MLD—Query Statistics	252
Monitoring MLD—Report Statistics	253
Monitoring MLD—CR Statistics.	254
Monitoring MLD—Groups Information	255
Monitoring MLD—MRouters Information	256
Monitoring MLD—Interface Information.	256
How to Monitor IGMP Routing.	258
Monitoring IGMP Routing—IGMP Information.	258
Monitoring IGMP Routing—Multicast Router Information	258
Monitoring IGMP Routing—IGMP Snooping Statistics.	259
How to Monitor Virtual Routing	261
Monitoring Virtual Routing Statistics	261
Monitoring Virtual Routing State	262
Monitoring Number Statistics.	262
Monitoring Number Information	263
How to Monitor Access Control Lists	264
Monitoring ACL Statistics	264
Monitoring ACL Port Statistics	264
Monitoring MAC ACL Statistics.	264

Monitoring IP ACL Statistics	265
Monitoring ACL6 Statistics.	265
How to Monitor Fiber Channel over Ethernet (FCoE)	266
Viewing FCoE FC Port Information	266
Viewing FCoE FC Database Information	267
Viewing Fabric DataBase Information	267
Viewing FCoE Link State Database Information.	267
Viewing FCoE Steering Database Information	268
Viewing FCoE Domain Information	269
Viewing Fabric Login Database Information	269
Viewing FCS Database Information	270
Viewing Topology Database Information	270
Viewing FC Switch WWN Information	270
Viewing FC Name Server Database Information	270
Viewing FC Fabric Login Database Database Information	271
Viewing FC Domain Database Information.	271
Viewing FCS Interconnect Information	272
Viewing FC Registered State Change Notification Information	273
Viewing FCF Port Information	273
Viewing FC Zoning Status Information	273
Viewing FC Name Server Database Statistics	274
Viewing FC Fabric Device Management Interface Statistics.	275
Viewing FC FCS Statistics	275
Viewing FC Registered State Change Notification Statistics.	276
Viewing FC FCoE Forwarder Notification Statistics	276
Viewing FIP Snooping Port Information	277
Viewing FIP Snooping Statistics	278
Viewing FIP Snooping Information	278
Viewing FIP Snooping FCF Detected Information	278
Viewing FIP Snooping FCoE Connections Detected Information	279
Viewing FIP Snooping VLAN Information	279
How to Monitor QoS Information	280
Monitoring QoS Counters	280
How to Monitor Virtualization	281
Viewing VMready Port Information.	281
Viewing VMready VM Information	282
How to Monitor Edge Virtual Bridging (EVB)	283
Viewing VDP TLV (VSI Discovery Protocol Type-Length-Value) Information.	283
Viewing VSI (Virtual Station Interface) Information	283
Viewing VM Information	284
Viewing VSI DB Information	284
Viewing VSI DB ACL Information	285
How to Monitor Unified Fabric Port Information	287
Monitoring CDCP Information	287
Monitoring Port Information	287
Monitoring QoS Information	288
Monitoring TLV Information	288
Monitoring VLAN Information	288

Monitoring Virtual Port Information	289
How to Monitor SDN-VE Gateway Information	290
Monitoring SDN-VE ARP Information	290
Monitoring SDN-VE Connectivity Service EndPoint Information	290
Monitoring SDN-VE Connectivity Service Server Information	291
Monitoring SDN-VE Connectivity Service Tunnel Information	291
Monitoring SDN-VE Connectivity Service Statistics	292
Monitoring SDN-VE Management Console General Information	292
Monitoring SDN-VE Management Console Forward Rules	293
Monitoring SDN-VE Management Console IP Interface	293
Monitoring SDN-VE Management Console Subnet	294
Monitoring SDN-VE Management Console VNID-VLAN Mapping	294
Monitoring SDN-VE Network Address Translation Rules	294
How to Monitor Stacking Information	296
Monitoring Stack/Fabric Information	296
Monitoring Stack/Fabric Link Information	296
Monitoring Stack/Fabric Push Status Information	297
Monitoring Stack/Fabric Trunk Information	297
Monitoring Stack/Fabric Path Information	297
Monitoring Stack/Fabric Port Number Mapping Information	298
Monitoring Stack/Fabric Master Switch Information	298
Monitoring Stack/Fabric Backup Switch Information	299
Monitoring Stack/Fabric Configured Switches Information	299
Monitoring Stack/Fabric Attached Switches Information	300
Monitoring Stack/Fabric Current Settings Information	300
Monitoring Stack/Fabric Management Interface Information	301
How to Monitor iSwitch Information	302
Viewing Port Information	302
Viewing Host Uplink Information	302
How to Launch a Chart	303
How to Export a Statistical Summary	305
Administering Exported Files	305
How to Print a Statistical Summary	307
Chapter 6. Configuring the Switch	309
Configuration Steps	311
Editing in Form Pane	311
Editing in Tabular Pane	312
Selection Windows	312
Submitting and Applying Changes	313
About Various Configure Tabs	313
General Switch Configuration	314
General Configuration	314
Software Image Configuration	316
Syslog Hosts Configuration	318
Levels of Severity	320
SNMP Trap Settings	321
SNMP Trap Hosts	322
Syslog Settings	323

General RADIUS Configuration	324
RADIUS Server Configuration	325
General TACACS+ Configuration	327
TACACS+ Server Configuration	328
TACACS+ User Map Configuration	330
TACACS+ Command Authorization Configuration	330
LDAP Server Configuration	330
Network Time Protocol Configuration.	331
NTP MD5 Key Configuration.	332
Management Network Configuration	333
Port Mirroring Configuration.	333
Internal VLAN Configuration	334
Configuration, Image, and Dump Control	334
USB Copy	337
Configuring Access Users	338
Configuring Access User.	338
Configuring Layer 2 Protocols	339
General Layer 2 Protocol Configuration	339
Configuring Trunks.	340
Trunk Hash Configuration	340
Trunk Groups Configuration	341
LACP Trunk Group Configuration	341
Configuring LACP	343
LACP General Configuration.	343
LACP Ports Configuration	344
Configuring 802.1x	345
General 802.1x Configuration.	345
Global 802.1x Configuration	345
Guest VLAN Configuration	346
Port Configuration	346
Configuring MSTP and RSTP	348
MSTP/RSTP Configuration.	348
Configuring CIST.	349
CIST Bridge Configuration	349
CIST Port Configuration	350
Configuring Spanning Tree Protocol	351
Spanning Tree Configuration.	351
STP Groups Configuration	353
STG Port Configuration	354
Configuring Forwarding Database	355
FDB General Configuration	355
FDB Static Configuration	356
FDB Static Multicast Configuration	356
Configuring Virtual Link Aggregation Groups	357
General Configuration.	357
Health Check Configuration	358
Trunk Configuration	358
LACP Configuration	358
Inter-Switch Link (ISL) Configuration	359

Configuring Hot Links	360
Hot Links General Configuration	360
Hot Links Triggers Configuration	360
Configuring Virtual LANs	362
VLAN Memberships Configuration	362
Private VLAN Configuration	363
Protocol VLAN Configuration	363
VMAP Configuration for Non-Server Ports	365
VMAP Configuration for Server Ports	365
VMAP Configuration for All Ports	365
Configuring Link Layer Discovery Protocol (LLDP)	366
LLDP General Configuration	366
LLDP Port Configuration.	366
Port Global TLV State	367
Configuring Failover	369
General Configuration	369
Triggers Configuration.	369
Configuring Active Multipath Protocol (AMP)	371
General Configuration	371
Group Configuration	371
Configuring Edge Control Protocol (ECP)	373
ECP General Configuration.	373
Configuring IP Interfaces	374
IP General Configuration.	374
IP Interfaces Configuration	374
IP Forwarding Configuration	375
Network Filters Configuration	375
Loopback Interfaces Configuration	376
Static ARP Configuration.	376
Floating IPv4 Configuration	376
Floating IPv6 Configuration	377
IPv4 Interface Configuration	377
IPv6 Interface Configuration	377
Stacks Unit Management Interface Configuration	378
Configuring Gateways	379
Gateways Configuration	379
IPv4 Data Gateway Configuration.	379
IPv6 Data Gateway Configuration.	380
IPv4 Management Gateway Configuration	380
IPv6 Management Gateway Configuration	381
Stacks Unit Management Gateway Configuration	381
Configuring Routes	382
General Configuration	382
IPv4 Static Routes Configuration	382
IPv6 Static Routes Configuration	383
IPMC Ports Configuration	383
IPMC Trunks Configuration	384
IPMC Adminkeys Configuration	384
Configuring RMAPs	386

General Configuration	386
Access List Configuration	386
AS-Path Access List Configuration	387
Configuring RIP	388
General Configuration	388
RIP Interface Configuration	388
Static Route Redistribute Configuration	389
BGP External Route Redistribute Configuration	389
BGP Internal Route Redistribute Configuration	390
Fixed Route Redistribute Configuration	390
OSPF Route Redistribute Configuration	390
OSPF External Route Redistribute Configuration	391
Configuring OSPF	392
OSPF General Configuration	392
OSPF Area Configuration	393
OSPF Interface Configuration	394
OSPF Summary Range Configuration	395
OSPF Virtual Interface Configuration	396
OSPF Host Table Configuration	397
OSPF Static Route Redistribution Configuration	397
OSPF Fixed Route Redistribution Configuration	398
OSPF RIP Route Redistribution Configuration	398
OSPF MD5 Key Configuration	399
OSPF Loopback Interface Configuration	399
OSPF BGP External Route Redistribute Configuration	399
OSPF BGP Internal Route Redistribute Configuration	400
Configuring OSPFv3	401
OSPFv3 General Configuration	401
OSPFv3 Area Configuration	402
OSPFv3 Host Table Configuration	403
OSPFv3 Neighbor Table Configuration	403
OSPFv3 Interface Configuration	404
OSPFv3 Virtual Interface Configuration	405
OSPFv3 Summary Range Configuration	406
OSPFv3 External Range Configuration	407
OSPFv3 Route Redistribution Configuration	407
OSPFv3 Connected Route Configuration	408
OSPFv3 Static Route Configuration	409
Configuring MLD	410
MLD General Configuration	410
MLD Interface Configuration	410
Configuring BGP	411
General Configuration	411
Peer Configuration	411
Peer Redistribution Configuration	413
Aggregation Configuration	414
Group Configuration	414
Group Redistribution Configuration	415
Configuring IGMP	416

General Configuration	416
Snooping Configuration	417
IGMPv3 Snooping Configuration	417
Static Multicast Router Configuration	418
Relay Configuration	418
Relay Multicast Router Configuration	419
Filter Configuration	419
Filter Ports Configuration	419
Advanced Configuration	420
Querier Configuration	420
Configuring DNS	422
DNS Server Configuration	422
Configuring Bootp-Relay	423
General Configuration	423
Server Configuration	423
Broadcast Domain Configuration	424
Broadcast Domain Server Configuration	424
Option82 Configuration	424
Configuring Flooding	425
VLAN Flooding Configuration	425
Configuring VRRP	426
VRRP General Configuration	426
VRRP Virtual Router Configuration	427
VRRP Virtual Interface Configuration	428
VRRP Virtual Router Group Configuration	429
Configuring DHCP	430
Enabling or Disabling DHCP Snooping	430
DHCP Snooping VLAN Configuration	430
Configuring ARP	431
ARP Configuration	431
Static ARP Configuration	431
Configuring Ports	432
Port Properties Configuration	432
Ports General Configuration	433
Threshold Rate Configuration	434
Gigabit Link Configuration	434
Unidirectional Link Detection (UDLD) Configuration	435
Operations, Administration and Management (OAM) Configuration	435
ACL Configuration	436
STP Configuration	436
Port Priority Configuration	437
Unicast Bandwidth Configuration	437
Spanning Tree Protocol (STP) Configuration	437
DHCP Snooping Configuration	438
Reflective Relay Configuration	438
MAC Notification Configuration	438
Private VLAN Configuration	438
Port Map Configuration	439
Configuring QoS – WRED/ECN	440

General Configuration	440
WRED/ECN Port Configuration	440
WRED/ECN Port Profile Configuration	440
Unicast Bandwidth Configuration.	441
802.1p Port Configuration	441
Port Priority Configuration.	441
Port Priority CoS Configuration.	442
CoS Weight Configuration	442
Port Multicast Priority CoS Configuration	442
Multicast CoS Weight Configuration	443
DSCP General Configuration	443
DSCP Configuration	443
Global Profile Configuration	444
Configuring ACLs	445
General ACL Properties Configuration	445
Adding an ACL	446
General ACL6 Properties Configuration	448
ACL6 IPv6 Configuration	448
ACL6 Meter Configuration.	449
ACL6 Re-mark Configuration	449
ACL6 TCP-UDP Configuration	450
ACL Groups Configuration	451
ACL Block Configuration	451
Management ACL Configuration	451
ACL Log Configuration	453
ACL VMAPs Configuration	453
Adding VMAPs to an ACL	455
MAC ACL Configuration	458
IP ACL Configuration	459
Configuring CEE (Converged Enhanced Ethernet)	461
CEE General Configuration	461
Priority Allocation Configuration	461
Bandwidth Allocation Configuration	461
PFC (Priority Flow Control) Configuration	462
PFC Status Configuration	462
Port PFC Configuration	462
Port PFC Status Configuration	462
DCBX (Data Center Bridging Capability Exchange) Protocol Configuration	464
Configuring Multicast Priority	465
Configuring Multicast Bandwidth Allocation.	466
Configuring FCoE (Fiber Channel over Ethernet)	467
FCoE Alias Configuration	467
FCoE Alias Member Configuration	467
FCoE Zone Configuration	468
FCoE Zone Member Configuration	468
FCoE ZoneSet Configuration	469
FCoE ZoneSet Member Configuration	469
FCoE Active ZoneSet Configuration.	470
FCoE Optimization Configuration	470

FCoE Ports Configuration	470
FCoE Global Configuration.	470
FCoE FC Interface Configuration	471
FCoE FCF Configuration	471
FCoE NPV Configuration	472
FIP Snooping Configuration	473
FIP Snooping Port Configuration	473
Configuring Switch Partition	474
SPAR IDs Configuration	474
SPAR Local Domains Configuration	474
Configuring Virtualization	476
General VM Configuration	476
VMware vCenter Configuration.	477
VM Profiles Configuration	478
VM Groups Configuration	479
VM Policy Configuration.	480
VM Ready Configuration	480
VMware vCenter Access Configuration	481
VM Profiles Configuration	481
VM Groups Configuration	482
VM Policy Configuration.	482
VM Check Configuration.	483
VM Hello Configuration	483
VM Ports Configuration	484
Virtual Machines Configuration.	484
VM Advanced Pre-Provisioning.	485
VM Organizationally Unique Identifier MAC	486
VM OUI Configuration	487
vNIC General Configuration	487
vNIC Port Configuration	487
vNIC Group Configuration.	487
EVB General Configuration.	488
EVB Profiles Configuration.	489
VSI DB Host Configuration.	489
Configuring iSwitch Virtual Data Station	490
vCenter Configuration	490
Virtual Data Station Configuration	490
Configuring Unified Fabric Port (UFP).	491
UFP General Configuration.	491
UFP Ports Configuration	491
UFP Virtual Ports Configuration	491
Configuring an SDN-VE Gateway.	493
SDN-VE General Configuration.	493
SDN-VE Management Console Configuration.	493
Configuring Stacking	494
Stack/Fabric Configuration	494
Stack/Fabric Switch Naming and Pre-Configuration	494
Stack/Fabric Switch Binding Settings.	495
Stack/Fabric Switch Backup Settings	495

Next Reboot Switch Settings	495
Stack/Fabric Boot Switch Configuration	496
Chapter 7. VMready Across the Datacenter Wizard	497
Configuring VMready Across the Datacenter Wizard	498
Step 2: Select VMready Switches	500
Step 3: Define the VM Management Server	502
Step 4: Select Hypervisors	503
Step 5: Configure VM Groups	505
Step 6: Configure Virtual Machines	507
Step 6.1: Pre-Provisioned VM MAC	508
Step 6.2: Add VMs Learned or Retrieved	509
Step 7: VMAPs	510
Step 7.1: Configure VMAPs.	510
Step 7.2: Add VMAP Configuration	513
Step 7.3: Deploy VMAP Configuration	515
Step 8: Configure Server Ports	516
Step 8.1: Configuring Server Ports	517
Step 9: Configure Switch-Specific Settings	518
Step 9.1: Modifying Switch-Specific Settings	519
Step 10: Configure Port Groups	520
Step 10.1: Modify Port Group Settings	522
Step 11: Associate Port Group to a vSwitch	522
Step 12: Review and Deploy the Configuration	523
Step 12.1: Deploying the VMready Configuration	524
Chapter 8. Centralized VSI Database	527
VSI Database Overview	528
How to Configure VSI DB from the VSI DB Console	529
VSI ACL Configuration	529
VSI Type Configuration	531
How to Administer VSI Database Using RESTful APIs	533
VSI Types RESTful APIs	533
Access Control for RESTful APIs	534
XML Schema for VSI Types	535
VSI Types RESTful API Reference - Examples	538
GET Request to Retrieve VSI Types Configured with a Specific Version	539
GET Request to Retrieve an Individual VSI Type	542
GET Request to Retrieve All Configured VSI Types	544
POST Request to Create a VSI Type	548
PUT Request to Modify an Existing VSI Type	550
DELETE Request to Delete an Existing VSI Type	551
Chapter 9. Performing Device-Specific Actions	553
Synchronizing the Configuration - Sync Config.	554
VLAN and Port Synchronization	555
Global Actions	557
Launching Device Access Utilities	558
Launching the Web Interface.	558

Chapter 10. Maintenance	559
Taking SNSC's Critical Data Backup	560
Configuration Files	560
Database	560
Setting Backup Directory on System Networking Switch Center Server.	560
Initiating Critical Data Backup	561
Restoring the Data from the Critical Data Backup	562
Restoring the Data for System Networking Switch Center Installed on a Linux System.	562
Taking System Networking Switch Center Support Dump	563
Chapter 11. Manager of Managers	565
Manager of Managers Overview	566
Enabling the Manager of Managers Service.	567
Logging In to the Manager of Managers	568
About Manager of Managers Windows and Panels	569
Main Window	569
Instance View Window	569
Summary Panel.	570
Performing Actions in the Manager of Managers	572
Adding an Instance of System Networking Switch Center	572
Renaming an Instance of System Networking Switch Center	572
Deleting an Instance of System Networking Switch Center	573
Launching Switch Version Report	573
Launching System Networking Switch Center	574
Chapter 12. Using the Command Line Interface	577
Launching the CLI Shell	578
Using the CLI for Individual Command Execution	579
CLI Command Reference	580
options general	581
options refresh	581
options security.	582
options purge.	583
options logfile	583
options data_collection	584
options cli_conf.	584
options dial_home	585
options vm	587
show	589
device add	591
device delete	594
device import.	595
device export.	596
reports event	596
reports svr	597
reports vmr	598
stats acl	598
stats bridge.	599
stats port.	599

stats routing	601
stats switch	605
stats virtual_routing.	606
info 8021.	607
info bridge	607
info hotlinks	609
info port	609
info routing	609
info stack_general.	613
info stack_switch	614
info switch.	615
info virtual_routing	616
firmware apply.	616
firmware backup	617
firmware conf_backup.	620
firmware conf_upload.	623
firmware config_dump	625
firmware diff_config	625
firmware diff_flash	625
firmware panicdump	626
firmware reset	629
firmware save	629
firmware tsdump	631
firmware upload	634
data backup	636
support dump	636
Appendix A. Externally Launching Switch Center	637
List of Page IDs	638
Appendix B. Integrating with Tivoli Network Manager.	647
Requirements	647
Step 1: Generate Signer Certificate	647
Step 2: Create Key Store	650
Step 3: Configure SNSC for LIC & SSO.	650
Step 4: Create SNSC User Groups in IBM Tivoli Network Manager	651
Step 5: Edit IBM Tivoli Network Manager tools and menu configuration files .	654
Step 5.1: IBM Tivoli Network Manager – TNM Properties.	655
Step 5.2: IBM Tivoli Network Manager – Create SNSC Launch-In-Context	
Tools Files	655
Step 5.3: IBM Tivoli Network Manager – Create SNSC Launch-In-Context	
Menu File	656
Step 5.4: IBM Tivoli Network Manager – Update Global Launch-In-Context	
Menu File	657
Step 6: Re-login to IBM Tivoli Network Manager TIP GUI	658
Appendix C. Integrating with IBM Systems Director	659
Step 1: Create External App Launch Template File	659
Step 2: Register External App Launch Template File	664

Step 3: Configure Single Sign-On Credentials	664
Appendix D. Using Third-Party JDBC/ODBC Tools	669
Requirements	670
Task 1: EasySoft ODBC-JDBC Gateway – Configuring JVM	670
Task 2: EasySoft ODBC-JDBC Gateway – Configuring Data Source (DSN)	670
Task 3: ODBC Test Utility – Connecting to Data Source	671
Task 4: ODBC Test Utility – Retrieving the Data from the Database and Viewing	672

Chapter 1. Installing Switch Center

System Networking Switch Center allows you to administer and maintain switches through a Web browser interface.

- [“Installation Prerequisites” on page 24](#)
- [“Installing SNSC Manager” on page 27](#)
- [“Uninstalling System Networking Switch Center 8.1” on page 31](#)

Installation Prerequisites

- [“System Requirements” on page 24](#)
- [“Disk Storage Requirements” on page 24](#)
- [“Browser Requirements” on page 25](#)
- [“Switch Configuration Requirements” on page 25](#)
- [“General Requirements” on page 26](#)
- [“FTP/SFTP/TFTP Server Requirements” on page 26](#)

System Requirements

Lenovo System Networking Switch Center (SNSC) is a Web application that you install on a Linux or Windows system. The system must meet the following requirements:

Windows System Requirements

- Intel x86 32-bit or 64-bit system
- Windows Server 2008 or Windows Server 2012
- Minimum 1 GB RAM
- Minimum 800 MB free disk space during installation

Linux System Requirements

- Intel x86 32-bit or 64-bit system
- SUSE Linux Enterprise Server 10, SUSE Linux Server 11, Red Hat Enterprise Linux 6.1 for x86, or Red Hat Enterprise Linux 6.2 for x86
- Minimum 1 GB RAM
- Minimum 800 MB free disk space during installation
- If running on a 64-bit Red Hat system, the compatibility/legacy package containing glibc must be installed.

Disk Storage Requirements

Consider the following when you plan disk space for SNSC:

- The total number of discovered devices.
- The number of SNSC active UI sessions with a page monitoring/viewing performance data
- The number of days that you plan to store switch performance data and events in the SNSC database

Typically, you need to plan for the following amount of disk space:

- 1K per device.
- 5 MB per hour for each SNSC UI session monitoring performance data at 10 seconds frequency

- 1 MB for storing 5000 events (traps and syslogs) received from a device

Browser Requirements

SNSC is a Web application. You can log into SNSC from any system that supports the following browser versions:

- Microsoft Internet Explorer Version 8.x, 9.x, and 11.x
- Mozilla Firefox Version 10.x and 17.x
- Google Chrome Version 31

You must enable JavaScript on each browser.

Enabling JavaScript in Microsoft Internet Explorer

1. Open Microsoft Internet Explorer.
2. Click **Tools > Internet Options**.
3. Click **Security**.
4. Click the Internet icon.
5. Click **Custom Level**.
6. Scroll to **Scripting**.
7. Click **Enable Active Scripting**.
8. Click **OK**.

Enabling JavaScript in Mozilla Firefox

1. Open Mozilla Firefox.
2. Click **Tools > Options**.
3. Click **Content**.
4. Click **Enable JavaScript**.
5. Click **OK**.

Switch Configuration Requirements

Be sure that each switch that you plan to discover meets the following requirements.

- Ensure that SNMP access is enabled on the switch. See the *User Guide* documentation for the switch for information about how to enable SNMP access.
- Ensure that the switch is physically connected to the network.
- Ensure that the switch is turned on and receiving power.
- Ensure that the switch has a correct IP address.
- Ensure that the switch is not blocking access from the client IP address.

- Be sure that you can successfully ping the switch.
- If you plan to use the automatic switch discovery feature, you must configure the switches in either SNMPv1 or SNMPv2c.
- If you plan to use the manual discovery feature, you can configure the switch in SNMPv1 or SNMPv2c or v3.

General Requirements

- You must locate a copy of the SNSC 8.1 installation image.
- You must have an ID with administrator privileges on the server where you plan to install SNSC 8.1.
- SNSC 8.1 uses the following ports:
 - Port 40080 for HTTP
 - Port 40443 for HTTPs
 - Port 40999 for RMI Service

Ensure that no applications use the ports, or configure SNSC to use different ports.

SNSC 8.1 also uses the following standard ports:

- Port 162 for SNMP trap reception
- Port 514 for syslog reception

Ensure that no other applications use the ports in the list.

FTP/SFTP/TFTP Server Requirements

SNSC requires but does not install an FTP, SFTP, or TFTP server. You must provide and configure an FTP, SFTP, or TFTP server to perform any of the image and configuration management functions (see [“Configuring FTP/SFTP/TFTP Server Parameters” on page 79](#)).

Installing SNSC Manager

The instructions in this section explain how to install SNSC 8.1 on Linux or Windows systems.

Installing Lenovo System Networking Switch Center 8.1 on a Linux System

Note: The installers have the signature `8.1.x.x_install_lin.bin`. In the following procedures, `<installer>.bin` is used to indicate the signature being installed.

New Installation

1. Log in as root on the Linux system where you plan to install SNSC 8.1.
2. Download the SNSC 8.1 installer for Linux from the IBM Web site.
3. Run the installation script as follows:
`# <installer>.bin`
4. The SNSC 8.1 application will be installed in the following directory:
`/opt/ibm/SNSC`

The installer automatically starts SNSC services near the end of the installation process.

Prerequisite Library for 64-Bit Red Hat Installations

If the following error is displayed after you install Lenovo System Networking Switch Center on a 64-bit Linux system:

```
Starting System Networking Switch Center...ERROR!  
Currently JDK/JRE is installed on this system, whereas  
SNSC requires JDK/JRE 1.5 and above for running.
```

Follow these instructions to install a Linux library that enables Lenovo System Networking Switch Center (a 32-bit application) to run on a 64-bit system.

1. Log into the 64-bit Linux system as 'root'.
2. Install the following 32-bit support library which is part of Red Hat's optional compatibility/legacy package:

```
# yum install glibc.i686
```

3. Start Switch Center services:

```
# /opt/ibm/SNSC/bin/startup.bin
```

SNSC services are registered with the init process, which causes the services to start automatically when the Linux system starts.

Upgrading the Existing SNSC

1. Log in as root on the Linux system that includes the SNSC software you want to upgrade.
2. Download the SNSC 8.1 installer for Linux from the IBM Web site.
3. Run the installation script as follows:
`# <installer>.bin`
4. The installation prompts you to confirm whether to proceed with the upgrade. Enter **yes** to upgrade SNSC to version 8.1.

The installer automatically starts SNSC services near the end of the upgrade process.

Installing Lenovo Switch Center 8.1 on a Windows System

Note: The installers have the signature `8.1.x.x_install_win.exe`. In the following procedures, `<installer>.exe` is used to indicate the signature being installed.

New Installation

1. Log in as an administrator on the Windows system where you plan to install SNSC 8.1.
2. Download the SNSC 8.1 installer for Windows from the IBM site.
3. Double-click `<installer>.exe`
4. Click **Next**.
5. Select the typical installation option.
6. Click **Finish**.

The installer automatically starts SNSC services near the end of the installation process.

SNSC services are registered as Windows Services. Hence, they are automatically started when the Windows system starts up.

Upgrading the Existing SNSC

1. Log in as an administrator on the Windows system that includes the SNSC software you want to upgrade.
2. Download the SNSC 8.1 installer for Windows from the IBM site.
3. Double-click `<installer>.exe`
4. Click **Next**.
5. The installation program prompts you to confirm whether to proceed with the upgrade. Click **yes** to upgrade SNSC to version 8.1.
6. Click **Finish**.

The installer automatically starts SNSC services near the end of the installation process.

Verifying Installation

Prerequisite: Before you can verify installation, you must ensure that the SNSC 8.1 services are started on the server where SNSC is installed.

- To check if the SNSC services are running on Linux, login as 'root' and run the following shell script:
`# /opt/ibm/SNSC/bin/check.sh`
- To start SNSC services on Linux, login as 'root' and run the following shell script:
`# /opt/ibm/SNSC/bin/startup.sh`
- To check if the SNSC services are running on Windows, login as Administrator and choose menu **Start > All Programs > Lenovo > Switch Center > Check Services.**
- To start the services on Windows, login as Administrator and choose menu **Start > All Programs > Lenovo > Switch Center > Start Services.**

In this procedure you test the local browser connection on the server and verify that the three default users created by the installation program can log in successfully. For information about the privileges available to the default users, see [“Changing the Default Passwords” on page 37.](#)

1. Launch a browser.
 - a. If you are logged in to the server where you installed SNSC 8.1, enter one of the following:
 - o `http://localhost:40080/snc`
 - o `https://localhost:40443/snc`
 - b. If you are logging in to SNSC 8.1 from another computer, enter one of the following:
 - o `http://<hostname>:40080/snc`
 - o `https://<hostname>:40443/snc`

where `<hostname>` is the domain name or IP address of the server where you have installed Switch Center.

2. Enter admin/admin.
3. Verify that the home page displays.
4. Click **Logout.**
5. Enter oper/oper.
6. Verify that the home page displays.
7. Click **Logout.**
8. Enter user/user.
9. Verify that the home page displays.

10. Click **Logout**.
11. Make a note of the hostname where you installed SNSC. You will distribute the hostname to other administrators, operators and users.

Uninstalling System Networking Switch Center 8.1

The instructions in this section explain how to uninstall SNSC 8.1 on a Linux or Windows system.

- [“Uninstalling System Networking Switch Center 8.1 on Linux” on page 31](#)
- [“Uninstalling System Networking Switch Center 8.1 on Windows” on page 31](#)

Uninstalling System Networking Switch Center 8.1 on Linux

1. Log in as root on the system where you have installed SNSC 8.1.
2. Uninstall SNSC 8.1 by issuing the following command:
`# /opt/ibm/SNSC/uninstall/uninstall.sh`

Uninstalling System Networking Switch Center 8.1 on Windows

1. Log in as administrator on the system where you have installed SNSC 8.1.
2. Uninstall SNSC 8.1 by clicking **Start > Programs > Lenovo > Switch Center > Uninstall SNSC**.
3. You can also uninstall SNSC 8.1 by clicking **Start > Settings > Control Panel > Add or Remove Programs**. Select **SNSC – 7.x.x.x** and click **Change/Remove**.

Chapter 2. Getting Started With SNSC 8.1

This chapter covers the following topics:

- [“Logging into Lenovo System Networking Switch Center” on page 34](#)
- [“Configuring SNSC Installed on a Multi-Homed System” on page 35](#)
- [“First Steps” on page 36](#)
- [“How to Discover Switches” on page 40](#)
- [“About the SNSC User Interface” on page 52](#)
- [“About the Device List Page” on page 56](#)
- [“VM Management Server – Connector Configuration and VMware Infrastructure \(VI\) Client Integration” on page 82](#)
- [“Dial Home Configuration” on page 86](#)
- [“How to View Information About Lenovo System Networking Switch Center” on page 90](#)
- [“How to View Logs” on page 92](#)
- [“Advanced Configuration and Tuning” on page 101](#)
- [“How to Manually Set Device Discovery Date” on page 107](#)

Logging into Lenovo System Networking Switch Center

Launch a browser and log in to Switch Center using one of the following:

- <http://<hostname>:40080/snsc>
- <https://<hostname>:40443/snsc>

where *<hostname>* is the domain name or IP address of the server where you installed Switch Center. If Switch Center is installed on a multi-homed system and is configured to use a specific IP address (see [“Configuring SNSC Installed on a Multi-Homed System” on page 35](#)), then *<hostname>* must be that IP address.

Enter `admin` in the User Name field and enter `admin` in the Password field the first time that you log in.

- [“Configuring SNSC Installed on a Multi-Homed System” on page 35](#)
- [“First Steps” on page 36](#)
- [“How to Discover Switches” on page 40](#)
- [“About the SNSC User Interface” on page 52](#)
- [“How to View Information About Lenovo System Networking Switch Center” on page 90](#)
- [“How to View Information About Lenovo System Networking Switch Center” on page 90](#)
- [“How to View Logs” on page 92](#)
- [“Advanced Configuration and Tuning” on page 101](#)
- [“How to Manually Set Device Discovery Date” on page 107](#)

Configuring SNSC Installed on a Multi-Homed System

If you are planning to install SNSC on a multi-homed system that has multiple IP addresses to connected networks, you may want SNSC to use a particular IP address of that system for all operations.

Configuring SNSC on a Windows System

You can configure SNSC to use a particular IP address using the following steps:

1. Log into the system as an administrator.
2. Stop the SNSC Service by choosing the start menu item:
Start > All Programs > Lenovo > Switch Center > Stop Services
3. Run `configure_multihome.bat` by issuing the following command:
C:\Program Files\IBM\SNSC\bin\configure_multihome.bat
4. This script prompts you to continue and then lists all the IP addresses configured on that system.
5. Choose the IP address that you want SNSC to use (this step also requires a confirmation).
6. Once the operation is complete, start the SNSC Service by choosing the start menu item:
Start > All Programs > Lenovo > Switch Center > Start Services
7. SNSC listens on the given IP address for UI requests and it also uses the IP address for administering the devices.

Configuring SNSC on a Linux System

You can configure SNSC to use a particular IP address using the following steps:

1. Log into the system as a root user.
2. Stop SNSC Service by issuing the following command:
/opt/ibm/SNSC/bin/shutdown.sh
3. Run `configure_multihome.sh` by issuing the following command:
/opt/ibm/SNSC/bin/configure_multihome.sh
4. This script prompts you to continue and then lists all the IP addresses configured on that system.
5. Choose the IP address that you want SNSC to use (this step also requires a confirmation).
6. Once the operation is complete, start SNSC Service by issuing the following command:
/opt/ibm/SNSC/bin/startup.sh
7. SNSC listens on the given IP address for UI requests and it also uses the IP address for administering the devices.

First Steps

The first time that you log in to SNSC, complete the following steps. You must log in as an administrator to complete the steps.

1. Enable or Disable Root Users (see [“Enabling and Disabling Root Users” on page 36](#))
2. Change the default admin, oper and user passwords (see [“Changing the Default Passwords” on page 37](#)).
3. Discover switches (see [“How to Discover Switches” on page 40](#)).

Enabling and Disabling Root Users

By default, SNSC allows users who have administrator privileges to modify user passwords (Security Configuration) and change the authentication mechanism (Local or RADIUS or TACACS+ through Authentication Configuration). However, some deployments may want to enforce stricter access privileges for such operations. To address such deployments, SNSC allows users to enable a special privileged ‘root’ user. The root user brings in the following changes:

- When you enable root user mode, SNSC requires that you enter the root password before you can perform security and authentication configuration
- You cannot directly log in to SNSC as root. You must login with the normal Admin/Oper/User credentials and then enter root password while performing Security and Authentication Configuration.
- The default root password is root.
- The root user is disabled by default.

Enabling the Root User

Use the following procedure to enable the Root User.

1. Stop SNSC Service:

On a Linux system, issue the following command:
/opt/ibm/SNSC/bin/shutdown.sh

2. Navigate to the following directory:
<SNSC Installation Directory>/conf/auth
3. Open the following file in a text editor: `rootuser.properties`
4. Set `enabledRootUser` to **true**.
5. Start SNSC Service:

On a Linux system, issue the following command:
/opt/ibm/SNSC/bin/startup.sh

Disabling the Root User

Use the following procedure to disable the Root User.

1. Stop SNSC Service:

On a Linux system, issue the following command:

```
# /opt/ibm/SNSC/bin/shutdown.sh
```

2. Navigate to the following directory:
<SNSC Installation Directory>/conf/auth
3. Open the following file in a text editor: rootuser.properties
4. Set EnableRootUser to **false**.
5. Start SNSC Service:

On a Linux system, issue the following command:

```
# /opt/ibm/SNSC/bin/startup.sh
```

Changing the Default Passwords

The SNSC installation program creates three default users. The default user names and passwords are:

- admin/admin
- oper/oper
- user/user

If you are an administrator, you can log in to SNSC as each user type and change the default passwords to help improve system security.

- **Administrator**—Only administrators can make permanent changes to the switch that persist after a switch is rebooted. Administrators can access switch functions to configure and troubleshoot problems on the switch.
- **Operator**—Operators have the same capabilities as listed for User plus the ability to reboot switches. Operators cannot change the switch configuration, such as uploading images and configuration files.
- **User**—User interaction with the switch is completely passive; nothing can be changed on the switch. Users can display information that has no security or privacy implications, such as switch statistics and current operational state information.

Changing the Default Administrator Password

1. Login to SNSC.
2. Choose menu **Options > Security Configuration**.
3. Click **admin** in the **Modify Password For** list.
4. If Admin is mapped to root, enter the Admin password in the Admin Password field or enter the root password in the Root Password field.
5. Enter and re-enter the new administrator password.

6. Click **Modify**.
7. Test the new password:
 - a. Click **Logout**.
 - b. Enter admin in the User Name field.
 - c. Enter the updated administrator password.
 - d. Click **Login**.

Changing the Default Operator Password

1. Login to SNSC.
2. Choose menu **Options > Security Configuration**.
3. Click **oper** in the **Modify Password For** list.
4. If Admin is mapped to root, enter the Admin password in the Admin Password field or enter the root password in the Root Password field.
5. Enter and re-enter the new password for operator.
6. Click **Modify**.
7. Test the new password:
 - a. Click **Logout**.
 - b. Enter **oper** in the User Name field.
 - c. Enter the updated operator password.
 - d. Click **Login**.

Changing the Default User Password

1. Login to SNSC.
2. Choose menu **Options > Security Configuration**.
3. Click **user** in the **Modify Password For** list.
4. If **Admin** is mapped to root, enter the Admin password in the Admin Password field or enter the root password in Root Password field.
5. Enter the current administrator password in the Admin Password field.
6. Enter and re-enter the new user password.
7. Click **Modify**.

8. Test the new password:
 - a. Click **Logout**.
 - b. Enter user in the User Name field.
 - c. Enter the updated user password.
 - d. Click **Login**.

Changing the Default Root Password

Important: You can only perform this task if the Admin user is not mapped to the root user. See [“Enabling and Disabling Root Users” on page 36](#).

1. Log in to SNSC.
2. Choose menu **Options > Security Configuration**.
3. Click **root** in the **Modify Password For** list.
4. Enter the root password in the Root Password field.
5. Enter and re-enter the new root password.
6. Click **Modify**.

How to Discover Switches

SNSC has two switch discovery options. You can automatically discover switches via IP address or subnet range. You can also use the manual discovery method to add individual switches.

Domain and node configuration and administration is available only to the users login as an administrator (in case, if Root user is disabled) or to those users, who know 'root' password (in case, if Root user is enabled).

- “Using Auto Discovery” on page 40
- “Using Manual Discovery” on page 45
- “Importing Device Lists from a CSV File” on page 46
- “Exporting a Discovered List of Switches to a CSV File” on page 50
- “Troubleshooting Switch Import and Discovery Problems” on page 50

Using Auto Discovery

Use this switch discovery process to add more than one switch at a time to the SNSC system. The Auto Discovery Configuration window displays the configuration parameters that SNSC uses to find switches when you start the Auto Discovery operation. You must configure the switches in either SNMPv1 or SNMPv2 to use the auto-discovery feature.

Choose menu **Options > Discovery > Discovery Configuration** to open the Auto Discovery Configuration window (see [Figure 1 on page 40](#)).

Figure 1. Auto Discovery Configuration Window

Filter Type	From Address	To Address	Read Community	Write Community	Timeout	Retries
Include Address Range	10.241.107.32	10.241.107.32	public	private	3	1

You can perform the following auto discovery configuration tasks:

- Modify global configuration parameters
- Print global configuration and range summary values
- Modify or delete an existing configuration

- Insert a configuration

Table 1. *Auto Discovery Configuration field descriptions*

Field	Description
Period Between Rescan	The delay, in seconds, after which the Auto-Discovery process is activated to re-scan the configured IP address and subnet ranges. The default value is 18000 seconds (5 hours).
Timeout	The timeout value, in seconds. The timeout value controls how long SNSC waits for a response from a switch during auto-discovery. You can specify a timeout while configuring auto-discovery parameters. If you do not specify a timeout, SNSC uses the global timeout value. Note: This timeout value is applicable to both ICMP and SNMP requests sent during auto discovery.
Retries	The number of retries that you want SNSC to attempt during auto-discovery. You can specify the number of retries while configuring auto-discovery parameters. If you do not specify a retry interval, SNSC uses the global retries value. Note: The Retries is applicable only to SNMP requests sent during auto discovery. For ICMP, no retries are attempted.
Filter Type	Lists whether the entry is to be included (Include Address Range) or excluded (Exclude Address Range) while performing discovery operation.
From Address	Starting IP address of the range.
To Address	Ending IP address of the range.
Read Community	SNMP v1/v2c read-community password.
Write Community	SNMP v1/v2c write-community password.
Timeout	The timeout value, in seconds. The timeout value controls how long SNSC waits for a response from a switch during auto-discovery. You can specify a timeout while configuring auto-discovery parameters. If you do not specify a timeout, SNSC uses the global timeout value.
Retries	The number of retries that you want SNSC to attempt during auto-discovery. You can specify the number of retries while configuring auto-discovery parameters. If you do not specify a retry interval, SNSC uses the global retries value.
Root Password	Allows you to enter the root password. When the 'Root' user is enabled, the discovery configuration window can be launched by all users. However, the operations are allowed only when user enters the valid Root password. Note: This field is visible only when Root user is enabled.

Auto Discovering Switches in a Subnet Range

You can configure SNSC to automatically discover switches by searching for a specified subnet or subnet mask range.

1. Choose menu **Options > Discovery > Discovery Configuration**.
2. If Root user is enabled, enter the root password.
3. Click **Insert**.

4. Select **Include Address Range - Subnet** from the Filter Type list (see [Figure 2 on page 43](#)).
5. Enter the subnet information in the Subnet and Subnet Mask fields. The IP subnet range must include less than 256 IP addresses.
6. If required, change the default community strings entered in the Read Community and Write Community fields. The default strings are public and private respectively. These settings apply to SNMP version 1 or 2 access.
7. (Optional) Enter a subnet range to exclude from the Auto Discovery process.
 - a. Click **Insert**. The Auto Discovery dialog box reopens.
 - b. Select **Exclude Address Range - Subnet** from the Filter Type list.
 - c. Enter the subnet information to exclude in the Subnet and Subnet Mask fields.
 - d. Click **Insert**. The Exclude Address Range appears in the Auto Discovery Configuration window.
8. Click **Insert**.
9. Click **OK** to close the Auto Discovery information message. SNSC begins to discover switches according to the values you defined for the subnets and masks.

Click **Close** to close the Auto Discovery Configuration window. Choose menu **Logs > Auto Discovery Log** to view the status of the Auto Discovery process.

Figure 2. Auto-Discovery Configuration by Subnet Range Window

Auto Discovery Configuration - Insert

Filter Type: Include Address Range - Subnet

(Maximum Include Address Range is 256 addresses)

Subnet:

Subnet Mask/Prefix:

From:

To:

specify other information

General

SNMP Version: SNMPv1

Timeout: 3 1..300

Retries: 1 1..5

SNMPv1/2c

Read Community:

Write Community:

SNMPv3

User Name:

Authentication Protocol: NONE

Authentication Password:

Privacy Protocol: NONE

Privacy Password:

Insert Close

See also:

- [“Auto Discovering Switches by IP Address”](#) on page 43
- [“Using Manual Discovery”](#) on page 45
- [“Troubleshooting Switch Import and Discovery Problems”](#) on page 50
- [“How to View Logs”](#) on page 92

Auto Discovering Switches by IP Address

You can only use this feature for switches that are configured in SNMPv1 or SNMPv2.

1. Choose menu **Options > Discovery > Discovery Configuration**.
2. If Root user is enabled, enter the root password.
3. Click **Insert**.
4. Select **Include Address Range - IP address range** from the Filter Type list (see [Figure 3 on page 45](#)).

5. Enter the IP address range in the *From* and *To* fields. The IP subnet range must include less than 256 IP addresses.
6. Type the appropriate community strings in the Read Community and Write Community fields. The default strings are public and private, respectively. These settings apply to SNMP version 1 or 2 access.
7. Click **Insert**.
8. (Optional) Enter an IP address range to exclude from the Auto Discovery process.
 - a. Click **Insert**.
 - b. Select **Exclude Address Range - IP Address Range** from the Filter Type list.
 - c. Enter the IP address range to exclude in the *From* and *To* fields.
 - d. Click **Insert**. The Exclude Address Range appears in the Auto Discovery Configuration window.
9. Click **Insert**.
10. Click **OK** to close the Auto Discovery information message.

SNSC begins to discover switches according to the values you defined for the IP address range.

Click **Close** to close the Auto Discovery Configuration window. Choose menu **Logs > Auto Discovery Log** to view the status of the Auto Discovery process.

After the SNSC service starts, the Auto Discovery program attempts discovery on all of the ranges that you entered. This is the only time when all ranges are discovered.

After you enter a new range, that range, and only that range, is discovered.

Figure 3. Auto-discovery Configuration by IP Address Range Window

Auto Discovery Configuration - Insert

Filter Type: Include Address Range - IP address range

(Maximum Include Address Range is 256 addresses)

Subnet:

Subnet Mask/Prefix:

From:

To:

specify other information

General

SNMP Version: SNMPv1

Timeout: 3 1..300

Retries: 1 1..5

SNMPv1/2c

Read Community:

Write Community:

SNMPv3

User Name:

Authentication Protocol: NONE

Authentication Password:

Privacy Protocol: NONE

Privacy Password:

Insert Close

Using Manual Discovery

Use this switch discovery process to add one switch at a time to the SNSC system.

1. Perform the manual discovery using one of the following steps:
 - a. Click **Add a Switch** in Summary Page or Main Page. This operation results in adding the newly discovered device under the Root node in the navigation tree.
 - b. In Main Page, right-click **Root** or a domain name in the left pane and click **Add a Switch**.
2. Type the IP address of the switch that you want to discover in the IP Address field (see [Figure 4 on page 46](#)).
3. If Root user is enabled, enter the root password in Root Password field (this field is not visible if Root user is disabled).
4. If you are discovering the switch configured with SNMPv1 or SNMPv2c:
 - a. Enter the correct read and write community strings in Read Community and Write Community fields respectively.
 - b. Click **Open**. SNSC begins the switch discovery process.

5. To discover a switch that is configured as SNMPv3:
 - a. Click **Use SNMPv3**.
 - b. Enter the user name in User Name field.
 - c. If Authentication is enabled on the switch (switch is configured in AuthNoPriv or AuthPriv), select the authentication protocol (**MD5** or **SHA1**) from Authentication Protocol list and enter the authentication password in Authentication Password field.
 - d. If Privacy is enabled on the switch (switch is configured in AuthPriv), select either **DES** or **AES** in the Privacy Protocol list and enter the privacy password in the Privacy Password field.
 - e. Click **Open**. SNSC begins the switch discovery process.

Figure 4. Manual Discovery Configuration Window

Importing Device Lists from a CSV File

SNSC's auto-discovery mechanism uses ICMP and SNMP to discover the devices. If you don't want to use auto-discovery or don't want to allow ICMP, then you can import the devices from a CSV (comma separated value) list. Importing the devices from the list saves precious time as you don't have to individually discover each devices using Manual Discovery option.

Note: The Import Device List window can import only devices that are Up and can be manually discovered by SNSC.

The following sections show the Device List CSV file format along with some samples:

File Format:

```
<each row> ::= <Device Address>[,<SNMP Data>]
```

```

<Device Address> ::= <IP Address> | <IP Address Range>
<SNMP Data> ::= [<Timeout>], [<Retries>], <SNMP Params>
<SNMP Params> ::= <SNMP Version>, { <SNMP v1/v2c Data> | <SNMP v3 Data> }
<SNMP Version> ::= v1 | v2c | v3
<SNMP v1/v2c Data> ::= <Read Community>, <Write Community>
<Read Community> ::= <Plain Text> | <Encrypted Text>
<Write Community> ::= <Plain Text> | <Encrypted Text>
<SNMP v3 data> ::= <User Name>,[<Authentication Info>, <Privacy Info>]
<Authentication Info> ::= { MD5 | SHA }, <Password>
<Privacy Info> ::= { DES|AES }, <Password>
<Password> ::= <Plain Text> | <Encrypted Text>

```

As we can see in the file format, the Device Address is mandatory and the SNMP Data information is optional. You can specify SNMP Data during import and this information is used as follows:

- If the row contains SNMP data, then it is used instead of the data specified during import.
- If the row doesn't contain SNMP data, then the information supplied during import is used.

Note: You can only specify Community Strings and Passwords in plain-text. When SNSC exports the device list, it saves the Community Strings and Passwords in encrypted form, which can only be deciphered by SNSC.

File Samples:

No SNMP Data:

```
192.168.1.10
192.168.1.20-192.168.1.24
192.168.20.100
...
```

With SNMPv1/v2 Data with plain-text community strings:

```
192.168.1.10,3,1,v1,public,private
192.168.1.20-192.168.1.24,5,2,v2c,public1,private1
192.168.20.100,3,1,v1,public2,private2
...
```

With SNMPv3 Data with plain-text passwords:

```
192.168.1.10,3,1,v3,ibm1 # NO_AUTH_NO_PRIV
192.168.1.20-192.168.1.24,5,1,v3,ibm2,MD5,adminmd5 #
AUTH_NO_PRIV
192.168.20.100,3,1,v3,ibm3,SHA,adminsha,DES,admindes # AUTH_PRIV
```

Importing the Device List

Choose menu **Discovery > Import Device List** to open the Import Device List window (see [Figure 5 on page 49](#)). To import the device list, perform the following steps:

1. Click **Browse...** and select the CSV file containing the import list.
 - If Root user is enabled, enter the correct root password in Root Password field (this field is not visible, in case, if Root user is disabled).
 - If one or more rows in the CSV file doesn't contain SNMP Data, you can specify the information by checking Specify Other Information check box and following the additional steps given below:
 - a. Select **SNMP Version**.
 - b. Enter the timeout value in seconds in Timeout field.
 - c. Enter the retries in Retries field.
 - d. If SNMP v1 or v2c is selected, Enter appropriate community strings in Read Community and Write Community fields.
 - e. If SNMP v3 is selected:
 - Enter user name in User Name field.
 - Select the authentication protocol from Authentication Protocol list.
 - If authentication protocol is not set to NONE, enter the authentication password in Authentication Password field.
 - Select the privacy protocol from Privacy Protocol list.
 - If privacy protocol is not set to NONE, enter the privacy password in Privacy Password field.
2. Click **Import** to import the list.

Figure 5. Import Device List Window



Table 2. Import Device List field descriptions

Field	Description
IP Address Ranges File	The CSV file containing the list of IP addresses of the switches to be discovered.
Root Password	The root password field. This field is visible if Root user is enabled.
Specify Other Information	Enables or disables SNMP specific fields.
SNMP Version	The SNMP version to use for those entries in CSV file that doesn't contain SNMP data.
Timeout	The timeout in seconds to use for those entries in CSV file that doesn't contain SNMP data. The range is 1 to 300 seconds.
Retries	The number of retries to use for those entries in CSV file that doesn't contain SNMP data. The range is 1 to 5.
Read Community	The Read Community to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv1 or SNMPv2c is selected in SNMP Version.
Write Community	The Write Community to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv1 or SNMPv2c is selected in SNMP Version.

Table 2. *Import Device List field descriptions (continued)*

Field	Description
User Name	The user name to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv3 is selected in SNMP Version.
Authentication Protocol	The authentication protocol to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when SNMPv3 is selected in SNMP Version.
Authentication Password	The authentication password to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only when Authentication Protocol is set to MD5 or SHA1.
Privacy Protocol	The privacy protocol to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only Authentication Protocol is set to MD5 or SHA1.
Privacy Password	The privacy password to use for those entries in CSV file that doesn't contain SNMP data. This field is enabled only Privacy Protocol is set to DES or AES.

Note: If the file containing the list of valid IP addresses to be discovered contains the IP address of a switch that has already been discovered, an error message is displayed, but the discovery of the other devices on the list continues. The error message contains the IP address and is logged in the discovery log (Discovery_Import.log).

Exporting a Discovered List of Switches to a CSV File

You can export the discovered switches along with SNMP data to a CSV file. You can import the CSV file into SNSC (see [“Importing Device Lists from a CSV File” on page 46](#)). To export the discovered switches:

1. Choose menu **Discovery > Export Device List**.
2. In the resulting dialog, select “Save File” option and click **OK**.
3. In the resulting file browser window, select the file, in which the contents to be saved.

Notes:

- While exporting the data, SNSC encrypts the Community Strings (in case of SNMPv1 or SNMPv2c) and Passwords (in case of SNMPv3). This can be decrypted only by SNSC during import.
- If SNMP data is not completely available, the associated SNMP data field is blank.

Troubleshooting Switch Import and Discovery Problems

Check the following items if SNSC displays an error message during switch discovery.

- In slower networks, increase the **Retry Count** and **Timeout** values on the Auto Discovery Configuration window. See [Table 1 on page 41](#) for more information.
- In the **Open Device** window, ensure that the correct read and write community strings have been entered for SNMP version 1 and 2 connections.

- In the **Open Device** window, ensure that the correct SNMP version 3 information has been entered for SNMP version 3 connections.
- Ensure that the switch is physically connected to the network.
- Ensure that the switch is turned on and receiving power.
- Ensure that the switch has been assigned a correct IP address.
- Verify that you entered the correct IP address is being used in the **Open Device** window.
- Ensure that the problem does not exist because of an unrelated network misconfiguration.
- Ensure that SNMP access is enabled on the switch. See the *User Guide* for the selected switch for information about how to enable SNMP access.
- Ensure that the switch is not blocking access from the client IP address.
- After the SNSC service starts, auto discovery attempts to discover switches using all of the ranges you entered. This is the only time when all ranges are discovered.
- After you enter a new range, that range, and only that range, is discovered.

For more information, see [“How to Discover Switches” on page 40](#)

Troubleshooting Multiple IP Addresses

Note the following items if SNSC displays an error message during switch discovery:

- If you try to add a switch that has already been discovered by SNSC but with a different IP address, an error message is displayed containing the IP address the device had when it was initially discovered and all the configured IP addresses of the switch.
- If you try to insert an IP address range containing the IP address of a switch that has already been discovered by SNSC, an error message is displayed and discovery is aborted. The message contains the IP address in the range you submitted, the IP address already discovered by the switch, and all configured IP addresses on the switch.
- If you submit an IP address range that contains the IP address of a switch that has already been discovered by SNSC, an error message is logged in the Discovery_Import log. However, discovery of the rest of the switches in the range continues, and no error message is displayed.

For more information, see [“How to Discover Switches” on page 40](#)

About the SNSC User Interface

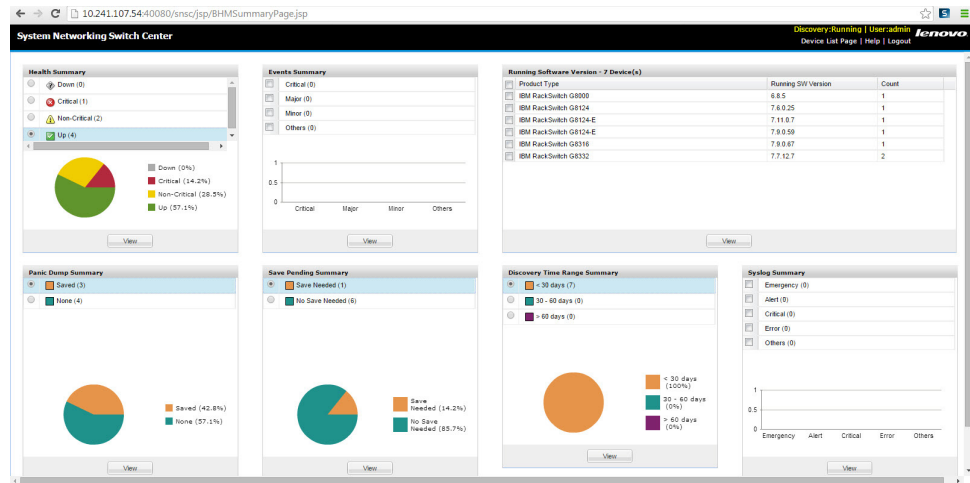
The following topics are discussed in this section:

- [“About the Home Page” on page 52](#)
- [“The Device List Pane” on page 57](#)
- [“The Domains Pane” on page 56](#)
- [“The Summary Status Pane” on page 56](#)
- [“The Device List Pane” on page 57](#)
- [“Device List Page – Menu Bar” on page 57](#)
- [“Device Menu” on page 58](#)
- [“Group Operations Menu” on page 59](#)
- [“Reports Menu” on page 61](#)
- [“Logs Menu” on page 62](#)
- [“Options Menu” on page 63](#)
- [“Help Menu” on page 65](#)
- [“About the Device Console Page” on page 65](#)
- [“Changing System Networking Switch Center Configuration” on page 70](#)
- [“Changing the Default Refresh Configuration Parameters” on page 71](#)
- [“Changing the Default Data Collection Configuration Parameters” on page 72](#)
- [“Changing the Default DB Data Purge Configuration Parameters” on page 74](#)
- [“Configuring Authentication” on page 75](#)
- [“Configuring FTP/SFTP/TFTP Server Parameters” on page 79](#)

About the Home Page

The SNSC home page gives a quick summary of the devices discovered. It provides a graphical representation of Health Status, Panic Dump, Events, Save Pending, Running Software Version, Device Discovery Timestamp, and Syslog message types, grouped into separate panels along with the device counts. (See [Figure 6 on page 53](#)). The information is updated periodically to give the actual counts and status of managed devices. It provides an option for the user to filter the devices available on the device list page based on the selection made here. Click **Add a Switch** to directly perform a manual discovery of switches for the SNSC system. The **Go to Device List Page** option lists all the devices discovered and does not perform any filtering.

Figure 6. SNSC Manager Home Page Example



Health Status Summary Pane

The Health Status pane shows the individual count of devices discovered that are Down (red), Critical (orange), Non-Critical (yellow) and Up (green). It also provides a pie chart that indicates the percentages of Down/Critical/Non-Critical/Up devices (See [Figure 7 on page 53](#)). You can filter out the devices depending on the Health Status by selecting the appropriate choice and clicking View, which takes you to the Device list page (See [Figure 8 on page 54](#)).

You can clear the selection any time by clicking on top of the device list to reset the filter and see the complete list of devices discovered.

Figure 7. Health Summary Pane

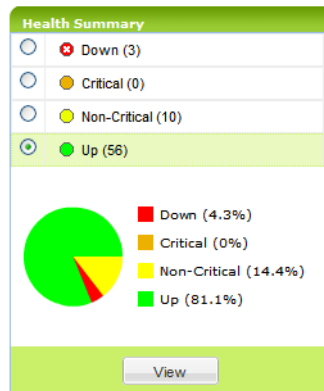
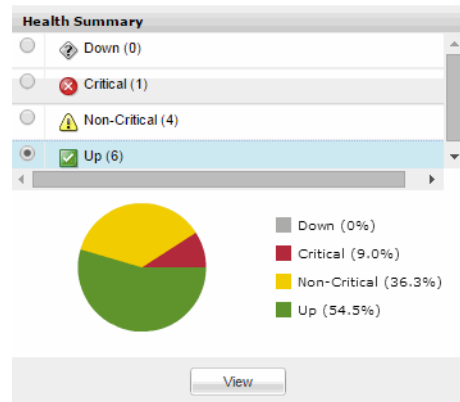


Figure 8. Filtered Device List Based on Health Status



Note: SNSC shows Critical and Non-Critical status for RackSwitches and BladeCenter switches.

For RackSwitches, SNSC directly gets the status information that indicates one or more of the following conditions:

Critical:

- One or more temperature sensors are in the failure range (e.g. ≥ 100 C).
- Fan Modules/Fans are not working properly, as follows:
 - RackSwitch G8000, RackSwitch G8100, RackSwitch G8124/G8124-E: One or more fans are running at less than or equal to 500 RPM
 - RackSwitch G8052: Fewer than 3 Fan Modules are in good state. A Fan Module is considered good if fans in that module are running at more than 500 RPM
 - RackSwitch G8264: Fewer than 4 Fan Modules are in good state. A Fan Module is considered good if fans in that module are running at more than 500 RPM
- One power supply is off.

Non-Critical:

- One or more temperature sensors are in the warning range (≥ 85 C and < 100 C).
- A panic dump exists in flash.

For IBM BladeCenter switches, SNSC assigns the status by combining the status of the following discreet variables on those switches:

Critical:

- One or more temperature sensors are in the failure range.

Non-Critical:

- One or more temperature sensors are in the warning range.
- A panic dump exists in flash.

Events Summary Pane

The Events Summary pane displays the number of events of each selected type that have occurred. You can select one or more of the following types of events to view:

- Critical
- Major
- Minor
- Others

It also provides a a graph that indicates the status of all devices. Click **View** to filter devices based on the status of their event type.

Running Software Version Summary Pane

The Running Software Version Summary categorizes the devices discovered by product type and running software version. You can filter the devices by product type and version by selecting one or more product types and clicking **View**.

Panic Dump Summary Pane

The Panic Dump Summary shows the count of discovered devices based on their panic-dump status, as follows:

- Devices that have a panic dump saved (yellow)
- Devices with no panic dump (green)

It also provides a pie chart that indicates the panic-dump status of all devices. Click **View** to filter devices based on the status of their panic dumps.

Save Pending Summary Pane

The Save Pending Summary shows the count of discovered devices based on their save status, as follows:

- Devices that have configuration saved (No Save Needed)
- Devices that do not have configuration (Save Needed)

It also provides a pie chart that indicates the saved status of all devices. Click **View** to filter devices based on their saved status.

Discovery Time Range Summary Pane

The Discovery Time Range Summary shows the count of discovered devices based on duration of discovery (the number of days elapsed since their discovery in SNSC). This Summary Pane also provides a pie chart that indicates the number of devices discovered in the given time range. Click **View** to filter devices based on their discovery date.

About the Device List Page

The SNSC Device List page consists of three framed windows with menu and filter bars. The left-hand frame has two sub-panes – Domains and Summary Status. The right-hand or center frame consists of a menu bar, filter bar, and the Device List pane.

The Domains Pane

The Domains pane displays the list of domains. By default, Switch Center is shipped with two domains:

- Root
- Non-IBM Devices

When the discovery information is imported from Tivoli Network Manager, the domains are created under Root and these domains maps to the Network Domains in Tivoli Network Manager.

The newly discovered devices imported from a CSV file are placed under Root domain.

The Non-IBM Devices domain serves as a place holder for listing non supported devices.

The Summary Status Pane

The Summary Status window displays information about the health status for all discovered switches.. The data in the Summary Status window is refreshed automatically.

The Summary Status Health column displays the count of discovered devices that are Up, Down, Critical and Non-Critical. If SNSC is able to send and receive SNMP messages to a device, the switch health is set as Up or else, the status is set as Down. For RackSwitches and IBM BladeCenter specific switches, SNSC can show additional status information (Critical and Non-Critical).

The Device List Pane

The Device List content pane displays the list of all the devices discovered in SNSC.

By default, the device list shows Product Name along with Favorite Icon and Notes flag, IP Address, System Name, Health Status, Save Pending and Running Software Version fields, while other fields such as Config For Next Reset, Discovery Date, MAC address, Location, Rack, Chassis, Module Bay, and Domain are hidden. You can enable SNSC to either show or hide any column by clicking the right corner of any column, then selecting Columns and then checking or clearing one or more columns to show or hide them.

The Health Status column shows the status as a combination of colored icon with appropriate text for better readability (see [Figure 9 on page 57](#)).

Figure 9. Device List Showing Health Status

Product Name	IP Address	System Name	Health Status	Save Pending	Running Software Version
IBM RackSwitch GB316	10.241.107.21		Up	save/needed	7.9.0.67
IBM RackSwitch GB332	10.241.107.23		Critical	noSave/needed	7.7.12.7
IBM RackSwitch GB124-E	10.241.107.26		Non-Critical	save/needed	7.11.0.7
IBM RackSwitch GB124-E	10.241.107.27	scosier_128	Down	save/needed	7.9.0.59

Stacked Switches

For easy recognition, the Device List displays stacked switches in a slightly different manner (see [Figure 10 on page 57](#)):

- The switches in the stack are grouped together in the device list with the same IP Address.
- The master switch shows the Product Name, whereas the other switches in the stack do not show this field. This distinction makes it easier to recognize the stack of switches.
- The health status of stacked switches (except the master switch) will show as either inStack or detached.

Figure 10. Device List Showing Stacked Switches

Product Name	IP Address	System Name	Health Status	Running Software Version	Chassis	Module Bay	Switch State	Switch Mode
Stack (3 devices)	9.43.93.47		Non-Critical	7.8.0.2	63161341...	7 (switch# 1)		
IBM Networking OS Virtual Fabric 10Gb Switch Module...	9.43.93.47				63161341...	10 (switch# 2)		
	9.43.93.47				63161341...	9 (switch# 3)		
	9.43.93.47				63161341...	8 (switch# 4)		
IBM RackSwitch GB264	9.43.101.37		Critical	0.0.0		-1 (switch# 1)		
	9.43.101.37					-1 (switch# 2)		
IBM Networking Operating System RackSwitch GB264...	9.43.101.236	SCSetup23	Critical	0.0.0		0 (switch# 1)		
	9.43.101.236		Non-Critical		d63da09b...	1 (switch# 3)		
	9.43.101.236		Non-Critical		47376eac...	4 (switch# 4)		

Device List Page – Menu Bar

The menu bar of the Device List page provides the global commands that can be invoked either on an individual device or a group of devices. The following table describes the main menu bar items.

Table 3. *Device List Page — Menu Bar Items*

Menu	Description
Device	This menu item is enabled only for individual device selection and provides commands for opening Monitor, Configure pages and for performing actions.
Group Operations	Provides commands associated with firmware and configuration deployment, reports and actions that can be invoked on an individual or a group of devices.
Reports	Displays various reports such as Events, Syslog, Alerts, Switch Version Report, VMready VM report associated with all the discovered devices.
Logs	Displays various log windows showing the messages logged by SNSC.
Options	Provides various windows to assist configuring SNSC properties.
Discovery	Provides various windows to assist Device Import operations from Tivoli Network Manager and CSV file.
Virtualization Tools	Provides the options for launching virtualization tools: VSI DB Console and VMready Across the Datacenter wizard.
Maintenance	Provides commands associated with SNSC maintenance operations such as Purging DB configuration, Log file configuration, Backing up critical data and creating Tech Support Dump.
Help	Provides commands for accessing online help and support options for SNSC.

Device Menu

The following table describes the Device List page **Device** menu commands:

Table 4. *Device List Page — Device Menu*

Sub-menu	Description
Monitor	This menu launches Device Console showing Monitor frame. The Monitor frame consists of multiple panels displaying various switch data and statistical information.
Configure	This menu is enabled only for few supported devices. When activated, it shows Device Console's configuration frame enabling privileged user to set various device parameters.
Sync Config	Opens the Sync Config frame that can be used for synchronizing switch configuration such as VLAN and Ports for other switches.
Set Discovery Date	Opens the Set Discovery Date dialog that can be used for manually setting the discovery date for the selected device/switch.
Change SNMP Parameters	Opens the Modify Discovery Parameters dialog that can be used for changing the SNMP parameters used by SNSC for managing the selected device/switch.

Table 4. *Device List Page — Device Menu (continued)*

Sub-menu	Description
Actions	<p>Provides a set of actions commands that can be invoked on the selected device. The following lists various commands:</p> <p><i>Apply</i> - Applies any changes that you have made to the switch configuration.</p> <p><i>Save</i> - Saves the current configuration to the flash memory.</p> <p><i>Diff Config</i> - Opens a window to display any pending configuration changes.</p> <p><i>Diff Flash</i> - Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch.</p> <p><i>Config Dump</i> - Opens a window to display a dump of the current switch configuration.</p> <p><i>Syslog Dump</i> - Opens a window to display the syslogs available on the switch.</p> <p><i>Revert</i> - Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings.</p> <p><i>Revert Apply</i> - Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings.</p> <p><i>Reboot Switch</i> - Reboots the switch by reloads and saving the current RAM memory.</p> <p><i>Delete</i> - Deletes the switch entry from SNSC device list.</p>
Launch	Provides the commands for launching the Browser Based Interface.

Group Operations Menu

The following table describes the Device List page **Group Operations** menu commands:

Table 5. *Device List Page — Group Operations Menu*

Sub-menu	Description
CLI Push	Opens a text window enabling the user to type-in CLI commands that can be invoked on the selected switch(es).
Collect Data From Device	Refreshes the device data by retrieving the information from the selected switch(es).
Switch Version Report	Displays the switch version report associated with the selected switch(es).

Table 5. *Device List Page — Group Operations Menu (continued)*

Sub-menu	Description
Transceiver Information Report	<p>Displays the transceiver information report associated with the selected switch(es).</p> <p>Transceiver Information is available only for those switches supporting 10G ports.</p>
VM Data Center Report	<p>Displays the VM Data Center report associated with VMready switches in the selected list of switch(es).</p>
Set Discovery Date	<p>Opens the Set Discovery Date dialog that can be used for manually setting the discovery date for the selected device(s)/switch(es).</p>
Deployment	<p>Provides a set of commands for performing various operations related to firmware and configuration deployment on the selected switch(es):</p> <p><i>Image Upgrade</i> – Uploads the selected firmware from the given FTP/SFTP/TFTP server on to the selected switch(es).</p> <p><i>Image Backup</i> – Backs up the firmware from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server.</p> <p><i>Configuration Upgrade</i> – Uploads the selected configuration file from the given FTP/SFTP/TFTP server on to the selected switch(es).</p> <p><i>Configuration Backup</i> – Backs up the configuration from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server.</p> <p><i>Panic Dump</i> – Downloads the panic dump from the selected switch(es) and stores them on the given FTP/SFTP/TFTP server.</p> <p><i>Tech Support Dump</i> – Generates the tech support dump on the selected switch(es) and stores them on the given FTP/SFTP/TFTP server.</p> <p><i>Scheduled Jobs</i> – Displays the window for viewing and cancelling the scheduled jobs.</p>

Table 5. *Device List Page — Group Operations Menu (continued)*

Sub-menu	Description
Group Actions	<p>Provides a set of actions commands that can be invoked on the selected switch(es). The following lists various commands:</p> <p><i>Apply</i> - Applies any changes that you have made to the switch configuration of the selected switch(es).</p> <p><i>Save</i> - Saves the current configuration to the flash memory on the selected switch(es).</p> <p><i>Reboot Switch</i> - Reboots the selected switch(es).</p> <p><i>Delete</i> - Deletes the selected switch entry/entries from SNSC device list.</p>
Notes	<p>Provides a set of commands associated with adding or removing notes:</p> <p><i>Add</i> - Opens up Notes dialog that can be used for adding notes for the selected device(s)/switch(es).</p> <p><i>Remove</i> - Removes the notes, if present, for the selected device(s)/switch(es).</p>

Reports Menu

The following table describes the Device List page **Reports** menu commands:

Table 6. *Device List Page — Reports Menu*

Sub-menu	Description
SNSC Alerts	Displays the list of alerts generated by SNSC.
Switch Version Report	Displays the switch version report of the switches.
Transceiver Information Report	Displays the transceiver information report associated with those switches supporting 10G ports.
VM Data Center Report	Displays the VM Data Center report associated with VMready switches.
VMready VM Report	<p>Provides the following VM reports:</p> <ul style="list-style-type: none"> • <i>Port Groups</i> - Port Groups memberships that are configured on the discovered VMready switches. • <i>VM Groups</i> - Virtual Machine Groups memberships that are configured on the discovered VMready switches.

Logs Menu

The following table describes the Device List page **Logs** menu commands:

Table 7. *Device List Page — Logs Menu*

Sub-menu	Description
Discovery Import Log	Opens the log window showing the messages logged while importing the discovery information from Tivoli Network Manager.
Concurrent Backup Log	Opens the log window showing the messages logged by while performing firmware or configuration backup operation.
Concurrent Download Log	Opens the log window showing the messages logged by while performing firmware or configuration download operation.
Concurrent Reset Log	Opens the log window showing the messages logged by while performing switch reboot (reset) operation.
Scheduled Backup Log	Opens the log window showing the messages logged by while performing firmware or configuration backup operation at a scheduled time.
Scheduled Download Log	Opens the log window showing the messages logged by while performing firmware or configuration download operation at a scheduled time.
Scheduled Reset Log	Opens the log window showing the messages logged by while performing switch reboot (reset) operation at a scheduled time.
CLI Push Log	Opens the log window showing the messages logged while performing CLI push operation.
DB Log	Opens the log window showing the messages logged while performing Database operation.
CMI Log	Opens the log window showing the messages logged while communicating with the switches.
VSI DB RESTful Access Log	Opens the log window showing the messages logged by while processing access to VSI DB from REST clients.
Authentication Log	Opens the log window showing the messages logged while performing user authentication.
Sync Config Log	Opens the log window showing the messages logged while performing sync config operation.
VM Server Log	Opens the log window showing the messages logged while communicating with Virtual Machine Management Server.
VMready Deployment	Contains the following VMready Across Datacenter logs: <ul style="list-style-type: none"> • VMAP: Displays VMAPs deployed to the switches from the VMready Across the Datacenter Wizard. • VMready: Displays VMready configuration deployment to the various switches from the VMready Across the Datacenter Wizard.

Options Menu

The following table describes the Device List page **Options** menu commands:

Table 8. *Device List Page — Options Menu*

Sub-menu	Description
General Properties	Opens up the properties window where you can set the values such as Concurrent Limit, Session Timeout and Temperature format.
Refresh Configuration	Opens the properties window where you can set the refresh interval.
Security Configuration	Opens the properties window where you can set the user password.
Data Collection Configuration	Opens the properties window where you can set the polling interval for health check and performance statistics collector.
Authentication Configuration	Opens the properties window where you can set the authentication mechanism and the associated properties.
FTP/SFTP/TFTP Configuration	Opens the properties window where you can set the IP address and login credentials (FTP only) to use for accessing FTP, TFTP, or SFTP server.
Discovery Time Range Configuration	Opens the Discovery Time Range Configuration window, which allows you to set the time range in number of days.
VM Manager Server Connector	<i>Configuration</i> – Opens up the configuration window where you can manage VM Manager Server credentials
Dial Home	Provides Commands for configuring Dial Home: <ul style="list-style-type: none"> • <i>Email Configuration</i> – Opens a configuration window where you can configure Mail Server parameters and add the list of email addresses for Dial Home operation. • <i>Traps Configuration</i> – Opens a configuration window where you can add or remove a list of SNMP traps for Dial Home operation. • <i>Health Status Configuration</i> – Opens a configuration window where you can add or remove a list of health status messages for Dial Home operation.

Discovery Menu

The following table describes the Device List page Discovery menu commands:

Table 9. *Device List Page — Discovery Menu*

Sub-menu	Description
Discovery Configuration	Opens the discovery configuration window, where you can view/edit the following parameters: <ul style="list-style-type: none"> • Period Between Rescans – The delay, in seconds, after which SNSC's automatic device import process is activated to import the discovery data from Tivoli Network Manager. • Timeout – The timeout value, in seconds, used while performing the data gathering operation during device discovery. • Retries – The number of retries used while performing the data gathering operation during device discovery.

Table 9. *Device List Page — Discovery Menu (continued)*

Sub-menu	Description
Import Device List	Imports the devices from a CSV file and starts discovering them.
Export Device List	Allows you to export the discovered devices to a CSV file.

Virtualization Tools Menu

The following table describes the Device List page Virtualization Tools menu commands:

Table 10. *Device List Page — Virtualization Tools Menu*

Sub-menu	Description
VSI DB Console	Opens the VSI Console window for configuring ACL and VSI types, so that SNSC can be used as the centralized VSI DB manager.
VMready Across Datacenter	Opens the wizard for configuring VMready features across all supported switches.

Maintenance Menu

The following table describes the Device List page Maintenance menu commands:

Table 11. *Device List Page — Maintenance Menu*

Sub-menu	Description
DB Data Purge Configuration	Opens the properties window where you can set the database purge interval.
Log File Configuration	Opens the properties window where you can set the log file size and backup count.
SNSC Support Dump	Opens the support dump dialog that can be used for saving tech support dump data on the browser system for debugging.
Data Backup	Provides commands for taking the backup of SNSC's critical data. <ul style="list-style-type: none">• Take Data Backup – Backs up SNSC's critical data and stores the backup data in the configured directory.• Set Data Backup Directory – Opens the window where you can set the directory on SNSC server to use for keeping the backup data.

Help Menu

The following table describes the Device List page **Help** menu commands:

Table 12. *Device List Page — Help Menu*

Sub-menu	Description
Help Contents	Opens the context specific online Help page.
IBM Systems Networking	Takes you to IBM Systems Networking page in a separate window.
About System Networking Switch Center	Opens a dialog box that shows the version, license details and the list of supported switches.

About the Device Console Page

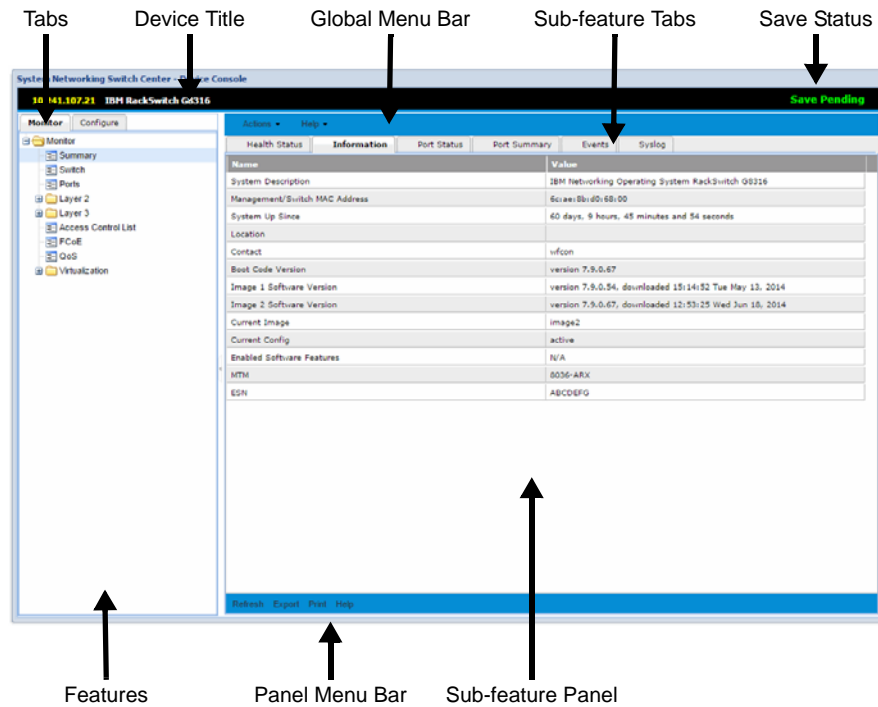
The Device Console page (see [Figure 11 on page 66](#)) enables you to view various monitoring pages associated with device parameters and statistics data. This page also allows you to configure device parameters for which configuration management is supported.

You can open the device console page using one of the below approaches:

- In the Device List content pane, click the IP Address hyper-link.
- Enter the IP Address of the device in "Go To" field and click **Search** icon (Magnifying Glass).
- Select the switch and click either menu **Devices > Monitor** or **Devices > Configure**.

The Device Console page consists of three framed windows with menu bars. The top frame shows the device information. The left-hand frame shows the feature tabs (Monitor and Configure) and a tree listing the supported features. The right-hand frame consists of a menu bar, sub-feature tabs and the content pane showing the data associated with the selected tab.

Figure 11. System Networking Switch Center – Device Console Page



Device Console - Top Frame

On the left-hand side, the top frame shows the selected switch information consisting of IP address, switch type. On the right-hand side, it shows the save pending status indicating whether configuration save is needed for that switch or not.

Device Console – Feature (or Left) Frame

The feature (or left) frame displays the tabs corresponding to Monitor and Configure options. The Configure tab is enabled only for those switches for which configuration management is supported.

When you select a tab, the corresponding features listed in a tree hierarchy. When you select a node, the right hand content pane is refreshed to display the tabs associated with the selected feature (node).

Device Console – Content (or Right) Frame

The content (or right) frame displays the global menu bar, tabs and panel menu bar corresponding to feature selected in Feature (or Right) frame.

Device Console Page – Menu Bar

The menu bar of the Device Console page provides the global commands that can be invoked for the selected switch irrespective of the selected tab. The following table describes the Main Menu Bar items.

Table 13. *Device Console Page — Menu Bar Items*

Menu	Description
Actions	Provides a set of actions commands that can be invoked on the selected switch.
Help	Provides commands for accessing online help and support options for SNSC.

Actions Menu

The following table describes the Device Console page **Actions** menu commands:

Table 14. *Device Console Page — Actions Menu*

Sub-menu	Description
Apply	Applies any changes that you have made to the switch configuration.
Save	Saves the current configuration to the flash memory.
Diff Config	Opens a window to display any pending configuration changes.
Diff Flash	Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch.
Config Dump	Opens a window to display a dump of the current switch configuration.
Syslog Dump	Opens a window to display the syslogs available on the switch.
Revert	Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings.
Revert Apply	Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings.
Reboot Switch	Reboots the switch by reloads and saving the current RAM memory.
Exit	Closes the Device Console window.

Help Menu

The following table describes the Device Console **Help** menu commands:

Table 15. *Device Console — Help Menu*

Sub-menu	Description
Help Contents	Opens the context specific online Help page.
IBM Systems Networking	Takes you to IBM Systems Networking page in a separate window.
About System Networking Switch Center	Opens a dialog box that shows the version, license details and the list of supported switches.

Device Console Page – Panel Menu Bar

The panel menu bar is specific to the panel shown in the content pane. Though some of them are disabled for some panels, but the associated action remains the same across panels.

Table 16. *Device Console — Panel Menu Bar Items*

Menu	Description
Submit	Submits the configuration changes you have made to the switch parameters. This menu is available only for configuration panels.
Apply	Applies any changes that you have made to the switch configuration. This menu is available only for configuration panels.
Refresh	Refreshes the panel contents.
Export	Export the data displayed in the panel to a CSV file.
Print	Opens the Print dialog so that you can print the current page.
Help	Launches the context-sensitive help page.

Device List – Go To search option

The Device List page includes a *Go To* field that allows you to list the device based on IP address or System Name string. You can perform this operation by specifying the IP address or part/full system name string in the *Go To* field and click the **Search** icon (Magnifying Glass).

If you enter an IP address or System Name in *Go To* field and if a device with that IP address is discovered, the corresponding Device Console page launches upon the completion of search operation.

If you specify part of the System Name string and it matches multiple devices (for example, there are 3 switches configured with system names “Core Switch1”, “Router Switch2”, “Gateway Switch3” and you specify the search string as “Switch”), then all those matched devices are provided in a filtered list (similar to the List Device(s) drop-down function).

Note: SNSC-C provides an option at the top of the filtered list to clear the filter.

Device List – Favorite Marking and Adding Notes

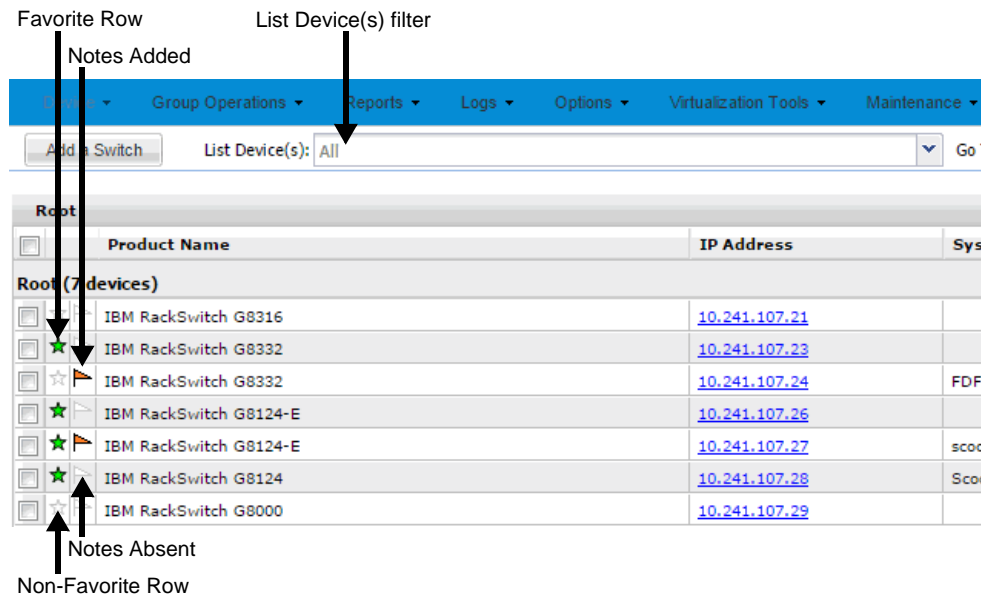
The Device List page enables you to set any row as a Favorite row so that you can list only those devices using List Device(s) filter (see [Figure 12 on page 69](#)). If you have logged in as an Administrator, you can also add notes for any discovered device to indicate any changes such as firmware upgrade or configuration upgrade occurring at a later date or time so other users can see that message.

Favorite Marking

The Favorite marking works in toggle mode – clicking a favorite row removes the favorite marking and likewise, clicking a non-favorite row makes it a favorite one. Favorite row is marked with green star icon, where as the non-favorite row displays hollow gray star icon (see [Figure 11 on page 66](#)).

Note: Favorite markings are user-specific and the feature is available to all types of users.

Figure 12. Device List Showing Favorites and Notes Icons



Adding Notes

If you have logged into SNSC as an Administrator, you can add Notes for an individual device/switch, using the following steps:

1. Click the Notes icon (see [Figure 12 on page 69](#)) to open the Notes dialog.
2. Type-in the text you want to add.
3. Click **OK**.

You can also add Notes to group of rows, using the following steps:

1. In Device List table, select one or more rows.
2. Choose menu **Group Operations > Notes > Add** to bring up Notes dialog.
3. Type the text you want to add.
4. Click **OK**.

Note: When Notes is added, the Notes icon changes to Notes Added icon (orange flag).

You can see the added Notes as a tool tip by moving the mouse on Notes Added icon (see [Figure 13 on page 70](#)).

Figure 13. Display of Notes as a Tool Tip

Root		
<input type="checkbox"/>	Product Name	IP Address
Root (7 devices)		
<input type="checkbox"/>	IBM RackSwitch G8316	10.241.107.21
<input checked="" type="checkbox"/>	IBM RackSwitch G8332	10.241.107.23
<input type="checkbox"/>	IBM RackSwitch G8332	10.241.107.24
<input checked="" type="checkbox"/>	IBM RackSwitch G8124-E	10.241.107.26
<input checked="" type="checkbox"/>	IBM RackSwitch G8124-E	10.241.107.27
<input checked="" type="checkbox"/>	IBM RackSwitch G8124	10.241.107.28
<input type="checkbox"/>		10.241.107.29

Device will be reset @ 12 midnight!

Removing Notes

You can remove the Notes through Administrator login using the following steps:

1. Click the **Notes Added** icon (see [Figure 13 on page 70](#)) to open the Notes dialog.
2. Click **Remove**.

Notes from group of rows also can be removed using the following steps:

1. In Device List table, select one or more rows.
2. Choose menu **Group Operations > Notes > Remove**.

Changing System Networking Switch Center Configuration

You can change many of the parameters that influence SNSC's behavior. You can find the corresponding commands under the **Options** and **Maintenance** menus. The following sub sections list those parameters that can be configured:

- ["Changing the Default General Properties" on page 70](#)
- ["Changing the Default Health Check Properties" on page 71](#)
- ["Changing the Default Refresh Configuration Parameters" on page 71](#)
- ["Changing the Default Data Collection Configuration Parameters" on page 72](#)
- ["Changing the Default Log File Configuration Parameters" on page 73](#)
- ["Changing the Default DB Data Purge Configuration Parameters" on page 74](#)

Changing the Default General Properties

The General Properties parameters control the number of servers on which you can currently perform group operations. See [Figure 14 on page 71](#) for an example of the General Properties window.

1. Choose menu **Options > General Properties**.
2. Change the Concurrent Limit setting. The value range is 10 to 50.
3. Change whether to display the temperature in Celsius or Fahrenheit.
4. Click **Save**. The changes take effect immediately.

Figure 14. General Properties Window

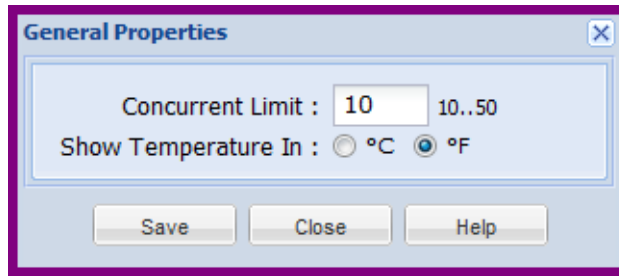


Table 17. General Properties field descriptions

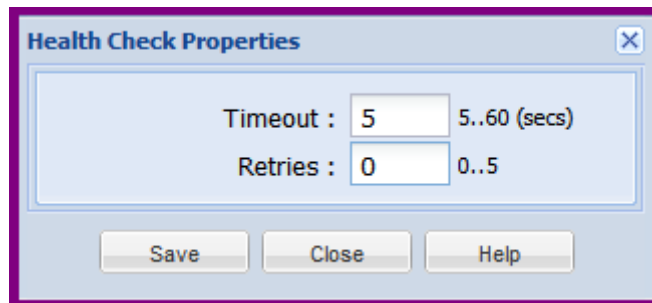
Field	Description
Concurrent Limit	Defines number of concurrent processing to be made while performing group operations. Default value is 10.
Show Temperature In	Refers to the temperature sensor display in Celsius (°C) or Fahrenheit (°F). Default setting is °F.

Changing the Default Health Check Properties

The health check properties control the timeout and the retries used while performing the periodic health check for the discovered switches. See [Figure 15 on page 71](#) for an example of the Health Check Properties window.

1. Choose menu **Options > Health Check Properties**.
2. Change the Timeout setting. The value range is 5 to 60 seconds.
3. Change the Retries setting. The value range is 0 to 5.
4. Click **Save**. The changes take effect during next health check polling.

Figure 15. Health Check Properties Window

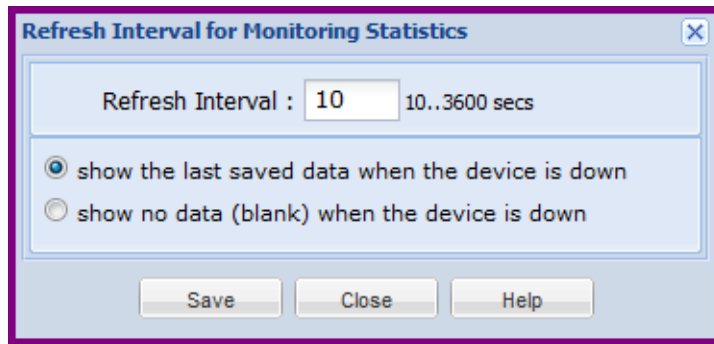


Changing the Default Refresh Configuration Parameters

The refresh configuration parameters control how frequently SNSC updates the statistics tables in the user interface. The statistics tables are updated by loading information from the SNSC database. For example, if you set the polling configuration parameters to 20 seconds, the switch statistical information is refreshed every 20 seconds. The new parameter takes effect immediately. See [Figure 16 on page 72](#) for an example of the Refresh Configuration parameters window.

1. Choose menu **Options > Refresh Configuration**.
2. Enter the new value for Refresh Interval between 10 to 3600 seconds.
3. Select one of the options that enables SNSC to display either the last saved data or no data (blank) when the selected device is down.
4. Click **Save**.

Figure 16. Refresh Interval for Monitoring Statistics Window



Changing the Default Data Collection Configuration Parameters

The data collection parameters control how often SNSC collects switch data from the database. See [Figure 17 on page 72](#) for an example of the data collection parameter configuration window.

1. Choose menu **Options > Data Collection Configuration**.
2. Enter new values for HealthCheck Server and Performance Statistics polling intervals. For HealthCheck Server, the value ranges from 10 to 3600 seconds. For Performance Statistics, the value ranges from 5 to 3600 seconds.
3. Click **Save**. The new parameter takes effect immediately.

Figure 17. Data Collection Configuration Window

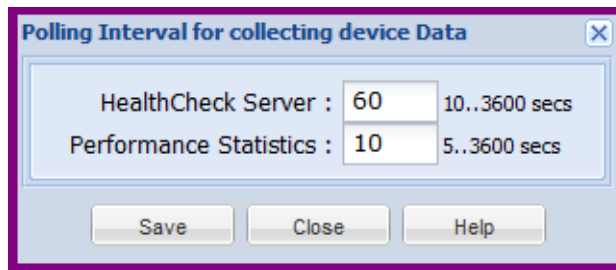


Table 18. Data Collection Properties field descriptions

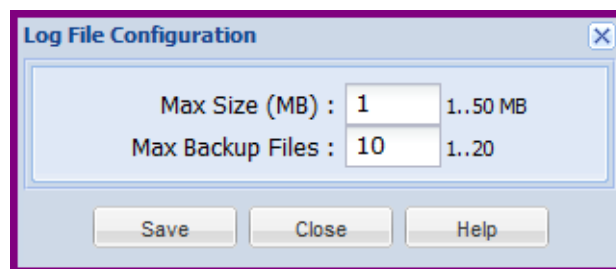
Field	Description
HealthCheck Server	Defines the interval in seconds that SNSC checks the switch status, either up or down.
Performance Statistics	Defines the interval in seconds that SNSC collects and updates performance statistics.

Changing the Default Log File Configuration Parameters

The log file configuration parameters control the log file size and the maximum number of log file backup that SNSC can keep at any given time. You can change the log file configuration using the following steps:

1. Choose menu **Maintenance > Log File Configuration**.
2. Enter the new value for maximum file size in MB (Max Size (MB)) between 1 to 50.
3. Enter the new value for maximum number of backup files to keep the log messages (Max Backup Files) between 1 to 20.
4. Click **Save**.

Figure 18. Log File Configuration Window



Changing the Default DB Data Purge Configuration Parameters

The database purge parameters control the frequency of database purges. After a database purge, information about events, syslog and performance data are removed. You can select days or events count as the basis for database purge frequency.

For example, if the purge frequency is set for seven days, then the data older than seven days are purged regularly. The purged data is stored in text form and you can find these files in the following directory: `<SNSC INST DIR>/database/backup`. The purged data files are created using the following notation:

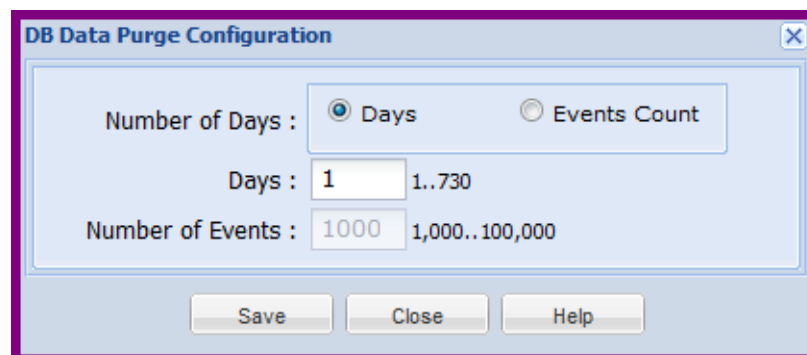
- `events_DDMMYYYY_HHMMSS.txt`
- `syslogs_DDMMYYYY_HHMMSS.txt`

In the above notation, DD stands for day (01-31), MMM stands for month (Jan, Feb, and so on), YYYY stands for year, HH for Hour (00-23), MM for minutes (00-59) and SS for seconds (00-59). However, you can change the purged data location and the format of the timestamp, by editing the `DBPurgedDirectory` and the `TimeStampFormat` parameters in the file `backup.properties` (see [“Modifying the backup.properties Configuration File” on page 103](#)).

1. Choose menu **Maintenance > DB Data Purge Configuration** (see [Figure 19 on page 74](#)).
2. Click Days or Events Count as the purge frequency parameter.
3. Complete the following steps if you selected Days. If you selected Events Count, go to step 4.
 - a. Enter a value between 1 and 730 in the Number of Days field.
 - b. Click **Save**.
4. If you selected Events Count, complete the following steps.
 - a. Enter a value between 1000 and 100,000 in the Number of Events field.
 - b. Click **Save**.

The new values take effect immediately.

Figure 19. DB Data Purge Configuration Window



Configuring Authentication

You can configure SNSC to use different authentication mechanisms for authenticating SNSC users. The following subsections list different mechanisms supported by SNSC:

- [Local Authentication](#)
- [TACACS+ Authentication](#)
- [RADIUS Authentication](#)

Local Authentication

Local authentication is enabled by default in SNSC. In this mechanism, the user credentials are stored in SNSC database in encrypted format. If SNSC is configured to use a different type of authentication, can configure SNSC to use a local authentication using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select LOCAL as the authentication mechanism.
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Click **Save**.

TACACS+ Authentication

SNSC supports the default and the alternate TACACS+ authorization levels (similar to the switches). The following table shows authorization levels for the default and the alternate TACACS+ settings, one of which must be defined on the TACACS+ server.

Table 19. *TACACS+ Authorization Levels*

User Access Level	Default TACACS+ Authorization Level	Alternate TACACS+ Authorization Level
user	0	0 - 1
oper	3	6 - 8
admin	6	14 - 15

You can configure SNSC to use TACACS+ authentication using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select TACACS as the authentication mechanism to bring up TACACS+ specific fields (see [Figure 20 on page 76](#)).
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Select the authorization level to use – Default or Alternate (see [Table 19 on page 75](#)).
5. Enter the primary server IP address.
6. Enter the secondary server IP address.

7. Enter the secret for the primary server.
8. Enter the secret for the secondary server.
9. Enter the port number.
10. Enter a value for the timeout.
11. Enter a value for retries.
12. Click **Save**.

Figure 20. TACACS Authentication Configuration Window

The screenshot shows the 'Authentication Configuration' window. It has a title bar with a close button. The main area contains the following elements:

- 'Current Authentication Mechanism: LOCAL' (text field)
- 'Select Authentication Mechanism: TACACS' (dropdown menu)
- 'Admin Password: [empty text field]'
- 'Use Authroization Level' section with two radio buttons: 'Default (0-6)' (selected) and 'Alternate (0-15)'
- 'Server Properties Configuration' section with the following fields:
 - 'Primary Server IP Address: 0.0.0.0'
 - 'Secondary Server IP Address: 0.0.0.0'
 - 'Secret for Primary IP Address: [empty text field]'
 - 'Secret for Secondary IP Address: [empty text field]'
 - 'Port: 49'
 - 'Timeout: 5'
 - 'Retries: 3'
- At the bottom: 'Save', 'Close', and 'Help' buttons.

You can configure SNSC to use local authentication (in case, if authentication is set to a different mechanism) using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select LOCAL as the authentication mechanism.
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Click **Save**.

Note: If SNSC is unable to contact either the Primary or Secondary TACACS+ servers, it uses the LOCAL authentication mechanism for validating the user credentials.

RADIUS Authentication

For RADIUS authentication, similar to those requirements for the switches, SNSC requires all user privileges, other than those assigned to the Administrator, have to be defined in the RADIUS dictionary. RADIUS attribute 6 which is built into all RADIUS servers defines the administrator. The file name of the dictionary is RADIUS vendor-dependent. Configure the following RADIUS attributes on the RADIUS server:

User Name/Access	User Service Type	Value
user	<i>Vendor supplied</i>	255
oper	<i>Vendor supplied</i>	252
admin	<i>Vendor supplied</i>	6

You can configure SNSC to use RADIUS authentication using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select RADIUS as the authentication mechanism to bring up RADIUS specific fields (see [Figure 21 on page 78](#)).
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Enter the primary server IP address.
5. Enter the secondary server IP address.
6. Enter the secret for the primary server.
7. Enter the secret for the secondary server.
8. Enter the port number.
9. Enter a value for the timeout.
10. Enter a value for retries.
11. Click **Save**.

Figure 21. RADIUS Authentication Configuration Window

The screenshot shows the 'Authentication Configuration' window. At the top, 'Current Authentication Mechanism' is set to 'LOCAL'. Below it, 'Select Authentication Mechanism' is set to 'RADIUS'. The 'Admin Password' field is empty. A section titled 'Server Properties Configuration' contains the following fields: 'Primary Server IP Address' (0.0.0.0), 'Secondary Server IP Address' (0.0.0.0), 'Secret for Primary IP Address' (empty), 'Secret for Secondary IP Address' (empty), 'Port' (1645), 'Timeout' (5), and 'Retries' (3). At the bottom of the window are three buttons: 'Save', 'Close', and 'Help'.

Note: If SNSC is unable to contact either the Primary or Secondary RADIUS servers, it uses the LOCAL authentication mechanism for validating the user credentials.

LDAP Authentication

You can configure SNSC to use LDAP authentication using the following steps:

1. Choose menu **Options > Authentication Configuration**.
2. Select LDAP as the authentication mechanism.
3. If Admin is mapped to root, enter the Admin password in Admin Password field, or enter root password in Root Password field.
4. Enter the primary server IP address.
5. Enter the secondary server IP address.
6. Enter the port number.
7. Enter a value for the timeout.
8. Enter a value for retries.
9. Enter the LDAP server domain name.
10. Click **Save**.

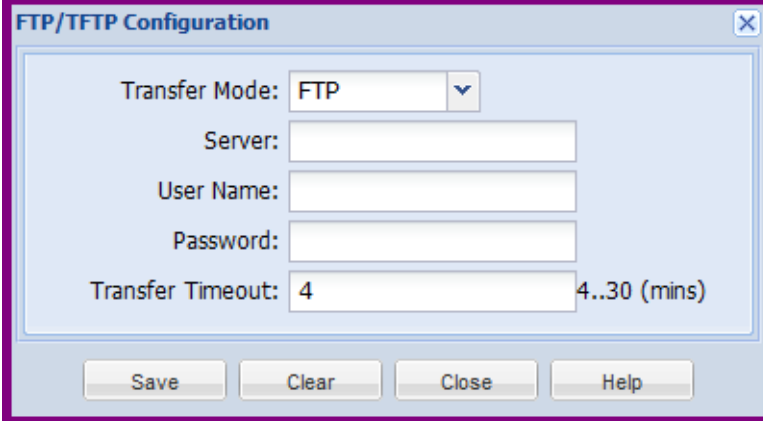
Note: If SNSC is unable to contact either the Primary or Secondary LDAP server, it uses the LOCAL authentication mechanism for validating user credentials.

Configuring FTP/SFTP/TFTP Server Parameters

You must configure an FTP, TFTP, or SFTP server before you can perform switch administration tasks such as image and configuration backup, image download, panic dump and so forth. For information about switch administration tasks, and the role of the FTP/SFTP/TFTP server, see [“Performing Group Operations” on page 125](#).

1. Choose menu **Options > FTP/SFTP/TFTP Configuration**.
2. Select FTP, TFTP, or SFTP as the transfer mode.
3. Enter the IP address of the FTP, TFTP, or SFTP server.
4. If you selected FTP as the transfer mode:
 - a. Enter the FTP server user name.
 - b. Enter the FTP server password.
5. Enter the transfer timeout in minutes. This timeout setting is useful for dealing with an FTP/SFTP/TFTP server residing in a slow network.
6. If you selected SFTP as the transfer mode:
 - a. Enter the SFTP server user name.
 - b. Enter the SFTP server password.
 - c. Enter the transfer server port (optional).
7. Click **Save**.

Figure 22. FTP/SFTP/TFTP Server Configuration Window



The screenshot shows a window titled "FTP/TFTP Configuration" with a close button in the top right corner. The window contains the following fields and controls:

- Transfer Mode:** A dropdown menu currently set to "FTP".
- Server:** An empty text input field.
- User Name:** An empty text input field.
- Password:** An empty text input field.
- Transfer Timeout:** A text input field containing the number "4", with a range indicator "4..30 (mins)" to its right.

At the bottom of the window, there are four buttons: "Save", "Clear", "Close", and "Help".

Modifying Discovery Parameters

You can modify SNMP parameters of a discovered device. This helps SNSC continue to manage the device if the SNMP parameters, such as community strings (SNMPv1/v2c) or authentication credentials (SNMPv3), are changed after discovering the device in SNSC.

To modify the SNMP parameters:

1. In Device List table, select the switch for which you want to change the SNMP parameters used by SNSC for managing that switch.
2. Choose menu **Device > Change SNMP Parameters** to open Modify dialog (see [Figure 23 on page 81](#)).
3. If Root user is enabled, enter the root password in Root Password field (this field is not visible if Root user is disabled).
4. If you want to use SNMPv1 or SNMPv2c:
 - a. Enter the new read and write community strings in Read Community and Write Community fields respectively.
 - b. Click **Save**. SNSC begins using the supplied SNMPv1 or SNMPv2c parameters for managing that switch.
5. If you want to use as SNMPv3:
 - a. Click **Use SNMPv3**.
 - b. Enter the new user name in User Name field.
 - c. If Authentication is enabled on the switch (switch is configured in AuthNoPriv or AuthPriv), select the authentication protocol (MD5 or SHA1) from Authentication Protocol list and enter the authentication password in Authentication Password field.
 - d. If Privacy is enabled on the switch (switch is configured in AuthPriv), select **DES** or **AES** in the Privacy Protocol list and enter the privacy password in the Privacy Password field.
 - e. Click **Save**. SNSC begins using the supplied SNMPv3 parameters for managing that switch.

Figure 23. Modify Discovery Configuration Window

Modify discovery parameters [X]

IP Address: 10.241.107.23

Read Community: []

Write Community: []

SNMPv3

Use SNMPv3

User Name: []

Authentication Protocol: NONE [v]

Authentication Password: []

Privacy Protocol: NONE [v]

Privacy Password: []

Save Close Help

VM Management Server – Connector Configuration and VMware Infrastructure (VI) Client Integration

SNSC provides the following advanced support:

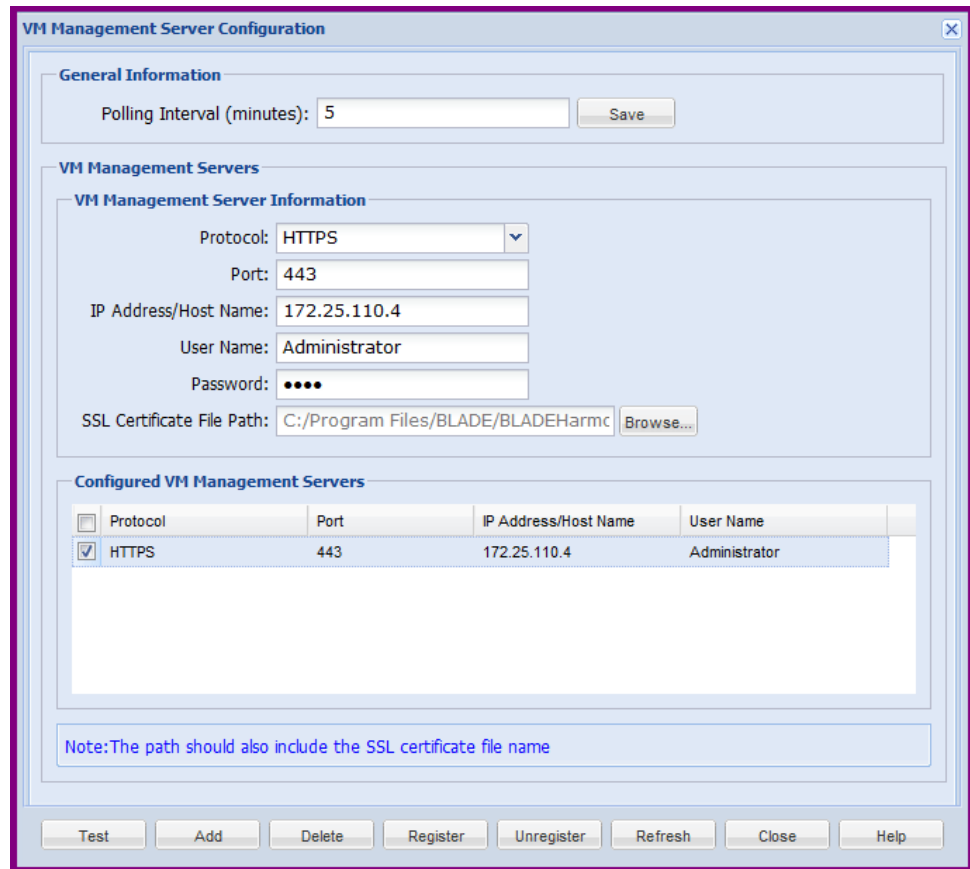
- Viewing the virtual switch information that are available in VMready switch versions.
- Integrating SNSC with VMware Infrastructure (VI) Client application so that SNSC can be launched inside VMware Infrastructure (VI) Client.

Configuring VM Management Server Connector

To retrieve Virtualization information from the VirtualCenter and to integrate SNSC with VMware Infrastructure (VI) Client, you need to configure the VM Management Server Connector. The VM Management Server Connector retrieves the required information by interacting with the VirtualCenter.

1. Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see [Figure 24 on page 83](#)).
2. Select the protocol to be used for connecting to VirtualCenter. If you are using HTTPS, you must generate the keystore.
3. In the Port field, enter the port on which VirtualCenter is listening for HTTP or HTTPS requests.
4. In the IP Address/Host Name field, enter the IP address or host name of the system on which Virtual Center is running.
5. Enter the user name in User Name field that should be used for authenticating with VirtualCenter.
6. Enter the password in Password field that should be used for authenticating with VirtualCenter.
7. If you have selected HTTPS protocol, enter the path of the file containing SSL Certificate. If you select HTTPS protocol, enter the file path that contains the SSL certificate or click Browse to browse for the file.
8. (Optional) To check whether the given address and login credentials are valid, click **Test**.
9. Click **Add** to save the configuration.
10. (Optional) In the Polling Interval field, enter the polling interval in minutes to be used for periodically contacting VirtualCenter to retrieve the information and click **Save** to store the configured value.

Figure 24. VM Management Server Configuration Window



Integrating System Networking Switch Center with VMware Infrastructure (VI) Client Application

You can integrate SNSC UI with VMware Infrastructure (VI) Client Application so that SNSC can be conveniently launched within VI Client environment (see [Figure 25 on page 84](#)).

1. Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see [Figure 24 on page 83](#)).
2. Select the VM Management Server to use from the Configured VM Management Servers table (see “[Configuring VM Management Server Connector](#)” on page 82 for steps on how to configure VM Management Server connector).
3. Click **Register**. If there are any errors, SNSC displays that error message.

You can also check whether or not SNSC is registered with VMware Infrastructure (VI) Client application using the following steps:

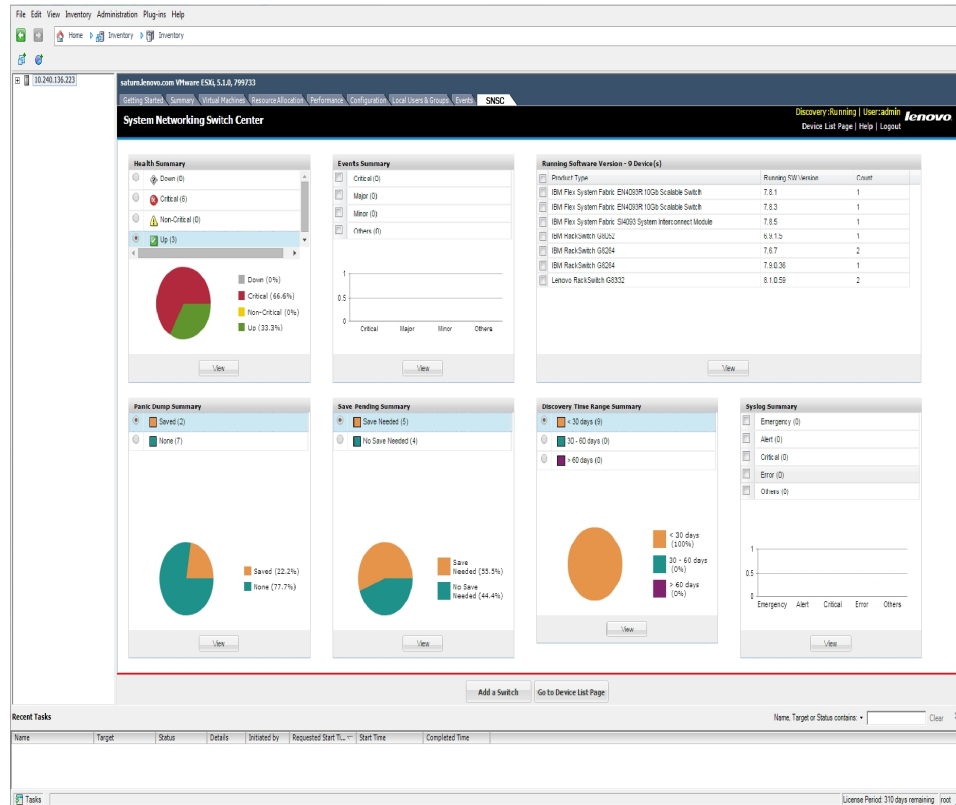
1. Launch VI client application (if it is already running, then close it and launch it again)
2. Choose menu **Plug-ins > Manage Plug-ins** to launch Plug-in Manager window

3. If SNSC is successfully registered, you will see an entry for System Networking Switch Center under Installed Plug-ins section.

Launching System Networking Switch Center from VMware Infrastructure (VI) Client Application

1. Once you have integrated SNSC in VM Management Server, launch VMware Infrastructure (VI) client application. Note that if VMware Infrastructure (VI) Client application is already running, you have to close and restart it to enable VI Client to download the newly added plug-in (System Networking Switch Center).
2. Select SNSC tab in VI Client (see [Figure 25 on page 84](#)) to bring up the SNSC login page.

Figure 25. System Networking Switch Center Launched Inside VMware Infrastructure (VI) Client Application



Un-registering System Networking Switch Center from VMware Infrastructure (VI) Client Application

Follow these steps to un-register Switch Center from the VI client application:

1. Choose menu **Options > VM Management Server Connector > Configuration** to launch the VM Management Server Configuration window (see [Figure 25 on page 84](#)).
2. In the Configured VM Management Servers table (see “[Configuring VM Management Server Connector](#)” on page 82), select the VM Management Server from which you want to un-register SNSC.
3. Click **Unregister**.

Dial Home Configuration

The Dial Home feature offers a round-the-clock device monitoring facility. It enables you to configure SNSC to send an email alert to designated recipients upon receiving traps from the switches.

To configure Dial Home:

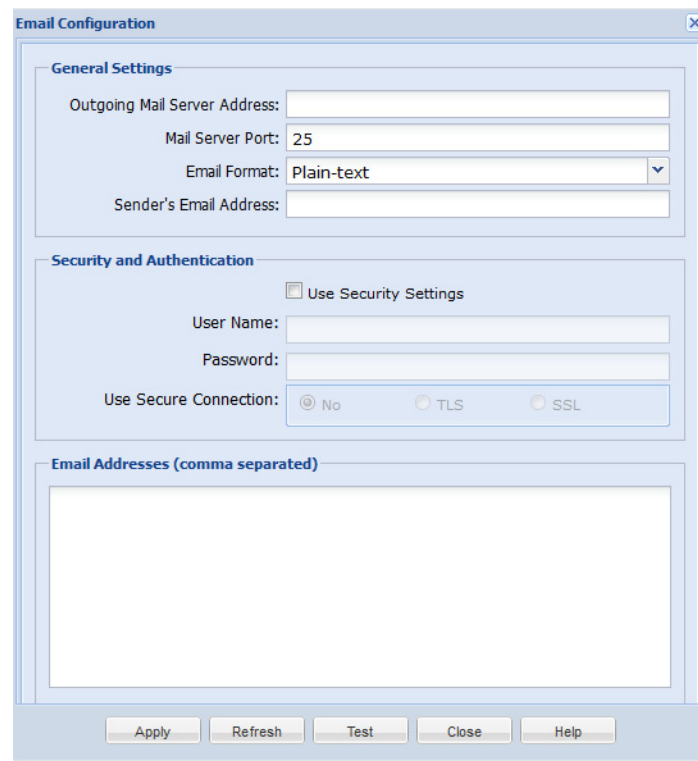
- Log into SNSC as an Administrator.
- Specify the outgoing email server to use and a list of recipients' email addresses.
- Select the traps for which the email alerts are to be sent.

Configuring Email Parameters

You can configure email parameters, such as Outgoing Mail Server, Email Format, Sender's Mail ID, and Recipient Email Addresses to be used for sending email alerts:

1. Choose menu **Options > Dial Home > Email Configuration** to launch the Email Configuration window.

Figure 26. Email Configuration Window



The screenshot shows the 'Email Configuration' window with the following sections:

- General Settings:** Includes text boxes for 'Outgoing Mail Server Address', 'Mail Server Port' (set to 25), a dropdown for 'Email Format' (set to Plain-text), and a text box for 'Sender's Email Address'.
- Security and Authentication:** Includes a checkbox for 'Use Security Settings', text boxes for 'User Name' and 'Password', and radio buttons for 'Use Secure Connection' (set to No, with options for TLS and SSL).
- Email Addresses (comma separated):** A large empty text area for entering recipient addresses.

At the bottom of the window are buttons for 'Apply', 'Refresh', 'Test', 'Close', and 'Help'.

2. In the **Outgoing Mail Server Address** field, enter the outgoing mail server address.
3. Enter the **Mail Server Port** to use. By default, it is set to SMTP port 25.
4. From the **Email Format** list, select the format in which the email alert is to be sent. You can send email alerts in plain text or in XML.

5. In the **Sender's Email Address** field, enter the address from which the email alerts are to be sent.
6. If you are using a POP3 mail server, you can configure additional security and authentication parameters as follows:
 - a. Check **Use Security Settings**.
 - b. Enter the User Name.
 - c. Enter the Password.
 - d. Next to **Use Secure Connection**, select either **No**, **TLS**, or **SSL**.
7. In the **Recipient Email Address** field, enter the recipients' email addresses, separated by a comma.
8. Before saving the configuration, verify whether the outgoing mail server address by clicking **Test**.
9. Click **Apply** to save the changes.

Adding Traps for Dial Home

To add traps for Dial Home:

1. Choose menu **Options > Dial Home > Traps Configuration** to launch the Traps Configuration window.

Figure 27. Traps Configuration Window

2. You can add traps applicable to all switches or specific to a list of IP addresses by selecting the **All** or **IP Address** option from **Select Devices**.

3. From the **Device Type** list, select the device.
4. If you select the **IP Address** option, in the **IP Addresses** field, enter a list of comma-separated IP addresses.
5. From the **Trap Type** list, select the traps to add for Dial Home.
6. Click **Add** to add the selected traps.

Adding Health Status Messages for Dial Home

To add health status message for Dial Home:

1. Choose menu **Options > Dial Home > HealthStatus Configuration** to launch the HealthStatus Configuration window.

Figure 28. HealthStatus Configuration Window

2. You can add health status messages applicable to all switches or specific to a list of IP addresses by selecting the **All** or **IP Address** option from **Select Devices**.
3. From the **Device Type** list, select the device.
4. If you select the **IP Address** option, in the **IP Addresses** field, enter a list of comma-separated IP addresses.
5. From the **HealthStatus Type** list, select the health status messages to add for Dial Home.
6. Click **Add** to add the selected messages.

Configuring the Email Message Format

When sending out email alerts, the display string OID (xxSwTrapDisplayString) that is normally associated with the trap is used as the Subject line. However, if the display string is missing, the trap description is used instead for the Subject line.

The Subject line also contains the IP address of the switch that emitted the trap, along with the trap type. The format of the Subject line is:

<IP Address>, <Trap Type>, <Variable Binding>

For example, a login failure (altSwLoginFailure) coming from a switch at IP address 192.168.1.10 with xxSwTrapDisplayString variable binding containing the information "Failed login attempt via TELNET from host 192.168.1.50" will be sent with the subject line as:

192.168.1.10, altSwLoginFailure, Failed login attempt via
TELNET from host 192.168.1.50

In the message body, the information associated with other variable bindings are included. The following example shows a typical message format (by taking various examples of the configurations files shown in the previous sections)

```
From: snscadmin@foo.com
To: zone1oper@foo.com, zone2oper@foo.com
Subject: 192.168.1.10, altSwLoginFailure, Failed login
attempt via TELNET from host
192.168.1.50
IP Address: 192.168.1.10
Trap Type: altSwLoginFailure
Description: Failed login attempt via TELNET from host
192.168.1.50
Severity: Major
Timestamp: Mon Sep 01, 2008 ...
Variable Bindings Information:
1. Sys Name: XYZ
2. Sys Location: SC
Sys Contact: Foo Admin
```

SNSC can be configured to send email messages in either plain text or XML. If using XML, the following schema is used for the message body:

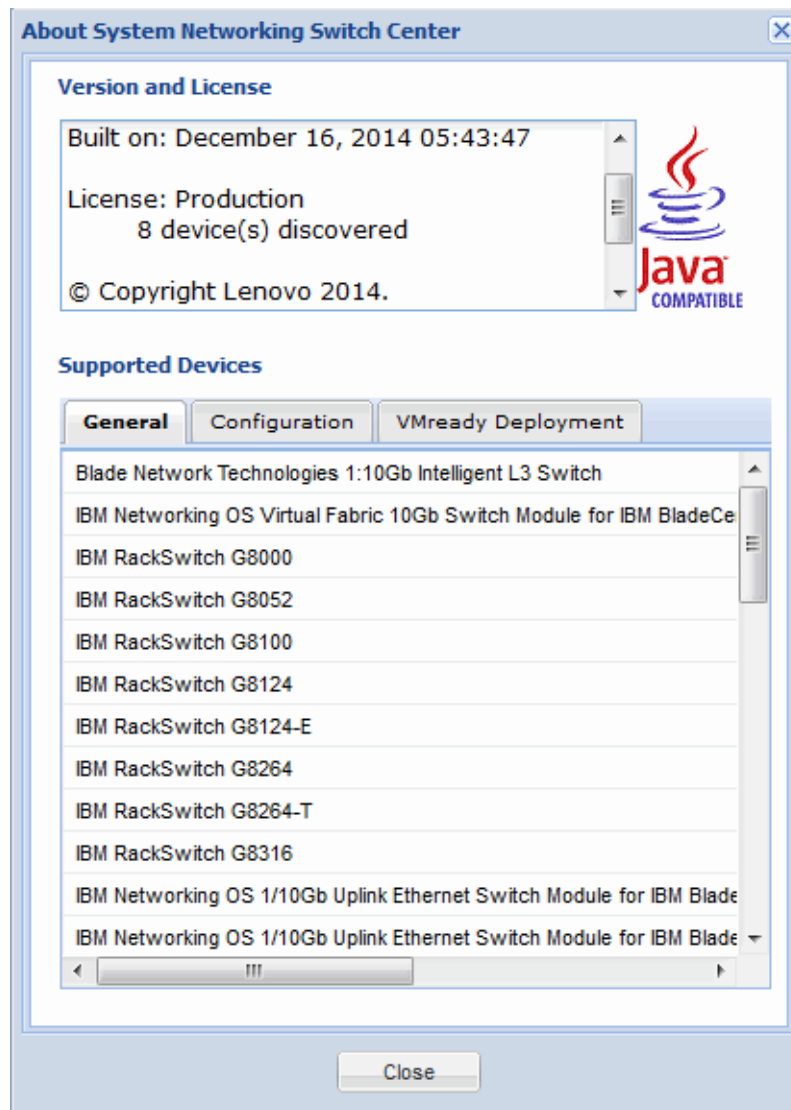
```
<message-body>
<ip-address>...</ip-address>
<trap-type>...</trap-type>
<description>...</description>
<severity>...</severity>
<timestamp>...</timestamp>
<varbind name="XXX" value="..."/>
<varbind name="XXY" value="..."/>
...
</message-body>
```

How to View Information About Lenovo System Networking Switch Center

1. Choose menu **Help > About RackSwitch G8264CS** to view information about the software version, supported devices and related data.
2. Click **General** tab to view the supported devices.
3. Click **Configuration** tab to view those devices for which configuration management is supported. It should be noted that not all devices listed in General tab are found in Configuration tab. This is due to the availability of configuration management feature to selected devices.
4. Click the **VMready Deployment** tab to view the devices for which the VMready Across Datacenter Wizard configurations are supported.
5. Click **Close** to close the window.

Tip: Choose menu **Help > IBM Systems Networking** to access the IBM's Systems Networking Web site. The IBM Systems Networking Web page opens up in a new browser window and your SNSC session remains active.

Figure 29. About System Networking Switch Center Window



How to View Logs

The log viewer feature lets you see specific information logged about actions and scheduled tasks. All information is specific to the SNSC application, not to any selected devices. For example, you can view a log of the scheduled backups, or look at the log generated by the most-recent SNSC auto discovery process.

SNSC has an automatic log archive program. After each log reaches the default size of 1 Mb, SNSC starts a new log and saves the previous logfile as *<logfile>.xx.log*. For example, you might have CMI logs named *cmi.1.log*, *cmi.2.log* and so forth. The current file is always named *<logfile>.log*. The oldest archive would be *cmi.1.log*.

When the quantity of archived log files reaches the default maximum of ten, the older file is deleted and the others are moved up. For example, *x.1.log* is deleted and *x.2.log* is renamed as *x.1.log* and so forth.

To modify the default log file size and maximum number of backup files, log in to the SNSC server and open *log.properties* under *<INSTALLATION DIR>\conf* directory. Edit the *LogFileMaxSizeKB* parameter to modify the maximum log file size. Edit the *MaxBackupFiles* parameter to modify the maximum number of maximum backup files. See [“Modifying the log.properties Configuration File” on page 101](#).

To view the archived log files, log in to the SNSC server and open log files residing under the following directory: *<INSTALLATION DIR>/logs*

Navigating the Log Files

This section describes the navigation controls available on each log window.

Note: Some log files can be more than 100 pages. Use your printer's Page Range feature to avoid printing the entire log.

Figure 30. Log File Navigation Controls

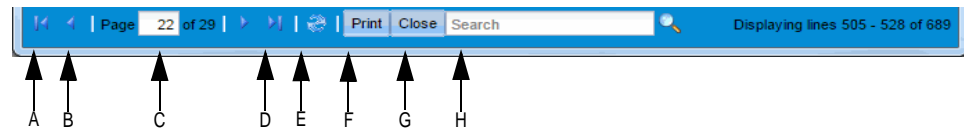


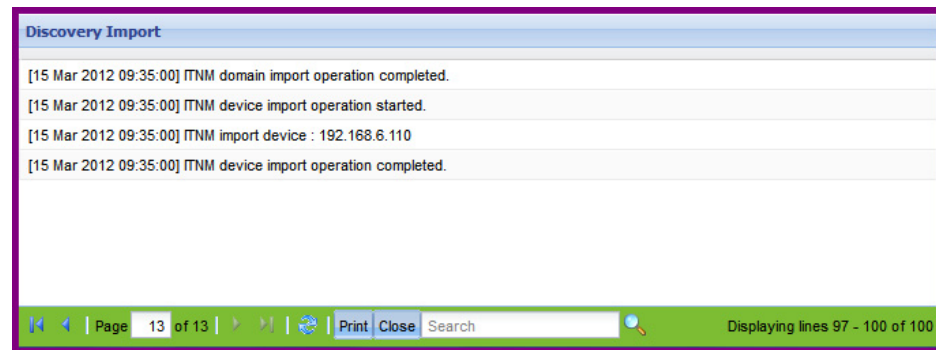
Table 20. Log File Navigation Controls

Control	Description
A	Go to first page of the log.
B	Go to the previous page.
C	Type a page number and click Enter to view the chosen page.
D	Go to the next page.
E	Go to the last page.
F	Refresh the current view of the log file.
G	Print the log.
H	Close the log viewer window.

Viewing the Discovery Import Log

This log captures data about the most recent import of devices and the network domains from Tivoli Network Manager.

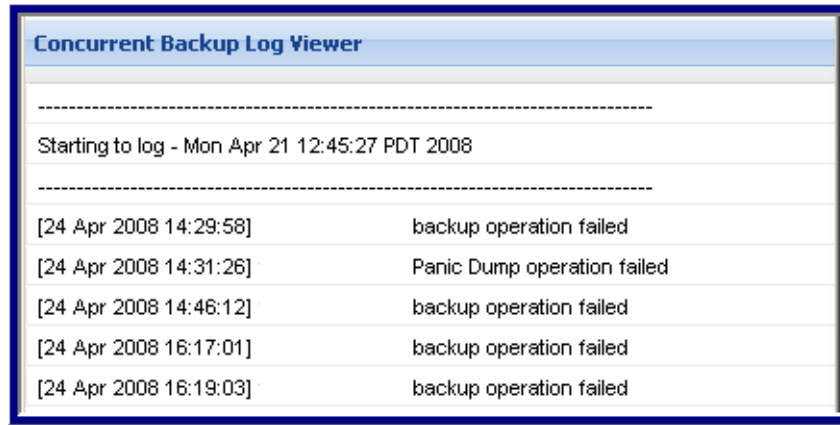
Figure 31. Discovery Import Log Viewer



Viewing the Concurrent Backup Log

This log captures status of concurrent backup tasks.

Figure 32. Concurrent Backup Log Viewer



The screenshot shows a window titled "Concurrent Backup Log Viewer". The log content is as follows:

Concurrent Backup Log Viewer	

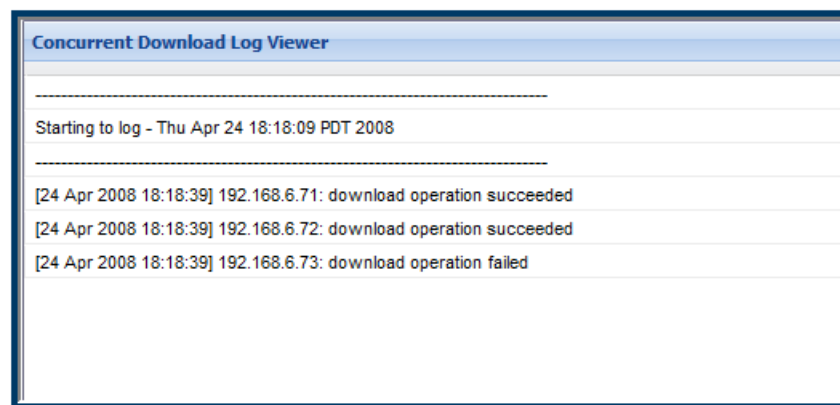
Starting to log - Mon Apr 21 12:45:27 PDT 2008	

[24 Apr 2008 14:29:58]	backup operation failed
[24 Apr 2008 14:31:26]	Panic Dump operation failed
[24 Apr 2008 14:46:12]	backup operation failed
[24 Apr 2008 16:17:01]	backup operation failed
[24 Apr 2008 16:19:03]	backup operation failed

Viewing the Concurrent Download Log

This log displays entries for Image Upgrade, Config Upgrade operations that are not scheduled.

Figure 33. Concurrent Download Log Viewer



The screenshot shows a window titled "Concurrent Download Log Viewer". The log content is as follows:

Concurrent Download Log Viewer	

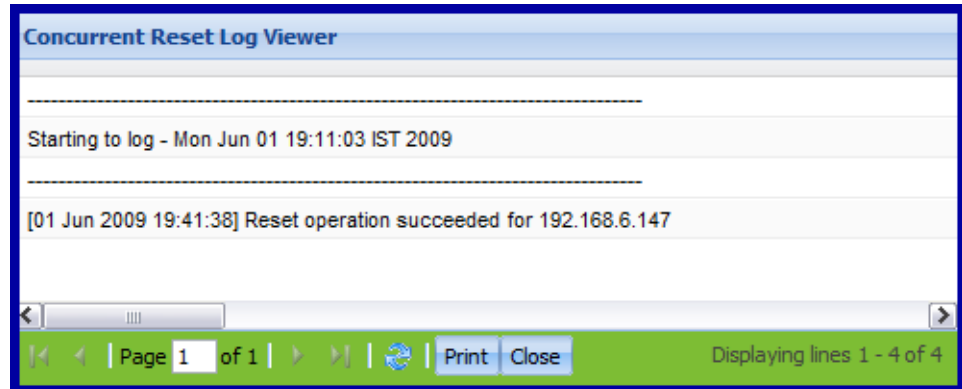
Starting to log - Thu Apr 24 18:18:09 PDT 2008	

[24 Apr 2008 18:18:39] 192.168.6.71:	download operation succeeded
[24 Apr 2008 18:18:39] 192.168.6.72:	download operation succeeded
[24 Apr 2008 18:18:39] 192.168.6.73:	download operation failed

Viewing the Concurrent Reset Log

This log displays entries for switch reset/reboot operations that are not scheduled.

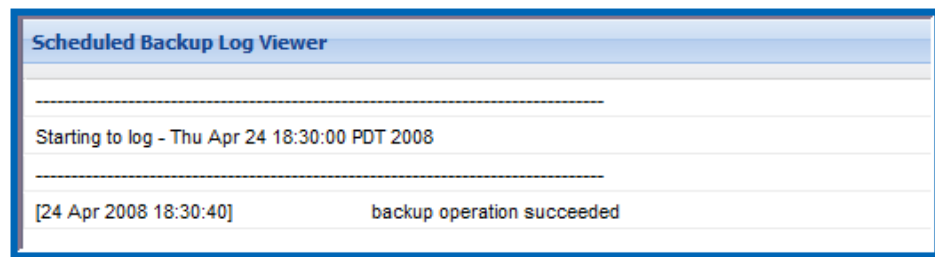
Figure 34. Concurrent Reset Log Viewer



Viewing the Scheduled Backup Log

This log captures status information about log entries for Image Backup, Config Backup, Panic Dump and TSDump operations that are scheduled in a job.

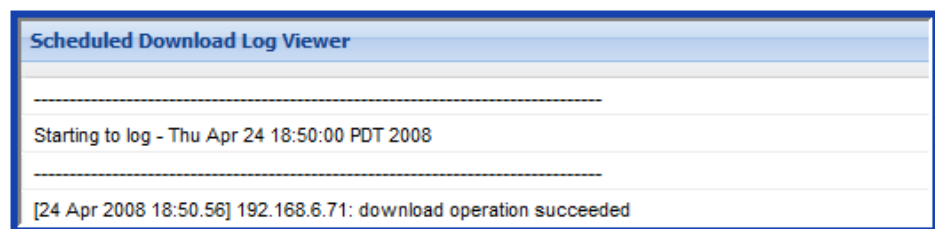
Figure 35. Scheduled Backup Log Viewer



Viewing the Scheduled Download Log

This log displays information about Image Upgrade and Config Upgrade operations that are scheduled in a job.

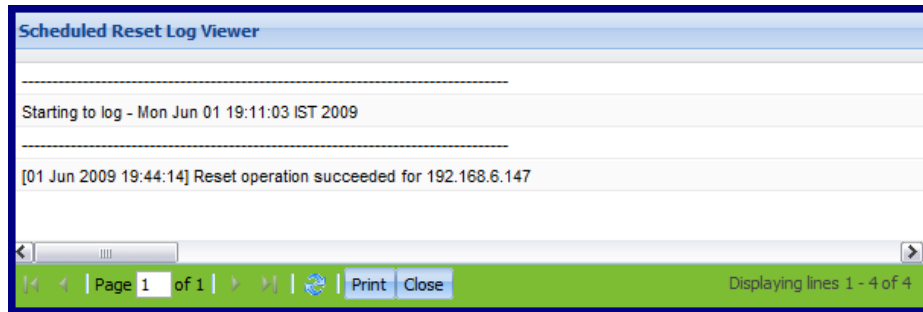
Figure 36. Scheduled Download Log Viewer



Viewing the Scheduled Reset Log

This log displays entries for switch reset/reboot operations that are scheduled in a job.


Figure 37. Scheduled Reset Log Viewer



Viewing the CLI Push Log File

This log displays the information dumped while performing the configuration upgrade for a switch using a set of CLI commands (CLI push).

Figure 38. CLI Push Log Viewer




```
CLI Push Log Viewer
-----
Starting to log - Sun Dec 13 21:40:30 PST 2009
-----
[15 Dec 2009 17:06:27] 172.24.60.3 [START]
Detecting CLI mode on the device using "verbose 0"...
verbose 0
Verbose level
The detection command succeeded indicating that the CLI mode on the device 172.24.60.3 is set to 'aoscli'.
verbose
Current verbose level 0: quiet (errors only; no prompts)
```

Viewing the DB Log File

This log file displays status information about SNSC database activities.

Figure 39. DB Log Viewer

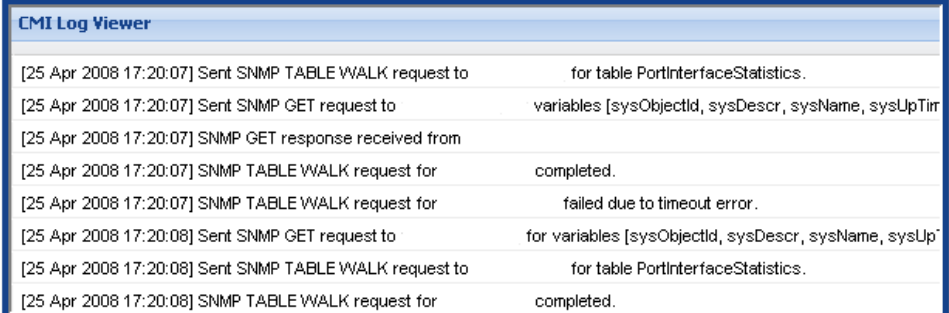


```
DB Log Viewer
-----
[25 Apr 2008 10:26:48] Initializing TrapReceiver Server is failed due to some exception.
[25 Apr 2008 10:26:48] Initializing TrapReceiver Server is failed due to some exception.
[25 Apr 2008 10:26:48] Initializing TrapReceiver Server is failed due to some exception.
[25 Apr 2008 10:26:58] Getting latest data from device is failed.
```

Viewing the CMI Log

This log file captures date, time and status tasks performed by the SNSC Common Management Interface (CMI). CMI is the SNSC component that communicates with discovered devices. The CMI log viewer shows detailed communication between SNSC and a device, including the IP address of the device.

Figure 40. CMI Log Viewer



```
CMI Log Viewer
-----
[25 Apr 2008 17:20:07] Sent SNMP TABLE WALK request to for table PortInterfaceStatistics.
[25 Apr 2008 17:20:07] Sent SNMP GET request to variables [sysObjectId, sysDescr, sysName, sysUpTir
[25 Apr 2008 17:20:07] SNMP GET response received from
[25 Apr 2008 17:20:07] SNMP TABLE WALK request for completed.
[25 Apr 2008 17:20:07] SNMP TABLE WALK request for failed due to timeout error.
[25 Apr 2008 17:20:08] Sent SNMP GET request to for variables [sysObjectId, sysDescr, sysName, sysUp
[25 Apr 2008 17:20:08] Sent SNMP TABLE WALK request to for table PortInterfaceStatistics.
[25 Apr 2008 17:20:08] SNMP TABLE WALK request for completed.
```

Viewing the VSI DB – RESTful Access Log

This log file contains the details of VSI DB access via REST APIs. The information includes the IP address of the client invoking REST API, type of request (GET/PUT/POST/DELETE), and the resource name. It also logs the status of each operation.

Figure 41. VSI Database – RESTful Access Log Viewer

VSI DB RESTful Access Log	
[06 Oct 2011 17:22:11]	192.168.6.72 | HTTPS | DELETE | /vsitypes/1/1 | 200 Success
[06 Oct 2011 17:22:34]	192.168.6.72 | HTTPS | DELETE | /vsitypes/25/16777215 | 200 Success
[06 Oct 2011 17:22:57]	192.168.6.72 | HTTPS | DELETE | /vsitypes/25/16777215 | 200 Success
[06 Oct 2011 17:24:08]	192.168.6.72 | HTTPS | DELETE | /vsitypes/25/16777215 | 200 Success
[06 Oct 2011 17:24:49]	192.168.6.72 | HTTPS | DELETE | /vsitypes/25/16777215 | 200 Success
[07 Oct 2011 11:14:55]	192.168.6.72 | HTTPS | GET | /vsitypes/10/10 | 200 Success
[07 Oct 2011 11:16:04]	192.168.6.72 | HTTPS | DELETE | /vsitypes/10/10 | 200 Success
[07 Oct 2011 11:17:19]	192.168.6.72 | HTTPS | DELETE | /vsitypes/10/10 | 400 Error: VSI Type (version: 10, index: 10) not configured.
[07 Oct 2011 11:18:14]	192.168.6.72 | HTTPS | GET | /vsitypes/1/1 | 200 Success
[07 Oct 2011 11:18:33]	192.168.6.72 | HTTPS | DELETE | /vsitypes/1/1 | 200 Success
[07 Oct 2011 11:20:02]	192.168.6.72 | HTTPS | GET | /vsitypes/1/1 | 200 Success

Viewing the Authentication Log

This log provides date, time and a description about authentication activities.

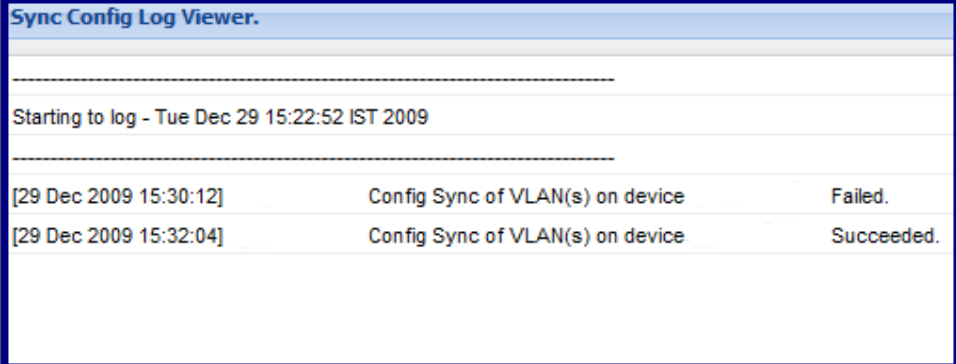
Figure 42. Authentication Log Viewer

Authentication Log Viewer	
[25 Apr 2008 11:57:34]	Local Auth mechanism is used for Authentication and Authorization for this BLADEHarmony Manage
[25 Apr 2008 11:57:34]	Authentication succeeded for admin and the user credential is admin.
[25 Apr 2008 12:08:53]	Local Auth mechanism is used for Authentication and Authorization for this BLADEHarmony Manage
[25 Apr 2008 12:08:53]	Authentication succeeded for admin and the user credential is admin.
[25 Apr 2008 12:27:41]	Local Auth mechanism is used for Authentication and Authorization for this BLADEHarmony Manage
[25 Apr 2008 12:27:41]	Authentication succeeded for admin and the user credential is admin.
[25 Apr 2008 13:13:51]	Local Auth mechanism is used for Authentication and Authorization for this BLADEHarmony Manage
[25 Apr 2008 13:13:51]	Authentication succeeded for admin and the user credential is admin.

Viewing the Sync Config Log File

This log contains date, time and status information about Sync Configuration tasks.

Figure 43. Sync Config Log Viewer



Sync Config Log Viewer.		
Starting to log - Tue Dec 29 15:22:52 IST 2009		
[29 Dec 2009 15:30:12]	Config Sync of VLAN(s) on device	Failed.
[29 Dec 2009 15:32:04]	Config Sync of VLAN(s) on device	Succeeded.

Viewing the VM Server Log

This logs the connectivity of SNSC with VirtualCenter and any data collection failures that happen while communicating with VirtualCenter.

Figure 44. VM Server Log Viewer



VM Server Log Viewer
Starting to log - Mon Jan 26 09:35:06 PST 2009
[26 Jan 2009 09:35:18] Invalid connection arguments like protocol, port, server address or user credentials
[26 Jan 2009 09:35:18] Failed to initialize vm property collector due to invalid connection arguments like protocol, port, server address or user credentials
[26 Jan 2009 09:44:50] Started vm property collector
[26 Jan 2009 09:44:54] Failed to collect hypervisor properties

Viewing the VMready Deployment Log

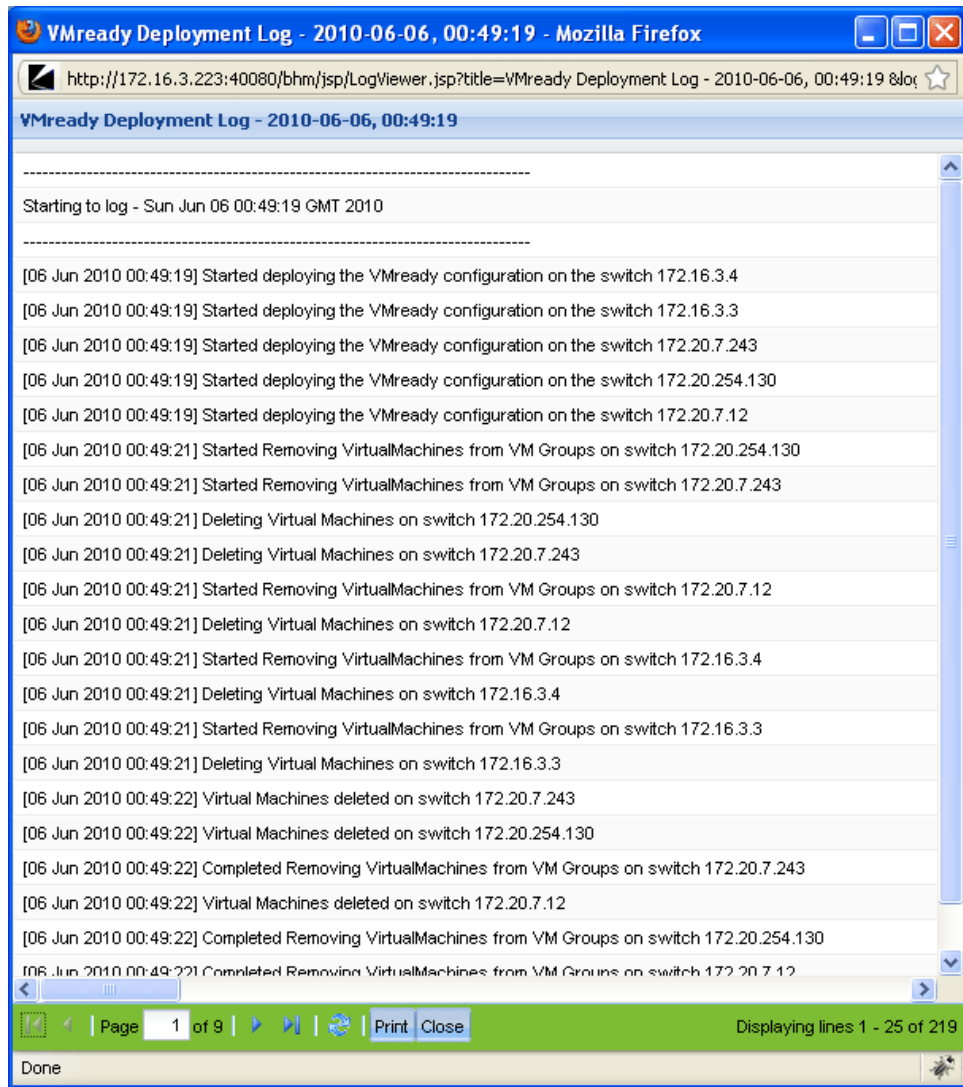
This contains logs related to VMAP and VMready configuration deployment initiated from the VMready Across Datacenter wizard.

Note: VMAP Log: Logs details about any VMAP configurations that were deployed on switches from the wizard. Each time a VMAP configuration is deployed, the previously stored log is erased.

- **VMready Log:** Logs details about the VMready configuration deployed by the wizard and also provides a means of viewing the snapshot of the configuration deployed.

To view the logs, select the date and time when the particular VMready configuration deployment was initiated and click **View** to view log of operations. See [Figure 45 on page 100](#). The configuration that was deployed can be viewed in XML format by clicking **View Deployed Configuration**.

Figure 45. VMready Log Viewer



Advanced Configuration and Tuning

This section provides information about parameters that you can modify in the SNSC configuration files. You must connect to the SNSC server via Telnet or a similar program. You perform advanced configuration and tuning tasks through a command-line interface.

The configuration files that are described in this section are:

- The `config-substitutions.properties` file is under the following directory:
`/opt/ibm/SNSC/webserver/var/conf/`
- The rest of the configuration files reside under the following directory:
`/opt/ibm/SNSC/conf`

Requirement: You must stop and restart SNSC services before any configuration file changes can take effect.

- [“Modifying the `log.properties` Configuration File” on page 101](#)
- [“Modifying the `server_config.properties` Configuration File” on page 102](#)
- [“Modifying the `backup.properties` Configuration File” on page 103](#)
- [“Modifying the `config-substitutions.properties` Configuration File” on page 103](#)
- [“Modifying the `alertseverity.properties` Configuration File” on page 103](#)
- [“Modifying the `cmi.properties` Configuration file” on page 104](#)
- [“Modifying the `security.properties` Configuration File” on page 104](#)
- [“Configuring for NIST 800-131a Strict Mode” on page 104](#)

Modifying the `log.properties` Configuration File

The `log.properties` file contains logging-specific properties that you can configure.

Table 21. *log.properties* file property descriptions

Property Name	Description
TimeStampFormat	This property defines the format of the timestamp used in the log files. To change the timestamp format to different value, see the JDK SimpleDateFormat API document, which provides a list of available formats. Default= <code>dd MMM yyyy HH:mm:ss</code> .
LogFileMaxSizeKB	This parameter defines the maximum log file size in kBytes. If the contents exceed this limit, the file is backed up using a roll number, for example, <code><logfile>.1.log</code>). Default maximum log file size = 1024, which equals 1 MB.
MaxBackupFiles	This parameter defines the maximum number of backup log files that SNSC can store. For example, if this value is ten, then SNSC keeps a maximum of ten backup files. The backup files use the filename format of <code><logfile>.1.log</code> to <code><logfile>.10.log</code> . Ten is the default value for the maximum number of backup files.

Modifying the server_config.properties Configuration File

The `server_config.properties` file contains SNSC server-specific parameters that you can configure.

Table 22. *server_config.properties file property descriptions*

Property Name	Description
<code>rmi_port</code>	The <code>rmi_port</code> is the port on which the SNSC server and client exchange information. Default value=40999
<code>cmi_timeout</code>	The <code>cmi_timeout</code> parameter is the timeout, in milliseconds, that SNSC uses to communicate with devices. Default value=5000, which is five seconds.
<code>session_timeout</code>	The <code>session_timeout</code> parameter defines the timeout, in seconds, that SNSC uses to automatically log you out of an inactive browser session when you are connected to SNSC. Default value=57600
<code>snmp_trap_service</code>	When the <code>snmp_trap_service</code> parameter is set to true, SNSC runs the trap listener on the specified trap port. Default value=true
<code>syslog_service</code>	When the <code>syslog_service</code> parameter it is set to true, SNSC runs the syslog listener on the specified syslog port. Default value=true
<code>snmp_trap_port</code>	The <code>snmp_trap_port</code> defines the port on which SNSC listens to receive the traps. The <code>snmp_trap_port</code> only applies if the <code>snmp_trap_service</code> parameter is set to true. Default value=162
<code>syslog_port</code>	The <code>syslog_port</code> parameter defines the port on which SNSC listens to receive the syslog messages. The <code>syslog_port</code> parameter applies only if <code>syslog_service</code> is set to true. Default value=514
<code>Group_operation_status_poll_intr</code>	The polling interval to check the status of group operations like image upgrade or backup that are in progress. Default value = 10s
<code>strict_security_mode</code>	Controls whether Switch Center operates in NIST 800-131a “strict” mode or in normal “compatibility” mode. A value of false (default) indicates compatability mode; true indicates strict mode. See “ Configuring for NIST 800-131a Strict Mode ” for more detail.

Modifying the backup.properties Configuration File

The backup.properties file contains event backup (DB purge) parameters and Critical Data Backup parameters.

Table 23. backup.properties file property descriptions

Property Name	Description
TimeStampFormat	This parameter defines the format of the timestamp used when SNSC saves purged events in a text file. To change the TimeStampFormat to a different value, see the JDK SimpleDateFormat API document. The API document provides a list of available formats. Default format=ddMMMyyyy_HHmss
DataBackupMaxWait-Time	The maximum time in minutes that Data Backup Operation waits for operation to complete.
DBPurgeDirectory	The directory (NFS or remote mounted) where the purged data files are stored.
DataBackupDirectory	The directory (it may be NFS or Remote mounted) where the data backup file will be stored during data backup operation. Note: This parameter can also be updated using menu Maintenance > Data Backup > Set Data Backup Directory .

Modifying the config-substitutions.properties Configuration File

The config-substitutions.properties file contains SNSC Web server configuration parameters that you can modify. The file is installed in the following directory:

```
/opt/ibm/SNSC/webserver/var/conf/
```

Table 24. config-substitutions.properties file property descriptions

Property Name	Description
HTTPPort=40080	This parameter defines the HTTP port on which the SNSC Web server listens for HTTP requests. Default value=40080.
HTTPSPort=40443	This parameter defines the HTTPs (SSL) port on which the SNSC Web server listens for HTTPs requests. Default value=40443.

Modifying the alertseverity.properties Configuration File

SNSC uses the alertseverity.properties file as a reference for assigning severity to generated SNSC Alerts. This property file contains all the alert types generated by SNSC, along with severity. If you want to change the default severity, edit this file with the new severity. The severity can be one of the following: CRITICAL, MAJOR, MINOR, WARNING, or INFORMATIONAL.

Modifying the `cmi.properties` Configuration file

SNSC uses `cmi.properties` to set the timeout value for handling Table specific responses. You can configure the timeout value to suit the environment depending on the network speed.

Modifying the `security.properties` Configuration File

The `security.properties` file contains security configuration parameters that you can modify. The file is installed in the following directory:

```
/opt/ibm/SNSC/webserver/var/conf/security
```

Table contains the `security.properties` file definitions.

Table 25. *Security.properties file property descriptions*

Property Name	Description
---------------	-------------

Configuring for NIST 800-131a Strict Mode

NIST 800-131a “strict” mode provides added security by only using protocols and encryption algorithms that are allowed under the NIST 800-131a specification.

By default, Switch Center operates in “compatibility” mode, meaning there is not strict enforcement of the use of only secure protocols and algorithms.

In strict mode the following changes occur:

1. The SNSC Web Server is configured to use only TLS 1.2
 - a. Using the SNSC GUI will require your browser to be configured to use TLS 1.2
 - b. SNSC REST APIs used for VSI DB access will require TLS 1.2
2. The SNSC Web Server is configured to use only the HTTPs port (default 40443). The HTTP port (default 40080) is not opened by the SNSC Web Server.
3. Device and User credentials (username and password) are stored using strict encryption.
4. SNMP communications to the devices can only use one of the strict encryption algorithms:
 - a. Privacy: AES-128
 - b. Authentication: SHA (HMAC-SHA-96)
5. The communication with VMware’s vCenter will only use HTTPs and TLS 1.2
6. The CLI Push feature does not offer the telnet option
7. Actions > Launch > HTTP is not available.
8. Switch discovery does not allow SNMPv1 or SNMPv2, only SNMPv3.
9. Only the AES and SHA SNMPv3 protocols are presented.
10. RADIUS and TACACS+ configuration disabled. Only secure LDAP is available.

Enabling and Disabling Strict Mode

To enable strict mode, perform the following steps:

1. Set the variable **strict_security_mode** to **true** in the `server_config.properties` file as described in the previous section, “Modifying the `server_config.properties` Configuration File”.
2. Run the following script that will reconfigure SNSC and then restart SNSC in strict mode.
 - a. Linux:
`/opt/ibm/SNSC/bin/configure_security.sh`
 - b. Windows:
`C:\Program Files\IBM\SNSC\bin\configure_securitymode.bat`

To enable compatibility mode (the default), perform the following steps:

1. Set the variable `strict_security_mode` to `false` in the `server_config.properties` file as described in [“Modifying the security.properties Configuration File” on page 104](#) and [“Modifying the log.properties Configuration File” on page 101](#).
2. Run the following script that will reconfigure SNSC and then restart SNSC in compatibility mode.
 - a. Linux:
`/opt/ibm/SNSC/bin/configure_security.sh`
 - b. Windows:
`C:\Program Files\IBM\SNSC\bin\configure_securitymode.bat`

Secure LDAP Configuration

Consider the following when setting up SNSC to communicate with a secure LDAP server:

1. To connect to a secure LDAP server, SNSC needs to trust the certificate that the secure LDAP server is using. The LDAP connection will not be established unless the server is trusted.
2. The file `/opt/ibm/SNSC/conf/security/security.properties` has a property to specify the trust store to be used when communicating to the secure LDAP server with TLSv.2.
3. If SNSC is in strict mode and the trust store file is not specified, connection to the secure LDAP server will fail.
4. Regular LDAP (without SSL) is always used in compatibility mode.

Next, use the `keytool` utility to generate a trust-store file using the secure LDAP server’s certificate.

Note: The `keytool` utility is available at the following location:

- Linux: `/opt/ibm/SNSC/j2re/bin`
- Windows: `C:\Program Files\IBM\SNSC\j2re\bin`

1. To make the client trust the server, they need to share a self-signed certificate. Export the certificate (in DER format) using `keytool`:

```
keytool -export -keystore <server_keystore_file> -alias <server_alias>  
-file <any_temp_file_name>.cer
```

2. Create a separate keystore, `trusted.ks`, using `keytool`:

```
keytool
```

3. Import the certificate `<any_temp_file_name>.cer` file:

```
keytool -import -<any_temp_file_name>.cer -alias <server_alias>  
-keystore trusted.ks -storepass secret
```

4. In the `security.properties` file, specify the `trusted.ks` path as described in the previous section, “Modifying the `security.properties` Configuration File”. SNSC can now use this trusted keystore to connect to the secure LDAP server.

How to Manually Set Device Discovery Date

By default, SNSC assigns the current date after discovering a device. The discovery date parameter helps you to filter the devices based on date range (see [“Discovery Time Range Summary Pane” on page 55](#)). Though SNSC assigns the discovery date automatically, but you can override that and specify a different date manually using the following steps:

1. Select a switch from the SNSC Device List page (see [Figure 9 on page 57](#)).
2. Choose **Device > Set Discovery Date**.
3. Click the date icon to bring up the date wizard and click the date.
4. If Root user is enabled, enter the root password.
5. Click **Save**.

You can also set the discovery date on more than one switch at a time using the following steps:

1. Select one or more switches from the SNSC Device List page (see [Figure 9 on page 57](#)).
2. Choose **Group Operations > Set Discovery Date**.
3. Click the date icon to bring up the date wizard and click the date.
4. If Root user is enabled, enter the root password.
5. Click **Save**.

How to Configure Discovery Time Range

The Discovery Time Ranges control how the device counts are shown in Discovery Time Range Summary Page (see [“Discovery Time Range Summary Pane” on page 55](#)) and how the devices are filtered.

1. Choose menu **Options > Discovery Time Range Configuration**.
2. Change Less Than (<) and Greater Than (>) settings.
3. If Root user is enabled, enter the root password.
4. Click **Save**.

Chapter 3. Viewing Reports

You can view various reports associated with all the discovered switches by choosing the items under the **Reports** menu in SNSC (SNSC).

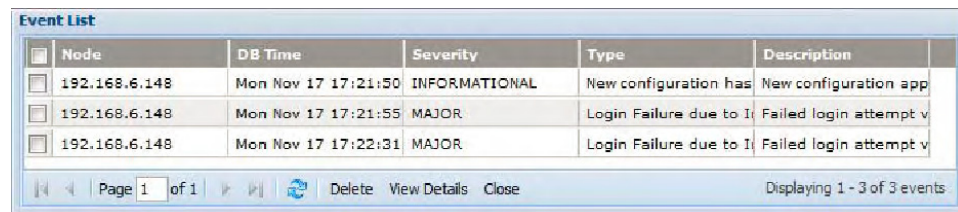
- [“How to View the Event List Report” on page 110](#)
- [“How to View the Syslog List Report” on page 111](#)
- [“How to View the Event List Report” on page 110](#)
- [“How to View the Switch Version Report” on page 114](#)
- [“How to View the Transceiver Information Report” on page 116](#)
- [“How to View the VM Data Center Report” on page 117](#)
- [“How to View the VMready VM Report” on page 119](#)

How to View the Event List Report

The Event list is a summary of events about all discovered switches. You can control how the report organizes and presents information (see [“How to Customize Information in Reports” on page 123](#)). To view the Event List report:

1. Click **Reports > Event List**.
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of an event, double-click any event row or select a row and click **View Details**.
4. To delete one or more events from the SNSC database:
 - a. Click the box next to Node.
 - b. Click **Delete** to remove the selected events from the database.
5. Click **Close** to return to the SNSC home page.

Figure 46. Event List Report SNSC Alerts Report Window



<input type="checkbox"/>	Node	DB Time	Severity	Type	Description
<input type="checkbox"/>	192.168.6.148	Mon Nov 17 17:21:50	INFORMATIONAL	New configuration has	New configuration app
<input type="checkbox"/>	192.168.6.148	Mon Nov 17 17:21:55	MAJOR	Login Failure due to I	Failed login attempt v
<input type="checkbox"/>	192.168.6.148	Mon Nov 17 17:22:31	MAJOR	Login Failure due to I	Failed login attempt v

Table 26. Event List Report field descriptions

Field	Description
Node	IP address of the device that sent the message.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	The severity of the trap as defined in the <code>trapseverity.properties</code> file. See “Advanced Configuration and Tuning” on page 101 .
Type	The trap type, which is included in the event from the device. The device defines the trap type.
Description	The text that was included in the message from the sending device.

How to View the Syslog List Report

The Syslog list is a summary of syslog messages received from the discovered switches. You can control how the report organizes and presents information (see [“How to Customize Information in Reports”](#) on page 123). To view the Syslog List report:

1. Click **Reports > Syslog List**.
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of a syslog message, double-click any event row or select a row and click **View Details**.
4. To delete one or more syslog entries from the SNSC database:
 - a. Click the box next to Node.
 - b. Click **Delete** to remove the selected events from the database.
5. Click **Close** to return to the SNSC home page.

Figure 47. Syslog List Report SNSC Alerts Report Window

Node	Node Time	DB Time	Severity	Description
<input type="checkbox"/> 172.20.89.102	Jan 27 16:05:59	Tue Jan 27 16:05:10.779 PST 2009	INFORMATIONAL	GbE2 Switch OS : image2 download com
<input type="checkbox"/> 172.20.89.102	Jan 27 16:06:30	Tue Jan 27 16:05:41.390 PST 2009	INFORMATIONAL	GbE2 Switch OS : Firmware downloaded t
<input type="checkbox"/> 172.20.89.102	Jan 27 16:07:47	Tue Jan 27 16:06:58.518 PST 2009	NOTICE	GbE2 Switch OS : System Reset from SNI

Table 27. Syslog List Report field descriptions

Field	Description
Node	IP address of the device that sent the message.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	<p>EMERG - indicates the system is unusable.</p> <p>ALERT - indicates action should be taken immediately.</p> <p>CRIT - indicates critical conditions.</p> <p>ERR - indicates error conditions or eroded operations.</p> <p>WARNING - indicates warning conditions.</p> <p>NOTICE - indicates a normal but significant condition.</p> <p>INFO - indicates an information message.</p> <p>DEBUG - indicates a debug-level message.</p>
Description	The text that was included in the message from the sending device.

How to View the SNSC Alerts Report

The SNSC Alerts list is a summary of internal alerts generated by SNSC when it detects intra-switch or inter-switch Virtual Machine movements with reference to switches. To view the SNSC Alerts report:

1. Click **Reports > SNSC Alerts** (see [Figure 46 on page 110](#)).
2. Use the Page text box or associated arrow buttons to navigate through the available pages.
3. To view the details of an alert, double-click any alert row or select a row and click **View Details**.
4. To delete one or more SNSC alerts entries from the SNSC database:
 - a. Click the box next to Node.
 - b. Click **Delete** to remove the selected alerts from the database.
5. Click **Close** to return to the SNSC home page.

Figure 48. SNSC Alerts Report SNSC Alerts Report Window

IP Address	Time	Severity	Type	Description
192.168.143.6	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 1 has move...
192.168.143.6	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 2 has move...
192.168.143.6	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 3 has move...
192.168.143.6	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 7 has move...
192.168.143.7	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 1 has move...
192.168.143.7	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 3 has move...
192.168.143.7	Wed May 27 13:01...	INFORMATIONAL	Inter-Switch VM Move	VM VM 4 has move...
192.168.144.7	Wed May 27 13:01...	INFORMATIONAL	Intra-Switch VM Move	VM VM 9 has move...

Table 28. SNSC Alerts Report field descriptions

Field	Description
IP Address	IP address of the switch that resulted in SNSC Alert
Time	The time that the alert was generated by SNSC.
Severity	The severity of the alert as defined in alertseverity.properties file. See “Advanced Configuration and Tuning” on page 101 for customization.
Type	The alert type
Description	The alert description

Table 29. *SNSC Alerts descriptions*

Field	Description
VM <name/MAC address> came online on port <#>	<i>Intra-switch alert</i> When SNSC detects a VM is on a non-zero port that was previously on port 0 of the same switch and not on a non-zero port of another switch.
VM <name/MAC address> came online on port <#> from <switch address>, port <#>	<i>Inter-switch alert</i> When SNSC detects a VM is on a non-zero port on a switch which was previously on a non-zero port of another switch.
VM <name/MAC address> returned to pre-provisioned state from port <#>	<i>Intra-switch alert</i> When SNSC detects a VM is on port 0 that was previously on a non-zero port on the same switch.
VM <name/MAC address> has moved from port <#> to <#>	<i>Intra-switch alert</i> When SNSC detects a VM has moved from one port to another port on the same switch.
VM <name/MAC address> has moved from port <#> to <switch address>, port <#>	<i>Inter-switch alert</i> When SNSC detects a VM has moved from one port to another port on a different switch.

How to View the Switch Version Report

The switch version report is a summary of data about all discovered switches (**Reports > Switch Version Report**) or selected discovered switches (**Group Operations > Switch Version Report**). You can control how the report organizes and presents information (see [“How to Customize Information in Reports” on page 123](#)).

1. Click **Reports > Switch Version Report** or **Group Operations > Switch Version Report** (see [Figure 49 on page 114](#)).
2. Click **Refresh** to update the version of the report that you are viewing.
3. Click **Close** to return to the SNSC home page.

Figure 49. Switch Version Report window

Domain	Rack	Chassis	IP Address	Status	System Description	System Name	Discovery Date	Location
			10.241.107.21	Up	IBM Networking Operati...		2014-12-17	
			10.241.107.23	Up	IBM Networking Operati...		2014-12-17	
			10.241.107.24	Non-Critical	IBM Networking Operati...	EDF-2(2012)	2014-12-17	
			10.241.107.26	Up	IBM Networking Operati...		2014-12-17	
			10.241.107.27	Up	IBM Networking Operati...	scooter_128	2014-12-17	
			10.241.107.28	Critical	IBM Networking Operati...	Scooter	2014-12-17	
			10.241.107.29	Non-Critical	IBM Networking Operati...		2014-12-17	
		78607235068...	10.241.107.32	Up	Lenovo Flex System SI...	AnithaMercury	2014-12-18	Bangalore

Table 30. Switch Version Report field descriptions

Field	Description
Domain	Names of all switch domains.
Rack	The Rack name (in the navigation tree) in which the switch is contained
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.
Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Discovery Date	The date of the switch discovery.

Table 30. *Switch Version Report field descriptions (continued)*

Field	Description
Location	The physical location of the switch.
Image1	The software version of the image stored in the first image storage area.
Image2	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Config For Next Reset	Gives the configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Enabled Software Features	Gives information about the enabled software features.
Panic Dump	Gives panic dump status.
Time and Reason for last boot	Gives information about the last reboot cycle. For example, the reason might be power cycle.

How to View the Transceiver Information Report

The transceiver information report is a summary of port transceiver information of switches with 10G ports. To view Transceiver Information report:

1. Choose menu **Reports > Transceiver Information Report** to view the report of all discovered switches with 10G ports, or choose menu **Group Operations > Transceiver Information Report** to view the report of the selected switches with 10G ports (see [Figure 50 on page 116](#)).
2. Click **Refresh** to update the report that you are viewing.
3. Click **Close** to return to the SNSC home page.

Figure 50. Transceiver Information Report

IP Address	System Description	System Name	Port	Port SFP/XFP Alias	Device	Tx Enable	Rx Signal	Tx Fault	Vendor	Serial Number	Approval
192.168.6.89	BNT RackSwitch G8000		6 : Port48	Extn48 SFP 4	Detached	C					
192.168.6.89	BNT RackSwitch G8000		5 : Port48	Extn48 SFP 4	Detached	C					
192.168.6.89	BNT RackSwitch G8000		4 : Port48	Extn48 SFP 4	Detached	C					
192.168.6.89	BNT RackSwitch G8000		3 : Port48	Extn48 SFP 4	Detached	C					
192.168.6.89	BNT RackSwitch G8000		2 : Port48	Extn48 SFP 4	Detached	C					
192.168.6.89	BNT RackSwitch G8000		1 : Port48	Extn48 SFP 4	NO device	Not					
192.168.6.90	BNT RackSwitch G8124		Port1	Port 1	NO device	Not					
192.168.6.90	BNT RackSwitch G8124		Port2	Port 2	NO device	Not					
192.168.6.90	BNT RackSwitch G8124		Port3	Port 3	NO device	Not					

Table 31. Transceiver Information Report field descriptions

Field	Description
IP Address	IP address of the switch.
System Description	Product name of the switch.
System Name	Administrative-assigned name for the switch.
Port	Port index number
Port SFP/XFP Alias	10G SFP/XFP port alias
Device	Device name. “NO device” indicates device/cable is not connected.
Tx Enable	TX-Enable status
Rx Signal	RX-Signal status
Tx Fault	TX-Fault status
Vendor	Vendor name for the device
Serial Number	Serial number of the device
Approval	Approval state for the device: (i) Not Installed (ii) Not Approved (iii) Approved (iv) Detached

How to View the VM Data Center Report

The VM Data Center Report is a list of virtual machines (VMs) that match the following criteria:

- MAC address has been discovered on a server (downlink) port of a switch, and
- MAC address is found in one of the configured VM Management Servers.

At least one VM Management Server must be configured that contains information about the VMs whose MAC addresses will be discovered on the switches.

For RackSwitches (for example, G8124), you must define which ports are server ports in order for the VMs to be reported properly.

To launch the VM Data Center Report, choose menu **Reports > VM Data Center Report** or **Group Operations > VM Data Center Report** (see [Figure 51 on page 117](#)).

Figure 51. VM Data Center Report

Chassis ID	Bay #	Switch MAC	Switch IP	System Name	Port	VLAN	VM Name	VM IP
2UX8160110	2	00:18:b1:31:a0:00	192.168.6.147	VMTest1	EXT2	5	VM1	172.24.1.10
2UX8160111	3	00:25:03:c6:14:00	192.168.6.148	VMTest2	EXT2	5	VM2	172.24.1.11
2UX8160112	4	fc:cf:62:10:ad:00	192.168.6.149	VMTest3		5	VM3	172.24.1.12

Table 32. VM Data Center Report field descriptions

Field	Description
Chassis ID	The chassis ID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.
Switch MAC	MAC Address of the switch on which the VM was discovered.
Switch IP	IP Address of the switch on which the VM was discovered.
System Name	Name of the switch on which the VM was discovered.
Port	Server port on which Virtual Machine was discovered.
VLAN	VLAN to which the Virtual Machine is associated.
VM Name	Name of the discovered virtual machine. This information is retrieved from VMWare vCenter.
VM IP	IP Address of the Virtual Machine. This information is retrieved from VMWare vCenter.
VM vNIC	vNIC address of the Virtual Machine. This information is retrieved from VMWare vCenter.

Table 32. *VM Data Center Report field descriptions*

Field	Description
PortGroup/VLAN	PortGroup and VLAN of Virtual Machine as configured in the hypervisor. This information is retrieved from VMWare vCenter.
Hypervisor	Name of the Hypervisor on which the VM is running. This information is retrieved from VMWare vCenter.

How to View the VMready VM Report

There are two types of VMready VM Reports:

- VM Groups: Reports the membership of the Virtual Machine Groups that are configured on each of the discovered VMready capable switches. The VM Groups Report provides a summary of all Virtual Machines discovered by the switches listed in SNSC.
- Port Groups: Reports the membership of the Port Groups that are configured on each of the discovered VMready capable switches.

VMready VM Report – VM Groups

To launch the VM Groups Report, choose menu **Reports > VMready VM Report > VM Groups** (see [Figure 52 on page 120](#)).

Figure 52. VMready VM Report – VM Groups window

Switch IP Address/Name	Group	Chassis UUID	Bay#	Switch MAC	VLAN	Switch#
192.168.130.91	9	G2C1		1a:30:92:a1:b2:91	3089	non-stack
192.168.130.91	25	G2C1		1a:30:92:a1:b2:91	215	non-stack
192.168.130.91	26	G2C1		1a:30:92:a1:b2:91	2140	non-stack
192.168.130.91	27	G2C1		1a:30:92:a1:b2:91	2395	non-stack
192.168.130.91	31	G2C1		1a:30:92:a1:b2:91	1812	non-stack
192.168.130.91	9	G2C1		1a:30:92:a1:b2:91	3767	non-stack
192.168.130.91	18	G2C1		1a:30:92:a1:b2:91	1495	non-stack
192.168.130.91	None	G2C1		1a:30:92:a1:b2:91	3556	non-stack
192.168.130.91	29	G2C1		1a:30:92:a1:b2:91	1485	non-stack
192.168.130.91	13	G2C1		1a:30:92:a1:b2:91	3324	non-stack
192.168.130.91	24	G2C1		1a:30:92:a1:b2:91	3951	non-stack
192.168.130.91	30	G2C1		1a:30:92:a1:b2:91	1681	non-stack
192.168.130.91	15	G2C1		1a:30:92:a1:b2:91	1800	non-stack
192.168.130.91	20	G2C1		1a:30:92:a1:b2:91	1257	non-stack
192.168.130.91	7	G2C1		1a:30:92:a1:b2:91	3588	non-stack
192.168.130.91	19	G2C1		1a:30:92:a1:b2:91	425	non-stack
192.168.130.91	13	G2C1		1a:30:92:a1:b2:91	2936	non-stack
192.168.130.91	18	G2C1		1a:30:92:a1:b2:91	251	non-stack
192.168.130.91	9	G2C1		1a:30:92:a1:b2:91	1518	non-stack
192.168.130.91	28	G2C1		1a:30:92:a1:b2:91	2058	non-stack
192.168.130.111	20	G2C2		2a:30:b2:a1:b2:b1	2951	non-stack
192.168.130.111	18	G2C2		2a:30:b2:a1:b2:b1	1629	non-stack
192.168.130.111	30	G2C2		2a:30:b2:a1:b2:b1	3190	non-stack

Table 33. VMready VM Report – VM Groups field descriptions

Field	Description
Switch IP Address/Name	IP Address/Name of the switch on which the VM was discovered.
Groups	Group number to which the Virtual Machine is associated.
Chassis UUID	The chassis UUID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.
Switch MAC	MAC address of the switch.
VLAN	VLAN to which the Virtual Machine is associated.
Switch #	Switch number of the corresponding uplink or server ports if the switch is part of a stack. <ul style="list-style-type: none"> ● non-stack indicates the switch is not part of a stack. ● (Detached) indicates the switch is configured as part of a stack, but is not physically present at the time.
Port	Server port on which Virtual Machine was discovered.

Table 33. *VMready VM Report – VM Groups field descriptions (continued)*

Field	Description
Virtual MAC	MAC address of the Virtual Machine.
VM IP	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.

VMready VM Report – Port Groups

To launch the Port Groups Report, choose menu **Reports > VMready VM Report > Port Groups** (see [Figure 53 on page 122](#)).

Figure 53. VMready VM Report – Port Groups window

Switch IP Address/Name	Group	Chassis UUID	Bay #	Switch MAC	Switch #	Port
192.168.130.91	30	G2C1		1a:30:92:a1:b2: non-stack		EXT1
192.168.130.91	27	G2C1		1a:30:92:a1:b2: non-stack		EXT2, INT11
192.168.130.91	17	G2C1		1a:30:92:a1:b2: non-stack		EXT3, INT9
192.168.130.91	6	G2C1		1a:30:92:a1:b2: non-stack		EXT4, INT4
192.168.130.91	11	G2C1		1a:30:92:a1:b2: non-stack		EXT5
192.168.130.91	8	G2C1		1a:30:92:a1:b2: non-stack		EXT6
192.168.130.91	12	G2C1		1a:30:92:a1:b2: non-stack		EXT7
192.168.130.91	15	G2C1		1a:30:92:a1:b2: non-stack		EXT8
192.168.130.91	21	G2C1		1a:30:92:a1:b2: non-stack		EXT9, INT14
192.168.130.91	32	G2C1		1a:30:92:a1:b2: non-stack		INT1
192.168.130.91	14	G2C1		1a:30:92:a1:b2: non-stack		INT2, INT6
192.168.130.91	28	G2C1		1a:30:92:a1:b2: non-stack		INT3
192.168.130.91	23	G2C1		1a:30:92:a1:b2: non-stack		INT5
192.168.130.91	22	G2C1		1a:30:92:a1:b2: non-stack		INT7
192.168.130.91	24	G2C1		1a:30:92:a1:b2: non-stack		INT8
192.168.130.91	19	G2C1		1a:30:92:a1:b2: non-stack		INT10
192.168.130.91	1	G2C1		1a:30:92:a1:b2: non-stack		INT12
192.168.130.91	26	G2C1		1a:30:92:a1:b2: non-stack		INT13
192.168.130.111	13	G2C2		2a:30:b2:a1:b2: non-stack		EXT1
192.168.130.111	29	G2C2		2a:30:b2:a1:b2: non-stack		EXT2, EXT5, EXT6
192.168.130.111	7	G2C2		2a:30:b2:a1:b2: non-stack		EXT3
192.168.130.111	25	G2C2		2a:30:b2:a1:b2: non-stack		EXT4
192.168.130.111	8	G2C2		2a:30:b2:a1:b2: non-stack		EXT7

Table 34. VMready VM Report — Port Groups field descriptions

Field	Description
Switch IP Address/Name	IP Address/Name of the switch.
Groups	Group number to which the uplink or server ports are associated.
Chassis UUID	The chassis UUID of the switch. This is relevant only in case of stack of switches.
Bay #	The bay number in which the switch is residing. This is relevant only in case of stack of switches.
Switch MAC	MAC address of the switch.
Switch #	Switch number of the corresponding uplink or server ports if the switch is part of a stack. <ul style="list-style-type: none"> ● non-stack indicates the switch is not part of a stack. ● (Detached) indicates the switch is configured as part of a stack, but is not physically present at the time.
Port	Alias of uplink or server ports.

How to Customize Information in Reports

This section explains how to customize information displayed in the Switch Version Report and Event List window.

- [“Changing the Column Sort Order” on page 123](#)
- [“Displaying or Hiding Columns” on page 123](#)

Changing the Column Sort Order

1. Click a column heading.
2. Click **Sort Ascending** to sort information in ascending order.
3. Click **Sort Descending** to sort information in descending order.

Displaying or Hiding Columns

1. Click a column heading.
2. Click **Columns**.
3. Clear column names to hide one or more columns.
4. Click column names to display one or more columns.

Chapter 4. Performing Group Operations

You typically perform group operations on multiple switches of the same type. This chapter discusses the following group operations:

- [“How to Deploy Switch Image and Configuration on One or More Switches” on page 126](#)
- [“How to Run CLI Commands on One or More Switches” on page 134](#)
- [“How to Collect Data from One or More Switches on Demand” on page 136](#)
- [“How to Retrieve Switch Version Report from One or More Switches” on page 137](#)
- [“How to Retrieve Transceiver Information Report from One or More Switches” on page 138](#)
- [“How to Retrieve VM Data Center Report from One or More Switches” on page 139](#)
- [“How to Invoke Actions on One or More Switches” on page 140](#)
- [“How to Manually Set Discovery Date on One or More Switches” on page 141](#)
- [“How to Add/Remove Notes to/from One or More Switches” on page 142](#)

Note: The Concurrent Limit setting (see **Options > General Properties**) controls the number of switches on which System Networking Switch Center (SNSC) can simultaneously perform group operations. For example, if the Concurrent Limit parameter is set to 10, SNSC can perform actions on a maximum of 10 switches at the same time. See [“Changing the Default General Properties” on page 70](#) to change the general properties.

How to Deploy Switch Image and Configuration on One or More Switches

You can deploy switch image (firmware) or configuration on one or more selected switches through group operations. In addition to deploying them, you can backup firmware and/or configuration from multiple switches and download panic dump, tech support dump from multiple switches. These group operations can be initiated to take effect immediately or can be configured to occur at a scheduled time.

- [“How to Upgrade Switch Image on One or More Switches” on page 127](#)
- [“How to Backup Switch Image from One or More Switches” on page 128](#)
- [“How to Upgrade Switch Configuration on One or More Switches” on page 129](#)
- [“How to Backup Switch Configuration from One or More Switches” on page 130](#)
- [“How to Download Panic Dump from One or More Switches” on page 131](#)
- [“How to Download Tech Support Dump from One or More Switches” on page 132](#)
- [“How to View Scheduled Jobs” on page 132](#)

Note: You must configure an FTP, TFTP, or SFTP server before you can perform most group operations. When you perform a task that involves an FTP, TFTP, or SFTP server, SNSC displays information about the server, such as transfer mode and IP address. See [“Configuring FTP/SFTP/TFTP Server Parameters” on page 79](#) to set up the server.

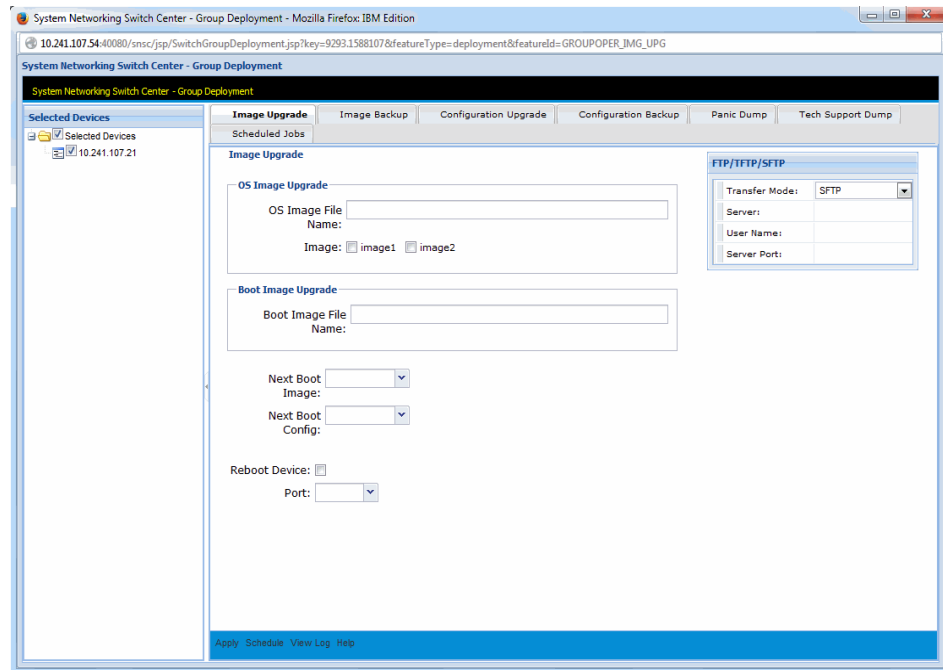
To launch Group Deployment page:

- Select one or more switches in the device list (see [Figure 6 on page 53](#)).
- Choose any one option under menu **Group Operations > Deployment**.

The Group Deployment page (see [Figure 54 on page 127](#)) consists of two framed windows: the Selected Devices frame (left) and the Content Frame (right).

The Selected Devices frame lists the selected switches for which the group operation is going to be performed. It also allows you to deselect any switches from the selection list. The Content frame shows the sub-features in the form of tabs and the corresponding details in a panel along with panel specific menu bar at the bottom.

Figure 54. System Networking Switch Center – Group Deployment Page



How to Upgrade Switch Image on One or More Switches

You can upgrade the switch image (firmware) on one or more switches of the same type by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches of the same type from the SNSC Device List page. You can make use of List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations > Deployment > Image Upgrade** to launch Image Upgrade window.
4. Enter the name of the switch OS image in the OS Image File Name field. This switch OS image must reside on the FTP/SFTP/TFTP Server.
 - a. Choose **image1** if you want the switch OS image in image 1 slot on the switch.
 - b. Choose **image2** if you want the switch OS image in image 2 slot on the switch.
5. Enter the name of the switch boot image in Boot Image File Name field. This switch boot image must reside on the FTP/SFTP/TFTP Server.
6. (Optional) Choose **Next Boot Image** if you want to load a different OS image during next boot.
7. (Optional) Choose **Next Boot Config** if you want to load a different configuration during next boot.

8. Choose **Reboot Device** if you want the new image files to take effect. If you select **Reboot Device**, then Image Upgrade operation will reset the switch after upgrading the switch images. This operation interrupts service on the selected switches.
9. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
10. Click **Apply** to immediately copy the image file to the selected switches.
11. (Optional) Click **Schedule** to set the parameters required to copy the image file to the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
12. Click **View Log** to open a window that displays information about the procedure.

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Backup Switch Image from One or More Switches

You can backup the switch image (firmware) from one or more switches by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Image Backup** to launch Image Backup window.
4. Select the image type to backup from Image list.
5. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
6. Select the transfer mode – FTP, TFTP, or SFTP.
7. Click **Apply** to immediately start the image backup process.

8. (Optional) Click **Schedule** to set the parameters required to backup the image file from the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
9. Click **View Log** to open a window that displays information about the procedure.

The default image backup file stored on FTP/SFTP/TFTP server is in the following format:

<IPAddress>_ddMMyyyy_HHmss .img

For example, the image backed up from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

192.168.1.1_07Mar2008_235901 .img

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Upgrade Switch Configuration on One or More Switches

You can upgrade the switch configuration on one or more switches of the same type by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches of the same type from the System Networking Switch Center Device List page. You can make use of List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations > Deployment > Configuration Upgrade** to launch Configuration Upgrade window.
4. Enter the name of the configuration file in Configuration File Name. This configuration file should be residing on the FTP/SFTP/TFTP Server.
5. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
6. Select the transfer mode – FTP, TFTP, or SFTP.
7. Click **Apply** to immediately copy the configuration file to the selected switches.

8. (Optional) Click **Schedule** to set the parameters required to copy the configuration file to the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
9. Click **View Log** to open a window that displays information about the procedure.

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Backup Switch Configuration from One or More Switches

You can backup the switch configuration from one or more switches by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Configuration Backup** to launch Configuration Backup window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start the configuration backup process.
7. (Optional) Click **Schedule** to set the parameters required to backup the configuration from the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The configuration file that you backed up is stored on FTP/SFTP/TFTP server in the following format:

```
config_<IPAddress>_ddMMMyyyy_HHmss.txt
```

For example, the configuration file backed up from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
config_192.168.1.1_07Mar2008_235901.txt
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Download Panic Dump from One or More Switches

When a switch encounters a fatal condition during runtime, it captures the current hardware and software state information into a panic dump. You can download the panic dump from one or more switches by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the System Networking Switch Center Device List page.
3. Choose menu **Group Operations > Deployment > Panic Dump** to launch Panic Dump window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start downloading the panic dump.
7. (Optional) Click **Schedule** to set the parameters required to download the panic dump from the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The panic dump is stored on FTP/SFTP/TFTP server in the following format:

```
panicdump_<IPAddress>_ddMMMyyyy_HHmss
```

For example, the panic dump saved from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
panicdump_192.168.1.1_07Mar2008_235901
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to Download Tech Support Dump from One or More Switches

You can download the tech support dump from one or more switches by using this feature.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > Deployment > Tech Support Dump** to launch Tech Support Dump window.
4. Choose **Port** through which the operation should be performed. Note that this field may not be available for the selected switch. Please disregard this step if it does not apply to your switch.
5. Select the transfer mode – FTP, TFTP, or SFTP.
6. Click **Apply** to immediately start downloading the tech support dump.
7. (Optional) Click **Schedule** to set the parameters required to download the tech support dump from the selected switches at a later time.
 - a. Enter the schedule name of the job.
 - b. Select a job type.
 - c. Enter the date to start the job.
 - d. Enter the hour and minute to start the job.
 - e. Click **Schedule**.
 - f. To review job parameters, choose menu **Group Operations > Deployment > Scheduled Jobs**.
8. Click **View Log** to open a window that displays information about the procedure.

The tech support dump is stored on FTP/SFTP/TFTP server in the following format:

```
tsdump_<IPAddress>_ddMMMyyyy_HHmms
```

For example, the tech support dump saved from the switch 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named as follows:

```
tsdump_192.168.1.1_07Mar2008_235901
```

Note: If you are using SFTP as the transfer protocol, you can configure a server port to which your SFTP server is listening.

How to View Scheduled Jobs

You can view and refresh the list of scheduled jobs and you can cancel one or more scheduled jobs. You can see information about the job type, scheduled start date, ID of the person who scheduled the job and the job name.

1. Choose menu **Group Operations > Deployment > Scheduled Jobs** (see [Figure 55 on page 133](#)). The window displays all currently scheduled jobs.
2. Click **View Details** to bring up the window showing the details of the selected scheduled job.
3. To cancel one or more jobs:
 - a. Select the job or jobs that you want to cancel.
 - b. Click **Cancel Jobs**.
 - c. Click **Refresh** to verify that the scheduled jobs list does not displayed the cancelled jobs.

Figure 55. Scheduled Jobs pane

Schedule Name	Operation Type	Selected Device(s)	Job Type	Date	User
Conf_Backup	Configuration Bac...	10.241.107.21...	One-time	Mon Dec 22 03:4...	admin

Table 35. Scheduled Jobs field descriptions

Field	Description
Schedule Name	Name of the scheduled job as created by the user.
Operation Type	The operation type, such as Image Upgrade, Image Backup, Configuration Upgrade, that is going to be performed by the scheduled job.
Selected Devices	The list of selected devices. Due to limited space, ellipsis is employed in case of multiple devices. But the list of all the selected devices can be seen by clicking View Details to open a window showing the details of the selected scheduled job.
Job Type	The type of the job. It can be: <ul style="list-style-type: none"> ● One-time – Meaning it is executed once as scheduled ● Recurrent – Recurring job occurring at regular interval
Date	The scheduled date and time information. In case of Recurrent type of jobs, a different tag such as Daily, Weekly and Monthly is used along with the time and/or date.
User	User who created the scheduled job.

How to Run CLI Commands on One or More Switches

Using this facility, you can make changes to the switch configuration on multiple switches by executing one or more CLI commands. When you perform this operation, you must save the changes so that they are retained beyond the next time the switch is reset. When you execute the save command, your new configuration changes are placed in the active configuration block. The previous configuration is copied into the backup configuration block.

Note: Make sure that you enter complete commands, so no prompting for further input is required. When using ISCLI commands, make sure that the commands do not prompt for further input, such as show commands that have long output.

To run CLI commands on a switch:

1. Log in to SNSC as an administrator.
2. Select one or more switches of the same type from the SNSC Device List page. The devices do not need be of the same type. However, you can use the List Device(s) filter in the Device List page to select a particular type of switch.
3. Choose menu **Group Operations** > **CLI Push** to launch the window (see [Figure 56 on page 135](#)).
4. Enter the Admin Username and Password of the switch.
5. Choose the protocol (SSH or Telnet) over which the CLI commands should be sent.
6. Enter one or more CLI commands.
7. (Optional) Click **Open** to open a file containing CLI commands.
8. (Optional) Click **Save** to save the CLI commands in the window.
9. Click **Execute** to run the CLI commands on the selected switches.
10. Click **Close** to close the window and return to the Device List page.

Figure 56. CLI Push window

The image shows a software window titled "CLI Push". It is divided into two main sections. The top section, titled "Authentication Details For the switch", contains three input fields: "Admin Username :", "Admin Password :", and "Send Commands Over :". The "Send Commands Over :" field has two radio buttons, "SSH" (which is selected) and "Telnet". The bottom section, titled "Commands", is a large empty rectangular area. At the bottom of the window, there is a horizontal bar with six buttons: "Execute", "Open", "Save", "View Log", "Close", and "Help".

How to Collect Data from One or More Switches on Demand

You can asynchronously refresh the data of the selected switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > Collect Data From Device**.

How to Retrieve Switch Version Report from One or More Switches

You can retrieve the switch version report from one or more switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > Switch Version Report**.
4. For more information, refer to [“How to View the Switch Version Report” on page 16](#).

How to Retrieve Transceiver Information Report from One or More Switches

You can retrieve the Transceiver Information report from one or more switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > Transceiver Information Report**.
4. For more information, refer to [“How to View the Transceiver Information Report” on page 18](#).

How to Retrieve VM Data Center Report from One or More Switches

You can retrieve the VM Data Center report from one or more switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > VM Data Center Report**.
4. For more information, refer to [“How to View the VM Data Center Report” on page 19](#).

How to Invoke Actions on One or More Switches

You can use this facility to invoke action commands such as **Apply**, **Save** on one or more switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. To apply any pending configuration changes on the selected switches:
 - a. Choose **Group Operations > Group Actions > Apply**.
 - b. Click **Yes** to confirm that you want to apply the configuration on the selected switch(es).
4. To save the current configuration to the flash memory on the selected switches:
 - a. Choose **Group Operations > Group Actions > Save**.
 - b. Click **Yes** to confirm that you want to save the configuration on the selected switch(es).
5. To reboot the selected switches:
 - a. Choose **Group Operations > Group Actions > Reboot Switch**.
 - b. Click **Yes** to confirm that you want to reboot the selected switch(es).
6. To delete the selected switch entries from SNSC device list:
 - a. Choose **Group Operations > Group Actions > Delete**.
 - b. Click **Yes** to confirm that you want to delete the selected switch(es).

Note: While invoking **Delete** operation, if you select one or members of a stack of switches, the entire stack will be deleted.

How to Manually Set Discovery Date on One or More Switches

You can manually set the discovery date on one or more switches.

1. Log in to SNSC as an administrator.
2. Select one or more switches from the SNSC Device List page.
3. Choose menu **Group Operations > Set Discovery Date**.
4. Click the date icon to open the Date wizard and click the date.
5. If Root user is enabled, enter the root password.
6. Click **Save**.

How to Add/Remove Notes to/from One or More Switches

You can add notes or remove notes from on one or more switches.

1. Log in to SNSC as any valid user.
2. Select one or more switches from the SNSC Device List page.
3. To add Notes:
 - a. Choose menu **Group Operations > Notes > Add**.
 - b. Type the text that you want to add.
 - c. Click **OK**.
4. To remove Notes:
 - a. Choose menu **Group Operations > Notes > Remove**.
 - b. Click **Yes** in the confirmation dialog to remove notes.

Chapter 5. Monitoring a Switch

The monitoring feature provides real-time information and statistics about various components of a selected switch. The monitoring facility is provided as part of the Device Console page in (see [Figure 11 on page 66](#)).

Choose menu **Options > Data Collection Configuration** to view or change the Performance Statistics interval parameter. The parameter determines how often performance statistics are collected from a device and written to the SNSC (SNSC) database. Performance Statistics collection only occurs on a device when a user opens a monitoring page for that device. If no users have selected a monitor page, no performance statistics collection occurs on any discovered device.

Choose menu **Options > Refresh Configuration** to view or change the interval that determines how often the user interface is updated with new performance statistics from the database.

- [“How to Monitor the Switch” on page 145](#)
- [“How to Modify a Statistical Monitoring Page” on page 147](#)
- [“How to View Switch Summary” on page 148](#)
- [“How to Monitor Switch Statistics” on page 153](#)
- [“How to Monitor a Port” on page 164](#)
- [“How to Monitor Bridge Statistics” on page 174](#)
- [“How to Monitor LLDP Information” on page 179](#)
- [“How to Monitor Failover Information” on page 182](#)
- [“How to Monitor vLAG Information” on page 184](#)
- [“How to Monitor Hotlinks Statistics” on page 189](#)
- [“How to Monitor 802.1x/p Information” on page 191](#)
- [“How to Monitor ECP \(Edge Control Protocol\) Information” on page 192](#)
- [“How to Monitor LACP \(Link Aggregation Control Protocol\) Information” on page 193](#)
- [“How to Monitor IP Routing” on page 199](#)
- [“How to Monitor BGP Routing” on page 214](#)
- [“How to Monitor RIP Routing” on page 216](#)
- [“How to Monitor OSPF Routing” on page 218](#)
- [“How to Monitor IGMP Routing” on page 258](#)
- [“How to Monitor Virtual Routing” on page 261](#)
- [“How to Monitor Access Control Lists” on page 264](#)
- [“How to Monitor Fiber Channel over Ethernet \(FCoE\)” on page 266](#)
- [“How to Monitor QoS Information” on page 280](#)
- [“How to Monitor Virtualization” on page 281](#)
- [“How to Monitor Edge Virtual Bridging \(EVB\)” on page 283](#)

- [“How to Monitor Unified Fabric Port Information” on page 287](#)
- [“How to Monitor iSwitch Information” on page 302](#)
- [“How to Launch a Chart” on page 303](#)
- [“How to Export a Statistical Summary” on page 305](#)
- [“How to Print a Statistical Summary” on page 307](#)

How to Monitor the Switch

You can launch **Device Console – Monitoring** page by choosing one of the following ways after you log in to SNSC:

1. Log in to SNSC.
2. Launch Device Console page. You can launch this page using one of the following approaches:
 - a. Select a switch from the SNSC Home page (see [Figure 6 on page 53](#)) and choose menu **Device > Monitor**.
 - b. Click the IP address link of the switch you want to manage in device list table in the Home page.
 - c. In Home page's Go To: text field, enter the IP address of the switch you want to manage and click the **Search** (Magnifying Glass) icon.
3. Select the category from Monitor's tab in the left frame.

When you select a category, it results in the display of tab associated content pane. For example, if you select Summary, the content pane shows the following sub-category in the form of tabs:

- Health Status
- Information
- Port Status
- Port Summary

You can select one of the sub-category tabs to view the specific details.

Table 36. *Monitoring Button Descriptions*

Button	Description
Refresh	Statistics are refreshed automatically on a regular basis. Click Refresh to display updated values between the regular refresh intervals. Choose menu Options > Refresh Configuration to change the refresh intervals.
Export	You can export monitoring statistics to a spreadsheet in CSV (comma separated value) format. Choose menu Export > Save to create a .csv file that you can open in Microsoft Excel. See “How to Export a Statistical Summary” on page 305 for more information.
Print	Click to send the statistics to the printer. See “How to Print a Statistical Summary” on page 307 for more information.
Chart	This button is available for all statistics related pages, enabling you to launch a chart and plot values in real-time. See “How to Launch a Chart” on page 303 for more information.
Help	Click to launch context-sensitive help for the page that you are viewing.

Table 36. *Monitoring Button Descriptions (continued)*

Button	Description
Port	This button is only available when you monitor ports. Click to change the port that is being monitored. See “How to Monitor a Port” on page 164 for more information.
Clear Counter	Select this option to clear the counter values only on the user interface.
Clear Statistics	Select this option to clear the statistics on the switch and reset them to zero.

About Various Monitor Tabs

Some **Device Console > Monitor** tabs might not be available for the selected switch. Please disregard the corresponding information if it does not apply to your switch.

How to Modify a Statistical Monitoring Page

You can customize information displayed by the monitoring pages.

- [“Changing the Column Sort Order” on page 147](#)
- [“Displaying or Hiding Columns” on page 147](#)

Changing the Column Sort Order

1. Click a column heading.
2. Click **Sort Ascending** to sort information in ascending order.
3. Click **Sort Descending** to sort information in descending order.

Displaying or Hiding Columns

1. Click a column heading.
2. Click **Columns**.
3. Clear column names to hide one or more columns.
4. Click column names to display one or more columns.

How to View Switch Summary

Select Monitor's **Summary** category to view Switch Summary information. This section covers the following switch summary topics:

- “Viewing Health Status” on page 148
- “Viewing Information” on page 149
- “Viewing Port Status” on page 149
- “Viewing Port Summary” on page 150
- “Viewing Events” on page 151
- “Viewing Syslog” on page 152

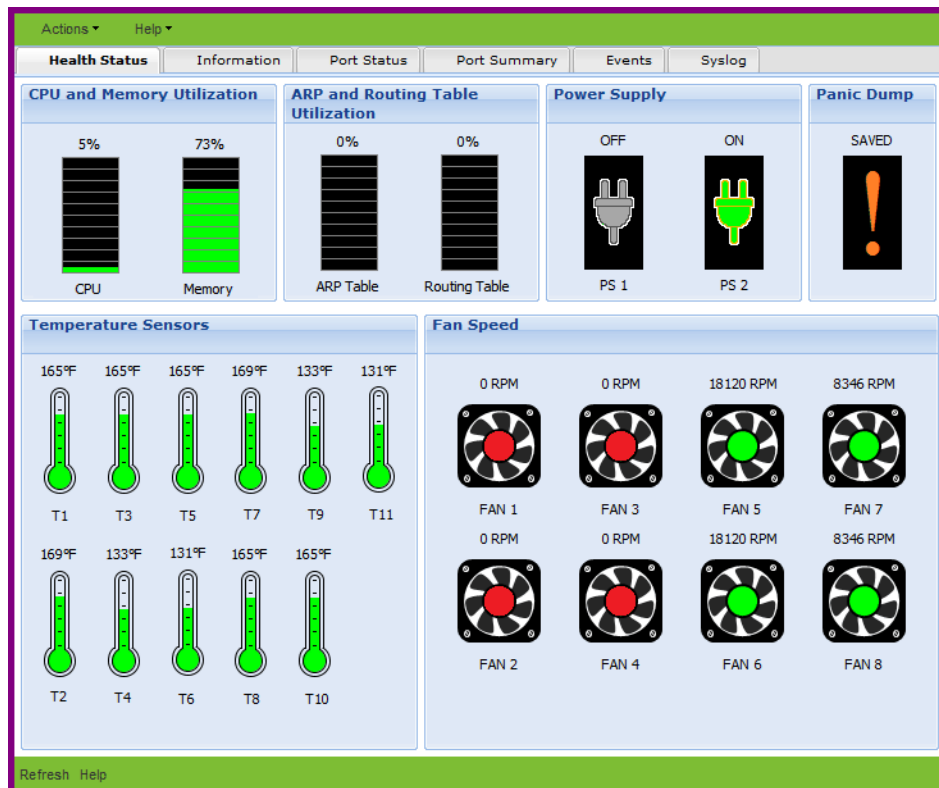
Viewing Health Status

Device Console > Monitor > Summary > Health Status

The Health Status page pictorially shows CPU and Memory Utilization, ARP and Routing Table Utilization, Power Supply Status, Panic Dump Status, Temperature Sensors reading and Fan Speed (see [Figure 57 on page 148](#)).

Note: The utilization, power supply status, temperature sensors, and fan speed might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Figure 57. Health Status Window



Viewing Information

Device Console > Monitor > Summary > Information

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 37. *Switch Information field descriptions*

Field	Description
System Description	Displays the product name of the switch.
MAC Address	MAC address of the switch.
System Up Since	Displays the date and time when the switch was last booted.
Location	The physical location of the node, such as telephone closet, third floor.
Contact	Information about the contact person for this managed node.
Boot Code Version	The software version of the switch boot code.
Image 1 Software Version	The software version of the image stored in the first image storage area.
Image 2 Software Version	The software version of the image stored in the second image storage area.
Current Image	The software image that is active (image1 or image2).
Current Config	The current configuration block (active, backup, factory).
Primary Server Key	The NTP Authentication primary server key.
Secondary Server Key	The NTP Authentication secondary server key.
NTP Authentication State	The NTP Authentication state. A value of 1 means Enabled; a value of 0 means Disabled.
Enabled Software Features	The software features that are enabled on the switch.

Viewing Port Status

Device Console > Monitor > Summary > Port Status

The Port Status displays the state, speed and transmit and receive utilization corresponding to all the ports of the selected switch (see [Figure 58 on page 150](#)).

Figure 58. Port Status Window

Port Name	Port State	Speed	Transmit Utilization(%)	Receive Utilization(%)
Downlink1	down	100 Mb	0%	0%
Downlink2	down	100 Mb	0%	0%
Downlink3	down	100 Mb	0%	0%
Downlink4	inoperative	1000 Mb	0%	0%
Downlink5	up	1000 Mb	51%	72%
Downlink6	disabled	any	0%	0%
Downlink7	down	100 Mb	0%	0%
Downlink8	inoperative	10000 Mb	0%	0%
Downlink9	inoperative	100 Mb	0%	0%
Downlink10	down	10000 Mb	0%	0%
Downlink11	down	10 Mb	0%	0%
Downlink12	disabled	10 Mb	0%	0%
Downlink13	up	10000 Mb	24%	22%
Downlink14	disabled	100 Mb	0%	0%
Downlink15	down	1000 Mb	0%	0%
Downlink16	disabled	10000 Mb	0%	0%
Xconnect1	disabled	10 Mb	0%	0%
Mgmt	disabled	10 Mb	0%	0%
Uplink1	inoperative	any	0%	0%

Table 38. Port Status field descriptions

Field	Description
Port Name	The physical port of the switch
Port State	The port status
Speed	The port speed
Transmit Utilization (%)	Transmission utilization in percentage (number of bytes sent out per speed)
Receive Utilization (%)	Receive utilization in percentage (number of bytes taken in per speed)

Viewing Port Summary

Device Console > Monitor > Summary > Port Summary

Table 39. Port Summary field descriptions

Field	Description
Port	Displays the port number. Note: The value will be in the following format if switch is connected to a stack: <Switch#> : <Port#/Port Alias>
Port Name	The port name defined by the administrator.

Table 39. *Port Summary field descriptions*

Field	Description
Speed	Displays the link speed.
Port State	Displays the current enabled or disabled value for the port link.
VLAN	VLAN tag state of the port.
Tag PVID	Displays state of VLAN tag persistence. The default value is disabled, or "untagged". When disabled, or untagged, the VLAN tag is removed from packets where the VLAN tag matches the port PVID.
PVID	Displays the default VLAN number that is used to forward frames that are not VLAN tagged. The default number is 1.
Tag PVID Ingress	Displays state of tagging the ingress frames with the port's VLAN ID. When enabled, the PVID tag is inserted into untagged and 802.1Q single-tagged ingress frames as outer VLAN ID. The default setting is disabled.

Viewing Events

Device Console > Monitor > Summary > Events

Table 40. *Events field descriptions*

Field	Description
Node	IP address of the device that sent the event.
DB Time	The time that the event was received at the server and placed into the SNSC database.
Severity	The severity of the trap as defined in trapseverity.properties file. See “Advanced Configuration and Tuning” on page 101 for customization information.
Type	The trap type, which is included in the event from the device. The type is defined by the device.
Description	The text that was included in the event from the sending device.

Notes:

- You can remove events from the SNSC database by selecting the event(s) and by clicking **Delete**.
- You can view the details of an event including the SNMP variable bindings either by double-clicking any event row or by selecting a row and clicking **View Details**.

Viewing Syslog

Device Console > Monitor > Summary > Syslog

Table 41. *Syslog field descriptions*

Field	Description
Node	IP address of the device that sent the message.
Node Time	The time the message was generated by the device that sent it.
DB Time	The time that the message was received at the server and placed into the SNSC database.
Severity	Severity level, as follows: EMERG - indicates the system is unusable. ALERT - indicates action should be taken immediately. CRIT - indicates critical conditions. ERR - indicates error conditions or eroded operations. WARNING - indicates warning conditions. NOTICE - indicates a normal but significant condition. INFO - indicates an information message. DEBUG - indicates a debug-level message.
Description	The text that was included in the event from the sending device.

Notes:

- To remove syslog messages from the SNSC database, select the message(s) and click **Delete**.
- To view the details of a Syslog message, either double-click any event row or select a row and click **View Details**.

How to Monitor Switch Statistics

Select Monitor's **Switch** category to monitor Switch Statistics. This section covers the following switch statistics topics:

- “Monitoring SNMP Statistics” on page 154
- “Viewing Information Summary” on page 156
- “Monitoring Packet Statistics” on page 157
- “Monitoring MP CPU Statistics” on page 158
- “Monitoring STP Statistics” on page 158
- “Monitoring UFD Statistics” on page 158
- “Monitoring UFD Information” on page 159
- “Monitoring NTP Statistics” on page 159
- “Monitoring Trunk Groups” on page 161
- “Monitoring Trunk Group Ports” on page 161
- “Monitoring TACACS+ Authentication Statistics” on page 162

Note: Some of the monitor pages display Absolute Value, Average/sec, Minimum/sec, Maximum/sec and LastVal/sec. The following table describes how those values are calculated.

Table 42. *Statistics field descriptions*

Field	Description
AbsoluteValue	The current value retrieved from the device.
Average/sec	The average value calculated over time.
Minimum/sec	<p>The value is calculated over time using one of the following formula:</p> <ul style="list-style-type: none">• $\text{AbsoluteValue} / \langle \text{polling interval} \rangle$ in case of Counter type variables.• $(\text{AbsoluteValue} - \text{Previous value}) / \langle \text{polling interval} \rangle$ in case of Integer type variables. <p>However, the table value is updated only if the new Minimum/sec value is less than the previous Minimum/sec.</p>

Table 42. *Statistics field descriptions (continued)*

Field	Description
Maximum/sec	<p>The value is calculated over time using one of the following formula:</p> <ul style="list-style-type: none"> • $AbsoluteValue / \langle polling\ interval \rangle$ in case of Counter type variables. • $(AbsoluteValue - Previous\ value) / \langle polling\ interval \rangle$ in case of Integer type variables. <p>However, the table value is updated only if the new Maximum/sec value is greater than the previous Maximum/sec.</p>
LastVal/sec	<p>The value is calculated over time using one of the following formula:</p> <ul style="list-style-type: none"> • $AbsoluteValue / \langle polling\ interval \rangle$ in case of Counter type variables. • $(AbsoluteValue - Previous\ value) / \langle polling\ interval \rangle$ in case of Integer type variables.

Monitoring SNMP Statistics

Device Console > Monitor > Switch > SNMP Statistics

Table 43. *SNMP Statistics field descriptions*

Field	Description
Packets In	The number of messages delivered to the SNMP switch from the transport service.
Packets Out	The number of SNMP Messages passed from the SNMP switch to the transport service.
Packets Using Unsupported SNMP Version	The number of SNMP messages that were received for an unsupported SNMP version.
Packets with Unknown Community String	The number of SNMP messages received that used an unknown SNMP community name.
Packets with Wrong Community String	The number of SNMP messages that represented an SNMP operation that was not allowed by the SNMP community named in the message.

Table 43. *SNMP Statistics field descriptions (continued)*

Field	Description
ASN1 Decode Errors	<p>The number of Abstract Syntax Notation One (ASN.1) or BER errors that occurred while the SNMP was decoding received SNMP messages.</p> <p>Note: OSI's method of specifying abstract objects is called ASN.1 (Abstract Syntax Notation One, defined in X.208), and one set of rules for representing such objects as strings of ones and zeros is called the BER (Basic Encoding Rules, defined in X.209). ASN.1 is a flexible notation that lets you define a variety of data types, from simple types such as integers and bit strings to structured types such as sets and sequences. BER describes how to represent or encode values of each ASN.1 type as a string of eight-bit octets.</p>
Too Big Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Too Big Errors In occurred
No Such Name Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when the No Such Names In error occurred.
Bad Value Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Bad Value Errors occurred.
Read Only Errors In	<p>The number of valid SNMP PDUs that were delivered to the SNMP entity when the Read Only Errors In occurred.</p> <p>Note: This is a protocol error that generates an SNMP PDU that contains readOnly in the error status field. This method detects incorrect implementations of the SNMP.</p>
Generic Errors In	The number of SNMP PDUs that were delivered to the SNMP entity when Generic Errors In occurred.
MIB Variables Retrieved	The number of MIB objects successfully retrieved by the SNMP switch after valid SNMP get-request and get-next Protocol Data Units (PDU).
MIB Variables Modified	The number of MIB objects that were successfully altered by the SNMP stack after valid SNMP set-request PDUs.
GET Requests In	The number of SNMP get-request PDUs that were accepted and processed by the SNMP stack.
GET NEXT Requests In	The number of SNMP get-next PDUs that were accepted and processed by the SNMP stack.
SET Requests In	The number of SNMP set-request PDUs that were accepted and processed by the SNMP stack.
GET Responses In	The total number of SNMP Get-Response PDUs accepted and processed by the SNMP agent.

Table 43. *SNMP Statistics field descriptions (continued)*

Field	Description
Traps Received	The total number of SNMP Trap Protocol Data Units (PDUs), which have been accepted and processed by the SNMP protocol entity.
Too Big Errors Out	The number of SNMP PDUs that were generated by the SNMP entity when Too Big Errors Out occurred.
No Such Names Out	The number of SNMP PDUs that were generated by the SNMP entity when No Such Names Out error occurred.
Bad Value Errors Out	The number of SNMP PDUs that were generated by the SNMP entity when Bad Value Errors Out occurred.
Generic Errors Out	The number of SNMP PDUs that were generated by the SNMP when Generic Errors Out occurred.
GET Requests Out	The total number of SNMP Get-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
GET NEXT Requests Out	The total number of SNMP Get-Next Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
SET Requests Out	The total number of SNMP Set-Request Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
GET Responses Out	The total number of SNMP Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.
Traps Out	The total number of SNMP Trap Protocol Data Units (PDUs), which have been generated by the SNMP protocol entity.

Viewing Information Summary

Device Console > Monitor > Switch > Information

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 44. *Information Summary field descriptions*

Field	Description
Config Save Status	Shows the configuration save status: saveInProgress, saveSuccessful, saveFailed, notInitiated, saveNotRequired
Config Restore Status	Shows the configuration restoration status: restoreInProgress, restoreSuccessful, restoreFailed, notInitiated
Config Restore Version	Shows the restored version of the configuration.

Table 44. *Information Summary field descriptions (continued)*

Field	Description
Last Boot Time	The time the switch was last rebooted.
Alloc Count	Total number of packet allocations from the packet buffer pool by the TCP/IP protocol stack.
Release Count	Total number of times the packet buffers are freed (released) to the packet buffer pool by the TCP/IP protocol stack.
Fail Count	Total number of packet allocation failures from the packet buffer pool by the TCP/IP protocol stack.
Peak Usage Count	The highest number of packet allocations with size greater than 128 bytes and less than or equal to 1536 bytes from the packet buffer pool by the TCP/IP protocol stack.

Monitoring Packet Statistics

Device Console > Monitor > Switch > Packet Statistics

Table 45. *Packet Statistics field descriptions*

Field	Description
Packets Allocated	The total number of allocated packets.
Packets Freed	The total number of freed allocated packets.
Failed Packet Allocations	The total number of failed allocated packets.
Medium Packet Allocations	The current number of allocated medium size packets. A medium packet contains between 129 and 1,536 bytes.
Jumbo Packet Allocations	The current number of allocated jumbo size packets. A jumbo packet contains between 1537 and 9,216 bytes.
Small Packet Allocations	The number of allocated small size packets. A small packet contains 128 bytes or less.
Medium Packet Allocations High Water Mark	The maximum number of allocated medium size packets. A medium packet contains between 129 and 1,536 bytes.
Jumbo Packet Allocations High Water Mark	The maximum number of allocated jumbo size packets. A jumbo packet contains between 1,537 and 9,216 bytes.
Small Packet Allocations High Water Mark	The maximum number of allocated small size packets. A small packet contains 128 bytes or less.

Monitoring MP CPU Statistics

Device Console > Monitor > Switch > MP CPU Statistics

Table 46. *MP CPU Statistics field descriptions*

Field	Description
Switch Number	The switch number.
UUID	The UUID of the switch.
MP Cpu Utilization (1 Second Avg)	The percentage of CPU utilization as measured over the last one-second interval.
MP Cpu Utilization (5 Second Avg)	The percentage of CPU utilization as measured over the last five-second interval.
MP Cpu Utilization (1 Minute Avg)	The percentage of CPU utilization as measured over the last one-minute interval.
MP Cpu Utilization (5 Minute Avg)	The percentage of CPU utilization as measured over the last five-minute interval.

Monitoring STP Statistics

Device Console > Monitor > Switch > STP Statistics

Table 47. *Spanning Tree Protocol field descriptions*

Field	Description
STG	Shows the Spanning Tree Group number. MIF TEST
Port	Shows the port number.
Receive Cfg	Shows the number of configuration BPDUs received.
Receive TCN	Shows the number of TCN (Topology Change Notification) messages received.
Transmit Cfg	Shows the number of configuration BPDUs transmitted.
Transmit TCN	Shows the number of TCN (Topology Change Notification) messages transmitted.

Monitoring UFD Statistics

Device Console > Monitor > Switch > UFD Statistics

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 48. *Uplink Failure Detection Statistics field descriptions*

Field	Description
Number of times LTM link failure	The total numbers of times that link failures were detected on the uplink ports in the Link to Monitor group.
Number of times LTM Link in Blocking State	The total number of times that Spanning Tree Blocking state was detected on the uplink ports in the Link to Monitor group.
Number of times LTD got auto disabled	The total numbers of times that downlink ports in the Link to Disable group were automatically disabled because of a failure in the Link to Monitor group.

Monitoring UFD Information

Device Console > Monitor > Switch > UFD Information

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 49. *Uplink Failure Detection Information field descriptions*

Field	Description
UFD State	Shows the operational status of UFD: enabled or disabled.
Link to Monitor Status	Shows the current status of the Link to Monitor (LtM).
Link to Monitor Ports	Shows the ports in the assigned to the LtM.
Link to Monitor Trunks	Shows the trunks assigned to the LtM.
Link to Disable Status	Shows the current status of the Link to Disable (LtD).
Link to Disable Ports	Shows the ports assigned to the LtD.
Link to Disable Trunks	Shows the trunks assigned to the LtD.

Monitoring NTP Statistics

Device Console > Monitor > Switch > NTP Statistics

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 50. *NTP Statistics field descriptions*

Field	Description
NTP Requests Sent to Primary NTP Server	The total number of Network Time Protocol (NTP) requests the switch sent to the primary NTP server to synchronize time.
NTP Responses received from Primary NTP Server	The total number of NTP responses received from the primary NTP server.
Update Clock Using Primary NTP Server Response	The total number of times the switch updated its time based on the NTP responses received from the primary NTP server.
NTP Requests sent to Secondary NTP Server	The total number of NTP requests the switch sent to the secondary NTP server to synchronize time.
NTP Responses received from Secondary NTP Server	The total number of NTP responses received from the secondary NTP server.
Update clock using Secondary NTP Server Response	The total number of times the switch updated its time based on the NTP responses received from the secondary NTP server.
Last Update NTP Server	Last update of time on the switch based on either primary or secondary NTP response received.
Last Update NTP Time	The time stamp showing the time when the switch was last updated
Primary Server Key	The NTP Authentication primary server key.
Secondary Server Key	The NTP Authentication secondary server key.
NTP Authentication State	NTP Authentication state. Enabled=1 and Disabled=0

Monitoring Trunk Groups

Device Console > **Monitor** > **Switch** > *Trunk Groups*

Table 51. *Trunk Groups field descriptions*

Field	Description
Index	The switch Trunk Groups, by number.
State	The current operational state of the Trunk Group.
Ports	The member ports within each Trunk Group.

Monitoring Trunk Group Ports

Device Console > **Monitor** > **Switch** > *Trunk Group Ports*

Table 52. *Trunk Groups field descriptions*

Field	Description
Trunk Group	The Trunk Group number.
Port	The port number.
Port State	The link status of the port.

Monitoring Switch Memory Statistics

Device Console > **Monitor** > **Switch** > *Memory Statistics*

Table 53. *Memory Statistics field descriptions*

Field	Description
Switch Number	The number of the configured switch.
UUID	The UUID of the chassis containing the embedded switch. An empty string is returned for Top of Rack switches.
Total Memory(In Bytes)	The total memory in bytes.
Free Memory(In Bytes)	The free memory in bytes.
Shared Memory(In Bytes)	The shared memory in bytes.
Buffer Memory(In Bytes)	The buffer memory in bytes.
Total Swap Memory(In Bytes)	The total swap memory in bytes.
Free Swap Memory(In Bytes)	The free swap memory in bytes.

Table 53. *Memory Statistics field descriptions (continued)*

Field	Description
Total High Memory(In Bytes)	The total high memory in bytes.
Free High Memory(In Bytes)	The free high memory in bytes.

Monitoring TACACS+ Authentication Statistics

Device Console > Monitor > Switch > TACACS Authentication Statistics

Table 54. *TACACS Authentication Statistics field descriptions*

Field	Description
Start Requests	Number of authentication start requests sent to server.
Continue Requests	Number of authentication continue requests sent to server.
Enable Requests	Number of authentication enable requests sent to server.
Abort Requests	Number of authentication abort requests sent to server.
Pass Received	Number of authentication pass received from server.
Fail Received	Number of authentication fails received from server.
Get User Received	Number of authentication get users received from server.
Get Password Received	Number of authentication get passwords received from server.
Get Data Received	Number of authentication get data received from server.
Error Received	Number of authentication errors received from server.
Follow Received	Number of authentication follows received from server.
Restart Received	Number of authentication re starts received from server.
Session Timeout	Number of authentication session time outs.
Auth Requests	Number of authorization requests sent to server.
Auth Pass Adds Received	Number of authorization pass adds received from server.
Auth Pass Replace Received	Number of authorization pass replaces received from server.
Auth Fails Received	Number of authorization fails received from server.
Auth Error Received	Number of authorization errors received from server.
Auth Follows Received	Number of authorization follows received from server.

Table 54. *TACACS Authentication Statistics field descriptions (continued)*

Field	Description
Auth Session Timeouts	Number of authorization session time outs.
Acct Start Requests	Number of accounting start requests sent to server.
Acct Wd Requests	Number of accounting watchdog requests sent to server.
Acct Stop Requests	Number of accounting stop requests sent to server.
Acct Success Received	Number of accounting success received from server.
Acct Error Received	Number of accounting errors received from server.
Acct Follow Received	Number of accounting follow received from server.
Acct Session Timeouts	Number of accounting session time outs.
Malformed Pkt Received	Number of Malformed packets received from server.
Socket Failure	Number of socket failures occurred.
Connection Failure	Number of connection failures occurred.

How to Monitor a Port

Select Monitor's **Port** category to monitor Port Statistics and Information. This section covers the following port statistics and information topics:

- [“Monitoring Port—Summary” on page 164](#)
- [“Monitoring Port—Interface Statistics” on page 164](#)
- [“Monitoring Port—802.1x Statistics” on page 166](#)
- [“Monitoring Port—IP Statistics” on page 167](#)
- [“Monitoring Port—Authenticator Diagnostics Statistics” on page 167](#)
- [“Monitoring Port—Bridge Statistics” on page 169](#)
- [“Monitoring Port—Ethernet Error Statistics” on page 170](#)
- [“Monitoring Port—Transceiver Information” on page 171](#)

Monitoring Port—Summary

Device Console > Monitor > Ports > Summary

Table 55. *Port Summary field descriptions*

Field	Description
Port	The physical port.
Speed	The port speed.
Bytes In	The number of bytes received by the port.
Unicast Packets In	The number of unicast packets received by the port.
Bytes Out	The number of bytes transmitted by the port.
Unicast Packets Out	The number of unicast packets transmitted by the port.

Monitoring Port—Interface Statistics

Device Console > Monitor > Ports > Interface Statistics

Table 56. *Port Interface field descriptions*

Field	Description
Bytes In	The number of bytes received on the interface, including framing characters.
Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were not addressed to a multicast or a broadcast address at this sublayer.

Table 56. *Port Interface field descriptions (continued)*

Field	Description
Non-Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast or a broadcast address at this sublayer.
Discarded Packets	The number of inbound packets that were discarded, although no errors had been detected to prevent their delivery to a higher-layer protocol. This can occur to free up buffer space.
Error Packets	For packet-oriented interfaces, the number of inbound packets with errors that prevented their delivery to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units with errors that prevented their delivery to a higher-layer protocol.
Unknown Protocol Packets	For packet-oriented interfaces, the number of packets received via the interface that were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing, the number of transmission units received via the interface that were discarded because of an unknown or unsupported protocol. Note: If the interface does not support protocol multiplexing, Unknown Protocol Packets will be zero (0).
Bytes Out	The number of bytes transmitted out of the interface, including framing characters.
Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were not addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Non-Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Outbound Discards	The number of outbound packets that were discarded, although no errors had been detected that would prevent their transmission. This can occur to free up buffer space.
Not Sent Due to Error	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.
Outbound Packet Queue Length	The number of packets in the output queue.

Table 56. *Port Interface field descriptions (continued)*

Field	Description
Broadcasts In	The number of packets, delivered by this sublayer to a higher layer, that were addressed to a broadcast address at this sublayer.
Broadcasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Multicasts In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this includes Group and Functional addresses.
Multicasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast address at this sublayer. The count includes the packets that were discarded or not sent. For a MAC layer protocol, this count includes Group and Functional addresses.

Monitoring Port—802.1x Statistics

Device Console > Monitor > Ports > 802.1x Statistics

Table 57. *Port 802.1x field descriptions*

Field	Description
EAPOL Frames Received	Total number of EAPOL frames received.
EAPOL Frames Transmitted	Total number of EAPOL frames transmitted.
EAPOL Start Frames Received	Total number of EAPOL start frames received.
EAPOL Logoff Frames Received	Total number of EAPOL logoff frames received.
EAPOL Response Id Frames Received	Total number of EAPOL response ID frames received.
EAPOL Response Frames Received	Total number of EAPOL response frames received.
EAPOL Request Id Frames Transmitted	Total number of EAPOL request ID frames transmitted.

Table 57. *Port 802.1x field descriptions (continued)*

Field	Description
EAPOL Request Frames Transmitted	Total number of EAPOL request frames transmitted.
Invalid EAPOL Frames Received	Total number of invalid EAPOL frames received.

Monitoring Port—IP Statistics

Device Console > Monitor > Ports > IP Statistics

Table 58. *Port IP Statistics field descriptions*

Field	Description
Good Packets In	Number of good packets received.
Header Error Packets In	Number of header error packets received.
Inbound Discard Packets	Number of discarded inbound packets.

Monitoring Port—Authenticator Diagnostics Statistics

Device Console > Monitor > Ports > Authenticator Diagnostics Statistics

Table 59. *Port Authenticator Diagnostics Statistics field descriptions*

Field	Description
Authentication Enters Connecting	Total number of times that the state machine transitions to the CONNECTING state from any other state.
Authentication Logoffs	Total number of times that the state machine transitions from CONNECTING to DISCONNECTED as a result of receiving an EAPOLLogoff message.
Authentication Enter Authenticating	Total number of times that the state machine transitions from CONNECTING to AUTHENTICATING, as a result of an EAPResponse/Identity message being received from the Supplicant.
Authentication Success	Total number of times that the state machine transitions from AUTHENTICATING to AUTHENTICATED, as a result of the Backend Authentication state machine indicating successful authentication of the Supplicant.
Authentication Timeout	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of the Backend Authentication state machine indicating authentication timeout.

Table 59. *Port Authenticator Diagnostics Statistics field descriptions (continued)*

Field	Description
Authentication Failure	Total number of times that the state machine transitions from AUTHENTICATING to HELD, as a result of the Backend Authentication state machine indicating authentication failure.
Reauthentication s	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of a re-authentication request.
EAP Starts while Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Start message being received from the Supplicant.
EAP Logoff while Authenticating	Total number of times that the state machine transitions from AUTHENTICATING to ABORTING, as a result of an EAPOL-Logoff message being received from the Supplicant.
Reauthentication s after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of a re-authentication request.
EAP Starts after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to CONNECTING, as a result of an EAPOL-Start message being received from the Supplicant.
EAP Logoff after Authentication	Total number of times that the state machine transitions from AUTHENTICATED to DISCONNECTED, as a result of an EAPOLLogoff message being received from the Supplicant.
Backend Responses	Total number of times that the state machine sends an initial Access-Request packet to the Authentication server. Indicates that the Authenticator attempted communication with the Authentication Server.
Backend Access Challenges	Total number of times that the state machine receives an initial Access-Challenge packet from the Authentication server. Indicates that the Authentication Server has communication with the Authenticator.
Other Backend Requests	Total number of times that the state machine sends an EAP-Request packet (other than an Identity, Notification, Failure, or Success message) to the Supplicant. Indicates that the Authenticator chose an EAP-method.
Backend Non Nak Responses	Total number of times that the state machine receives a response from the Supplicant to an initial EAP-Request, and the response is something other than EAP-NAK. Indicates that the Supplicant can respond to the Authenticators chosen EAP-method.

Table 59. *Port Authenticator Diagnostics Statistics field descriptions (continued)*

Field	Description
Backend Authentication Success	Total number of times that the state machine receives an Accept message from the Authentication Server. Indicates that the Supplicant has successfully authenticated to the Authentication Server.
Backend Authentication Failures	Total number of times that the state machine receives a Reject message from the Authentication Server. Indicates that the Supplicant has not authenticated to the Authentication Server.

Monitoring Port—Bridge Statistics

Device Console > **Monitor** > **Ports** > *Bridge Statistics*

Table 60. *Port bridge field descriptions*

Field	Description
Maximum size of INFO	The maximum size of the INFO (non-MAC) field that this port will receive or transmit.
Frames In	The number of frames that have been received by this port from its segment. Note: Packets In only counts frames that are for a protocol being processed by the local bridging function, including bridge management frames.
Frames Out	The number of frames that have been transmitted by this port to its segment. Note: Packets Out only counts frames that are for a protocol being processed by the local bridging function, including bridge management frames.
Discarded Frames In	The number of valid received frames that were discarded (filtered) by the forwarding process.

Monitoring Port—Ethernet Error Statistics

Device Console > Monitor > Ports > Ethernet Error Statistics

Table 61. Port Ethernet Error Statistics field descriptions

Field	Description
Alignment Errors	The number of frames received on a particular interface that were not of integral length and did not pass the FCS check. The count is incremented when the Alignment Error status is returned by the MAC service to the LLC, or other MAC user. Frames with multiple errors are counted exclusively.
FCS Errors	The number of frames received on a particular interface that failed the FCS health check because of length. The count is incremented when the Frame Check Error status is returned by the MAC service to the LLC, or other MAC user. Frames with multiple errors are counted exclusively.
Single Collision Frames	The number successfully transmitted frames on a particular interface where transmission was inhibited by a single collision. Note: A frame that is counted by Single Collision Frames can also be counted by the occurrences of the Unicast Packets Out, Multicasts Out, or Broadcast Out, but not recorded by the event of Multiple Collision Frames.
Multiple Collision Frames	A count of successfully transmitted frames on a particular interface where transmission was inhibited by more than one collision. Note: A frame that is counted by Multiple Collision Frames can also be counted by Unicast Packets Out, Multicasts Out, or Broadcast Out, but not recorded by Single Collision Frames.
SQE Test Errors	The number of times the SQE TEST ERROR message was generated by the PLS sublayer for a particular interface.
Deferred Transmissions	A number of frames where the first transmission attempt, on a particular interface, is delayed because the medium is busy. Note: The count represented by an instance of this object does not include frames involved in collisions.
Late Collisions	The number of times that a collision is detected, on a particular interface, later than 512 bit-times into the transmission of a packet. A late collision, included in the count of Late Collisions, can be considered as a generic collision for other statistics. Note: bit-times vary per system. Example: On a 10Mbps system, 512 bit-times represents 51.2 microseconds.
Excessive Collisions	A number of frames on a particular interface in which transmission failed because of excessive collisions.

Table 61. *Port Ethernet Error Statistics field descriptions (continued)*

Field	Description
Internal MAC Transmission Errors	The number of frames transmitted on a particular interface that failed because of an internal MAC sublayer transmit error. This frame error is only counted if it was not recorded under Late Collisions, Excessive Collisions, or Carrier Sense Errors. Note: Internal Mac Transmit Errors may represent a number of transmission errors that were not otherwise recorded.
Carrier Sense Errors	The number of times the carrier sense condition was lost or was never asserted while attempting to transmit a frame on a particular interface. The count, represented by an instance of this object, is incremented once per transmission attempt.
Received Frames > Maximum Length	A number of frames received on a specific interface that exceeded the allowed maximum frame size. The count is incremented when the Received Frames > Maximum Length status is returned by the MAC service to the LLC, or other MAC user. Received frames that have multiple errors are counted exclusively.
Internal MAC Receive Errors	The number of frames on a specific interface that could not be accepted because of an internal MAC sublayer error. This frame error is only counted if it was not recorded under Received Frames > Maximum Length, Alignment Errors, or FCS Errors. Note: Internal Mac Receive Errors may represent a number of receive errors that were not otherwise recorded.

Monitoring Port—Transceiver Information

Device Console > Monitor > Ports > Transceiver Info

Note: This tab is available only for switches with 10G ports. Please disregard this information if it does not apply to your switch.

Table 62. *Port Transceiver Information field descriptions*

Field	Description
Port	10G port index
Port SFP/XFP Alias	10G SFP/XFP port alias
Device	Device name. "NO device" indicates device/cable is not connected.
Tx Enable	TX-Enable status. It can be (i) Not Installed (ii) Enabled (iii) Disabled (iv) Detached (v) Not Available
Rx Signal	RX-Signal status, as follows: e (i) Not Installed (ii) Down (iii) Link (iv) Detached (v) Not Available

Table 62. *Port Transceiver Information field descriptions (continued)*

Field	Description
Tx Fault	TX-Fault status, as follows: (i) Not Installed (ii) Fault (iii) None (iv) Detached (v) Not Available
Vendor	Vendor name of the device
Serial Number	Serial number of the device
Approval	Approval state for the device, as follows: (i) Not Installed (ii) Not Approved (iii) Approved (iv) Detached
Device Part Number	External Port SFP/XFP device part number.
Device Revision	External Port SFP/XFP device revision.
Device Voltage	External Port SFP/XFP device voltage.
Device Temperature	External Port SFP/XFP device temperature.
Device Laser Wave Length	External Port SFP/XFP device laser wave length.

How to Monitor Virtual LAN Statistics

Select Monitor's **Layer 2 > Virtual LANs** category to monitor VLAN Statistics and Information. This section covers the following bridge statistics and information topics:

- [“Monitoring Bridge—Forwarding Database Information” on page 174](#)

Monitoring Virtual LANs—VLAN Membership Information

Device Console > Monitor > Layer 2 > Virtual LANs > VLAN Memberships

Table 63. *VLAN Memberships field descriptions*

Field	Description
VLAN ID	The VLAN ID.
VLAN Name	The name of the VLAN.
VLAN Status	The status of the VLAN: enabled or disabled.
VLAN Ports	The port list information in the VLAN.

How to Monitor Bridge Statistics

Select Monitor's **Bridge** category to monitor Bridge Statistics and Information. This section covers the following bridge statistics and information topics:

- “Monitoring Bridge—Forwarding Database Information” on page 174
- “Monitoring Bridge—Forwarding Statistics” on page 174
- “Monitoring Bridge—Forwarding Database Multicast Information” on page 175
- “Monitoring Bridge—Base Port Information” on page 175
- “Monitoring Bridge—CIST Bridge Information” on page 176
- “Monitoring Bridge—CIST Port Information” on page 177
- “Monitoring Bridge—STP Information” on page 178

Monitoring Bridge—Forwarding Database Information

Device Console > Monitor > Layer 2 > Bridge > Forwarding Database Information

Table 64. *Forwarding Database field descriptions*

Field	Description
MAC Address	The MAC address of the FDB entry.
VLAN/Group	The VLAN number or Group number of the FDB entry.
Port	The physical port on which the MAC address is located
State	The status of the bridge: forwarding or unknown. An address that is in the forwarding state means that it has been learned by the switch. If the state for the port is listed as unknown, the MAC address has not yet been learned by the switch, but has only been seen as a destination address.
Trunk	Shows all FDB entries on a single trunk. When trunk groups are configured, you can view the state of each port in the various trunk groups.
Status	The status of the forwarding database.

Monitoring Bridge—Forwarding Statistics

Device Console > Monitor > Layer 2 > Bridge > Forwarding Statistics

Table 65. *Monitoring Forwarding Statistics field descriptions*

Field	Description
Current Entries	Current number of entries in the Forwarding Database.
Highest Number of Entries	Highest number of entries recorded at any given time in the Forwarding Database.

Monitoring Bridge—Forwarding Database Multicast Information

Device Console > **Monitor** > **Layer 2** > **Bridge** > *Forwarding Database Multicast Information*

Table 66. *Monitoring Forwarding Database Multicast Information field descriptions*

Field	Description
Index	The static multicast FDB entry index.
MAC Address	The static multicast MAC address for the FDB entry.
VLAN	The VLAN ID for the FDB entry.
Ports	The multicast MAC address port list.

Monitoring Bridge—Base Port Information

Device Console > **Monitor** > **Layer 2** > **Bridge** > *Base Port Information*

Table 67. *Monitoring Base Port field descriptions*

Field	Description
STP	The index for Spanning Tree Protocol groups.
Port	The port number for Spanning Tree Protocol groups.
State	The current state of the port as defined by Spanning Tree Protocol, as follows: disabled, blocking, listening, learning, forwarding, discarding, broken, or na.
Designated Root	The unique Bridge Identifier of the Bridge recorded as the Root in the Configuration BPDUs transmitted by the Designated Bridge for the segment to which the port is attached.
Designated Cost	The path cost of the Designated Port of the segment connected to this port. This value is compared to the Root Path Cost field in received bridge PDUs.
Designated Bridge	The designated bridge resides closest to the root bridge and is responsible for forwarding packets from the LAN towards the root bridge. This bridge is displayed as character string starting with the bridge priority (1-65535) followed by a hyphen and six byte MAC address of that switch.
Designated Port	The designated port identifies the physical ports.
Forward Transitions	The number of times this port has transitioned from the Learning state to the Forwarding state.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated

Table 67. *Monitoring Base Port field descriptions (continued)*

Field	Description
Role	Whether the port is enabled or disabled.
Link Type	The link type.
Edge	Whether the port is an Edge port.
Guard State	The guard state of the port.
Priority	The priority of the port.

Monitoring Bridge—CIST Bridge Information

Device Console > Monitor > Layer 2 > Bridge > CIST Bridge Information

Table 68. *CIST Bridge field descriptions*

Field	Description
CIST Root Bridge	The bridge identifier of the root of the common spanning tree as determined by the Spanning Tree Protocol as executed by this node. This value is used as the CIST Root Identifier parameter in all Configuration Bridge PDUs originated by this node.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
Port	The port number of the port that offers the lowest path cost from this bridge to the CIST root bridge.
Hello Time	The amount of time between the transmission of configuration bridge PDUs in seconds.
Max. Age	Displays the value in seconds that all bridges use for MaxAge when this bridge is acting as the root.
Forward Delay	The time (in seconds) that all bridges use for forward delay when this bridge is acting as the root.
CIST Regional Root	The bridge identifier of the root of the multiple spanning tree region as determined by the Spanning Tree Protocol as executed by this node. This value is used as the CIST Regional Root Identifier parameter in all configuration bridge PDUs originated by this node.

Table 68. *CIST Bridge field descriptions (continued)*

Field	Description
Regional Path Cost	The cost of the path to the CIST regional root as seen from this bridge.
Mstp Digest	The digest of the MSTP.

Monitoring Bridge—CIST Port Information

Device Console > Monitor > Layer 2 > Bridge > CIST Port Information

Table 69. *CIST Port field descriptions*

Field	Description
Port	Specifies the CIST bridge port being configured.
Priority	The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	The port path cost parameter is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A setting of 0 indicates that the cost will be set to the appropriate default after the link speed has been auto negotiated.
State	Specifies if the CIST Bridge port is enabled or disabled.
Role	Specifies the role of the CIST Bridge port.
Designated Bridge	The designated bridge resides closest to the root bridge and is responsible for forwarding packets from the LAN towards the root bridge. This bridge is displayed as character string starting with the bridge priority (1-65535) followed by a hyphen and six byte MAC address of that switch.
Designated Port	The designated port identifies a physical port. This is a number that is the numerical sum of bridge priority and the actual physical port number. For example, a physical port number four with bridge priority 32768 will be displayed as $32678+4=32772$.
Link Type	The port link type.
Hello Time	Amount of time between the transmission of Configuration Bridge PDUs in seconds.
Edge	Whether or not this port is an edge port.

Monitoring Bridge—STP Information

Device Console > Monitor > Layer 2 > Bridge > STP

Table 70. STP Information field descriptions

Field	Description
STG	Spanning Tree Group index.
Time Since Topology Change	Time since the last time a topology change was detected by the bridge entity, in milliseconds.
Topology Changes	Total number of topology changes detected by this bridge since the management entity was last reset or initialized.
Designated Root	Bridge identifier of the root of the spanning tree, as determined by the Spanning Tree Protocol executed by this node. This value is used as the Root Identifier in all Configuration Bridge PDUs originated by this node.
Root Cost	Cost of the path to the root, as seen from this bridge.
Root Port	Port number of the port which offers the lowest cost path from this bridge to the root bridge.
Maximum Age	Maximum age of Spanning Tree Protocol information learned from the network on any port before it is discarded, in hundredths of a second. This is the actual value that currently is in use on this bridge.
Hello Time	Amount of time between the transmission of Configuration Bridge PDUs by this node on any port when it is the root of the spanning tree or trying to become so, in hundredths of a second. This is the actual value that currently is in use on this bridge.
Forward Delay	Time value that controls how fast a port changes its spanning state when moving towards the Forwarding state, in hundredths of a second. The Forward Delay value determines how long the port stays in each of the Listening and Learning states, which precede the Forwarding state. The Forward Delay value is also used to age all dynamic entries in the Forwarding Database, after a topology change has been detected.
Hold Time	Time interval during which no more than two Configuration Bridge PDUs are transmitted by this node, in hundredths of a second.

How to Monitor LLDP Information

Select Monitor's **Layer 2 > LLDP** category to monitor Link Layer Detection Protocol (LLDP) information. This section covers the following topics:

- [“Monitoring LLDP Port Information” on page 179](#)
- [“Viewing Remote Devices” on page 179](#)
- [“Viewing EVB \(Edge Virtual Bridging\) Remote Information” on page 180](#)

Monitoring LLDP Port Information

Device Console > Monitor > Layer 2 > LLDP > LLDP Port Info

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 71. *LLDP Port Information field descriptions*

Field	Description
Port	The port alias or number.
EVB TLV State	Shows whether EVB TLV state is enabled or disabled.

Viewing Remote Devices

Device Console > Monitor > Layer 2 > LLDP > Remote Devices

Note: Please disregard this information if it does not apply to your switch.

Table 72. *LLDP Remote Devices field descriptions*

Field	Description
Index	The index number.
Remote TTL	The remote TTL.
Local Port	The local port number.
Chassis Subtype	The chassis subtype.
Chassis ID	The chassis ID number.
Port Subtype	The port subtype.
Port	The port associated with the remote device.
System Name	The system name.
System Description	The system description.
Port Description	The port description.
Supported capabilities	The supported capabilities.

Table 72. *LLDP Remote Devices field descriptions*

Field	Description
Enabled Capabilities	The enabled capabilities.
DMAC	The remote device MAC.

Viewing Remote Devices Management Address

Device Console > Monitor > Layer 2 > LLDP > Remote Devices Management Address

Note: Please disregard this information if it does not apply to your switch.

Table 73. *LLDP Remote Devices Management Address field descriptions*

Field	Description
Subtype	The remote device subtype.
Management Address	The remote device management address
Interface Subtype	The interface subtype.
Object Identifier	The object identifier associated with the remote device.

Viewing EVB (Edge Virtual Bridging) Local Information

Device Console > Monitor > Layer 2 > LLDP > EVB Local Info

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 74. *EVB Local Information field descriptions*

Field	Description
Index	EVB index number.
Port	Port associated with the local EVB.
Capability	Supported capabilities.
Current	Current capabilities.
RTE Value	Local ECP RTE value.

Viewing EVB (Edge Virtual Bridging) Remote Information

Device Console > Monitor > Layer 2 > LLDP > EVB Remote Info

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 75. *EVB Remote Information field descriptions*

Field	Description
Index	EVB index number.
Port	Port associated with the remote EVB.
Capability	Supported capabilities.
Current	Current capabilities.
RTE Value	Remote ECP RTE value.

How to Monitor Failover Information

Select Monitor's **Layer 2 > Failover** category to monitor Failover information. This section covers the following Failover topics:

- “Monitoring General Trigger Status” on page 182
- “Monitoring Trigger Information” on page 182
- “Monitoring Monitored Port Status” on page 183
- “Monitoring Controlled Port Status” on page 183
- “Monitoring Virtual Port Status” on page 183

Monitoring General Trigger Status

Device Console > Monitor > Layer 2 > Failover > General

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 76. *Failover General field descriptions*

Field	Description
Failover State	Failover state (on or off)

Monitoring Trigger Information

Device Console > Monitor > Layer 2 > Failover > Trigger Information

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 77. *Failover Trigger Information field descriptions*

Field	Description
Trigger ID	Trigger identifier
Trigger State	Trigger state (enabled or disabled)
Operational Links Limit	Limit on number of operational links
Monitor State	Runtime monitor state (up or down)
Monitored Ports	List of monitored ports
Control State	Runtime controlled state (auto-controlled or auto-disabled)
Controlled Ports	List of controlled ports
Controlled vPorts	List of controlled virtual ports
Fabric Path Monitor	The fabricpath monitor

Monitoring Monitored Port Status

Device Console > **Monitor** > **Layer 2** > **Failover** > *Monitor Port Status*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 78. *Failover Monitor Port Status field descriptions*

Field	Description
Trigger ID	Trigger identifier
Monitored Port	Port number of the monitored port.
Port Status	Port status (operational or failed)

Monitoring Controlled Port Status

Device Console > **Monitor** > **Layer 2** > **Failover** > *Control Port Status*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 79. *Failover Control Port Status field descriptions*

Field	Description
Trigger ID	Trigger identifier
Controlled Port	Port number of the controlled port.
Port Status	Port status (operational or failed)

Monitoring Virtual Port Status

Device Console > **Monitor** > **Layer 2** > **Failover** > *Virtual Port Status*

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 80. *Failover Virtual Port Status field descriptions*

Field	Description
Trigger ID	Trigger identifier
Port ID	ID number of the port.
vPort ID	ID number of the virtual port.
vPort Status	Virtual port status (operational or failed)

How to Monitor vLAG Information

Select Monitor's **Layer 2 > VLAG** category to monitor vLAG information. This section covers the following vLAG information topics:

- “Monitoring vLAG General Information” on page 184
- “Monitoring vLAG Instance Information” on page 185
- “Monitoring vLAG ISL Group Information” on page 185
- “Monitoring vLAG PDU Statistics” on page 186
- “Monitoring vLAG IGMP Statistics” on page 187
- “Monitoring vLAG ISL Statistics” on page 187

Monitoring vLAG General Information

Device Console > Monitor > Layer 2 > VLAG > General

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 81. vLAG General field descriptions

Field	Description
State	The current running state of vLAG. The value can be Enabled or Disabled.
Admin Role	The current admin role of the switch. The role can be PRIMARY, SECONDARY, or UNELECTED.
Operational Role	The vLAG switch operational role. The value can be PRIMARY, SECONDARY, or UNELECTED.
ISL Id	The vLAG ISL ID.
Local MAC	The local vLAG MAC address.
Local Priority	The local vLAG priority.
Peer MAC	The peer vLAG MAC address.
Peer Priority	The peer vLAG priority.
Health Check Status	The current health check running status. The value can be Up or Down.
Startup Delay Interval	The startup delay timer interval.
Startup Delay Status	The startup delay timer status. The value can be Unstarted, Running, or Finished.
System MAC	The system vLAG MAC address.

Table 81. vLAG General field descriptions (continued)

Field	Description
Auto Recovery Interval	The system auto recovery interval.
Auto Recovery Status	The system auto recovery status. The value can be Unstarted, Running, or Finished.

Monitoring vLAG Instance Information

Device Console > Monitor > Layer 2 > VLAG > Instance Information

Use this tab to view vLAG Instance Information.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 82. vLAG Instance Information field descriptions

Field	Description
Id	The Identifier of the instance.
Trunk Id	The Trunk ID of the instance.
Admin Key	The Admin Key of the vLAG instance. Only applicable with dynamic trunks.
State	The current running state of the vLAG instance. The state can be Down(1), localUp(2), remoteUp(3), or formed(4).

Monitoring vLAG ISL Group Information

Device Console > Monitor > Layer 2 > VLAG > ISL Group Information

Use this tab to view vLAG ISL Group Information.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 83. vLAG ISL Group Information field descriptions

Field	Description
ISL Id	The vLAG ISL ID.
Trunk Group State	The vLAG ISL trunk group state. The state can be: <ul style="list-style-type: none">● Static(1) - static trunk group● LACP (2) - dynamic trunk group
Trunk	The vLAG ISL portchannel number.
Admin Key	The vLAG ISL LACP admin key.
Ports	The port list that forms the ISL.
Ports [Up]	The ISL member ports state.

Monitoring vLAG PDU Statistics

Device Console > Monitor > Layer 2 > VLAG > PDU

Use the **PDU** tab to view the VLAG PDU statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 84. *vLAG PDU statistics field descriptions*

Field	Description
Sent for Role Election	The total number of vLAG PDUs sent for role elections.
Sent for System Info	The total number of vLAG PDUs sent for role system info.
Sent for Peer Instance Enable	The total number of vLAG PDUs sent for peer instance enable.
Sent for Peer Instance Disable	The total number of vLAG PDUs sent for peer instance disable.
Sent for FDB Dynamic Add	The total number of vLAG PDUs sent for addition of FDB dynamic entry.
Sent for FDB Dynamic Delete	The total number of vLAG PDUs sent for deletion of FDB dynamic entry.
Sent for FDB Inactive Add	The total number of vLAG PDUs sent for addition of FDB inactive entry.
Sent for FDB Inactive Delete	The total number of vLAG PDUs sent for deletion of FDB inactive entry.
Sent for Health Check	The total number of vLAG PDUs sent for health check.
Sent for ISL Hello	The total number of vLAG PDUs sent for ISL hello.
Sent for Other	The total number of vLAG PDUs sent for others.
Sent for Unknown	The total number of vLAG PDUs sent for unknowns.
Received for Role Election	The total number of vLAG PDUs received for role elections.
Received for System Info	The total number of vLAG PDUs received for role system info.
Received for Peer Instance Enable	The total number of vLAG PDUs received for peer instance enable.
Received for Peer Instance Disable	The total number of vLAG PDUs received for peer instance disable.

Table 84. *vLAG PDU statistics field descriptions (continued)*

Field	Description
Received for FDB Dynamic Add	The total number of vLAG PDUs received for addition of FDB dynamic entry.
Received for FDB Dynamic Delete	The total number of vLAG PDUs received for deletion of FDB dynamic entry.
Received for FDB Inactive Add	The total number of vLAG PDUs received for addition of FDB inactive entry.
Received for FDB Inactive Delete	The total number of vLAG PDUs received for deletion of FDB inactive entry.
Received for Health Check	The total number of vLAG PDUs received for health check.
Received for ISL Hello	The total number of vLAG PDUs received for ISL Hello.
Received for Other	The total number of vLAG PDUs received for others.
Received for Unknown	The total number of vLAG PDUs received for unknowns.

Monitoring vLAG IGMP Statistics

Device Console > **Monitor** > **Layer 2** > **VLAG** > **IGMP**

Use the **IGMP** tab to view the vLAG IGMP statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 85. *vLAG IGMP field descriptions*

Field	Description
Reports Forwarded	The total number of IGMP reports forwarded to the peer.
Leaves Forwarded	The total number of IGMP leaves forwarded to the peer.

Monitoring vLAG ISL Statistics

Device Console > **Monitor** > **Layer 2** > **VLAG** > **ISL**

Use the **ISL** tab to view the vLAG ISL statistics.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 86. *vLAG ISL field descriptions*

Field	Description
In Octets	The total number of vLAG ISL octets received.
In Packets	The total number of vLAG ISL packets received.
Out Octets	The total number of vLAG ISL octets sent.
Out Packets	The total number of vLAG ISL packets sent.

How to Monitor Hotlinks Statistics

Select Monitor's **Hotlinks** category to monitor Hotlinks statistics. This section covers the following Hotlinks statistics topics:

- [“Monitoring Hot Links Summary” on page 189](#)
- [“Monitoring Hot Links Statistics” on page 189](#)
- [“Monitoring Hot Links Information” on page 190](#)

Monitoring Hot Links Summary

Device Console > Monitor > Layer 2 > Hot Links > Summary

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 87. *Hot Links Summary field descriptions*

Field	Description
ID	The trigger identifier
Name	The trigger name
State	Trigger state – enable or disable
Preempt State	Preempt State – enable or disable
Forward Delay	Forward Delay setting in seconds
Active	The active interface information
Active VLANs on Master Interface	The active VLANs on the master interface
Active VLANs on Backup Interface	The active VLANs on the backup interface

Monitoring Hot Links Statistics

Device Console > Monitor > Layer 2 > Hot Links > Statistics

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 88. *Hot Links Statistics field descriptions*

Field	Description
Trigger ID	Trigger ID number.
Master Active	Total number of times the Master interface transitioned to the Active state.
Backup Active	Total number of times the Backup interface transitioned to the Active state.

Table 88. *Hot Links Statistics field descriptions (continued)*

Field	Description
FDB Update	Total number of FDB update requests sent.
FDB Failed	Total number of FDB update requests that failed.

Monitoring Hot Links Information

Device Console > Monitor > Layer 2 > Hot Links > Info

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 89. *Hot Links Info field descriptions*

Field	Description
Hotlinks Setting	Hotlinks on/off setting
Hotlinks FDB Update Setting	Hotlinks FDB update enabled/disabled setting
Hotlinks BPDU Flood Setting	Hotlinks BPDU Flood enabled/disabled setting
Hotlinks FDB Update Rate	Hotlinks FDB update rate (packets per second)

How to Monitor 802.1x/p Information

Select Monitor's **802.1x/p** category to monitor 802.1x/p information. This section covers the following 802.1x/p information topics:

- “Monitoring 802.1x General Information” on page 191
- “Monitoring 802.1p—Priority COSq Information” on page 191
- “Monitoring Port Priority Information” on page 191

Monitoring 802.1x General Information

Device Console > Monitor > Layer 2 > 802.1x/p > 802.1x General

Table 90. *802.1X General Information field descriptions*

Field	Description
System Capability	The capability of the switch as an 802.1x Authenticator. It cannot be used as an Authentication Server or a Supplicant.
System Status	The operational status of 802.1x: enabled or disabled
Protocol Version	The protocol version in use.

Monitoring 802.1p—Priority COSq Information

Device Console > Monitor > Layer 2 > 802.1x/p > 802.1p Priority COSq

Table 91. *802.1p Priority COSq Information field descriptions*

Field	Description
Priority	The 802.1p priority level.
COSq	The Class of Service queue number.
Weight	The scheduling weight of the COS queue.

Monitoring Port Priority Information

Device Console > Monitor > Layer 2 > 802.1x/p > Port Priority

Table 92. *802.1p Port Priority Information field descriptions*

Field	Description
Port	The port number.
Priority	The 802.1p priority level for the port.
COSq	The Class-of-Service (COS) queue number.
Weight	The scheduling weight of the COS queue.

How to Monitor ECP (Edge Control Protocol) Information

Select Monitor's **Layer 2 > ECP** category to view ECP information. This section covers the following topics:

- [“Viewing ECP \(Edge Control Protocol\) Channel Information” on page 192](#)

Viewing ECP (Edge Control Protocol) Channel Information

Device Console > Monitor > Layer 2 > ECP > ECP Channel Info

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 93. *ECP Channel Information field descriptions*

Field	Description
Index	ECP index number.
Port	Port associated with the ECP channel.
Stag	VLAN tag with a Tag Protocol Identification value allocated for “802.1Q Service Tag Type.”
Send Length	Send length value.
Send Next	Index number associated with the next send.
Receive Last Sequence	Sequence number associated with the last received.
State Machine	State machine index.
Rx Count	Received packets count.
Tx Count	Transmitted packets count.
Rx Drop	Number of packets dropped during receive.
Tx Drop	Number of packets dropped while transmitting.
State	State (enabled or disabled).
ACK Error	Acknowledgement errors.

How to Monitor LACP (Link Aggregation Control Protocol) Information

Select Monitor's **Layer 2 > LACP** category to view LACP information. This section covers the following topics:

- “Monitoring Port—LACP Statistics” on page 193
- “Monitoring Port—LACP Aggregator Information” on page 194
- “Monitoring Port—LACP Port General Information” on page 194
- “Monitoring Port—LACP Port Administrator Information” on page 196
- “Monitoring Port—LACP Port Operator Information” on page 197

Monitoring Port—LACP Statistics

Device Console > Monitor > LACP > LACP Statistics

Device Console > Monitor > Layer 2 > LACP > LACP Statistics

Table 94. Port LACP Statistics field descriptions

Field	Description
Valid LACPDUs Received	Total number of valid LACP data units received.
Valid Marker PDUs Received	Total number of valid LACP marker data units received.
Valid Marker Rsp PDUs Received	Total number of valid LACP marker response data units received.
Unknown Version/TLV Type	Total number of LACP data units with an unknown version or type, length, and value (TLV) received.
Illegal Subtype Received	Total number of LACP data units with an illegal subtype received.
LACPDUs Transmitted	Total number of LACP data units transmitted.
Marker PDUs Transmitted	Total number of LACP marker data units transmitted.
Marker Rsp PDUs Transmitted	Total number of LACP marker response data units transmitted.

Monitoring Port—LACP Aggregator Information

Device Console > Monitor > Layer 2 > LACP > LACP Aggregator Information

Table 95. Port LACP Aggregator Information field descriptions

Field	Description
Aggregator ID	The aggregator ID.
MAC Address	MAC address assigned to the aggregator.
Actor System Priority	Priority value associated with the Actor's System ID.
Actor System ID	Unique identifier for the System where this aggregator resides.
Individual State	Indicates whether the aggregator represents an Individual link (true) or an Aggregate (false).
Actor Admin Key	Current value of the administrator key for the aggregator.
Actor Oper Key	Current value of the operational key for the aggregator.
Partner System Priority	Priority value associated with the Partner's System ID.
Partner System ID	Unique identifier for the current protocol Partner of this aggregator.
Partner Oper Key	Current value of the operational key for the aggregator's current protocol partner
Ready State	Indicates whether the aggregator is ready or not.
Number of Ports in Aggregator	Total number of member ports within this aggregator.
Minimum Links of Ports	Set the minimum number of links for this port. If the specified minimum number of ports are not available, the trunk is placed in the down state.

Monitoring Port—LACP Port General Information

Device Console > Monitor > LACP > LACP Port General Information

Device Console > Monitor > Layer 2 > LACP > LACP Port General Information

Table 96. LACP Port General Information field descriptions

Field	Description
LACP Status	Current LACP status for the port: true or false
LACP Admin Status	Current LACP admin status: true or false
Actor System ID	Unique identifier for the System where this aggregator resides.

Table 96. *LACP Port General Information field descriptions (continued)*

Field	Description
Actor System Priority	Priority value associated with the Actor's System ID.
Actor Admin Key	Current value of the administration key for the Aggregation Port.
Actor Oper Key	Current value of the operational key for the Aggregation Port.
Actor Port Number	Port number locally assigned to the Aggregation Port.
Actor Port Priority	Priority value assigned to this Aggregation Port.
Individual State	Indicates whether the Aggregation Port operates only as an Individual link (<i>true</i>) or is able to aggregate (<i>false</i>).
Selected Aggregator ID	Identifier of the aggregator that this Aggregation Port has currently selected.
Attached Aggregator ID	Identifier of the aggregator to which this Aggregation Port is currently attached.
Ready_N Flag	Indicates whether or not the timer has expired while waiting to attach to an aggregator.
Need to Transmit Flag	Displays the new protocol information to be transmitted on the link.
Selection Logic	Indicates the selection logic. A value of <i>selected</i> indicates the selection of an appropriate aggregator. A value of <i>unselected</i> indicates that no aggregator is currently selected, and <i>standby</i> indicates a restriction on the selected aggregator.
Port Moved	Indicates whether or not if receive machine for a port is in the <i>port_disabled</i> state, and the combination of partner oper system and partner oper port number in use by the port, has been received in an incoming LACPDU on a different port.
Collision and Detection State	State of Collision Detection: <i>on</i> or <i>off</i>
Rx Machine State	State of the Rx Machine.
Mux Machine State	State of the Mux Machine.
Periodic Machine State	State of the Periodic Machine.
Periodic Transmit Timer	Value of the Periodic Transit timer

Table 96. *LACP Port General Information field descriptions (continued)*

Field	Description
Current While Timer	Value of the current While timer.
Current Operational State	Whether operation of the LACP port aggregator is enabled or disabled.

Monitoring Port—LACP Port Administrator Information

Device Console > Monitor > Layer 2 > LACP > LACP Port Administrator Information

This tab is used to show LACP Port Administrator Information.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 97. *Port LACP Port Administrator Information field descriptions*

Field	Description
Actor Administrator Port State	The state of the Actor Administrator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it is displayed a blank state, which is not a NULL state.
Actor Administrator Port Activity	The state of Actor Administrator Port Activity
Actor Administrator Port Synchronization	The state of Actor Administrator Port Synchronization
Actor Administrator Port Defaulted	The state of Actor Administrator Port Defaulted
Actor Administrator Port Timeout	The state of Actor Administrator Port Timeout
Actor Administrator Port Collecting	The state of Actor Administrator Port Collecting
Actor Administrator Port Expired	The state of Actor Administrator Port Expired

Table 97. Port LACP Port Administrator Information field descriptions (continued)

Field	Description
Actor Administrator Port Aggregation	The state of Actor Administrator Port Aggregation
Actor Administrator Port Distributing	The state of Actor Administrator Port Distributing

Monitoring Port—LACP Port Operator Information

Device Console > **Monitor** > **Layer 2** > **LACP** > *LACP Port Operator Information*

This tab is used used to show LACP Port Operator Information.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 98. Port LACP Port Operator Information field descriptions

Field	Description
Partner Operator System Priority	The value of Partner Operator Port System Priority
Partner Operator System ID	Partner Operator Port System ID
Partner Operator Port Key	The value of Partner Operator Port Key
Partner Operator Port Number	The Partner Operator Port Number
Partner Operator Port Priority	The value of Partner Operator Port Priority
Actor Operator Port State	The state of the Actor Operator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation, and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it is displayed a blank state, which is not a NULL state.
Actor Operator Port Activity	The state of Actor Operator Port Activity
Actor Operator Port Synchronization	The state of Actor Operator Port Synchronization
Actor Operator Port Defaulted	The state of Actor Operator Port Defaulted
Actor Operator Port Timeout	The state of Actor Operator Port Timeout

Table 98. *Port LACP Port Operator Information field descriptions (continued)*

Field	Description
Actor Operator Port Collecting	The state of Actor Operator Port Collecting
Actor Operator Port Expired	The state of Actor Operator Port Expired
Actor Operator Port Aggregation	The state of Actor Operator Port Aggregation
Actor Operator Port Distributing	The state of Actor Operator Port Distributing
Partner Operator Port State	The state of the Partner Operator Port. This is an octet mask with the following bits: Activity, Synchronization, Defaulted, Timeout, Collecting, Expired, Aggregation, and Distributing. If all of them are 0, the state is displayed as 0x0, otherwise it is displayed a blank state, which is not a NULL state.
Partner Operator Port Activity	The state of Partner Operator Port Activity
Partner Operator Port Synchronization	The state of Partner Operator Port Synchronization
Partner Operator Port Defaulted	The state of Partner Operator Port Defaulted
Partner Operator Port Timeout	The state of Partner Operator Port Timeout
Partner Operator Port Collecting	The state of Partner Operator Port Collecting
Partner Operator Port Expired	The state of Partner Operator Port Expired
Partner Operator Port Aggregation	The state of Partner Operator Port Aggregation
Partner Operator Port Distributing	The state of Partner Operator Port Distributing

How to Monitor IP Routing

Select Monitor's **Routing > IP** category to monitor IP Routing Statistics and Information. This section covers the following IP Routing statistics and information topics:

- “Monitoring IP Routing—IP Interface Statistics” on page 199
- “Monitoring IP Routing—Interface Information” on page 200
- “Monitoring IP Routing—TCP Statistics” on page 201
- “Monitoring IP Routing—TCP Connections” on page 202
- “Monitoring IP Routing—UDP Statistics” on page 203
- “Monitoring IP Routing—UDP Information” on page 203
- “Monitoring IP Routing—IP Statistics” on page 203
- “Monitoring IP Routing—ICMP In Statistics” on page 205
- “Monitoring IP Routing—ICMP Out Statistics” on page 206
- “Monitoring IP Routing—DNS Statistics” on page 207
- “Monitoring IP Routing—Routes” on page 208
- “Monitoring IP Routing—Routes Standard” on page 208
- “Monitoring IP Routing—Routes Statistics” on page 209
- “Monitoring IP Routing—ARP” on page 210
- “Monitoring IP Routing—ARP Statistics” on page 211
- “Monitoring IP Routing—Gateway Information” on page 212
- “Monitoring IP Routing—IP Address Information” on page 213

Monitoring IP Routing—IP Interface Statistics

Device Console > Monitor > Layer 3 > IP > IP Interface Statistics

Device Console > Monitor > Layer 3 > IP > General > IP Interface Statistics

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 99. Routing IP Interface Statistics field descriptions

Field	Description
Interface	The number of the interface. The interface number is either one of the 256 IP interfaces or one of the physical ports.
Bytes In	The number of bytes received on the interface, including framing characters.
Bytes Out	The number of bytes transmitted out of the interface, including framing characters.

Table 99. *Routing IP Interface Statistics field descriptions (continued)*

Field	Description
Unicast Packets In	The number of packets, delivered by this sublayer to a higher layer that were not addressed to a multicast or a broadcast address at this sublayer.
Unicast Packets Out	The number of packets that higher-level protocols requested to transmit that were not addressed to a multicast or broadcast address at this sublayer. The count includes the packets that were discarded or not delivered.
Multicasts In	The number of packets, delivered by this sublayer to a higher layer that were addressed to a multicast address at this sublayer. For a MAC layer protocol, this includes Group and Functional addresses.
Multicasts Out	The number of packets that higher-level protocols requested to transmit that were addressed to a multicast address at this sublayer. The count includes the packets that were discarded or not sent. For a MAC layer protocol, this includes Group and Functional addresses.
Discarded Packets	The number of inbound packets that were discarded, although no errors had been detected to prevent their delivery to a higher-layer protocol. This can occur to free up buffer space.
Outbound Discards	The number of outbound packets that were discarded, although no errors had been detected that would prevent their transmission. This can occur to free up buffer space.
Error Packets	For packet-oriented interfaces, the number of inbound packets with errors that prevented their delivery to a higher-layer protocol. For character-oriented or fixed-length interfaces, the number of inbound transmission units with errors that prevented their delivery to a higher-layer protocol.
Not Sent Due to Error	For packet-oriented interfaces, the number of outbound packets that could not be transmitted because of errors. For character-oriented or fixed-length interfaces, the number of outbound transmission units that could not be transmitted because of errors.

Monitoring IP Routing—Interface Information

Device Console > Monitor > Layer 3 > IP > *Interface Information*

Device Console > Monitor > Layer 3 > IP > **Data IP Interface > *Interface Information***

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 100. *Routing IP Interface Information field descriptions*

Field	Description
Interface	The interface type: <ul style="list-style-type: none"> • An IP interface; for example <i>IP 10</i>. • A physical (port) number depending on the switch; for example <i>Downlink2</i>.
Description	A text string containing information about the interface. <ul style="list-style-type: none"> • A logical interface is described as <i>net0, net1</i>, etc. • A Fast Ethernet physical (port) interface is described as <i>utp ethernet (10/100)</i> • A Gigabit Ethernet physical (port) interface is described as <i>fiber ethernet (1000)</i>
Type	The type of interface. A virtual interface (propVirtual) or a physical interface that is assigned to a switch port (e.g. ethernetCsmacd).
MTU (Largest Packet)	The size of the largest datagram which can be sent or received on the interface, specified in octets
Speed	The speed of the physical interface: 10 Mbps, 100 Mbps, 1000Mbps, 10000Mbps, 40000Mbps, any or other.
MAC Address	The MAC address of the physical interface.
Admin State	The administrative state of the Interface: up, down or testing
Operational Status	The status of the Interface: up, down, testing, unknown, dormant, notPresent or lowerLayerDown.
Last Change	Lists the date of the last change to the interface.
MIB Specification	A reference to MIB definitions those are specific to the media that realizes the interface. Example: if the interface is realized by Ethernet, then MIB Specific refers to a document that defines Ethernet objects.

Monitoring IP Routing—TCP Statistics

Device Console > Monitor > Layer 3 > IP > TCP Statistics

Device Console > Monitor > Layer 3 > IP > General > TCP Statistics

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 101. *Routing IP TCP field descriptions*

Field	Description
Active Opens	The number of TCP connections that were a direct transition to the SYN-SENT state from the CLOSED state.
Passive Opens	The number of TCP connections that were a direct transition to the SYN-RCVD state from the LISTEN state.
Failed Attempts	The number of TCP connections that were a direct transition to the CLOSED state from the SYN-SENT state or the SYN-RCVD state, and a direct transition to the LISTEN state from the SYN-RCVD state.
Resets In	The number of TCP connections that made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
Segments In	The total number of segments received, including those received in error. This count includes segments received on currently established connections.
Segments Out	The total number of transmitted segments, including those on current connections, but excluding those that contain only retransmitted bytes.
Retransmitted Segments	The total number of retransmitted segments: the number of TCP segments transmitted that contain one or more previously transmitted bytes.
Segments Received with Errors	The total number of received segments, including errors. This count includes segments received on currently established connections.
Resets Out	The number of transmitted TCP segments that contain the RST flag.

Monitoring IP Routing—TCP Connections

Device Console > **Monitor** > **Layer 3** > **IP** > *TCP Connections*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *TCP Connections*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 102. *Routing TCP Connections field descriptions*

Field	Description
Connection State	TCP connection state
Local IP Address	The local IP Address
Local TCP Port	The local port number

Table 102. *Routing TCP Connections field descriptions*

Field	Description
Remote IP Address	The remote IP address
Remote TCP Port	The remote port number

Monitoring IP Routing—UDP Statistics

Device Console > **Monitor** > **Layer 3** > **IP** > *UDP Statistics*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *UDP Statistics*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 103. *Routing IP UDP field descriptions*

Field	Description
Datagrams In	The total number of UDP datagrams delivered to UDP users.
No Application at Port	The total number of received UDP datagrams when no application was at the destination port.
Dropped Datagrams	The number of received UDP datagrams that could not be delivered for reasons other than the absence of an application at the destination port.
Datagrams Out	The total number of delivered UDP datagrams.

Monitoring IP Routing—UDP Information

Device Console > **Monitor** > **Layer 3** > **IP** > *UDP Information*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *UDP Information*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 104. *Routing UDP Information field descriptions*

Field	Description
Local IP Address	The local IP address for the UDP listener. When the UDP listener accepts datagrams for any IP interface associated with the node, the address is 0.0.0.0.
Local UDP Port	The local port number for the UDP listener.

Monitoring IP Routing—IP Statistics

Device Console > **Monitor** > **Layer 3** > **IP** > *IP Statistics*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *IP Statistics*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 105. *Routing IP Statistics field descriptions*

Field	Description
Good Packets In	The number of input datagrams received from interfaces, including those received in error.
Header Error Packets In	The number of input datagrams that were discarded because of errors in the IP headers. Errors: bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, and so on.
Address Errors In	The number of input datagrams that were discarded because the IP address in the IP header's destination field was not a valid address at this switch. Invalid addresses: 0.0.0.0, addresses of unsupported Classes such as Class E, and so forth. For entities that are not IP Gateways that do not forward datagrams, the count includes datagrams that were discarded because the destination address was not a local address.
Packets Routed	The number of input datagrams for which this entity was not their final IP destination. An attempt was made to find a route to forward them to that final destination. In entities that do not act as IP Gateways, the count only includes packets that were Source-Routed via this entity, and that the Source-Route option processing was successful.
Packets In with Unknown Protocol	The number of locally-addressed datagrams that were received successfully, but were discarded because of an unknown or an unsupported protocol.
Inbound Dropped Packets	The number of input IP datagrams that were discarded, although no errors were identified. This can occur because of insufficient buffer space. Note: This counter does not include any datagrams that were discarded while waiting for reassembly.
Packets Consumed	The total number of input datagrams successfully delivered to IP user-protocols, including ICMP.
Packets Out	The total number of IP datagrams that local IP user-protocols, including ICMP, supplied to IP in requests for transmission. Note: This counter does not include any datagrams that were counted in Packets Routed.
Outbound Dropped Packets	The number of output IP datagrams that were discarded, although no problems were noted. This can occur because of insufficient buffer space. Note: This counter includes datagrams that were counted in Packets Routed if the packets met this discard criterion.

Table 105. *Routing IP Statistics field descriptions (continued)*

Field	Description
Non-Routable Dropped Packets	The number of IP datagrams discarded because no route was available for transmitting them to their destinations. Note: This counter includes any packets counted in Packets Routed that meet this no-route criterion. Also included, are any datagrams that a host cannot route because all of the default gateways are down.
IP Fragments Reassembled	The number of received IP fragments that needed to be reassembled.
Packet Reassembly Successes	The number of IP datagrams successfully reassembled.
Packet Reassembly Failures	The number of failures detected by the IP reassembly algorithm. Possible failures include timed out, errors, and so on. Note: This is not necessarily a count of discarded IP fragments. Some algorithms, notably the algorithm in RFC 815, can lose track of the number of fragments by combining them as they are received.
Successful Packet Fragmentation	The number of IP datagrams that have been successfully fragmented.
Failed Packet Fragmentation	The number of IP datagrams that have been discarded because they could not be fragmented, such as when the Don't Fragment flag has been set.
Fragments Created	The number of IP datagrams that have been fragmented.
Routing Discards	The number of dropped packets.

Monitoring IP Routing—ICMP In Statistics

Device Console > **Monitor** > **Layer 3** > **IP** > *ICMP In Statistics*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *ICMP In Statistics*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 106. *Routing IP ICMP In field descriptions*

Field	Description
Packets In	The number of received ICMP messages.
Error Packets In	The number of received ICMP Time error messages.
Destination Unreachable Packets In	The number of received ICMP Destination Unreachable messages.

Table 106. *Routing IP ICMP In field descriptions (continued)*

Field	Description
Time Exceeded Packets In	The number of received ICMP Time Exceeded messages.
Parameter Problem Packets In	The number of received ICMP Parameter Problem messages.
Source Quench Packets In	The number of received Internet Control Message Protocol (ICMP) Source Quench messages.
Redirect Packets In	The number of received ICMP Redirect messages.
Echo (Ping) Request Packets In	The number of received ICMP Echo (request) messages.
Echo (Ping) Reply Packets In	The number of received ICMP Echo Reply messages.
Timestamp Request Packets In	The number of received ICMP Timestamp (request) messages.
Timestamp Reply Packets In	The number of received ICMP Timestamp Reply messages.
Address Mask Request Packets In	The number of received ICMP Address Mask Request messages.
Address Mask Reply Packets In	The number of received ICMP Address Mask Reply messages.

Monitoring IP Routing—ICMP Out Statistics

Device Console > Monitor > Layer 3 > IP > ICMP Out Statistics

Device Console > Monitor > Layer 3 > IP > General > ICMP Out Statistics

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 107. *Routing IP ICMP Out field descriptions*

Field	Description
Packets Out	The total number of delivered ICMP packets.
Error Packets Out	The number of ICMP packets delivered with error messages.
Destination Unreachable Packets Out	The number of transmitted ICMP Destination Unreachable messages.

Table 107. Routing IP ICMP Out field descriptions (continued)

Field	Description
Time Exceeded Packets Out	The number of transmitted ICMP Time Exceeded messages.
Parameter Problem Packets Out	The number of transmitted ICMP Parameter Problem messages.
Source Quench Packets Out	The number of Internet Control Message Protocol (ICMP) Source Quench messages sent.
Redirect Packets Out	The number of ICMP Redirect messages sent. Note: For a host, this object will always be 0 (zero) since hosts do not send redirects.
Echo (Ping) Request Packets Out	The number of transmitted ICMP Echo request messages.
Echo (Ping) Reply Packets Out	The number of transmitted ICMP Echo Reply messages.
Timestamp Request Packets Out	The number of transmitted ICMP Timestamp request messages.
Timestamp Reply Packets Out	The number of transmitted ICMP Timestamp Reply messages.
Address Mask Request Packets Out	The number of transmitted ICMP Address Mask Request messages.
Address Mask Reply Packets Out	The number of transmitted ICMP Address Mask Reply messages.

Monitoring IP Routing—DNS Statistics

Device Console > **Monitor** > **Layer 3** > **IP** > *DNS Statistics*

Device Console > **Monitor** > **Layer 3** > **IP** > **General** > *DNS Statistics*

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 108. Routing IP DNS Statistics field descriptions

Field	Description
Good DNS Requests In	The number of DNS request packets that have been received.
DNS Requests Out	The number of DNS request packets that have been transmitted.
Bad DNS Requests In	The number of DNS request packets received that were dropped.

Monitoring IP Routing—Routes

Device Console > Monitor > Layer 3 > Routes > Routes

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 109. *Routing Routes Information field descriptions*

Field	Description
Route	The index number of the routing table.
Destination IP Address	The destination IP address of this route.
Destination IP Mask	The IP mask of this route.
Next-Hop Router 1	The gateway of this route.
Tag Type	The tag type: ICMP, static, SNMP, addr, RIP, broadcast, martian, or multicast.
Route Type	The type of route: indirect, direct, local, broadcast, martian, multicast, or other.
Interface	The IP interface of this route that is used as the source IP for routing.
Route Metric	The routing metric for the route.

Monitoring IP Routing—Routes Standard

Device Console > Monitor > Layer 3 > Routes > Routes Standard

Device Console > Monitor > Layer 3 > IP > General > Routes Standard

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 110. *Routing Routes Standard Information field descriptions*

Field	Description
Local Interface Index	The index value identifying the local interface through which the next hop of this route should be reached.
Destination IP Address	The destination IP address of this route. Note: Multiple routes to a single destination can appear in the table if the Destination IP Address has been defined by the Network Management Protocol.
Next Hop	The IP address of the next hop of this route. Note: If a route bound to an interface is through a broadcast media, Next Hop Address is the agent's IP address on that interface.

Table 110. *Routing Routes Standard Information field descriptions (continued)*

Field	Description
Route Type	The type of route: direct, indirect, invalid, or other. Note: The type invalid disassociates both the destination and the route entry that are identified with this entry. Management stations must be prepared to receive information from agents that correspond to entries that are not currently in use.
Route Protocol	The route protocol/mechanism via which this route was learned: other, local, netmgmt, icmp, egg, ggp, hello, rip, is-is, es-is, ciscoIgrp, bbnSpfIgp, ospf, bgp
Route Age	The number of seconds since this route was last updated or otherwise determined to be correct.
Route Mask	The mask that must be logically Ended with the destination address before it is compared to the destination address of the router. If the value of the destination address is 0.0.0.0 (default value), the mask value is also 0.0.0.0. If the system does not support arbitrary subnet masks, an agent constructs the router mask based on the class of the network of the destination address: <ul style="list-style-type: none"> ● 255.0.0.0 for class A ● 255.255.0.0 for class B ● 255.255.255.0 for class C

Monitoring IP Routing—Routes Statistics

Device Console > Monitor > Layer 3 > Routes > Routes Statistics

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch

Table 111. *Routing Routes Statistics Information field descriptions*

Field	Description
IP Routes	The current number of IP routes.
Most IP Routes	The highest number of IP routes.
Maximum IP Routes	The maximum number of IP routes.

Monitoring IP Routing—IPv6 Routes

Device Console > Monitor > Layer 3 > Routes > IPv6 Routes

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch

Table 112. *IPv6 Routes Statistics Information field descriptions*

Field	Description
Route	The route number.
Destination IP Address	The destination IPv6 address.
Route Length	The route length.
Interface	The interface number.
Next Hop	The route number of the next hop.
Type	The route type.

Monitoring IP Routing—ARP

Device Console > Monitor > Layer 3 > IP > ARP

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 113. *Routing ARP Table field descriptions*

Field	Description
Destination IP Address	The destination IP address of the address resolution.
MAC Address	The MAC address for the Address Resolution Protocol (ARP) entry.
VLAN ID	The VLAN identifier for the ARP.
Source Port	The port number.
Flag	<p>The flag status of this ARP: <i>clear</i>, <i>unresolved</i> (U), <i>permanent</i> (P), <i>indirect</i> (R), or <i>layer4</i> (p 4) (in 20.1.1.0 and higher). These flags are defined as follows:</p> <ul style="list-style-type: none"> ● U: Unresolved or unknown ARP entry. The MAC address of the client has not yet been learned. ● P: Permanent entry created for switch IP interface. This entry never ages out. ● P 4: Permanent entry created for Layer 4 proxy IP address or virtual server IP address. ● R: Indirect ARP cache entry. This entry is used for faster forwarding the next time the packet comes for the same destination.

Monitoring IP Routing—ARP Statistics

Device Console > Monitor > Layer 3 > IP > ARP Statistics

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 114. *Routing ARP Statistics field descriptions*

Field	Description
ARP Entries	The current number of ARP entries.
Most ARP Entries	The highest number of ARP entries.
Max ARP Entries	The maximum number of ARP entries.

Monitoring IP Routing—IPv4 Information

Device Console > Monitor > Layer 3 > IP > Management IP Interface > IPv4 Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 115. *Management IP Interface IPv4 Information field descriptions*

Field	Description
MAC Address	The MAC address.
IP Address	The IP address.
IP Subnet Mask	The subnet mask of the IP address. The subnet mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.
DHCP State	Whether DHCP is enabled.
Status	The status of the interface.

Monitoring IP Routing—IPv6 Information

Device Console > Monitor > Layer 3 > IP > Management IP Interface > IPv6 Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 116. *Management IP Interface IPv6 Information field descriptions*

Field	Description
MAC Address	The MAC address.
IP Address	The IP address.
Prefix	The IPv6 prefix.
Status	The status of the interface.

Monitoring IP Routing—IPv4 Management Embedded Interface Information

Device Console > Monitor > Layer 3 > IP > Management IP Interface > IPv4 Mgmt Embedded Interface

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 117. *IPv4 Management Embedded Interface field descriptions*

Field	Description
MAC Address	The MAC address.
IP Address	The IP address.
IP Subnet Mask	The subnet mask of the IP address. The subnet mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.
DHCP State	Whether DHCP is enabled.
Status	The status of the interface.

Monitoring IP Routing—Gateway Information

Device Console > Monitor > Layer 3 > Gateway > IPv4 Information

Device Console > Monitor > Layer 3 > Gateway > Data Gateway > IPv4 Information

Device Console > Monitor > Layer 3 > Gateway > Management Gateway > IPv4 Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 118. *Routing Gateway Information field descriptions*

Field	Description
Gateway	The gateway index.
Address	The gateway IP address.
Status	The status of the gateway.

Monitoring IP Routing—Gateway IPv6 Information

Device Console > Monitor > Layer 3 > Gateway > IPv6 Information

Device Console > Monitor > Layer 3 > Gateway > Data Gateway > IPv6 Information

Device Console > Monitor > Layer 3 > Gateway > Management Gateway > IPv6 Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 119. *Routing Gateway Information field descriptions*

Field	Description
Gateway	The gateway index.
Address	The gateway IP address.
Status	The status of the gateway.

Monitoring IP Routing—IP Address Information

Device Console > Monitor > Layer 3 > IP > IP Address Information

Device Console > Monitor > Layer 3 > IP > General > IP Address Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 120. *Routing IP Address Information field descriptions*

Field	Description
IP Address	The IP address
Interface	The index number of the interface.
IP Subnet Mask	The subnet mask of the IP address. The subnet mask is an IP address with all the network bits set to 1 and all the hosts bits set to 0.
Broadcast LSB	The broadcast address of the interface.
Maximum Reassembly Size	The size of the largest IP datagram that can be re-assembled from fragmented IP datagrams.

Monitoring IP Routing—IPv6 Path Maximum Transmission Unit Information

Device Console > Monitor > Layer 3 > IP > IPv6 PMTU Information

Note: This tab might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 121. *IPv6 PMTU Information field descriptions*

Field	Description
Index	The index in the PMTU table of the IPv6 entry.
Destination IP	The destination IP address
Since	The time when the path MTU was first recorded.
PMTU Value	The value of the IPv6 PMTU.

How to Monitor BGP Routing

Select Monitor's **Routing > BGP** category to monitor BGP Routing Statistics and Information. This section covers the following BGP Routing statistics and information topics:

- [“Monitoring BGP Routing—BGP Peers Summary” on page 214](#)
- [“Monitoring BGP Routing—BGP Routing Table” on page 215](#)

Monitoring BGP Routing—BGP Peers Summary

Device Console > Monitor > Layer 3 > BGP > Peers Summary

Table 122. *Routing BGP Peers Summary Information field descriptions*

Field	Description
Remote Address	The remote IP address of this entry's BGP peer.
Peer	The BGP Identifier of this entry's BGP peer.
State	The BGP peer connection state: idle, connect, active, opensent, openconfirm or established.
Status	The BGP status: stop or start
Version	The negotiated version of BGP running between the two peers.
Local Address	The local IP address of this entry's BGP connection.
Local Port	The local port for the TCP connection between the BGP peers.
Local Autonomous System	The Local Autonomous System number.
Remote Port	The remote port for the TCP connection between the BGP peers. Note that the objects <code>bgpPeerLocalAddr</code> , <code>bgpPeerLocalPort</code> , <code>bgpPeerRemoteAddr</code> and <code>bgpPeerRemotePort</code> provide the appropriate reference to the standard MIB TCP connection table.
Remote Autonomous System	The remote autonomous system number.
Received Updates	The number of BGP UPDATE messages received on this connection. This object should be initialized to zero (0) when the connection is established.
Sent Updates	The number of BGP UPDATE messages transmitted on this connection. This object should be initialized to zero (0) when the connection is established.

Table 122. *Routing BGP Peers Summary Information field descriptions (continued)*

Field	Description
Received Messages	The total number of messages received from the remote peer on this connection. This object should be initialized to zero when the connection is established.
Sent Messages	The total number of messages transmitted to the remote peer on this connection. This object should be initialized to zero when the connection is established.
Last Error	The last error code and subcode seen by this peer on this connection. If no error has occurred, this field is zero. Otherwise, the first byte of this two byte OCTET STRING contains the error code, and the second byte contains the subcode.
FSM Established	The total number of times the BGP FSM transitioned into the established state.
FSM Time	This timer indicates how long (in seconds) this peer has been in the Established state or how long since this peer was last in the Established state. It is set to zero when a new peer is configured or the router is booted.
Hold Time	Time interval in seconds for the Hold Timer established with the peer.
Keep Alive	Time interval in seconds for the KeepAlive timer established with the peer.
Time Since Last Update	Elapsed time in seconds since the last BGP UPDATE message was received from the peer. Each time the <code>bgpPeerInUpdates</code> is incremented, the value of this object is set to zero (0).

Monitoring BGP Routing—BGP Routing Table

Device Console > Monitor > Layer 3 > BGP > *Routing Table*

Table 123. *Routing BGP Routing Table field descriptions*

Field	Description
Index	BGP router index.
Network	BGP network address.
Next Hop	BGP NextHop addresses from this network.
Metric	BGP metric from this network.
Local Preference	BGP local preference from this network.
Weight	Total weight of AS paths from this network.
Path	AS paths from this network.
Origin	BGP route origin from this network.

How to Monitor RIP Routing

Select Monitor's **Routing > RIP** category to monitor RIP Routing Statistics and Information. This section covers the following RIP Routing statistics and information topics:

- [“Monitoring RIP Routing—RIP V2 Statistics” on page 216](#)
- [“Monitoring RIP Routing—RIP Route Information” on page 217](#)

Monitoring RIP Routing—RIP V2 Statistics

Device Console > Monitor > Layer 3 > RIP > RIP V2 Statistics

Table 124. *Routing RIP V2 field descriptions*

Field	Description
Packets Received	The number of RIPv2 packets received.
Packets Sent	The number of RIPv2 packets sent.
Requests Received	The number of RIPv2 requests received.
Responses Received	The number of RIPv2 responses received.
Requests Sent	The number of RIPv2 requests sent.
Responses Sent	The number of RIPv2 responses sent.
Route Timeouts	The number of RIPv2 route timeouts.
Bad Size Received	The number of RIPv2 packets with a bad size received.
Bad Version Received	The number of RIPv2 packets with a bad version received.
Bad Zero Received	The number of RIPv2 packets with a bad zero received.
Bad Source Port Received	The number of RIPv2 packets with a bad source port received.
Bad Source IP Received	The number of RIPv2 packets with a bad source IP received.
From Self Received	The number of RIPv2 packets received from the originating switch.

Monitoring RIP Routing—RIP Route Information

Device Console > Monitor > Layer 3 > RIP > RIP Route Information

Table 125. Routing RIP Route Information field descriptions

Field	Description
RIP Route Index	Index number of the RIP route.
Destination IP Address	Destination IP address for the route.
RIP Route Mask	Destination IP mask for the route
RIP Route Gateway	IP address for the next-hop router.
RIP Route Metric	Metric value for the route.

How to Monitor OSPF Routing

Select Monitor's **Routing > OSPF** category to monitor OSPF Routing Statistics and Information. This section covers the following OSPF Routing statistics and information topics:

- “Monitoring OSPF Routing—General OSPF Statistics” on page 218
- “Monitoring OSPF Routing—OSPF Area Statistics” on page 221
- “Monitoring OSPF Routing—OSPF Area Neighbor Statistics” on page 222
- “Monitoring OSPF Routing—OSPF Area Interface Statistics” on page 223
- “Monitoring OSPF Routing—OSPF Area Receive Error Statistics” on page 224
- “Monitoring OSPF Routing—OSPF Area Interface Receive Error Statistics” on page 225
- “Monitoring OSPF Routing—OSPF Interface Change Statistics” on page 225
- “Monitoring OSPF Routing—OSPF Interface Transmission Statistics” on page 226
- “Monitoring OSPF Routing—OSPF Interface Neighbor Statistics” on page 227
- “Monitoring OSPF Routing—OSPF Area Information” on page 228
- “Monitoring OSPF Routing—OSPF Interface Information” on page 228
- “Monitoring OSPF Routing—OSPF Neighbor Interface Information” on page 230
- “Monitoring OSPF Routing—OSPF Virtual Interface Information” on page 230
- “Monitoring OSPF Routing—OSPF Stats2 Information” on page 231
- “Monitoring OSPF Routing—OSPF Link-State DB Information” on page 232
- “Monitoring OSPF Routing—OSPF External Link-State DB Information” on page 232
- “Monitoring OSPF Routing—OSPF Summary Range Information” on page 233
- “Monitoring OSPF Routing—OSPF Routes Information” on page 233

Monitoring OSPF Routing—General OSPF Statistics

Device Console > Monitor > Layer 3 > OSPF > General OSPF Statistics

Table 126. *Routing General OSPF field descriptions*

Field	Description
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface.
Hello In	The total number of Hello packets received for this OSPF interface.

Table 126. *Routing General OSPF field descriptions (continued)*

Field	Description
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State Request In	The total number of Link State Request packets received for this OSPF interface.
Link State Request out	The total number of Link State Request packets transmitted for this OSPF interface.
Link State Acks In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Acks Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Updates In	The total number of Link State Update packets received for this OSPF interface.
Link State Updates Out	The total number of Link State Update packets transmitted for this OSPF interface.
Neighbor Hello In	The sum total of all Hello packets received from neighbors on all OSPF areas and interfaces.
Neighbor State	The sum total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds), across all OSPF areas and interfaces.
Neighbor Adjoint Ok	The sum total number of decisions to be made (again) as to whether an adjacency should be established/maintained with the Neighbor across all OSPF areas and interfaces.
Neighbor Negotiation Done	The sum total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, across all OSPF areas and interfaces.
Neighbor Exchange Done	The sum total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, across all OSPF areas and interfaces.
Neighbor Bad Link State Request	The sum total number of Link State Requests that have been received for a link state advertisement that is not contained in the database across all interfaces and OSPF areas.

Table 126. *Routing General OSPF field descriptions (continued)*

Field	Description
Neighbor Bad Sequences	<p>The sum total number of Database Description packets which have been received that either:</p> <ul style="list-style-type: none">• has an unexpected DD sequence number, or• has had the init bit set unexpectedly, or• has an options field differing from the last Options field received in a Database Description packet. <p>Any of these conditions indicate that some error has occurred during adjacency establishment for all OSPF areas and interfaces.</p>
Neighbor Loading Done	<p>The sum total number of link state updates received for all out-of-date portions of the database across all OSPF areas and interfaces.</p>
Neighbor Hello 1 way	<p>The sum total number of Hello packets received from neighbors, in which this router is not mentioned across all OSPF interfaces and areas.</p>
Neighbor Reset Adjacency	<p>The sum total number of times the Neighbor adjacency has been reset across all OPSF areas and interfaces.</p>
Neighbor Down	<p>The total number of Neighboring routers down (i.e. in the initial state of a neighboring conversation) across all OSPF areas and interfaces.</p>
Neighbor Hello 2 way	<p>The sum total number of Hello packets received from neighbors, in which this router is mentioned across all OSPF interfaces and areas.</p>
Interface Up	<p>The sum total number of interfaces up in all OSPF areas.</p>
Interface Down	<p>The sum total number of interfaces down in all OSPF areas.</p>
Interface Not Connected	<p>The sum total of interfaces no longer connected to the attached network across all OSPF areas and interfaces.</p>
Interface Connected	<p>The sum total number of interfaces, connected to the attached network in all OSPF areas.</p>
Interface Wait Timer Fired	<p>The sum total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) across all OSPF areas and interfaces.</p>
Interface Backup Routers	<p>The sum total number of Backup Designated Routers on the attached network for all OSPF areas and interfaces.</p>
Interface Bidirectional Changes	<p>The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPF areas.</p>

Table 126. *Routing General OSPF field descriptions (continued)*

Field	Description
Hello Timer Fired	The sum total number of times the Hello timer has been fired (which triggers the send of a Hello packet) across all OSPF areas and interfaces.
Retransmit Timer Fired	The sum total number of times the Retransmit timer has been fired across all OSPF areas and interfaces.
Link State Lock Timer Fired	The sum total number of times the LSA Lock timer has been fired across all OSPF areas and interfaces.
Link State Ack Timer Fired	The sum total number of times the LSA Ack timer has been fired across all ospf areas and interfaces.
Dbage Fired	The total number of times the Dbage has been fired.
Summary Timer Fired	The total number of times the Summary timer has been fired.
ASE Export Timer Fired	The total number of times the (Autonomous System External route) ASE Export timer has been fired.

Monitoring OSPF Routing—OSPF Area Statistics

Device Console > Monitor > Layer 3 > OSPF > OSPF Area Statistics

Table 127. *Routing OSPF Area field descriptions*

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface.
Hello In	The total number of Hello packets received for this OSPF interface.
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State In	The total number of Link State Request packets received for this OSPF interface.
Link State Out	The total number of Link State Request packets transmitted for this OSPF interface.

Table 127. *Routing OSPF Area field descriptions (continued)*

Field	Description
Link State Ack In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Ack Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Update In	The total number of Link State Update packets received for this OSPF interface.
Link State Update Out	The total number of Link State Update packets transmitted for this OSPF interface.

Monitoring OSPF Routing—OSPF Area Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPF > OSPF Area Neighbor Statistics

Table 128. *Routing OSPF Area Neighbor Statistics*

Field	Description
Index	The index of the OSPF Interface for which these statistics apply.
Hello In	The total number of Hello packets received from neighbors in this OSPF interface.
Start State	The total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds) in this OSPF interface.
Adjoint Okay	The total number of decisions to be made (again) as to whether an adjacency should be established or maintained with the neighbor for this OSPF interface.
Negotiated Done	The total number of neighbors in this state in which the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, for this OSPF interface.
Exchange Done	The total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, for this OSPF interface.
Bad Link State Request	The total number of Link State Requests which have been received for a link state advertisement not contained in the database for this interface.

Table 128. *Routing OSPF Area Neighbor Statistics (continued)*

Field	Description
Bad Sequences	The total number of Database Description packets which have been received that either: <ul style="list-style-type: none">• has an unexpected DD sequence number, or• has had the init bit set unexpectedly, or• has an options field differing from the last Options field received in a Database Description packet. Any of these conditions indicate that some error has occurred while establishing adjacency for this interface.
Loading Done	The total number of link state updates received for all out-of-date portions of the database for this OSPF interface.
Hello 1 way	The total number of Hello packets received from neighbors, in which this router is not mentioned for this OSPF interface.
Reset Adjacency	The sum total number of times the Neighbor adjacency has been reset on this interface.
Down	The total number of Neighboring routers down (i.e. in the initial state of a Neighbor conversation) for this interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPF area.

Monitoring OSPF Routing—OSPF Area Interface Statistics

Device Console > **Monitor** > **Layer 3** > **OSPF** > *OSPF Area Interface Statistics*

Table 129. *Routing OSPF Area Interfaces field descriptions*

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Up	The total number of times the interface was up.
Down	The total number of times the interface was down.
Not Connected	The total number of times the interface was no longer connected to the attached network.
Connected	The total number of times the interface connected back to the attached network.
Wait Timer Fired	The total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) for this OSPF interface.

Table 129. *Routing OSPF Area Interfaces field descriptions (continued)*

Field	Description
Backup Routers	The total number of Backup Designated Routers on the attached network for this OSPF interface.
Bidirectional Changes	The total number of changes in the set of bidirectional neighbors associated with the interface for this OSPF interface.

Monitoring OSPF Routing—OSPF Area Receive Error Statistics

Device Console > Monitor > Layer 3 > OSPF > OSPF Area Receive Error Statistics

Table 130. *Routing OSPF Area Receive Error Statistics field descriptions*

Field	Description
Index	Index of the OSPF Area for which these statistics apply.
Wrong Password	Total number of packets received with a wrong password in this area.
Wrong NetMask	Total number of packets received with a wrong netmask in this area.
Wrong Hello Interval	Total number of packets received with a different hello interval in this area.
Dead Interval	Total number of packets received with a different dead interval in this area.
Options	Total number of packets received with a different options in this area.
Unknown Neighbor	Total number of packets received from an unknown neighbor in this area.
Wrong Area	Total number of packets received with a wrong area.
Invalid Self Originated LSA	The total number of packets received with invalid self originated LSAs.

Monitoring OSPF Routing—OSPF Area Interface Receive Error Statistics

Device Console > **Monitor** > **Layer 3** > **OSPF** > *OSPF Area Interface Receive Error Statistics*

Table 131. *OSPF Area Interface Receive Error Statistics field descriptions*

Field	Description
Index	Index of the OSPF Area for which these statistics apply.
Wrong Password	Total number of packets received with a wrong password in this area.
Wrong NetMask	Total number of packets received with a wrong netmask in this area.
Wrong Hello Interval	Total number of packets received with a different hello interval in this area.
Dead Interval	Total number of packets received with a different dead interval in this area.
Options	Total number of packets received with a different options in this area.
Unknown Neighbor	Total number of packets received from an unknown neighbor in this area.
Wrong Area	Total number of packets received with a wrong area.

Monitoring OSPF Routing—OSPF Interface Change Statistics

Device Console > **Monitor** > **Layer 3** > **OSPF** > *OSPF Interface Change Statistics*

Table 132. *OSPF Interface Change Statistics field descriptions*

Field	Description
Index	The index number.
Interface Up	The sum total number of interfaces that are up in all OSPF areas.
Interface Down	The sum total number of interfaces down in all OSPF areas.
Interface Not Connected	The sum total of interfaces no longer connected to the attached network across all OSPF areas and interfaces.
Interface Connected	The sum total number of interfaces, connected to the attached network in all OSPF areas.
Interface Wait Timer Fired	The sum total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) across all OSPF areas and interfaces.

Table 132. *OSPF Interface Change Statistics field descriptions (continued)*

Field	Description
Interface Backup Routers	The sum total number of Backup Designated Routers on the attached network for all OSPF areas and interfaces.
Interface Bidirectional Changes	The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPF areas.

Monitoring OSPF Routing—OSPF Interface Transmission Statistics

Device Console > Monitor > Layer 3 > OSPF > OSPF Interface Transmission Statistics

Table 133. *OSPF Interface Transmission Statistics field descriptions*

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Packets In	The total number of OSPF packets received for this OSPF interface.
Packets Out	The total number of OSPF packets transmitted for this OSPF interface
Hello In	The total number of Hello packets received for this OSPF interface,
Hello Out	The total number of Hello packets transmitted for this OSPF interface.
Database Description In	The total number of Database Description packets received for this OSPF interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPF interface.
Link State Request In	The total number of Link State Request packets received for this OSPF interface.
Link State Request Out	The total number of Link State Request packets transmitted for this OSPF interface.
Link State Acks In	The total number of Link State Acknowledgement packets received for this OSPF interface.
Link State Acks Out	The total number of Link State Acknowledgement packets transmitted for this OSPF interface.
Link State Updates In	The total number of Link State Update packets received for this OSPF interface.
Link State Updates Out	The total number of Link State Update packets transmitted for this OSPF interface.

Monitoring OSPF Routing—OSPF Interface Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPF > *OSPF Interface Neighbor Statistics*

Table 134. *OSPF Interface Neighbor Statistics field descriptions*

Field	Description
Index	The index of the OSPF Area for which these statistics apply.
Hello In	The total number of Hello packets received from neighbors in this OSPF interface.
Start State	The total number of neighbors in this state (i.e. an indication that Hello packets should now be sent to the neighbor at intervals of HelloInterval seconds.) in this OSPF interface.
Adjoint OK	The total number of decisions to be made (again) as to whether an adjacency should be established or maintained with the neighbor for this OSPF interface.
Negotiated Done	The total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, for this OSPF interface.
Exchange Done	The total number of neighbors in this state (i.e. in an adjacency's final state) having transmitted a full sequence of Database Description packets, for this OSPF interface.
Bad Link State Request	The total number of Link State Requests which have been received for a link state advertisement not contained in the database for this interface.
Bad Sequences	The total number of Database Description packets that have been received that either: <ul style="list-style-type: none"> ● have an unexpected DD sequence number ● unexpectedly have had the init bit set ● have an options field that differs from the last Options field that was received in a Database Description packet. Any of these conditions indicate that some error has occurred during adjacency establishment for this interface.
Loading Done	The total number of link state updates received for all out-of-date portions of the database for this OSPF interface.
Hello 1 way	The total number of Hello packets received from neighbors, in which this router is not mentioned for this OSPF interface.
Reset Adjacency	The sum total number of times the Neighbor adjacency has been reset on this interface.
Down	The total number of Neighboring routers down (i.e. in the initial state of a neighbor conversation.) for this interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPF area.

Monitoring OSPF Routing—OSPF Area Information

Device Console > Monitor > Layer 3 > OSPF > OSPF Area Information

Table 135. Routing OSPF Area Information field descriptions

Field	Description
Index	The OSPF area number for which the OSPF info table is related.
Area IP Address	The IP address of the OSPF area.
Interfaces	The total number of interfaces for this OSPF area.
Interfaces Up	The number of interfaces that are UP in this area.
Link State Database Entries	The number of Link State Database entries for this OSPF area.
Auth Type	Area authentication.
Accepted LS Type	LS types accepted by this area.
SPF	Number of times the SPF algorithm has been executed.
Area Border Router	Count of ABR local to this area.
AS Boundary Router	Count of ASBR local to this area.
Total Neighbors	The total number of OSPF neighbors.
INIT State	Total neighbors in INIT state.
EXCH State	Total neighbors in EXCH state.
FULL State	Total neighbors in FULL state.

Monitoring OSPF Routing—OSPF Interface Information

Device Console > Monitor > Layer 3 > OSPF > OSPF Interface Information

Table 136. Routing OSPF Interface Information field descriptions

Field	Description
Index	The OSPF interface number for which the OSPF info table is related.
Interface IP Address	The IP address of the OSPF interface.
Area	The index of the area in which the interface belongs.
Admin Status	Admin Status of the interface: down(0), up(1).
Passive Status	Passive status of the interface: disabled(0), enabled(1).

Table 136. *Routing OSPF Interface Information field descriptions (continued)*

Field	Description
Router ID	The router ID of the switch.
State	The state of the interface: Down(0), Loopback(1), Waiting(2), P to P(3), DR(4), BackuDR(5), DR Other(6).
Priority	Interface router priority
Designated Router ID	The OSPF Designated Router IP (IP Address) for this OSPF interface.
Designated Router IP	The OSPF Designated Router IP Address for this OSPF interface.
Backup Designated Router ID	The OSPF Backup Designated Router IP for this OSPF interface.
Backup Designated Router IP	The OSPF Backup Designated Router IP Address for this OSPF interface.
Hello Interval	The hello timer for this OSPF interface.
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	The dead timer for this OSPF interface.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)
Wait Interval	The OSPF Wait interval for this OSPF interface.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	The retransmit interval for this OSPF interface.
Transit Delay	The transit delay for this OSPF interface.
Total Neighbors	The total number of neighbors for this OSPF interface.
Total Events	The total number of events for this OSPF interface.
Auth Type	Type of authentication being used: none(1) - no authentication, password(2) - use password, md5(3) - use MD5 authentication.
Point To Point Status	Point-to-point status of the interface: disabled(0), enabled(1).

Monitoring OSPF Routing—OSPF Neighbor Interface Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Neighbor Interface Information*

Table 137. *Routing OSPF Neighbor Interface Information field descriptions*

Field	Description
Interface	The OSPF interface number.
Neighbor	The OSPF neighbor identifier.
Priority	The priority of the OSPF neighbor.
State	The state of the OSPF neighbor: down, attempt, init, twoway, exStart, exchange, loading, full
Designated Router	IP address of the designated router for the OSPF neighbor.
Backup Designated Router	The IP Address of the backup designated router for this OSPF neighbor.
IP Address	The IP Address of the OSPF neighbor.

Monitoring OSPF Routing—OSPF Virtual Interface Information

Device Console > Monitor > Layer 3 > OSPF > *OSPF Virtual Interface Information*

Table 138. *Routing OSPF Virtual Interface Information field descriptions*

Field	Description
Index	The OSPF Virtual Interface number for which this table is related.
IP Address	The IP Address of this virtual interface.
Area	The index of the OSPF area to which this virtual interface belongs.
Router ID	The Router ID
State	State: disabled(0), enabled(1)
Cost	The cost of the virtual interface.
Transit Delay	The transit delay for the virtual interface.
Hello Interval	Hello interval.
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	Dead interval.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)

Table 138. *Routing OSPF Virtual Interface Information field descriptions (continued)*

Field	Description
Wait Interval	Wait interval.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	Retransmit interval.
Authentication	Authentication.
Events	Events
Neighbor	The IP Address of the OSPF neighbor for this virtual interface.
Neighbor State	State: down(0), attempt(1), init(2), 2 way(3), exstart(4), exchange(5), loading(6), full(7)
Area ID	The Area ID of the virtual interface.

Monitoring OSPF Routing—OSPF Stats2 Information

Device Console > Monitor > Layer 3 > OSPF > OSPF Stats2 Information

Table 139. *Routing OSPF Stats2 Information field descriptions*

Field	Description
Start Time	The time when OSPF has been started.
Up Time	The time since OSPF has been started.
Supported Types	The Link State Types that are supported.
Interfaces for Router	The number of interfaces for this router.
Virtual Links for Router	The number of virtual links for this router.
Total Neighbors	The total number of OSPF neighbors.
Neighbors in Initial State	The number of neighbors in the initial state of exchange.
Neighbors in Exchange State	The number of neighbors in the exchange state.
Neighbors in Full State	The number of neighbors in the initial state of exchange.
Areas	The total number of areas.
Transit Areas	The total number of transit areas.
NSSA Areas	The total number of NSSA areas.

Monitoring OSPF Routing—OSPF Link-State DB Information

Device Console > Monitor > Layer 3 > OSPF > OSPF Link-State DB Information

Table 140. *Routing OSPF Link-State DB Information field descriptions*

Field	Description
Area of Link-state Advertisement	The 32 bit identifier of the Area from which the Link-state Advertisement was received.
Type	The type of the link state advertisement. Each link state type has a separate advertisement format.
Link-state ID	The Link State ID is an LS Type Specific field containing either a Router ID or an IP Address; it identifies the piece of the routing domain that is being described by the advertisement.
Originating Router	The 32 bit number that uniquely identifies the originating router in the Autonomous System.
Sequence	The sequence number field is a signed 32-bit integer. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number the more recent the advertisement.
Age	This field is the age of the link state advertisement in seconds.
Checksum	This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum.
Advertisement	The entire Link State Advertisement, including its header.

Monitoring OSPF Routing—OSPF External Link-State DB Information

Device Console > Monitor > Layer 3 > OSPF > OSPF External Link-State DB Information

Table 141. *Routing OSPF External Link-State DB Information field descriptions*

Field	Description
Type	The type of the link state advertisement. Each link state type has a separate advertisement format.
ID	The Link State ID is an LS Type Specific field containing either a Router ID or an IP Address; it identifies the piece of the routing domain that is being described by the advertisement.

Table 141. Routing OSPF External Link-State DB Information field descriptions (continued)

Field	Description
Router	The 32 bit number that uniquely identifies the originating router in the Autonomous System.
Sequence	The sequence number field is a signed 32-bit integer. It is used to detect old and duplicate link state advertisements. The space of sequence numbers is linearly ordered. The larger the sequence number, the more recent the advertisement.
Age	This field is the age of the link state advertisement in seconds.
Checksum	This field is the checksum of the complete contents of the advertisement, excepting the age field. The age field is excepted so that an advertisement's age can be incremented without updating the checksum. The checksum used is the same that is used for ISO connectionless datagrams; it is commonly referred to as the Fletcher checksum.
Advertisement	The entire Link State Advertisement, including its header.

Monitoring OSPF Routing—OSPF Summary Range Information

Device Console > **Monitor** > **Layer 3** > **OSPF** > *OSPF Summary Range Information*

Table 142. Routing OSPF Summary Range Information field descriptions

Field	Description
Index	The OSPF range index.
Area	The area associated for this OSPF range.
Network	The network associated for this OSPF range.
Mask	The mask associated for this OSPF range.
Action	The action (propagate/hide) assigned to this OSPF range.
List Type	The summary address list (Non-NSSA/NSSA) assigned to this OSPF range.

Monitoring OSPF Routing—OSPF Routes Information

Device Console > **Monitor** > **Layer 3** > **OSPF** > *OSPF Routes Information*

Table 143. Routing OSPF Routes Information field descriptions

Field	Description
Index	The OSPF route table index.
Destination	The destination associated with this OSPF route.
Mask	The mask associated with this OSPF route.

Table 143. *Routing OSPF Routes Information field descriptions (continued)*

Field	Description
Via	The next hop for this OSPF route.
Type	The route type code: <ul style="list-style-type: none">● IA - OSPF inter area● N1 - OSPF NSSA external type 1● N2 - OSPF NSSA external type 2● E1 - OSPF external type 1● E2 - OSPF external type 2● * - best

Monitoring OSPF Routing—OSPF Loopback Information

Device Console > Monitor > Layer 3 > OSPF > OSPF Loopback Information

Table 144. *Routing OSPF Loopback Information field descriptions*

Field	Description
Index	The OSPF interface number to which the OSPF information table is related.
Interface IP Address	The IP address of the OSPF interface.
Area	The index of the area that the interface belongs.
Admin Status	Admin Status of the interface: down(0), up(1).
Passive Status	Passive status of the interface: disabled(0), enabled(1).
Router ID	The router ID of the switch.
State	The state of the interface: Down(0), Loopback(1), Waiting(2), P to P(3), DR(4), BackuDR(5), DR Other(6).
Priority	Interface router priority.
Designated Router ID	The OSPF Designated Router IP (IP Address) for this OSPF interface.
Designated Router IP	The OSPF Designated Router IP Address for this OSPF interface.
Backup Designated Router ID	The OSPF Backup Designated Router IP for this OSPF interface.
Backup Designated Router IP	The OSPF Backup Designated Router IP address for this OSPF interface.
Hello Interval	The hello timer for this OSPF interface.

Table 144. *Routing OSPF Loopback Information field descriptions (continued)*

Field	Description
Hello Interval Units	Units of time measurement for Hello interval: seconds(0), milliseconds(1)
Dead Interval	The dead timer for this OSPF interface.
Dead Interval Units	Units of time measurement for Dead interval: seconds(0), milliseconds(1)
Wait Interval	The OSPF Wait interval for this OSPF interface.
Wait Interval Units	Units of time measurement for Wait interval: seconds(0), milliseconds(1)
Retransmit Interval	The retransmit interval for this OSPF interface.
Transit Delay	The transit delay for this OSPF interface.
Total Neighbors	The Total number of neighbours for this OSPF interface.
Total Events	The total number of events for this OSPF interface.
Auth Type	Type of authentication being used: none(1) - no authentication, password(2) - use password, md5(3) - use MD5 authentication.
Point To Point Status	Point-to-point status of the interface: disabled(0), enabled(1).

How to Monitor OSPFv3 Routing

Select Monitor's **Routing > OSPFv3** category to monitor OSPFv3 Routing Statistics and Information. This section covers the following OSPFv3 Routing statistics and information topics:

- “Monitoring OSPFv3 Routing—General Statistics” on page 236
- “Monitoring OSPFv3 Routing—OSPFv3 Area Statistics” on page 239
- “Monitoring OSPFv3 Routing—OSPFv3 Area Neighbor Statistics” on page 240
- “Monitoring OSPFv3 Routing—OSPFv3 Area Interface Statistics” on page 241
- “Monitoring OSPFv3 Routing—OSPFv3 Area Error Statistics” on page 241
- “Monitoring OSPFv3 Routing—OSPFv3 Interface Transmission Statistics” on page 243
- “Monitoring OSPFv3 Routing—OSPFv3 Interface Neighbor Statistics” on page 244
- “Monitoring OSPFv3 Routing—OSPFv3 Interface Change Statistics” on page 245
- “Monitoring OSPFv3 Routing—OSPFv3 Area Interface Error Statistics” on page 245
- “Monitoring OSPFv3 Routing—OSPFv3 General Information” on page 246
- “Monitoring OSPFv3 Routing—OSPFv3 Area Information” on page 248
- “Monitoring OSPFv3 Routing—OSPFv3 Interface Information” on page 248
- “Monitoring OSPFv3 Routing—OSPFv3 Routes Information” on page 250
- “Monitoring OSPFv3 Routing—OSPFv3 Neighbor Interface Information” on page 250
- “Monitoring OSPFv3 Routing—OSPFv3 Virtual Interface Information” on page 251

Monitoring OSPFv3 Routing—General Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > General

Table 145. *Routing General OSPFv3 field descriptions*

Field	Description
Packets In	The total number of OSPFv3 packets received for this OSPFv3 interface.
Packets Out	The total number of OSPFv3 packets transmitted for this OSPFv3 interface.
Hello In	The total number of Hello packets received for this OSPFv3 interface.
Hello Out	The total number of Hello packets transmitted for this OSPFv3 interface.

Table 145. *Routing General OSPFv3 field descriptions (continued)*

Field	Description
Database Description In	The total number of Database Description packets received for this OSPFv3 interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPFv3 interface.
Database Description Discarded	The total number of Database Description packets discarded for this OSPFv3 interface.
Link State Request In	The total number of Link State Request packets received for this OSPFv3 interface.
Link State Request Out	The total number of Link State Request packets transmitted for this OSPFv3 interface.
Link State Request Discarded	The total number of Link State Request packets discarded for this OSPFv3 interface.
Link State Acks In	The total number of Link State Acknowledgement packets received for this OSPFv3 interface.
Link State Acks Out	The total number of Link State Acknowledgement packets transmitted for this OSPFv3 interface.
Link State Acks Discarded	The total number of Link State Acknowledgement packets discarded for this OSPFv3 interface.
Link State Updates In	The total number of Link State Update packets received for this OSPFv3 interface.
Link State Updates Out	The total number of Link State Update packets transmitted for this OSPFv3 interface.
Link State Updates Discarded	The total number of Link State Update packets discarded for this OSPFv3 interface.
Neighbor Down	The total number of Neighboring routers down (in the initial state of a neighbor conversation) across all OSPFv3 areas and interfaces.
Neighbor Attempt State	Specifies whether the login attempt was via CONSOLE or TELNET. With telnet login it also displays the IP address of the host from which the attempt was made.
Neighbor Init State	The sum total number of neighbors in the INIT state.
Neighbor Hello 2 way	The sum total number of Hello packets received from neighbors, in which this router is mentioned across all OSPFv3 interfaces and areas.

Table 145. *Routing General OSPFv3 field descriptions (continued)*

Field	Description
Neighbor Hello In	The sum total of all Hello packets received from neighbors on all OSPFv3 areas and interfaces.
Neighbor ExStart State	The sum total number of neighbors in this state across all OSPFv3 areas and interfaces.
Neighbor Exchange State	The sum total number of neighbors in this state across all OSPFv3 areas and interfaces.
Neighbor Full State	The sum total number of neighbors in this state across all OSPFv3 areas and interfaces.
Neighbor ExStart State	The sum total number of neighbors in this state across all OSPFv3 areas and interfaces.
Neighbor All Events	The sum total number all neighbor events across all OSPFv3 interfaces and areas.
Interface Down	The sum total number of interfaces down in all OSPFv3 areas.
Interface Not Connected	The sum total of interfaces no longer connected to the attached network across all OSPFv3 areas and interfaces.
Interface Waiting State	The sum total number of interfaces waiting on the attached network for all OSPFv3 areas and interfaces.
Interface Ptop State	The sum total number of interfaces in this state connected to the attached network in all OSPFv3 areas.
Interface Dr State	The sum total number of interfaces in this state connected to the attached network in all OSPFv3 areas.
Interface Backup State	The sum total number of Backup Designated Routers on the attached network for all OSPFv3 areas and interfaces.
Interface DrOther State	The sum total number of interfaces in this state connected to the attached network in all OSPFv3 areas.
Interface All Events	The sum total number of events between interfaces connected to the attached network in all OSPFv3 areas.
Hello Timer Fired	The sum total number of times the Hello timer has been fired (which triggers the send of a Hello packet) across all OPSF areas and interfaces.
Kickoff Timer Fired	The sum total number of times the Kickoff timer has been fired (which triggers the send of a Kickoff packet) across all OPSF areas and interfaces.

Table 145. *Routing General OSPFv3 field descriptions (continued)*

Field	Description
Kickoff Poll Timer Fired	The sum total number of times the Kickoff poll timer has been fired (which triggers the send of a Kickoff poll) across all OPSF areas and interfaces.
KickoffNbrProbe Timer Fired	The sum total number of times the Kickoff Neighbor Probe timer has been fired (which triggers the send of a Kickoff neighbor probe) across all OPSF areas and interfaces.

Monitoring OSPFv3 Routing—OSPFv3 Area Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Area

Table 146. *Routing OSPFv3 Area field descriptions*

Field	Description
Index	The index of the OSPFv3 Area for which these statistics apply.
Packets In	The total number of OSPFv3 packets received for this OSPFv3 interface.
Packets Out	The total number of OSPFv3 packets transmitted for this OSPFv3 interface.
Discarded Packets	The total number of OSPFv3 packets discarded for this OSPFv3 interface.
Hello In	The total number of Hello packets received for this OSPFv3 interface.
Hello Out	The total number of Hello packets transmitted for this OSPFv3 interface.
Discarded Hello	The total number of Hello packets discarded for this OSPFv3 interface.
Database Description In	The total number of Database Description packets received for this OSPFv3 interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPFv3 interface.
Database Description Discarded	The total number of Database Description packets discarded for this OSPFv3 interface.
Req State In	The total number of Link State Request packets received for this OSPFv3 interface.
Req State Out	The total number of Link State Request packets transmitted for this OSPFv3 interface.
Req Discarded	The total number of Link State Request packets discarded for this OSPFv3 interface.

Table 146. *Routing OSPFv3 Area field descriptions (continued)*

Field	Description
Ack In	The total number of Link State Acknowledgement packets received for this OSPFv3 interface.
Ack Out	The total number of Link State Acknowledgement packets transmitted for this OSPFv3 interface.
Ack Discarded	The total number of Link State Acknowledgement packets discarded for this OSPFv3 interface.
Update In	The total number of Link State Update packets received for this OSPFv3 interface.
Update Out	The total number of Link State Update packets transmitted for this OSPFv3 interface.
Update Discarded	The total number of Link State Update packets discarded for this OSPFv3 interface.

Monitoring OSPFv3 Routing—OSPFv3 Area Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Area Neighbor

Table 147. *Routing OSPFv3 Area Neighbor Statistics*

Field	Description
Index	The index of the OSPFv3 Interface for which these statistics apply.
Down	The total number of Neighboring routers down (in the initial state of a Neighbor conversation) for this interface.
Attempt State	The total number of neighbors in this state for this OSPFv3 interface.
Init State	The total number of neighbors in this state for this OSPFv3 interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPFv3 area.
ExStart State	The total number of neighbors in this state (an indication that Hello packets will now be sent to the neighbor at intervals of HelloInterval seconds) in this OSPFv3 interface.
Exchange State	The total number of neighbors in this state (in an adjacency's final state) having transmitted a full sequence of Database Description packets, for this OSPFv3 interface.
Loading State	The total number of link state updates received for all out-of-date portions of the database for this OSPFv3 interface.

Table 147. *Routing OSPFv3 Area Neighbor Statistics (continued)*

Field	Description
Full State	The total number of neighbors in this state for this OSPFv3 interface.
All Events	The total number of Area Neighbor events for this OSPFv3 interface.

Monitoring OSPFv3 Routing—OSPFv3 Area Interface Statistics

Device Console > **Monitor** > **Layer 3** > **OSPFv3** > **Statistics** > *Area Interface*

Table 148. *Routing OSPFv3 Area Interfaces field descriptions*

Field	Description
Index	The index of the OSPFv3 Area for which these statistics apply.
Down	The total number of times the interface was down.
Loop	The total number of times the interface was looping with the attached network.
Waiting	The total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) for this OSPFv3 interface.
Ptop	The total number of times the interface was in this state on the attached network for this OSPFv3 interface.
Dr	The total number of times the interface was in this state on the attached network for this OSPFv3 interface.
Backup	The total number of Backup Designated Routers on the attached network for this OSPFv3 interface.
DrOther	The total number of times the interface was in this state on the attached network for this OSPFv3 interface.
All Events	The total number of events involving neighbors associated with the interface for this OSPFv3 interface.

Monitoring OSPFv3 Routing—OSPFv3 Area Error Statistics

Device Console > **Monitor** > **Layer 3** > **OSPFv3** > **Statistics** > *Area Error*

Table 149. *Routing OSPFv3 Area Error field descriptions*

Field	Description
Index	Index of the OSPFv3 Area for which these statistics apply.
Passive In	Total number of packets received via passive input in this area.
Ospf Off	Total number of packets received with OSPFv3 off in this area.

Table 149. *Routing OSPFv3 Area Error field descriptions*

Field	Description
Interface Off	Total number of packets received with the interface off in this area.
Wrong NetMask	Total number of packets received with a wrong netmask in this area.
Router Id 0	Total number of packets received with a router ID of "0" in this area.
Same Router Id	Total number of packets received with the same router ID in this area.
Interface Off	Total number of packets received with a mismatched interface in this area.
Bad Area ID	Total number of packets received with a wrong area.
Bad Destination Address	Total number of packets received with a bad destination address in this area.
Bad Checksum	Total number of packets received with a bad checksum in this area.
Bad Neighbor	Total number of packets received with a bad neighbor in this area.
Bad Packet Type	Total number of packets received with a bad packet type in this area.
Hello Mismatch	Total number of packets received with a different hello interval in this area.
Options Mismatch	Total number of packets received with a different options in this area.
Dead Mismatch	Total number of packets received with a different dead interval in this area.
No Neighbor	Total number of packets received from an unknown neighbor in this area.
Wrong Area	Total number of packets received with a wrong area.

Monitoring OSPFv3 Routing—OSPFv3 Interface Transmission Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Interface

Table 150. *OSPFv3 Interface Statistics field descriptions*

Field	Description
Index	The index of the OSPFv3 Area for which these statistics apply.
Packets In	The total number of OSPFv3 packets received for this OSPFv3 interface.
Packets Out	The total number of OSPFv3 packets transmitted for this OSPFv3 interface
Packets Discarded	The total number of OSPFv3 packets discarded for this OSPFv3 interface
Hello In	The total number of Hello packets received for this OSPFv3 interface,
Hello Out	The total number of Hello packets transmitted for this OSPFv3 interface.
Hello Discarded	The total number of Hello packets discarded for this OSPFv3 interface.
Database Description In	The total number of Database Description packets received for this OSPFv3 interface.
Database Description Out	The total number of Database Description packets transmitted for this OSPFv3 interface.
Database Description Discarded	The total number of Database Description packets discarded for this OSPFv3 interface.
Req In	The total number of Link State Request packets received for this OSPFv3 interface.
Req Out	The total number of Link State Request packets transmitted for this OSPFv3 interface.
Req Discarded	The total number of Link State Request packets discarded for this OSPFv3 interface.
Ack In	The total number of Link State Acknowledgement packets received for this OSPFv3 interface.
Ack Out	The total number of Link State Acknowledgement packets transmitted for this OSPFv3 interface.
Ack Discarded	The total number of Link State Acknowledgement packets discarded for this OSPFv3 interface.

Table 150. *OSPFv3 Interface Statistics field descriptions (continued)*

Field	Description
Update In	The total number of Link State Update packets received for this OSPFv3 interface.
Update Out	The total number of Link State Update packets transmitted for this OSPFv3 interface.
Update Discarded	The total number of Link State Update packets discarded for this OSPFv3 interface.

Monitoring OSPFv3 Routing—OSPFv3 Interface Neighbor Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Interface Neighbor

Table 151. *OSPFv3 Interface Neighbor Statistics field descriptions*

Field	Description
Index	The index of the OSPFv3 Area for which these statistics apply.
Down	The total number of Neighboring routers down (in the initial state of a neighbor conversation.) for this interface.
Attempt	The total number of attempts to communicate with neighbors in this OSPFv3 interface.
Init	The total number of neighbors in this state in this OSPFv3 interface.
Hello 2 Way	The total number of Hello packets received from neighbors, in which this router is mentioned in the OSPFv3 area.
Hello In	The total number of Hello packets received from neighbors in this OSPFv3 interface.
ExStart	The total number of neighbors in this state (an indication that Hello packets will now be sent to the neighbor at intervals of HelloInterval seconds.) in this OSPFv3 interface.
Exchange	The total number of neighbors in this state wherein the Master/slave relationship has been negotiated, and sequence numbers have been exchanged, for this OSPFv3 interface.
Full	The total number of neighbors in this state in this OSPFv3 interface.
All Events	The total number of events between neighbors in this OSPFv3 interface.

Monitoring OSPFv3 Routing—OSPFv3 Interface Change Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Interface Change

Table 152. *OSPFv3 Interface Change Statistics field descriptions*

Field	Description
Index	The index number.
Down	The sum total number of interfaces down in all OSPFv3 areas.
Loop	The sum total of interfaces looping in the attached network across all OSPFv3 areas and interfaces.
Waiting	The sum total number of times the Wait Timer has been fired, (indicating the end of the waiting period that is required before electing a (Backup) Designated Router) across all OSPFv3 areas and interfaces.
Ptop	The sum total number of changes made to this state across all OSPFv3 areas and interfaces.
Dr	The sum total number of changes made to this state across all OSPFv3 areas and interfaces.
Backup	The sum total number of Backup Designated Routers on the attached network for all OSPFv3 areas and interfaces.
DrOther	The sum total number of changes made to this state across all OSPFv3 areas and interfaces.
All Events	The sum total number of changes in the set of bidirectional neighbors associated with any interface across all OSPFv3 areas.

Monitoring OSPFv3 Routing—OSPFv3 Area Interface Error Statistics

Device Console > Monitor > Layer 3 > OSPFv3 > Statistics > Interface Error

Table 153. *OSPFv3 Interface Error Statistics field descriptions*

Field	Description
Index	Index of the OSPFv3 Area for which these statistics apply.
Passive In	Total number of packets received via passive input in this interface.
Ospf Off	Total number of packets received with OSPFv3 off in this interface.
Interface Off	Total number of packets received with the interface off in this interface.
Ospf Mismatch	Total number of packets received with an OSPF mismatch in this interface.
Router Id 0	Total number of packets received with a router ID of "0" in this interface.

Table 153. *OSPFv3 Interface Error Statistics field descriptions (continued)*

Field	Description
Same Router Id	Total number of packets received with the same router ID in this interface.
Interface Mismatch	Total number of packets received with a mismatched interface in this interface.
Bad Area ID	Total number of packets received with a wrong area.
Bad Destination Address	Total number of packets received with a bad destination address in this interface.
Bad Checksum	Total number of packets received with a bad checksum in this interface.
Bad Neighbor	Total number of packets received with a bad neighbor in this interface.
Bad Packet Type	Total number of packets received with a bad packet type in this interface.
Hello Mismatch	Total number of packets received with a different hello interval in this interface.
Options Mismatch	Total number of packets received with different options in this interface.
Dead Mismatch	Total number of packets received with a different dead interval in this interface.
MTU Mismatch	Total number of packets received with a different MTU in this interface.
No Neighbor	Total number of packets received from an unknown neighbor in this interface.

Monitoring OSPFv3 Routing—OSPFv3 General Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > General

Table 154. *Routing OSPFv3 General Information field descriptions*

Field	Description
Version	The OSPFv3 area number for which the OSPFv3 information table is related.
Router ID	The IP address of the router.
Start Time	The time when OSPFv3 was started.
Up Time	The time since OSPFv3 was started.
Area Border Router	Count of ABR local to this area.

Table 154. *Routing OSPFv3 General Information field descriptions (continued)*

Field	Description
AS Boundary Router	Count of ASBR local to this area.
External LSA	The number of external LSAs for this area.
Interface Count for Router	The total number of interfaces for this router.
Number of new LSA Received	The total number of new LSAs received by this router.
Number of LSA Originated	The total number of LSAs sent by this router.
Vlink Count for Router	The total number of Vlinks for this router.
Number of Entries in Link State Database	The number of Link State Database entries for this OSPFv3 area.
Total Number of OSPF Neighbors	The total number of OSPF neighbors.
Number of neighbours in the exchange or loading state	The total number of neighbors in the EXCH or LOAD state.
Total Number of Areas	The total number of OSPFv3 areas.
Total number of areas containing active interfaces.	The total number of OSPFv3 areas containing active interfaces.
Router is in overflow state or not	Whether or not the router is in overflow state.
SPF Delay	Number of times the SPF algorithm has been executed.
SPF Hold Time	The SPF hold time.
Different Types of ABRs supported	Total number of types of ABRs supported by this interface.
NSSA Def	The NSSA definition.

Monitoring OSPFv3 Routing—OSPFv3 Area Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > Area

Table 155. Routing OSPFv3 Area Information field descriptions

Field	Description
Index	The OSPFv3 area number for which the OSPFv3 info table is related.
Id	The IP address of the OSPFv3 area.
Status	The status of the OSPFv3 area.
Number of Interfaces	The total number of interfaces for this OSPFv3 area.
Interfaces Up	The number of interfaces that are UP in this area.
SPF	Number of times the SPF algorithm has been executed.
LSDB Entries	The number of Link State Database entries for this OSPFv3 area.
Area Border Router	Count of ABR local to this area.
AS Boundary Router	Count of ASBR local to this area.
Neighbor FULL State	Total number of neighbors in the FULL state.
Vurtal Neighbor FULL State	Total number of virtual neighbors in the FULL state.

Monitoring OSPFv3 Routing—OSPFv3 Interface Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > Interface

Table 156. Routing OSPFv3 Interface Information field descriptions

Field	Description
Index	The OSPFv3 interface number for which the OSPFv3 info table is related.
Instance ID	The OSPFv3 instance ID number.
Local Address	The IP address of the local OSPFv3 interface.
Area ID	The index of the area in which the interface belongs.
Admin Status	Admin Status of the interface: down(0), up(1).
Passive	Passive status of the interface: disabled(0), enabled(1).
Network Type	The network type.

Table 156. *Routing OSPFv3 Interface Information field descriptions (continued)*

Field	Description
State	The state of the interface: Down(0), Loopback(1), Waiting(2), P to P(3), DR(4), BackuDR(5), DR Other(6).
Priority	Interface router priority
Designated Router ID	The OSPFv3 Designated Router ID for this OSPFv3 interface.
Backup Designated Router ID	The OSPFv3 Backup Designated Router IP for this OSPFv3 interface.
Hello	The hello timer for this OSPFv3 interface.
Dead	The dead timer for this OSPFv3 interface.
Poll	The OSPFv3 poll interval for this OSPFv3 interface.
Retransmit	The retransmit interval for this OSPFv3 interface.
Transit Delay	The transit delay for this OSPFv3 interface.
Total Neighbors	The total number of neighbors for this OSPFv3 interface.
Events	The total number of events for this OSPFv3 interface.
Metric Cost	The metric cost for this OSPFv3 interface.
Authentication Spi ID	Authentication Security Parameter Index (SPI) ID.
Authentication Status	Authentication status of the interface: disabled(0), enabled(1).
Authentication Type	Type of authentication being used: none(1) - no authentication, password(2) - use password, md5(3) - use MD5 authentication.
Authentication Key	Authentication key of the interface.
Encryption Spi ID	Encryption Security Parameter Index (SPI) ID.
Encryption Status	Encryption status of the interface: disabled(0), enabled(1).
Encryption Type	Type of encryption being used.
Encryption Key	Encryption key of the interface.
Lsa Supression Status	LSA suppression status.

Monitoring OSPFv3 Routing—OSPFv3 Routes Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > Routes

Table 157. Routing OSPFv3 Routes Information field descriptions

Field	Description
Index	The OSPFv3 route table index.
Destination IPv6 Address	The IPv6 address of the destination associated with this OSPFv3 route.
Prefix Length	The length of the IPv6 prefix associated with this OSPFv3 route.
Next Hop IPv6 Address	The IPv6 address of the next hop for this OSPFv3 route.
Type of the Route	The route type code: <ul style="list-style-type: none"> ● IA - OSPFv3 inter area ● N1 - OSPFv3 NSSA external type 1 ● N2 - OSPFv3 NSSA external type 2 ● E1 - OSPFv3 external type 1 ● E2 - OSPFv3 external type 2 ● * - best
Area ID	The ID of the OSPFv3 area.
Cost	The cost of the route.
Type2Cost	The type 2 cost of the route.
Interface Index	The index of the interface.

Monitoring OSPFv3 Routing—OSPFv3 Neighbor Interface Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > Neighbor

Table 158. Routing OSPFv3 Neighbor Information field descriptions

Field	Description
Index	The OSPFv3 area number for which the OSPFv3 info table is related.
Interface Number	The OSPFv3 interface number.
Instance ID	The OSPFv3 instance ID.
Router ID	ID of the designated router for the OSPFv3 neighbor.
IPv6 Address	The IPv6 address of the destination area.
Priority	The priority of the OSPFv3 neighbor.

Table 158. *Routing OSPFv3 Neighbor Information field descriptions (continued)*

Field	Description
Neighbor State	The state of the OSPFv3 neighbor: down, attempt, init, twoway, exStart, exchange, loading, full
Neighbor Events	Events involving this OSPFv3 neighbor.

Monitoring OSPFv3 Routing—OSPFv3 Virtual Interface Information

Device Console > Monitor > Layer 3 > OSPFv3 > Information > OSPFv3 Virtual Interface Information

Table 159. *Routing OSPFv3 Virtual Interface Information field descriptions*

Field	Description
Index	The OSPFv3 Virtual Interface number for which this table is related.
Area ID	The Area ID of the virtual interface.
Router ID of Virtual Neighbor	The Router ID of the virtual neighbor
Transit Delay	The transit delay for the virtual interface.
Retransmit Interval	Retransmit interval.
Hello Interval	Hello interval.
Router Dead Interval	Dead interval.
State	State: disabled(0), enabled(1)
Events	Events.
Status	The status of the virtual interface.
Link State Advertisements	The link state: down(0), attempt(1), init(2), 2 way(3), exstart(4), exchange(5), loading(6), full(7).
LS Checksums	Link state checksums.

How to Monitor Multicast Listener Discovery

Select Monitor's **Routing > MLD** category to monitor MLD Statistics and Information. This section covers the following MLD statistics and information topics:

- [“Monitoring MLD—General Statistics” on page 252](#)
- [“Monitoring MLD—Query Statistics” on page 252](#)
- [“Monitoring MLD—Report Statistics” on page 253](#)
- [“Monitoring MLD—CR Statistics” on page 254](#)
- [“Monitoring MLD—Groups Information” on page 255](#)
- [“Monitoring MLD—MRouters Information” on page 256](#)
- [“Monitoring MLD—Interface Information” on page 256](#)

Monitoring MLD—General Statistics

Device Console > Monitor > Layer 3 > MLD > Statistics > General

Table 160. *MLD General Statistics field descriptions*

Field	Description
Bad Length	Number of messages received with length errors.
Bad Checksum	Number of messages received with an invalid IP checksum.
Bad ReceiveIf	Number of messages received on an interface not enabled for MLD.
NonLocal Received	Number of messages received from non-local senders.
Invalid Packets	Number of rejected packets.
Total L3 IPv6Sgv Entries	Total number of Layer 3 IPv6 SGV entries.
Total MLD Groups	Total number of MLD entries.

Monitoring MLD—Query Statistics

Device Console > Monitor > Layer 3 > MLD > Statistics > MLD Query Statistics

Table 161. *MLD Query Statistics field descriptions*

Field	Description
Index	Index of the interface.
General Query In	Number of incoming general query packets.
General Query Out	Number of outgoing general query packets.

Table 161. *MLD Query Statistics field descriptions (continued)*

Field	Description
General Query Error	Number of invalid general query packets.
MAS Query In	Number of incoming multicast address-specific query packets.
MAS Query Out	Number of outgoing multicast address-specific query packets.
MASSQ Query In	Number of incoming multicast address and source-specific query packets.
MASSQ Query Out	Number of outgoing multicast address and source-specific query packets.
MASSQ Query Error	Number of invalid multicast address and source-specific query packets.

Monitoring MLD—Report Statistics

Device Console > Monitor > Layer 3 > MLD > Statistics > MLD Report Statistics

Table 162. *MLD Report Statistics field descriptions*

Field	Description
Index	Index of the interface.
MLDv1 Report In	Number of packets received by a multicast listener in response to MLDv1 query
MLDv1 Report Out	Number of packets sent by a multicast listener in response to MLDv1 query
MLDv1 Report Error	Number of invalid packets sent or received by a multicast listener in response to MLDv1 query
MLDv1 Done In	Number of packets received by a host when it wants to stop receiving multicast traffic
MLDv1 Done Out	Number of packets sent by a host when it wants to stop receiving multicast traffic
MLDv1 Done Error	Number of invalid packets sent and received by a host when it wants to stop receiving multicast traffic
MLDv2 Report In	Number of packets received by a multicast listener in response to MLDv2 query
MLDv2 Report Out	Number of packets sent by a multicast listener in response to MLDv2 query
MLDv2 Report Error	Number of invalid packets sent or received by a multicast listener in response to MLDv2 query

Monitoring MLD—CR Statistics

Device Console > Monitor > Layer 3 > MLD > Statistics > MLD CR Statistics

Table 163. MLD CR Statistics field descriptions

Field	Description
Index	Index of the interface.
INC CRs In	Number of incoming current state records with include filter mode.
INC CRs Out	Number of outgoing current state records with include filter mode.
INC CRs Error	Number of invalid current state records with include filter mode.
EXC CRs In	Number of incoming current state records with exclude filter mode.
EXC CRs Out	Number of outgoing current state records with exclude filter mode.
EXC CRs Error	Number of invalid current state records with exclude filter mode.
TO_INC FCMRs In	Number of incoming filter mode change records for which the filter mode has changed to include mode
TO_INC FCMRs Out	Number of outgoing filter mode change records for which the filter mode has changed to include mode
TO_INC FCMRs Error	Number of invalid filter mode change records for which the filter mode has changed to include mode
TO_EXC FCMRs In	Number of incoming filter mode change records for which the filter mode has changed to exclude mode
TO_EXC FCMRs Out	Number of outgoing filter mode change records for which the filter mode has changed to exclude mode
TO_EXC FCMRs Error	Number of invalid filter mode change records for which the filter mode has changed to exclude mode
ALLOW SLCRs In	Number of incoming source list change records for which the specified sources from where the data is to be received has changed.
ALLOW SLCRs Out	Number of outgoing source list change records for which the specified sources from where the data is to be received has changed.
ALLOW SLCRs Error	Number of invalid source list change records for which the specified sources from where the data is to be received has changed.

Table 163. *MLD CR Statistics field descriptions (continued)*

Field	Description
BLOCK SLCRs In	Number of incoming source list change records for which the specified sources from where the data is to be received is to be blocked.
BLOCK SLCRs Out	Number of outgoing source list change records for which the specified sources from where the data is to be received is to be blocked.
BLOCK SLCRs Error	Number of invalid source list change records for which the specified sources from where the data is to be received is to be blocked.

Monitoring MLD—Groups Information

Device Console > Monitor > Layer 3 > MLD > Information > MLD Groups Information

Table 164. *MLD Groups Information field descriptions*

Field	Description
Index	Displays a numeric identifier for the MLD Group.
Multicast IPv6 Address	The multicast IPv6 address.
Group Port Number	Displays the group port number.
VLAN ID	Displays the VLAN ID.
Last Reporter	Displays the last reporter.
Source	Displays the source.
Filter Type	Displays the MLD group filter type.
Expiry Time	Displays the MLD group expiration time.
Version	Displays the MLD group version.
Forwarding Status	Displays the MLD forwarding state for this source/group IP address.

Monitoring MLD—MRouters Information

Device Console > Monitor > Layer 3 > MLD > Information > MLD MRouters Information

Table 165. *MLD MRouters Information field descriptions*

Field	Description
MRouter ID	Displays the numeric identifier for the MLD Group.
Interface	Displays the interface for the MLD Group.
Source IP	Displays the link-local address of the reporter.
Port Number	Displays the port number on which the general query is received.
VLAN	Displays the VLAN ID on which the general query is received.
QRV	Displays the Querier's robustness variable value.
QQIC	Displays the Querier's query interval code
Maximum Response Delay	Displays the configured maximum query response time.
Version	Displays the MLD version configured on the interface.
Expiry Time	Displays the interval after which the multicast router decides that there are no more listeners for a multicast address or a particular source on a link.

Monitoring MLD—Interface Information

Device Console > Monitor > Layer 3 > MLD > Information > MLD MRouters Information

Table 166. *MLD MRouters Information field descriptions*

Field	Description
Index	Displays a numeric identifier for the MLD interface.
State	Displays the state of the MLD interface.
Version	Displays the MLD version configured on the interface.
VLAN	Displays the VLAN ID on which the general query is received.
Querier Status	Displays the Querier's status.
Querier Address	Displays the Querier's IP Address.
Maximum Response Delay	Displays the configured maximum query response time.

Table 166. *MLD MRouters Information field descriptions (continued)*

Field	Description
Querier Expiry Time	Displays the querier expiration time.
Querier Port Number	Displays the port number on which the query is received.
Groups	Displays the MLD groups.

How to Monitor IGMP Routing

Select Monitor's **Routing > IGMP** category to monitor IGMP Routing Statistics and Information. This section covers the following IGMP Routing statistics and information topics:

- [“Monitoring IGMP Routing—IGMP Information” on page 258](#)
- [“Monitoring IGMP Routing—Multicast Router Information” on page 258](#)
- [“Monitoring IGMP Routing—IGMP Snooping Statistics” on page 259](#)

Monitoring IGMP Routing—IGMP Information

Device Console > Monitor > Layer 3 > IGMP > IGMP Information

Note: This tab or some of its fields might not appear on your switch. Please ignore any fields that do not apply to your switch.

Table 167. *Routing IGMP Information field descriptions*

Field	Description
Index	Displays a numeric identifier for the IGMP instance.
Group	Displays the IGMP group address received.
VLAN	Displays the VLAN on which the IGMP group is registered.
Trunk	Displays the trunk on which the IGMP group is registered.
Port	Displays the port on which the IGMP group is registered.
Version	Displays the IGMP group version.
Expires	Displays the IGMP expiration time.
Mode	Displays the IGMPv3 filter mode for this host (either INCLUDE, EXCLUDE, or N/A)
Source IP	Displays the Source IP address of the IGMP group.
Forward	Displays the IGMPv3 forwarding state for this source/group IP address.
Group Expires	Displays the IGMPv3 group expiration time.

Monitoring IGMP Routing—Multicast Router Information

Device Console > Monitor > Layer 3 > IGMP > Multicast Router Information

Table 168. *Routing IGMP MRouter Information field descriptions*

Field	Description
Index	Displays a numeric identifier for the IGMP instance.
VLAN	Displays the VLAN on which the Mrouter is connected.
Port	Displays the port on which the Mrouter is connected.

Table 168. *Routing IGMP MRouter Information field descriptions (continued)*

Field	Description
Version	Displays the IGMP version.
Expires	Displays the Mrouter expiration time.
Max Query Response Time	Displays the maximum query response time interval.
Querier Robustness	The Querier Robustness value of this IGMP Mrouter.
Querier Query Interval Code	The Querier query interval code of this IGMP Mrouter.
Source IP	The source IP address of this IGMP Mrouter.

Monitoring IGMP Routing—IGMP Snooping Statistics

Device Console > Monitor > Layer 3 > IGMP > IGMP Snooping Statistics

Table 169. *Routing IGMP Snooping Statistics field descriptions*

Field	Description
VLAN	The index of the VLAN for which these statistics apply.
Received Valid Packets	Total number of valid IGMP packets received on this VLAN.
Received Invalid Packets	Total number of invalid IGMP packets received on this VLAN.
Received General Queries	Total number of IGMP General Query packets received on this VLAN.
Received Specific Queries	Total number of IGMP Group Specific Query packets received on this VLAN.
Received Leave Packets	Total number of IGMP Leave packets received on this VLAN.
Received Report Packets	Total number of IGMP Report packets received on this VLAN.
Sent Specific Queries	Total number of IGMP Group Specific Query packets transmitted on this VLAN.
Sent Report Packets	Total number of IGMP Report packets transmitted on this VLAN.
Sent Leave Packets	Total number of IGMP Leave packets transmitted on this VLAN.
Received PIM Hello Packets	Total number of PIM Hello packets received on this VLAN

Table 169. *Routing IGMP Snooping Statistics field descriptions (continued)*

Field	Description
Received Group Source Specific Queries	Total number of Group Source Specific queries (GSSQ) received on this VLAN
Received Current State Records	Total number of IGMP Current State records (CSRs) received on this VLAN
Received Source List Changed Records	Total number of IGMP Source List Change records (SLCRs) received on this VLAN
Received Filter Changed Records	Total number of IGMP Filter Mode Change records (FMCRs) received on this VLAN
Sent General Query Packets	Total number of IGMP General Query packets sent on this VLAN
Received Discarded Packets	Total number of IGMP packets discarded on this VLAN

How to Monitor Virtual Routing

Select Monitor's **Virtual Routing** category to monitor Virtual Routing Statistics and Information. This section covers the following Virtual Routing statistics and information topics:

- [“Monitoring Virtual Routing Statistics” on page 261](#)
- [“Monitoring Virtual Routing State” on page 262](#)

Monitoring Virtual Routing Statistics

Device Console > Monitor > Layer 3 > Virtual Routing > Virtual Routing Statistics

Table 170. *Virtual Routing field descriptions*

Field	Description
VRRP Advertisements In	The total number of VRRP advertisements that were received.
VRRP Advertisements Out	The total number of VRRP advertisements that were transmitted.
Bad VRRP Advertisements	The total number of bad VRRP advertisements that were received. Bad VRRP advertisements are the advertisements that are ignored.
VRRP Bad Version	The total number of VRRP advertisements that had a bad version number.
VRRP Bad Address	The total number of VRRP advertisements that had a bad address.
VRRP Bad Password	The total number of VRRP advertisements that had a bad password.
VRRP Bad VRID	The total number of VRRP advertisements that had a bad virtual router ID.
VRRP Bad Data	The total number of VRRP advertisements that had bad data.
VRRP Bad Interval	The total number of VRRP advertisements that had a bad interval.

Monitoring Virtual Routing State

Device Console > Monitor > Layer 3 > Virtual Routing > Virtual Routing State

Table 171. Virtual Routing State field descriptions

Field	Description
Virtual Router Index	The index number of the VRRP virtual router.
State	The state of the VRRP virtual router, as follows: <ul style="list-style-type: none">● init identifies the initialization state which essentially announces each VRRP participating routers parameters such as capability, priority.● master identifies the elected master virtual router.● backup identifies that the virtual router is in backup mode.● holdoff identifies the state when a router changes the state from backup to master.
VRRP Ownership	The ownership status of the VRRP virtual router, as follows: <ul style="list-style-type: none">● owner identifies the preferred master virtual router. A virtual router is the owner when the IP address of the virtual router and its IP interface are the same.● renter identifies virtual routers which are not owned by this device.

Monitoring Number Statistics

Device Console > Monitor > Layer 3 > NBR > NBR Statistics

Table 172. NBR Statistics field descriptions

Field	Description
Current Number of Entries	The current number of entries.
Highest Number of Entries	The highest number of entries.
Max Number of Entries	The maximum number of entries.

Monitoring Number Information

Device Console > Monitor > Layer 3 > NBR > NBR Information

Table 173. NBR Information field descriptions

Field	Description
Index	VM index number.
Destination IP	The destination IP address.
State	The state of the host.
MAC Address	The MAC address.
VLAN ID	The VLAN ID.
Port	The port number.
Age	The age of the link.
Interface	The number of the interface. The interface number is either one of the 256 IP interfaces or one of the physical ports.

How to Monitor Access Control Lists

Select Monitor's **Access Control List** category to monitor Access Control Lists (ACL) statistics. This section covers the following ACL statistics topics:

- [“Monitoring ACL Statistics” on page 264](#)
- [“Monitoring ACL Port Statistics” on page 264](#)
- [“Monitoring MAC ACL Statistics” on page 264](#)
- [“Monitoring IP ACL Statistics” on page 265](#)

Monitoring ACL Statistics

Device Console > Monitor > Access Control List > ACL Statistics

Table 174. *ACL Statistics field descriptions*

Field	Description
ACL	ACL Index Number.
Total Hits	Total number of hits (matches) for the ACL.

Monitoring ACL Port Statistics

Device Console > Monitor > Access Control List > MAC ACL Statistics

Table 175. *ACL Statistics field descriptions*

Field	Description
ACL	ACL index number.
Port	Port index number.
Total Hits	Total number of hits (matches) for the ACL.

Monitoring MAC ACL Statistics

Device Console > Monitor > Access Control List > MAC ACL Statistics

Table 176. *ACL Statistics field descriptions*

Field	Description
MAC ACL No	MAC ACL index number.
MAC Match Count	Total number of matches for the ACL.
MAC ACL Stats	Total number of hits for the ACL.

Monitoring IP ACL Statistics

Device Console > Monitor > Access Control List > IP ACL Statistics

Table 177. *ACL Statistics field descriptions*

Field	Description
IP ACL No	IP ACL index number.
IP Match Count	Total number of matches for the ACL.
IP ACL Stats	Total number of hits for the ACL.

Monitoring ACL6 Statistics

Device Console > Monitor > Access Control List > ACL6 Statistics

Table 178. *ACL6 Statistics field descriptions*

Field	Description
ACL	ACL6 index number.
Port	Port index number.
Total Hits	Total number of hits (matches) for the ACL.

How to Monitor Fiber Channel over Ethernet (FCoE)

Select Monitor's FCoE category to view information about FCoE Initialization Protocol (FIP) Snooping information and statistics. This section covers the following topics:

- [“Viewing FCoE FC Port Information” on page 266](#)
- [“Viewing FCoE FC Database Information” on page 267](#)
- [“Viewing Fabric DataBase Information” on page 267](#)
- [“Viewing FCoE Link State Database Information” on page 267](#)
- [“Viewing FCoE Steering Database Information” on page 268](#)
- [“Viewing FCoE Domain Information” on page 269](#)
- [“Viewing Fabric Login Database Information” on page 269](#)
- [“Viewing FIP Snooping Port Information” on page 277](#)
- [“Viewing FIP Snooping Statistics” on page 278](#)
- [“Viewing FIP Snooping Information” on page 278](#)
- [“Viewing FIP Snooping FCF Detected Information” on page 278](#)
- [“Viewing FIP Snooping FCoE Connections Detected Information” on page 279](#)

Viewing FCoE FC Port Information

Device Console > Monitor > FC/FCoE > FC > FC Port

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 179. *FC Port Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Omni-Port	Omni-Port number.
Omni-Port Alias	Omni-Port alias.
Admin Port Status	Whether the Admin port is online or offline.sf
Operational Port Status	Whether the Operational port is online or offline.
Login Port Status	Whether the Login port is logged in.
Config Port Type	Either F for Fibre or Eth for Ethernet.
Link Status	Whether the link is active or inactive.
Link Speed	The speed of the link.s

Viewing FCoE FC Database Information

Device Console > Monitor > FC/FCoE > FC > FCoE DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 180. *FCoE DataBase Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Record Number	The record number.
VLAN ID	The VLAN ID number.
FCID	The Fibre Channel ID number.
WWN	The World Wide Number.
MAC Address	The MAC address of the device.
Port	The port number.s

Viewing Fabric DataBase Information

Device Console > Monitor > FC/FCoE > FC > Fabric DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 181. *Fabric DataBase Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Fabric Record Number	The fabric record number.
VLAN ID	The VLAN ID number.
FCID	The Fibre Channel ID number.
Management ID	The management ID number.
Switch WWN	The World Wide Number of the switch.

Viewing FCoE Link State Database Information

Device Console > Monitor > FC/FCoE > FC > Link State DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 182. *FCoE Link State Database Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Record Number	The record number.
Link Record Number	The link record number.
Switch WWN	The World Wide Number of the switch.
Domain ID	The Domain ID number.
Port Out	The port output.
Hops	The number of hops.
cost	The cost.
Age	The age of the link.
Number of Links	The number of links connected.
Neighbor ID	The neighbor ID number.
Local Port	The local port number.
Remote Port	The remote port number.
Link Cost	The link cost.

Viewing FCoE Steering Database Information

Device Console > Monitor > FC/FCoE > FC > Steering DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 183. *FCoE Steering Database Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Record Number	The record number.
Internal Record Number	The internal record number.
Switch WWN	The World Wide Number of the switch.
Remote Domain	The Remote Domain ID number.
Default Output Port	The default output port number

Table 183. *FCoE Steering Database Information field descriptions (continued)*

Field	Description
In Port	The input port.
Output Port	The output port.

Viewing FCoE Domain Information

Device Console > Monitor > FC/FCoE > FC > FC Domain

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 184. *FCoE Domain Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Domain ID	The domain ID number.
Type	The domain type.
FDMI Enabled	Whether FDMI is enabled; true or false.
RA Timeout	The RA timeout.
RT Timeout	The RT timeout.
ED Timeout	The ED timeout.
FS Timeout	The FS timeout.
DS Timeout	The DS timeout.
Auto Balance TOV	The auto balance timeout value.

Viewing Fabric Login Database Information

Device Console > Monitor > FC/FCoE > FC > FLOGI DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 185. *FCoE Fabric Login Database Information field descriptions*

Field	Description
Stack Member	The stack which this port is a member of.
Fabric Record Number	The record number.
Port	The port number.
FCID	The Fibre Channel ID number.

Table 185. *FCoE Fabric Login Database Information field descriptions (continued)*

Field	Description
PWWN	The World Wide Number of the port.
Node WWN	The World Wide Number of the node.

Viewing FCS Database Information

Device Console > Monitor > FC/FCoE > FC > FCS DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Viewing Topology Database Information

Device Console > Monitor > FC/FCoE > FC > Topology DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Viewing FC Switch WWN Information

Device Console > Monitor > FC/FCoE > FC > Information > Switch WWN

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 186. *FC Switch WWN Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Switch WWN	The switch WWN.
FCF Switch WWN	The FCF switch WWN.

Viewing FC Name Server Database Information

Device Console > Monitor > FC/FCoE > FC > Information > Name Server DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 187. *FC Name Server DB Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Index	The Database Record Index.
FCID	The FCNS database FCID.

Table 187. *FC Name Server DB Information field descriptions (continued)*

Field	Description
Port WWN	The FCNS database port WWN.
Node WWN	The FCNS database node WWN.
FC4-Type:Feature	The FCNS database fc4 type and fc4 feature.
Port Type	The FCNS database port type.
Class of Service	The FCNS database class of service.
Symbolic Port Name	The FCNS database symbolic port name.
Symbolic Node Name	The FCNS database symbolic node name.
Fabric Port Name	The FCNS database fabric port name.
Hard Address	The FCNS database hard address.
Permanent Port Name	The FCNS database permanent port name.

Viewing FC Fabric Login Database Database Information

Device Console > Monitor > FC/FCoE > FC > Information > FLOGI DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 188. *FC FLOGI DB Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Index	The Database Record Index.
Port Number	The port number.
Port WWN	The FLOGI database port World Wide Number.
FCID	The FLOGI database FCID.
ELS Code	The FLOGI database ELS code.

Viewing FC Domain Database Information

Device Console > Monitor > FC/FCoE > FC > Information > FDMI DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 189. *FC FDMI DB Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Index	The Database Record Index.
HBA ID	The FDMI database HBA ID.
Node WWN	The FDMI database NWWN.
Manufacturer Name	The FDMI database Manufacturer Name.
Serial Number	The FDMI database serial number.
Model	The FDMI database model name.
Model Description	The FDMI database model description.
Hardware Version	The FDMI database hardware version.
Driver Version	The FDMI database driver version
OS Name Version	The FDMI database OS name version.
CT Payload Length	The FDMI database CT payload length.
Port Number	The port number.

Viewing FCS Interconnect Information

Device Console > Monitor > FC/FCoE > FC > Information > FCS InterConnect

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 190. *FCS InterConnect Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Index	The Database Record Index.
Interconnect Element WWN	The interconnect element WWN.

Viewing FC Registered State Change Notification Information

Device Console > Monitor > FC/FCoE > FC > Information > RSCN

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 191. *FC RSCN Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Index	The RSCN State Change Registration (SCR) Record Index.
FCID	The RSCN State Change Registration (SCR) FCID.
Bitmap	The RSCN State Change Registration (SCR) bitmap.

Viewing FCF Port Information

Device Console > Monitor > FC/FCoE > FC > Information > FCF Ports

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 192. *FCF Ports Information field descriptions*

Field	Description
Switch Number	The switch number.
Index	The FCF Index.
VLAN ID	The VLAN ID.
Port Type	FCF port type.
Port Number	FCF port number.
FCID	The FCF port FCID.
FPMA	The FCF port FPMA.
Local Port WWN	The local FCF port WWN.
Peer MAC Address	The FCF port peer MAC address
Peer Switch WWN	The FCF port peer switch WWN.
Peer Port WWN	The FCF port peer port WWN.
Port Status	The FCF port status.

Viewing FC Zoning Status Information

Device Console > Monitor > FC/FCoE > FC > Information > Zoning Status

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 193. *FC Zoning Status Information field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Zone Set Count	The zone set count.
Zone Count.	The zone count.
Member Count	The zone member count.
Alias Count	The zone alias count.
Max ZoneSets	The maximum number of zone sets.
Max Zones	The maximum number of zones.
Max Members	The maximum number of zone members.
Max Alias	The maximum number of zone aliases.
Max Alias Members	The maximum number of zone alias members.

Viewing FC Name Server Database Statistics

Device Console > Monitor > FC/FCoE > FC > Statistics > Name Server DB

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 194. *FC Name Server DB Statistics field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Registrations Received	The number of registrations that have been received.
Registrations Accepted	The number of registrations that have been accepted.
Registrations Rejected	The number of registrations that have been rejected.
Queries Received	The number of queries that have been received.
Queries Accepted	The number of queries that have been accepted.
Queries Rejected	The number of queries that have been rejected.

Viewing FC Fabric Device Management Interface Statistics

Device Console > Monitor > FC/FCoE > FC > Statistics > FDMI

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 195. *FC FDMI Statistics field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Registrations Received	The number of registrations that have been received.
Registrations Accepted	The number of registrations that have been accepted.
Registrations Rejected	The number of registrations that have been rejected.
Deregistrations Received	The number of deregistrations that have been received.
Deregistrations Accepted	The number of deregistrations that have been accepted.
Deregistrations Rejected	The number of deregistrations that have been rejected.

Viewing FC FCS Statistics

Device Console > Monitor > FC/FCoE > FC > Statistics > FCS

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 196. *FC FCS Statistics field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
Registrations Received	The number of registrations that have been received.
Registrations Accepted	The number of registrations that have been accepted.
Registrations Rejected	The number of registrations that have been rejected.
Queries Received	The number of queries that have been received.

Table 196. *FC FCS Statistics field descriptions (continued)*

Field	Description
Queries Accepted	The number of queries that have been accepted.
Queries Rejected	The number of queries that have been rejected.

Viewing FC Registered State Change Notification Statistics

Device Console > Monitor > FC/FCoE > FC > Statistics > RSCN

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 197. *FC RSCN Statistics field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
SCR Received	The number of state change requests that have been received.
SCR ACC Sent	The number of state change requests that have been accepted.
SCR RJT Sent	The number of state change requests that have been rejected.
RSCN Sent	The number of registered state change notifications that have been sent.
RSCN ACC Received	The number of registered state change notifications that have been accepted.
RSCN RJT Received	The number of registered state change notifications that have been rejected.

Viewing FC FCoE Forwarder Notification Statistics

Device Console > Monitor > FC/FCoE > FC > Statistics > FCF

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 198. *FC FCF Statistics field descriptions*

Field	Description
Switch Number	The switch number.
VLAN ID	The VLAN ID.
FLOGI Received	The number of fabric logins that have been received.
FLOGI ACC Sent	The number of fabric logins that have been accepted.
FLOGI RJT Sent	The number of fabric logins that have been rejected.
Log Out Received	The number of logouts that have been received.

Table 198. *FC FCF Statistics field descriptions (continued)*

Field	Description
Log Out ACC Sent	The number of logouts that have been accepted.
Log Out RJT Sent	The number of logouts that have been rejected.
NS PLogi Received	The number of FC port logins that have been received.
NS PLogi ACC Sent	The number of FC port logins that have been accepted.
NS PLogi RJT Sent	The number of FC port logins that have been rejected.
Ns Log Out Received	The number of FC port logouts that have been received.
Ns Log Out ACC Sent	The number of FC port logouts that have been accepted.
Ns Log Out RJT Sent	The number of FC port logouts that have been rejected.
PLOGI Mgmt Server Received	The number of FC management server port logins that have been received.
PLOGI Mgmt Server ACC Sent	The number of FC management server port logins that have been accepted.
PLOGI Mgmt Server RJT Sent	The number of FC management server port logins that have been rejected.
Management Server LOGOUT Received	The number of FC management server port logouts that have been received.
Management Server Logout ACC Sent	The number of FC management server port logouts that have been accepted.
Management Server Logout RJT Sent	The number of FC management server port logouts that have been rejected.
Total Frames Received	The total number of frames that have been received.
Total Frames Sent	The total number of frames that have been sent.
Frames Dropped	The number of frames that have been dropped.

Viewing FIP Snooping Port Information

Device Console > **Monitor** > **FC/FCoE** > **FSB** > *FIP Snooping Port Information*

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch. d

Table 199. *FIP Snooping Port Information field descriptions*

Field	Description
Port	Port index for FIP Snooping.
ACL Sequencer	FIP sequence number for an ACL in the corresponding port.
ACL	FIP Snooping ACL entry.

Viewing FIP Snooping Statistics

Device Console > Monitor > FC/FCoE > FSB > FIP Snooping Statistics

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 200. *FIP Snooping Statistics field descriptions*

Field	Description
Index	The index of FIP snooping statistics.
FCF Added	Number of FCF (Fiber Channel Forwarder) added to the FCoE database.
FCF Removed	Number of FCF (Fiber Channel Forwarder) removed from the FCoE database.
FCoE Connection Added	Number of FCoE connections added to the FCoE database.
FCoE Connection Removed	Number of FCoE connections removed from the FCoE database.

Viewing FIP Snooping Information

Device Console > Monitor > FC/FCoE > FSB > FIP Snooping Information

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 201. *FIP Snooping Information field descriptions*

Field	Description
Total number of FCFs detected	The total number of FCFs detected.
Total number of FCoE connections	The total number of FCoE connections.

Viewing FIP Snooping FCF Detected Information

Device Console > Monitor > FC/FCoE > FSB > FIP Snooping FCF Detected

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 202. *FIP Snooping FCF Detected field descriptions*

Field	Description
Index	FCF index
FCF MAC	FCF MAC address
Port	FCF port
VLAN	FCF VLAN

Viewing FIP Snooping FCoE Connections Detected Information

Device Console > Monitor > FC/FCoE > FSB > FIP Snooping FCoE Connections Detected

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 203. *FIP Snooping FCoE Connections Detected field descriptions*

Field	Description
Index	FCoE connection index.
VN Port MAC	FCoE connection VN Port MAC.
FCF MAC	FCoE connection FCF MAC.
Port	FCoE connection Port.
VLAN	FCoE connection VLAN.

Viewing FIP Snooping VLAN Information

Device Console > Monitor > FC/FCoE > FSB > FIP Snooping VLAN Information

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 204. *FIP Snooping VLAN field descriptions*

Field	Description
FCOE VLAN Index	The FCoE VLAN index.
Feature Index	The FCoE VLAN feature index. The feature index will accept values from 1 to the maximum SPAR ID (8) for the VLANs created by SPAR and 0 for other types of VLANs.
FCOE VLAN Creator	The FCoE VLAN Creator.
VLAN Ports	The port list information in the VLAN.

How to Monitor QoS Information

Select Monitor's **QoS** category to view information about QoS. This section covers the following topics:

- [“Monitoring QoS Counters” on page 280](#)

Monitoring QoS Counters

Device Console > Monitor > QoS > QoS Counters

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 205. *QoS Counters field descriptions*

Field	Description
Port Index	The index of the port
Queue Index	The index of the queue per port
Total Tx Packets	The total transmitted packets
Dropped Packets	The dropped packets
Total Tx Bytes	The total transmitted bytes
Dropped Bytes	The dropped bytes
Tx Packets Rate	The transmitted packets rate
Dropped Packets Rate	The dropped packets rate
Tx Bytes Rate	The transmitted bytes rate
Dropped Bytes Rate	The dropped bytes rate

How to Monitor Virtualization

Select Monitor's **Virtualization** category to view information about the association of various ports with Virtual Switch Groups, trunk groups and LACP keys, as well as VM information listing the details of all Virtual Machines discovered by the VMready switch. This section covers the following topics:

- [“Viewing VMready Port Information” on page 281](#)
- [“Viewing VMready VM Information” on page 282](#)

Viewing VMready Port Information

Device Console > Monitor > Virtualization > VMready Port Info

Note: This tab is available only for the VMready capable switches. Please disregard this information if it does not apply to your switch.

Uplink Port

This section lists all uplink (non-server) ports showing the status, Group number, Trunk number, and LACP key number.

Table 206. *Uplink Port field descriptions*

Field	Description
Status	Status of the uplink port. Green icon indicates Up status and Red icon indicates Down status.
Port	Alias of uplink port.
Group	Group number to which the uplink port is associated.
Trunk #	Trunk number to which the uplink port is associated.
LACP Key #	LACP key number to which the uplink port is associated.

Server Port

This section lists all server (or internal) ports showing the status, Group number, Trunk number, and LACP key number.

Table 207. *Server Port field descriptions*

Field	Description
Status	Status of the server ports. Green icon indicates Up status and Red icon indicates Down status.
Port	Alias of server port.
Group	Group number to which the server port is associated.
Trunk #	Trunk number to which the server port is associated.
LACP Key #	LACP key number to which the server port is associated.

Viewing VMready VM Information

Device Console > Monitor > Virtualization > VMready > VMready VM Info

This section lists all Virtual Machines (VMs) discovered by the switch. You can filter the Virtual Machines list based on the Virtual Switch Groups (Groups) to which they belong.

Note: This table will be blank if no VM have been discovered by the switch. This table will not be shown in the tab if Virtual Machine Groups have not been enabled on the switch.

Table 208. *VMs Discovery field descriptions*

Field	Description
Virtual MAC	MAC address of the Virtual Machine.
Group	Group number to which the Virtual Machine is associated.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the virtual machine discovered on the selected port. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
VLAN	VLAN to which the Virtual Machine is associated.
Port	Server port on which Virtual Machine was discovered.

How to Monitor Edge Virtual Bridging (EVB)

Select Monitor's Virtualization > EVB category to view information about Edge Virtual Bridging (EVB) information. This section covers the following topics:

- [“Viewing VDP TLV \(VSI Discovery Protocol Type-Length-Value\) Information” on page 283](#)
- [“Viewing VSI \(Virtual Station Interface\) Information” on page 283](#)
- [“Viewing VM Information” on page 284](#)
- [“Viewing VSI DB Information” on page 284](#)
- [“Viewing VSI DB ACL Information” on page 285](#)

Viewing VDP TLV (VSI Discovery Protocol Type-Length-Value) Information

Device Console > Monitor > Virtualization > EVB > VDP TLV Info

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 209. *VDP TLV Information field descriptions*

Field	Description
Index	VDP Type-Length-Value (TLV) Index.
Type	TLV Type.
Length	TLV length.
TLV OUI	Organizationally Unique Identifier (OUI) associated with TLV.
Sub Type	TLV sub type.
Request	Request information.
Response	Response information.
Manager ID	Manager ID.

Viewing VSI (Virtual Station Interface) Information

Device Console > Monitor > Virtualization > EVB > VSI Info

Note: This tab is available only for EVB capable switches. Please disregard this information if it does not apply to your switch.

Table 210. *VSI Information field descriptions*

Field	Description
Index	VSI index number.
VSI Type ID	VSI Type ID.

Table 210. *VSI Information field descriptions*

Field	Description
Version	VSI version.
MAC Address	MAC address associated with the VSI type.
VLAN	VLAN associated with the VSI type.
Port	Port associated with the VSI type.
Tx ACL	Transmit ACL number.
Rx Entry	Receive Entry.

Viewing VM Information

Device Console > Monitor > Virtualization > EVB > VM Info

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 211. *Virtual Machine Information field descriptions*

Field	Description
Index	VM index number.
VSI Type ID	VSI Type ID associated with this VM.
Version	VSI Type version information.
MAC Address	VSI MAC associated with this VM.
VLAN	VLAN associated with this VM.
Port	The VSI Port.
Tx ACL	The transmit ACL information of this VM.
Rx Info	The receiver information of this VM.
ACL Info	ACL information of this VM.
VPort	The VSI virtual port information of the active VM. A value of 0 means the VM is over the physical port but not the virtual port.

Viewing VSI DB Information

Device Console > Monitor > Virtualization > EVB > VSI DB Info

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 212. *VSI Database Information field descriptions*

Field	Description
Index	VM index number.
DB Name	VSI database (DB) name.
VSI Type ID	VSI Type ID associated with this VM.
Version	VSI Type version information.
Manager ID	VSI DB Manager ID.
VLANs	VLANs associated with this VSI DB.
Tx Rate	The transmit rate.
Tx Burst	The transmit burst count.
Rx Rate	The receive rate.
Rx Burst	The receive burst count.

Viewing VSI DB ACL Information

Device Console > Monitor > Virtualization > EVB > VSI DB ACL Info

Note: This tab might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 213. *VSI Database ACL Information field descriptions*

Field	Description
Index	VM index number.
ACL	The ACL index number.
VSI Type ID	VSI Type ID.
Version	The VSI database version.
Manager ID	The VSI manager ID.
Source MAC	The source MAC address.
Source MAC Mask	The source MAC address mask.
Destination MAC	The destination MAC address.
Destination MAC Mask	The destination MAC address mask.
VLAN	The virtual LAN.
Ethernet Type	The ethernet type.

Table 213. *VSI Database ACL Information field descriptions*

Field	Description
Source	The source IP address.
Source Mask	The source IP address mask.
Destination	The destination IP address.
Destination Mask	The destination IP address mask.
ToS	Type of Service.
IP Proto	The IP protocol.
TCP Flags	TCP flags.
TCP Flags Mask	TCP flags mask.
Source Port	The source port.
Source Port Mask	The source port mask.
Destination Port	The destination port.
Destination Port Mask	The destination port mask.
ACL Action	The ACL action.
New Priority	The new priority value.

How to Monitor Unified Fabric Port Information

Select Monitor's **UFP** category to view information about Unified Fabric Port (UFP). This section covers the following topics:

- [“Monitoring CDCP Information” on page 287](#)
- [“Monitoring Port Information” on page 287](#)
- [“Monitoring QoS Information” on page 288](#)
- [“Monitoring TLV Information” on page 288](#)
- [“Monitoring VLAN Information” on page 288](#)
- [“Monitoring Virtual Port Information” on page 289](#)

Monitoring CDCP Information

Device Console > **Monitor** > **Virtualization** > **UFP** > *CDCP Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 214. *CDCP Information field descriptions*

Field	Description
Index	The CDCP port index
Status	The CDCP port status

Monitoring Port Information

Device Console > **Monitor** > **Virtualization** > **UFP** > *Port Information*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 215. *Port Information field descriptions*

Field	Description
Index	The port index.
State	The port state information.
Virtual Ports	The virtual ports information.
Channel 1 State	The Channel 1 State.
Channel 2 State	The Channel 2 State.
Channel 3 State	The Channel 3 State.
Channel 4 State	The Channel 4 State.

Monitoring QoS Information

Device Console > Monitor > Virtualization > UFP > QoS Information

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 216. *QoS Information field descriptions*

Field	Description
Port Index	The port index.
Virtual Port Index	The Virtual Port index.
Min Bandwidth per vPort	The minimum bandwidth per vPort.
Max Bandwidth per vPort	The maximum bandwidth per vPort.

Monitoring TLV Information

Device Console > Monitor > Virtualization > UFP > TLV Information

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 217. *TLV Information field descriptions*

Field	Description
Index	The TLV port index.
Status	The TLV port status.

Monitoring VLAN Information

Device Console > Monitor > Virtualization > UFP > VLAN Information

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 218. *VLAN Information field descriptions*

Field	Description
Index	The VLAN index.
Virtual Port List	The virtual ports list.
External Port List	The external ports list.
Internal Port List	The internal ports list.

Table 218. *VLAN Information field descriptions*

Field	Description
UFP Port List	The UFP ports list.
VMR Port List	The VMready ports list.

Monitoring Virtual Port Information

Device Console > Monitor > Virtualization > UFP > Virtual Port Information

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 219. *Virtual Port Information field descriptions*

Field	Description
Port Index	The port index.
Virtual Port Index	The virtual port index.
State	The virtual port state.
Mode	The virtual port mode.
SV ID	The virtual port SV ID.
Default VLAN	The virtual port default VLAN.
Default Tag	The virtual port default tag.
Virtual Ports VLAN	The virtual port VLANs.
EVB Profile ID	The EVB Profile ID.
VMR Port List	The VMready ports list.

How to Monitor SDN-VE Gateway Information

Select Monitor's **Dove GW** category to view information about an SDN-VE Gateway. This section covers the following topics:

- “Monitoring SDN-VE ARP Information” on page 290
- “Monitoring SDN-VE Connectivity Service EndPoint Information” on page 290
- “Monitoring SDN-VE Connectivity Service Server Information” on page 291
- “Monitoring SDN-VE Connectivity Service Tunnel Information” on page 291
- “Monitoring SDN-VE Connectivity Service Statistics” on page 292
- “Monitoring SDN-VE Management Console General Information” on page 292
- “Monitoring SDN-VE Management Console Forward Rules” on page 293
- “Monitoring SDN-VE Management Console IP Interface” on page 293
- “Monitoring SDN-VE Management Console Subnet” on page 294
- “Monitoring SDN-VE Management Console VNID-VLAN Mapping” on page 294
- “Monitoring SDN-VE Network Address Translation Rules” on page 294

Monitoring SDN-VE ARP Information

Device Console > Monitor > Dove GW > ARP

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 220. *SDN-VE ARP field descriptions*

Field	Description
Destination IP Address	The SDN-VE gateway IP address.
Flag	The flag for the SDN-VE gateway.
MAC Address	The MAC address of the SDN-VE gateway.
VLAN ID	The VLAN ID.
Age	The age of the ARP.
Port	The port of the SDN-VE gateway.

Monitoring SDN-VE Connectivity Service EndPoint Information

Device Console > Monitor > Dove GW > DCS > Information > EndPoint

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 221. *SDN-VE DCS EndPoint field descriptions*

Field	Description
Index	The index.
Source VNID	The source virtual network ID.
IP Address	The IP address.
MAC Address	The MAC address of the SDN-VE endpoint.
Source Port	The source port.
Destination Port	The destination port.
Protocol	The protocol.
Destination VNID	The destination virtual network ID.
Location IP Address	The IP address of the endpoint.

Monitoring SDN-VE Connectivity Service Server Information

Device Console > **Monitor** > **Dove GW** > **DCS** > **Information** > *Server*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 222. *SDN-VE DCS Server field descriptions*

Field	Description
Index	The index.
VNID	The server virtual network ID.
IP Address	The server IP address.
Source Port	The source port.
Destination Port	The destination port.

Monitoring SDN-VE Connectivity Service Tunnel Information

Device Console > **Monitor** > **Dove GW** > **DCS** > **Information** > *Tunnel*

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 223. *SDN-VE DCS Tunnel field descriptions*

Field	Description
Index	The index.
VNID	The virtual network ID of the tunnel.
IP Address	The tunnel IP address.
Refernce Count	The reference count.

Monitoring SDN-VE Connectivity Service Statistics

Device Console > Monitor > Dove GW > DCS > Statistics > Statistics

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 224. *SDN-VE DCS Statistics field descriptions*

Field	Description
Index	The index.
Packet Type	The packet type.
Received Packets	The number of packets received.
Received Error Packets	The number of error packets received.
Transmitted Packets	The number of packets sent.
Transmitted Error Packets	The number of error packets sent.

Monitoring SDN-VE Management Console General Information

Device Console > Monitor > Dove GW > DMC > General

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 225. *SDN-VE DMC General field descriptions*

Field	Description
Dove GW Type	The type of SDN-VE gateway.
TEP IP Address	The tunnel endpoint IP address.
External IP Address	The external IP address.

Table 225. *SDN-VE DMC General field descriptions*

Field	Description
Registration Status	Whether the SDN-VE gateway is registered.
REST Sync Version	REST sync version.
Role	The management console role.

Monitoring SDN-VE Management Console Forward Rules

Device Console > Monitor > Dove GW > DMC > Forward Rules

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 226. *SDN-VE DMC Forward Rules field descriptions*

Field	Description
Index	The index.
IP Address	The IP address.
Protocol	The protocol
Destination Port	The destination port
Real IP Address	The real IP address
Real Port	The real port.
VNID	The virtual network ID.
Minimum PIP	Minimum PIP
Maximum PIP	Maximum PIP

Monitoring SDN-VE Management Console IP Interface

Device Console > Monitor > Dove GW > DMC > IP Interface

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 227. *SDN-VE DMC IP Interface field descriptions*

Field	Description
Index	The index.
VNID	The virtual network ID.
IP Address	The IP address.
Ports Range Start	The start of the range of ports.
Ports Range End	The end of the range of ports.

Table 227. *SDN-VE DMC IP Interface field descriptions*

Field	Description
Domain	The domain name.
External MultiCast	The external multicast.

Monitoring SDN-VE Management Console Subnet

Device Console > Monitor > Dove GW > DMC > Subnet

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 228. *SDN-VE DMC Subnet field descriptions*

Field	Description
Index	The index.
VNID	The virtual network ID.
IP Address	The IP address.
IP Mask	The IP mask.
Next Hop	The IP addresses of the next hop.
Mode	The command mode.

Monitoring SDN-VE Management Console VNID-VLAN Mapping

Device Console > Monitor > Dove GW > DMC > Subnet

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 229. *SDN-VE DMC Subnet field descriptions*

Field	Description
Index	The index.
VNID	The virtual network ID.
VLAN ID	The VLAN ID.

Monitoring SDN-VE Network Address Translation Rules

Device Console > Monitor > Dove GW > NAT > NAT Rules

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 230. *SDN-VE NAT Rules field descriptions*

Field	Description
Index	The index.
VNID	The virtual network ID.
Protocol	The protocol.
External IP Address	The External IP address.
Overlay IP Address	The overlay IP address.
Flag	The flag

How to Monitor Stacking Information

Select Monitor's **Stack** category to view information about stacking. This section covers the following topics:

- [“Monitoring Stack/Fabric Information” on page 296](#)
- [“Monitoring Stack/Fabric Link Information” on page 296](#)
- [“Monitoring Stack/Fabric Push Status Information” on page 297](#)
- [“Monitoring Stack/Fabric Trunk Information” on page 297](#)
- [“Monitoring Stack/Fabric Path Information” on page 297](#)
- [“Monitoring Stack/Fabric Current Settings Information” on page 300](#)
- [“Monitoring Stack/Fabric Management Interface Information” on page 301](#)

Monitoring Stack/Fabric Information

Device Console > Monitor > Stack/Fabric > General > General

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 231. *Stack/Fabric General Information field descriptions*

Field	Description
Stack State	The state of the stack.
Number of Attached Switches	The number of attached switches.

Monitoring Stack/Fabric Link Information

Device Console > Monitor > Stack/Fabric > General > Link

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 232. *Stack/Fabric Link Information field descriptions*

Field	Description
Switch Description	The switch description.
Port	The switch port number.
Stack Port MAC	The MAC address of the stack port, displayed as <i><switch#>:<port#></i> .
Stack Link State	The stack link state.
Trunk ID	The ID number of the trunk.

Table 232. *Stack/Fabric Link Information field descriptions*

Field	Description
Peer Port	The port number of the stack peer, displayed as <switch#>:<port#>.
Peer Trunk ID	The trunk number of the stack peer.

Monitoring Stack/Fabric Push Status Information

Device Console > Monitor > Stack/Fabric > General > Push Status

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 233. *Stack/Fabric Push Status Information field descriptions*

Field	Description
Attached Switch Number	The switch number of the attached switch.
Image1 Transfer Status	The transfer status of Image1.
Image2 Transfer Status	The transfer status of Image2.
Boot Image Transfer Status	The transfer status of the boot image.
Config File Transfer Status	The transfer status of the configuration file.

Monitoring Stack/Fabric Trunk Information

Device Console > Monitor > Stack/Fabric > General > Trunk

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 234. *Stack/Fabric Trunk Information field descriptions*

Field	Description
Attached Switch Number	The number of the attached switch.
Trunk Ports	The numbers of the trunk ports.
Peer Attached Switch Number	The switch number of the peer attached switch.
Peer Port	The ID number of the peer port.

Monitoring Stack/Fabric Path Information

Device Console > Monitor > Stack/Fabric > General > Path

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 235. *Stack/Fabric Path Information field descriptions*

Field	Description
Switch Description	The switch description.
Attached Source Switch Number	The number of the attached source switch.
Attached Destination Switch Number	The number of the attached destination switch.
Stack Trunk ID	The ID number of the stack trunk.

Monitoring Stack/Fabric Port Number Mapping Information

Device Console > Monitor > Stack/Fabric > General > Stack Port Number Mapping

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 236. *Stack/Fabric Port Number Mapping Information field descriptions*

Field	Description
Switch Description	The switch description.
Configured Switch Number	The number of the configured switch.
Switch Port Number	The number of the switch port.
Stack Port Number	The number of the stack port.

Monitoring Stack/Fabric Master Switch Information

Device Console > Monitor > Stack/Fabric > Switch > Master

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 237. *Stack/Fabric Master Switch Information field descriptions*

Field	Description
Configured Switch Number	The number of the configured switch.
Switch MAC Address	The MAC address of the switch.

Table 237. *Stack/Fabric Master Switch Information field descriptions*

Field	Description
Switch UUID	The UUID of the switch.
Switch Bay Number	The switch bay number.

Monitoring Stack/Fabric Backup Switch Information

Device Console > Monitor > Stack/Fabric > Switch > BackUp

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 238. *Stack/Fabric Backup Switch Information field descriptions*

Field	Description
Configured Switch Number	The number of the configured switch.
Switch MAC Address	The MAC address of the switch.
Switch State	The state of the switch.
Switch UUID	The UUID of the switch.
Switch Bay Number	The number of the bay in which the switch is located.

Monitoring Stack/Fabric Configured Switches Information

Device Console > Monitor > Stack/Fabric > Switch > Configured Switches

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 239. *Stack/Fabric Configured Switches Information field descriptions*

Field	Description
Switch Description	Description of the switch.
Configured Switch Number	The number of the configured switch.
Chassis UUID	The UUID of the switch.
Bay Number	The bay number of the switch
Switch MAC Address	The MAC address of the switch.

Table 239. *Stack/Fabric Configured Switches Information field descriptions*

Field	Description
Attached Switch Number	The number of the attached switch.
Stacking Mode	Whether the switch is enabled for stacking mode.

Monitoring Stack/Fabric Attached Switches Information

Device Console > Monitor > Stack/Fabric > Switch > Attached Switches

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 240. *Stack/Fabric Attached Switches Information field descriptions*

Field	Description
Switch Description	Description of the switch.
Attached Switch Number	The ID number of the attached switch.
Switch MAC Address	The MAC address of the switch.
Chassis UUID	The UUID of the switch.
Chassis Bay Number	The bay number of the switch
Configured Switch Number	The number of the configured switch.
Switch State	The state of the switch.
Software Image Slot	The software image slot.
Software Version	The version of the software the switch is running.
Serial Number	The serial number of the switch.
Stacking Mode	Whether the switch is enabled for stacking mode.
Switch Type	The switch type.

Monitoring Stack/Fabric Current Settings Information

Device Console > Monitor > Stack/Fabric > Switch > Current Settings

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 241. *Stack/Fabric Current Settings Information field descriptions*

Field	Description
Switch Description	Description of the switch.
Attached Switch Number	The number of the attached switch.
Stacking Mode	The stacking mode for the switch: master, backup, or member.
Stack Trunk Ports	The stack trunk ports.
Stack Vlan Number	The vLAN number of the stack.
Domain	The domain number (1-100).

Monitoring Stack/Fabric Management Interface Information

Device Console > Monitor > Stack/Fabric > Management Interface

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch

Table 242. *Stack/Fabric Management Interface field descriptions*

Field	Description
IP Address	The IP address of the stack.
Subnet Mask	The subnet mask of the stack.
Gateway	The IP address of the gateway.
Vlan ID	The vLAN number of the stack.
Floating IPv4 Address	The floating IPv4 management IP address of the Master Switch Management IP Interface.
Floating IPv4 Mask	The floating subnet mask of the Master Switch Management IP Interface.
Floating IPv6 Address	The floating IPv6 management IP address of the Master Switch Management IP Interface.
Floating IPv6 Mask	The floating subnet mask of the Master Switch Management IP Interface.

How to Monitor iSwitch Information

Select Monitor's **iSwitch** category to view information about iSwitch information. This section covers the following topics:

- [“Viewing Port Information” on page 302](#)
- [“Viewing Host Uplink Information” on page 302](#)

Viewing Port Information

Device Console > Monitor > iSwitch > Port Information

Table 243. *Port Information field descriptions*

Field	Description
Port ID	The OS port ID mapping to the distributed virtual port ID on vDS.
vDS Port ID	The distributed virtual port ID on virtual distributed switch (vDS).
Profile	The PortGroup to which the distributed virtual port ID belongs.
Connected	The name of the entity (example: VM name) connected to the port.
MAC Address	The MAC address of the entity (example: VM MAC address) connected to the port.
Host	The VMware host on which the entity (example: VM) connects to the port.
State	The status (Link Up/down/blocked) of the port.

Viewing Host Uplink Information

Device Console > Monitor > iSwitch > Host Uplink Information

Table 244. *Host Uplink Information field descriptions*

Field	Description
Host Name	The name of the VMware host.
Port ID	The OS uplink port ID.
Device Name	The name of the entity (example: “physical nic”) connected to the uplink port.
State	The status (Link Up/down/blocked) of the uplink port.
MAC Address	The MAC address of the entity connected to the uplink port.
Port Group	The PortGroup to which the port ID belongs to.

How to Launch a Chart

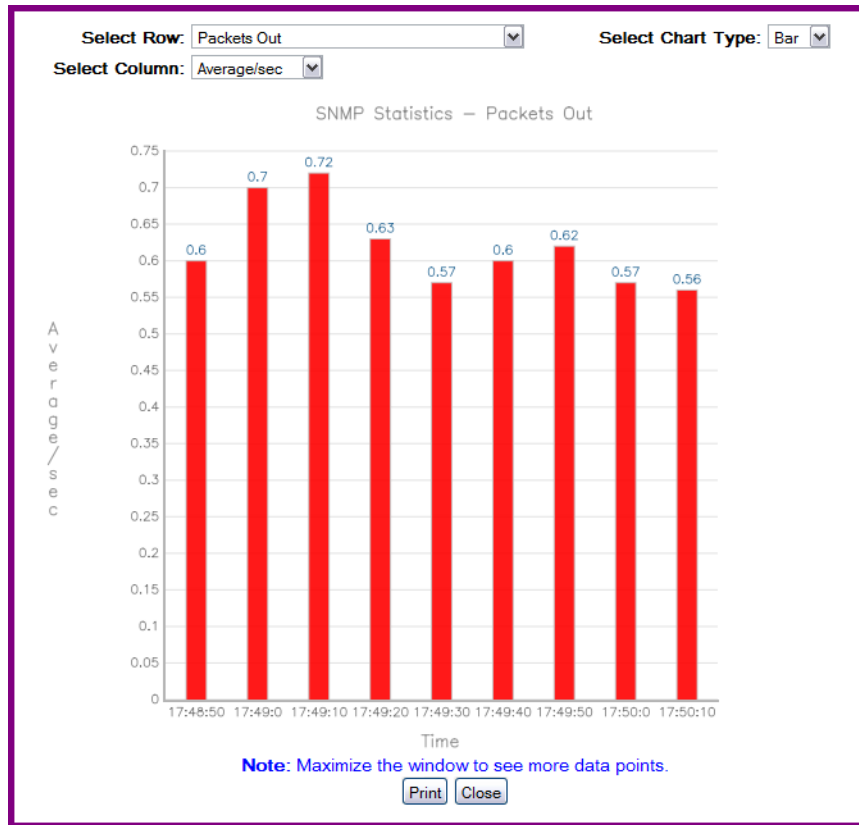
Real-time charting facility is supported for all statistics data. The chart feature plots the trend (the difference between the previous value and the current value) of either the Absolute Value—for statistics that show Absolute, Cumulative, Average/sec, Minimum/sec, Maximum/sec and LastVal/sec (such as **Monitor > Switch > SNMP Statistics**)—or the selected columnar value (such as “Bytes In” from the **Monitor > Port > Summary** page).

You can launch a chart using the following steps:

1. Select a switch and click any Monitor page showing statistics data.
2. In the statistics page, select a row that you want to plot.
3. For statistics pages showing Absolute, Cumulative values (such as **Monitor > Switch > SNMP Statistics**), click the **Chart** button to start plotting the graph.
4. For statistics pages that show only Absolute values for various parameters (such as the **Monitor > Port > Summary** page that show values for Bytes In, Bytes Out and so on), do the following:
 - a. Select the column for which you want to plot the graph. You can do so by making use of the drop-down list next to Chart button.
 - b. Click the **Chart** button to start plotting the graph.

[Figure 59 on page 304](#) shows an example graph plotting the trend for the Bytes In parameter of a port.

Figure 59. Bar Chart



When plotting charts from tables of statistics that include Absolute, Cumulative, Average values (such as the **Monitor > Switch > SNMP Statistics** page), you can perform the following actions:

- Change the chart type to Bar or Line by using **Select Chart Type** drop-down list.
- You can change to a different row by using **Select Row** drop-down list.
- You can Print a snap-shot of the graph by clicking the **Print** button.

When plotting charts from tables having multiple parameters (such as the **Monitor > Port > Summary** page), you can perform the following actions:

- Change the chart type to Bar or Line by using **Select Chart Type** drop-down list.
- You can change to a different row by using **Select Row** drop-down list.
- You can change to a different column by using **Select Column** drop-down list.
- You can Print a snap-shot of the graph by clicking the **Print** button.

How to Export a Statistical Summary

SNSC gives you the option to export statistical data to a comma separated value (.csv) file that you can open in any spreadsheet program, such as Microsoft Excel or OpenOffice.

1. Select a switch.
2. Click **Monitor**.
3. Select a category, such as **Switch**.
4. Click a statistic category, such as packet statistics.
5. Click **Export** (see [Figure 60 on page 305](#)).
 - a. Click **OK** to accept the default settings.
 - b. Click **Save to Disk** to save the file on your computer.
 - c. Click **Do this automatically for files like this from now on** to preserve your settings.


Process the file as you would any other spreadsheet. [Figure 60 on page 305](#) shows an example of an exported spreadsheet that contains packet statistics.

Note: If you open the spreadsheet in Microsoft Office Excel 2007, you can save the spreadsheet as an Excel 97-2003 Workbook so that Microsoft Office Excel 2003 users can open it.

Figure 60. Packet Statistics Spreadsheet example

5	Packet Statistics					
6	Parameter	AbsoluteValue	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
7	Packets Allocated	17503011	0	0	0	0
8	Packets Freed	17503005	0	0	0	0
9	Failed Packet Allocations	0	0	0	0	0
10	Medium Packet Allocations	5	0	0	0	0
11	Jumbo Packet Allocations	0	0	0	0	0
12	Small Packet Allocations	1	0	0	0	0
13	Medium Packet Allocations High Water Mark	7	0	0	0	0
14	Jumbo Packet Allocations High Water Mark	0	0	0	0	0
15	Small Packet Allocations High Water Mark	2	0	0	0	0

Administering Exported Files

After you export a file, SNSC opens a window that displays the name of the exported file and the download status of the file. Click the  icon in your task bar to open the Downloads window (see [Figure 61 on page 306](#)). You can perform the following tasks:

- Click **Open** to view the exported spreadsheet.
- Click **Remove** to delete the exported spreadsheet from your desktop.

- Click **Clean Up** to clear all information about exported files from the Downloads window.

Figure 61. Downloads window

5	Packet_Statistics					
6	Parameter	AbsoluteValue	Average/sec	Minimum/sec	Maximum/sec	LastVal/sec
7	Packets Allocated	17503011	0	0	0	0
8	Packets Freed	17503005	0	0	0	0
9	Failed Packet Allocations	0	0	0	0	0
10	Medium Packet Allocations	5	0	0	0	0
11	Jumbo Packet Allocations	0	0	0	0	0
12	Small Packet Allocations	1	0	0	0	0
13	Medium Packet Allocations High Water Mark	7	0	0	0	0
14	Jumbo Packet Allocations High Water Mark	0	0	0	0	0
15	Small Packet Allocations High Water Mark	2	0	0	0	0

How to Print a Statistical Summary

The statistical summary is printed in portrait format and might contain multiple pages, depending on the volume of data.

1. Select a switch.
2. Click **Monitor**.
3. Select a category, such as **Switch**.
4. Click a statistic category, such as packet statistics.
5. Click **Print**.

Chapter 6. Configuring the Switch

Using the configuration facility in System Networking Switch Center (SNSC), you can configure various parameters of a selected switch. The configuration facility is provided as part of the Device Console page (see [Figure 11 on page 66](#)).

Notes:

- The configuration feature is available for certain firmware versions. You can see the list of supported switch types along with the firmware version from About dialog (see [“How to View Information About Lenovo System Networking Switch Center” on page 90](#)).
- You must be logged in using the administrator account to change switch configuration settings.

The topics in this chapter cover the following main switch configuration features:

- [“Configuration Steps” on page 311](#)
- [“General Switch Configuration” on page 314](#)
- [“Configuring Access Users” on page 338](#)
- [“Configuring Layer 2 Protocols” on page 339](#)
- [“Configuring Trunks” on page 340](#)
- [“Configuring LACP” on page 343](#)
- [“Configuring 802.1x” on page 345](#)
- [“Configuring MSTP and RSTP” on page 348](#)
- [“Configuring CIST” on page 349](#)
- [“Configuring Spanning Tree Protocol” on page 351](#)
- [“Configuring Forwarding Database” on page 355](#)
- [“Configuring Virtual Link Aggregation Groups” on page 357](#)
- [“Configuring Hot Links” on page 360](#)
- [“Configuring Virtual LANs” on page 362](#)
- [“Configuring Link Layer Discovery Protocol \(LLDP\)” on page 366](#)
- [“Configuring Failover” on page 369](#)
- [“Configuring Active Multipath Protocol \(AMP\)” on page 371](#)
- [“Configuring Edge Control Protocol \(ECP\)” on page 373](#)
- [“Configuring IP Interfaces” on page 374](#)
- [“Configuring Gateways” on page 379](#)
- [“Configuring Routes” on page 382](#)
- [“Configuring RMAPs” on page 386](#)
- [“Configuring RIP” on page 388](#)
- [“Configuring OSPF” on page 392](#)

- [“Configuring BGP” on page 411](#)
- [“Configuring IGMP” on page 416](#)
- [“Configuring DNS” on page 422](#)
- [“Configuring Bootp-Relay” on page 423](#)
- [“Configuring Flooding” on page 425](#)
- [“Configuring VRRP” on page 426](#)
- [“Configuring ARP” on page 431](#)
- [“Configuring Ports” on page 432](#)
- [“Configuring QoS – WRED/ECN” on page 440](#)
- [“Configuring ACLs” on page 445](#)
- [“Configuring CEE \(Converged Enhanced Ethernet\)” on page 461](#)
- [“Configuring FCoE \(Fiber Channel over Ethernet\)” on page 467](#)
- [“Configuring Switch Partition” on page 474](#)
- [“Configuring Virtualization” on page 476](#)
- [“Configuring iSwitch Virtual Data Station” on page 490](#)
- [“Configuring Unified Fabric Port \(UFP\)” on page 491](#)

Configuration Steps

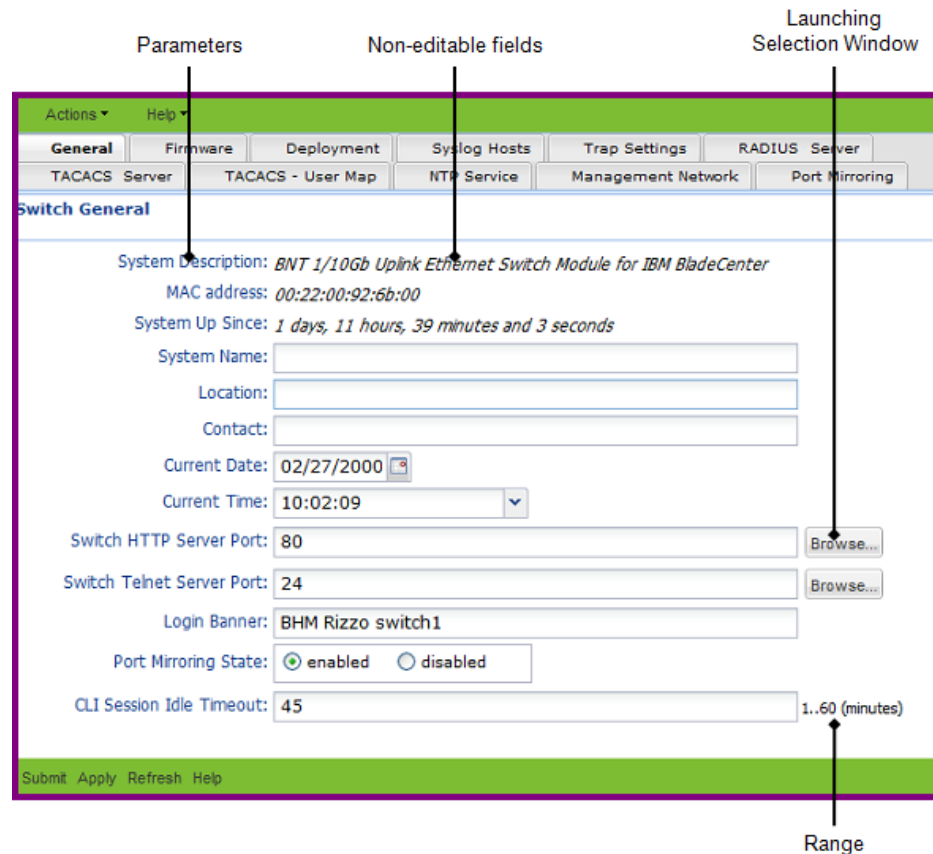
This topic covers the steps involved in configuring switch parameters:

- “Editing in Form Pane” on page 311
- “Editing in Tabular Pane” on page 312
- “Selection Windows” on page 312
- “Submitting and Applying Changes” on page 313

Editing in Form Pane

The Form pane (see [Figure 62 on page 311](#)) is mainly displayed for those configurable features associated with scalar variables. You can configure the parameters either by entering new values in the text fields or by selecting the value from the drop-down list or using radio-buttons. The non configurable parameters' values are shown in italics.

Figure 62. Configuration: Form Pane



Editing in Tabular Pane

The Tabular pane (see [Figure 63 on page 312](#)) is mainly displayed for those configurable features associated with tables. Unlike form pane, tabular pane allows you to configure the parameters either through inline cell editing or in a separate window that can be launched by clicking **Modify**. While inline editing, you can configure the parameters either by entering new values in the editable cell or by selecting the value from the drop-down list associated with the cell. The non-configurable parameters are shown in non-editable cells with a slightly dark background.

Note: When you modify data in a cell, the cell appears blue until the change is saved.

Figure 63. Configuration: Tabular Pane

Table Heading

Selected Row

VLAN	Name	Ports	State	Spanning Tree Group
1	Default VLAN	INT1-INT14;EXT1;EXT	enabled	2
2	VM group 6		enabled	1
20	VM group 5	INT2;EXT2	enabled	1
30	VM group 11		enabled	1
35	VM group 10		enabled	1
4095	Mgmt VLAN	INT1-MGT2	enabled	128

Submit Apply Refresh Insert Modify Delete Export Print Help Note: Double-click light background cells to modify the value

Non-editable cells

Editable cells (light background)

Selection Windows

Selection windows appear throughout SNSC's configuration panels to let you select from a list of values.

To use a Selection window:

1. Click **Browse...** beside a field that displays it. The resultant window shows the already configured value with checked check box along with a slightly dark background for the row color.
2. From the Selection window, select the desired item.

3. Some Selection windows allow for multiple selections and some only allow for one selection.
4. Click **OK**.

Submitting and Applying Changes

You can submit your changes using the following steps:

1. Click **Submit** in the bottom of form or tabular pane. By default, the **Submit** button is disabled. However, when you make an edit, it is enabled. The Submit action results in sending your changes to the switch. Note that Submit action is specific to the panel.
2. Click **Apply**. This action results in applying the changes that you had submitted in the previous step.
3. Click **Save** for saving the changes to the flash memory.
4. You can activate **Apply** and **Save** actions from any configuration panel. In other words, they are not specific to any panel.
5. Use the Save indicator located at the right top corner of the Device Console window (see [Figure 11 on page 66](#)) to decide whether or not to activate **Save**.

About Various Configure Tabs

Some **Device Console > Configure** tabs might not be available for the selected switch. For some switch types, though the tabs are present, but some fields might not be available. Please disregard the corresponding information if it does not apply to your switch.

General Switch Configuration

The following sections describe general switch configuration tasks you can perform with SNSC (SNSC):

- [“General Configuration” on page 314](#)
- [“Software Image Configuration” on page 316](#)
- [“Configuration, Image, and Dump Control” on page 334](#)
- [“Syslog Hosts Configuration” on page 318](#)
- [“SNMP Trap Settings” on page 321](#)
- [“Syslog Settings” on page 323](#)
- [“General RADIUS Configuration” on page 324](#)
- [“RADIUS Server Configuration” on page 325](#)
- [“General TACACS+ Configuration” on page 327](#)
- [“TACACS+ Server Configuration” on page 328](#)
- [“TACACS+ User Map Configuration” on page 330](#)
- [“TACACS+ Command Authorization Configuration” on page 330](#)
- [“LDAP Server Configuration” on page 330](#)
- [“Network Time Protocol Configuration” on page 331](#)
- [“NTP MD5 Key Configuration” on page 332](#)
- [“Management Network Configuration” on page 333](#)
- [“Port Mirroring Configuration” on page 333](#)

General Configuration

Device Console > **Configure** > **Switch** > *General*

The following table describes the fields of the **General** configuration tab.

Table 245. *Switch General Configuration field descriptions*

Field	Description
System Description	Displays the product name of the switch.
Management/Switch MAC Address	MAC address of the switch.
System Up Since	Displays the date and time when the switch was last booted.
System Name	The administrative-assigned name for the managed node. You may enter the name of the device in this field to show up in the tool tip.

Table 245. *Switch General Configuration field descriptions (continued)*

Field	Description
Location	The physical location of the node, such as telephone closet, 3rd floor.
Contact	Information about the contact person for this managed node.
Current Date	Displays the date on the real time clock.
Current Time	Displays the time on the real time clock.
Switch HTTP Server Port	Sets the TCP port number that the switch uses for any HTTP traffic. The default is port 80. Click Browse... to list all available TCP ports.
Switch Telnet Server Port	Sets the TCP port number that the switch uses for Telnet traffic. The default is HTTP port 23. Click Browse... to list all available TCP ports.
Login Banner	Displays the user-defined login banner. The message is displayed whenever you log into the switch using the Command Line Interface.
Port Mirroring State	Enables or disables the port mirroring state of the switch. The mirroring and monitoring ports are configured under the Mirror tab.
CLI Session Idle Timeout	Sets the idle timeout for CLI sessions, in minutes.
Service Required LED	Enables or disables the Service Required LED.
Logging Option	The logging option specifying whether the logging is to be done at console or not.
Login Authentication	Sets the login mechanism to local, remoteRadius or remoteTacacs.
Time Zone	Shows the configuration save status.
Telnet Access	Sets the Telnet access on the switch.
Switch Tftp Server Port	Sets the TFTP server listening port.
System Banner	Sets the banner text.
DayLightSavings Time	Enables or disables Daylight Saving Time (DST).
Display Host in CLI Prompt	Enables or disables displaying the host name in CLI prompt.

Table 245. *Switch General Configuration field descriptions (continued)*

Field	Description
Default IP Address on Data Interface	Enables or disables the use of default IP address on Data interface.
Default IP Address on Mgmt Interface	Enables or disables the use of default IP address on Management interface.
Default IP Address on MgmtA Interface	Enables or disables the use of default IP address on ManagementA interface.
Default IP Address on MgmtB Interface	Enable or disable the use of default IP address on ManagementB interface.
DCBX Feature	Enables or disables DCBX features.
Reminders	Enables or disables the Reminders feature.
Security Mode	Sets the security mode (compatibility, strict, or strictsnmpolduser).
SSL Protocol Version	Sets the SSL protocol version (tls10, tls11, or tls12).

Software Image Configuration

Device Console > Configure > Switch > Firmware

Use the Firmware tab to manage the switch software images. The following table describes the fields of the **Firmware** configuration tab.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 246. *Switch Firmware Configuration field descriptions*

Field	Description
Running Software Version	The version of the software image that is currently running on the system.
Boot Code Version	The software version of the switch boot code.
Image 1 Software Version	The software version of the image stored in the first image storage area.
Image 2 Software Version	The software version of the image stored in the second image storage area.
Image For Next Reset	Selects the software image to use during after the next reboot.

Table 246. *Switch Firmware Configuration field descriptions*

Field	Description
Configuration For Next Reset	Selects the configuration information to load during the next reboot.
CLI Mode for Next Reset	Selects the CLI mode used after the next reboot.
Selectable CLI Mode	Selects the next status of the CLI mode prompt.
Use BOOTP	Enables or disables the usage of BOOTP for obtaining an IP address for the switch.
Use DHCP	Enables or disables Dynamic Host Control Protocol for setting the management IP address. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for MGTA	Enables or disables DHCP for setting the management IP address on management port A. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for MGTB	Enables or disables DHCP for setting the management IP address on management port B. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Use DHCP for EXTM	Enables or disables DHCP for setting the management IP address on external management port. When enabled, the IP address obtained from the DHCP server overrides the static IP address.
Apply Pending	Indicates whether any pending changes must be applied to the switch configuration.
Save Pending	Indicates whether any applied changes to the switch configuration must also be saved.
SNMP Free Resources Timeout	<p>The SNMP Free Resources Timeout indicates the number of minutes before the resources are freed and the state is set back to idle. Once SNMP operations that use the machine state are finished, the resources used by these operations must be freed by setting the state back to idle so that other commands can be issued via SNMP. One such operation would be an SNMP apply.</p> <p>This setting normally would not require modification unless you are using a MIB browser or performing debugging operations that might require a shorter or longer timeout period for SNMP operations.</p>
Boot Profile For Next Reset	The profile to use after the next reboot.

Table 246. *Switch Firmware Configuration field descriptions*

Field	Description
Configuration Save Option	Indicates whether the configuration of the switch has to be saved or not.
Configuration Save File Name	The file in which the switch configuration to be saved.
Configuration Save Status	Shows the configuration save status.
Configuration Restore Option	Indicates whether the configuration of the switch has to be restored or not.
Configuration Restore File Version	The file in which the switch configuration to be restored.
Configuration Restore Status	Shows the configuration restore status.
MTM	Sets the value for Machine Type Model (MTM).

Syslog Hosts Configuration

Device Console > Configure > Switch > Syslog Hosts

Use the **Syslog Hosts** tab to configure where syslog messages are sent and the severity of messages to be sent.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 247. *Syslog Hosts Configuration field descriptions*

Field	Description
1st Syslog Host IP Address	The IP address of the first Syslog host. The Syslog host is where syslog messages are to be sent.
Transfer Port for 1st Syslog Host	Selects the transfer port to use for sending syslog message to first Syslog host: <ul style="list-style-type: none">● DATA: Data port● EXTM: External management port● MGT, MGTA, MGTB: Internal management port
2nd Syslog Host IP Address	The IP address of the second Syslog host. The Syslog host is where syslog messages are to be sent.

Table 247. *Syslog Hosts Configuration field descriptions*

Field	Description
Transfer Port for 2nd Syslog Host	Selects the transfer port to use for sending syslog message to second Syslog host: <ul style="list-style-type: none">● DATA: Data port● EXTM: External management port● MGT, MGTA, MGTB: Internal management port
1st Syslog Host Facility	Syslog Facility: Messages are dumped from the 1st Syslog Host to the selected bucket: local0 to local7.
2nd Syslog Host Facility	Syslog Second Facility: Messages are dumped from the 2nd Syslog Host to the selected bucket: local0 to local7.
1st Syslog Host Severity	This option sets the severity level of the first syslog host displayed. The default is 7, which logs all severity levels. For a detailed description of the severity levels, see “ Levels of Severity ,” next. The severity levels of the 1st Syslog Host are separate from those of the 2nd Syslog Host.
2nd Syslog Host Severity	This option sets the severity level of the second syslog host displayed. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “ Levels of Severity ,” next. The severity levels of the 2nd Syslog Host are separate from those of the 1st Syslog Host.
Source Loopback Interface	Sets the loopback interface used for the source IP of the Syslog message.
Syslog Console Severity	This option sets the severity level of the syslog console. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “ Levels of Severity ,” next.
Syslog Buffer Severity	This option sets the severity level of the syslog buffer. The default is 7, which logs all severity levels. For a detailed description of the seven levels of severity, see “ Levels of Severity ,” next.

Levels of Severity

All Syslog messages have a level of severity attached to them. The following table describes the severity levels.

Table 248. *Syslog Severity Level descriptions*

Number	Name	Description
0	Emergency	The system is unusable.
1	Alert	Take action immediately.
2	Critical	The condition of the system is critical.
3	Error	The system has errors.
4	Warning	The system is giving a warning.
5	Notice	The condition of the system is normal but with significant conditions that need attention.
6	Informational	The system is working but information about certain conditions is available.
7	Debug	The system is giving out debug-level messages.

SNMP Trap Settings

Device Console > **Configure** > **Switch** > *SNMP Trap Settings*

Use the **SNMP Trap Settings** tab to enable or disable SNMP traps on a per-feature basis.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 249. *SNMP Trap Settings field descriptions*

Field	Description
SNMP Trap Source Interface	SNMP Trap Source Interface: DATA or MGT.
Send Authentication Traps	Enables or disables the switch to generate authentication failure traps.

SNMP Trap Hosts

Device Console > Configure > Switch > *SNMP Trap Hosts*

Use the **SNMP Trap Hosts** tab to configure the IP address where SNMP traps are to be sent. Up to 16 entries can be added in the table.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 250. *SNMP Trap Hosts field descriptions*

Field	Description
Trap Host IP Address	The IP address of the host where SNMP traps are to be sent.
Community String	The trap host community string.

Syslog Settings

Device Console > Configure > Switch > Syslog Settings

Use the **Syslog Settings** tab to enable or disable Syslog messages on a per-feature basis. The following tables describe various fields.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 251. *Syslog Settings field descriptions*

Field	Description
Console	Enables or disables logging of messages to the console.
System	Enables or disables system level alerts.
Management (flash, config, login)	Enables or disables management (flash, config, login) alerts.
CLI	Enables or disables CLI generated error messages.
Spanning Tree	Enables or disables spanning tree-related alerts.
VLAN	Enables or disables VLAN-related alerts.
SSH	Enables or disables SSH-related alerts.
VRRP	Enables or disables VRRP-related alerts.
NTP	Enables or disables NTP-related alerts.
IP	Enables or disables IP-related alerts.
WEBUI	Enables or disables Browser Based Interface-related alerts.
OSPF	Enables or disables OSPF-related alerts.
RMON	Enables or disables RMON-related alerts.
UFP	Enables or disables UFP-related alerts.
802.1x	Enables or disables 802.1-related alerts.
Config	Enable or disable switch configuration-related syslog and SNMP traps.
Config Change	Enable or disable switch configuration change related alerts.
BGP	Enables or disables BGP-related alerts.
Hot Links	Enables or disables Hot Links-related alerts.
Server	Enables or disables Server-related alerts.
Difftrak	Enables or disables Difftrak-related alerts.
LLDP	Enables or disables LLDP-related alerts.
VM	Enables or disables VM-related alerts.

Table 251. *Syslog Settings field descriptions*

Field	Description
Failover	Enables or disables Failover-related alerts.
DCBX	Enables or disables DCBX-related alerts.
FCoE	Enables or disables FCoE-related alerts.
VLAG	Enables or disables VLAG-related alerts.
LACP	Enables or disables LACP-related alerts.
Link	Enables or disables Link-related alerts.
VNIC	Enables or disables VNIC-related alerts.
TFTP	Enables or disables TFTP-related alerts.
Stacking	Enables or disables Stacking-related alerts.
MLD	Enables or disables all MLD-related alerts.
IGMP Group	Enables or disables all IGMP Group-related alerts.
IGMP Mrouter	Enables or disables all IGMP Mrouter-related alerts.
IGMP Querier	Enables or disables all IGMP Querier-related alerts.
OSPFv3	Enables or disables OSPFv3-related alerts.
IPv6	Enables or disables IPv6-related alerts.
Private VLAN	Enables or disables Private VLAN-related alerts.
SLP	Enables or disables SLP-related alerts.
Netconf	Enables or disables NETCONF-related alerts.
ALL	Enables or disables logging for all features in the switch.

General RADIUS Configuration

Device Console > Configure > Switch > RADIUS General

Use the **RADIUS General** tab to configure general parameters associated with RADIUS Server.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 252. *RADIUS General field descriptions*

Field	Description
Ext Debug Mask	Mask for enabling or disabling the Debug/Trace prints in the RADIUS module.
Maximum Number of Users	Maximum number of User entries stored. The value of this object will be stored for the MemPool Initialization.

Table 252. *RADIUS General field descriptions*

Field	Description
Secure Backdoor Status	Status of RADIUS Server Secure Backdoor. If it is enabled allow noradius user to login with admin password otherwise it won't allow noradius user to login.
Port	Specify the RADIUS port number.
Server Enabled	Flag to denote whether the server is enabled or not.
Acct Port	Specify the RADIUS Accounting port number.
Accounting Enabled	Flag to denote whether the RADIUS Accounting is enabled or not.

RADIUS Server Configuration

Device Console > **Configure** > **Switch** > *RADIUS Server*

Use the **RADIUS Server** tab to configure parameters to access RADIUS Server for authentication.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 253. *RADIUS Server Settings field descriptions*

Field	Description
Primary RADIUS Server IP Address	Sets the IP address for the primary RADIUS server.
Secondary RADIUS Server IP Address	Sets the IP address for the secondary RADIUS server.
Transfer Port for Primary RADIUS Server	Selects the type of port to which the primary RADIUS server is connected: <ul style="list-style-type: none">● data: Data port● extm: External management port● mgt: Internal management port
Transfer Port for Secondary RADIUS Server	Selects the type of port to which the secondary RADIUS server is connected: <ul style="list-style-type: none">● data: Data port● extm: External management port● mgt: Internal management port
Port	Sets the user-configurable RADIUS application port. The default is RADIUS port number 1645.
Timeout	Sets the time-out in seconds.

Table 253. *RADIUS Server Settings field descriptions*

Field	Description
Retries	Sets the number of retries to the RADIUS server before timing out.
RADIUS Authentication	Enables or disables RADIUS authentication.
Primary Secret	Sets the shared secret password between the switch and the primary RADIUS server.
Secondary Secret	Sets the shared secret password between the switch and the secondary RADIUS server.
Source Loopback Interface	Sets the loopback interface used for the source IP of the RADIUS message.
RADIUS Backdoor	Enables or disables access through the RADIUS backdoor. Enabling this feature allows telnet, HTTP/HTTPS, and SSH access.
Secure Backdoor	Enables or disables the RADIUS backdoor using secure password for telnet/SSH/ HTTP/HTTPS.

Note: In case of IBM System Networking Distributed Switch 5000V, the RADIUS Server Configuration is listed in a table form with the parameters listed in the following table.

Table 254. *RADIUS Server Table field descriptions*

Field	Description
Server Index	RADIUS server index.
Server IP Address	Sets the IP address for the given RADIUS server.
Server Type	Sets the RADIUS server type (auth, acct, both).
Server Secret	Sets the shared secret password between the switch and this RADIUS server.
Timeout	Sets the time-out interval, in seconds.
Retries	Set the number of retries to the RADIUS server before timing out.

General TACACS+ Configuration

Device Console > **Configure** > **Switch** > *TACACS General*

Use the **TACACS General** tab to configure general parameters associated with TACACS+ Server.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 255. *TACACS General field descriptions*

Field	Description
Server	The active server address. Setting this object to zero disables the active server concept.
Trace Level	The debug trace level for TACACS+ client implementation. This is bit mapped data. Each bit of this object represent a trace level as given below: 0x00000001 - Information 0x00000002 - Errors 0x00000004 - Tx. packet dump 0x00000008 - Rx. packet dump 0xffffffff - All of the above 0x00000000 - No trace
Retransmit	Number of times the TACACS+ client searches the list of TACACS+ servers.
Privilege Level	Enable/disable Cisco type privilege level mapping. By default, privilege level mapping is disabled and the privilege levels are mapped as follows: 0 = CLI_AUTH_USER 3 = CLI_AUTH_OPER 6 = CLI_AUTH_ADMIN Once the privilege level is enabled, the following privilege levels are mapped: 0 - 1 = CLI_AUTH_USER 6 - 8 = CLI_AUTH_OPER 14 - 15 = CLI_AUTH_ADMIN
Secure Backdoor Status	Status of TACACS Server Secure Backdoor.
Server Enabled	Flag to denote whether the server is enabled or not.

TACACS+ Server Configuration

Device Console > Configure > Switch > TACACS Server

Use the **TACACS Server** tab to configure parameters to access TACACS+ Server for authentication.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 256. *TACACS+ Server Settings field descriptions*

Field	Description
Primary Server	Sets the IP address for the primary TACACS+ server.
Secondary Server	Sets the IP address for the secondary TACACS+ server.
Transfer Port for Primary Server	Selects the port type to which the primary TACACS+ server is connected: <ul style="list-style-type: none">● data: Data port● extm: External management port● mgt: Internal management port
Transfer Port for Secondary Server	Selects the type of port to which the secondary TACACS+ server is connected: <ul style="list-style-type: none">● data: Data port● extm: External management port● mgt: Internal management port
Port	Sets the user-configurable TACACS+ application port. The default is TACACS+ port number 49.
Timeout	Sets the time-out in seconds.
Retries	Sets the number of retries to the TACACS+ server before timing out.
TACACS+ Authentication	Enables or disables TACACS+ authentication.
Password Change	Enables or disables password change.
Primary Secret	Sets the shared secret password between the switch and the primary TACACS+ server.
Secondary Secret	Sets the shared secret password between the switch and the secondary TACACS+ server.
TACACS+ Backdoor	Enables or disables access through the TACACS+ backdoor. Enabling this feature allows Telnet access and HTTP/HTTPS/SSH access.
Secure Backdoor	Enables or disables the TACACS+ backdoor using secure password for telnet/SSH/ HTTP/HTTPS.

Table 256. *TACACS+ Server Settings field descriptions*

Field	Description
Privilege Level Mapping	Enables or disables TACACS+ privilege-level mapping.
Command Authorization	Enables or disables command authentication.
Command Logging	Enables or disables command logging.
Directed Request	Enables or disables TACACS+ directed request.
Login Attempts	Sets the number of login attempts to the TACACS+ server.
Accounting	Enables or disables TACACS+ accounting.
Source Loopback Interface	Sets the loopback interface used for the source IP of the TACACS+ message.

Note: In case of IBM System Networking Distributed Switch 5000V, the TACACS+ Server Configuration is listed in a table form with the parameters listed in the following table.

Table 257. *TACACS+ Server Table field descriptions*

Field	Description
Server IP Address	Sets the IP address for the given TACACS+ server.
Server Single Connect	Enables (yes) or disables (no) server single connect.
Port	Sets the user-configurable TACACS+ application port. The default port is 49.
Timeout	Sets the time-out interval, in seconds.
Server Secret	Sets the shared secret password between the switch and this TACACS+ server.

TACACS+ User Map Configuration

Device Console > Configure > Switch > TACACS User Map

Use the **TACACS User Map** tab to configure TACACS User Mappings.

Note: This feature might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 258. *TACACS+ User Mapping field descriptions*

Field	Description
User ID	The remote privilege identifier
Mapping	The user mapping. It can be one of the following: none, user, oper, or admin

TACACS+ Command Authorization Configuration

Device Console > Configure > Switch > TACACS Command Auth

Use the **TACACS Command Auth** tab to configure TACACS command authorization parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 259. *TACACS+ Command Auth field descriptions*

Field	Description
Privilege Level	Privilege level associated with the CLI command.
Authorization Status	If command authorization status is true, then all commands with specified privilege level will be sent to TACACS+ server for authorization.
Accounting Status	If command accounting status is true, then all commands with specified privilege level will be sent to TACACS+ server for accounting.

LDAP Server Configuration

Device Console > Configure > Switch > LDAP Server

Use the **LDAP Server** tab to configure parameters to access LDAP Server for authentication.

Note: This tab or some fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 260. *LDAP Server Settings field descriptions*

Field	Description
Primary Server	Sets the IP address for the primary LDAP server.
Transfer Port for Primary Server	Selects the type of port to which the primary LDAP server is connected: <ul style="list-style-type: none"> ● data: Data port ● mgt: Management port ● extm: External management port
Secondary Server	Sets the IP address for the secondary LDAP server.
Transfer Port for Secondary Server	Selects the type of port to which the secondary LDAP server is connected: <ul style="list-style-type: none"> ● data: Data port ● mgt: Management port ● extm: External management port
Port	Sets the user-configurable LDAP application port. The default is LDAP port number 389.
Timeout	Sets the time-out in seconds.
Retries	Sets the number of retries to the LDAP server before timing out.
LDAP Authentication	Enables or disables LDAP authentication.
LADP Backdoor	Enables or disables the LDAP backdoor.
Domain Name	Sets the LDAP domain name.

Network Time Protocol Configuration

Device Console > Configure > Switch > NTP Service

Use the **NTP Service** tab to configure Network Time Protocol settings.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 261. *NTP Server Settings field descriptions*

Field	Description
NTP Service	Enables or disables the Network Time Protocol (NTP) switch.
Primary NTP Service IP Address	Sets the IP address of the primary NTP server.

Table 261. *NTP Server Settings field descriptions*

Field	Description
Secondary NTP Service IP Address	Sets the IP address of the secondary NTP server.
Transfer Port for Primary Server	Selects the type of port to which the primary NTP server is connected: <ul style="list-style-type: none">● data: Data port● ext7/extm: External management port● mgt: Internal management port
Transfer Port for Secondary Server	Selects the type of port to which the secondary NTP server is connected: <ul style="list-style-type: none">● data: Data port● ext7/extm: External management port● mgt: Internal management port
Server Resync Interval	Specifies how often to resynchronize the switch clock with the NTP server:
Source Loopback Interface	Sets the loopback interface used for the source IP of the NTP message.
Admin Status	Sets the Admin Status (up, down, testing).
Ops Poll Server	Enables (yes) or disables (no) the trigger for the NTP client to transmit a request to the designated servers.
Primary Server Key	Sets the NTP Authentication primary server key.
Secondary Server Key	Sets the NTP Authentication secondary server key.
NTP Authentication State	Sets the NTP Authentication state. Enabled=1 and Disabled=0

NTP MD5 Key Configuration

Device Console > Configure > Switch > NTP MD5 Key

Use the **NTP MD5 Key** tab to configure NTP MD5 key parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 262. *NTP MD5 Key Settings field descriptions*

Field	Description
Index	The index for the NTP MD5 key.
MD5 Key	The NTP MD5 key code.

Management Network Configuration

Device Console > Configure > Switch > Management Network

Use the **Management Network** tab to define IP address ranges allowed to manage the switch using both the data and management ports.

Table 263. *Switch Management Network field descriptions*

Field	Description
Index	The index for the Management Network.
IP Address	The IP address for the Management Network.
IP Mask	The IP Mask for the Management Network.

Port Mirroring Configuration

Device Console > Configure > Switch > Port Mirroring

Use the **Port Mirroring** tab to configure, enable, and disable the monitored port. When port mirroring is enabled, network packets being sent and/or received on a target port are duplicated and sent to a monitoring port. You can attach a network analyzer to the monitoring port to collect detailed information about your network performance and usage.

Table 264. *Port Mirroring field descriptions*

Field	Description
Monitoring Port	The selected port for monitoring; Receives the duplicated packets delivered by the Mirrored Port.

Table 264. *Port Mirroring field descriptions*

Field	Description
Mirrored Port	Sets the selected port for mirroring: Packets received by or delivered from this port are delivered to the Monitoring Port.
Direction Mirrored	<p>This field lets you specify the direction in which packets are received by the mirrored port:</p> <ul style="list-style-type: none"> ● in: Packets received by the mirrored port. ● out: Packets transmitted from the mirrored port. ● both: Packets received by or transmitted from the mirrored port. <p>It is necessary to specify the direction because:</p> <ul style="list-style-type: none"> ● If the source port of the frame matches the mirrored port and the mirrored direction is set to in, then no frame is sent to the monitor port; if the direction is set to both, then only packets sent out by the mirrored port are sent to monitor port. ● If the destination port of the frame matches the mirrored port and the mirrored direction is set to out, then no frame is sent to the monitor port.

Internal VLAN Configuration

Device Console > Configure > Switch > Internal VLAN

Use the **Internal VLAN** tab to configure internal VLANs.

Table 265. *Internal VLAN field descriptions*

Field	Description
First internal-VLAN	Sets the first internal VLAN.
Last internal-VLAN	Sets the last internal VLAN.
Black-Hole VLAN	Sets the black-hole VLAN.

Configuration, Image, and Dump Control

Device Console > Configure > Config/Image/Dump Control > Config/Image/Dump Control

Use the Config/Image/Dump Control to configure an FTP, TFTP, or SFTP server required for software image or configuration upgrade/download operations, and for downloading Panic and Tech Support Dump from the switch. The following table describes the fields of the **Config/Image/Dump Control** configuration tab.

Notes:

- The password field is only valid for FTP and SFTP protocols.
- The password field will appear blank even when there is a password set. This is for security reasons.
- This tab or some of its fields might not be available for the selected switch type. Please disregard this tab if it does not apply to your switch.

Table 266. *Config/Image/Dump Control field descriptions*

Field	Description
Server	Domain name or IP address of the FTP/SFTP/TFTP server.
Transfer Protocol	Choose FTP, TFTP, or SFTP
User Name	User name for FTP operation. If specified, the transfer mode is set to FTP. If this field is blank, the transfer mode is set to TFTP.
Password	Password required for FTP operation. Blank for TFTP mode.
Server Port [22]:	This option only applies to SFTP. The default port is 22. You may change this. This option is only valid if you select SFTP as the Transfer Protocol.
Action	<p>Select the FTP/SFTP/TFTP server action:</p> <ul style="list-style-type: none"> • Image Upgrade: Downloads the file specified in the Image File Name field from the FTP/SFTP/TFTP server to one of the switch image slots. The image slot is specified in the Image menu. • Config Upgrade: Downloads the configuration information contained in the file specified in the Configuration File Name field from the FTP/SFTP/TFTP server to the switch and makes it the active switch configuration. • Config Backup: Backs up the active configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the Configuration File Name field. • Panic Dump: Backs up the core dump from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the Dump File Name field. • Image Backup: Backs up the firmware by uploading it from the switch to the FTP/SFTP/TFTP server. The backup image file name is specified in the Image File Name field. • Tech Support Dump: Uploads the TS dump from the switch to the FTP/SFTP/TFTP server. The TS dump file name is specified in the TS Dump File Name field. • bkupconfig-upgrade: Downloads the backup configuration information contained in the file specified in the Configuration File Name field from the FTP/SFTP/TFTP server to the switch. • bkupconfig-backup: Backs up the backup configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The backup file name is specified in the Configuration File Name field. • activeconfig-upgrade: Downloads the active configuration information contained in the file specified in the Configuration File Name field from the FTP/SFTP/TFTP server to the switch. • activeconfig-backup: Backs up the active configuration by uploading it from the switch to the FTP/SFTP/TFTP server. The active backup file name is specified in the Configuration File Name field.

Table 266. *Config/Image/Dump Control field descriptions (continued)*

Field	Description
SiFabric Mode	Select whether to use SI Fabric mode. The choices are non-si-Fabric-mode or si-Fabric-mode.
Image	Selects the image file slot to use in file transfer operations that pertain to the switch image files. The choices are image1, image2, and boot.
Configuration File Name	Name of the file to be used in get/put configuration action selected in the Action drop-down list.
Dump File Name	Name of the file to be used in put dump action selected in the Action drop-down list.
TS Dump File Name	Name of the file to be used in put tsdump action selected in the Action drop-down list.
Image File Name	Name of the file to be used in combination with the action selected in the Action drop-down list.
CA Certificate File Name	Name of the CA certificate file.
Host Certificate File Name	Name of the host certificate file.
Host Key File Name	Name of the host key file.
Public Key User Name	User name for the public key.
Public Key File Name	Name of the public key file.
Port for Transfer	Selects the transfer port to use for config/image/dump control operation: <ul style="list-style-type: none">• data: Data port• extm: External management port• mgt: Internal management port
HDFP Mode	Choose non-hdfp-mode or hdfp-mode.
Transfer Status	The transfer status of the selected Action.
Staggered Mode	Enable or disable staggered mode.

USB Copy

Device Console > Configure > Config/Image/Dump Control > USB Copy

Use the **USB Copy** tab to copy switch image, configuration, syslog and crash dump from switch flash to USB.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 267. *USB Copy field descriptions*

Field	Description
Operation	Select the operation: <ul style="list-style-type: none">● FromUSB – copy from USB to Flash● ToUSB – copy from Flash to USB
File Name	Name of the USB file to be used for copy operation.
Flash File	Select the flash file slot to use for copy operation, as follows: boot, image1, active, syslog, and crashdump.
Transfer Status	The transfer status of the copy operation.

Configuring Access Users

The following sections describe configuration tasks you can perform for access users:

- [“Configuring Access User” on page 338](#)

Configuring Access User

Device Console > Configure > Access User > Access User

Use the **Access User** tab to configure access user parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 268. *Access User field descriptions*

Field	Description
User Identifier	The user identification number.
Class of Service	The Class of Service level for the user.
User Name	The user name.
Password	The user password. Note that <encrypted> is displayed in this field.
State	The state indicating whether the user is enabled or not.

Configuring Layer 2 Protocols

The following sections describe configuration tasks you can perform for Layer 2 protocols:

- [“General Layer 2 Protocol Configuration” on page 339](#)

General Layer 2 Protocol Configuration

Device Console > **Configure** > **Layer 2** > **General** > *General*

Use the **General** tab to configure Layer 2 protocol settings.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 269. *General Layer 2 field descriptions*

Field	Description
Spanning Tree State	Enables or disables Spanning Tree State.
VLAN Auto STG	Enables or disables VLAN automatic STG assignment.
PVST+ Compatibility	Enables or disables PVST+ compatibility mode.
STP Loop Guard	Enables or disables STP Loop Guard.
MAC Notification	Enables or disables MAC notification.

Configuring Trunks

The following sections describe trunk configuration tasks you can perform:

- [“Trunk Hash Configuration” on page 340](#)
- [“Trunk Groups Configuration” on page 341](#)

Trunk Hash Configuration

Device Console > Configure > Layer 2 > Trunk > Trunk Hash

Trunk hash parameters are set globally for the switch. Select one or two parameters, to configure any of the following valid combinations:

- SMAC (source MAC only)
- DMAC (destination MAC only)
- SIP (source IP only)
- DIP (destination IP only)
- SIP + DIP (source IP and destination IP)
- SMAC + DMAC (source MAC and destination MAC)

The following table describes the fields of the **Trunk Hash** configuration tab.

Note: Some fields might not be available for the selected switch. Please disregard field descriptions that do not apply to your switch.

Table 270. *Trunk Hash field descriptions*

Field	Description
General Settings	
Ingress Port Hash	Enable or disable trunk hashing on the ingress port.
L4 Port Hash	Enable or disable trunk hashing on L4 port.
Local Preference Hash	Enable or disable local preference hashing.
Layer 2	
Source MAC Hash	Enable or disable trunk hashing on the source MAC.
Destination MAC Hash	Enable or disable trunk hashing on the destination MAC.
Layer 3	
Use L2 for IP Hash	Enable or disable using L2 for trunk hashing.
Source IP Hash	Enable or disable trunk hashing on the source IP.
Destination IP Hash	Enable or disable trunk hashing on the destination IP.

Table 270. *Trunk Hash field descriptions (continued)*

Field	Description
FCoE	
Source-id Hash	Enable or disable trunk hashing on the source ID.
Destination-id Hash	Enable or disable trunk hashing on the destination ID.
Cntag-id Hash	Enable or disable trunk hashing on the cntag ID.
Originator-id Hash	Enable or disable trunk hashing on the originator ID.
Responder-id Hash	Enable or disable trunk hashing on the responder ID.
Fabric-id Hash	Enable or disable trunk hashing on the fabric ID.

Trunk Groups Configuration

Device Console > **Configure** > **Layer 2** > **Trunk** > *Trunk Groups*

Trunk groups provide super-bandwidth, multi-link connections between switches or other trunk-capable devices. A trunk group is a group of ports that act together, combining their bandwidth to create a single, larger virtual link. For details, see your switch's Application Guide.

The following restrictions apply:

- Any physical switch port can belong to only one trunk group.
- Best performance is achieved when all ports in any given trunk group are configured for the same link parameters (speed, mode, flow control).
- Trunking from non-IBM, non-BLADE, and non-Lenovo switches must comply with Cisco® EtherChannel® technology.

The following table describes the fields of the **Trunk Groups** configuration tab.

Table 271. *Trunk Groups field descriptions*

Field	Description
Trunk Group	The number of the trunk group.
Ports	The physical ports in the trunk group.
State	Enables or disables the trunk group.

LACP Trunk Group Configuration

Device Console > **Configure** > **Layer 2** > **Trunk** > *LACP Trunk Groups*

LACP trunk groups provide aggregation of trunk lines to have super-bandwidth, multi-link connections between switches or other trunk-capable devices. An LACP trunk group is a group of trunks that act together, combining their bandwidth to create a single, larger virtual link. For details, see your switch's Application Guide.

The following table describes the fields of the **Trunk Groups** configuration tab.

Table 272. *LACP Trunk Groups field descriptions*

Field	Description
LACP Trunk Group	The LACP trunk group.
Admin Key	Admin Key.

Configuring LACP

The following sections describe LACP configuration tasks you can perform:

- “LACP General Configuration” on page 343
- “LACP Ports Configuration” on page 344

LACP General Configuration

Device Console > Configure > Layer 2 > LACP > LACP General

The switch supports the IEEE 802.3ad standard. At the core of the 802.3ad standard is Link Aggregation Control Protocol (LACP). This protocol lets you to group several physical ports into one logical port (LACP trunk group) with any switch that supports IEEE 802.3ad standard (LACP). You can configure the trunk groups manually, called the static trunks, as well as you can configure trunk group using the IEEE 802.3ad standard called the LACP trunks. If more than the maximum number of ports are configured in the LACP trunk, they are put in the standby state to replace any ports that fail.

LACP automatically determines which member links can be aggregated and then aggregates them. It provides for the controlled addition and removal of physical links for the link aggregation.

The following lists LACP modes:

- *off* (default): You can configure this port in to a regular static trunk group. When the system initializes, all ports are in off mode by default.
- *active*: The port is capable of forming an LACP trunk. This port initiates negotiation with the partner system port by sending LACP packets.
- *passive*: The port is capable of forming an LACP trunk. This port only responds to the negotiation requests sent from an LACP active port.

Each LACP *active* or *passive* port must have an admin key, an operational key, and an aggregator for LACP to start negotiation on these ports. You must assign the same admin key to a group of ports to make them aggregatable. Link Aggregation ID (LAG ID) is generated internally based on the operational key. All the aggregatable ports must have the same LAG ID. You can form an active LACP trunk group with all the ports that have the same LAG ID.

The following table describes the fields of the **LACP General** configuration tab.

Table 273. LACP General field descriptions

Field	Description
Actor System Priority	Defines the priority value. Lower numbers provide higher priority.
LACPDU Timeout	Defines the timeout period before invalidating LACP data from a remote partner. You can choose between short (3 seconds) or long (90 seconds) timeout periods.

LACP Ports Configuration

Device Console > Configure > Layer 2 > LACP > LACP Ports

Use the **LACP Ports** tab to configure individual ports for LACP operation.

Note: Some fields might not be available for the selected switch. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **LACP Ports** configuration tab.

Table 274. *LACP Ports field descriptions*

Field	Description
Port	The port number
Mode	The ports can be in the following modes: <ul style="list-style-type: none">● off: Using this option, you can turn LACP off for this port. You can use this port to manually configure a static trunk. All ports are in off mode by default.● active: Using this option, you can turn LACP on and set this port to active. Only active ports initiate negotiation with the partner system port by sending the LACP packets.● passive: Using this option, you can turn LACP on and set this port to passive mode. Passive ports do not initiate negotiation, but only respond to the negotiation requests from active ports.
Port Priority	Sets the priority value for the selected port. Lower numbers provide higher priority.
Administrative Key	Sets the admin key for this port. Only ports with the same admin key and oper key (operational state) can form an LACP trunk group.
Minimum links	Sets the minimum links for this port.
Suspend-individual	Sets whether the port is treated as an individual link when it does not get Link Aggregation Control Protocol Data Units (LACDUs) from the peer port. <ul style="list-style-type: none">● Select Individual to have the port be treated as a normal link.● Select Suspend to not have the port be treated as a normal link.

Configuring 802.1x

The following sections describe 802.1x configuration tasks you can perform using:

- “General 802.1x Configuration” on page 345
- “Global 802.1x Configuration” on page 345
- “Guest VLAN Configuration” on page 346
- “Port Configuration” on page 346

General 802.1x Configuration

Device Console > **Configure** > **Layer 2** > **802.1x** > *General*

Use the **General** tab to configure 802.1x status.

Table 275. *General 802.1x field descriptions*

Field	Description
Status	Enables or disables 802.1x

Global 802.1x Configuration

Device Console > **Configure** > **Layer 2** > **802.1x** > *Global*

Use the **Global** tab to configure 802.1x properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 276. *Global 802.1x field descriptions*

Field	Description
Authentication Mode	Sets the type of access control as follows: forceUnauth, auto, forceAuth
EAP-Request/Identity Quiet Period	Sets the wait-time interval before transmitting an EAP-Request/ Identity frame to the client after an authentication failure in the previous round of authentication.
Retransmission Period	Sets the wait time interval for an EAP-Response/Identity frame from the client before retransmitting an EAP-Request/Identity frame.
Supplicant Timeout	Sets the wait-time interval for an EAP-Response packet from the client before retransmitting the EAP-Request packet to the authentication server.
Server Authentication Request Timeout	Sets the wait-time interval for a response from the RADIUS server before declaring an authentication timeout.
Maximum Requests	Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the client.

Table 276. *Global 802.1x field descriptions*

Field	Description
Re-authentication Period	Sets the wait-time interval before re-authenticating a client.
Re-authentication Status	Sets the re-authentication status (on or off).
Dynamic VLAN Assignment	Sets Dynamic VLAN assignment (on or off).

Guest VLAN Configuration

Device Console > Configure > Layer 2 > 802.1x > Guest VLAN

Use the **Guest VLAN** tab to configure 802.1x guest VLANs.

Table 277. *Guest VLAN field descriptions*

Field	Description
VLAN	VLAN number of the Guest VLAN.
Status	Enables or disables the Guest VLAN.

Port Configuration

Device Console > Configure > Layer 2 > 802.1x > Port

Use the **Port** tab to configure 802.1x port parameters.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 278. *Port 802.1x field descriptions*

Field	Description
Port	Port Index
Authentication Mode	Sets the access control type as follows: forceUnauth, auto, forceAuth
EAP-Request/Identity Quiet Period	Sets the wait period before transmitting an EAP-Request/Identity frame to the client after an authentication failure in the previous round of authentication.
Retransmission Period	Sets the wait period for an EAP-Response/Identity frame from the client before retransmitting an EAP-Request/Identity frame.
Supplicant Timeout	Sets the wait period for an EAP-Response packet from the client before retransmitting the EAP-Request packet to the authentication server.

Table 278. *Port 802.1x field descriptions*

Field	Description
Server Authentication Request Timeout	Sets the wait period for a response from the RADIUS server before declaring an authentication timeout.
Maximum Requests	Sets the maximum number of times the authenticator retransmits an EAP-Request packet to the client.
Re-authentication Period	Sets the wait period before re-authenticating a client when periodic re-authentication is enabled.
Re-authentication Status	Sets the re-authentication status (on or off).
Dynamic VLAN Assignment	Sets Dynamic VLAN assignment (on or off).

Configuring MSTP and RSTP

The following sections describe the configuration tasks you can perform to MSTP and RSTP:

- [“MSTP/RSTP Configuration” on page 348](#)

MSTP/RSTP Configuration

Device Console > Configure > Layer 2 > MSTP/RSTP > MSTP

Use MSTP tab to configure and manage parameters for Multiple Spanning Tree Protocol (MSTP) or to change the spanning tree mode.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **MSTP** configuration tab.

Table 279. *MSTP and RSTP field descriptions*

Field	Description
Region's Name	Sets the region name for MST.
MST Region Revision/MST Region Version	Sets the region revision being used for MST.
Maximum Hop Count	Sets the maximum hop count value for the MST.
Spanning Tree Mode	Specifies whether MSTP, RSTP, or PVRST is being used.

Configuring CIST

The following sections describe the configuration tasks you can perform to Common and Internal Spanning Tree (CIST):

- “CIST Bridge Configuration” on page 349
- “CIST Port Configuration” on page 350

CIST Bridge Configuration

Device Console > Configure > Layer 2 > CIST > CIST Bridge

Use the CIST Bridge tab to configure CIST bridge parameters.

The following table describes the fields of the **CIST Bridge** configuration tab.

Table 280. *CIST Bridge field descriptions*

Field	Description
Bridge Priority	Sets the CIST bridge priority value.
Bridge Root Maximum Age	Sets the time (in seconds) for the maximum age of a CIST bridge root.
Bridge Root Forward Delay	Sets the time (in seconds) for a CIST bridge root forward delay.
Virtual LANs	Defines a list of VLANs associated with the CIST.

CIST Port Configuration

Device Console > Configure > Layer 2 > CIST > CIST Port

Use the CIST Port tab to configure CIST bridge port parameters.

The following table describes the fields of the **CIST Port** configuration tab.

Note: Some fields might not be available for the selected switch. Please disregard field descriptions that do not apply to your switch.

Table 281. *CIST Port field descriptions*

Field	Description
Port	Specifies the CIST bridge port being configured.
Priority	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A value of 0 indicates that the default cost is computed for an auto negotiated link speed.
Spanning Tree State	Enable or disables STP for this port.
Hello Time	Sets the Hello interval in seconds.
PVST Protection	Enables or disables PVST Protection for this port.

Configuring Spanning Tree Protocol

The following sections describe the configuration tasks you can perform to Spanning Tree Protocol (STP):

- [“Spanning Tree Configuration” on page 351](#)
- [“STP Groups Configuration” on page 353](#)
- [“STG Port Configuration” on page 354](#)

Spanning Tree Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > Spanning Tree

Use the Spanning Tree tab to configure STP properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **Spanning Tree** configuration tab.

Table 282. *Spanning Tree Protocol field descriptions*

Field	Description
Protocol Type	Displays the version of Spanning Tree Protocol, as follows: <ul style="list-style-type: none">• decLb100(2) indicates the DEC LANbridge 100 Spanning Tree Protocol• ieee8021d(3) indicates IEEE 802.1d
Priority	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority.
Last Topology Change	The time since a topology change was last detected by the bridge. Time is displayed in days:hours:minutes:seconds.
Total Topology Changes	Displays total number of topology changes that were detected by the bridge.
Root Identifier	The bridge identifier of the root of the spanning tree. This value is used as the Root Identifier parameter in all the configuration bridge protocol data units (PDU) that were originated by this node.
Root Cost	The cost of the path to the root as seen from this bridge.
Root Port	The number of the port that offers the lowest cost path from this bridge to the root bridge.
Maximum Age	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it re-configures the STP network.

Table 282. *Spanning Tree Protocol field descriptions*

Field	Description
Hello Interval	<p>Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value.</p> <p>The value is entered in units of 1/100 of a second. Therefore, the default value of 2 seconds is displayed in this field as 200. The time is measured when the bridge is the root of the spanning tree (or trying to become so).</p>
Forwarding Delay	<p>The time for a port to change its spanning state when moving to a Forwarding state. Forwarding Delay determines how long the port stays in the Listening and Learning states that precede the Forwarding state. This value is also used for aging all dynamic entries in the Forwarding Database, after a topology change. Forwarding Delay is displayed in units of 1/100 of a second.</p> <p>The bridge uses this value, unless the bridge becomes the root. In that case, Forwarding Delay becomes the value that all bridges, including this one, use when this bridge becomes the root.</p>
Root Maximum Age	<p>Sets the Maximum bridge age. When this bridge is acting as the root, all bridges use Root Maximum Age for Maximum Age: 6 to 40 seconds. The value is entered into this field in units of 1/100 of a second. Therefore, the default value of 20 seconds is displayed in this field as 2000. Maximum Age is an integer: an error may be returned if the input value is not a whole number.</p>
Root Hello Interval	<p>Sets the value that all bridges use for Hello Interval when this bridge is acting as the root: 1 to 10 seconds.</p> <p>The value is entered into this field in units of 1/100 of a second. Therefore, the default value of 2 seconds is displayed in this field as 200. Hello Root Interval is an integer: an error may be returned if the input value is not a whole number.</p>
Root Forwarding Delay	<p>Sets the state change delay. When this bridge is acting as the root, all bridges use Root Forwarding Delay for Forwarding Delay: 4 to 30 seconds.</p> <p>The value is entered in units of 1/100 of a second. Therefore, the default value of 15 seconds is displayed in this field as 1500. Root Forwarding Delay is an integer: an error may be returned if the input value is not a whole number.</p>
Aging Time	<p>Sets the time-out period, in seconds, for the dynamically-learned forwarding information.</p>

Table 282. *Spanning Tree Protocol field descriptions*

Field	Description
Hold Time	The time value that determines the interval length during which no more than two Configuration bridge PDUs shall be transmitted by this node, in units of 1/100 of a second.
Uplink Fast	Enables or disables Fast Uplink Convergence, which provides rapid Spanning Tree convergence to an upstream switch during failover. Note: When enabled, this feature increases bridge priorities to 65500 for all STGs and path cost by 3000 for all external STP ports.
Station Update Rate	Configures the station update rate, in packets per second.
BPDU Guard	Enables or disables BPDU guard, to avoid spanning-tree loops on ports with Port Fast Forwarding enabled.

STP Groups Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > STP Groups

Use the STP Groups tab to configure and maintain Spanning Tree Groups.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **STP Groups** configuration tab.

Table 283. *STP Groups field descriptions*

Field	Description
Index	The Spanning Tree Group (STG) index number.
State	The current state (on or off) of Spanning Tree Protocol for the Spanning Tree Group.
Priority	Configures the bridge priority. The bridge priority parameter controls which bridge on the network is the STP root bridge. To make this switch the root bridge, configure the bridge priority lower than all other switches and bridges on your network. The lower the value, the higher the bridge priority. The range is 0 to 65535, and the default is 32768 for top of rack switches and 61440 for embedded switches.
Hello Time	Configures the bridge hello time. The hello time specifies how often the root bridge transmits a configuration bridge protocol data unit (BPDU). Any bridge that is not the root bridge uses the root bridge hello value. The range is 1 to 10 seconds, and the default is 2 seconds.

Table 283. STP Groups field descriptions

Field	Description
Forward Delay	Configures the bridge forward delay parameter. The forward delay parameter specifies the amount of time that a bridge port has to wait before it changes from the listening state to the learning state and from the learning state to the forwarding state. The range is 4 to 30 seconds, and the default is 15 seconds.
Maximum Age	Configures the bridge maximum age. The maximum age parameter specifies the maximum time the bridge waits without receiving a configuration bridge protocol data unit before it re configures the STP network. The range is 6 to 40 seconds, and the default is 20 seconds.
VLANs	Displays the VLANs in the Spanning Tree Group.

STG Port Configuration

Device Console > Configure > Layer 2 > Spanning Tree Protocol > STG Port

Use the STG Port tab to configure and manage STG ports.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **STG Port** configuration tab.

Table 284. STG Port field descriptions

Field	Description
Group Index	The Spanning Tree Group (STG) number.
Port	The port number that is associated with the Spanning Tree Group.
Port State	Shows the STP port state information as either on or off.
Priority	Configures the port priority. The port priority helps determine which bridge port becomes the designated port. In a network topology that has multiple bridge ports connected to a single segment, the port with the lowest port priority becomes the designated port for the segment.
Path Cost	Configures the port path cost. The port path cost is used to help determine the designated port for a segment. Generally speaking, the faster the port, the lower the path cost. A value of 0 indicates that the default cost is computed for an auto negotiated link speed.

Configuring Forwarding Database

The following sections describe the configuration tasks you can perform to Forwarding Database (FDB):

- [“FDB General Configuration” on page 355](#)
- [“FDB Static Configuration” on page 356](#)
- [“FDB Static Multicast Configuration” on page 356](#)

FDB General Configuration

Device Console > Configure > Layer 2 > Forwarding Database > *FDB General*

Use the FDB General tab to configure the aging value for FDB entries.

FDB Static Configuration

Device Console > Configure > Layer 2 > Forwarding Database > FDB Static

Use the **FDB Static** tab to configure static entries in the FDB.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **FDB Static** configuration tab.

Table 285. *Forwarding Database Static field descriptions*

Field	Description
Index	Configures the FDB entry number.
MAC Address	Configures the MAC address of the static FDB entry.
VLAN	Configures the VLAN number of the static FDB entry.
Port	Configures the port number of the static FDB entry. This field applies only if the Type is set to port.
Type	Sets the type (port, trunk, adminkey).
Trunk	Configures the trunk number. This field applies only if the Type is set to trunk.
Adminkey	Configures the LACP adminkey . This field applies only if the Type is set to adminkey.

FDB Static Multicast Configuration

Device Console > Configure > Layer 2 > Forwarding Database > Static Multicast

Use the **Static Multicast** tab to configure FBD static multicast entries.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 286. *FDB Static Multicast field descriptions*

Field	Description
Index	Configures the FDB entry number.
MAC Address	Configures the MAC address of the static multicast FDB entry.
VLAN	Configures the VLAN number of the static multicast FDB entry.
Ports	Configures the port numbers of the static multicast FDB entry.

Configuring Virtual Link Aggregation Groups

The following sections describe the configuration tasks associated with Virtual Link Aggregation Groups (VLAGs):

- [“General Configuration” on page 357](#)
- [“Health Check Configuration” on page 358](#)
- [“Trunk Configuration” on page 358](#)
- [“LACP Configuration” on page 358](#)
- [“Inter-Switch Link \(ISL\) Configuration” on page 359](#)

General Configuration

Device Console > Configure > Layer 2 > VLAG > General

Use the **General** tab to configure general VLAG properties.

Table 287. *VLAG General field descriptions*

Field	Description
System Priority	Sets the VLAG priority for the switch used for election of Primary and Secondary VLAG switches.
Tier ID	Sets the VLAG Tier ID.
StartUp Delay Interval	Sets the VLAG startup Delay Timer interval.
Global State	Enables or disables VLAG globally on the switch.
Auto Recovery Interval	Sets the vLAG Auto Recovery Timer interval. The Timer prevents all vLAG ports from staying in <code>ErrDisabled</code> state when booting two vLAG switches but one cannot be up.

Health Check Configuration

Device Console > Configure > Layer 2 > VLAG > Health Check

Use the Health Check tab to set VLAG health check parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch. .

Table 288. *VLAG Health Check field descriptions*

Field	Description
Peer IP Address	Sets the IP address of the peer switch used for health checks.
Peer IPv6 Address	Sets the IPV6 address of the peer switch used for health checks.
Connect Retry Interval	Sets the interval at which the retry attempt will be made to connect to the peer.
Attempts	Sets the number of keep-alive attempts.
Interval	Sets the interval between keep-alive messages sent during health checks.

Trunk Configuration

Device Console > Configure > Layer 2 > VLAG > Trunk

Use the **Trunk** tab to configure VLAG trunk groups.

Table 289. *VLAG Trunk field descriptions*

Field	Description
Trunk Group	Sets the trunk group as VLAG.
State	Enables or disables VLAG for this trunk group.

LACP Configuration

Device Console > Configure > Layer 2 > VLAG > LACP

Use the **LACP** tab to configure LACP trunks for VLAG.

Table 290. *vLAG LACP field descriptions*

Field	Description
Adminkey	Sets the LACP admin key as VLAG.
State	Enables or disables VLAG for this LACP admin key.

Inter-Switch Link (ISL) Configuration

Device Console > Configure > Layer 2 > VLAG > ISL

Use the **ISL** tab to configure Inter-Switch Links for VLAG.

Table 291. *VLAG ISL field descriptions*

Field	Description
Trunk	Sets the trunk group for the VLAG Inter-Switch Link (ISL).
Admin Key	Sets the LACP <i>admin key</i> for the VLAG Inter-Switch Link.

Configuring Hot Links

The following sections describe the configuration tasks associated with Hot Links:

- “Hot Links General Configuration” on page 360
- “Hot Links Triggers Configuration” on page 360

Hot Links General Configuration

Device Console > Configure > Layer 2 > Hot Links > General Configuration

Use the General Configuration tab to configure general Hot Links properties.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Hot Links** General Configuration tab.

Table 292. *Hot Links General field descriptions*

Field	Description
Hot Links	Enables or disables Hot Links.
FDB Update	Enables or disables Hot Links FDB Update.
FDB Update Rate	Sets FDB update rate in packets per second.
BPDU Flood	Enables or disables Hot Links BPDU Flooding.

Hot Links Triggers Configuration

Device Console > Configure > Layer 2 > Hot Links > Triggers

Use the Triggers tab to configure Hot Links triggers.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Triggers** tab.

Table 293. *Hot Links Triggers field descriptions*

Field	Description
Trigger Id	The trigger identifier.
Name	The trigger name.
State	Enables or disables Trigger state.
Preemption State	Enables or disables Preemption state.
Forward Delay	Forward Delay setting, in seconds.
Master Port	Selects the master interface port number.

Table 293. *Hot Links Triggers field descriptions*

Field	Description
Master Trunk	Sets the master interface trunk number.
Master Adminkey	Sets the master interface <i>admin key</i> number.
Backup Port	Selects the backup interface port number.
Backup Trunk	Sets the backup interface trunk number.
Backup Adminkey	Sets the backup interface <i>admin key</i> number.

Configuring Virtual LANs

The following sections describe the configuration tasks associated with Virtual LANs (VLANs):

- [“VLAN Memberships Configuration” on page 362](#)
- [“Private VLAN Configuration” on page 363](#)
- [“Private VLAN Configuration” on page 363](#)
- [“VMAP Configuration for Non-Server Ports” on page 365](#)
- [“VMAP Configuration for Server Ports” on page 365](#)
- [“VMAP Configuration for All Ports” on page 365](#)

VLAN Memberships Configuration

Device Console > Configure > Layer 2 > Virtual LANs > VLAN Memberships

Use Virtual Local Area Networks (VLANs) to split up groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among logical segments.

Note: All ports must belong to at least one VLAN. Any port which is removed from a VLAN and which is not a member of any other VLAN is automatically added to default VLAN 1. A port cannot be removed from VLAN 1 if the port has no membership in any other VLAN. Also, a port cannot be part of more than one VLAN unless it is configured for VLAN tagging.

Use the VLAN Memberships General tab to configure general VLAN properties.

The following table describes the fields of the **VLAN Memberships** configuration tab.

Table 294. *VLAN Memberships field descriptions*

Field	Description
VLAN	The VLAN identification number. The number can be set when a VLAN is inserted or modified.
Name	The VLAN name. The default is none, except for the first VLAN name, which has a default name of Default VLAN, and for the last VLAN name, which has a default name of Mgmt VLAN.
Ports	The ports in the VLAN. The default is none except for VLAN 1. By default, all ports belong to VLAN 1. To select the ports belonging to the VLAN group by Click Ports... or double-click on the ports column in the table to select the ports belonging to the VLAN group.
State	Enables or disables a VLAN.

Table 294. *VLAN Memberships field descriptions (continued)*

Field	Description
Virtual Ports	The UFP virtual ports assigned to this VLAN.
Spanning Tree Group	The Spanning Tree Group (STG) assigned to the VLAN. To choose an STG, double-click on the field. Then right-click to select Browse...

Private VLAN Configuration

Device Console > Configure > Layer 2 > Virtual LANs > Private VLAN

Use this feature to configure Private VLANs.

Note: This tab or some of the fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 295. *Private VLAN field descriptions*

Field	Description
VLAN	The VLAN ID configured as private VLAN.
VLAN Type	The VLAN type, as follows: none, primary, isolated, community
Primary VLAN	Sets Private VLAN mapping between a primary and a secondary VLAN.
State	Sets whether the private VLAN is enabled or disabled.

Protocol VLAN Configuration

Device Console > Configure > Layer 2 > Virtual LANs > Protocol VLAN

Use this feature to configure Protocol VLANs (PVLANS).

Table 296. *Protocol VLAN field descriptions*

Field	Description
VLAN	The VLAN ID configured as Protocol VLAN.
Protocol VLAN Identifier	Sets the PVLAN number.
Frame Type	Sets the frame type for the selected protocol.
Ether Type	Sets the ether type for the selected protocol.
Priority	Sets the protocol priority.
State	Enables or disables the selected protocol on the VLAN.

Table 296. *Protocol VLAN field descriptions*

Field	Description
Ports	List of ports belongs to the selected protocol on this VLAN.
Predefined Protocol	Sets the predefined protocol.

VMAP Configuration for Non-Server Ports

Device Console > Configure > Layer 2 > Virtual LANs > VMAP for Non Server Ports

Use this feature to add or remove a VLAN Map to non-server ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

Table 297. *VMAP for Non-Server Ports field descriptions*

Field	Description
VLAN ID	The VLAN <u>ID</u> .
VMAPs	List of VLAN Maps

VMAP Configuration for Server Ports

Device Console > Configure > Layer 2 > Virtual LANs > VMAP for Server Ports

Use this feature to add or remove a VLAN Map to server ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP for Server Ports** configuration tab.

Table 298. *VMAP for Server Ports field descriptions*

Field	Description
VLAN ID	The VLAN Id.
VMAPs	List of VLAN Maps

VMAP Configuration for All Ports

Device Console > Configure > Layer 2 > Virtual LANs > VMAP for All Ports

Use this feature to add or remove a VLAN Map to External and Internal ports.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP for All Ports** configuration tab.

Table 299. *VMAP for All Ports field descriptions*

Field	Description
VLAN ID	VLAN identifier.
VMAPs	List of VLAN Maps

Configuring Link Layer Discovery Protocol (LLDP)

The following sections describe the configuration tasks associated with LLDP:

- “LLDP General Configuration” on page 366
- “LLDP Port Configuration” on page 366
- “Port Global TLV State” on page 367

LLDP General Configuration

Device Console > Configure > Layer 2 > LLDP > General

Use the LLDP General tab for enabling or disabling LLDP state and configuring general parameters.

Note: This tab or some fields might not be available for the selected switch type. Please disregard this tab or field descriptions that do not apply to your switch.

Table 300. *LLDP General field descriptions*

Field	Description
LLDP State	Enable or disable LLDP state.
Transmission Interval	Sets the message transmission interval in seconds.
Holdtime Multiplier	Sets the message hold time multiplier.
Notification Interval	Sets the trap notification interval, in seconds.
Transmission Delay	Sets the message transmission delay, in seconds.
Reinitialization Delay	Sets the re-initialization delay, in seconds.

LLDP Port Configuration

Device Console > Configure > Layer 2 > LLDP > LLDP Port

Use the LLDP Port tab to enable or disable EDCP TLV State of the ports.

Note: This tab is available only for LLDP capable switches. Some of the columns might not appear on your switch. Please disregard this information if it does not apply to your switch.

Table 301. *LLDP Port field descriptions*

Field	Description
Port	Port number.
Admin Status	Enables or disables the admin status of the LLDP port.
SNMP Trap Notification	Enables or disables the SNMP trap notification state of the LLDP port.

Table 301. *LLDP Port field descriptions*

Field	Description
TLV State	
Port Description	Enables or disables Port Description TLV state of the LLDP port.
System Name	Enables or disables System Name TLV state of the LLDP port.
System Description	Enables or disables System Description TLV state of the LLDP port.
System Capabilities	Enables or disables System Capabilities TLV state of the LLDP port.
Management Address	Enables or disables Management Address TLV state of the LLDP port.
Port VLAN ID	Enables or disables Port VLAN ID TLV state of the LLDP port.
Port and Protocol VLAN ID	Enables or disables Port and Protocol VLAN ID TLV state of the LLDP port.
VLAN Name	Enables or disables VLAN Name TLV state of the LLDP port.
Protocol Identity	Enables or disables Protocol Identity TLV state of the LLDP port.
MAC/PHY Configuration	Enables or disables MAC/PHY Configuration/Status TLV state of the LLDP port.
Power Via MDI	Enables or disables Power Via MDI TLV state of the LLDP port.
Link Aggregation	Enables or disables Link Aggregation TLV state of the LLDP port.
Maximum Frame Size	Enables or disables Maximum Frame Size TLV state of the LLDP port.
DCBX	Enables or disables DCBX TLV state of the LLDP port.
QCN	Enables or disables QCN TLV state of the LLDP port.

Port Global TLV State

Device Console > **Configure** > **Layer 2** > **LLDP** > *Port Global TLV State*

Use the **Port Global TLV State** tab to set LLDP port's TLV state.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 302. *Port Global TLV State field descriptions*

Field	Description
Port	The port index.
Global TLV State	Select the global TLV state for the port.

Configuring Failover

The following sections describe the tasks associated with Failover configuration:

- “General Configuration” on page 369
- “Triggers Configuration” on page 369

General Configuration

Device Console > Configure > Layer 2 > Failover > General

Use the **General** tab to enable or disable Layer 2 Failover.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 303. *Failover General field descriptions*

Field	Description
Failover State	Turns Failover on or off.
VLAN State	Turns the VLAN state on or off.

Triggers Configuration

Device Console > Configure > Layer 2 > Failover > Trigger

Use the **Trigger** tab to set Failover Triggers.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard information if it does not apply to your switch.

Table 304. *Failover Triggers field descriptions*

Field	Description
Trigger Identifier	The Failover trigger identifier.
State	Enables or disables the trigger state.
Fabric Path Monitor	Enables or disables failover fabric path monitoring.
Limit	Sets the minimum number of operational links allowed within each trigger before the trigger initiates a failover event.
	Manual Monitor (MM)
MM Port	Adds the selected port to the Manual Monitor port configuration.
MM Trunk	Adds a trunk group to the Manual Monitor port configuration.
MM Key	Adds an LACP admin key to the Manual Monitor.
	Manual Control (MC)

Table 304. *Failover Triggers field descriptions*

Field	Description
MC Port	Adds the selected port to the Manual Control port configuration.
MC Trunk	Adds a trunk group to the Manual Control port configuration.
MC Key	Adds an LACP admin key to the Manual Control.
MC vPort	Adds the selected virtual port to the Manual Control port configuration.

Configuring Active Multipath Protocol (AMP)

The following sections describe the configuration tasks associated with Active Multipath Protocol (AMP):

- [“General Configuration” on page 371](#)
- [“Group Configuration” on page 371](#)

General Configuration

Device Console > Configure > Layer 2 > AMP > General

Use the **General** tab to configure AMP properties.

Table 305. *AMP General field descriptions*

Field	Description
AMP State	Globally enables or disables Active Multipath Protocol (AMP).
Switch Type	Sets the active multipath switch type to access or aggregator.
Switch Priority	Sets the AMP priority for the switch. A lower priority value denotes a higher precedence. It is recommended that aggregator switches be configured with lower priority values than access switches.
Keep Alive Interval	Sets the time interval between AMP keep alive messages.
Keep Alive Timeout Count	Sets the timeout count, which is the number of unreceived keep-alive packets the switch waits before declaring a timeout due to loss of connectivity with the peer.
Aggregator Link Type	Sets the Aggregator Link Type as follows: port, trunk, lacp
Aggregator Link Id	Sets the consistent value for Aggregator Link Type.

Group Configuration

Device Console > Configure > Layer 2 > AMP > Group

Use the **Group** tab to configure AMP groups.

Table 306. *AMP Group field descriptions*

Field	Description
Index	AMP Group Index.
State	Enables or disables AMP Group.
First Link Type	Sets First AMP Link Type as follows: none, port, trunk, lacp

Table 306. *AMP Group field descriptions*

Field	Description
First Link Id	Sets the consistent value for First Link type.
Second Link Type	Sets Second AMP Link Type as follows: none, port, trunk, lacp
Second Link Id	Sets the consistent value for Second Link type.

Configuring Edge Control Protocol (ECP)

The following sections describe the configuration tasks associated with ECP:

- [“ECP General Configuration” on page 373](#)

ECP General Configuration

Device Console > Configure > Layer 2 > ECP > General

Use the **General** tab to configure ECP properties.

Note: This tab is available only for ECP-capable switches. Please disregard this information if it does not apply to your switch.

Table 307. *ECP General field descriptions*

Field	Description
Retransmission Interval	Sets ECP retransmission interval in milliseconds.

Configuring IP Interfaces

The following sections describe the configuration tasks associated with IP interfaces:

- “IP General Configuration” on page 374
- “IP Interfaces Configuration” on page 374
- “IP Forwarding Configuration” on page 375
- “Network Filters Configuration” on page 375
- “Loopback Interfaces Configuration” on page 376
- “Static ARP Configuration” on page 376

IP General Configuration

Device Console > Configure > Layer 3 > IP > General

Use the **General** tab to set the Router ID.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

IP Interfaces Configuration

Device Console > Configure > Layer 3 > IP > Interfaces

Use the IP Interfaces tab to configure IP Interfaces.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IP Interfaces** tab.

Table 308. *IP Interfaces field descriptions*

Field	Description
Index	Index number of the interface.
MTU	Sets the maximum transmission unit (MTU) for the interface.
Admin Status	Sets the administrative status (up, down, testing).
Port Name	Sets the port name (alias).
IP Interface	The IP interface number. This number can be set when an IP interface is inserted.
Address	The IP address of the interface in IPv4 interfaces.
Mask	The subnet mask of the interface in IPv4 interfaces.
VLAN	The VLAN associated with the interface. Each interface can belong to one VLAN, although any VLAN can have multiple IP interfaces associated with it.

Table 308. *IP Interfaces field descriptions*

Field	Description
State	Enables or disables the state of the interface.
Boot Relay	Enables or disables the BOOTP relay.

IP Forwarding Configuration

Device Console > **Configure** > **Layer 3** > **IP** > *Forwarding*

Use the Forwarding tab to configure IP Forwarding.

Table 309. *IP Forwarding field descriptions*

Field	Description
Forwarding State	Sets the forwarding state (on or off).
Directed Broadcasts	Enables or disables directed broadcasts.
ICMP Redirects	Enables or disables ICMP Redirects.
ICMPv6 Redirects	Enables or disables ICMPv6 Redirects.

Network Filters Configuration

Device Console > **Configure** > **Layer 3** > **IP** > *Network Filters*

Use this tab to configure network filters.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 310. *Network Filters field descriptions*

Field	Description
Index	The index number of the network filter.
Address	Sets the IP address.
Mask	Sets the IP subnet mask.
State	Enables or disables the network filter.

Loopback Interfaces Configuration

Device Console > Configure > Layer 3 > IP > Loopback Interfaces

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 311. *Loopback Interfaces field descriptions*

Field	Description
Index	The index number of the loopback interface.
Address	Sets the IP address.
Mask	Sets the IP subnet mask.
State	Enables or disables the loopback interface.

Static ARP Configuration

Device Console > Configure > Layer 3 > IP > Static ARP

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 312. *Static ARP field descriptions*

Field	Description
Index	The index number of the static ARP entry.
Interface	Sets the IP interface for the entry.
Address	Sets the IP address of the entry.
MAC Address	Sets the MAC address for the entry.

Floating IPv4 Configuration

Device Console > Configure > Layer 3 > IP > Floating IP

Device Console > Configure > Layer 3 > IP > Floating IP > Floating IPv4

Use this tab to configure floating IPv4 entries.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 313. *Floating IPv4 field descriptions*

Field	Description
IPv4 Address	Sets the floating management IPv4 address.
IPv4 Mask	Sets the floating management IPv4 subnet mask.

Floating IPv6 Configuration

Device Console > Configure > Layer 3 > IP > Floating IP > Floating IPv6

Use this tab to configure floating IPv6 entries.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 314. *Floating IPv6 field descriptions*

Field	Description
IPv6 Address	Sets the floating management IPv6 address.
IPv6 Prefix Length	Sets the floating management IPv4 prefix length.

IPv4 Interface Configuration

Device Console > Configure > Layer 3 > IP > Management Interfaces > IPv4

Use this tab to configure IPv4 interfaces.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 315. *IPv4 field descriptions*

Field	Description
MAC Address	MAC address of the unit.
Address	Sets the management IPv4 address of the interface.
Mask	Sets the management IPv4 subnet mask of the interface.
State	Sets the state of the management IPv4 interface.
DHCP State	Sets the DHCP state of the management IPv4 interface.

IPv6 Interface Configuration

Device Console > Configure > Layer 3 > IP > Management Interfaces > IPv6

Use this tab to configure IPv6 interfaces.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 316. *IPv6 field descriptions*

Field	Description
MAC Address	MAC address of the unit.
Address	Sets the management IPv6 address of the interface.

Table 316. *IPv6 field descriptions*

Field	Description
Prefix Length	Sets the management IPv6 prefix length of the interface.
State	Sets the state of the management IPv6 interface.

Stacks Unit Management Interface Configuration

Device Console > Configure > Layer 3 > IP > Stacks Unit Management Interface

Use this tab to configure stacks unit management interfaces.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 317. *Stacks Unit Management Interface field descriptions*

Field	Description
MAC Address	MAC address of the unit.
Address	Sets the management IPv6 address of the interface.
Mask	Sets the subnet mask of the interface.
State	Sets the state of the interface.
DHCP State	Sets the DHCP state of the interface.

Configuring Gateways

The following sections describe the configuration tasks associated with gateways:

- “Gateways Configuration” on page 379

Gateways Configuration

Device Console > Configure > Layer 3 > Gateways > Gateways

Use the Gateways tab to configure gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Gateways** tab.

Table 318. *Gateways field descriptions*

Field	Description
Index	The gateway index number.
IP Address	Sets the IPv4 address of the default gateway.
Interval	Sets the interval between ping attempts.
Retries	Sets the number of failed attempts to declare the default gateway down.
State	Enables or disables the default gateway.
ARP	Enables or disables the Address Resolution Protocol health checks.

IPv4 Data Gateway Configuration

Device Console > Configure > Layer 3 > Gateways > Data Gateways > IPv4

Use the **IPv4** tab to configure IPv4 data gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IPv4** tab.

Table 319. *IPv4 field descriptions*

Field	Description
Index	The gateway index number.
IP Address	Sets the IPv4 address of the default gateway.
Interval	Sets the interval between ping attempts.
Retries	Sets the number of failed attempts to declare the default gateway down.

Table 319. *IPv4 field descriptions*

Field	Description
State	Enables or disables the default gateway.
ARP	Enables or disables the Address Resolution Protocol health checks.

IPv6 Data Gateway Configuration

Device Console > Configure > Layer 3 > Gateways > Data Gateways > IPv6

Use the **IPv6** tab to configure IPv6 data gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IPv6** tab.

Table 320. *IPv6 field descriptions*

Field	Description
Index	The gateway index number.
IP Address	Sets the IPv6 address of the default data gateway.
State	Enables or disables the default data gateway.

IPv4 Management Gateway Configuration

Device Console > Configure > Layer 3 > Gateways > Management Gateways > IPv4

Use the **IPv4** tab to configure IPv4 management gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IPv4** tab.

Table 321. *IPv4 field descriptions*

Field	Description
MAC Address	The gateway MAC address.
IP Address	Sets the IPv4 address of the default management gateway.
Interval	Sets the interval between ping attempts.
Retries	Sets the number of failed attempts to declare the default management gateway down.
State	Enables or disables the default management gateway.

IPv6 Management Gateway Configuration

Device Console > Configure > Layer 3 > Gateways > Management Gateways > IPv6

Use the **IPv6** tab to configure IPv6 management gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **IPv6** tab.

Table 322. *IPv6 field descriptions*

Field	Description
MAC Address	The gateway MAC address.
IP Address	Sets the IPv6 address of the default management gateway.
State	Enables or disables the default management gateway.

Stacks Unit Management Gateway Configuration

Device Console > Configure > Layer 3 > IP > Stacks Unit Management Gateways

Use this tab to configure stacks unit management gateways.

Note: This tab is available only for certain switch types. In addition, some fields might not be available for the selected switch type. Please disregard the information if it does not apply to your switch.

Table 323. *Stacks Unit Management Gateway field descriptions*

Field	Description
MAC Address	MAC address of the unit.
Address	Sets the management IPv6 address of the interface.
Interval	Sets the interval between ping attempts.
Retries	Sets the number of failed attempts to declare the gateway DOWN.
State	Sets the state of the default gateway.

Configuring Routes

The following sections describe the tasks associated with Routes configuration:

- “General Configuration” on page 382
- “IPv4 Static Routes Configuration” on page 382
- “IPMC Ports Configuration” on page 383
- “IPMC Trunks Configuration” on page 384
- “IPMC Adminkeys Configuration” on page 384

General Configuration

Device Console > Configure > Layer 3 > Routes > General

Use the **General** tab to configure Routes health check and hash parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 324. *Routes General Configuration field descriptions*

Field	Description
Ping Interval for ECMP Health Check	Sets the ECMP health-check ping interval, in seconds.
Retries for ECMP Health Check	Sets the number of ECMP health-check retries.
ECMP Hash	Sets ECMP hashing parameters: dipsip, sip
Gateway Health Check	Enables or disables Gateway health-check functionality.

IPv4 Static Routes Configuration

Device Console > Configure > Layer 3 > Routes > IP Static Routes

Device Console > Configure > Layer 3 > Routes > IPv4 Static Routes

Use the **IP Static Routes** or **IPv4 Static Routes** tab to configure IPv4 Static Routes.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 325. *IPv4 Static Routes Configuration field descriptions*

Field	Description
Index	The index of the static routing table.
Destination IP	Sets the destination IP address for this route.
Subnet Mask	Sets the subnet mask for this route.

Table 325. IPv4 Static Routes Configuration field descriptions

Field	Description
Gateway	Sets the IP address of the gateway for this route.
Route IP Interface	Sets the IP interface for this route.

IPv6 Static Routes Configuration

Device Console > Configure > Layer 3 > Routes > IPv6 Static Routes

Use the **IPv6 Static Routes** tab to configure IPv6 Static Routes.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 326. IPv6 Static Routes Configuration field descriptions

Field	Description
Index	The index of the static IPv6 routing table.
Dest IPv6 Address	Sets the destination IPv6 address for this route.
Prefix Length	Sets the prefix length for this IPv6 route.
Gateway	Sets the IPv6 address of the gateway for this route.
Interface	Sets the IPv6 interface for this route.

IPMC Ports Configuration

Device Console > Configure > Layer 3 > Routes > IPMC Ports

Use the **IPMC Ports** tab to configure IPMC ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 327. IPMC Ports Configuration field descriptions

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Ports	Sets the ports as host ports for this IPMC route.
Primary Ports	Sets the ports as primary ports for this IPMC route.
Backup Ports	Sets the ports as backup ports for this IPMC route.

Table 327. *IPMC Ports Configuration field descriptions*

Field	Description
Virtual Router	Sets the virtual router ID for this IPMC route.
Delete	Clears Host Ports or Primary Ports or Backup Ports from this IPMC route.

IPMC Trunks Configuration

Device Console > Configure > Layer 3 > Routes > IPMC Trunks

Use the **IPMC Trunks** tab to configure IPMC trunks.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 328. *IPMC Trunks Configuration field descriptions*

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Trunk	Sets the trunk as host trunk for this IPMC route.
Primary Trunk	Sets the trunk as primary trunk for this IPMC route.
Backup Trunk	Sets the trunk as backup trunk for this IPMC route.
Virtual Router	Sets the virtual router ID for this IPMC route.
Host Ports	Shows the ports of host trunks configured for this IPMC route.
Primary Ports	Shows the ports of primary trunks configured for this IPMC route.
Backup Ports	Shows the ports of backup trunks configured for this IPMC route.
Delete	Clears Host Trunk(s) or Primary Trunk(s) or Backup Trunk(s) from this IPMC route.

IPMC Adminkeys Configuration

Device Console > Configure > Layer 3 > Routes > IPMC Adminkeys

Use the **IPMC Adminkeys** tab to configure IPMC *admin keys*.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 329. *IPMC Adminkeys Configuration field descriptions*

Field	Description
Index	The index of the IPMC static routing table.
Destination IP	Sets the destination IPMC address for this route.
VLAN	Sets the VLAN ID for this IPMC route.
Host Adminkey	Sets the adminkey as host adminkey for this IPMC route.
Primary Adminkey	Sets the adminkey as primary adminkey for this IPMC route.
Backup Adminkey	Sets the adminkey as backup adminkey for this IPMC route.
Virtual Router	Sets the virtual router ID for this IPMC route.
Host Ports	Shows the ports of host adminkeys configured for this IPMC route.
Primary Ports	Shows the ports of primary adminkeys configured for this IPMC route.
Backup Ports	Shows the ports of backup adminkeys configured for this IPMC route.
Delete	Clears Host Adminkey(s) or Primary Adminkey(s) or Backup Adminkey(s) from this IPMC route.

Configuring RMAPs

The following sections describe the tasks associated with RMAP configuration:

- [“General Configuration” on page 386](#)
- [“Access List Configuration” on page 386](#)
- [“AS-Path Access List Configuration” on page 387](#)

General Configuration

Device Console > Configure > Layer 3 > RMAP > General

Use the **General** tab to configure RMAP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 330. *RMAP General Configuration field descriptions*

Field	Description
RMAP	The route map index.
Local Preference	Sets the local preference of the matched route.
AS-Path	Sets AS-Path Prepend of the matched route.
Precedence	Sets the precedence of the route map.
Metric Type	Sets metric-type of the matched route: none, type 1, or type 2
Metric	Sets the metric of the route map.
Weight	Sets the weight of the route map.
State	Enables or disables the route map.
Next Hop	Sets the next-hop of the advertised matching routes to the current peer address (BGP only).

Access List Configuration

Device Console > Configure > Layer 3 > RMAP > Access List

Use the **Access List** tab to configure RMAP Access List.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 331. *RMAP Access List Configuration field descriptions*

Field	Description
RMAP	The route map index.
Access List	Sets the IP access list.
Network Filter	Sets the network filter for the route map access list.

Table 331. *RMAP Access List Configuration field descriptions*

Field	Description
Metric	Sets the metric for the route map access list.
Action	Sets the action for the route map access list: permit or deny
State	Enables or disables the route map access list.

AS-Path Access List Configuration

Device Console > Configure > Layer 3 > RMAP > AS-Path Access List

Use the **AS-Path Access List** tab to configure RMAP Autonomous System path Access List.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 332. *RMAP AS-Path Access List Configuration field descriptions*

Field	Description
RMAP	The route map index.
AS-path Index	Sets the Autonomous System (AS) path index.
AS Number	Sets AS filter's path number.
Action	Sets the AS filter action: permit or deny
State	Enables or disables the AS filter.

Configuring RIP

The following sections describe the tasks associated with RIP configuration:

- “General Configuration” on page 388
- “RIP Interface Configuration” on page 388
- “Static Route Redistribute Configuration” on page 389
- “BGP External Route Redistribute Configuration” on page 389
- “BGP Internal Route Redistribute Configuration” on page 390
- “Fixed Route Redistribute Configuration” on page 390
- “OSPF Route Redistribute Configuration” on page 390
- “OSPF External Route Redistribute Configuration” on page 391

General Configuration

Device Console > Configure > Layer 3 > RIP > General

Use the **General** tab to configure RIP state and update period

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 333. *RIP General Configuration field descriptions*

Field	Description
Global RIP State	Enables or disables RIP.
Update Period	Sets the time interval for sending for RIP table updates, in seconds.

RIP Interface Configuration

Device Console > Configure > Layer 3 > RIP > RIP Interface

Use the **RIP Interface** tab to configure RIP interfaces.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 334. *RIP Interface Configuration field descriptions*

Field	Description
Index	RIP Interface Index.
Version	Sets the RIP version used by this interface: v1, v2, both
Supplying Route Updates	Enables or disables supplying route updates to other routers.
Listening to Route Updates	Enables or disables listening to route updates from other routers.

Table 334. *RIP Interface Configuration field descriptions*

Field	Description
Triggered Updates	Enables or disables Triggered Updates, which are used to speed convergence.
Multicast Updates	Enables or disables multicast updates of the routing table.
Poisoned Reverse	Enables or disables the poisoned reverse. When disabled, the switch uses only split horizon.
RIP Protocol	Enables or disables RIP protocol.
Route Metric	Sets the RIP route metric for this interface.
Authentication Type	Sets the authentication type used on this interface: none, password
Authentication Key	Sets the authentication key password.
Default Route action	Sets the default route action: both, supply, listen, none
Split Horizon	Enables or disables split horizon.

Static Route Redistribute Configuration

Device Console > **Configure** > **Layer 3** > **RIP** > *Static Route Redistribute*

Use the **Static Route Distribute** tab to configure RIP static route redistribution parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 335. *RIP Static Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to RIP Static Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

BGP External Route Redistribute Configuration

Device Console > **Configure** > **Layer 3** > **RIP** > *BGP External Route Redistribute*

Use the **BGP External Route Distribute** tab to configure RIP External BGP redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 336. *RIP – BGP External Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to the RIP External BGP Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

BGP Internal Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > BGP Internal Route Redistribute

Use the **BGP Internal Route Distribute** tab to configure RIP Internal BGP redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 337. *RIP – BGP Internal Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to the RIP Internal BGP Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

Fixed Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > Fixed Route Redistribute

Use the **Fixed Route Distribute** tab to configure RIP Fixed Route redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 338. *RIP – Fixed Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to the RIP Fixed Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

OSPF Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > OSPF Route Redistribute

Use the **Fixed Route Distribute** tab to configure RIP OSPF routes redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 339. *RIP – OSPF Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to the RIP OSPF Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

OSPF External Route Redistribute Configuration

Device Console > Configure > Layer 3 > RIP > OSPF External Route Redistribute

Use the **Fixed Route Distribute** tab to configure RIP OSPF external routes redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 340. *RIP – OSPF External Route Redistribute Configuration field descriptions*

Field	Description
Metric	Specify the metric to be assigned to the RIP OSPF External Route. A value of 0 indicates none.
Route Maps	Click Browse... to open a Browser window. You can select pre-defined route maps in this window.

Configuring OSPF

The following sections describe the configuration tasks associated with Open Shortest Path First (OSPF) Routing protocol:

- [“OSPF General Configuration” on page 392](#)
- [“OSPF Area Configuration” on page 393](#)
- [“OSPF Interface Configuration” on page 394](#)
- [“OSPF Summary Range Configuration” on page 395](#)
- [“OSPF Virtual Interface Configuration” on page 396](#)
- [“OSPF Host Table Configuration” on page 397](#)
- [“OSPF Static Route Redistribution Configuration” on page 397](#)
- [“OSPF Fixed Route Redistribution Configuration” on page 398](#)
- [“OSPF RIP Route Redistribution Configuration” on page 398](#)
- [“OSPF MD5 Key Configuration” on page 399](#)
- [“OSPF Loopback Interface Configuration” on page 399](#)
- [“OSPF BGP External Route Redistribute Configuration” on page 399](#)
- [“OSPF BGP Internal Route Redistribute Configuration” on page 400](#)

OSPF General Configuration

Device Console > Configure > Layer 3 > OSPF > General

Use the General tab to configure OSPF administrative settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **General** tab.

Table 341. *OSPF General field descriptions*

Field	Description
Route Metric	Sets the metric used for OSPF Configuration. A value of 0 indicates none.
Route Metric Type	Sets the metric type used for OSPF Configuration to none, type 1, or type 2.
State	Enables or disables OSPF. The value enabled denotes that the OSPF Process is active on at least one interface; disabled disables it on all interfaces.
LSDB	Sets the LSDB limit for external LSA. A value of 0 means there is no limit.

OSPF Area Configuration

Device Console > Configure > Layer 3 > OSPF > Areas

Use the Area tab to configure OSPF Area settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Areas** tab.

Table 342. *OSPF Area field descriptions*

Field	Description
Index	The OSPF area number for which the OSPF area table is related.
ID	The OSPF area ID. This is a 32-bit integer that uniquely identifies an area. Area ID 0.0.0.0 is used for the OSPF backbone. If you are attempting to delete the OSPF backbone area, make sure there are no configured Virtual Interfaces.
Type	Defines the type of area. For example, when a virtual link has to be established with the backbone, the area type must be defined as transit. <ul style="list-style-type: none">● Transit area: This area type allows area summary information to be exchanged between routing devices. Any area that is not a stub area or NSSA is considered to be transit area.● Stub area: An OSPF area where external routing information is not distributed. Typically, a stub area is connected to only one other area.● NSSA: Not-So-Stubby Area (NSSA) is similar to stub area, with additional capabilities. For example, routes originating from within the NSSA can be propagated to adjacent transit and backbone areas. External routes from outside the Autonomous System (AS) can be advertised within the NSSA, but are not distributed into other areas.
Metric	The metric value applied at the indicated type of service. This metric is the metric that is applied to the default route when it is advertised in a Stub/NSSA area.
Authentication Type	Type of authentication being used, as follows: <ul style="list-style-type: none">● None: No authentication required.● Password: Authenticates simple passwords so that only trusted routing devices can participate.● MD5: MD5 cryptographic authentication is required.

Table 342. *OSPF Area field descriptions*

Field	Description
SPF Interval	The OSPF interval, which is the time interval between two successive SPF calculations of the shortest path tree using the Dijkstra's algorithm.
Status	This variable displays the status of the entry. Currently it is always in active state.

OSPF Interface Configuration

Device Console > Configure > Layer 3 > OSPF > Interfaces

Use the Interfaces tab to configure OSPF Interfaces settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Interfaces** tab.

Table 343. *OSPF Interfaces field descriptions*

Field	Description
Index	The OSPF area index
Area	Configures the area number this OSPF interface.
Priority	The priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value of 0 (zero) signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers use their Router ID as a tie breaker.
Cost	Configures cost set for the selected path--preferred or backup. Usually the cost is inversely proportional to the bandwidth of the interface. Low cost indicates high bandwidth.
Hello Interval	Configures the interval in seconds or milliseconds (depending on Hello Interval Unit) between the Hello packets for the interfaces.
Hello Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Hello Interval.
Router Dead Interval	The number of seconds or milliseconds (depending on Dead Interval Unit) that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Router Dead Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Router Dead Interval.

Table 343. *OSPF Interfaces field descriptions*

Field	Description
Transit Delay/ Transmission Delay	The estimated number of seconds it takes to transmit a link state update packet over this interface.
Retransmit Interval/ Retransmission Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.
Authentication Key	The Authentication Key. If the Area's Authorization Type is a simple password, and the key length is shorter than 8 octets, the agent left adjusts and zero fills to 8 octets. Note that unauthenticated interfaces need no authentication key, and simple password authentication cannot use a key of more than 8 octets. Larger keys are useful only with authentication mechanisms not specified in this document. When read, the Authentication key always returns an Octet String of length zero.
MD5 Key	MD5 authentication key string.
Passive	Enables or disables Passive mode.
Point-to-Point Interface	Enables or disables point-to-point interface.
Status	Enables or disables the status of the entry.

OSPF Summary Range Configuration

Device Console > **Configure** > **Layer 3** > **OSPF** > *Summary Ranges*

Use the Summary Ranges tab to configure OSPF Summary Range settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Summary Ranges** tab.

Table 344. *OSPF Summary Ranges field descriptions*

Field	Description
Index	The current OSPF summary range.
Address	The base IP address for the range.
Mask	The IP address mask for the range.
Area Index	The area index used by the switch.
Hide State	Allows the OSPF summary range to be hidden or visible.
State	Enables or disables the OSPF summary range.

OSPF Virtual Interface Configuration

Device Console > Configure > Layer 3 > OSPF > Virtual Interfaces

Use the Virtual Interfaces tab to configure OSPF Virtual Interfaces settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Interfaces** tab.

Table 345. *OSPF Virtual Interfaces field descriptions*

Field	Description
Index	The Virtual Interface index.
Area Index	The OSPF area index
Hello Interval	Configures the interval in seconds or milliseconds (depending on Hello Interval Unit) between the hello packets for the interfaces.
Hello Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Hello Interval.
Router Dead Interval	The number of seconds or milliseconds (depending on Dead Interval Unit) that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Router Dead Interval Unit	Sets the unit of measurement (seconds or milliseconds) for Router Dead Interval.
Transit Delay/ Transmission Delay	The estimated number of seconds it takes to transmit a link-state update packet over this interface.
Retransmit Interval/ Retransmission Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies that belong to this interface. This value is also used when retransmitting database description and link-state request packets. This value should be well over the expected round-trip time.
Neighbor	The Router ID of the Virtual Neighbor.
Authentication Key	The authentication key. If the Authorization Type is a simple password, the device left-adjusts and zero-fills to 8 octets. Simple password authentication cannot use a key of more than 8 octets. Note: Unauthenticated interfaces do not require an authentication key.
MD5 Key	MD5 key authentication string.
Status	Enables or disables the status of the entry.

OSPF Host Table Configuration

Device Console > Configure > Layer 3 > OSPF > Host Table

Use the Host Table tab to configure OSPF Host Table settings.

Notes:

- You must enable the OSPF Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Host Table** tab.

Table 346. *OSPF Host Table field descriptions*

Field	Description
Index	Enter a host entry number. Host routes are used for advertising network device IP addresses to external networks within OSPF.
Host Address	The IP Address of the OSPF host.
Area Number	The OSPF area index number.
Cost	The metric to be advertised.
State	Enables or disables the status of the entry.

OSPF Static Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > Static Route Redistribute

Use the Static Route Redistribute tab to configure OSPF Static Route Redistribution settings.

Notes:

- You must enable the OSPF Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Static Route Redistribute** tab.

Table 347. *OSPF Static Route Redistribute field descriptions*

Field	Description
Metric	Sets the metric to be assigned to redistributed static routes. A value of 0 indicates none.

Table 347. *OSPF Static Route Redistribute field descriptions*

Field	Description
Metric Type	Sets the metric type of the redistributed static route as none, type1, or type2.
Route Map	Click the Browse... button to open a Browser window. You can select pre-defined route maps in this window.

OSPF Fixed Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > Fixed Route Redistribute

Use the Fixed Route Redistribute tab to configure OSPF Fixed Route Redistribution settings.

Notes:

- You must enable the OSPF Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Fixed Route Redistribute** tab.

Table 348. *OSPF Fixed Route Redistribute field descriptions*

Field	Description
Metric	The export metric for redistributed fixed routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the redistributed fixed route as none, type1, or type2.
RMAP	Click the Browse... button to open a Browser window. You can select pre-defined route maps in this window.

OSPF RIP Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPF > RIP Route Redistribute

Use the RIP Route Redistribute tab to redistribute Routing Information Protocol (RIP) settings into OSPF.

Notes:

- You must enable the OSPF Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **RIP** tab.

Table 349. *OSPF RIP Route Redistribute field descriptions*

Field	Description
Metric	Specify the metric to be assigned for redistributed RIP routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the redistributed RIP route to none, type1, or type2.
RMAP	Click the Browse... button to open a Browser window. You can select pre-defined route maps in this window.

OSPF MD5 Key Configuration

Device Console > **Configure** > **Layer 3** > **OSPF** > *MD5 Key*

Use this tab to configure OSPF MD5 keys.

Table 350. *OSPF MD5 Key field descriptions*

Field	Description
Index	Key index number
Key	Sets the MD5 key for OSPF packets.

OSPF Loopback Interface Configuration

Device Console > **Configure** > **Layer 3** > **OSPF** > *Loopback Interface*

Use this tab to configure an OSPF loopback interface.

Table 351. *OSPF Loopback Interface field descriptions*

Field	Description
Index	Sets the index number of the loopback interface.
Area	Sets the area number for the interface.
Status	Enables or disables the OSPF loopback interface.

OSPF BGP External Route Redistribute Configuration

Device Console > **Configure** > **Layer 3** > **OSPF** > *BGP External Route Redistribute*

Use the BGP External Routes Redistribute tab to redistributed eBGP routes into OSPF.

Table 352. *OSPF BGP External Route Redistribute field descriptions*

Field	Description
Metric	Sets the metric to be assigned to redistributed BGP external routes . A value of 0 indicates none.
Metric Type	Sets the metric type of redistributed BGP external routes to none, type1, or type2.
RMAP	Click Browse... to open a browser window. You can select pre-defined route maps in this window.

OSPF BGP Internal Route Redistribute Configuration

Device Console > Configure > Layer 3 > OSPF > BGP Internal Route Redistribute

Use the BGP Internal Routes Redistribute tab to redistributed iBGP routes into OSPF.

Table 353. *OSPF BGP Internal Route Redistribute field descriptions*

Field	Description
Metric	Sets the metric to be assigned to redistributed BGP internal routes . A value of 0 indicates none.
Metric Type	Sets the metric type of the redistributed BGP internal routes to none, type1, or type2.
RMAP	Click Browse... to open a browser window. You can select pre-defined route maps in this window.

Configuring OSPFv3

The following sections describe the configuration tasks associated with Open Shortest Path First (OSPFv3) Routing protocol:

- “OSPF General Configuration” on page 392
- “OSPF Area Configuration” on page 393
- “OSPF Host Table Configuration” on page 397
- “OSPFv3 Neighbor Table Configuration” on page 403
- “OSPF Interface Configuration” on page 394
- “OSPF Virtual Interface Configuration” on page 396
- “OSPF Summary Range Configuration” on page 395
- “OSPF BGP External Route Redistribute Configuration” on page 399
- “OSPF Static Route Redistribution Configuration” on page 397
- “OSPFv3 Connected Route Configuration” on page 408
- “OSPF Fixed Route Redistribution Configuration” on page 398

OSPFv3 General Configuration

Device Console > Configure > Layer 3 > OSPFv3 > General

Use the **General** tab to configure OSPFv3 administrative settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **General** tab.

Table 354. *OSPFv3 General field descriptions*

Field	Description
Router ID	Sets the IP address of the router.
OSPFv3 State	Enables or disables OSPFv3. The value enabled denotes that the OSPFv3 Process is active on at least one interface; disabled disables it on all interfaces.
ABR Type	Sets the Area Border Router type.
LSDB	Sets the Link State Database limit for external LSA.
Edit Overflow	Sets the edit overflow.
Reference Bandwidth	Sets the reference bandwidth.
SPF Delay	Sets the Shortest Path First delay.
SPF Hold	Sets the Shortest Path First hold.
NSSA internal ASBR	Enables or disables the router as a not-so-stubby area internal autonomous system boundary router.

OSPFv3 Area Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Areas

Use the **Areas** tab to configure OSPFv3 Area settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Areas** tab.

Table 355. *OSPFv3 Area field descriptions*

Field	Description
Area Index	The OSPFv3 area number for which the OSPFv3 area table is related.
Area ID	The OSPFv3 area ID. This is a 32-bit integer that uniquely identifies an area. Area ID 0.0.0.0 is used for the OSPFv3 backbone. If you are attempting to delete the OSPFv3 backbone area, make sure there are no configured Virtual Interfaces.
Stub/NSSA Area Stability Interval	Sets the stub or not-so-stubby area stability interval.
Area Type	<p>Defines the type of area. For example, when a virtual link has to be established with the backbone, the area type must be defined as transit.</p> <ul style="list-style-type: none"> • Transit area: This area type allows area summary information to be exchanged between routing devices. Any area that is not a stub area or NSSA is considered to be transit area. • Stub area: An OSPFv3 area where external routing information is not distributed. Typically, a stub area is connected to only one other area. • NSSA: Not-So-Stubby Area (NSSA) is similar to stub area, with additional capabilities. For example, routes originating from within the NSSA can be propagated to adjacent transit and backbone areas. External routes from outside the Autonomous System (AS) can be advertised within the NSSA, but are not distributed into other areas.
No Summary	Enables or disables the status.
Stub/NSSA Area Default Route Metric	Sets the metric value applied at the indicated type of service. This metric is the metric that is applied to the default route when it is advertised in a Stub/NSSA area.
Stub/NSSA Area Default Route Metric Type	Sets the metric value applied at the indicated type of service.

Table 355. *OSPFv3 Area field descriptions (continued)*

Field	Description
Translation Role for the NSSA Area	Translation role for the NSSA area: always(1), or candidate (2).
Status	This variable displays the status of the entry. Currently it is always in active state.

OSPFv3 Host Table Configuration

Device Console > **Configure** > **Layer 3** > **OSPFv3** > *Host Table*

Use the **Host Table** tab to configure OSPFv3 Host Table settings.

Notes:

- You must enable the OSPFv3 Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Host Table** tab.

Table 356. *OSPFv3 Host Table field descriptions*

Field	Description
Host ID	Enter a host entry number. Host routes are used for advertising network device IP addresses to external networks within OSPFv3.
Host IPV6 Address	The IPV6 address of the OSPFv3 host.
Area Number	The OSPFv3 area index number.
Output Cost	The metric to be advertised.
State	Enables or disables the status of the entry.

OSPFv3 Neighbor Table Configuration

Device Console > **Configure** > **Layer 3** > **OSPFv3** > *Neighbor Table*

Use the **Neighbor Table** tab to configure OSPFv3 Neighbor Table settings.

Notes:

- You must enable the OSPFv3 Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Neighbor Table** tab.

Table 357. *OSPFv3 Neighbor Table field descriptions*

Field	Description
Neighbor ID	Enter a neighbor entry number.
Neighbor IPv6 Address	The IPv6 address of the OSPFv3 neighbor.
Priority	The OSPFv3 area priority.
State	Enables or disables the status of the entry.

OSPFv3 Interface Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Interface

Use the **Interface** tab to configure OSPFv3 Interface settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Interface** tab.

Table 358. *OSPFv3 Interface field descriptions*

Field	Description
Interface Number	The interface number.
Interface ID	The interface ID.
Area	Configures the area number this OSPFv3 interface.
Interface Output Cost	Configures cost set for the selected path--preferred or backup. Usually the cost is inversely proportional to the bandwidth of the interface. Low cost indicates high bandwidth.
Priority	The priority of this interface. Used in multi-access networks, this field is used in the designated router election algorithm. The value of 0 (zero) signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers use their Router ID as a tie breaker.
Hello Interval	Configures the interval in milliseconds between the Hello packets for the interfaces.
Dead Interval	The number of milliseconds that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Poll Interval	Configures the interval in milliseconds between polls for the interfaces.

Table 358. *OSPFv3 Interface field descriptions*

Field	Description
Transit Delay	The estimated number of seconds it takes to transmit a link state update packet over this interface.
Retransmit Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.
Passive	Enables or disables Passive mode.
Network Type	Sets the type of network.
Status	Enables or disables the status of the entry.
AuthSPI	Sets the Authentication SPI.
Authentication Enable	Enables or disables authentication
Authentication Type	The Authentication Type. If it is a simple password, and the key length is shorter than 8 octets, the agent left adjusts and zero fills to 8 octets.
Authentication Key	The Authentication Key. Note that unauthenticated interfaces need no authentication key, and simple password authentication cannot use a key of more than 8 octets. Larger keys are useful only with authentication mechanisms not specified in this document. When read, the Authentication key always returns an Octet String of length zero.
Authentication	Sets Authentication.
EncrySPI	Sets the Authentication SPI.
Encryption Enable	Enables or disables encryption
Encryption Authentication Type	The Encryption Authentication Type. If it is a simple password, and the key length is shorter than 8 octets, the agent left adjusts and zero fills to 8 octets.
Encryption Auth Key	The Encryption Key. Note that unauthenticated interfaces need no authentication key, and simple password authentication cannot use a key of more than 8 octets. Larger keys are useful only with authentication mechanisms not specified in this document. When read, the Authentication key always returns an Octet String of length zero.
Encryptpion	Sets Encryption.
LSA Suppress	Sets suppression of LSA.

OSPFv3 Virtual Interface Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Virtual Interface

Use the **Virtual Interface** tab to configure OSPFv3 Virtual Interface settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Interface** tab.

Table 359. *OSPFv3 Virtual Interface field descriptions*

Field	Description
Index	The Virtual Interface index.
Area Number	The OSPFv3 area number.
Virtual Neighbor Router ID	The Router ID of the Virtual Neighbor.
Hello Interval	Configures the interval in milliseconds between the hello packets for the interfaces.
Router Dead Interval	The number of milliseconds that a router's hello packets have not been seen before its neighbors declare the router down. This must be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
Transit Delay	The estimated number of seconds it takes to transmit a link-state update packet over this interface.
Retransmit Interval	The number of seconds between link-state advertisement retransmissions, for adjacencies that belong to this interface. This value is also used when retransmitting database description and link-state request packets. This value should be well over the expected round-trip time.
Status	Enables or disables the status of the entry.

OSPFv3 Summary Range Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Summary Range

Use the **Summary Range** tab to configure OSPFv3 Summary Range settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Summary Range** tab.

Table 360. *OSPFv3 Summary Range field descriptions*

Field	Description
Index	Sets the OSPFv3 index.
IPv6 Address	Sets the base IPv7 address for the range.
Prefix Length	Sets the prefix length for the IPv6 address for the range.
Area Number	The area number used by the switch.

Table 360. *OSPFv3 Summary Range field descriptions*

Field	Description
Hide Range	Allows the OSPFv3 summary range to be hidden or visible.
LSA Type	Sets the LSA type.
Route Tag	Sets the route tag.
State	Enables or disables the OSPFv3 summary range.

OSPFv3 External Range Configuration

Device Console > Configure > Layer 3 > OSPFv3 > External Range

Use the **External Range** tab to configure external ranges for OSPFv3.

Table 361. *OSPFv3 BGP External Route Redistribute field descriptions*

Field	Description
AS Ext Range Number	Sets the range number for which the OSPFv3 AS-External range table is related.
Address	Sets the IPv6 address of the external range.
Prefix Length	Sets the subnet IPv6 prefix length for the range.
Area Number	The area number used by the switch.
Set P-bit in the generated LSA	Enables or disables setting the P-bit in the generated LSA.
Aggr Effect	Sets the aggregation effect.
State	The state of the external range.

OSPFv3 Route Redistribution Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Route Redistribute

Use the **Route Redistribute** tab to configure OSPFv3 Route Redistribution settings.

Notes:

You must enable the OSPFv3 Administrative Status (State) for performing this configuration.

This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Route Redistribute** tab.

Table 362. *OSPFv3 Route Redistribute field descriptions*

Field	Description
Redistribute Entry Number	The redistribution entry number for which the OSPFv3 redistribution entry table is related.
IPv6 Address	Sets the IPv6 address of the redistribution entry.
Prefix Length	Sets the subnet IPv6 prefix length for the redistribution entry.
Metric to be applied to route	Sets the metric to be assigned to redistributed static routes. A value of 0 indicates none.
Metric Type	Sets the metric type of the redistributed static route as none, type1, or type2.
Route Tag	Sets the route tag.
Route Tag Type Manual	Sets the route tag type (manual or automatic).
State	The current OSPF redistribution entry configuration.

OSPFv3 Connected Route Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Connected Routes

Use the **Connected Routes** tab to configure OSPFv3 connected route settings.

Notes:

- You must enable the OSPFv3 Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Connected Routes** tab.

Table 363. *OSPFv3 Connected Routes field descriptions*

Field	Description
Metric	The export metric for connected routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the connected route as none, type1, or type2.
Route Tag	Sets the route tag.
Route Tag Type Manual	Sets the route tag type (manual or automatic).

OSPFv3 Static Route Configuration

Device Console > Configure > Layer 3 > OSPFv3 > Static Routes

Use the **Static Routes** tab to configure OSPFv3 static route settings.

Notes:

- You must enable the OSPFv3 Administrative Status (State) for performing this configuration.
- This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table Static the fields of the **Connected Routes** tab.

Table 364. *OSPFv3 Connected Routes field descriptions*

Field	Description
Metric	The export metric for static routes. A value of 0 indicates none.
Metric Type	Specify the metric type of the static route as none, type1, or type2.
Route Tag	Sets the route tag.
Route Tag Type Manual	Sets the route tag type (manual or automatic).

Configuring MLD

The following sections describe the tasks associated with MLD configuration:

- “General Configuration” on page 411
- “Peer Configuration” on page 411

MLD General Configuration

Device Console > Configure > Layer 3 > MLD > General

Use the **General** tab to turn the MLD Global State on or off.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

MLD Interface Configuration

Device Console > Configure > Layer 3 > MLD > Interface

Use the **Interface** tab to configure MLD interface parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 365. *MLD Interface Configuration field descriptions*

Field	Description
Index	The index ID of the router.
Interval	Sets the interval for MLD Query messages.
Max Response Interval	Sets the maximum MLD response interval.
Robustness	Sets the MLD Robustness variable, which allows you to tune the switch for expected packet loss on the subnet. If the subnet is expected to be lossy (high rate of packet loss), increase the value.
Last Interval	Sets the query interval for the Querier to send a query after receiving a host done message from a host on the subnet.
Dynamic MRouter	Enables or disables dynamic Mrouter learning on the interface.
State	Enables or disables the MLD interface.

Configuring BGP

The following sections describe the tasks associated with BGP configuration:

- “General Configuration” on page 411
- “Peer Configuration” on page 411
- “Peer Redistribution Configuration” on page 413
- “Aggregation Configuration” on page 414
- “Group Configuration” on page 414
- “Group Redistribution Configuration” on page 415

General Configuration

Device Console > Configure > Layer 3 > BGP > General

Use the **General** tab to configure BGP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 366. *BGP General Configuration field descriptions*

Field	Description
State	Enables or disables BGP state.
Local Preference	Sets the local preference value. The path with the higher value is preferred.
Autonomous System Number	Sets the autonomous system (AS) number.
Max External BGP Paths	Sets the maximum external BGP paths.
Max Internal BGP Paths	Sets the maximum internal BGP paths.
ASN4 to ASN2 Compatibility	Enables or disables ASN4 to ASN2 compatibility.
DSCP Marking	Sets the BGP DSCP marking value.
Cluster ID	Sets the IP address of the cluster.
Client To Client Reflection	Enables or disables client-to-client reflection.

Peer Configuration

Device Console > Configure > Layer 3 > BGP > Peer General

Use the **Peer General** tab to configure BGP peer parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 367. *BGP Peer Configuration field descriptions*

Field	Description
Index	BGP Peer index.
Remote Address	Sets the remote IP address for the specified peer.
Remote Autonomous System	Sets the remote autonomous system number for the specified peer.
Local Interface	Sets the Local IP interface.
Local Loopback Interface	Sets the Local IP loopback interface.
Hold Time	Sets the Hold Time.
Keep Alive Time	Sets the keep-alive time for the specified peer in seconds.
Advertisements Time	Sets the minimum time between Advertisements.
Time to Live	Sets the time-to-live value for the specified peer.
TTL Security Hops	Sets BGP TTL Security Hops.
Next Hop Self	Enables or disables using this router as next-hop in BGP updates.
Connect Retry Interval	Sets the connection retry interval, in seconds.
Route Originations Time	Sets the minimum time between route originations.
Peer State	Enables or disables the peer.
Password	Sets the peer BGP password.
Passive State	Enables or disables BGP passive peer.
In-Route Map	Click Browse... to open a Browser window. You can select pre-defined route maps in this window to add them to the in-route map list.
Out-Route Map	Click Browse... to open a Browser window. You can select pre-defined route maps in this window to add them to the out-route map list.
Peer Client	

Peer Redistribution Configuration

Device Console > Configure > Layer 3 > BGP > Peer Redistribution

Use the **Peer Redistribution** tab to configure BGP redistribution parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 368. *BGP Peer Redistribution Configuration field descriptions*

Field	Description
Index	BGP Peer index.
Route Metric	Sets the default metric of advertised routes.
Default Route Action	Sets the default route action: none, import, originate or redistribute.
RIP State	Enables or disables advertising RIP routes.
OSPF State	Enables or disables advertising OSPF routes.
Fixed State	Enables or disables advertising fixed routes.
Static State	Enables or disables advertising static routes.

Aggregation Configuration

Device Console > Configure > Layer 3 > BGP > Aggregation

Use the **Aggregation** tab to configure BGP aggregation.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 369. *BGP Aggregation Configuration field descriptions*

Field	Description
Index	Aggregation index
Address	Sets the starting subnet IP address for the aggregation.
Mask	Sets the subnet mask for the aggregation.
State	Enables or disables the aggregation.

Group Configuration

Device Console > Configure > Layer 3 > BGP > Group

Use the **Group** tab to configure BGP Groups.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 370. *BGP Group Configuration field descriptions*

Field	Description
Index	BGP Group index.
Name	Sets the group name.
Remote Address	Sets the remote IP address for the specified group.
Remote Mask	Sets the remote network mask for the specified group.
Local Interface	Sets the Local IP interface.
Local Loopback Interface	Sets the Local IP loopback interface.
Limit	Sets the maximum number of BGP dynamic peers.
Hold Time	Sets the Hold Time.
Keep Alive Time	Sets the keep-alive time for the specified peer in seconds.
Advertisements Time	Sets the minimum time between Advertisements.
Time to Live	Sets the time-to-live value for the specified peer.
Next Hop Self	Enables or disables using this router as next-hop in BGP updates.

Table 370. *BGP Group Configuration field descriptions*

Field	Description
Route Originations Time	Sets the minimum time between route originations.
Peer State	Enables or disables the peer.
TTL Security Hops	Sets BGP TTL Security Hops.
Password	Sets the peer BGP password.
In-Route Map	Click Browse... to open a Browser window. You can select pre-defined route maps in this window to add them to the in-route map list.
Out-Route Map	Click Browse... to open a Browser window. You can select pre-defined route maps in this window to add them to the out-route map list.

Group Redistribution Configuration

Device Console > Configure > Layer 3 > BGP > Group Redistribution

Use the **Group Redistribution** tab to configure BGP Group Redistribution.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 371. *BGP Group Redistribution Configuration field descriptions*

Field	Description
Index	BGP Group index.
Route Metric	Sets the default metric of advertised routes.
Default Route Action	Sets the default route action: none, import, originate or redistribute.
RIP State	Enables or disables advertising RIP routes.
OSPF State	Enables or disables advertising OSPF routes.
Fixed State	Enables or disables advertising fixed routes.
Static State	Enables or disables advertising static routes.

Configuring IGMP

The following sections describe the tasks associated with IGMP configuration:

- “General Configuration” on page 416
- “Snooping Configuration” on page 417
- “IGMPv3 Snooping Configuration” on page 417
- “Static Multicast Router Configuration” on page 418
- “Relay Configuration” on page 418
- “Relay Multicast Router Configuration” on page 419
- “Filter Configuration” on page 419
- “Filter Ports Configuration” on page 419
- “Advanced Configuration” on page 420
- “Querier Configuration” on page 420

General Configuration

Device Console > Configure > Layer 3 > IGMP > General

Use the **General** tab to configure IGMP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 372. *IGMP General Configuration field descriptions*

Field	Description
State	Enables or disables IGMP state.
Filter State	Enables or disables Filter state.
Querier State	Enables or disables Querier state.

Snooping Configuration

Device Console > Configure > Layer 3 > IGMP > Snooping

Use the **Snooping** tab to configure IGMP Snooping.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 373. *IGMP Snooping Configuration field descriptions*

Field	Description
State	Enables or disables IGMP Snooping state.
Multicast Router Timeout	Sets the timeout value, in seconds, for IGMP Membership queries.
Timeout	Sets the query response interval.
Query Interval	Sets the query interval.
Robustness	Sets the IGMP robustness.
Unregistered IPMC	Enables or disables unregistered IPMC flooding.
Router Alert	Enables or disables sending IGMP router alert messages.
Report Aggregation	Enables or disables IGMP Membership Report aggregation.
Source IP	Sets the IGMP snooping source IP address for the selected VLAN.
Snooping VLANs	Click Browse... to open a Browser window. You can select the VLANs in this window to add them to IGMP Snooping.
Fast Leave VLANs	List of configured FastLeave VLANs.

IGMPv3 Snooping Configuration

Device Console > Configure > Layer 3 > IGMP > V3 Snooping

Use the **V3 Snooping** tab to configure IGMPv3 Snooping.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 374. *IGMPv3 Snooping Configuration field descriptions*

Field	Description
State	Enables or disables IGMPv3 Snooping.
Sources	Sets the maximum number of IGMP multicast sources to snoop from within the group record.

Table 374. *IGMPv3 Snooping Configuration field descriptions*

Field	Description
Exclude Filter-mode Reports	Enables or disables snooping on IGMPv3 Exclude Reports. When disabled, the switch ignores Exclude Reports.
V1/V2 Report Snooping	Enables or disables snooping on IGMP version 1 and version 2 reports. When disabled, the switch drops IGMPv1 and IGMPv2 reports.

Static Multicast Router Configuration

Device Console > Configure > Layer 3 > IGMP > Static Multicast Router

Use the **Static Multicast Router** tab for IGMP static multicast router configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 375. *IGMP Static Multicast Router Configuration field descriptions*

Field	Description
Port	Sets the port number of the Static Multicast Router entry.
VLAN	Sets the VLAN number of the Static Multicast Router.
Version	Sets the IGMP version of the Static Multicast Router: version1, version2, version3.

Relay Configuration

Device Console > Configure > Layer 3 > IGMP > Relay

Use the **Relay** tab for IGMP relay configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 376. *IGMP Relay Configuration field descriptions*

Field	Description
State	Enables or disables IGMP Relay.
VLANs	Click Browse... to open a Browser window. You can select the VLANs in this window to add them to IGMP Relay.
Report Interval	Sets the unsolicited reports interval in seconds.

Relay Multicast Router Configuration

Device Console > Configure > Layer 3 > IGMP > Relay Multicast Router

Use the **Relay Multicast Router** tab for IGMP relay multicast router configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 377. *IGMP Relay Multicast Router Configuration field descriptions*

Field	Description
Index	IGMP Relay Multicast Router index.
Address	Sets the IP address of the IGMP multicast router used for IGMP Relay.
State	Enables or disables the multicast router.
Interval	Sets the time interval, in seconds, between ping attempts to the upstream multicast routers.
Failed Attempts	Sets the number of failed ping attempts required before the switch declares this multicast router as DOWN.
Successful Attempts	Sets the number of successful ping attempts required before the switch declares this multicast router as UP.
Version	Sets the IGMP Version: igmpv1 or igmpv2

Filter Configuration

Device Console > Configure > Layer 3 > IGMP > Filter

Use the **Filter** tab for IGMP filter configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 378. *IGMP Filter Configuration field descriptions*

Field	Description
Index	IGMP Filter index.
Multicast Address1	Sets the IP Multicast Address 1 for the filter.
Multicast Address2	Sets the IP Multicast Address 2 for the filter.
Action	Allows or denies multicast traffic for the specified IP multicast addresses.
State	Enables or disables IGMP filter.

Filter Ports Configuration

Device Console > Configure > Layer 3 > IGMP > Filter Ports

Use the **Filter Ports** tab for IGMP filter ports configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 379. *IGMP Filter Ports Configuration field descriptions*

Field	Description
Port	The port index.
State	Enables or disables IGMP filtering on a port.
Filter	Adds an IGMP filter to this port.

Advanced Configuration

Device Console > Configure > Layer 3 > IGMP > Advanced

Use the **Advanced** tab for IGMP advanced configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 380. *IGMP Advanced Configuration field descriptions*

Field	Description
Query Interval	Sets the interval for IGMP Query Reports, in seconds.
Robustness	Configures the IGMP Robustness variable, which allows you to tune the switch for expected packet loss on the subnet. If the subnet is expected to be lossy (high rate of packet loss), increase the value.
Timeout	Sets the timeout value for IGMP Membership Reports, in seconds.
Fast leave VLANs	Click Browse... to open a Browser window. You can select the VLANs in this window to add them to Fast Leave VLANs list.
Router Alert	Enables or disables the Router Alert option in IGMP messages.

Querier Configuration

Device Console > Configure > Layer 3 > IGMP > Querier

Use the **Querier** tab for IGMP Querier configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 381. *IGMP Querier Configuration field descriptions*

Field	Description
VLAN	The VLAN index.
Source IP	Sets the source IP address used as a proxy for IGMP Group Specific Queries.
Election Type	Sets the IGMP Querier election criteria as IPv4 address or MAC address.
Interval	Sets the interval between IGMP Query broadcasts, in seconds.
Max Response Time	Sets the maximum query response interval, in seconds.
Robustness	Sets the IGMP Robustness variable, which is number of times that the switch sends each IGMP message.
Startup Interval	Sets the Startup Query Interval, in seconds, which is the interval between general queries sent out during startup.
Startup Count	Sets the Startup Query Count, which is the number of IGMP queries sent out during startup. Each query is separated by the Startup Query Interval.
Version	Sets the IGMP Version of the VLAN: igmpv1, igmpv2, igmpv3
State	Enables or disables Querier on the selected VLAN.

Configuring DNS

The following sections describe the tasks associated with DNS configuration:

- [“DNS Server Configuration” on page 422](#)

DNS Server Configuration

Device Console > Configure > Layer 3 > DNS > DNS Server

Use the **DNS Server** tab to configure DNS Server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 382. *DNS Server Configuration field descriptions*

Field	Description
Primary Server IP Address	Sets the IP address of primary DNS server.
Primary Port	Sets the port of primary DNS server: data, mgt, or extm
Secondary Server IP Address	Sets the IP address of secondary DNS server.
Secondary Port	Sets the port of secondary DNS server: data, mgt, or extm
Domain Name	Sets the default domain name used by the switch.
IP Version	Sets the IP version: currently fixed at IPv4.

Configuring Bootp-Relay

The following sections describe the tasks associated with Bootp-Relay configuration:

- [“General Configuration” on page 423](#)
- [“Server Configuration” on page 423](#)
- [“Broadcast Domain Configuration” on page 424](#)
- [“Broadcast Domain Server Configuration” on page 424](#)
- [“Option82 Configuration” on page 424](#)

General Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > General

Use the **General** tab to configure Bootp-Relay state.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 383. *Bootp-Relay General Configuration field descriptions*

Field	Description
State	Enables or disables Bootp-Relay

Server Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > Server

Use the **Server** tab to configure Bootp-Relay Server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 384. *Bootp-Relay Server Configuration field descriptions*

Field	Description
Index	The server index.
Address	Sets the Bootp-Relay server address.

Broadcast Domain Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > Broadcast Domain

Use the **Broadcast Domain** tab to configure Bootp-Relay broadcast domain.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 385. *Bootp-Relay Broadcast Domain Configuration field descriptions*

Field	Description
Index	Broadcast domain index.
VLAN	Sets the VLAN of the broadcast domain. Each broadcast domain must have a unique VLAN.
State	Enables or disables the broadcast domain.

Broadcast Domain Server Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > Broadcast Domain Server

Use the **Broadcast Domain Server** tab to configure Bootp-Relay broadcast domain server.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 386. *Bootp-Relay Broadcast Domain Server Configuration field descriptions*

Field	Description
Index	Broadcast domain index.
Server	Broadcast domain server index.
Address	Sets the broadcast domain server address.

Option82 Configuration

Device Console > Configure > Layer 3 > Bootp-Relay > Option82

Use the **Option82** tab for Bootp-Relay option82 configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 387. *Bootp-Relay Option82 Configuration field descriptions*

Field	Description
State	Enables or disables the Bootp-Relay option 82.
Policy	Sets the policy of Bootp-Relay option 82: replace, drop, or keep

Configuring Flooding

The following sections describe the flooding configuration tasks you can perform:

- [“VLAN Flooding Configuration” on page 425](#)

VLAN Flooding Configuration

Device Console > Configure > Layer 3 > Flooding > VLAN Flooding

Use this tab to configure VLAN flooding.

Table 388. *VLAN Flooding field descriptions*

Field	Description
VLAN	Sets the VLAN ID.
Flood unregistered IPMC	Enables or disables flooding unregistered IPMCs.
Send unregistered IPMC to CPU	Enables or disables flooding unregistered IPMCs to CPU.
Optimized Flooding	Enables or disables Optimized flooding.

Configuring VRRP

The following sections describe the configuration tasks associated with Virtual Router Redundancy Protocol (VRRP) protocol:

- [“VRRP General Configuration” on page 426](#)
- [“VRRP Virtual Router Configuration” on page 427](#)
- [“VRRP Virtual Interface Configuration” on page 428](#)
- [“VRRP Virtual Router Group Configuration” on page 429](#)

VRRP General Configuration

Device Console > Configure > Layer 3 > VRRP > General

Use the General tab to configure general VRRP settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **General** tab.

Table 389. *VRRP General field descriptions*

Field	Description
VRRP Operation State	Globally enables or disables VRRP operation.
Virtual Router Tracking	Sets the increment of VRRP virtual router priority. This priority is adjusted by tracking the state of other virtual routers. The value 254 provides maximum priority.
IP Interface Tracking	Sets the increment of VRRP virtual router priority. This priority is adjusted by tracking the number of active (up) IP interfaces on the switch.
VLAN Switch Port Tracking	Sets the increment of VRRP virtual router priority. The priority is adjusted by tracking the port state of those ports that belong to the same virtual LAN as the virtual router.
Hot Standby	Enables or disables hot-standby processing, in which two or more switches provide redundancy for each other.
Hold Off	Sets the Hold Off value.

VRRP Virtual Router Configuration

Device Console > Configure > Layer 3 > VRRP > Virtual Router

Use the Virtual Router tab to configure VRRP Virtual Router settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Router** tab.

Table 390. VRRP Virtual Router field descriptions

Field	Description
Index	The index number of the VRRP virtual router.
ID	Defines the virtual router ID. This is used in conjunction with addr (below) to define a virtual router on this switch. To create a pool of VRRP-enabled routing devices which can provide redundancy to each other, each participating VRRP device must be configured with the same virtual router: one that shares the same VRID and addr combination. The VRID for standard virtual routers (where the virtual router IP address is not the same as any virtual server) can be any integer as defined on your particular switch model.
IP Address	Defines the IP address for this virtual router using dotted decimal notation. This is used in conjunction with the VRID (above) to configure the same virtual router on each participating VRRP device.
IP Interface	Sets the IP interface that the VRRP virtual router represents. If the IP interface has the same IP address as the IP Address option above, this switch is considered the "owner" of the defined virtual router. An owner has a special priority of the highest available virtual router number, and always assumes the role of master router, even if it must pre-empt another virtual router which has assumed master routing authority. This pre-emption occurs even if the Pre-emption option below is disabled.
Virtual Router State	Enables or disables the virtual router.
Priority	Defines the election priority bias for this virtual server. During the master router election process, the routing device with the highest virtual router priority number wins. If there is a tie, the device with the highest IP interface address wins. If this virtual router's IP address (addr) is the same as the one used by the IP interface, the priority for this virtual router is automatically set to the highest available priority value.
Advertisement Interval	Sets the time interval between VRRP advertisements.

Table 390. *VRRP Virtual Router field descriptions*

Field	Description
Pre-emption	Enables or disables a higher priority Backup VRRP virtual router to pre-empt a low-priority Master. When enabled, if this virtual router is in backup mode but has a higher priority than the current master, this virtual router pre-empts the lower priority master and assumes control. Note that even when Pre-emption is disabled, this virtual router always pre-empts any other master if this switch is the owner. A switch is the owner when the IP interface address and virtual router address are the same.
Pre-emption Delay	Sets the delay for pre-emption.
Virtual Routes Tracking	Enables or disables tracking other virtual routers for priority adjustment.
IP Interfaces Tracking	Enables or disables tracking other router interfaces for priority adjustment.
VLAN Switch Ports Tracking	Enables or disables tracking the states of VLAN ports for priority adjustment.
Fast Advertisement	Enables or disables fast advertisement.

VRRP Virtual Interface Configuration

Device Console > Configure > Layer 3 > VRRP > Virtual Interface

Use the Virtual Interface tab to configure VRRP Virtual Interface settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Interface** tab.

Table 391. *VRRP Virtual Interface field descriptions*

Field	Description
Index	The VRRP interface number.
Authentication	Sets the type of authentication in use. <ul style="list-style-type: none">● none: No authentication.● password: use the specified password for authentication.
Password	Sets the password for authentication.

VRRP Virtual Router Group Configuration

Device Console > **Configure** > **Layer 3** > **VRRP** > *Virtual Router Group*

Use the Virtual Router Group tab to configure VRRP Virtual Router Group settings.

Note: This tab is available only for certain switch types. Please disregard the information if it does not apply to your switch.

The following table describes the fields of the **Virtual Router Group** tab.

Table 392. *VRRP Virtual Router Group field descriptions*

Field	Description
Index	The number of the VRRP virtual router. Note: The index value is always 1 and you can add only one entry in this table.
ID	The VRRP virtual group identifier.
IP Interface	Sets the IP Interface that the VRRP virtual group represents.
Virtual Router Group State	Enables or disables the VRRP virtual router group.
Priority	Sets the priority value to be used by the specified VRRP virtual routers.
Advertisement Interval	Sets the time interval (in seconds) between VRRP advertisements.
Pre-emption	Enables or disables a higher priority Backup VRRP virtual router to pre-empt a low priority Master.
Pre-emptive Delay Interval	Sets the pre-emptive delay interval, in seconds.
IP Interfaces Tracking	Enables or disables tracking other router interfaces for priority adjustment.
VLAN Switch Ports Tracking	Enables or disables tracking port state of VLAN ports for priority adjustment.
Fast Advertisements	Enables or disables fast advertisement.
Restricted Advertisement	Enables or disables restricted advertisement.

Configuring DHCP

The following sections describe DHCP configuration tasks you can perform:

- “[Enabling or Disabling DHCP Snooping](#)” on page 430
- “[DHCP Snooping VLAN Configuration](#)” on page 430

Enabling or Disabling DHCP Snooping

Device Console > Configure > Layer 3 > DHCP > Snooping

Use this tab to enable or disable DHCP Snooping.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 393. *DHCP Snooping field descriptions*

Field	Description
DHCP Snooping	Enables or disables DHCP snooping
DHCP Snooping Option82	Enables or disables DHCP snooping option 82.

DHCP Snooping VLAN Configuration

Device Console > Configure > Layer 3 > DHCP > Snooping VLAN

Use the **Snooping VLAN** tab to configure DHCP snooping parameters for VLANs.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 394. *DHCP Snooping VLAN Configuration field descriptions*

Field	Description
VLAN ID	The VLAN ID.
State	Sets the state of the VLAN.

Configuring ARP

The following sections describe ARP configuration tasks you can perform:

- [“ARP Configuration” on page 431](#)
- [“Static ARP Configuration” on page 431](#)

ARP Configuration

Device Console > Configure > Layer 3 > ARP > ARP

Use this tab to configure Address Resolution Protocol (ARP) parameters.

Table 395. *ARP field descriptions*

Field	Description
Cache Timeout	Sets the time after which the entry in cache is deleted.
Cache Pending Time	Sets the time for which an unresolved entry is held until a response is received.
Max Retries	Sets the maximum number of retry attempts.
Re-ARP Period	Sets the Re-ARP period in seconds.

Static ARP Configuration

Device Console > Configure > Layer 3 > ARP > Static ARP

Use the **Static ARP** tab to configure ARP parameters.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 396. *Static ARP Configuration field descriptions*

Field	Description
Index	The static ARP index.
IP Address	Sets the IP address for the ARP entry.
MAC Address	Sets the MAC address for the ARP entry.
VLAN	Sets the VLAN for the ARP entry.
Port	Sets the Port for the ARP entry.

Configuring Ports

SNSC lets you configure physical properties on a per-port basis.

This section covers the following topics:

- “Port Properties Configuration” on page 432
- “Ports General Configuration” on page 433
- “Threshold Rate Configuration” on page 434
- “Gigabit Link Configuration” on page 434
- “Unidirectional Link Detection (UDLD) Configuration” on page 435
- “Operations, Administration and Management (OAM) Configuration” on page 435
- “ACL Configuration” on page 436
- “STP Configuration” on page 436
- “Port Priority Configuration” on page 437
- “Unicast Bandwidth Configuration” on page 437
- “Reflective Relay Configuration” on page 438
- “MAC Notification Configuration” on page 438
- “Private VLAN Configuration” on page 438
- “Port Map Configuration” on page 439

Port Properties Configuration

Device Console > Configure > Ports > Ports

Use this feature to configure port properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **Ports** configuration tab.

Table 397. *Ports field descriptions*

Field	Description
Port	Port Index
Name	Port Name
State	Enables or disables the port.
VLAN Tag State	Sets the VLAN tagging of the port: tagged or untagged. You cannot add a port to more than one VLAN unless the port is tagged.

Table 397. Ports field descriptions (continued)

Field	Description
Default VLAN	Sets the default VLAN ID for the port. Note: To select another VLAN ID for this port, double-click the cell to display configured VLANs and select any of the VLANs that appear in the list. Then click Modify . The Default VLAN field displays the new selection.
PVID Tag State	Sets the PVID tag state: tagged or untagged.
PVID ingress Tag State	Sets the ingress PVID tag state of the port: tagged or untagged.
DSCP Remarking	Enables or disables DSCP re-marking on a port.
Link Trap	Enables or disables link trap.
Hold Off	Sets the hold off value.
BPDU Guard	Enables or disables BPDU Guard.
RMON	Enables or disables Remote Monitoring.
FDB Learning	Enables or disables Layer 2 FDB learning on the port.
Flood Blocking	Enables or disables port Flood Blocking. When enabled, unicast and multicast packets with unknown destination MAC addresses are blocked from the port.
LFD Status	Determines whether the switch puts this port in an error-disabled state when the link continually goes up and down.
Error Disable	Enables or disables error disable recovery.
EVB Profile	Sets the EVB profile (0-16).
MAC Addr Notification	Enables or disables the MAC address notification syslog messages on the port.

Ports General Configuration

Device Console > **Configure** > **Ports** > *Ports General*

Use this tab to configure the general port properties.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 398. Ports General field descriptions

Field	Description
Port	Port number.
VLAN Tag State	Enables or disables VLAN tag state.

Table 398. *Ports General field descriptions*

Field	Description
PVID Tag State	Enables or disables VLAN tag persistence. When disabled, the VLAN tag is removed from packets whose VLAN tag matches the port PVID even if the port is a tagged member of that VLAN.
FDB Learning	Enables or disables FDB learning on the port.
Flooding	Enables or disables flooding on the port.
MAC Notification	Enables or disables MAC notification syslog messages on the port.
Link Logging	Enables or disables syslog for interface state change.

Threshold Rate Configuration

Device Console > Configure > Ports > Threshold Rate

Use this tab to configure the port threshold rates.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 399. *Threshold Rate field descriptions*

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Multicast Threshold	Enables or disables the port's multicast threshold. If disabled (dis), the port forwards all multicast packets.
Multicast Threshold Rate	Sets the number of multicast packets per second to the specified value.
Broadcast Threshold	Enables or disables the port's broadcast threshold. If disabled (dis), the port forwards all broadcast packets.
Broadcast Threshold Rate	Sets the number of broadcast packets per second to the specified value.
DLF Threshold	Enables or disables the port's unknown unicast threshold. If disabled (dis), the port forwards all unknown unicast packets.
DLF Threshold Rate	Sets the number of unknown unicast packets per second to the specified value.

Gigabit Link Configuration

Device Console > Configure > Ports > Gigabit Link

Use this tab to configure the port link parameters.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 400. *Gigabit Link field descriptions*

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Auto-Negotiation	Sets the auto-negotiation for Gigabit Ethernet connection (on or off).
Speed	Sets the port speed for Fast Ethernet connection as follows: 10Mbps, 100Mbps, 1000Mbps, any
Mode	Sets the port mode for Fast Ethernet connection as follows: full-duplex, half-duplex, full-or half-duplex
Flow Control	Sets the port flow control for Gigabit Ethernet connection as follows: other, transmit, receive, both, none

Unidirectional Link Detection (UDLD) Configuration

Device Console > Configure > Ports > UDLD

Use this tab to configure Unidirectional Link Detection (UDLD) for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 401. *Port UDLD field descriptions*

Field	Description
Port	Port number.
Name	Port name.
UDLD	Enables or disables UDLD.
Mode	Sets the UDLD mode for the port (normal or aggressive).

Operations, Administration and Management (OAM) Configuration

Device Console > Configure > Ports > OAM

Use this tab to configure Operations, Administration and Management (OAM) parameters for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 402. *Port OAM field descriptions*

Field	Description
Port	Port number.
Name	Port name.
OAM	Enables or disables OAM discovery process.
Mode	Sets the OAM mode for the port (active or passive).

ACL Configuration

Device Console > Configure > Ports > ACL/QOS

Use this tab to configure Access Control Lists (ACLs) for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 403. *Port ACL/QOS field descriptions*

Field	Description
Port	Port number.
ACL	Adds the specified ACL to the port.
ACL Group	Adds the specified ACL group to the port.

STP Configuration

Device Console > Configure > Ports > STP

Use this tab to configure Spanning Tree (STP) parameters for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 404. *Port STP field descriptions*

Field	Description
Port	Port number.
Name	Port name.
State	Enables or disables the port.
Port Edge	Enables or disables the port as an edge port.
Link Type	Sets the link type for the selected port.
Guard Type	Sets the Spanning Tree Guard type (loop, root, none, default).

Port Priority Configuration

Device Console > Configure > QOS > 802.1p > Port Priority

Use this tab to configure port priority.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 405. *Port Priority field descriptions*

Field	Description
Port	Port number.
Priority	Sets the priority for the selected port.

Unicast Bandwidth Configuration

Device Console > Configure > Ports > Unicast Bandwidth

Use this tab to configure Unicast Bandwidth for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 406. *Unicast Bandwidth field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Unicast Bandwidth	Sets the port unicast bandwidth.

Spanning Tree Protocol (STP) Configuration

Device Console > Configure > Ports > STP

Use this tab to configure Spanning Tree Protocol for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 407. *STP field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Port Edge	Enables or disables edge port status for the port.
Line Type	Sets the link type (auto, p2p, or shared).
Guard Type	Sets the guard type for the port (default, loop, root, or none).

DHCP Snooping Configuration

Device Console > Configure > Ports > DHCP Snooping

Use this tab to configure DHCP Snooping for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 408. *DHCP Snooping field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Trusted	Sets whether or not this is a trusted port.
Rate Limit	Sets the rate limit for the port.

Reflective Relay Configuration

Device Console > Configure > Ports > Reflective Relay

Use this tab to configure Reflective Relay for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 409. *Reflective Relay field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Reflective Relay	Enables or disables reflective relay for the port.

MAC Notification Configuration

Device Console > Configure > Ports > Mac Notification

Use this tab to configure MAC Notification for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 410. *MAC Notification field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Mac Notification	Enables or disables Mac notification for the port.

Private VLAN Configuration

Device Console > Configure > Ports > Private VLAN

Use this tab to configure private VLANs for the port.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 411. *Private VLAN field descriptions*

Field	Description
Port	Sets the index of the row in the port configurations table.
Name	Sets the switch port name.
Private VLAN	Enables or disables the private VLAN.
Primary VLANs	Sets the primary VLANs for the port.
Secondary VLANs	Sets the secondary VLANs for the port.

Port Map Configuration

Device Console > **Configure** > **Ports** > *Port Map*

Use this tab to configure port mapping.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 412. *Port Map field descriptions*

Field	Description
Port	The port number.
Booted Mode	The booted port configuration; either unmapped(0) for ports that are not mapped, or mapped(1) for mapped ports.
Saved Mode	The saved port configuration; either unmapped(0) for ports that are not mapped, or mapped(1) for mapped ports.

Configuring QoS – WRED/ECN

The following sections describe the tasks associated with QoS WRED/ECN configuration:

- [“General Configuration” on page 440](#)
- [“WRED/ECN Port Configuration” on page 440](#)
- [“WRED/ECN Port Profile Configuration” on page 440](#)

General Configuration

Device Console > Configure > QoS > WRED/ECN > General

Use the **General** tab to set WRED and ECS states globally.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 413. *WRED/ECN General Configuration field descriptions*

Field	Description
WRED	Turns global WRED state on or off.
ECN	Turns global ECN state on or off.

WRED/ECN Port Configuration

Device Console > Configure > QoS > WRED/ECN > Ports

Use the **Ports** tab to set WRED and ECS states for ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 414. *WRED/ECN Port Configuration field descriptions*

Field	Description
Port	The port index
WRED	Turns WRED state for the selected port on or off.
ECN	Turns ECN state for the selected port on or off.

WRED/ECN Port Profile Configuration

Device Console > Configure > QoS > WRED/ECN > Port Profiles

Use the **Port Profiles** tab to set WRED and ECS profile parameters for ports.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 415. *WRED/ECN Port Profile Configuration field descriptions*

Field	Description
Port	The port index
Transmit Queue	The global transmit queue index.
TCP Min Threshold Rate	Sets the minimum threshold value of the global TCP profile for the port.
TCP Max Threshold Rate	Sets the maximum threshold value of the global TCP profile for the port.
TCP Drop Rate	Sets the drop rate value of the global TCP profile for the port.
Non TCP Min Threshold Rate	Sets the minimum threshold value of the global non TCP profile for the port.
Non TCP Max Threshold Rate	Sets the maximum threshold value of the global non TCP profile for the port.
Non TCP Drop Rate	Sets the drop rate value of the global non TCP profile for the port.
WRED State	Turns on or off WRED state of the global transmit queue for the port.

Unicast Bandwidth Configuration

Device Console > **Configure** > **QoS** > *Unicast Bandwidth*

Use the **Unicast Bandwidth** tab to set the unicast bandwidth configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

802.1p Port Configuration

Device Console > **Configure** > **QoS** > **802.1p** > *General*

Use the **General** tab to set the default 802.1p port configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Port Priority Configuration

Device Console > **Configure** > **QoS** > **802.1p** > Port Priority

Use the **Port Priority** tab to configure Port Priority.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch. Priority CoS Configuration

Table 416. *Port Priority Configuration field descriptions*

Field	Description
Port	Switch Port Number.
Priority	Switch Port Priority; a number between 0 and 7.

Port Priority CoS Configuration

Device Console > Configure > QoS > 802.1p > Priority CoS

Use the **Priority CoS** tab to configure Priority CoS.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 417. *Priority CoS Configuration field descriptions*

Field	Description
Priority	Frame Priority Number.
CoS	CoS for a Frame Priority; a number between 0 and 7.

CoS Weight Configuration

Device Console > Configure > QoS > 802.1p > CoS Weight

Use the **CoS Weight** tab to configure CoS Weight.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 418. *CoS Weight Configuration field descriptions*

Field	Description
CoS	CoS Number.
Weight	Weight of CoS

Port Multicast Priority CoS Configuration

Device Console > Configure > QoS > 802.1p > Multicast Priority CoS

Use the **Multicast Priority CoS** tab to configure Multicast Priority CoS.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 419. *Multicast Priority CoS Configuration field descriptions*

Field	Description
Priority	Frame Priority Number.
Multicast CoS	Class of Service for a Frame priority.

Multicast CoS Weight Configuration

Device Console > **Configure** > **QoS** > **802.1p** > Multicast CoS Weight

Use the **Multicast CoS Weight** tab to configure the Multicast CoS Weight.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 420. *Multicast CoS Weight Configuration field descriptions*

Field	Description
CoS	Class of Service number.
Weight	Weight of Multicast CoS queue.

DSCP General Configuration

Device Console > **Configure** > **QoS** > **DSCP** > General

Use the **General** tab to set the DSCP state globally.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 421. *DSCP General Configuration field descriptions*

Field	Description
DSCP State	Turns global DSCP state on or off.

DSCP Configuration

Device Console > **Configure** > **QoS** > **DSCP** > DSCP Configuration

Use the **DSCP Configuration** tab to set DSCP Mapped/802.1p Priority.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 422. *DSCP Configuration field descriptions*

Field	Description
DSCP	DSCP value

Table 422. *DSCP Configuration field descriptions (continued)*

Field	Description
New Mapped DSCP	Map DSCP Value
802.1p Priority	Map 802.1p value

Global Profile Configuration

Device Console > Configure > QoS > WRED/ECN > Global Profile

Use the **Global Profile** tab to configure WRED and ECS profile parameters

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 423. *WRED/ECN Global Profile Configuration field descriptions*

Field	Description
Transmit Queue	The global transmit queue index.
TCP Min Threshold Rate	Sets the minimum threshold value of the global TCP profile.
TCP Max Threshold Rate	Sets the maximum threshold value of the global TCP profile.
TCP Drop Rate	Sets the drop rate value of the global TCP profile.
Non TCP Min Threshold Rate	Sets the minimum threshold value of the global non TCP profile.
Non TCP Max Threshold Rate	Sets the maximum threshold value of the global non TCP profile.
Non TCP Drop Rate	Sets the drop rate value of the global non TCP profile.
WRED State	Turns on or off WRED state of the global transmit queue.

Configuring ACLs

This section covers the following ACL topics:

- [“General ACL Properties Configuration” on page 445](#)
- [“Adding an ACL” on page 446](#)
- [“General ACL6 Properties Configuration” on page 448](#)
- [“ACL6 IPv6 Configuration” on page 448](#)
- [“ACL6 Meter Configuration” on page 449](#)
- [“ACL6 Re-mark Configuration” on page 449](#)
- [“ACL6 TCP-UDP Configuration” on page 450](#)
- [“ACL Groups Configuration” on page 451](#)
- [“ACL Block Configuration” on page 451](#)
- [“Management ACL Configuration” on page 451](#)
- [“ACL Log Configuration” on page 453](#)
- [“ACL VMAPs Configuration” on page 453](#)
- [“MAC ACL Configuration” on page 458](#)
- [“IP ACL Configuration” on page 459](#)

General ACL Properties Configuration

Device Console > Configure > Access Control List > ACL

Use this feature to configure the general ACL properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **ACL** configuration tab.

Table 424. *ACL field descriptions*

Field	Description
ACL	Configures the ACL number
Block	Displays the ACL Block number
Group	Displays the ACL Group number
Egress Ports	Displays the egress port, if applicable.
Statistics	Enables or disables statistics collection for this ACL.
Filter Action	Configures a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets, or set the Class of Service queue that handles the packets.
Priority	Configures the 802.1p priority (none, 0-7).

Table 424. *ACL field descriptions*

Field	Description
Out Prof DSCP Enable	Enables or disables out profile DSCP
CoSq	Configures the Class of Service queue. This section applies only if you set the filter action to setcos.
Mirror Port	Sets the port as the mirror target.
Log	Enables or disables logging for the selected ACL.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.
User Priority	Sets user defined priority for the ACL.

Adding an ACL

To add an ACL, click **Insert** in the ACL Configuration window. (**Device Console > Configure > Access Control List > ACL**).

The following table describes the fields of the Insert ACL window.

Table 425. *Insert ACL field descriptions*

Field	Description
ACL	Configures the ACL index number.
Egress Ports	Sets the Egress ports. Click Browse to select the ports.
Statistics	Enables or disables the ACL statistics.
Log	Enables or disables logging for the selected ACL.
Filter Action	Sets the filter action to none, permit, deny or setprio (set priority).
Priority	Sets the priority (none, prio0-prio7). Note that this field is enabled only when you set the Filter Action to setprio. The default setting is none.
Mirror Port	Sets the Mirror ports. Click Browse to select the ports.
Filter Action VLAN	Sets the VLAN to be changed. Note that this field is enabled only when you set the Filter Action to changevlan. Setting VLAN to 0 automatically disables changevlan for this VLAN.
Ethernet Format	Sets the Ethernet format (none, Ethernet2, SNAP, LLC).
Tag Format	Sets the Tag format (disabled, any, none, tagged).
IP Format	Sets the IP format (none, ipv4, ipv6).

Table 425. *Insert ACL field descriptions (continued)*

Field	Description
Source MAC address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type (none, arp, ipv4, ipv6, mpls, rarp, any, other).
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to other.
VLAN ID	Sets the VLAN Identifier.
VLAN Mask	Sets the VLAN mask.
802.1p Priority	Sets 802.1p priority (none, 0-7).
Type Of Service	Sets the Type Of Service.
Protocol	Sets the protocol.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.
Meter Action	Sets the meter action to unconfigured, outdrop or outpass.
Meter Status	Enables or disables port metering.
Committed Rate	Sets the committed rate.

Table 425. *Insert ACL field descriptions (continued)*

Field	Description
Maximum Burst Size	Sets the maximum burst size.
In Prof User	Sets the in-profile user to 0-7.
In Prof Dscp	Sets the in-profile DSCP value to 0-63.
In Prof ToS	Enables or disables in-profile ToS.
Out Prof Dscp	Sets the out-profile DSCP value to 0-63.
In Profile User Enable	Enables or disables in-profile user.
In Profile Dscp Enable	Enables or disables in-profile DSCP.
Out Profile Dscp Enable	Enables or disables out-of-profile DSCP.

General ACL6 Properties Configuration

Device Console > Configure > Access Control List > ACL6 > General

Use this feature to configure the general ACL properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **ACL** configuration tab.

Table 426. *ACL6 General field descriptions*

Field	Description
ACL6	Configures the ACL6 number
Egress Ports	Displays the egress port, if applicable.
Statistics	Enables or disables statistics collection for this ACL.
Filter Action	Configures a filter action for packets that match the ACL6 definitions. You can choose to permit (pass) or deny (drop) packets, or set the Class of Service queue that handles the packets.

ACL6 IPv6 Configuration

Device Console > Configure > Access Control List > ACL6 > IPv6

Use this feature to configure ACL IPv6 properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the IPv6 window.

Table 427. *ACL6 IPv6 field descriptions*

Field	Description
ACL6	Configures the ACL6 index number.
Source IPv6 Address	Sets a source IPv6 address for the ACL. If defined, traffic with this source IP address will match this ACL.
Source IPv6 Prefix	Sets a source IPv6 prefix for the ACL. If defined, traffic with this source IP prefix will match this ACL. .
Destination IPv6 Address	Sets a destination IPv6 address for the ACL. If defined, traffic with this destination IP address will match this ACL.
Destination IPv6 Prefix	Sets a destination IPv6 prefix for the ACL. If defined, traffic with this destination IP prefix will match this ACL.
IPv6 Flow Label	Sets the flow label for the ACL. If defined, traffic with this flow label will match this ACL.
IPv6 Traffic Class	Sets the traffic class for the ACL. If defined, traffic with this traffic class will match this ACL.
IPv6 Next Header	Sets an IPv6 next header for the ACL.

ACL6 Meter Configuration

Device Console > Configure > Access Control List > ACL6 > Meter

Use this feature to configure ACL6 meter properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the Meter window.

Table 428. *ACL6 Meter field descriptions*

Field	Description
ACL	Configures the ACL6 index number.
Meter Action	Sets the meter action.
Meter Status	The current meter status.
Committed Rate	Sets the committed rate, in Kilobits per second. The committed rate must be a multiple of 64.
Maximum Burst Size	Sets the maximum burst size, in Kilobits.

ACL6 Re-mark Configuration

Device Console > Configure > Access Control List > ACL6 > Re-mark

Use this feature to configure ACL6 re-mark properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the Re-mark window.

Table 429. *ACL6 Re-mark field descriptions*

Field	Description
ACL	Configures the ACL6 index number.
User Priority	Sets the user priority.
In Prof Dscp	Re-marks the DiffServ Code Point (DSCP) of in-profile packets to the selected value.
ToS	Enables or disables mapping of TOS (Type of Service) priority to 802.1p priority for in-profile packets. When enabled, the TOS value is used to set the 802.1p value.
User Enable	Sets the maximum burst size, in Kilobits.
In Prof Dscp Enable	Enables or disables updating DSCP settings.

ACL6 TCP-UDP Configuration

Device Console > Configure > Access Control List > ACL6 > TCP-UDP

Use this feature to configure ACL6 TCP-UDP properties.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 430. *ACL6 TCP-UDP field descriptions*

Field	Description
ACL6	Configures the ACL6 index number.
Source Port	Sets a source port for the ACL. If defined, traffic with the specified TCP or UDP source port will match this ACL.
Source Port Mask	Sets the mask for the source port for the ACL.
Destination Port	Defines a destination port for the ACL. If defined, traffic with the specified TCP or UDP destination port will match this ACL.
Destination Port Mask	Sets the mask for the destination port for the ACL.
TCP Flags	Sets a TCP or UDP flag for the ACL.
TCP Flags Mask	Sets a TCP or UDP flag mask for the ACL.

ACL Groups Configuration

Device Console > Configure > Access Control List > Groups

Use this tab to compile one or more ACLs and ACL Blocks into an ACL Group. Once you create an ACL Group, you can assign the ACL Group to one or more ports.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

The following table describes the fields of the **ACL Groups** configuration tab.

Table 431. *Access Control List Groups field descriptions*

Field	Description
ACL Group	Configures the ACL Group number.
ACLs	Add ACLs to the ACL Group, or remove ACLs from the ACL Group.
ACL6s	Add ACL Blocks to the ACL Group, or remove ACL Blocks from the ACL Group.

ACL Block Configuration

Device Console > Configure > Access Control List > ACL Block

Use the **ACL Block** tab for ACL Block configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 432. *ACL Block Configuration field descriptions*

Field	Description
ACL Block	Sets the ACL Block number.
ACLs	Adds or removes ACLs to or from the ACL Block.

Management ACL Configuration

Device Console > Configure > Access Control List > Management ACL

Use the **Management ACL** tab for Management ACL configuration.

Note: This tab might not be available for the selected switch type. Please disregard this tab if it do not apply to your switch.

Table 433. *Management ACL Configuration field descriptions*

Field	Description
ACL	Sets the Management ACL number.
User Enable	Sets the user-specified update method for this ACL: disabled, enabled.

Table 433. *Management ACL Configuration field descriptions*

Field	Description
Statistics	Enables or disables the statistics collection for this ACL.
Filter Action	Sets a filter action for packets that match the ACL definitions. You can choose to permit (pass) or deny (drop) packets.
Protocol	Sets the protocol.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.

ACL Log Configuration

Device Console > Configure > Access Control List > Log

Use this tab to configure ACL logging.

Table 434. *ACL Logging field descriptions*

Field	Description
Interval	Sets filter log display interval.
Rate Limit	Sets filter log queue rate limit.

ACL VMAPs Configuration

Device Console > Configure > Access Control List > VMAP > VMAP

Use this feature to add or remove a VLAN Map to ACLs.

Note: This tab is available only for VMready capable switches. Please disregard this information if it does not apply to your switch.

The following table describes the fields of the **VMAP** configuration tab.

Table 435. *ACL VMAP field descriptions*

Field	Description
Index	VMAP index
Egress Ports	Displays the egress ports.
Statistics	Enables or disables statistics collection for this ACL and VMAP.
Filter Action	Configures a filter action for packets that match the ACL VMAP definitions. You can choose to permit (pass) or deny (drop) packets, or set the Class of Service queue that handles the packets.
Priority	Sets the VLAN priority.
Mirror Port	Sets the port as the mirror target.
Ethernet Format	Sets the Ethernet format (none, ethernet2, snap, llc).
Tag Format	Sets the Tag format (disabled, any, none, tagged).
IP Format	Sets the IP format (none, ipv4, ipv6).
Source MAC Address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.

Table 435. *ACL VMAP field descriptions (continued)*

Field	Description
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type (none, arp, ipv4, ipv6, mpls, rarp, any, other)
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to "other".
802.1p Priority	Sets 802.1p priority (0-7, none).
Type of Service	Sets the Type of Service value.
Protocol	Sets the protocol type.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
TCP Flags	Sets the TCP flags.
TCP Flags Mask	Sets the TCP flags mask.
Port Metering Status	Enables or disables port metering.
Meter Action	Sets the meter action (unconfigured, outdrop, outpass).
Meter Status	Enables or disables meter status.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
In Prof User	Sets the in-profile user value.
In Prof Dscp	Sets the in-profile DSCP value.
In Prof ToS	Enables or disables in-profile ToS.
Out Prof Dscp	Sets the out-of-profile DSCP value.

Table 435. *ACL VMAP field descriptions (continued)*

Field	Description
In Prof User Enable	Sets the in-profile user (disabled, user defined state).
In Prof Dscp Enable	Sets the in-profile DSCP (disabled, user defined state).
Out Prof Dscp Enable	Enables or disables out-of-profile DSCP.

Adding VMAPs to an ACL

You can add VMAPs to an ACL by clicking **Insert** in ACL VMAPs configuration window (**Device Console > Configure > Access Control List > VMAP**).

The following table describes the fields of the Insert VMAP window.

Table 436. *Insert VMAP field descriptions*

Field	Description
Index	The VMAP index.
Egress Ports	Sets the Egress ports. Use Browse button to select the ports.
Statistics	Enables or disables the statistics.
Filter Action	Sets the filter action (none, permit, deny, setprio).
Priority	Sets the priority (0-7, none). Note that this field is enabled only when you set the Filter Action to setprio. Or else, none is taken by default.
Filter Action VLAN	Sets the VLAN to be changed. Note that this field is enabled only when you set the Filter Action to changevlan. Setting VLAN to 0 automatically disables changevlan for this VLAN.
Ethernet Format	Sets the Ethernet format (none, ethernet2, snap, llc).
Tag Format	Sets the Tag format (disabled, any, none, tagged).
IP Format	Sets the IP format (none, ipv4, ipv6).
Source MAC Address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.

Table 436. *Insert VMAP field descriptions (continued)*

Field	Description
Ethernet Type	Sets the Ethernet type (none, arp, ipv4, ipv6, mpls, rarp, any, other)
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to “other”.
802.1p Priority	Sets 802.1p priority (0-7, none).
Type of Service	Sets the Type of Service value.
Protocol	Sets the protocol type.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Port Metering Status	Enables or disables port metering.
Meter Action	Sets the meter action (unconfigured, outdrop, outpass).
Meter Status	Enables or disables meter status.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
In Prof User	Sets the in-profile user value.
In Prof Dscp	Sets the in-profile DSCP value.
In Prof ToS	Enables or disables in-profile ToS.
Out Prof Dscp	Sets the out-of-profile DSCP value.
In Prof User Enable	Sets the in-profile user (disabled, user defined state).
In Prof Dscp Enable	Sets the in-profile DSCP (disabled, user defined state).

Table 436. *Insert VMAP field descriptions (continued)*

Field	Description
Out Prof Dscp Enable	Enables or disables out-of-profile DSCP.
Mirror Port	Sets the port as the mirror target.
Tcp Flags	Sets the TCP flags.
Tcp Flags Mask	Sets the TCP flags mask.

MAC ACL Configuration

Device Console > Configure > Access Control List > MAC ACL

Use this tab to configure MAC ACLs.

Table 437. *MAC ACL field descriptions*

Field	Description
ACL	MAC ACL rule number.
In Ports	Sets the complete set of ports over which if the packet arrives the filter rule will be applicable. If the incoming port list is 0 (zero), the filter rule is applicable for all the incoming ports. By default in-port list is maintained as 0.
Out Ports	This field is applicable only if the filter action is set to <code>allow</code> . If the outgoing port list is non-zero, the packet will be sent over the specified ports only. If the outgoing port list is 0 (zero), the port over which the packet is to be switched will be based on further processing on the packet. By default, the out-port list is maintained as 0.
Protocol Type	Sets the non IP protocol type to be filtered. The values are: <code>aarp</code> , <code>amber</code> , <code>dec-spanning</code> , <code>decnet-iv</code> , <code>diagnostic</code> , <code>dsm</code> , <code>etype-6000</code> , <code>etype-8042</code> , <code>lat</code> , <code>larc-sca</code> , <code>mop-console</code> , <code>mop-dump</code> , <code>msdos</code> , <code>mump</code> , <code>netbios</code> , <code>vines-echo</code> , <code>vines-ip</code> , <code>xns-idp</code> A value of 0 (zero) means the filter is applicable for all protocols.
Source Address	Sets the source MAC address to be matched with the packet.
Destination Address	Sets the destination MAC address to be matched with the packet.
VLAN	Sets the VLAN ID to be filtered. A value of 0 (zero) means no VLAN is configured for filtering
Action	Sets the action to be taken on the packet if the filter rule matches. If the action is <code>allow</code> , the packet will be forwarded according to the forwarding rules. If the action is <code>drop</code> , the packet will be discarded.
Statistics Status	Sets the stats status (true or false).
Mirror	Enables or disable port mirroring.
Mirror Port	Sets the port to which the packets matching the ACLs should be mirrored. This attribute is operational only when mirroring is enabled.
User Priority	Sets the user priority. A value of -1 means no user priority is configured.

IP ACL Configuration

Device Console > Configure > Access Control List > IP ACL

Use this tab to configure IP ACLs.

Table 438. *IP ACL field descriptions*

Field	Description
ACL	IP ACL rule number.
In Ports	Sets the complete set of ports over which if the packet arrives the filter rule will be applicable. If the incoming port list is 0 (zero), the filter rule is applicable for all the incoming ports. By default in-port list is maintained as 0.
Out Ports	This field is applicable only if the Filter Action is set to allow. If the outgoing port list is non-zero, the packet will be sent over the specified ports only. If the outgoing port list is 0 (zero), the port over which the packet is to be switched will be based on further processing on the packet. By default out-port list is maintained as 0.
Type	Sets the category of IP filters. Standard IP filter provides the basic IP filter option (IP address/mask) whereas extended IP filter provides additional options (Protocol, TCP/UDP Port numbers, TCP flags, TOS, DSCP and ICMP types). This attribute needs to be set before configuring the other attributes of this table.
Protocol Type	Sets the protocol type to be checked against the packet.
Message Type	Sets the message type to be checked against the packet.
Message Code	Sets the message code to be checked against the packet.
Source Address	Sets the source IP address to be matched with the packet.
Source Mask	Sets the IP subnet mask for source IP address.
Destination Address	Sets the destination IP address to be matched with the packet.
Destination Mask	Sets the IP subnet mask for destination IP address.
Min Source Protocol Port	Sets the minimum port in the source port range.
Min Destination Protocol Port	Sets the minimum port in the destination port range.
Max Source Protocol Port	Sets the maximum port in the source port range.
Max Destination Protocol Port	Sets the maximum port in the destination port range.
ACK Bit	Sets the TCP ACK bit to be checked against the packet.

Table 438. *IP ACL field descriptions (continued)*

Field	Description
RST Bit	Sets the TCP RST bit to be checked against the packet.
FIN Bit	Sets the TCP FIN bit to be checked against the packet.
SYN Bit	Sets the TCP SYN bit to be checked against the packet.
URG Bit	Sets the TCP URG bit to be checked against the packet.
PSH Bit	Sets the TCP PSH bit to be checked against the packet.
IP TOS Bit	Sets the IP TOS bit to be checked against the packet.
DSCP	Sets the IP DSCP value to be checked against the packet.
Action	Sets the action to be taken on the packet if the filter rule matches.
Statistics Status	Sets whether ACL's Hit Count to be maintained or not.
Mirror	Enables or disable port mirroring.
Mirror Port	Sets the port to which the packets matching the ACLs should be mirrored. This attribute is operational only when mirroring is enabled.

Configuring CEE (Converged Enhanced Ethernet)

The following sections describe the configuration tasks associated with CEE:

- “CEE General Configuration” on page 461
- “Priority Allocation Configuration” on page 461
- “Bandwidth Allocation Configuration” on page 461
- “PFC (Priority Flow Control) Configuration” on page 462
- “PFC Status Configuration” on page 462
- “Port PFC Configuration” on page 462
- “Port PFC Status Configuration” on page 462
- “DCBX (Data Center Bridging Capability Exchange) Protocol Configuration” on page 464

CEE General Configuration

Device Console > **Configure** > **CEE** > *General*

Use the **CEE General** tab to enable or disable the global state.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Priority Allocation Configuration

Device Console > **Configure** > **CEE** > *Priority Allocation*

Use the **CEE Priority Allocation** tab to set Priority Group for the configured Priority.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 439. *Priority Allocation field descriptions*

Field	Description
Priority	Priority value (0-7).
Priority Group	Priority Group configured for the priority (0-7, no bandwidth limit).

Bandwidth Allocation Configuration

Device Console > **Configure** > **CEE** > *Bandwidth Allocation*

Use the **CEE Bandwidth Allocation** tab to set Bandwidth for the Priority Groups.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 440. *Bandwidth Allocation field descriptions*

Field	Description
Priority Group	Priority Group index.
Bandwidth	Bandwidth range (0-100).

PFC (Priority Flow Control) Configuration

Device Console > Configure > CEE > PFC

Use the PFC tab to enable or disable the global PFC state.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

PFC Status Configuration

Device Console > Configure > CEE > PFC Status

Use the **PFC Status** tab to enable or disable the global PFC status of individual priority.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 441. *PFC Status field descriptions*

Field	Description
Priority	Priority value (0-7).
Global PFC Status	PFC status (enabled or disabled).

Port PFC Configuration

Device Console > Configure > CEE > Port PFC

Use the **Port PFC** tab to enable or disable the PFC status of individual ports.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 442. *Port PFC field descriptions*

Field	Description
Port	Port number.
PFC status	PFC status for the port (enabled or disabled).

Port PFC Status Configuration

Device Console > Configure > CEE > Port PFC Status

Use the **Port PFC Status** tab to enable or disable the PFC status of port and priority combination.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 443. *Port PFC Status field descriptions*

Field	Description
Port	Port number.
Priority	Priority value.
PFC status	PFC status (enabled or disabled).

DCBX (Data Center Bridging Capability Exchange) Protocol Configuration

Device Console > Configure > CEE > DCBX

Use the **DCBX** tab to configure various features of DCBX.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 444. *DCBX field descriptions*

Field	Description
Port	Port number.
DCBX State	DCBX status (enabled or disabled).
ETS Willing	ETS Willing setting (enabled or disabled).
ETS Advertise	ETS Advertise setting (enabled or disabled).
PFC Willing	PFC Willing setting (enabled or disabled).
PFC Advertise	PFC Advertise setting (enabled or disabled).
App Protocol Willing	App Protocol Willing setting (enabled or disabled).
App Protocol Advertise	App Protocol Advertise setting (enabled or disabled).

Configuring Multicast Priority

Device Console > Configure > CEE > Multicast Priority

This provides information on Multicast Priority Allocation.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 445. *CEE Multicast priority field descriptions*

Field	Description
Multicast Priority	Multicast Priority
Group Number	Multicast Priority Group Number

Configuring Multicast Bandwidth Allocation

Device Console > Configure > CEE > Multicast Bandwidth Allocation

This provides information on Multicast Bandwidth Allocation.

Note: This tab is available only for CEE capable switches. Please disregard this information if it does not apply to your switch.

Table 446. *CEE Multicast Bandwidth Allocation field descriptions*

Field	Description
Multicast Priority Group	Multicast Priority Group
Multicast Group Bandwidth	Multicast Group Bandwidth
Description	Description

Configuring FCoE (Fiber Channel over Ethernet)

The following sections describe the configuration tasks associated with FCoE:

- “FCoE Alias Configuration” on page 467
- “FCoE Zone Configuration” on page 468
- “FCoE Zone Member Configuration” on page 468
- “FCoE ZoneSet Configuration” on page 469
- “FCoE ZoneSet Member Configuration” on page 469
- “FCoE Active ZoneSet Configuration” on page 470
- “FCoE Optimization Configuration” on page 470
- “FCoE Ports Configuration” on page 470
- “FCoE Global Configuration” on page 470
- “FCoE FC Interface Configuration” on page 471
- “FCoE FCF Configuration” on page 471
- “FCoE NPV Configuration” on page 472
- “FIP Snooping Configuration” on page 473
- “FIP Snooping Port Configuration” on page 473

FCoE Alias Configuration

Device Console > **Configure** > **FC/FCoE** > **Zoning** > *FC Alias*

Use the **FC Alias** tab to set information on all the port FC Aliases configured in all the VLANs.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 447. *FCoE FC Alias Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN ID.
Index	Sets the index.
FC Alias Name	Sets the name of the FC Alias for this port.
Rename	Rename the port alias specific to the VLAN.

FCoE Alias Member Configuration

Device Console > **Configure** > **FC/FCoE** > **Zoning** > *Alias Member*

Use the **Alias Member** tab to set FC alias members.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 448. *FCoE Zone Member Configuration field descriptions*

Field	Description
VLAN	The VLAN which has the port FC Alias configured.
FC Alias Index	Sets the FC Alias index in the given VLAN.
Member FC Alias Index	Sets the FC Alias member index.
FC Alias	Sets the port FC Alias name.
PWWN	Sets the member name in the port FC Alias.

FCoE Zone Configuration

Device Console > Configure > FC/FCoE > Zoning > Zone

Use the **Zone** tab to set FC zones.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 449. *FCoE Zone Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN number.
Index	Sets the index.
Name	Sets the zone name.
Clone	Creates a new zone with the attributes of the selected zone.
Rename	Renames the FC zone.

FCoE Zone Member Configuration

Device Console > Configure > FC/FCoE > Zoning > Zone Member

Use the **Zone Member** tab to set FC zone members.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 450. *FCoE Zone Member Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN number.
Zone Index	Sets the zone index.
Zone Member Index	Sets the zone member index.
Zone Name	Sets the zone name.

Table 450. *FCoE Zone Member Configuration field descriptions*

Field	Description
Member Type	Sets the zone member type.
PWWN	Sets the port World Wide Name mapping.
FC Alias	Sets the FC alias.

FCoE ZoneSet Configuration

Device Console > Configure > FC/FCoE > Zoning > ZoneSet

Use the **ZoneSet** tab to set FC zone sets.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 451. *FCoE ZoneSet Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN number.
Index	Sets the zoneset index.
Name	Sets the zoneset name.
Clone	Creates a new zoneset with the attributes of the selected zone.
Rename	Renames the FC zoneset.

FCoE ZoneSet Member Configuration

Device Console > Configure > FC/FCoE > Zoning > ZoneSet Member

Use the **ZoneSet Members** tab to set FC zone set members.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 452. *FCoE ZoneSet Member Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN number.
ZoneSet Index	Sets the zoneset index.
ZoneSet Zone Index	Sets the zoneset zone index.
ZoneSet Name	Sets the zoneset name.
Member Name	Sets the zoneset member name.

FCoE Active ZoneSet Configuration

Device Console > Configure > FC/FCoE > Zoning > Active ZoneSet

Use the **Zone** tab to set FC zone sets.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 453. *FCoE Active ZoneSet Configuration field descriptions*

Field	Description
VLAN	Sets the VLAN number.
Active ZoneSet	Sets the active zoneset.
Default Zone	Sets the default zone.
Deactivate?	Activates or deactivates the zoneset.

FCoE Optimization Configuration

Device Console > Configure > FC/FCoE > FCoE > FCoE Optimization

Use the **FCoE Optimization** tab to turn FCoE optimized forwarding on or off.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

FCoE Ports Configuration

Device Console > Configure > FC/FCoE > FCoE > FC Ports

Use the **FC Ports** tab to designate ports as FC ports.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

FCoE Global Configuration

Device Console > Configure > FC/FCoE > FCoE > Global Configuration

Use the **Global Configuration** tab to modify the Switch Member, FCMap, FCF Priority, and FIPS Keep Alive values..

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 454. *FCoE Global Configuration field descriptions*

Field	Description
Switch Member	Sets the switch member.
FCMap	Sets the FC map.
FCF Priority	Sets the FCF priority.
FIPS Keep Alive	Sets the Fibre Channel Initialization Protocol (FIP) Keep Alive advertising period, in seconds.

FCoE FC Interface Configuration

Device Console > Configure > FC/FCoE > FCoE > FC Interface

Use the **FC Interface** tab to modify the Speed, Shutdown, and E-Port values.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 455. *FCoE FC Interface Configuration field descriptions*

Field	Description
Stack Member	The stack member.
Omni-Port	The omni-port number.
Speed	Sets the interface speed.
Shutdown	Shuts down or turns on the interface.
E-Port	Enables or disables the e-port feature.

FCoE FCF Configuration

Device Console > Configure > FC/FCoE > FCoE > FCF

Use the **FCF** tab to enable or disable FCF and change FC Domain values.

Note: This tab is available only for FCoE capable switches. Some of the fields listed might not apply to your FCoE capable switch. Please disregard this information if it does not apply to your switch.

Table 456. *FCoE FCF Configuration field descriptions*

Field	Description
VLAN	The VLAN ID.
FCF	Enables or disables FCF.
Switch Number	The switch number.
VLAN ID	The VLAN ID.
FCF State	Enables or disables FCF.
Area Size	Sets the area size (256-4096, default 1024) of FCF-enabled VLAN.
FCF Priority	Sets the FCF Priority (0-255, default 128) on an FCF-enabled VLAN.

Table 456. FCoE FCF Configuration field descriptions

Field	Description
FC Map	Sets the FC map (0xefc00-0xefcff) on an FCF-enabled VLAN. Notes: <ul style="list-style-type: none">• The range must be in hexadecimal.• The FC map cannot be changed after FCF is enabled.
FIP Keep Alive Period	Sets the FIP keep alive period, in milliseconds (250-90000, default 8000) on an FCF-enabled VLAN.
Login Limit	Sets the maximum number of concurrent FC Fabric Logins (FLOGIs) or FC Discovery messages (FDISCs) allowed on a VLAN.
Member Ports	List of member ports of the given VLAN (any configurable VLAN) irrespective of the VLAN's FCF status.
FC Domain	Sets the FC domain identifier (0-239) and type (Preferred=1; Static=0) in the format <i>Domain_ID:type</i> .

FCoE NPV Configuration

Device Console > Configure > FC/FCoE > FCoE > NPV

Use the **NPV** tab to change VLAN, NPV, Traffic Map Ext Ports, and Member Ports values.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 457. FCoE NPV Configuration field descriptions

Field	Description
VLAN	The VLAN number.
NPV	Enables or disables NPV.
Traffic Map Ext Ports	Enables or disables the selected ports as NP (external uplink) ports.
Member Ports	The member ports.

FIP Snooping Configuration

Device Console > **Configure** > **FC/FCoE** > **FSB** > *FIP Snooping*

Use the **FIP Snooping** tab to set the FIP Snooping global state and ACL timeout.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 458. *FIP Snooping field descriptions*

Field	Description
Global State	FIP state (on or off).
ACL Timeout	ACL Timeout setting (enabled or disabled).
Auto VLAN	Auto VLAN setting (enabled or disabled)

FIP Snooping Port Configuration

Device Console > **Configure** > **FC/FCoE** > *FIP Snooping Port*

Use the **FIP Snooping** tab configure FIP Snooping Ports.

Note: This tab is available only for FCoE capable switches. Please disregard this information if it does not apply to your switch.

Table 459. *FIP Snooping Port field descriptions*

Field	Description
Port	Port number.
FCF Mode	Fiber Channel Forwarding mode (on, off, auto)
State	FIP Snooping state for the port (enabled or disabled)

Configuring Switch Partition

The following sections describe the configuration tasks associated with Switch Partition (SPAR). This section covers the following topics:

- “[SPAR IDs Configuration](#)” on page 474
- “[SPAR Local Domains Configuration](#)” on page 474

SPAR IDs Configuration

Device Console > Configure > SPAR > IDs

Use the **SPAR IDs** tab to configure SPAR IDs.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 460. *SPAR IDs field descriptions*

Field	Description
ID	The SPAR ID.
Name	Sets the SPAR name.
State	Enables or disables the SPAR state.
Uplink Type	Sets the Uplink Type: Port, Trunk, or Admin Key.
Uplink Port	Sets the SPAR uplink port.
Uplink Trunk	Sets the SPAR uplink trunk.
Uplink Adminkey	Sets the SPAR uplink adminkey.
Domain Mode	Sets the SPAR domain mode: passthrough, local
Default Domain Server Port List	Sets the SPAR default domain server port list.
Default Domain SPAR VID	Sets the SPAR default domain SPAR VID.

SPAR Local Domains Configuration

Device Console > Configure > SPAR > Local Domains

Use the **Local Domains** tab to configure SPAR local domains.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard this information if it does not apply to your switch.

Table 461. *SPAR Local Domains field descriptions*

Field	Description
ID	The local domain SPAR ID.
IVID	The local domain IVID.
Server Port List	Sets the SPAR local domain server port list.
VID	Sets the SPAR local domain VID.
Name	Sets the SPAR local domain name.
State	Enables or disables the SPAR local domain state.

Configuring Virtualization

Use virtualization to configure VMready features. This section covers the following virtualization topics:

Note: The following features are available only for VMready capable switches. Please disregard this information if it does not apply to your switch. vNIC Configuration is presently available only on the VMready switches Rackswitch G8124 and IBM 10-port 10Gb Ethernet Switch Module.

- [“General VM Configuration” on page 476](#)
- [“VMware vCenter Configuration” on page 477](#)
- [“VM Profiles Configuration” on page 478](#)
- [“VM Groups Configuration” on page 479](#)
- [“VM Policy Configuration” on page 480](#)
- [“VM Check Configuration” on page 483](#)
- [“VM Hello Configuration” on page 483](#)
- [“VM Ports Configuration” on page 484](#)
- [“Virtual Machines Configuration” on page 484](#)
- [“VM Advanced Pre-Provisioning” on page 485](#)
- [“VM Organizationally Unique Identifier MAC” on page 486](#)
- [“VM OUI Configuration” on page 487](#)
- [“vNIC General Configuration” on page 487](#)
- [“vNIC Port Configuration” on page 487](#)
- [“vNIC Group Configuration” on page 487](#)
- [“EVB General Configuration” on page 488](#)
- [“EVB Profiles Configuration” on page 489](#)
- [“VSI DB Host Configuration” on page 489](#)
- [“vCenter Configuration” on page 490](#)
- [“Virtual Data Station Configuration” on page 490](#)

General VM Configuration

Device Console > Configure > Virtualization > General

Use this feature to enable or disable VMReady.

The following table describes the fields of the Virtualization's **General** configuration tab.

Table 462. *Virtualization General field descriptions*

Field	Description
VMReady	Enables or disables VMReady.

Server port configuration allows you to set the server ports on RackSwitches, such as the G8000 and G8124.

Table 463. *Virtualization Server Port field descriptions*

Field	Description
Server ports	Selects the switch ports to assign as server ports.

VMware vCenter Configuration

Device Console > Configure > Virtualization > VMware vCenter Access

Use this feature to set UDP port number used by ESX/ESXi server to send heartbeat message periodically to Virtual Center and configure VMware Virtual Center access information.

The following table describes the fields of the **VMware vCenter Access** configuration tab.

Table 464. *VMware vCenter Access field descriptions*

Field	Description
ESX/ESXi server to vCenter heartbeat UDP port	Set ESX/ESXi server to vCenter heartbeat UDP port number
Server IP Address	IP address of the system on which Virtual Center is running. You can select the Server IP address from the drop-down list, which shows the Virtual Centers configured in SNSC.
User Name	User name for the Virtual Center
Password	Password for the Virtual Center
Certificate Authentication	Enables or disables certificate authentication.

VM Profiles Configuration

Device Console > Configure > Virtualization > Profiles

Use this feature to configure VM Profiles.

Configuration of VMs with the VM Agent requires the use of VM profiles, which ease the configuration and management of VM Agent-based VM groups. The VM profile contains a set of properties that will be configured on the Virtual Switch.

After a VM profile has been defined, it can be assigned to a VM group or exported to one or more VMware hosts

The following table describes the fields of the **Profiles** configuration tab.

Table 465. *Virtualization Profiles field descriptions*

Field	Description
Name	Name of the profile
Vlan	Sets the VM profile's VLAN ID
Traffic Shaping Parameters - Average Bandwidth	Sets the average traffic, in Kilobits per second for the hypervisor's traffic shaping parameter.
Traffic Shaping Parameters - Burst Size	Sets the maximum burst size, in Kilobytes, for the hypervisor's traffic shaping parameter.
Traffic Shaping Parameters - Peak Bandwidth	Sets the peak traffic, in Kilobits per second, for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Average Bandwidth	Sets the Egress average traffic, in Kilobits per second for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Burst Size	Sets the maximum Egress burst size, in Kilobytes, for the hypervisor's traffic shaping parameter.
Egress Shaping Parameters - Egress Peak Bandwidth	Sets the Egress peak traffic, in Kilobits per second, for the hypervisor's traffic shaping parameter.

VM Groups Configuration

Device Console > Configure > Virtualization > Groups

Use this feature to configure VM Groups.

A VM group is a collection of members, such as VMs, ports, or trunk groups. Members of a VM group share certain properties, including VLAN membership, ACLs (VMAP), and VM profiles.

The following table describes the fields of the **Groups** configuration tab.

Table 466. *Virtualization Groups field descriptions*

Field	Description
Group Number	VM group number
Validation Mode	Sets the group validation mode: disable, basic, advanced.
Profile	Adds the selected VM profile to the VM group.
Vlan	Assigns a VLAN to this VM group. If you do not assign a VLAN to the VM group, the switch automatically assigns an unused VLAN when adding a port or a VM to the VM Group. Note: If you add a VM profile to this group, the group will use the VLAN assigned to the profile.
Tag State	Enables or disables VLAN tagging on ports in this VM group.
Ports	Adds the selected port to the VM group. Note: Add a port to a VM group only if no VMs on that port are members of the VM group.
Trunk ID	Assigns the trunk group to the VM group.
LACP Adminkey	Assigns an LACP admin key to the VM group. LACP trunks formed with this admin key will be included in the VM group.
VMAP for Non Server Ports	Assigns the selected VLAN Map to this VM group, limiting the operation of the VLAN Map to non-server ports only.
VMAP for Server Ports	Assigns the selected VLAN Map to this VM group, limiting the operation of the VLAN Map to server ports only.
VMAP for All Ports	Assigns the selected VLAN Map to this VM group with the operation of the VLAN Map extending to non-server and Server ports.

VM Policy Configuration

Device Console > Configure > Virtualization > VM Policy

Use this feature to limit the Transmit and Receive Bandwidth for each VM.

The following table describes the fields of the **VM Policy** configuration tab.

Note: Some fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 467. *Virtualization VM Policy field descriptions*

Field	Description
MAC	MAC address of the virtual machine.
ACL for Transmit Bandwidth	The ACL assigned to the transmission rate. The ACL is assigned automatically, in sequential order, if not specified. If there are no available ACLs, the Transmit Rate cannot be configured. Each Transmit Rate configuration reduces the number of available ACLs by one.
Control Status	Enables or disables bandwidth control on the VM policy
Committed TX Rate	The amount of bandwidth available for traffic transmitted from the VM to the switch, in kilobits per second. Enter the value in multiples of 64.
Maximum TX Burst Size	The maximum burst size for transmission, in Kilobits. Enter the value in multiples of 64.
Committed RX Rate	The amount of bandwidth available for traffic received from the VM to the switch, in kilobits per second. Enter the value in multiples of 64.
Maximum RX Burst Size	The maximum burst size for receiving, in Kilobits. Enter the value in multiples of 64.

VM Ready Configuration

Device Console > Configure > Virtualization > VMready > General

Use the **General** tab to enable or disable VM Ready.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

VMware vCenter Access Configuration

Device Console > Configure > Virtualization > VMready > VMware vCenter Access

Use the **VMware vCenter Access** tab for configuring VMware vCenter access.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 468. *VMware vCenter Access field descriptions*

Field	Description
ESX/ESCI server to vCenter heartbeat UDP port	Sets the UDP port for the ESX/ESCI server to vCenter heartbeat.
Server IP Address	Sets the IP address for the ESC/ESCI server.
User Name	Sets the user name for logging into the ESX/ESCI server.
Password	Sets the password for logging into the ESX/ESCI server.
Certificate Authentication	Enables or disables certificate authentication.

VM Profiles Configuration

Device Console > Configure > Virtualization > VMready > Profiles

Use the **Profiles** tab for configuring VM profiles.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 469. *VMware Profiles field descriptions*

Field	Description
Name	Sets the name of the profile.
Vlan	Sets the VLAN for the profile.
Average Bandwidth	Sets the ingress average bandwidth.
Burst Size	Sets the ingress burst size.
Peak Bandwidth	Sets the ingress peak bandwidth.
Egress Average Bandwidth	Sets the egress average bandwidth.
Egress Burst Size	Sets the egress burst size.
Egress Peak Bandwidth	Sets the egress peak bandwidth.

VM Groups Configuration

Device Console > Configure > Virtualization > VMready > Groups

Use the **Groups** tab for configuring VM groups.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 470. *VM Groups field descriptions*

Field	Description
Group Number	Sets the VM group number
Validation Mode	Sets the VM group validation mode.
Vlan	Sets the VLAN for the group.
Tag State	Sets the VM group tag state.
Ports	Sets the VM group ports.
Non Server Ports	Sets VMAP for non-server ports.
Server Paths	Sets VMAP server paths.
All Ports	Sets VMAP for all ports.
Virtual Ports	Sets VMAP for virtual ports.

VM Policy Configuration

Device Console > Configure > Virtualization > VMready > VM Policy

Use the **VM Policy** tab for configuring VM policies.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 471. *VM Policy field descriptions*

Field	Description
MAC	Sets the MAC number of the device.
ACL for Transmit Bandwidth	Sets the access control list for transmission bandwidth.
Control Status	Sets the control status for the policy.
Committed TX Rate	Sets the committed transmit rate.
Maximum TX Burst Size	Sets the maximum size for transmit bursts.

Table 471. *VM Policy field descriptions*

Field	Description
Committed RX Rate	Sets the committed receive rate.
Maximum RX Burst Size	Sets the maximum size for receive bursts.

VM Check Configuration

Device Console > **Configure** > **Virtualization** > **VMready** > *VM Check*

Use the **VM Check** tab for configuring the validations.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 472. *VM Check field descriptions*

Field	Description
Basic Mode Validation	Sets basic checking mode: log, link
Advanced Mode Validation	Sets advanced checking mode: log, link, acl
Max ACLs for Spoofed MACs	Sets value for the maximum number of ACLs that can be used by MAC Spoofing Check feature.
Trusted Ports	Add ports to configured trusted port list or remove ports from the configured trusted port list.

VM Hello Configuration

Device Console > **Configure** > **Virtualization** > **VMready** > *VM Hello*

Use the **VM Hello** tab for configuring Hello advertising.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 473. *VM Hello field descriptions*

Field	Description
Hello Advertisements	Sets the Hello advertising status.
Ports	Add ports to configured Hello port list or remove ports from the configured Hello port list.
Hello Address	Sets the VM Hello IP address.
Hello Periodicity	Sets the Hello packet send interval.

VM Ports Configuration

Device Console > Configure > Virtualization > VMready > Ports

Use this feature to assign the configured VM Group to non-server (Uplink) and server ports.

The following table describes the fields of the **Ports** configuration tab.

Table 474. *Virtualization Ports field descriptions*

Field	Description
Status	Color coded graphics showing the status: Green for up and Red for down.
Port	The non-server (Uplink) or server port number.
Group	Configured VM Group. Double-click the cell to configure a new value.
Trunk #	Trunk number to which the port is associated.
LACP Key #	LACP key number to which the port is associated.

Virtual Machines Configuration

Device Console > Configure > Virtualization > VMready > Virtual Machines

Use this feature to assign the configured VM Group to VMs.

The following table describes the fields of the **Virtual Machines** configuration tab.

Table 475. *Virtual Machines field descriptions*

Field	Description
Filter by Group	Lists only entries associated with the selected VM group.
Virtual MAC	MAC address of the virtual machine.
Group	Configured VM Group. Double-click the cell to configure a new value.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
VLAN	VLAN to which the Virtual Machine is associated.
Port	Server Port on which VM is discovered by the switch

VM Advanced Pre-Provisioning

Device Console > Configure > Virtualization > VMready > Advanced Pre-Provisioning

Use this feature to Pre-provision the VMs by assigning the VM Group to each selected VM.

Note: The VMs listed in the table are retrieved from Virtual Center and not learned by the switch. In addition, the VMs are listed only if the VM Management Server is configured.

The following table describes the fields of the **Advanced Pre-Provisioning** configuration tab.

Table 476. *Advanced Pre-Provisioning field descriptions*

Field	Description
Global Group	The VM group to use when VM group is NOT selected for the selected VM.
Virtual MAC	MAC address of the virtual machine.
Group	Configured VM Group. Double-click the cell to configure a new value.
IP Address	IP Address of the Virtual Machine.
VM Name	Name of the discovered virtual machine. If the VM Management Server Connector is not configured, this field is blank.
Hypervisor	Name of the Hypervisor on which the VM is running. If the VM Management Server Connector is not configured, this field is blank.
vCenter Name	The VM ware Virtual Center address
VLAN	VLAN to which the Virtual Machine is associated.
Port Group	Port Group to which the Virtual Machine is associated.

VM Organizationally Unique Identifier MAC

Device Console > Configure > Virtualization > VMready > OUI MAC

Use this feature to treat a locally administered MAC address as a virtual machine.

The following table describes the fields of the **OUI MAC** configuration tab.

Table 477. *OUI MAC field descriptions*

Field	Description
Local MAC as VMs	Enables or disables treatment of locally-administered MAC addresses as VMs.

VM OUI Configuration

Device Console > Configure > Virtualization > VMready > Misc

Use this feature to treat locally-administered MAC addresses as VMs.

The following table describes the fields of the **Misc** configuration tab.

Table 478. *OUI Misc field descriptions*

Field	Description
OUI Index	The Organizationally Unique Identifier (OUI) of the locally-administered MAC address.
OUI MAC	The new OUI of the locally-administered MAC address in the format xx:yy:zz.
Vendor	Vendor name of the locally-administered OUI.

vNIC General Configuration

Device Console > Configure > Virtualization > vNIC > General

Use this tab to enable or disable vNIC configuration on the switch.

Table 479. *vNIC General field descriptions*

Field	Description
Global vNIC On/Off	Enables or disables the vNIC configuration feature.
Uplink Sharing	Enables or disables vNIC uplink sharing.
Egress Metering State	Enables or disables vNIC egress metering.

vNIC Port Configuration

Device Console > Configure > Virtualization > vNIC > vNICs

Use this to configure vNICs on switch server ports.

Table 480. *vNICs Port field descriptions*

Field	Description
Port	Server port on which the vNIC is configured
vNIC	vNIC ID (1-4)
State	Operational state of the vNIC (enabled or disabled)
Max Bandwidth	Maximum bandwidth allocated to the vNIC

vNIC Group Configuration

Device Console > Configure > Virtualization > vNIC > vNIC Groups

Use this tab to configure vNIC groups on the switch.

Note: This tab or some of its fields might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 481. *vNIC Groups field descriptions*

Field	Description
Group Number	vNIC group ID (1-32).
State	Operational state of the vNIC group (enabled or disabled).
VLAN	VLAN associated with the vNIC group.
Failover state	Failover state of the vNIC group (enabled or disabled).
Key	Uplink LACP admin key in the vNIC group.
vNICs	vNICs associated with the vNIC group.
Server Ports	Server ports associated with the vNIC group.
Uplink Type	Sets the uplink type (port or trunk). Depending on the selection, SNSC chooses either port or trunk data while configuring vNIC groups on the switch.
Port	Note: The port associated with the vNIC group. Applicable only if the Uplink Type is set to Port.
Trunk	Note: The trunk associated with the vNIC group. Applicable only if the Uplink Type is set to Trunk.
Admin Key	The admin key associated with the vNIC group.

EVB General Configuration

Device Console > Configure > Virtualization > EVB > General

Use this tab to configure Edge Virtual Bridging (EVB) VSI DB update and clean operations.

Table 482. *EVB General field descriptions*

Field	Description
VSI DB Operation	Sets the VSI DB Operation to None, Update, or Clean. The default setting is None, which indicates no operation. If you select Update and click Submit , the switch will pull VSI Types from the VSI DB Manager. If you select Clean and click Submit , the VSI Types on the switch will be deleted.
Clean Associated VSI	Cleans the associated VSI from the switch.

EVB Profiles Configuration

Device Console > Configure > Virtualization > EVB > Profiles

Use this tab to configure Edge Virtual Bridging (EVB) profiles.

Table 483. *EVB Profiles field descriptions*

Field	Description
Profile Number	The profile index number.
Reflective Relay	Enables or disables the reflective relay.
VSI Discovery	Enables or disables VSI discovery.

VSI DB Host Configuration

Device Console > Configure > Virtualization > EVB > VSI DB Host

Use this tab to configure the VSI Database Host.

Note: This field might not be available for the selected switch. Please disregard this information if it does not apply to your switch.

Table 484. *VSI DB Host field descriptions*

Field	Description
Index	The index number. The index is always 1.
VSI DB Host Address	Sets the IP address of VSI DB Manager.
VSI DB Host Port	Sets the port on which VSI DB Manager is listening for processing RESTful requests.
Doc Path	Sets the resource path.
Doc File	Sets the resource name.
Interval	Sets the VSI DB automatic update interval (5-300 s). Set the interval to 0 (zero) to disable automatic updates.
Port	The port the switch uses to connect to the VSI DB server, such as MGT, EXTM, or DATA.
Protocol	Sets whether the switch uses HTTP or HTTPS to connect to the VSI DB server.

Configuring iSwitch Virtual Data Station

The following sections describe iSwitch vCenter and Virtual Data Station configuration tasks you can perform:

- “vCenter Configuration” on page 490
- “Virtual Data Station Configuration” on page 490

vCenter Configuration

Device Console > Configure > Virtualization > iSwitch > vCenter

Use this tab to configure iSwitch vCenter parameters.

Table 485. *vCenter field descriptions*

Field	Description
vCenter IP Address	Sets the IP address of the vCenter.
User Name	Sets the user name associated with the vCenter.
Password	Sets the user password.
Port	Sets the port on which vCenter is listening.
Apply/Delete vCenter Configuration	Applies or deletes the vCenter configuration, depending on the radio button selection.

Virtual Data Station Configuration

Device Console > Configure > Virtualization > iSwitch > Virtual Data Station

Use this tab to configure iSwitch Virtual Data Station parameters.

Table 486. *Virtual Data Station field descriptions*

Field	Description
vDS Name	Sets the name for virtual data station (vDS).
DataCenter Name	Sets the name of the datacenter associated with the vDS.
Apply/Delete VDS Configuration	Applies or deletes the VDS configuration, depending on the radio button selection.

Configuring Unified Fabric Port (UFP)

The following sections describe the configuration tasks associated with UFP:

- [“UFP General Configuration” on page 491](#)
- [“UFP Ports Configuration” on page 491](#)
- [“UFP Virtual Ports Configuration” on page 491](#)

UFP General Configuration

Device Console > Configure > Virtualization > UFP > General

Use this tab to configure general UFP parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 487. *UFP General field descriptions*

Field	Description
UFP	Enables or disables UFP.

UFP Ports Configuration

Device Console > Configure > Virtualization > UFP > Ports

Use the **Ports** tab to configure UFP port parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 488. *UFP Port field descriptions*

Field	Description
Index	The port number.
State	Enables or disables UFP on the selected port.

UFP Virtual Ports Configuration

Device Console > Configure > Virtualization > UFP > Virtual Ports

Use the **Virtual Ports** tab to configure UFP virtual port parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 489. *UFP Virtual Port field descriptions*

Field	Description
Port Index	The port number of the vPort.
vPort Index	The virtual port number of the vPort.
State	Enables or disables virtual port State.

Table 489. *UFP Virtual Port field descriptions (continued)*

Field	Description
Network Mode	Sets the virtual port network mode.
Network Default VLAN	Sets the virtual port default VLAN.
Network Default Tag	Enables or disables the virtual port tag state.
QoS Min Guaranteed Bandwidth	Sets the QoS minimum guaranteed bandwidth.
QoS Max Allowed Bandwidth	Sets the QoS maximum allowed bandwidth.
EVB Profile ID	Sets the EVB Profile ID.

Configuring an SDN-VE Gateway

The following sections describe the configuration tasks associated with configuring an SDN-VE gateway:

- [“SDN-VE General Configuration” on page 493](#)
- [“SDN-VE Management Console Configuration” on page 493](#)

SDN-VE General Configuration

Device Console > Configure > Dove GW > General

Use the **General** tab to configure stacking parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch..

Table 490. *SDN-VE General descriptions*

Field	Description
State	Enables or disables the gateway.
Reserved Ports	Selects ports to designate as “reserved.”
ACL State	Enables or disables access control lists.

SDN-VE Management Console Configuration

Device Console > Configure > Dove GW > DMC

Use the **General** tab to configure stacking parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch..

Table 491. *SDN-VE DMC descriptions*

Field	Description
IP Address	Sets the IP address of the management console.
Port	Sets the IP port of the management console.

Configuring Stacking

The following sections describe the configuration tasks associated with stacking:

- “Stack/Fabric Configuration” on page 494
- “Stack/Fabric Switch Naming and Pre-Configuration” on page 494
- “Stack/Fabric Switch Binding Settings” on page 495
- “Stack/Fabric Switch Backup Settings” on page 495
- “Next Reboot Switch Settings” on page 495
- “Stack/Fabric Boot Switch Configuration” on page 496

Stack/Fabric Configuration

Device Console > Configure > Stack/Fabric > Setup and Config > General

Use the **General** tab to configure stacking parameters.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 492. *Stack/Fabric General field descriptions*

Field	Description
Stack Name	Sets the stack name.
Bind Stack	Binds attached switch numbers.

Stack/Fabric Switch Naming and Pre-Configuration

Device Console > Configure > Stack/Fabric > Setup and Config > Switch Naming/Pre-configuration

Use the **Switch Naming/Pre-configuration** tab to assign each stacking switch a name and MAC address.

Note: This tab or some of the options displayed might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 493. *Stack/Fabric Switch Naming/Pre-configuration descriptions*

Field	Description
Configured Switch Number	The configured switch number.
Switch Description	Sets the switch description.
Chassis UUID	The UUID of the chassis containing the switch.
Chassis Bay	The chassis bay number for the switch.
MAC Address	The MAC address of the switch.

Stack/Fabric Switch Binding Settings

Device Console > Configure > Stack/Fabric > Setup and Config > Switch Binding

Use the **Switch Binding** tab to configure stacking switch binding.

Note: This tab or some of its fields might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 494. *Stack/Fabric Switch Binding Settings descriptions*

Field	Description
Attached Switch Number	The number of the attached switch.
Switch Mode	The stacking mode for the switch; master or backup.
Switch Type	The configured switch number of the attached switch. If the switch is not configured, 0 is returned.
Configured Switch Number	Binds the switch number entry to an attached switch. When read, 0 is returned.

Stack/Fabric Switch Backup Settings

Device Console > Configure > Stack/Fabric > Setup and Config > Backup Switch

Use the **Backup Switch** tab to set the number of the backup switch.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Next Reboot Switch Settings

Device Console > Configure > Stack/Fabric > Setup and Config > Next Reboot Switch Settings

Use the **Next Reboot Switch Settings** tab to configure the saved stacking boot.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch.

Table 495. *Stack/Fabric Next Reboot Switch Settings descriptions*

Field	Description
Attached Switch Number	The attached switch number.
Switch Description	The description of the switch.
Mode	The current stacking mode of the switch.
Trunk Ports	Sets the current external ports that form the Stack Trunk.
Vlan	The current stack VLAN number for control communication.

Table 495. *Stack/Fabric Next Reboot Switch Settings descriptions*

Field	Description
State	Sets the switch in stacking or standalone mode.
Domain	The domain number of the unit (1-100).

Stack/Fabric Boot Switch Configuration

Device Console > Configure > Stack/Fabric > Reboot > Individual Switch Reboot

Use the **Individual Switch Reboot** tab to configure the stacking boot switch.

Note: This tab might not be available for the selected switch type. Please disregard field descriptions that do not apply to your switch..

Table 496. *Stack/Fabric Individual Switch Reboot Settings descriptions*

Field	Description
Configured Switch Number	The configured switch number.
Switch Description	Description of the switch.
Reboot?	Sets whether to reboot the switch.

Chapter 7. VMready Across the Datacenter Wizard

The VMready Across the Datacenter Wizard provides a step by step approach to configure VMready features across all supported switches. The features include VM Server configuration, Hypervisor configuration, VM Groups configuration, Virtual Machines configuration, VMAP configuration, Server Ports configuration (this is applicable only for RackSwitches), Port Groups, and vSwitch Configuration. It provides an interface to directly deploy the configuration created across the various VMready switches. Some of the steps are not mandatory and can be skipped during the configuration.

The Wizard steps you through the configuration process. The topics in this chapter cover the following procedures:

- [“Configuring VMready Across the Datacenter Wizard” on page 498](#)
- [“Step 2: Select VMready Switches” on page 500](#)
- [“Step 3: Define the VM Management Server” on page 502](#)
- [“Step 4: Select Hypervisors” on page 503](#)
- [“Step 5: Configure VM Groups” on page 505](#)
- [“Step 6: Configure Virtual Machines” on page 507](#)
- [“Step 7: VMAPs” on page 510](#)
- [“Step 8: Configure Server Ports” on page 516](#)
- [“Step 9: Configure Switch-Specific Settings” on page 518](#)
- [“Step 10: Configure Port Groups” on page 520](#)
- [“Step 11: Associate Port Group to a vSwitch” on page 522](#)
- [“Step 12: Review and Deploy the Configuration” on page 523](#)

Configuring VMready Across the Datacenter Wizard

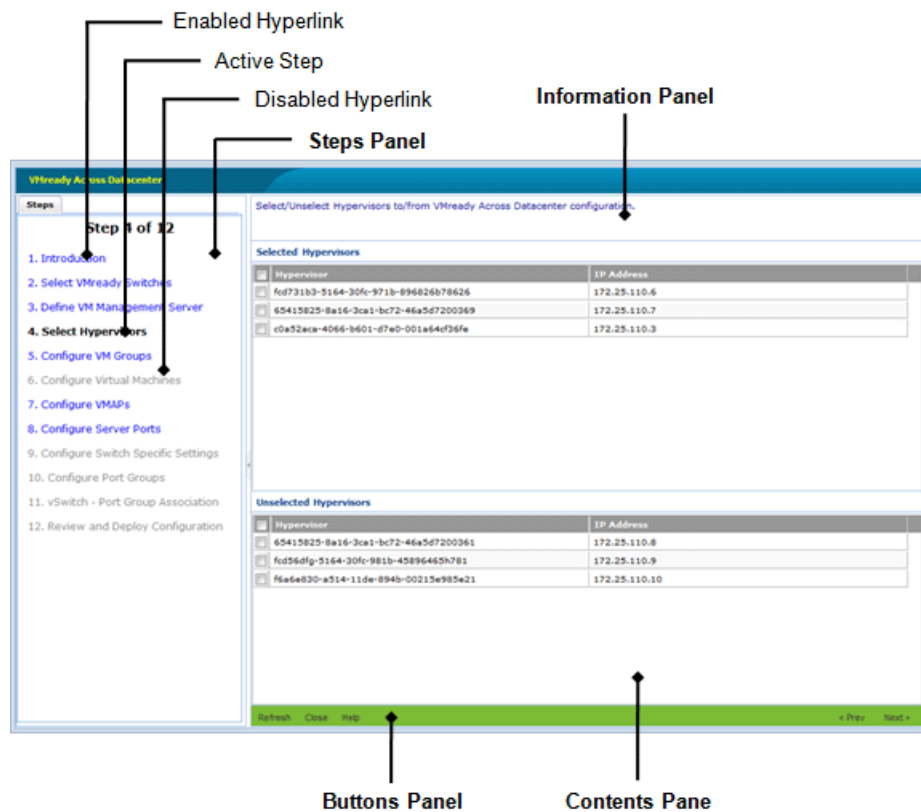
Device List > Virtualization Tools > VMready Across Datacenter

Figure 64 on page 498 shows the layout of the Wizard screen, which is comprised of two panels, a left panel indicating the steps of configuration available in the Wizard and a content panel showing the configurations for the corresponding step. Based on the content panel configuration, the corresponding step is highlighted in the left side panel. You also can navigate to any step by clicking on any step, which doubles as a hyperlink. Note that the hyperlink is activated only after visiting that step.

Notes:

- Only admin-level users can perform Wizard configuration and deployment.
- Before you use the VMready Across the Datacenter Wizard for the RackSwitch G8000, G8052, G8124, G8264, G8264CS, G8264-T, or G8316, ensure that the Virtual Machine Groups setting is enabled.

Figure 64. VMready Across the Datacenter—Wizard Layout



The content panel has three sections, as follows:

- Information panel at the top displays a summary of the configuration for the particular step.

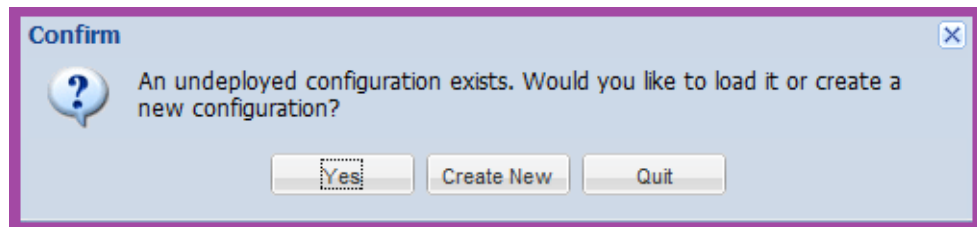
Note: Content pane in the center allows you to view and edit the configuration. When you modify data in a cell, the cell appears blue until the change is saved.

- Buttons menu at the bottom allows you perform various actions and traverse across the Wizard.

Notes:

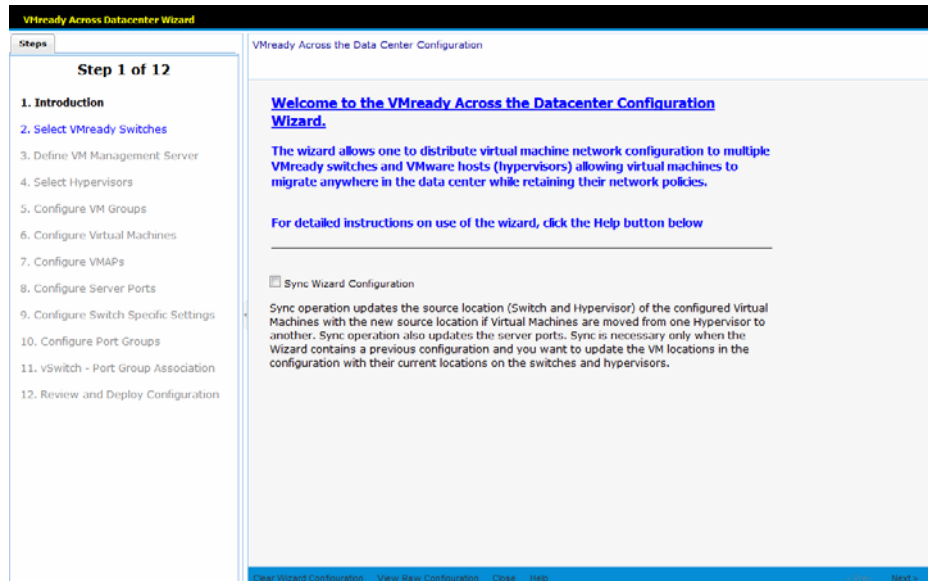
- The steps listed in the left panel are displayed when the VM Management Server is configured. If VM Management Server is not configured, then some steps are not visible.
- If an undeployed configuration exists, upon launch of the Wizard you are presented with a dialog box with options to load an existing configuration or create a new configuration as shown in [Figure 65 on page 499](#).

Figure 65. VMready Across the Datacenter—Launch Dialog



The introduction step of the Wizard does not perform any configuration. However, this step provides an option for the user to synchronize the previous configuration, clear any existing configuration or view the XML configuration in HTML format (see [Figure 66 on page 499](#)).

Figure 66. VMready Across the Datacenter—Wizard Introduction



Button/Checkbox	Description
Sync Wizard Configuration	Synchronizes the VM source addresses in the existing configuration by checking with VM Management Server and the configured VMready switches.
Clear Wizard Configuration	Clears the VMready Across the Datacenter Wizard configuration on the SNSC server.
View Raw Configuration	Opens a window showing the XML configuration, in HTML format (see Figure 68 on page 501).
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.

Figure 67. VMready Across the Datacenter—XML Configuration in HTML Format

vm-domain								
name	deployment-status							
default	notyet							
switches-list								
vmready-switches								
status	ipaddress	deploy-status	is-deleted	vmap-deploy-status				
new	192.168.6.81	notyet	no	notyet				
current	192.168.6.82	successful	no	successful				
current	192.168.6.83	failed	no	successful				
vmgroups-list								
vmgroup								
status	id	desc	VLAN	tag-state				
new	1	vmg1	1	e				
vmgroup-switch-conf								
switch-conf								
status	ipaddress	ports	lcp-adminkey	trunkid	vmap-ports-srvr	vmap-ports-nonsrvr	vmap-ports-all	
new	192.168.6.81	INT1:MGT1	17-18					
current	192.168.6.82	INT2:MGT1	17-18					
current	192.168.6.83	INT3:MGT1	17-18					
vmgroup								
status	id	desc	VLAN	tag-state				
new	2	vmg2	2	e				
vmgroup-switch-conf								
switch-conf								

Step 2: Select VMready Switches

This step lists all VMready switches discovered by SNSC (SNSC) and allows you to select the VMready switches in the configuration. For a new configuration, the switches are listed in the Unselected VMready Switches table. You can drag-and-drop the switch(es) to the Selected VMready Switches table. You also can drag-and-drop the switch(es) from the Selected VMready Switches table to the Unselected VMready Switches table. See [Figure 68 on page 501](#).

Note: The **Next** button is enabled only when one or more switches are added to the Select VMready Switches table.

Figure 68. VMready Across the Datacenter—Select VMready Switches

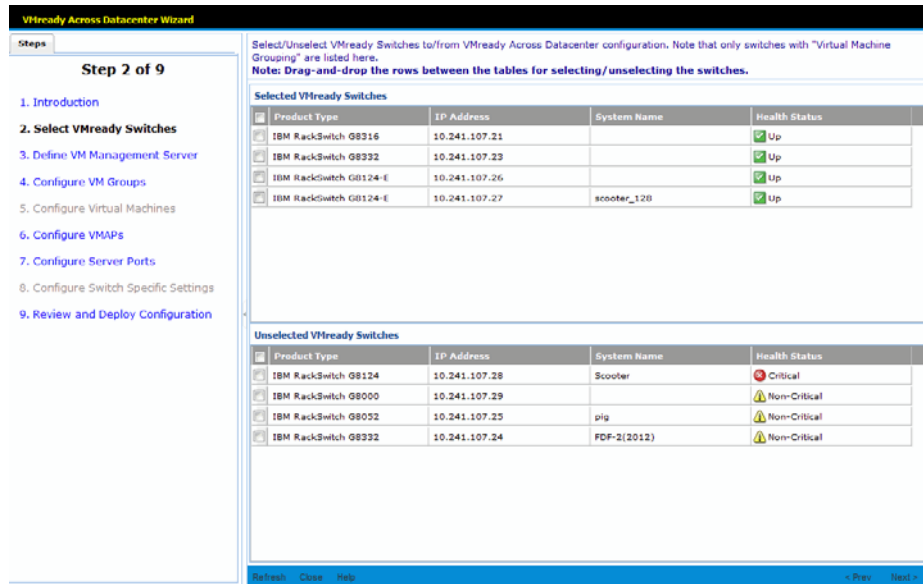


Table 497. Selected VMready Switches field descriptions

Field	Description
Product Type	Switch type (for example, IBM 10-port 10Gb Ethernet Switch Module).
IP Address	IP address of the VMready switch.
System Name	Configured system name (sysName)
Health Status	Health status of the switch (Up, Down, Critical or Non-Critical).

This step provides the following primary options:

Button	Description
Refresh	Refreshes the list of switches in the Unselected VMready Switches table.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you add a VMready switch.
Prev	Moves to the previous step or page in the configuration.

Step 3: Define the VM Management Server

This step is required only for a VMware environment, for which the VM Management Server (vCenter) can be configured and Hypervisors can be added in the VMready configuration. This step is optional and clicking **Next** will take you to step 4: Configuring VM Groups.

A VM Management Server (vCenter) can be configured by checking the checkbox and specifying the VM Management Server address, login credentials, protocol and port details. It gives an option to test the values configured by clicking **Test**. See [Figure 69 on page 502](#).

Note: The **Test** button is enabled only if the checkbox is selected and required values are entered.

Figure 69. VMready Across the Datacenter—Define VM Server

The screenshot shows the 'VMready Across Datacenter Wizard' at 'Step 3 of 12'. The main window is titled 'VM Management Server Configuration'. It contains a checkbox labeled 'Configure VM Management Server' which is checked. Below this are several input fields: 'IP Address/Host Name' with a dropdown menu showing '10.241.107.12', 'Protocol' set to 'HTTPS', 'Port' set to '443', 'User Name' set to 'root', and 'Password' masked with asterisks. There is also an 'SSL Certificate File Path' field with a 'Browse...' button. At the bottom right, there is a 'Test' button and a 'Next' button.

Field	Description
Configure VM Management Server	Checkbox that enables/disables VM Management Server configuration. By default, it is unchecked (disabled).
Protocol	Protocol to use for communicating with VM Management Server. It is either HTTP or HTTPS.
Port	Port on which the VM Management Server is accessible when the above configured protocol is used.
IP Address/Host Name	IP address or host name of the VM Management Server. You can select the VM Management Server address from the drop-down list, which shows the VM Management Servers configured in SNSC.
User Name	User name to use for accessing the VM Management Server.

Field	Description
Password	Password associated with the user name.
SSL Certificate File Path	Path on the local system containing the SSL certificate to use in case of HTTPS Protocol setting.

Button	Description
Test	Tests the configured parameters for validity.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you configure this step.
Prev	Moves to the previous step or page in the configuration.

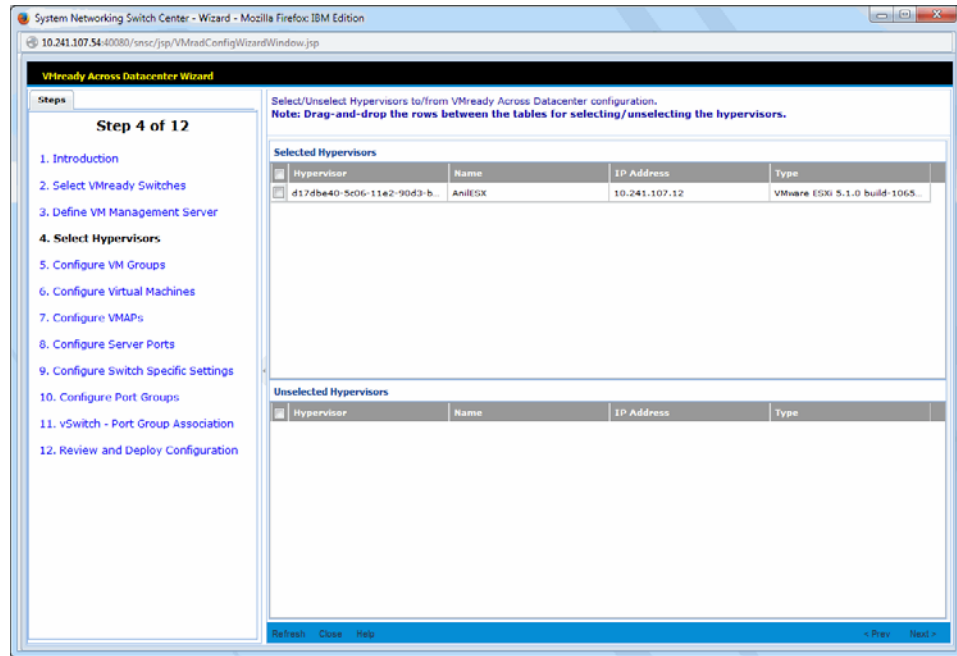
Step 4: Select Hypervisors

This step is skipped if you did not configure a VM Management Server (vCenter) in step 3.

This page lists all hypervisors that are known to the configured VM Management Server (see [“Step 3: Define the VM Management Server” on page 502](#)). For a new configuration, the hypervisors are listed in the Unselected Hypervisors table. You can drag-and-drop the hypervisor(s) to the Selected Hypervisors table to select them. Likewise, you can drag-and-drop the hypervisor(s) from the Selected Hypervisors table to the Unselected Hypervisors. See [Figure 70 on page 504](#).

Note: The **Next** button is enabled only when one or more hypervisors are added to the Select Hypervisors table.

Figure 70. VMready Across the Datacenter—Select Hypervisors



Field	Description
Hypervisor	Unique identifier (UUID) of the hypervisor.
Name	Name of the hypervisor.
IP Address	IP address of the hypervisor.
Type	Hypervisor type, including the version number and the build number.

This step provides the following primary options:

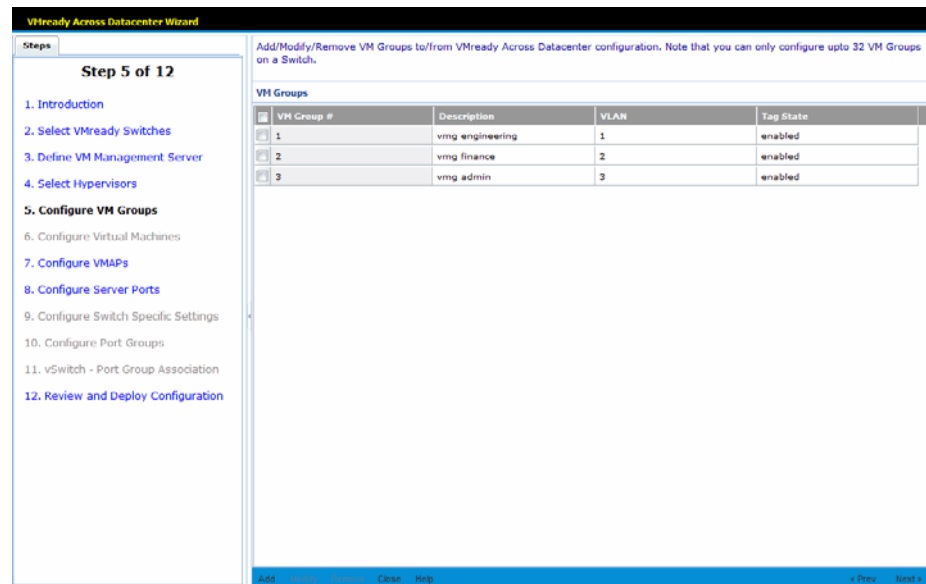
Button	Description
Refresh	Refreshes the list of switches in the Unselected Hypervisors table.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you add a Hypervisor.
Prev	Moves to the previous step or page in the configuration.

Step 5: Configure VM Groups

This step lists the VM Groups configured by the Wizard. It also allows you to add new groups, modify any existing groups, and remove previously configured groups. See [Figure 71 on page 505](#).

Note: For a new configuration, the VM Groups table is blank and the **Next** button is disabled until a VM Group is added.

Figure 71. VMready Across the Datacenter—Configure VM Groups



Field	Description
VM Group #	VM Group number.
Description	Text description given to the VM Group for convenience. This description is local to SNSC and not relayed to the VMready switches.
VLAN	VLAN assigned to the VM Group.
Tag State	Tag state (enabled or disabled).

This step provides the following primary options:

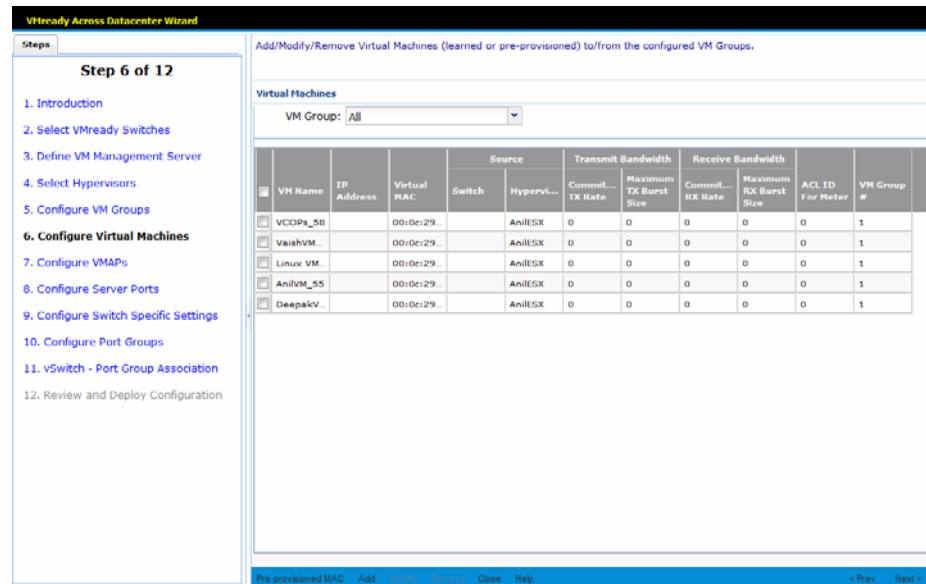
Button	Description
Add	Opens a child window to add a VM Group.
Modify	Opens a child window that allows you to modify the selected VM Group. Note: This button is enabled only when a row is selected.

Button	Description
Remove	Removes the selected VM Group(s). Note: This button is enabled only when one or more rows are selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you configure a VM group.
Prev	Moves to the previous step or page in the configuration.

Step 6: Configure Virtual Machines

This step lists the Virtual Machines (VMs) assigned to the VM groups created in step 5. For a new configuration the page is empty and you can add a VM or a pre-provisioned VM MAC to proceed with the Wizard configuration. You can filter the list based on the VM Group selected as shown in [Figure 72 on page 507](#).

Figure 72. VMready Across the Datacenter—Configure Virtual Machines



Field	Description
VM Group	The VM Group drop-down list displays the configured VM Groups, plus a selection for “All”, which shows the VMs configured for all VM Groups. Note: This field is not part of the table, but is available above the table.
VM Name	Name of the Virtual Machine assigned to the VM Group. Note: If the VM is pre-provisioned, this field is blank.
IP Address	IP address of the VM. Note: If VM is pre-provisioned, this field is blank.
Virtual MAC	The MAC address of the VM.
	Source
Switch	VMready switch which has discovered this VM. Note: This field can be blank.
Hypervisor	Hypervisor which has discovered this VM. Note: This field can be blank.

Field	Description
	Bandwidth Control Parameters
Committed TX Rate	Committed transmission rate.
Maximum TX Burst Size	Maximum transmission burst size.
Committed RX Rate	Committed receive rate.
Maximum RX Burst Size	Maximum receive burst size.
ACL ID For Meter	The ACL identifier.
VM Group #	The VM Group for which this VM is added (useful when the "All" option is selected in VM Group filter).

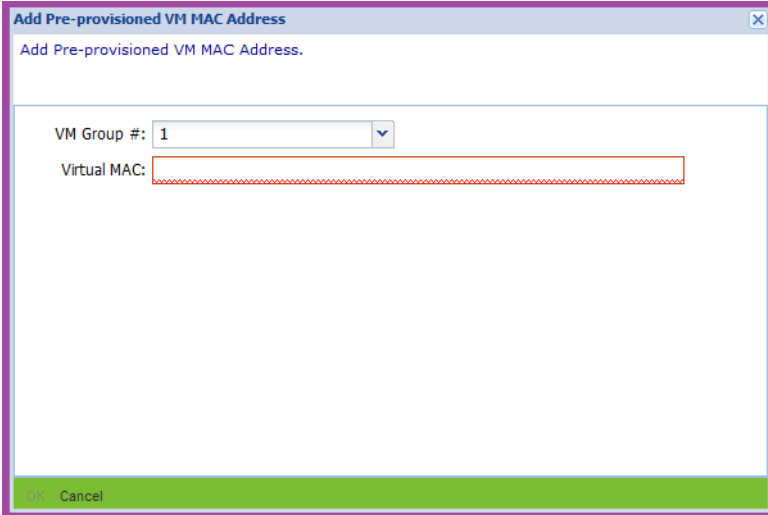
This step provides the following primary options:

Button	Description
Pre-provisioned MAC	Opens a child window to add a pre-provisioned VM MAC.
Add	Opens a child window to add a VM.
Modify	Opens a child window that allows you to modify the selected VM Bandwidth parameters. Note: This button is enabled only when a row is selected.
Remove	Removes the selected VM(s). Note: This button is enabled only when one or more rows are selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you configure a Virtual Machine.
Prev	Moves to the previous step or page in the configuration.

Step 6.1: Pre-Provisioned VM MAC

You can pre-provision a VM which is not yet discovered by any of the VMready switches configured for this VMready configuration. On the Virtual Machines page, click **Pre-provisioned MAC**. This action launches a child window enabling the user to specify the VM MAC Address and the VM Group to which this pre-provisioned MAC is to be added. See [Figure 73 on page 509](#).

Figure 73. Add Pre-provisioned VM



The screenshot shows a dialog box titled "Add Pre-provisioned VM MAC Address" with a close button (X) in the top right corner. The main text inside the dialog reads "Add Pre-provisioned VM MAC Address." Below this, there are two input fields: "VM Group #:" with a dropdown menu showing the value "1", and "Virtual MAC:" with an empty text input field. At the bottom of the dialog, there is a green bar containing a "Cancel" button.

Step 6.2: Add VMs Learned or Retrieved

Virtual Machines (VMs) can be learned by one or more VMready switches configured for this VMready configuration. VMs also can be retrieved from the VM Management Server (if it is configured). If these VMs are not yet discovered by VMready switches, from the Virtual Machine page you can click **Add**. This action launches a child window listing the VMs that are not yet added. See [Figure 74 on page 509](#).

Figure 74. Add Virtual Machines

Add Virtual Machines

Add VMs that are learned by each of the VMready switches and Hypervisors configured.

Add Virtual Machines

VM Group #: 1

	VM Name	IP Address	Virtual MAC	Source	
				Switch	Hypervisor
<input type="checkbox"/>	VMrad-VM3		00:50:56:93:46:7		172.20.95.200
<input type="checkbox"/>	New Virtual Machin		00:50:56:80:54:f		172.20.95.200
<input type="checkbox"/>	VMrad-VM5		00:50:56:93:6a:2		172.20.89.15
<input type="checkbox"/>	VMrad-VM1		00:50:56:93:34:9		172.20.95.200
<input type="checkbox"/>	DEMO_VA		00:50:56:80:72:d		172.20.95.200
<input type="checkbox"/>		172.16.3.220	00:50:56:43:46:2	172.16.200.2, por	
<input type="checkbox"/>		172.16.3.227	00:50:56:7e:ba:fe	172.16.200.2, por	

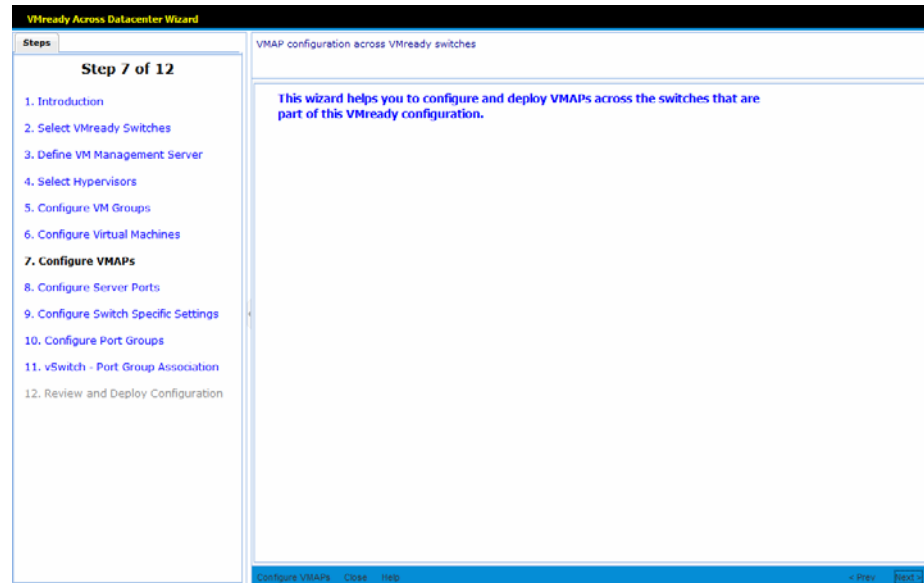
OK Cancel

Step 7: VMAPs

This step allows you to create VMAPs across VMready switches specific to the VMready configuration. You can view, configure, and deploy VMAPs across VMready switches contained in the Wizard. See [Figure 75 on page 510](#).

Note: This step is optional. Click **Next** to go to the Configure Switch Setting page.

Figure 75. VMready Across the Datacenter—VMAP Welcome Screen



This step provides the following options:

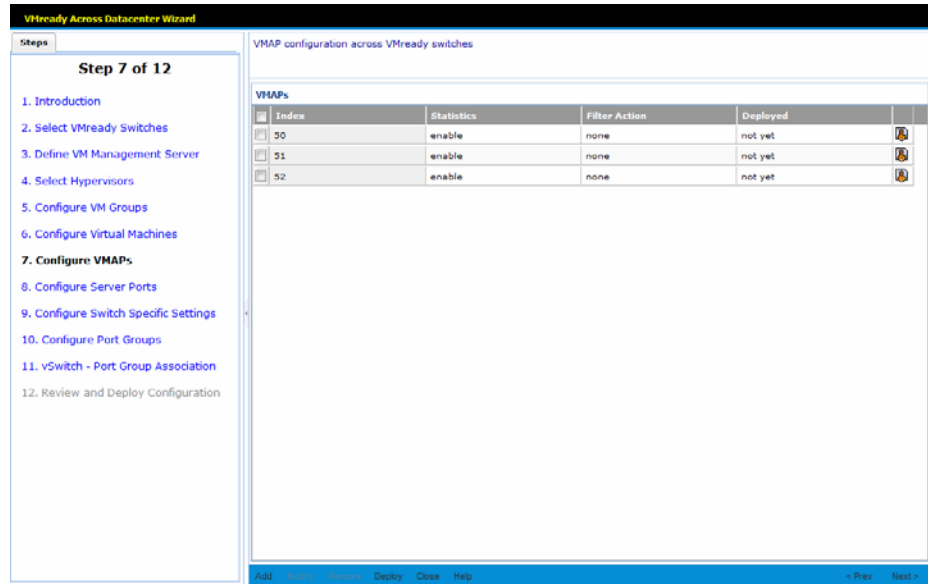
Button	Description
Configure VMAPs	Opens the window for configuring VMAPs.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 7.1: Configure VMAPs

To configure VMAPs, click **Configure VMAP** from the step 6 Welcome page. The VMAP Configuration table lists those VMAPs that are configured. It shows both deployed and Undeployed VMAP configurations on VMready switches. You can add a new VMAP or modify/delete an existing VMAP by clicking the appropriate button. See [Figure 76 on page 511](#).

Note: The VMAP configuration table lists only few parameters associated with the VMAP. To view the complete data, click **Details**.

Figure 76. VMready Across the Datacenter—Configure VMAPs



Field	Description
Index	VMAP index number. Indices from 50 to 110 are reserved for the VMAP Wizard.
Statistics	Shows whether VMAP statistics is enabled or disabled.
Filter Action	Filter action setting.
Deployed	Shows whether the VMAP is already configured/deployed (yes) on the switches or not (not yet).
Details	By clicking Details , you can view the complete VMAP configuration.

This step provides the following primary options:

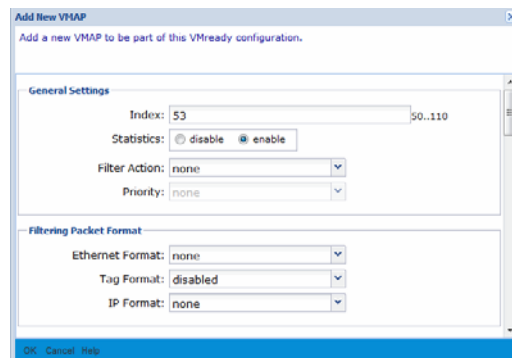
Button	Description
Add	Opens a child window to add a new VMAP configuration.
Modify	Opens a child window to modify the VMAP configured. Note: This button is enabled only when a row is selected.
Remove	Removes the selected VMAP(S) configured. Note: This button is enabled only when a row is selected.
Deploy	Initiates the VMAP deployment to the VMready switches available in VMready configuration. Note: This button is enabled only if a VMAP entry exists. It deploys all the VMAPs that are in undeployed state.

Button	Description
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 7.2: Add VMAP Configuration

To create a new VMAP configuration, in the Configure VMAP page, click **Add**. This opens a new dialog with various parameters that can be provided for the VMAP configuration. See [Figure 77 on page 513](#). The fields are placed in different groups for ease of configuration. Enter the parameters in the dialog and click **Ok**.

Figure 77. Add New VMAP



Field	Description
Index	The VMAP index. The value 50 to 110 are reserved for SNSC VMready Wizard.
Statistics	Enables or disables the statistics.
Filter Action	Sets the filter action to none, permit, deny or setprio (set priority).
Priority	Sets the priority to none or 0-7. Note that this field is enabled only when you set the Filter Action to setprio. Or else, none is taken by default.
Ethernet Format	Sets the Ethernet format to none, Ethernet2, SNAP or LLC.
Tag Format	Sets the tag format (disabled, any, none, or tagged).
IP Format	Sets the IP format (none, ipv4 or ipv6).
Source MAC address	Sets the source MAC address.
Source MAC Mask	Sets the source MAC mask.
Destination MAC Address	Sets the destination MAC address.
Destination MAC Mask	Sets the destination MAC mask.
Ethernet Type	Sets the Ethernet type to none, arp, ipv4, ipv6, mpls, rarp, any or other.

Field	Description
Ethernet Value	Sets the Ethernet value. Note that this field is enabled only when you set the Ethernet type to "other".
802.1p Priority	Sets 802.1p priority to none or 0-7.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Type Of Service	Sets the Type Of Service.
Protocol	Sets the protocol.
Source Port	Sets the source port.
Source Port Mask	Sets the source port mask.
Destination Port	Sets the destination port.
Destination Port Mask	Sets the destination port mask.
Committed Rate	Sets the committed rate.
Maximum Burst Size	Sets the maximum burst size.
Port Metering Status	Enables or disables port metering.
Meter Action	Sets the meter action to unconfigured, outdrop or outpass.
In Profile Dscp Enable	Enables or disables in-profile DSCP.
In Profile Dscp Value	Sets the in-profile DSCP value.
Out Profile Dscp Enable	Enables or disables out-of-profile DSCP.
Out Profile Dscp Value	Sets the out-of-profile DSCP value.
User Priority	Sets the user priority.
ToS Precedence	Enables or disables TOS precedence.

Step 7.3: Deploy VMAP Configuration

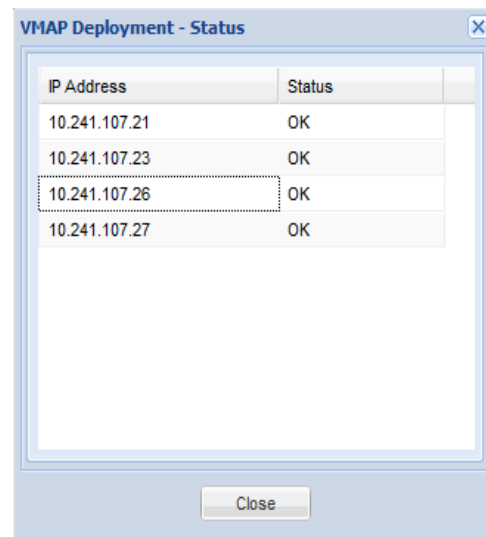
To deploy VMAPs on all VMready switches, in the VMAP Configuration page, click **Deploy**. This launches the confirmation dialog for deploying the configuration. If you click **Yes**, it initiates configuration of VMAPs on all the VMready switches of that VMready configuration.

Notes:

- Only those VMAPs that have their “Deployed” status set to **not yet** are deployed/configured.
- If a VMready switch is newly added, all the VMAPs are configured, regardless of their “Deployed on the Switch” setting.
- The messages associated with this deployment operation are logged in VMAP logs available from **Logs > VMready Deployment > VMready Across the DataCenter > VMAP Log**.

While the deployment operation is in progress, the wizard displays a progress bar and a log window of the deployment messages. After deployment is completed, a dialog appears that indicates the status of deployment (Ok, Failed, Device down) on each of the VMready switches. See [Figure 78 on page 515](#).

Figure 78. VMAP Deployment Status

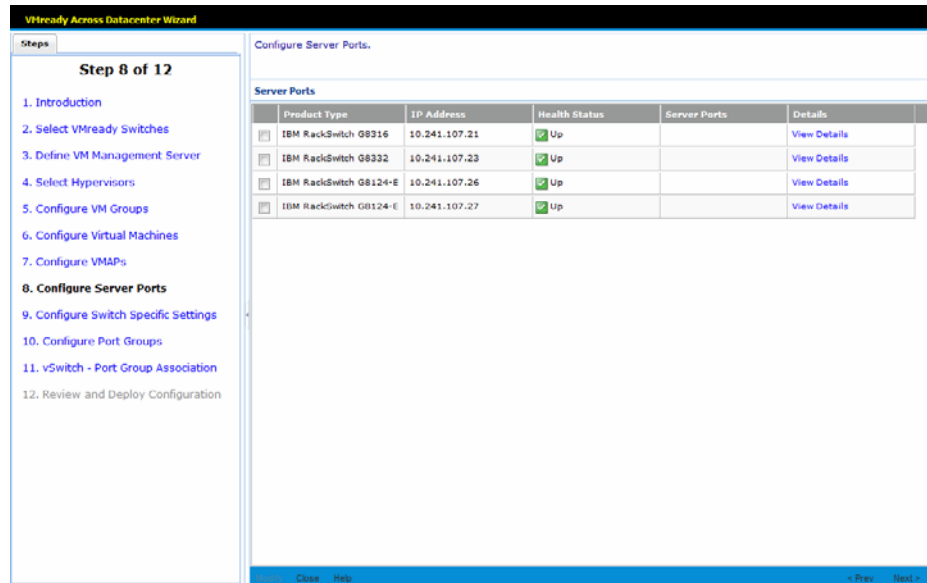


Step 8: Configure Server Ports

Note: This is an optional step intended for RackSwitches.

This page lists RackSwitches that are selected for the VMready configuration. It allows you to view and configure the Server Ports for the listed RackSwitches. See [Figure 76 on page 511](#).

Figure 79. VMready Across the Datacenter—Configure Server Ports



Field	Description
Product Type	Displays the product description.
IP Address	IP address of the VMready switch.
Health Status	Health Status (Up, Non-Critical, Critical, or Down, depending on global health status of the switch).
Server Ports	Displays a list of configured server ports.
Details	Click View Details to display the list of configured server ports in a pop-up window.

This step provides the following primary options:

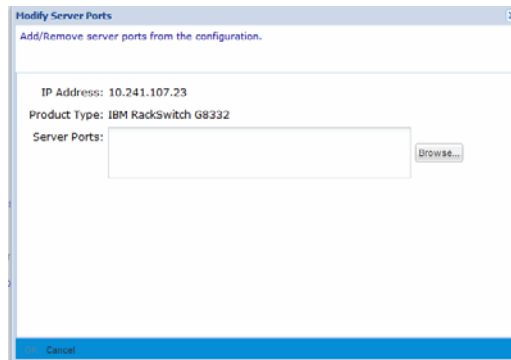
Button	Description
Configure	Opens a window for configuring server ports for the selected RackSwitch.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.

Button	Description
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 8.1: Configuring Server Ports

To configure the server ports for the selected switch, click **Configure**. This action launches a window that allows you to add or remove the server ports. See [Figure 80 on page 517](#).

Figure 80. Configure Server Ports window



Note: Click **Browse...** to launch the port selection window, which lists the configured ports and the available ports. By check-boxing the rows, the selected entries can be added or removed.

Step 9: Configure Switch-Specific Settings

This step provides an option to configure settings such as Ports, LACP *admin key*, Trunk ID, and VMAPs on the VMready switches. See [Figure 81 on page 518](#).

Note: This step is optional. Click **Next** to skip this step.

Figure 81. VMready Across the Datacenter—Configure Switch-Specific Settings

The screenshot shows the 'VMready Across the Datacenter Wizard' at 'Step 9 of 12'. The main area is titled 'Configure switch specific settings for VM Groups that are part of this VMready configuration.' Below this is a 'Switch Specific Settings' section with a 'VM Group' dropdown menu. A table displays the following data:

Product Type	IP Address	Health Status	Ports	LACP Adminkey	TrunkID	VMAP for		
						Server Ports	Non-Server Ports	All Ports
IBM RackS...	10.241.107...	Up						
IBM RackS...	10.241.107...	Up						
IBM RackS...	10.241.107...	Up						
IBM RackS...	10.241.107...	Up						

Field	Description
VM Group	VM Group drop-down list that displays the configured VM Groups. Selecting a VM Group shows the switch parameters that are specifically configured for that VM Group. Note: This field is not part of the table, but is available above the table.
Product Type	Switch type (for example, HP 1:10Gb Ethernet BL-c Switch).
IP Address	IP address of the VMready switch.
Health Status	Switch Health Status (Up or Down, depending on whether the switch is reachable or not).
Ports	The configured ports for that VM Group in a CSV format. An empty list indicates no configuration is present.
LACP Adminkey	The configured LACP <i>admin key</i> for that VM Group in CSV format. An empty list indicates no configuration is present.
Trunk ID	The configured Trunk IDs for the VM Group, in CSV format. An empty list indicates no configuration is present.
	VMAPs for
Server Ports	The configured VMAPs for Server (internal or downlink) ports.

Field	Description
Non-Server Ports	The configured VMAPs for Non-Server (external or uplink) ports.
All Ports	The configured VMAPs for Server and Non-Server ports.

This step provides the following primary options:

Button	Description
Modify/View	Opens a child window enabling the user to see or edit the switch specific settings. Note: This button is enabled only when a row is selected.
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration.
Prev	Moves to the previous step or page in the configuration.

Step 9.1: Modifying Switch-Specific Settings

To configure VMready switch specific settings for a VMready switch, first select VM Group and a VMready switch entry, then click **Modify** on the Switch Specific Settings page (Step 7.1: Configure VMAPs). This action launches a child window that allows you to edit the parameters. See Figure 82 on page 519.

Figure 82. Modify VMready Switch-Specific Settings

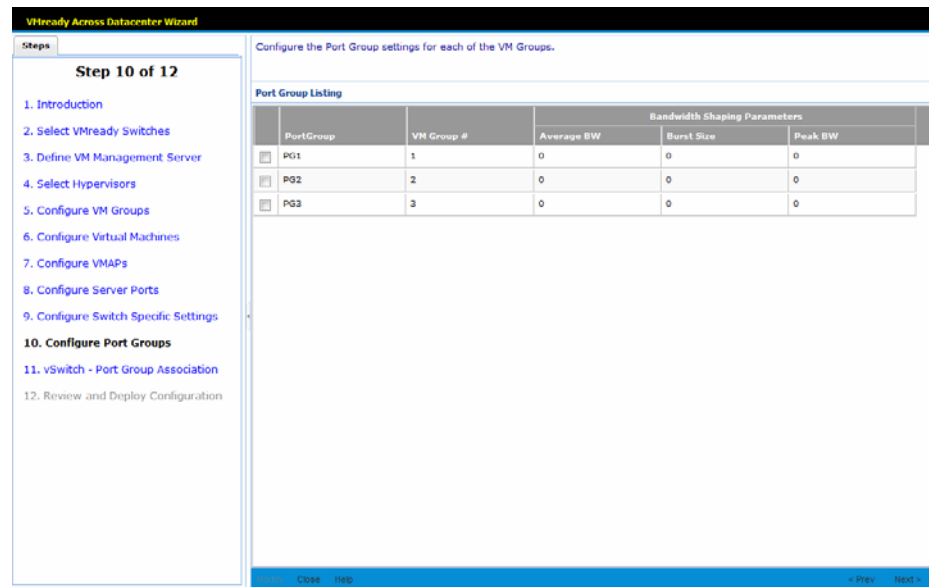


Step 10: Configure Port Groups

If VM Management Server is configured, when you click **Next** in the VMready Switch Specific Settings page, the Port Group Configuration screen is displayed. See [Figure 83 on page 520](#).

Note: If VM Management Server is not configured in step 3, the wizard skips this step.

Figure 83. VMready Across the Datacenter—Configure Port Groups



The Port Group Listing table lists the rows corresponding to each of the configured VM groups along with the associated Port Group. Initially, the Port Group cells are blank.

Note: The **Next** button is enabled only if Port groups are associated to each VM group.

Field	Description
Port Group	Port Group name.
VM Group #	VM Group associated with the Port Group.
	Bandwidth Shaping Parameters
Average BW	Average bandwidth, in Kilobits per second.
Burst Size	Maximum burst size, in Kilobytes.
Peak BW	Peak bandwidth, in Kilobits per second.

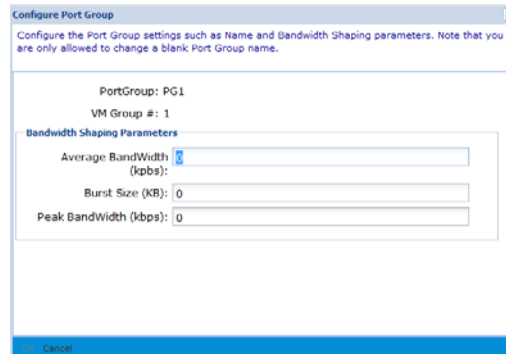
This step provides the following options:

Button	Description
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you associate Port groups to each VM group.
Prev	Moves to the previous step or page in the configuration.

Step 10.1: Modify Port Group Settings

To configure Port Group settings for a VM Group, click **Modify** on the Port Groups page. This action launches a child window that allows you to edit the parameters. See [Figure 84 on page 522](#).

Figure 84. Configure Port Group



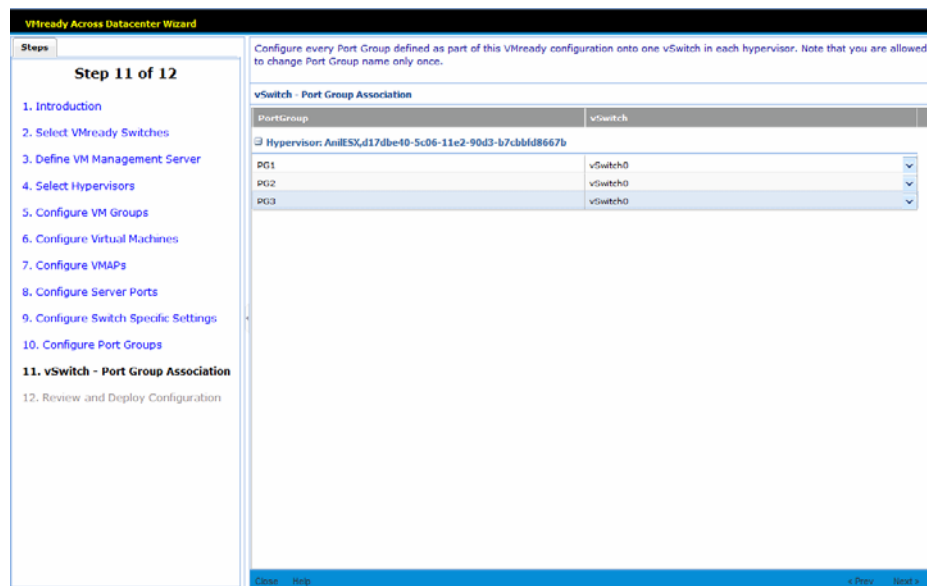
Step 11: Associate Port Group to a vSwitch

This step allows you to configure Port Groups (defined in [Step 10: Configure Port Groups](#)) onto one vSwitch on each hypervisor (defined in [Step 4: Select Hypervisors](#)).

Note: If VM Management Server is not configured in [Step 3: Define the VM Management Server](#), the wizard skips this step.

Click **Next** in Port Groups to display the screen showing per Hypervisor based vSwitch association for each Port Group. Initially, the vSwitch column shows none, but you can assign a vSwitch using the drop-down list on double click. See [Figure 85 on page 522](#).

Figure 85. VMready Across the Datacenter—vSwitch - Port Group Association



Field	Description
Hypervisor	Hypervisor displayed in the following format: Hypervisor: <Name>, <UUID> Note: Hypervisor cell spans each entire row. Each Hypervisor row lists the Port Groups and the vSwitch of the Hypervisor with which it is associated.
Port Group	Port Group. For each Hypervisor, each Port Group configured is shown in a separate row.
vSwitch	vSwitch of the Hypervisor with which the Port Group is associated. This field contains a drop-down list, which lists all the vSwitches of that Hypervisor along with an additional 'none' option.

Note: Each Hypervisor added to the configuration is shown in a separate row. Below each Hypervisor row are the rows for each configured Port Group and the associated vSwitch. The Hypervisor row contains a button that can be used for hiding or showing the Port Group and vSwitch rows associated with that Hypervisor. The **Next** button is enabled only when every Port Group is associated with a Hypervisor vSwitch.

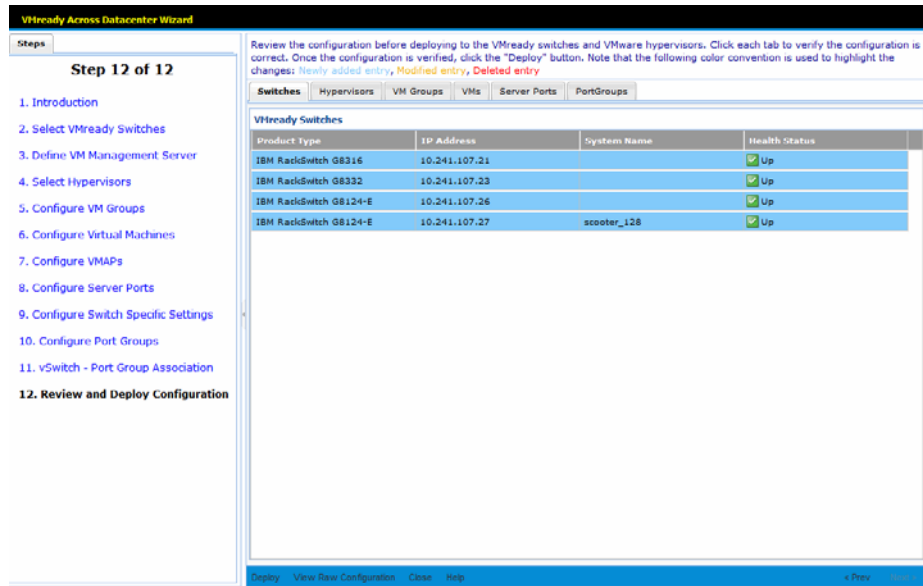
This step provides the following options:

Button	Description
Close	Closes the window. This action also gives an option for the user to keep or discard (delete) the undeployed configuration (XML).
Help	Opens the online Help page.
Next	Moves to the next step or page in the configuration. Note that the Next button is disabled until you associate Port groups with a vSwitch.
Prev	Moves to the previous step or page in the configuration.

Step 12: Review and Deploy the Configuration

This step allows you to review the configuration. The reviewing page is a multi-tabbed pane and some of the tabs are present or absent depending on whether VM Management Server is configured. See [Figure 86 on page 524](#).

Figure 86. VMready Across the Datacenter—Review Configuration



The following table provides a summary of the Review tabs.

Tab	Description
Switches	Lists the configured VMready switches.
Hypervisors	Lists the configured Hypervisors. Note: This tab is present only when the VM Management Server is configured.
VM Groups	Lists the configured VMready switches and the VM Group specific Switch Settings.
VMs	Lists the configured Virtual Machines.
Server Ports	Lists the configured Server Ports for the RackSwitches.
Port Groups	Lists the configured Port Groups and the vSwitch – Port Group association.

Step 12.1: Deploying the VMready Configuration

Once you have reviewed the configurations, click **Deploy** to display a confirmation dialog. Click **Ok** to initiate the deployment of the VMready configuration to the switches.

When you click **Ok**, the content frame displays a summary of the deployment across the configured VMready switches and Hypervisors (if VM Management Server is configured). See [Figure 87 on page 525](#).

A log window shows the messages logged during deployment. You can view the logs at any time, as explained in [“How to View Logs” on page 92](#).

Figure 87. VMready Across the Datacenter—Deployment Summary

VMready Across Datacenter

Steps

Step 12 of 12

1. Introduction
2. Select VMready Switches
3. Define VM Management Server
4. Select Hypervisors
5. Configure VM Groups
6. Configure Virtual Machines
7. Configure VMAPs
8. Configure Server Ports
9. Configure Switch Specific Settings
10. Configure Port Groups
11. vSwitch - Port Group Association
- 12. Review and Deploy Configuration**

Review the configuration before deploying to the VMready switches and VMware hypervisors. Click each tab to verify the configuration is correct. Once the configuration is verified, click the "Deploy" button. Note that the following color convention is used to highlight the changes: *Newly added entry*, *Modified entry*, *Deleted entry*

Deployment Summary

VMready Switches - Deployment Summary

IP Address	Product Type	Deployment Status
192.168.6.81	BNT 10-port 10Gb Ethernet Switch Module	OK
192.168.6.82	BNT 10-port 10Gb Ethernet Switch Module	FAILED
192.168.6.83	BNT 10-port 10Gb Ethernet Switch Module	In Progress
192.168.6.84	BNT 10-port 10Gb Ethernet Switch Module	Queued
192.168.6.90	BNT RackSwitch G8124	Queued
172.16.2.92	BNT RackSwitch G8032	Queued
172.16.2.91	BNT RackSwitch G8264	Queued
192.168.6.75	BNT/Nortel 1/10Gb Uplink Ethernet Switch Mod	Queued

Hypervisors - Deployment Summary

Hypervisor	IP Address	Deployment Status
fd731b3-5164-30fc-971b-896826b78626	172.25.110.6	OK
65415025-8a16-3ca1-bc72-46a5d7200369	172.25.110.7	In Progress
c0a52aca-4066-b601-d7e0-001a64f36fe	172.25.110.3	Queued

Cancel Help

Chapter 8. Centralized VSI Database

Some switches, such as the *Virtual Fabric 10Gb Switch Module for IBM BladeCenter*, support the *pull* model for deploying 802.1Qbg configuration. The pull model enables those switches to get (or pull) the network configuration such as Virtual Switch Instance (VSI) type and 802.1Qbg parameters from a centralized repository using RESTfulAPI, whenever the switches detects new VMs added to Hypervisors connected to them.

You can configure SNSC (SNSC) to host centralized VSI database repository, which exposes VSI DB resources through a RESTful API. The following topics describe the centralized VSI database:

- [“VSI Database Overview” on page 528](#)
- [“How to Configure VSI DB from the VSI DB Console” on page 529](#)
- [“How to Administer VSI Database Using RESTful APIs” on page 533](#)

VSI Database Overview

Figure 88 illustrates how SNSC can serve as the centralized VSI database repository.

Figure 88. VSI database

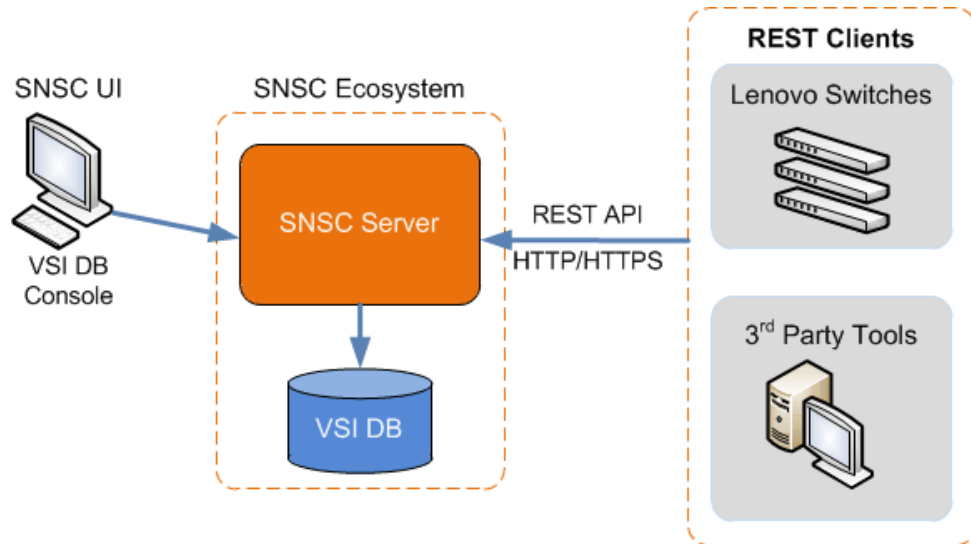


Figure 88 shows the VSI database structure, as follows:

- SNSC Server hosts the VSI database.
- You can configure VSI database by launching VSI DB Console from the SNSC UI as an administrative privileged user. The VSI DB Console allows you to create, modify, or delete VSI Type and 802.1Qbg-specific parameters.
- You can also configure VSI database by utilizing RESTful API through any home-grown or 3rd party REST client (Note that SNSC is not shipped with any REST clients).
- You can configure those Lenovo switches supporting REST clients with an SNSC address so that they can retrieve VSI Type and 802.1Qbg policies.

How to Configure VSI DB from the VSI DB Console

From the VSI DB Console, you can configure a VSI database using the following steps:

1. Create (configure) ACLs.
2. Create VSI Type by including ACLs that were created in step 1.

The following sections describe configuring VSI Type and 802.1Qbg parameters in VSI DB from the VSI DB Console:

- “VSI ACL Configuration” on page 529
- “VSI Type Configuration” on page 531

VSI ACL Configuration

You can insert, modify, or delete ACLs, using the following steps (see [Figure 89](#)):

1. Log into SNSC as an administrator privileged user.
2. Launch VSI DB Console by choosing menu **Virtualization Tools > VSI DB Console**.
3. Select the ACL tab.

You can add an ACL by clicking **Insert**.

You can click **Modify** or **Delete** on an existing ACL.

Figure 89. VSI DB Console – ACL Configuration

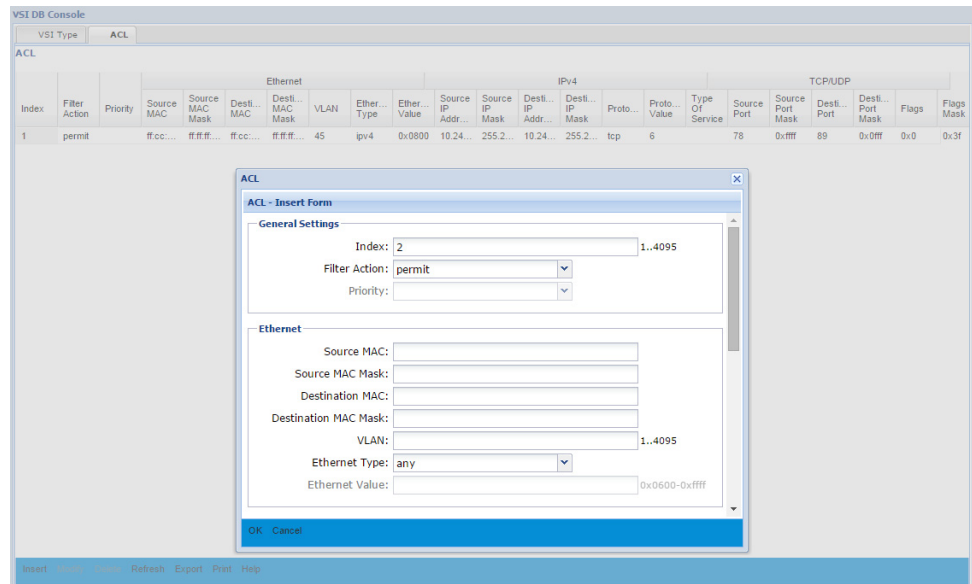


Table 498. *VSI DB – ACL Configuration field descriptions*

Field	Description
Index	The ACL index.
Filter ACtion	Sets the filter action as follows: none, permit, deny, setprio
Priority	Sets the priority in the range 0-7. Note that this field is enabled only when you set the Filter Action to setprio.
Source MAC	Sets the source MAC.
Source MAC Mask	Sets the source MAC mask.
Destination MAC	Sets the destination MAC.
Destination MAC Mask	Sets the destination MAC mask.
VLAN	Sets the VLAN number.
Ethernet Type	Sets the Ethernet type as follows: any, arp, ipv4, ipv6, mpls, rarp, user-defined
Ethernet Value	Sets the Ethernet value in the range 0x0600-0xffff. Note that this field can be used if you set the Ethernet Type to user-defined.
Source IP Address	Sets the source IP address.
Source IP Mask	Sets the source IP mask.
Destination IP Address	Sets the destination IP address.
Destination IP Mask	Sets the destination IP mask.
Protocol	Sets the protocol type as follows: any, tcp, udp, user-defined
Protocol Value	Sets the protocol value in the range 1-255. Note that this field can be used if you set the Protocol to user-defined.
Type of Service	Sets the type of service in the range 0-255.
Source Port	Sets the source port in the range 1-65535.
Source Port Mask	Sets the source port mask in the range 0x0000-0xffff.
Destination Port	Sets the destination port in the range 1-65535.
Destination Port Mask	Sets the destination port mask in the range 0x0000-0xffff.

Table 498. VSI DB – ACL Configuration field descriptions (continued)

Field	Description
Flags	Sets the TCP flags in the range 0x0-0x3f. Note that this is enabled only when you set the Protocol to tcp.
Flags Mask	Sets the TCP flags mask in the range 0x0-0x3f. Note that this is enabled only when you set the Protocol to tcp.

VSI Type Configuration

You can insert, modify, or delete VSI Types, using the following steps (see [Figure 90](#)):

1. Log into SNSC as an administrator privileged user.
2. Launch VSI DB Console by choosing menu **Virtualization Tools > VSI DB Console**.
3. Select the VSI Type tab.

You can add a VSI Type by clicking **Insert**.

You can click **Modify** or **Delete** on an existing VSI Type.

Figure 90. VSI DB Console – VSI Type Configuration

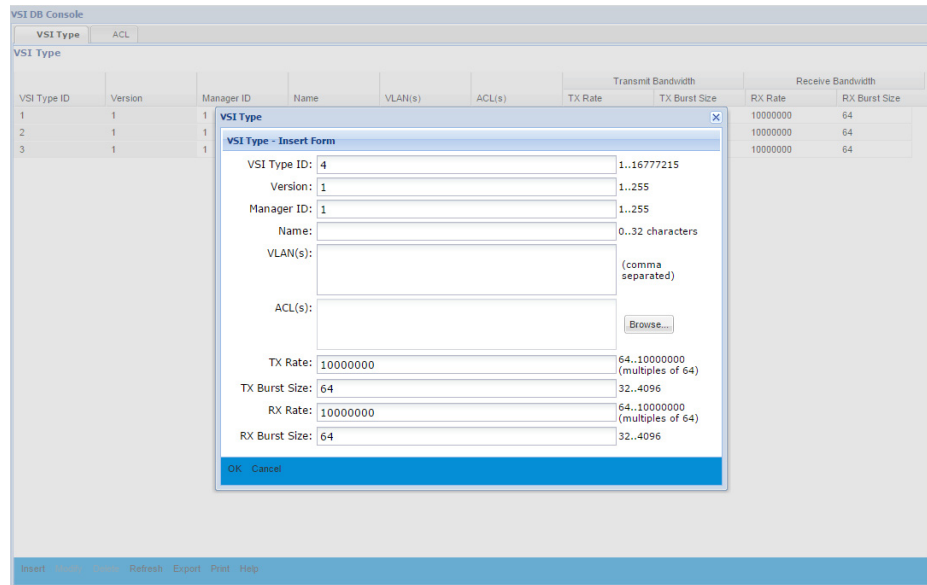


Table 499. VSI DB – VSI Type Configuration field descriptions

Field	Description
Index	VSI Type index (1-16777215).
Version	VSI Type version (1-255).
Manager ID	The manager ID (1-255) to which this VSI Type is associated.
Name	The VSI Type name (0-32).

Table 499. *VSI DB – VSI Type Configuration field descriptions (continued)*

Field	Description
VLAN(s)	The VLANs configured for this VSI Type.
ACL(s)	The ACLs configured for this VSI Type. Click Browse... to launch ACL selection window, which lists the configured ACLs.
TX Rate	Committed transmission rate (64-10000000 kbps). It must be a multiple of 64.
TX Burst Size	Maximum transmission burst size (32-4096 kilobits).
RX Rate	Committed receive rate (64-10000000 kbps). It must be a multiple of 64.
RX Burst Size	Maximum receive burst size (32-4096 kilobits).

How to Administer VSI Database Using RESTful APIs

SNSC exposes RESTful APIs that can be used by those switches supporting 802.1Qbg for deploying VSI Type configuration. You can also use these RESTful APIs to configure VSI DB in SNSC.

The following HTTP/HTTPS methods are supported by RESTful APIs:

- GET – For retrieving VSI Types
- POST – For creating new VSI Types
- PUT – For updating an existing VSI Type
- DELETE – For deleting an existing VSI Type

This chapter covers the following topics:

- [“VSI Types RESTful APIs” on page 533](#)
- [“Access Control for RESTful APIs” on page 534](#)
- [“XML Schema for VSI Types” on page 535](#)

VSI Types RESTful APIs

The following table provides the brief description of various RESTful APIs supported by SNSC:

Table 500. *RESTful APIs Supported by SNSC*

Resource URI	HTTP Method	Supported Protocol	Description
/vsitypes/	GET	HTTP, HTTPS	Returns a list of VSI Types associated with different versions.
/vsitypes/{version}/	GET	HTTP, HTTPS	Returns the list of VSI Types associated with the specified {version}.
/vsitypes/{version}/{id}	GET	HTTP, HTTPS	Returns the VSI Type created for {version} having the id as {id}.
/vsitypes/{version}/{id}	POST	HTTPS	Creates the VSI Type {id} for the version {version}.
/vsitypes/{version}/{id}	PUT	HTTPS	Modifies the VSI Type {id} created for the version {version}.
/vsitypes/{version}/{id}	DELETE	HTTPS	Deletes the VSI Type {id} created for the version {version}.

Note: The Resource URIs in the preceding table are listed in relative path. For example, /vsitypes/ maps to:

http://<server>:40080/snsc/rest/vsitypes/

or

https://<server>:40443/snsc/rest/vsitypes/

where <server> is the IP address of the system on which SNSC is installed.

Access Control for RESTful APIs

The RESTful APIs offered by SNSC requires authentication for creation (POST), modification (SET), and deletion (DELETE) methods.

SNSC uses Basic HTTP authentication, which requires the RESTful client to send the authentication information in the Authorization request header.

If you send a POST, PUT, and DELETE request without proper authentication credential, SNSC's RESTful service returns back a 401 response code (the challenge). The following snippet shows the challenge response send by SNSC in case of a bad authentication request:

```
HTTP/1.1 401 Authorization Required
Server: HTTPd/1.0
Date: Thu, 14 Jul 2011 12:23:15 GMT
WWW-Authenticate: Basic realm="VSI Types"
```

Note: In addition to authentication, POST, SET, and DELETE requests for VSI Types resources must be sent over HTTPS. If you use HTTP for sending POST, SET, and DELETE operations, SNSC's RESTful service returns the following error:

```
405 Method Not Allowed
```

XML Schema for VSI Types

The following list shows the XML schema associated with RESTfulVSI Type Request and Response:

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="vsi-types">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="vsi-type" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="vsi-type">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="id" type="xs:string" minOccurs="1"
maxOccurs="1"/>
        <xs:element name="version" type="xs:string" minOccurs="1"
maxOccurs="1"/>
        <xs:element name="managerid" type="xs:string"
minOccurs="1" maxOccurs="1"/>
        <xs:element name="name" type="xs:string" minOccurs="1"
maxOccurs="1"/>
        <xs:element name="vlanid" type="xs:string" minOccurs="1"
maxOccurs="unbounded"/>
        <xs:element ref="bandwidth" minOccurs="1" maxOccurs="1"/>
        <xs:element ref="acl" minOccurs="0"
maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="bandwidth">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="txrate" minOccurs="1" maxOccurs="1"/>
        <xs:element ref="rxrate" minOccurs="1" maxOccurs="1"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="acl">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="action" type="filterActionType"
minOccurs="0"
maxOccurs="1"/>
        <xs:element name="prio" type="priorityType"
minOccurs="0" maxOccurs="1"/>
        <xs:element ref="ethernet" minOccurs="0" maxOccurs="1"/>
        <xs:element ref="ipv4" minOccurs="0" maxOccurs="1"/>
        <xs:element ref="tcpudp" minOccurs="0" maxOccurs="1"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

```

```

        </xs:complexType>
    </xs:element>
    <xs:element name="txrate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="txcommittedrate" type="xs:string"
minOccurs="1"
                maxOccurs="1"/>
                <xs:element name="txburst" type="xs:string"
minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="rxrate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="rxcommittedrate" type="xs:string"
minOccurs="1"
                maxOccurs="1"/>
                <xs:element name="rxburst" type="xs:string"
minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="ethernet">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="smac" type="macAddressType"
minOccurs="0" maxOccurs="1"/>
                <xs:element name="smacmask" type="macAddressType"
minOccurs="0"
                maxOccurs="1"/>
                <xs:element name="dmac" type="macAddressType"
minOccurs="0" maxOccurs="1"/>
                <xs:element name="dmacmask" type="macAddressType"
minOccurs="0"
                maxOccurs="1"/>
                <xs:element name="vlan" type="xs:string" minOccurs="0"
maxOccurs="1"/>
                <xs:element name="ethtype" type="xs:string"
minOccurs="0" maxOccurs="1"/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="ipv4">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="sip" type="ipAddressType"
minOccurs="0" maxOccurs="1"/>
                <xs:element name="sipmask" type="ipAddressType"
minOccurs="0"
                maxOccurs="1"/>
                <xs:element name="dip" type="ipAddressType"

```



```

minOccurs="0" maxOccurs="1"/>
    <xs:element name="dipmask" type="ipAddressType"
minOccurs="0"
    maxOccurs="1"/>
    <xs:element name="ipproto" type="xs:string"
minOccurs="0" maxOccurs="1"/>
    <xs:element name="tos" type="xs:string" minOccurs="0"
maxOccurs="1"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element name="tcpudp">
<xs:complexType>
<xs:sequence>
    <xs:element name="sport" type="xs:string" minOccurs="0"
maxOccurs="1"/>
    <xs:element name="sportmask" type="xs:string"
minOccurs="0" maxOccurs="1"/>
    <xs:element name="dport" type="xs:string" minOccurs="0"
maxOccurs="1"/>
    <xs:element name="dportmask" type="xs:string"
minOccurs="0" maxOccurs="1"/>
    <xs:element name="flags" type="xs:string" minOccurs="0"
maxOccurs="1"/>
    <xs:element name="flagsmask" type="xs:string"
minOccurs="0" maxOccurs="1"/>
</xs:sequence>
</xs:complexType>
</xs:element>

<xs:simpleType name="filterActionType">
<xs:restriction base="xs:string">
    <xs:pattern value="none|permit|deny|setpriority"/>
</xs:restriction>
</xs:simpleType>

<xs:simpleType name="priorityType">
<xs:restriction base="xs:string">
    <xs:pattern value="|0|1|2|3|4|5|6|7"/>
</xs:restriction>
</xs:simpleType>

<xs:simpleType name="ipAddressType">
<xs:restriction base="xs:string">
<xs:pattern
value="(([0-1])?[0-9]([0-9])?|2[0-4][0-9]|25[0-5])\.(((0-1)
?[0-9]([0-9])?|2[0-4]
[0-9]|25[0-5])\.(((0-1)?)?[0-9]([0-9])?|2[0-4][0-9]|25[0-5])\
.(((0-1)?)?[0-9]([0-9])?|2[0-4][0-9]|25[0-5])"/>
</xs:restriction>
</xs:simpleType>

<xs:simpleType name="macAddressType">
<xs:restriction base="xs:string">
    <xs:pattern value="[0-9a-fA-F]{2}(:[0-9a-fA-F]{2}){5}"/>

```

```
    </xs:restriction>
  </xs:simpleType>
</xs:schema>
```

VSI Types RESTful API Reference - Examples

The following sections provide usage references for the supported VSI DB RESTful APIs.

- [“GET Request to Retrieve VSI Types Configured with a Specific Version” on page 539](#)
- [“GET Request to Retrieve an Individual VSI Type” on page 542](#)
- [“GET Request to Retrieve All Configured VSI Types” on page 544](#)
- [“POST Request to Create a VSI Type” on page 548](#)
- [“PUT Request to Modify an Existing VSI Type” on page 550](#)
- [“DELETE Request to Delete an Existing VSI Type” on page 551](#)

GET Request to Retrieve VSI Types Configured with a Specific Version

Resource URI	http://<server>:40080/snsc/rest/vsitypes/{version} (for HTTP) https://<server>:40443/snsc/rest/vsitypes/{version} (for HTTPS)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	202 OK and XML data (if data is available). 404 Not Found (if VSI Types are not available for specified version).

Example

GET VSI Types configured for version 2 from SNSC running on 192.168.1.1

http://192.168.1.1:40080/snsc/rest/vsitypes/2 (for HTTP)

https://192.168.1.1:40443/snsc/rest/vsitypes/2 (for HTTPS)

Response Template

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
  <vsi-type>
    <id>10</id>
    <version>2</version>
    <managerid>1</managerid>
    <name>VSI 1</name>
    <vlanid>11</vlanid>
    <vlanid>12</vlanid>
    <vlanid>13</vlanid>
    <vlanid>14</vlanid>
    <bandwidth>
      <txrate>
        <txcommittedrate>64</txcommittedrate>
        <txburst>32</txburst>
      </txrate>
      <rxrate>
        <rxcommittedrate>64</rxcommittedrate>
        <rxburst>32</rxburst>
      </rxrate>
    </bandwidth>
    <acl>
      <action>setpriority</action>
      <prio>1</prio>
      <ethernet>
        <smac>A1:BC:33:44:55:D6</smac>
        <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
        <dmac>A2:DD:33:44:55:E7</dmac>
        <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
      </ethernet>
    </acl>
  </vsi-type>
</vsi-types>
```

```

    <vlan>12</vlan>
    <ethtype>0x0800</ethtype>
  </ethernet>
  <ipv4>
    <sip>192.168.6.1</sip>
    <sipmask>255.255.255.0</sipmask>
    <dip>192.168.6.2</dip>
    <dipmask>255.255.255.0</dipmask>
    <ipproto>6</ipproto>
    <tos>0</tos>
  </ipv4>
  <tcpudp>
    <sport>1</sport>
    <sportmask>0xffff</sportmask>
    <dport>3</dport>
    <dportmask>0xffff</dportmask>
    <flags>0x0</flags>
    <flagsmask>0x1</flagsmask>
  </tcpudp>
</acl>
</vsi-type>
<vsi-type>
<id>11</id>
<version>2</version>
<managerid>1</managerid>
<name>VSI_1</name>
<vlanid>20</vlanid>
<bandwidth>
  <txrate>
    <txcommittedrate>128</txcommittedrate>
    <txburst>32</txburst>
  </txrate>
  <rxrate>
    <rxcommittedrate>128</rxcommittedrate>
    <rxburst>32</rxburst>
  </rxrate>
</bandwidth>
<acl>
  <action>setpriority</action>
  <prio>1</prio>
  <ethernet>
    <smac>B1:BC:33:44:55:D6</smac>
    <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
    <dmac>B2:DD:33:44:55:E7</dmac>
    <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
    <vlan>22</vlan>
    <ethtype>0x0800</ethtype>
  </ethernet>
  <ipv4>
    <sip>192.168.6.1</sip>
    <sipmask>255.255.255.0</sipmask>
    <dip>192.168.6.2</dip>
    <dipmask>255.255.255.0</dipmask>

```

```
<ipproto>6</ipproto>
<tos>0</tos>
</ipv4>
<tcpudp>
  <sport>1</sport>
  <sportmask>0xffff</sportmask>
  <dport>3</dport>
  <dportmask>0xffff</dportmask>
  <flags>0x0</flags>
  <flagsmask>0x1</flagsmask>
</tcpudp>
</acl>
</vsi-type>
</vsi-types>
```

GET Request to Retrieve an Individual VSI Type

Resource URI	http://<server>:40080/snsc/rest/vsitypes/{version}/{id} (for HTTP) https://<server>:40443/snsc/rest/vsitypes/{version}/{id} (for HTTPS)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	202 OK and XML data (if data is available). 404 Not Found (if VSI Types are not available for specified version).

Example

GET an individual VSI Type 2 configured for version 1 from SNSC running on 192.168.1.1

http://192.168.1.1:40080/snsc/rest/vsitypes/1/2 (for HTTP)

https://192.168.1.1:40443/snsc/rest/vsitypes/1/2 (for HTTPS)

Response Template

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
  <vsi-type>
    <id>2</id>
    <version>1</version>
    <managerid>1</managerid>
    <name>VSI 1</name>
    <vlanid>1</vlanid>
    <vlanid>2</vlanid>
    <vlanid>3</vlanid>
    <vlanid>4</vlanid>
    <bandwidth>
      <txrate>
        <txcommittedrate>64</txcommittedrate>
        <txburst>32</txburst>
      </txrate>
      <rxrate>
        <rxcommittedrate>64</rxcommittedrate>
        <rxburst>32</rxburst>
      </rxrate>
    </bandwidth>
    <acl>
      <action>setpriority</action>
      <prio>1</prio>
    </acl>
    <ethernet>
      <smac>11:22:33:44:55:66</smac>
      <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
      <dmac>11:22:33:44:55:56</dmac>
    </ethernet>
  </vsi-type>
</vsi-types>
```

```
<dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
<vlan>2</vlan>
<ethtype>0x0800</ethtype>
</ethernet>
<ipv4>
  <sip>192.168.6.1</sip>
  <sipmask>255.255.255.0</sipmask>
  <dip>192.168.6.2</dip>
  <dipmask>255.255.255.0</dipmask>
  <ipproto>6</ipproto>
  <tos>0</tos>
</ipv4>
<tcpudp>
  <sport>1</sport>
  <sportmask>0xffff</sportmask>
  <dport>3</dport>
  <dportmask>0xffff</dportmask>
  <flags>0x0</flags>
  <flagsmask>0x1</flagsmask>
</tcpudp>
</acl>
</vsi-type>
</vsi-types>
```

GET Request to Retrieve All Configured VSI Types

Resource URI	http://<server>:40080/snsc/rest/vsitypes (for HTTP) https://<server>:40443/snsc/rest/vsitypes (for HTTPS)
Method	HTTP GET
Supported Protocols	HTTP and HTTPS
Request Body	Not applicable
Returns	<ul style="list-style-type: none">● 202 OK and XML data (if data is available).● 404 Not Found (if VSI Types are not available for specified version).

Example

GET all configured Types from SNSC running on 192.168.1.1

http://192.168.1.1:40080/snsc/rest/vsitypes (for HTTP)

https://192.168.1.1:40443/snsc/rest/vsitypes (for HTTPS)

Response Template

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
  <vsi-type>
    <id>2</id>
    <version>1</version>
    <managerid>1</managerid>
    <name>VSI 1</name>
    <vlanid>1</vlanid>
    <vlanid>2</vlanid>
    <vlanid>3</vlanid>
    <vlanid>4</vlanid>
    <bandwidth>
      <txrate>
        <txcommittedrate>64</txcommittedrate>
        <txburst>32</txburst>
      </txrate>
      <rxrate>
        <rxcommittedrate>64</rxcommittedrate>
        <rxburst>32</rxburst>
      </rxrate>
    </bandwidth>
    <acl>
      <action>setpriority</action>
      <prio>1</prio>
      <ethernet>
        <smac>11:22:33:44:55:66</smac>
        <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
        <dmac>11:22:33:44:55:56</dmac>
      </ethernet>
    </acl>
  </vsi-type>
</vsi-types>
```



```

    <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
    <vlan>2</vlan>
    <ethtype>0x0800</ethtype>
</ethernet>
<ipv4>
    <sip>192.168.6.1</sip>
    <sipmask>255.255.255.0</sipmask>
    <dip>192.168.6.2</dip>
    <dipmask>255.255.255.0</dipmask>
    <ipproto>6</ipproto>
    <tos>0</tos>
</ipv4>
<tcpudp>
    <sport>1</sport>
    <sportmask>0xffff</sportmask>
    <dport>3</dport>
    <dportmask>0xffff</dportmask>
    <flags>0x0</flags>
    <flagsmask>0x1</flagsmask>
</tcpudp>
</acl>
</vsi-type>
<vsi-type>
<id>10</id>
<version>2</version>
<managerid>1</managerid>
<name>VSI 1</name>
<vlanid>11</vlanid>
<vlanid>12</vlanid>
<vlanid>13</vlanid>
<vlanid>14</vlanid>
<bandwidth>
    <txrate>
        <txcommittedrate>64</txcommittedrate>
        <txburst>32</txburst>
    </txrate>
    <rxrate>
        <rxcommittedrate>64</rxcommittedrate>
        <rxburst>32</rxburst>
    </rxrate>
</bandwidth>
<acl>
    <action>setpriority</action>
    <prio>1</prio>
    <ethernet>
        <smac>A1:BC:33:44:55:D6</smac>
        <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
        <dmac>A2:DD:33:44:55:E7</dmac>
        <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
        <vlan>12</vlan>
        <ethtype>0x0800</ethtype>
    </ethernet>
    <ipv4>

```

```

    <srcip>192.168.6.1</srcip>
    <srcipmask>255.255.255.0</srcipmask>
    <dstip>192.168.6.2</dstip>
    <dstipmask>255.255.255.0</dstipmask>
    <ipproto>6</ipproto>
    <tos>0</tos>
  </ip4>
  <tcpudp>
    <sport>1</sport>
    <sportmask>0xffff</sportmask>
    <dport>3</dport>
    <dportmask>0xffff</dportmask>
    <flags>0x0</flags>
    <flagsmask>0x1</flagsmask>
  </tcpudp>
</acl>
</vsi-type>
<vsi-type>
  <id>11</id>
  <version>2</version>
  <managerid>1</managerid>
  <name>VSI_1</name>
  <vlanid>20</vlanid>
  <bandwidth>
    <txrate>
      <txcommittedrate>128</txcommittedrate>
      <txburst>32</txburst>
    </txrate>
    <rxrate>
      <rxcommittedrate>128</rxcommittedrate>
      <rxburst>32</rxburst>
    </rxrate>
  </bandwidth>
  <acl>
    <action>setpriority</action>
    <prio>1</prio>
    <ethernet>
      <smac>B1:BC:33:44:55:D6</smac>
      <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
      <dmac>B2:DD:33:44:55:E7</dmac>
      <dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
      <vlan>22</vlan>
      <ethertype>0x0800</ethertype>
    </ethernet>
    <ip4>
      <srcip>192.168.6.1</srcip>
      <srcipmask>255.255.255.0</srcipmask>
      <dstip>192.168.6.2</dstip>
      <dstipmask>255.255.255.0</dstipmask>
      <ipproto>6</ipproto>
      <tos>0</tos>
    </ip4>
    <tcpudp>

```

```
<sport>1</sport>
<sportmask>0xffff</sportmask>
<dport>3</dport>
<dportmask>0xffff</dportmask>
<flags>0x0</flags>
<flagsmask>0x1</flagsmask>
</tcpudp>
</acl>
</vsi-type>
</vsi-types>
```

POST Request to Create a VSI Type

Resource URI	https://<server>:40443/snsc/rest/vsitypes/{version}/{id}
Method	HTTP POST
Supported Protocols	HTTPS
Request Body	XML (see the Request Template below)
Returns	201 Created & Location (returns header containing the URL of the newly created VSI Type). 401 Unauthorized (if authentication/authorization fails). 405 Method Not Supported (if the request is sent over HTTP). 415 Unsupported Media Type (if incorrect XML configuration is sent).

Example

Create (POST) VSI Type 2 for version 1 from SNSC running on 192.168.1.1

https://192.168.1.1:40443/snsc/rest/vsitypes/1/2

Request Template

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
  <vsi-type>
    <id>2</id>
    <version>1</version>
    <managerid>1</managerid>
    <name>VSI 1</name>
    <vlanid>1</vlanid>
    <vlanid>2</vlanid>
    <vlanid>3</vlanid>
    <vlanid>4</vlanid>
    <bandwidth>
      <txrate>
        <txcommittedrate>64</txcommittedrate>
        <txburst>32</txburst>
      </txrate>
      <rxrate>
        <rxcommittedrate>64</rxcommittedrate>
        <rxburst>32</rxburst>
      </rxrate>
    </bandwidth>
    <acl>
      <action>setpriority</action>
      <prio>1</prio>
      <ethernet>
        <smac>11:22:33:44:55:66</smac>
        <smacmask>ff:ff:ff:ff:ff:ff</smacmask>
        <dmac>11:22:33:44:55:56</dmac>
      </ethernet>
    </acl>
  </vsi-type>
</vsi-types>
```

```
<dmacmask>ff:ff:ff:ff:ff:ff</dmacmask>
<vlan>2</vlan>
<ethtype>0x0800</ethtype>
</ethernet>
<ipv4>
  <sip>192.168.6.1</sip>
  <sipmask>255.255.255.0</sipmask>
  <dip>192.168.6.2</dip>
  <dipmask>255.255.255.0</dipmask>
  <ipproto>6</ipproto>
  <tos>0</tos>
</ipv4>
<tcpudp>
  <sport>1</sport>
  <sportmask>0xffff</sportmask>
  <dport>3</dport>
  <dportmask>0xffff</dportmask>
  <flags>0x0</flags>
  <flagsmask>0x1</flagsmask>
</tcpudp>
</acl>
</vsi-type>
</vsi-types>
```

PUT Request to Modify an Existing VSI Type

Resource URI	https://<server>:40443/snsc/rest/vsitypes/{version}/{id}
Method	HTTP PUT
Supported Protocols	HTTPS
Request Body	XML (see the Request Template below)
Returns	201 Created & Location (returns header containing the URL of the newly created VSI Type). 401 Unauthorized (if authentication/authorization fails). 404 Not Found (if specified VSI Type is not configured). 405 Method Not Supported (if the request is sent over HTTP). 415 Unsupported Media Type (if incorrect XML configuration is sent).

Example

Update (PUT) few parameters of VSI Type 2 for version 1 in SNSC running on 192.168.1.1

https://192.168.1.1:40443/snsc/rest/vsitypes/1/2

Request Template

Only those parameters that need to be modified can be included in XML body.

```
<?xml version="1.0" encoding="UTF-8"?>
<vsi-types>
  <vsi-type>
    <id>2</id>
    <version>1</version>
    <managerid>1</managerid>
    <name>VSI NEW NAME 1</name>
    <bandwidth>
      <txrate>
        <txcommittedrate>128</txcommittedrate>
        <txburst>64</txburst>
      </txrate>
      <rxrate>
        <rxcommittedrate>128</rxcommittedrate>
        <rxburst>64</rxburst>
      </rxrate>
    </bandwidth>
  </vsi-type>
</vsi-types>
```

DELETE Request to Delete an Existing VSI Type

Resource URI	https://<server>:40443/snsc/rest/vsitypes/{version}/{id}
Method	HTTP DELETE
Supported Protocols	HTTPS
Request Body	Not applicable
Returns	204 No Content (if successful, with no content in the response object). 401 Unauthorized (if authentication/authorization fails). 404 Not Found (if specified VSI Type is not configured). 405 Method Not Supported (if the request is sent over HTTP).

Example

Delete VSI Type 2 for version 1 from SNSC running on 192.168.1.1

https://192.168.1.1:40443/snsc/rest/vsitypes/1/2

Chapter 9. Performing Device-Specific Actions

SNSC (SNSC) allows you to perform specific actions per switch including synchronizing the configuration, launching telnet and web interfaces and invoking the global `apply`, `save`, and `diff` commands.

The topics in this chapter cover the following main switch configuration features:

- [“Synchronizing the Configuration - Sync Config” on page 554](#)
- [“Global Actions” on page 557](#)
- [“Launching Device Access Utilities” on page 558](#)

Synchronizing the Configuration - Sync Config

The Sync Config feature gives you the option to replicate certain configuration such as VLAN and Port settings from one switch to multiple switches at the same time.

Restrictions:

- You can only copy data to and from switches that have a health status of Up.
- You can only use the Sync Config feature if previously-made configuration changes are saved to switch flash.

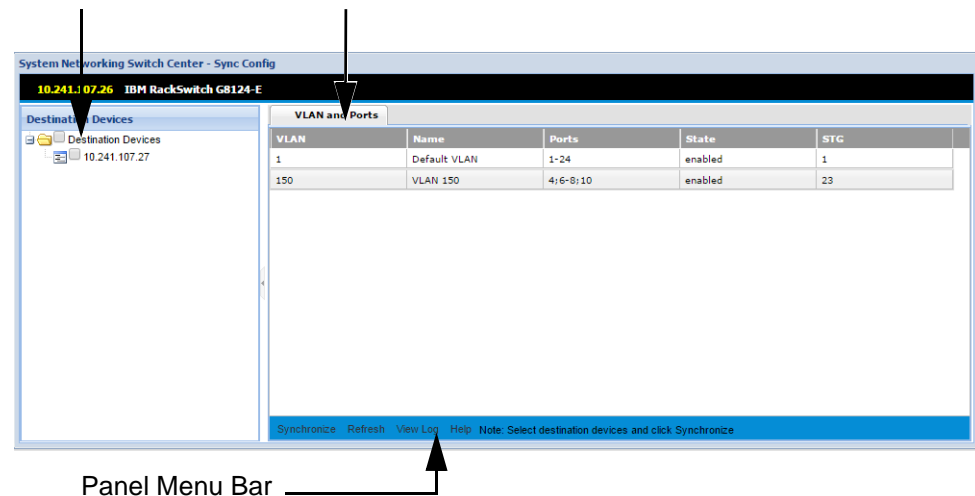
To launch Sync Config page:

1. Select a switch in the device list (see [Figure 6 on page 53](#)).
2. Choose **Device > Sync Config** menu.

The Sync Config page (see [Figure 91 on page 554](#)) consists of two framed windows: the Destination Devices frame (left) and the Content frame (right).

The Destination Devices frame lists the discovered switches with type matching with the selected target switch for which the Sync Config operation can be performed. By default, the destination devices are deselected. The Content frame shows the sub-features in the form of tabs and the corresponding details in a panel along with panel specific menu bar at the bottom.

Figure 91. Sync Config Page
Destination Devices Tabs



This section covers the following Sync Config topics:

- [“VLAN and Port Synchronization” on page 555](#)

VLAN and Port Synchronization

You can synchronize the following parameters from the selected source switch to the chosen set of destination switches:

- VLAN tag state
- VLAN table
- Default VLAN
- Management VLAN
- PVID

Notes:

- You can only synchronize data to and from switches that have a health status of Up and are of the same type.
- This operation will not be attempted on switches if previously-made configuration changes are not yet saved to switch flash. That is, it will not synchronize the configuration to switches that are in the “save pending” state.
- This feature is not supported on stacked switches.
- If Sync operation fails on a device, SNSC reverts any Sync Config changes done on that device.
- Since Sync Config changes the VLAN and Port information on target switches, there are chances of upsetting the network configuration, if the target switch is in live network. Sync Config is best suited for those switches having factory default configurations.

You can launch VLAN and Port Synchronization page using the following steps:

1. Select the switch that has the VLAN and Port configuration that you want to replicate on other devices.
2. Choose menu **Device > Sync Config** and click VLAN and Ports feature.
3. From the Select Devices list, select/deselect the switches in the Select Devices list.
4. Click **Synchronize**.
5. Click **Yes** to confirm that you want to synchronize the devices, or click **No** to cancel synchronization.
6. Click **View Log** to see the status of the Sync Config process.

The following table describes the fields of the **VLAN and Ports** synchronization tab.

Table 501. *Sync Config VLAN and Ports field descriptions*

Field	Description
VLAN	The VLAN ID configured on the source switch
Name	VLAN name
Ports	Ports associated with the VLAN Id

Table 501. *Sync Config VLAN and Ports field descriptions (continued)*

Field	Description
State	Enabled/Disabled state
STG	Associated Spanning Tree Protocol Group

Global Actions

The global actions feature allows you to invoke switch specific global commands. These commands are mainly used for rebooting the switch, applying and saving the changes to the configuration, viewing the difference, and reversing the configuration changes.

You can invoke these commands per-switch by using one of the following options:

- Select the switch and choose one of the items in **Device > Actions** menu.
- From the Device Console window, choose one of the items in **Actions** menu.

The following table lists the actions menus and the corresponding actions initiated on the switch:

Table 502. *Actions menus*

Action	Description
Apply	Applies any changes that you have made to the switch configuration
Save	Saves the current configuration to the flash memory.
Diff Config	Opens a window to display any pending configuration changes
Diff Flash	Opens a window to display any pending configuration changes and the affected configuration stored in flash memory on the switch.
Config Dump	Opens a window to display a dump of the current switch configuration.
Syslog Dump	Opens a window to display the syslogs available on the switch.
Revert	Reverts the switch to the current active configuration. This command is available if you did not apply the new configuration settings.
Revert Apply	Reverts the switch to the current saved configuration. This is available if you applied but did not save the new configuration settings.
Reboot Switch	Reboots the switch by reloads and saving the current RAM memory.
Delete	Deletes the switch entry from SNSC device list. Note: This option is not available in the Device Console window.

Launching Device Access Utilities

You can launch access utilities such as the Web interface using this facility.

This section covers the following launch topics:

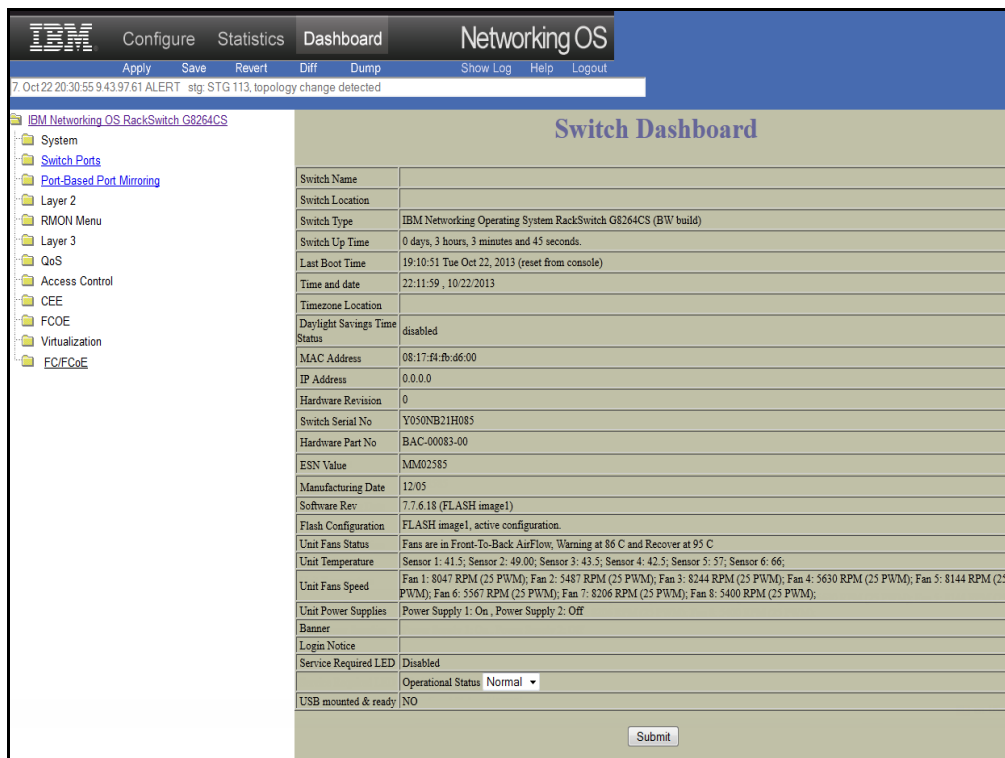
- “[Launching the Web Interface](#)” on page 558

Launching the Web Interface

This feature allows you to launch a web (Browser Based Interface, or BBI) session to the switch. For example, you might use this feature to configure SNMP settings on a switch before you perform the discovery procedure.

1. Select a switch.
2. Choose menu **Device > Launch > Web > HTTP or Device > Launch > Web > HTTPs** to launch HTTP or HTTPs based Web UI respectively. SNSC launches a BBI window in a new browser page (see [Figure 92 on page 558](#)).

Figure 92. BBI window



>>>>>>> **Review Note:** Folks, this is obviously wrong (although yes, it does appear that way as of Jan 15, 2015). Are we even supporting the BBI?

Chapter 10. Maintenance

Use the maintenance facility to backup SNSC's critical data. You can also take a runtime snap shot that would help the developers to debug issues noticed with SNSC (SNSC).

The topics in this chapter cover the following maintenance features:

- [“Taking SNSC's Critical Data Backup” on page 560](#)
- [“Restoring the Data from the Critical Data Backup” on page 562](#)
- [“Taking System Networking Switch Center Support Dump” on page 563](#)

Taking SNSC's Critical Data Backup

The critical data needed for running SNSC spans across the following areas:

- Configuration Files
- Database

Configuration Files

The configuration files can be further classified in to two groups namely, static data and dynamic data.

- **Static Data** – The data, which is not changed by SNSC during the course of operation. It primarily consists of mapping and rules files.
- **Dynamic Data** – The data that changes when SNSC is in operation.

The configuration files reside in the `conf` directory under the `<SNSC INSTALLATION>` location.

Database

The database stores the user credentials, device data including monitoring and performance parameters. For SNSC's day-to-day device administration and monitoring operation, the data stored in the database is very critical.

The database including purged data resides in database directory under the `<SNSC INSTALLATION>` location.

In addition to the previously mentioned critical data, the log messages play an important role in finding the status of the operation.

When SNSC backs up the critical data, it includes `conf`, `database`, and `logs` directories.

The backup operation involves in the following steps:

- [“Setting Backup Directory on System Networking Switch Center Server” on page 560](#)
- [“Initiating Critical Data Backup” on page 561](#)

Setting Backup Directory on System Networking Switch Center Server

SNSC stores the back up in the user specified repository/directory residing or mounted on the system where SNSC is installed. You can specify the directory for storing the backup operation using the following steps:

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

1. Choose **Maintenance > Data Backup > Set Data Backup Directory** to launch the window for specifying the backup directory.
2. Specify the directory where to save.

3. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
4. Click **Set**.

Initiating Critical Data Backup

Any user can initiate critical data backup provided the backup directory is set. You can initiate critical data backup using the following steps:

1. Choose **Maintenance > Data Backup > Take Data Backup** to launch the data backup window. This window shows data backup file path.
2. Click **OK**.

SNSC uses the standard ZIP format to compress the contents in backup file. The backup file is named as follows:

SNSC_<version>_<date>_<time>.zip

where:

<version> is the SNSC version in a.b.c.d format.

<date> is the date on the SNSC server system in yyyyymmdd format, on which the backup operation was initiated.

<time> is the time on the SNSC server system in HHMMSS format, at which the backup operation was initiated.

For example, if the backup operation is initiated in SNSC 5.2.1.0 on 23rd July 2010 at 14:01:43 hours, the backup file is named as:

SNSC.2.1.0_20100723_140143.zip

Note: While data backup is in progress, the database-related operations are queued until the backup operation, which might take from few seconds to couple of minutes depending on the database size, is completed.

Restoring the Data from the Critical Data Backup

You can restore the backed up data on any other SNSC installation, provided you are restoring the data for same version of SNSC:

- [“Restoring the Data for System Networking Switch Center Installed on a Linux System” on page 562](#)

Restoring the Data for System Networking Switch Center Installed on a Linux System

1. Log in as root on the Linux system installed with SNSC, where you want to restore the data.

2. Stop SNSC services by issuing the following command:

```
# /opt/ibm/SNSC/bin/shutdown.sh
```

3. Change directory to SNSC installation directory by issuing the following command:

```
# cd /opt/ibm/SNSC
```

4. Remove conf, database, and logs folders by issuing the following command:

```
# rm -rf conf database logs
```

5. Copy the backup file (ref: 3.1.2.2) to the following directory:

```
/opt/ibm/SNSC
```

6. Extract the backup file contents by issuing the following command:

```
# j2re/bin/jar xvf <backup file name>
```

For example, if the backup file name is
SNSC_5.2.1.0_20100723_140143.zip, the extract command is:

```
# j2re/bin/jar xvf SNSC_5.2.1.0_20100723_140143.zip
```

7. Start SNSC services by issuing the following command:

```
# /opt/ibm/SNSC/bin/startup.sh
```

Taking System Networking Switch Center Support Dump

SNSC support dump helps debugging the problem associated with configuration files and database. You can take the support dump using the following steps:

1. Choose **Maintenance > Data Backup > SNSC Support Dump** to launch the window.
2. (Optional) If you wish to include database, check **Include Database**.
3. Click **Save**, which brings up the save dialog.
4. Select the directory where you want to save the SNSC support dump and click **OK**.

The support dump file is named as follows:

SNSC_SupportDump_<version>_<date>_<time>.zip

where:

<version> is the SNSC version in a.b.c.d format.

<date> is the date on the SNSC server system in yyyyymmdd format, on which the backup operation was initiated.

<time> is the time on the SNSC server system in HHMMSS format, at which the backup operation was initiated.

For example, if the support dump is initiated in SNSC 8.1.0 on July 4th, 2015 at 14:01:43 hours, the support dump file is named:

SNSC_SupportDump_8.1.0_20150704_140143.zip

Chapter 11. Manager of Managers

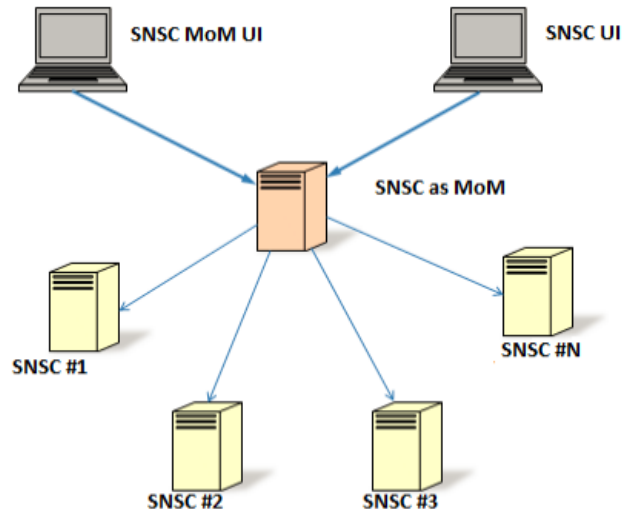
If you plan to deploy multiple instances of SNSC (SNSC), such as when managing thousands of devices, you can configure an additional instance of SNSC to function as a Manager of Managers (MoM).

- [“Manager of Managers Overview” on page 566](#)
- [“Enabling the Manager of Managers Service” on page 567](#)
- [“Logging In to the Manager of Managers” on page 568](#)
- [“About Manager of Managers Windows and Panels” on page 569](#)
- [“Performing Actions in the Manager of Managers” on page 572](#)

Manager of Managers Overview

Figure 93 on page 566 illustrates how SNSC can serve as Manager of Managers (MoM),

Figure 93. System Networking Switch Center as MoM



As seen in the overview picture:

- One of the SNSC instances is configured to support MoM functionality.
- The SNSC enabled with MoM collects selected attributes from all the devices discovered in other instances of SNSC (SNSC #1 through SNSC #N).
- The SNSC MoM consolidates the collected information, which can be viewed using a separate user interface (SNSC MoM UI).
- The SNSC instance with MoM enabled on it also serves, in parallel, as a regular SNSC. This functionality can be accessed using the regular SNSC UI.

Enabling the Manager of Managers Service

By default, the Manager of Managers (MoM) service is disabled. You can enable this service on any one instance using the following steps:

1. Stop SNSC Service:

On a Linux system, issue the following command:

```
# /opt/ibm/SNSC/bin/shutdown.sh
```

2. Navigate to the following directory:
<SNSC INSTALLATION DIR>/conf
3. Open the following file in a text editor: `server_conf.properties`
4. Set `enable_mom_service` to **true**.
5. By default, SNSC MoM collects the data from other configured instances once every five minutes. You can change this value using setting `mom_server_polling_interval`.
6. Start SNSC Service:

On a Linux system, issue the following command:

```
# /opt/ibm/SNSC/bin/startup.sh
```

Logging In to the Manager of Managers

You can login to Manager of Managers (MoM) UI using the following steps:

1. Launch a browser and enter the following URL:

If you want to use HTTP, the URL is `http://<hostname>:40080/snscmom`

If you prefer secure HTTP (HTTPS), the URL is
`https://<hostname>:40443/snscmom`

2. Use the same credentials that you use for logging in to SNSC to gain access to MoM features.

About Manager of Managers Windows and Panels

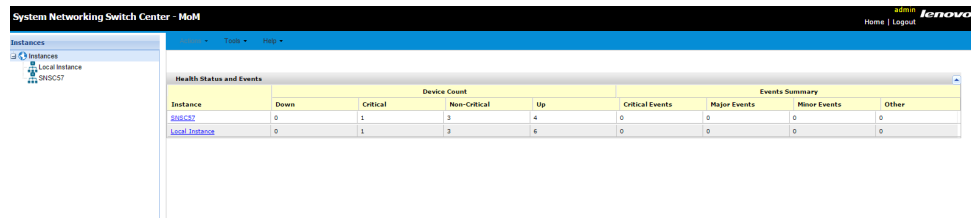
The following material describes the various Manager of Managers (MoM) user interface panels.

Main Window

Once you successfully login to the MoM, you will be presented with the Main Window (see [Figure 94 on page 569](#)).

The Main Window lists configured instances in the navigation panel on the left side of the window. The main content pane shows the health status summary associated with the configured instances. This health status summary is equivalent to Summary Status window shown in that instance of SNSC (see [“The Summary Status Pane” on page 56](#)).

Figure 94. MoM Main Window



Instance	Device Count				Events Summary			
	Down	Critical	Non-Critical	Up	Critical Events	Major Events	Minor Events	Other
SNSC2	0	1	3	4	0	0	0	0
Local Instance	0	1	3	4	0	0	0	0

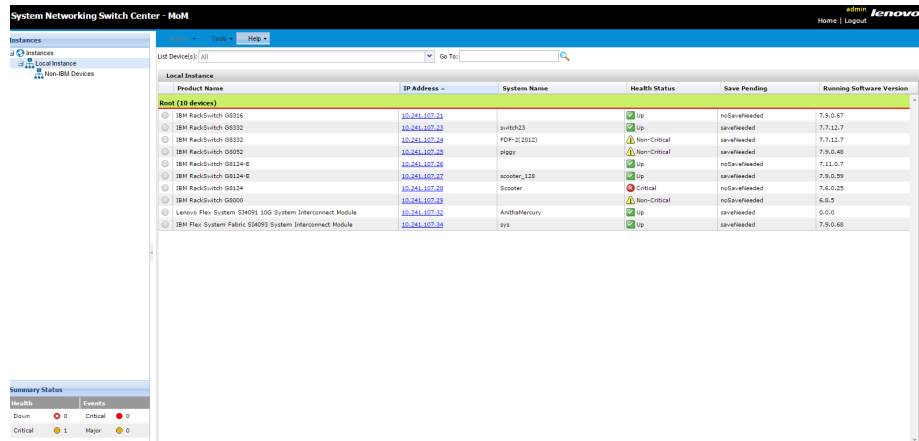
Note: You can navigate back to the Main Window from the rest of the windows by clicking the **Instances** node in the Instances navigation tree.

Instance View Window

From the Main Window, you can open the Instance View window (see [Figure 95 on page 569](#)) using one of the following steps:

- Click on any SNSC instance in the navigation tree (Instances)
- Click any Instance link in Health Status table view.

Figure 95. MoM Instance View Window



Product Name	IP Address	System Name	Health Status	Save Pending	Running Software Version
Root (10 devices)					
IBM FackSwitch 05116	10.241.107.21	switch23	Up	notSaveNeeded	7.9.0.67
IBM FackSwitch 05332	10.241.107.24		Up	saveNeeded	7.9.1.27
IBM FackSwitch 05332	10.241.107.24	PDF-2(012)	Non-Critical	saveNeeded	7.7.1.12.7
IBM FackSwitch 05332	10.241.107.24	PI227	Non-Critical	saveNeeded	7.9.0.48
IBM FackSwitch 05124-E	10.241.107.28		Up	notSaveNeeded	7.11.0.7
IBM FackSwitch 05124-E	10.241.107.21	master_122	Up	saveNeeded	7.9.0.59
IBM FackSwitch 05124	10.241.107.10	Scouter	Critical	notSaveNeeded	7.4.0.25
IBM FackSwitch 05000	10.241.107.29		Non-Critical	notSaveNeeded	6.8.5
Lenovo Flex System S9491 100 System Interconnect Module	10.241.107.32	Anthall Mercury	Up	saveNeeded	0.0.0
IBM Flex System Public S9493 System Interconnect Module	10.241.107.34	sys	Up	saveNeeded	7.9.0.68

The instance view window shows the following set of panels:

- Instances tree (upper-left panel) showing the nodes/domains configured in that instance of SNSC.
- Summary Status (lower-left panel) showing the summary information (similar to what is shown in case of SNSC).
- Content pane showing the list of devices discovered in that instance of SNSC, along with the brief summary.

Note: Unlike the SNSC window, the device list allows you to select only one device at a time.

Summary Panel

From Instance [Figure 96 on page 570](#) View window, you can launch the summary panel for any listed device using one of the following steps:

- Select a device in the content pane and click **Actions > Summary**, OR
- Click the **IP Address** link in device list table.

Figure 96. MoM Summary Panel

Summary	
Name	Value
Instance	Local Instance
Domain	
Rack	
Chassis	
IP Address	10.241.107.21
Health Status	Up
System Description	IBM Networking Operating System RackSwitch G8316
System Name	
Discovery Date	2015-01-14
Location	
Contact	wfcon
System Up Since	18 days, 7 hours, 55 minutes and 12 seconds
MAC address	6c:ae:8b:d0:68:00
Image 1 Software Version	version 7.9.0.54, downloaded 15:14:52 Tue May 13, 2014
Refresh Export Print Help	

Table 503. MOM Summary field descriptions

Field	Description
Instance	The SNSC instance in which the switch is discovered
Domain	The Domain name in which the switch is listed in the navigation tree.
Rack	The Rack name (in the navigation tree) in which the switch is contained
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.

Table 503. *MOM Summary field descriptions (continued)*

Field	Description
Health Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Location	The physical location of the switch.
Contact	The switch contact for support
Image1 Software Version	The software version of the image stored in the first image storage area.
Image2 Software Version	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Image for Next Reset	The firmware to choose for the next switch reset
Config For Next Reset	The configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Apply Pending	Displays information whether any changes are not yet applied on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Panic Dump	Displays panic dump status.
Time and Reason for last boot	Displays information about the last reboot cycle. For example, the reason might be power cycle.

Performing Actions in the Manager of Managers

You can perform various actions through the Manager of Managers (MoM), such as Adding an instance, Deleting or Renaming an existing instance, Launching Switch Version Report, or launching SNSC for an instance or a device.

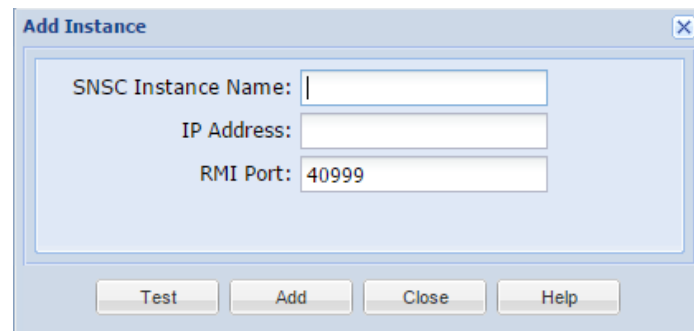
Adding an Instance of System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure adds an instance of SNSC to the MoM.

1. Click **Tools > Add Instance** to launch the window for adding an instance (see [Figure 97 on page 572](#)).
2. Enter a unique name for the SNSC instance.
3. Enter the IP address of the server on which the SNSC instance is running.
4. If the SNSC instance to be added uses a different RMI port, change it accordingly.
5. If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
6. (Optional) To verify the IP address and RMI port configuration, click **Test**. When you click the Test button, MoM checks whether the specified instance is accessible.
7. Click **Add** to add the instance.

Figure 97. MoM Add Instance Window



Renaming an Instance of System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure renames an existing instance of SNSC.

1. Navigate to the MoM Main Window.
2. Right-click an instance you want to rename, and select **Rename Instance**.
3. Enter a new name.

- If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
- Click **OK**.

Note: Renaming is not allowed for the default Local Instance.

Deleting an Instance of System Networking Switch Center

Note: This facility is available only to those users logged in as an administrator (if the Root user is disabled), or to those users who know root password (if the Root user is enabled).

This procedure deletes an existing instance of SNSC.

- Navigate to the MoM Main Window.
- Right-click an instance you want to delete, and select **Delete Instance**
- If the Root user is enabled, enter the root password in the Root Password field (this field is not visible if the Root user is disabled).
- Click **OK**.

Note: Deletion is not allowed for the default Local Instance.

Launching Switch Version Report

The Switch Version Report (see [Figure 98 on page 573](#)) provides a summary of data about all discovered switches across one or more SNSC instances that are added in the MoM.

To launch the Switch Version Report showing the summary of data from all the added instances:

- Right-click **Instances** node in Instances tree and select **Switch Version Report**, OR
- Click **Instances** node in Instances tree and select **Tools > Switch Version Report**.

Figure 98. MoM Switch Version Report

Instance	Domain	Rack	chassis	IP Address	Status	System Description	System Name	Discovery Date	Location	System Contact	System Uptime	Mac Address
Local Instance				10.241.107.21	Up	IBM Networking Operating		2015-01-14		vifon	15 days, 7 hour	6c:4e:1b:4b:4b:00
Local Instance				10.241.107.23	Up	IBM Networking Operating	switch23	2015-01-14			15 days, 7 hour	74:99:75:4b:47:00
Local Instance				10.241.107.24	Non-Critical	IBM Networking Operating	PDF-2(2012)	2015-01-14			15 days, 7 hour	74:99:75:4b:50:00
Local Instance				10.241.107.26	Non-Critical	IBM Networking Operating	piggys	2015-01-14			15 days, 7 hour	08:17:64:a3:ca:00
Local Instance				10.241.107.26	Up	IBM Networking Operating		2015-01-14			15 days, 7 hour	74:99:75:b3:ca:00
Local Instance				10.241.107.27	Up	IBM Networking Operating	acoster_128	2015-01-14			15 days, 7 hour	08:17:64:a1:f0:00
Local Instance				10.241.107.28	Critical	IBM Networking Operating	booster	2015-01-14			15 days, 7 hour	00:23:03:49:1b:00
Local Instance				10.241.107.29	Non-Critical	IBM Networking Operating		2015-01-14			15 days, 7 hour	00:23:0b:ac:71:1a
Local Instance			7660723506894	10.241.107.32	Up	Lenovo Flex System S340	AnithaHarury	2015-01-14	Bangalore	anitha@lenovo.com	15 days, 7 hour	a3:97:4b:1f:12:00
Local Instance			7660723506894	10.241.107.34	Up	IBM Flex System Fabric S...	sys	2015-01-14	BNT Lab	Blade Team	15 days, 7 hour	74:99:75:b3:ca:00

Table 504. MOM Switch Version Report field descriptions

Field	Description
Instance	The SNSC instance in which the switch is discovered
Domain	The Domain name in which the switch is listed in the navigation tree.
Rack	The Rack name (in the navigation tree) in which the switch is contained

Table 504. *MOM Switch Version Report field descriptions (continued)*

Field	Description
Chassis	The Chassis name (in the navigation tree) in which the switch is contained
IP Address	The IP address of the switch.
Health Status	Status showing whether the switch is currently up or down.
System Description	Displays the product name of the switch.
System Name	The administrative-assigned name for the switch.
Location	The physical location of the switch.
Contact	The switch contact for support
Image1 Software Version	The software version of the image stored in the first image storage area.
Image2 Software Version	The software version of the image stored in the second image storage area.
Boot Version	The software version of the switch boot code.
Running Software Version	The version of the software image that is currently running on the system.
Hardware Serial Number	The hardware serial number of the switch.
Image for Next Reset	The firmware to choose for the next switch reset
Config For Next Reset	The configuration to choose for the next switch reset.
Save Pending	Gives information whether any applied changes are not yet saved to FLASH memory on the switch.
Apply Pending	Displays information whether any changes are not yet applied on the switch.
Module Bay	The module bay in which the switch is installed.
Manufacture Date	Date the device was manufactured.
Panic Dump	Displays panic dump status.
Time and Reason for last boot	Displays information about the last reboot cycle. For example, the reason might be power cycle.

Launching System Networking Switch Center

You can launch SNSC for any instance or for any specific device.

To launch SNSC for an instance:

- Right-click an instance in the Instances tree and select **SNSC Launch, OR**

- Select an instance in the Instances tree and click **Tools > SNSC Launch**.

To launch SNSC for a specific device:

1. Navigate to Instance View Window.
2. Select the device for which you wish to launch SNSC.
3. Click **Tools > SNSC Launch**.

Note: When SNSC is launched, it prompts you to login. If SNSC is launched for a specific device, after successful login, the Summary page associated with the selected device is displayed.

Chapter 12. Using the Command Line Interface

SNSC (SNSC) provides a command line interface (CLI), an equivalent to the SNSC UI, which user can invoke on the system where SNSC is installed.

The CLI can be launched a single command or in a CLI shell that allows you to execute multiple commands. Here is an example of how the CLI shell works:

The CLI session is started by issuing the following command: **snscli**
The command results in the following user/password prompts:

```
Enter user-id:  
Enter password:
```

Once the user-id and password combination is validated, the CLI shell comes into existence. For admin user, the prompt will be displayed as `snscli#` and for non-admin users, it will be `snscli>`

You can execute the supported commands such as 'help', which displays the general help listing the supported commands. You can also type-in `<command>` **help**, which results in the help display for that command. This is more or less similar to DOS Commands on Windows CMD shell.

```
snscli# help  
usage:  
device      Displays the device configuration options for SNSC.  
firmware    Provides backup/upgrade options.  
options     Configures the general configurations on SNSC.  
reports     Display the individual reports information.  
stats       Display the statistics for the selected option.  
info        Display the information table for the selected option.  
show        Displays the current configurations on SNSC for the selected  
            option.  
help        Displays the global help information.  
exit        Exits from SNSCLI session.  
  
snscli# exit
```

Launching the CLI Shell

You can launch the CLI shell on the system where SNSC is installed using the following. On a Linux installation, from any shell terminal, issue the following command:

```
/opt/ibm/SNSC/bin/snsccli
```

Note: When the CLI shell is launched, the system prompts you to enter a username and password to gain access.

Using the CLI for Individual Command Execution

The CLI allows you to execute an individual command if you supply all the required information in one statement. When the CLI completes the operation, it sets the exit status to either 0 or other integer value indicating, respectively, the success or the failure of the operation. For example, you can invoke the CLI in the following way:

```
<Path to CLI> -username <user> -password <password> [command]
```

This type of invocation results in executing the CLI command outside the shell and setting the exit status. You can check the exit status using the following steps:

On a Windows installation, execute the following command in the CMD shell:

```
echo %ERROR_LEVEL%
```

On a Linux installation, execute the following shell command:

```
echo $?
```

CLI Command Reference

This entire section provides the usage references for the supported SNSC CLI commands.

Note: If the root user is disabled, all options and firmware commands are accessible only to admin privileged users. In case, if the root user is enabled, the options commands that require the root password for execution are available to all users.

options general

Command Syntax and Usage
options general Displays the usage information.
options general -concurrent_limit [<i><value></i>] Sets the Concurrent Limit with the given value. If the value is not specified, it displays the current setting and prompts you to enter a new value. SNSC UI Equivalent: Options > General Properties
options general -session_timeout [<i><value></i>] Sets the Session Timeout with the given value. If the value is not specified, it displays the current Session Timeout setting and prompts you to enter a new value. SNSC UI Equivalent: Options > General Properties
options general -temp_mode [C|F] Sets the temperature sensor display to show the reading in Celsius (C) or Fahrenheit (F). SNSC UI Equivalent: Options > General Properties
options general -concurrent_limit <i><value></i> -session_timeout <i><value></i> -temp_mode [C|F] Sets the Concurrent Limit, the Session Timeout, and the Temperature Display Mode parameters. SNSC UI Equivalent: Options > General Properties

options refresh

Command Syntax and Usage
options refresh Displays the usage information.
options refresh -time_interval [<i><value></i>] Sets the Refresh Time Interval with the given value. If the value is not specified, it displays the current Refresh Time Interval setting and prompts you to enter a new value. SNSC UI Equivalent: Options > Refresh Configuration

options security

Command Syntax and Usage
options security Displays the usage information.
options security -password [<i>user</i>] Sets the password of the given user. If the user is not specified, the system prompts you to enter the user name. While setting the password, the system prompts you to type-in admin password to complete the operation. SNSC UI Equivalent: Options > Security Configuration
options security mechanism -type [local|radius|tacacs] [-admin_pass | -root_pass <value>] [-pri_srv <value>] [-sec_srv <value>] [-pri_sec <value>] [-sec_sec <value>] [-port <value>] [-auth_level <default|alternate>] [-timeout <value>] [-retries <value>] Sets the authentication mechanism (local, TACACS+ or RADIUS). In case of TACACS+ or RADIUS, it also requires you to specify the values for other parameters such as primary/secondary servers, primary/secondary secrets, and so on. Note: In case of TACACS+ or RADIUS, if other parameters are not supplied in the command input, the system prompts you to specify the following: (i) If root user is enabled, then the system prompts for the root password or else, prompts for admin password. (ii) Primary and Secondary server addresses (iii) Secrets for Primary and Secondary servers (iv) Server port (v) Authorization Level (only for TACACS+) (vi) Timeout to use (vii) Number of retries SNSC UI Equivalent: Options > Authentication Configuration

options purge

Command Syntax and Usage
options purge Displays the usage information.
options purge -days <value> Sets the purge type to “days” and sets the number of days with the given value. SNSC UI Equivalent: Options > DB Data Purge Configuration
options purge -events <value> Sets the purge type to “events” and sets the events count with the given value. SNSC UI Equivalent: Options > DB Data Purge Configuration

options logfile

Command Syntax and Usage
options logfile Displays the usage information.
options logfile -max [<value>] Sets the maximum number of backup files to use while logging. If the value is not specified, it displays the current setting and prompts you to enter a new value. SNSC UI Equivalent: Options > Log File Configuration
options logfile -size [<value>] Sets the maximum size in MB for the log file. If the value is not specified, it displays the current setting and prompts you to enter a new value. SNSC UI Equivalent: Options > Log File Configuration
options logfile -max <value> -size <value> Sets the maximum number of backup files and the maximum size in MB for the log file. SNSC UI Equivalent: Options > Log File Configuration

options data_collection

Command Syntax and Usage
options data_collection Displays the usage information.
options data_collection -health [<i><value></i>] Sets the polling interval for health check service. If the value is not specified, it displays the current setting and prompts you to enter a new value. SNSC UI Equivalent: Options > Data Collection Configuration
options data_collection -perf [<i><value></i>] Sets the polling interval for performance statistics collection. If the value is not specified, it displays the current setting and prompts you to enter a new value. SNSC UI Equivalent: Options > Data Collection Configuration
options data_collection -health <i><value></i> -perf <i><value></i> Sets the polling interval for health check service and performance statistics collection. SNSC UI Equivalent: Options > Data Collection Configuration

options cli_conf

Command Syntax and Usage
options cli_conf Displays the usage information.
options cli_conf -attempts [<i><value></i>] Sets the number of unsuccessful login attempts the CLI session will allow. If the value is not specified, it displays the current setting and prompts for a new value.
options cli_conf -idle [<i><value></i>] Sets the idle session timeout value in minutes. If the value is not specified, it displays the current setting and prompts you to enter a new value.
options cli_conf -attempts <i><value></i> -idle <i><value></i> Sets the number of unsuccessful login attempts and the idle session timeout value in minutes.

options dial_home

Command Syntax and Usage
<p>options dial_home</p> <p>Displays the usage information.</p> <p>Note: This feature might not be available in your software edition. If so, please disregard this information.</p>
<p>options dial_home email_conf</p> <p>[-srv_addr <value>] [-srv_port <value>] [-format {Plain-Text|XML}] [-sender_email <value>] [-recipient_email <value>] [-user <value>] [-pass <value>] [-conn {No|TLS|SSL}] [-test]</p> <p>Configures the email parameters to use for generating email alerts. You can also specify the -test option at the end of the command. The -test option directs the system to first validate whether the parameters are correct. The changes are saved only if the parameters are valid, otherwise an error message is displayed.</p> <p>Note:</p> <p>If other parameters are not supplied, the system prompts you to specify:</p> <ul style="list-style-type: none">(i) Email Server Address, Port, User and Password details, connection type(ii) Format to use while sending the alerts(iii) Sender and Recipient Email Addresses <p>SNSC UI Equivalent: Options > Dial Home > Email Configuration</p>

Command Syntax and Usage

options dial_home trap_conf

[-dev_type <value>]

[-trap_type <value>]

[-ip <value>]

[-descr <value>]

Configures the trap parameters to use for generating email alerts.

Note:

If other parameters are not supplied, the system prompts you to specify:

- (i) Device type
- (ii) Trap type
- (iii) IP addresses
- (iv) Trap Description

SNSC UI Equivalent: Options > Dial Home > Traps Configuration

options dial_home trap_del

[-dev_type <value>]

[-trap_type <value>]

[-ip <value>]

Deletes the configured Dial Home entry for the specified device type and the trap.

Note:

If other parameters are not supplied, the system prompts you to specify:

- (i) Device type
- (ii) Trap type
- (iii) IP addresses

SNSC UI Equivalent: Options > Dial Home > Traps Configuration

options vm

Command Syntax and Usage
options vm Displays the usage information.
options vm -poll_int [<i><value></i>] Allows you to configure the VM polling interval. SNSC UI Equivalent: Options > VM Management Server Connector > Configuration

Command Syntax and Usage

options vm add -type [http|https]

[-port <value>]

[-ip <value>]

[-user <value>]

[-pass <value>]

[-ssl_cert <value>]

[-test]

Allows you to configure the protocol to use by SNSC to communicate with VM Server. You can also specify the `-test` option at the end of the command. The `-test` option directs the system to first validate whether the parameters are correct. The changes are saved only if the parameters are valid, otherwise an error message is displayed.

Note:

If optional parameters are not specified, the system prompts you to specify:

- (i) Protocol to use
- (ii) Port
- (iii) IP Address of the VM Server
- (iv) User name and Password for VM Server
- (v) SSL Certificate

SNSC UI Equivalent:

Options > VM Management Server Connector > Configuration

options vm del -type [http|https]

[-port <value>]

[-ip <value>]

[-user <value>]

Allows you to delete the configured entry used by SNSC to communicate with VM Server.

Note: If optional parameters are not specified, the system prompts you to specify:

- (i) Protocol to use
- (ii) Port
- (iii) IP Address of the VM Server
- (iv) User name and Password for VM Server

SNSC UI Equivalent:

Options > VM Management Server Connector > Configuration

show

Command Syntax and Usage
show Displays the usage information.
show auth_conf Displays the current authentication mechanism and its configuration. SNSC UI Equivalent: Options > Authentication Configuration
show cli_conf Displays the current CLI configuration.
show data_collection_conf Displays the current Data collection settings. SNSC UI Equivalent: Options > Data Collection Configuration
show data_purge_conf Displays the current data purging settings. SNSC UI Equivalent: Options > DB Data Purge Configuration
show dial_home -email Displays the email settings for Dial Home. Note: This feature might not be available in your software edition. If so, please disregard this information. SNSC UI Equivalent: Options > Dial Home > Email Configuration
show dial_home -traps Displays the traps settings for Dial Home. Note: This feature might not be available in your software edition. If so, please disregard this information. SNSC UI Equivalent: Options > Dial Home > Traps Configuration
show general_conf Displays the general settings such as concurrent limit and session timeout. SNSC UI Equivalent: Options > General Properties
show license_info Displays the license information SNSC UI Equivalent: Help > About System Networking Switch Center
show logfile_conf Displays the current log settings SNSC UI Equivalent: Options > Log File Configuration

Command Syntax and Usage
<p>show refresh_conf</p> <p>Displays the current refresh configuration</p> <p>SNSC UI Equivalent: Options > Refresh Configuration</p>
<p>show vm_conf -ssl_cert</p> <p>Displays the SSL certificate file details used in VM Management Server configuration.</p> <p>SNSC UI Equivalent:</p> <p>Options > VM Management Server Connector > Configuration</p>
<p>show vm_conf -vm_server</p> <p>Displays the VM Management Server configuration details.</p> <p>SNSC UI Equivalent:</p> <p>Options > VM Management Server Connector > Configuration</p>

device add

Command Syntax and Usage
device add Displays the usage information.

Command Syntax and Usage

```
device add -ip <IP address>  
[-version {v1|v2c|v3}]  
[-rcomm <value>]  
[-wcomm <value>]  
[-user <SNMPv3 username>]  
[-auth_proto {MD5|SHA1|NONE}]  
[-auth_pass <password>]  
[-priv_proto {DES|AES|NONE}]  
[-priv_pass <password>]  
[-root_pass <password>]
```

Discovers the given device, if supported, in SNSC.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) The SNMP version to use (v1, v2c or v3)
- (ii) If v1 or v2c is selected, the system prompts for:
 - (a) Read community string
 - (b) Write community string
- (iii) If v3 is specified, the system prompts for:
 - (a) SNMPv3 user name
 - (b) Authentication protocol to use
 - (c) Authentication password (only if Authentication protocol is NOT set to NONE)
 - (d) Privacy protocol to use (only if Authentication protocol is NOT set to NONE)
 - (e) Privacy password (only if Privacy protocol is NOT set to NONE).
- (iv) If root user is enabled, then the system prompts for the root password.

SNSC UI Equivalent:

Right-click any Domain and click **Add Device** or

Options > Discovery > Discovery Configuration > Insert

Command Syntax and Usage

```
device add -range <IP address range>
[-version {v1|v2c|v3}]
[-rcomm <value>]
[-wcomm <value>]
[-user <SNMPv3 username>]
[-auth_proto {MD5|SHA1|NONE}]
[-auth_pass <password>]
[-priv_proto {DES|AES|NONE}]
[-priv_pass <password>]
[-root_pass <password>]
```

Discovers devices in the given IP address range. The IP address range should be specified as <Start IP Address>-<End Octet>. For example, the input 192.168.1.1-20 indicates the range from 192.168.1.1 to 192.168.1.20

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) The SNMP version to use (v1, v2c or v3)
- (ii) If v1 or v2c is selected, the system prompts for:
 - (a) Read community string
 - (b) Write community string
- (iii) If v3 is specified, the system prompts for:
 - (a) SNMPv3 user name
 - (b) Authentication protocol to use
 - (c) Authentication password (only if Authentication protocol is NOT set to NONE)
 - (d) Privacy protocol to use (only if Authentication protocol is NOT set to NONE)
 - (e) Privacy password (only if Privacy protocol is NOT set to NONE).
- (iv) If root user is enabled, then the system prompts for the root password.

SNSC UI Equivalent: Options > Discovery > Discovery Configuration > Insert

device delete

Command Syntax and Usage
device delete Displays the usage information.
device delete -ip <i><IP address></i> [-root_pass <i><password></i>] Deletes the given device, if discovered in SNSC. Note: If the root user is enabled and the password parameter is not supplied within the command, then the system prompts for the root password. SNSC UI Equivalent: Device > Actions > Delete Group Operations > Group Actions > Delete
device delete -range <i><IP address range></i> [-root_pass <i><password></i>] Deletes the discovered devices that falls in the given IP address range. The IP address range should be specified as <i><Start IP Address>- <End Octet></i> . For example, the input <i>192 . 168 . 1 . 1 -20</i> indicates the range from 192.168.1.1 to 192.168.1.20 Note: If the root user is enabled and the password parameter is not supplied within the command, then the system prompts for the root password. SNSC UI Equivalent: Although, there is no range based delete in SNSC UI, but this CLI command is more or less similar to selecting multiple devices and deleting them using the following menu: Group Operations > Group Actions > Delete

device import

Command Syntax and Usage
<p>device import Displays the usage information.</p>
<p>device import -file <i><filename></i> [-version {v1|v2c|v3}] [-rcomm <i><value></i>] [-wcomm <i><value></i>] [-user <i><SNMPv3 username></i>] [-auth_proto {MD5|SHA1|NONE}] [-auth_pass <i><password></i>] [-priv_proto {DES|AES|NONE}] [-priv_pass <i><password></i>] [-timeout <i><value></i>] [-retries <i><value></i>] [-root_pass <i><password></i>]</p> <p>Discovers the IP addresses listed in the file provided the given IP address represents a supported device.</p> <p>Note: If not supplied in the command input, the system prompts you to specify the following:</p> <ul style="list-style-type: none">(i) The SNMP version to use (v1, v2c or v3)(ii) If v1 or v2c is selected, the system prompts for:<ul style="list-style-type: none">(a) Read community string(b) Write community string(iii) If v3 is specified, the system prompts for:<ul style="list-style-type: none">(a) SNMPv3 user name(b) Authentication protocol to use(c) Authentication password (only if Authentication protocol is NOT set to NONE)(d) Privacy protocol to use (only if Authentication protocol is NOT set to NONE)(e) Privacy password (only if Privacy protocol is NOT set to NONE).(iv) If root user is enabled, then the system prompts for the root password. <p>SNSC UI Equivalent: Options > Discovery > Import Device List</p>

device export

Command Syntax and Usage
device export Displays the usage information.
device export -file <filename> Exports the discovered devices information to a file. SNSC UI Equivalent: Options > Discovery > Export Device List

reports event

Command Syntax and Usage
reports event Displays the usage information. Note: This feature might not be available in your software edition. If so, please disregard this information.
reports event -snsc <IP address> Displays the SNSC alerts associated with the given IP address.
reports event -snsc all Displays the SNSC alerts associated with all the discovered devices. SNSC UI Equivalent: Reports > SNSC Alerts
reports event -snmp <IP address> Displays the SNMP events received from the given IP address. SNSC UI Equivalent: {Device Console} > Monitor > Summary > View Events
reports event -snmp all Displays the SNMP events received from all the discovered devices. SNSC UI Equivalent: Reports > Event List
reports event -syslog <IP address> Displays the Syslog messages received from the given IP address. SNSC UI Equivalent: {Device Console} > Monitor > Summary > View Syslogs
reports event -syslog all Displays the Syslog messages received from all the discovered devices. SNSC UI Equivalent: Reports > Syslog List

reports svr

Command Syntax and Usage
reports svr Displays the usage information.
reports svr -ip all Displays the switch version report of all the discovered devices SNSC UI Equivalent: Reports > Switch Version Report.
reports svr -ip <IP Address List> Displays the switch version report of those switches specified in the IP Address List in comma separated value (CSV) format. SNSC UI Equivalent: Group Operations > Switch Version Report.

reports vmr

Command Syntax and Usage
reports vmr Displays the usage information.
reports vmr -datacenter Displays the VMs retrieved from the VM Data Center. SNSC UI Equivalent: Reports > VM Data Center Report
reports vmr -group Displays the VM Groups details associated with Virtual Switch Groups. SNSC UI Equivalent: Reports > VMready VM Report > VM Groups
reports vmr -ports Displays the Port Groups details associated with Virtual Switch Groups. SNSC UI Equivalent: Reports > VMready VM Report > Port Groups

stats acl

Command Syntax and Usage
stats acl Displays the usage information.
stats acl -acl_stats [<i><IP address></i>] Displays the ACL statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Access Control List > ACL Statistics
stats acl -port_stats [<i><IP address></i>] Displays the ACL Port statistics of the given switch. Note: If the IP address is not specified, the system prompts you to type-in the IP address. SNSC UI Equivalent: {Device Console} > Monitor > Access Control List > ACL Port Statistics

stats bridge

Command Syntax and Usage
stats bridge Displays the usage information.
stats bridge -forwarding [<i><IP address></i>] Displays the Bridge Forwarding statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > Forwarding Statistics

stats port

Command Syntax and Usage
stats port Displays the usage information.
stats port -8021x [<i><IP address></i>] Displays the Port 802.1x statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > 802.1x Statistics
stats port -authdiag [<i><IP address></i>] Displays the Port Authenticator Diagnostics statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Authenticator Diagnostics Statistics
stats port -bridge [<i><IP address></i>] Displays the Port Bridge statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Bridge Statistics
stats port -ethernet [<i><IP address></i>] Displays the Port Ethernet Error statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Ethernet Error Statistics

Command Syntax and Usage
<p>stats port -interface [<i><IP address></i>]</p> <p>Displays the Port Interface statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Interface Statistics</p>
<p>stats port -ip [<i><IP address></i>]</p> <p>Displays the Port IP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > IP Statistics</p>
<p>stats port -lACP [<i><IP address></i>]</p> <p>Displays the Port LACP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > LACP Statistics</p>

stats routing

Command Syntax and Usage
<p>stats routing Displays the usage information.</p>
<p>stats routing -arp [<i><IP address></i>] Displays the ARP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > ARP Statistics</p>
<p>stats routing -dns [<i><IP address></i>] Displays the DNS statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > DNS Statistics</p>
<p>stats routing -icmp_in [<i><IP address></i>] Displays the ICMP In statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > ICMP In Statistics</p>
<p>stats routing -icmp_out [<i><IP address></i>] Displays the ICMP Out statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > ICMP Out Statistics</p>
<p>stats routing -igmp_snoop [<i><IP address></i>] Displays the IGMP Snooping statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > IGMP Snooping Statistics</p>
<p>stats routing -ip [<i><IP address></i>] Displays the IP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Statistics</p>

Command Syntax and Usage
<p>stats routing -ip_intf [<i><IP address></i>]</p> <p>Displays the IP Interface statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Interface Statistics</p>
<p>stats routing -ospf_area [<i><IP address></i>]</p> <p>Displays the OSPF Area statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Statistics</p>
<p>stats routing -ospf_area_intf [<i><IP address></i>]</p> <p>Displays the OSPF Area Interface statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Interface Statistics</p>
<p>stats routing -ospf_area_intf_rcv_err [<i><IP address></i>]</p> <p>Displays the OSPF Area Interface Receive Error statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Interface Receive Error Statistics</p>
<p>stats routing -ospf_area_rcv_err [<i><IP address></i>]</p> <p>Displays the OSPF Area Receive Error statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Receive Error Statistics</p>
<p>stats routing -ospf_gen [<i><IP address></i>]</p> <p>Displays the OSPF general statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF General Statistics</p>

Command Syntax and Usage
<p>stats routing -ospf_intf_change [<i><IP address></i>]</p> <p>Displays the OSPF Interface Change statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Interface Change Statistics</p>
<p>stats routing -ospf_intf_neigh [<i><IP address></i>]</p> <p>Displays the OSPF Interface Neighbor statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > Interface Neighbor Statistics</p>
<p>stats routing -ospf_intf_trans [<i><IP address></i>]</p> <p>Displays the OSPF Interface Transmission statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Interface Transmission Statistics</p>
<p>stats routing -ospf_neigh [<i><IP address></i>]</p> <p>Displays the OSPF Area Neighbor statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system prompts you to type-in the IP address.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Neighbor Statistics</p>
<p>stats routing -ripv2 [<i><IP address></i>]</p> <p>Displays the RIP v2 statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > RIP V2 Statistics</p>
<p>stats routing -route [<i><IP address></i>]</p> <p>Displays the Routes statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it.</p> <p>SNSC UI Equivalent: {Device Console} > Monitor > Routing > Route Statistics</p>

Command Syntax and Usage

stats routing -tcp [*<IP address>*]

Displays the TCP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > TCP Statistics

stats routing -udp [*<IP address>*]

Displays the UDP statistics of the given switch.

Note: If the IP address is not specified, the system will prompt you for it.

SNSC UI Equivalent: {Device Console} > Monitor > Routing > UDP Statistics

stats switch

Command Syntax and Usage
<p>stats switch Displays the usage information.</p>
<p>stats switch -mpcpu [<i><IP address></i>] Displays the MP CPU statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > MP CPU Statistics</p>
<p>stats switch -ntp [<i><IP address></i>] Displays the NTP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > NTP Statistics</p>
<p>stats switch -packet [<i><IP address></i>] Displays the Packet statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > Packet Statistics</p>
<p>stats switch -snmp [<i><IP address></i>] Displays the SNMP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > SNMP Statistics</p>
<p>stats switch -stp [<i><IP address></i>] Displays the STP statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > STP Statistics</p>
<p>stats switch -ufd [<i><IP address></i>] Displays the UFD statistics of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Switch > UFD Statistics</p>

stats virtual_routing

Command Syntax and Usage
stats virtual_routing Displays the usage information.
stats virtual_routing -virt_stats [<i><IP address></i>] Displays the Virtual Routing statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Virtual Routing > Virtual Routing Statistics

info 8021

Command Syntax and Usage
info 8021 Displays the usage information.
info 8021 -cosq [<i><IP address></i>] Displays the 802.1x Priority COSq information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > 802.1x/p > 802.1x Priority COSq
info 8021 -gen [<i><IP address></i>] Displays the 802.1x general information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > 802.1x/p > 802.1x General
info 8021 -port_priority [<i><IP address></i>] Displays the 802.1x Port Priority information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > 802.1x/p > Port Priority

info bridge

Command Syntax and Usage
info bridge Displays the usage information.
info bridge -base_port [<i><IP address></i>] Displays the Base Port information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > Base Port Information
info bridge -cist_bridge [<i><IP address></i>] Displays the CIST Bridge information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > CIST Bridge Information

Command Syntax and Usage
<p>info bridge -cist_port [<i><IP address></i>]</p> <p>Displays the CIST Port information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > CIST Port Information</p>
<p>info bridge -fdb [<i><IP address></i>]</p> <p>Displays the Forwarding Database information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > Forwarding Database Information</p>
<p>info bridge -stp [<i><IP address></i>]</p> <p>Displays the STP information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Bridge > STP</p>

info hotlinks

Command Syntax and Usage
info hotlinks Displays the usage information.
info hotlinks -hl_stats [<i><IP address></i>] Displays the Hotlinks statistics of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Hotlinks Statistics > Statistics

info port

Command Syntax and Usage
info port Displays the usage information.
info port -lACP_aggr [<i><IP address></i>] Displays the LACP aggregator information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > LACP Aggregator
info port -lACP_port_aggr [<i><IP address></i>] Displays the LACP port aggregator information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > LACP Port Aggregator

info routing

Command Syntax and Usage
info routing Displays the usage information.
info routing -arp [<i><IP address></i>] Displays the ARP information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > ARP

Command Syntax and Usage
<p>info routing -bgp_peers [<i><IP address></i>]</p> <p>Displays the BGP peers summary information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Peers Summary</p>
<p>info routing -bgp_route [<i><IP address></i>]</p> <p>Displays the BGP routing table information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Routing Table</p>
<p>info routing -gateway [<i><IP address></i>]</p> <p>Displays the Gateway information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Gateway Information</p>
<p>info routing -igmp [<i><IP address></i>]</p> <p>Displays the IGMP information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > IGMP Information</p>
<p>info routing -igmp_multicast [<i><IP address></i>]</p> <p>Displays the Multicast Router information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Multicast Router Information</p>
<p>info routing -interface [<i><IP address></i>]</p> <p>Displays the Interface information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Interface Information</p>
<p>info routing -ip_addr [<i><IP address></i>]</p> <p>Displays the IP address information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > IP Address Information</p>

Command Syntax and Usage
<p>info routing -ospf_area [<i><IP address></i>]</p> <p>Displays the OSPF Area information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Area Information</p>
<p>info routing -ospf_ext_lsdb [<i><IP address></i>]</p> <p>Displays the OSPF External Link State information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF External Link State Information</p>
<p>info routing -ospf_intf [<i><IP address></i>]</p> <p>Displays the OSPF interface information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Interface Information</p>
<p>info routing -ospf_lsdb [<i><IP address></i>]</p> <p>Displays the OSPF Link-State DB information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Link-State DB Information</p>
<p>info routing -ospf_neigh_intf [<i><IP address></i>]</p> <p>Displays the OSPF Neighbor interface information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Neighbor Interface Information</p>
<p>info routing -ospf_route [<i><IP address></i>]</p> <p>Displays the OSPF route information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Routes Information</p>
<p>info routing -ospf_stats2 [<i><IP address></i>]</p> <p>Displays the OSPF Stats2 information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Stats2 Information</p>

Command Syntax and Usage
<p>info routing -ospf_summ_range [<i><IP address></i>]</p> <p>Displays the OSPF Summary Range information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Summary Range Information</p>
<p>info routing -ospf_virt_intf [<i><IP address></i>]</p> <p>Displays the OSPF Virtual Interface information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > OSPF Virtual Interface Information</p>
<p>info routing -rip_route [<i><IP address></i>]</p> <p>Displays the RIP Router information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > RIP Route Information</p>
<p>info routing -routes [<i><IP address></i>]</p> <p>Displays the Routes information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Routes</p>
<p>info routing -routes_std [<i><IP address></i>]</p> <p>Displays the Routes standard information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > Routes Standard</p>
<p>info routing -tcp [<i><IP address></i>]</p> <p>Displays the TCP connections information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > TCP Connections</p>
<p>info routing -udp [<i><IP address></i>]</p> <p>Displays the UDP information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Routing > UDP Information</p>

info stack_general

Command Syntax and Usage
<p>info stack_general Displays the stack general usage information.</p>
<p>info stack_general -general [<i><IP address></i>] Displays the stack general information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > General Information</p>
<p>info stack_general -link [<i><IP address></i>] Displays the stack link information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Link Information</p>
<p>info stack_general -push_status [<i><IP address></i>] Displays the stack push status information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Push Status Information</p>
<p>info stack_general -trunk [<i><IP address></i>] Displays the stack trunk information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Trunk Information</p>
<p>info stack_general -path [<i><IP address></i>] Displays the stack path information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Path Information</p>
<p>info stack_general -stack_port_number_mapping [<i><IP address></i>] Displays the stack port number mapping information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Stack Port Number Mapping Information</p>

info stack_switch

Command Syntax and Usage
<p>info stack_switch</p> <p>Displays the stack general usage information.</p>
<p>info stack_switch -master [<i><IP address></i>]</p> <p>Displays the stack master information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > Switch > Master Information</p>
<p>info stack_switch -backup [<i><IP address></i>]</p> <p>Displays the stack backup information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > Switch > Backup Information</p>
<p>info stack_switch -configured_switches [<i><IP address></i>]</p> <p>Displays the configured switches information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > Switch > Configured Switches Information</p>
<p>info stack_switch -attached_switches [<i><IP address></i>]</p> <p>Displays the attached switch information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > Switch > Attached Switches Information</p>
<p>info stack_switch -path [<i><IP address></i>]</p> <p>Displays the stack path information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Path Information</p>
<p>info stack_switch -stack_port_number_mapping [<i><IP address></i>]</p> <p>Displays the stack port number mapping information of the given switch.</p> <p>Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Stack > General > Stack Port Number Mapping Information</p>

info switch

Command Syntax and Usage
info switch Displays the usage information.
info switch -trunk [<i><IP address></i>] Displays the Trunk Group information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Trunk Group Information
info switch -ufd [<i><IP address></i>] Displays the UFD information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > UFD Information

info virtual_routing

Command Syntax and Usage
info virtual_routing Displays the usage information.
info virtual_routing -state [<i><IP address></i>] Displays the Virtual Routing State information of the given switch. Note: If the IP address is not specified, the system will prompt you for it. SNSC UI Equivalent: {Device Console} > Monitor > Port > Virtual Routing State Information

firmware apply

Command Syntax and Usage
firmware apply Displays the usage information.
firmware apply -ip <i><IP address></i> Issues apply on the given switch. SNSC UI Equivalent: Device > Actions > Apply
firmware apply -domain <i><name></i> Issues apply on all switches contained in that domain. The domain refers to the groups/domains created in SNSC UI. SNSC UI Equivalent: Group Operations > Group Actions > Apply
firmware apply -list <i><IP addresses list></i> Issues apply on all switches in the list of IP Addresses, specified in comma separated value (CSV) format. SNSC UI Equivalent: Group Operations > Group Actions > Apply

firmware backup

Command Syntax and Usage
firmware backup Displays the usage information.
firmware backup -ip <IP address> [-host <FTP/SFTP/TFTP Server address>] [-user <FTP username>] [-password <FTP password>] [-image {image1|image2|boot}] [-port {data|mgt|ext}] [-timeout <value>] Transfers (saves) the specified firmware from the switch to the FTP/SFTP/TFTP server. The default image backup file stored on FTP/SFTP/TFTP server is <IP Address>_ddMMMyyy_HHmms. img. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named 192.168.1.1_07Mar2008_235901. img. Note: If not supplied in the command input, the system prompts you to specify the following: (i) The firmware to backup (image1, image2 or boot) (ii) FTP/SFTP/TFTP host address (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server). (iv) Timeout value (if not specified, the default value is used). (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Image Backup

Command Syntax and Usage

```
firmware backup -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-image {image1 | image2 | boot }  
[-port {data | mgt | ext }]  
[-timeout <value>]
```

Transfers (saves) the specified firmware from the switches listed in the domain to the FTP/SFTP/TFTP server. The domain refers to the groups/domains created in SNSC UI.

The default image backup file stored on FTP/SFTP/TFTP server is <IP Address>_ddMMMyyyy_HHmms. img. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named 192.168.1.1_07Mar2008_235901. img.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) The firmware to backup (image1, image2 or boot)
- (ii) FTP/SFTP/TFTP host address
- (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iv) Timeout value (if not specified, the default value is used).
- (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Backup

Command Syntax and Usage

```
firmware backup -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-image {image1|image2|boot}  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Transfers (saves) the specified firmware from the list of switches to the FTP/SFTP/TFTP server.

The default image backup file stored on FTP/SFTP/TFTP server is <IP Address>_ddMMMyyyy_HHmms. img. For example, the image backed up from the switch at IP address 192.168.1.1 on 7th March 2008 at 23:59:01 hours will be named 192.168.1.1_07Mar2008_235901. img.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) The firmware to backup (image1, image2 or boot)
- (ii) FTP/SFTP/TFTP host address
- (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iv) Timeout value (if not specified, the default value is used).
- (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Backup

firmware conf_backup

Command Syntax and Usage
firmware conf_backup Displays the usage information.
firmware conf_backup -ip <IP address> [-host <FTP/SFTP/TFTP Server address>] [-user <FTP username>] [-password <FTP password>] [-port {data|mgt|ext}] [-timeout <value>] Transfers (saves) the switch configuration from the switch to the FTP/SFTP/TFTP server. The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is config_<IPAddress>_ddMMMyyyy_HHmms.txt. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as config_192.168.1.1_07Mar2008_235901.txt. Note: If not supplied in the command input, the system prompts you to specify the following: (i) FTP/SFTP/TFTP host address (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server). (iii) Timeout value (if not specified, the default value is used). (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

Command Syntax and Usage

```
firmware conf_backup -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Transfers (saves) the switch configuration of the switches listed in the domain to the FTP/SFTP/TFTP server. The domain refers to the groups/domains created in SNSC UI.

The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is `config_<IP Address>_ddMMMyyyy_HHmms`.txt. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `config_192.168.1.1_07Mar2008_235901.txt`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

Command Syntax and Usage

```
firmware conf_backup -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Transfers (saves) the switch configuration from the list of switches to the FTP/SFTP/TFTP server.

The configuration file that you backed up is stored on an FTP, TFTP, or SFTP server. The default naming convention of the back-up file is `config_<IPAddress>_ddMMMyyyy_HHmms.txt`. For example, the configuration backed up from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `config_192.168.1.1_07Mar2008_235901.txt`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Backup

firmware conf_upload

Command Syntax and Usage
firmware conf_upload Displays the usage information.
firmware conf_upload -ip <IP address> [-host <FTP/SFTP/TFTP Server address>] [-file_name <name of the config file to upload>] [-user <FTP username>] [-password <FTP password>] [-port {data|mgt|ext}] [-timeout <value>] Uploads the given config file from the specified FTP/SFTP/TFTP server to the given switch. Note: If not supplied in the command input, the system prompts you to specify the following: (i) FTP/SFTP/TFTP host address (ii) The name of the config file to upload (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server). (iv) Timeout value (if not specified, the default value is used). (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

Command Syntax and Usage

```
firmware conf_upload -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-file_name <name of the config file to upload>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Uploads the given config file from the specified FTP/SFTP/TFTP server to the switches listed in the domain. The domain refers to the groups/domains created in SNSC UI.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) The name of the config file to upload
- (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iv) Timeout value (if not specified, the default value is used).
- (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

```
firmware conf_upload -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-file_name <name of the config file to upload>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Uploads the given config file from the specified FTP/SFTP/TFTP server to the listed switches.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) The name of the config file to upload
- (iii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iv) Timeout value (if not specified, the default value is used).
- (v) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Configuration Upgrade

firmware config_dump

Command Syntax and Usage
firmware config_dump Displays the usage information.
firmware config_dump -ip <IP address> Dumps the current configuration of the given switch on to the screen. SNSC UI Equivalent: Device > Actions > Config Dump

firmware diff_config

Command Syntax and Usage
firmware diff_config Displays the usage information.
firmware diff_config -ip <IP address> Displays the pending configuration information on the given switch. SNSC UI Equivalent: Device > Actions > Diff Config

firmware diff_flash

Command Syntax and Usage
firmware diff_flash Displays the usage information.
firmware diff_flash -ip <IP address> Displays the unsaved configuration information on the given switch. SNSC UI Equivalent: Device > Actions > Diff Flash

firmware panicdump

Command Syntax and Usage
firmware panic_dump Displays the usage information.
firmware panic_dump -ip <IP address> [-host <FTP/SFTP/TFTP Server address>] [-user <FTP username>] [-password <FTP password>] [-port {data|mgt|ext}] [-timeout <value>] Downloads the panic dump, if any, from the given switch and saves it on the specified FTP/SFTP/TFTP server. The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is panicdump_<IPAddress>_ddMMMyyyy_HHmms. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as panicdump_192.168.1.1_07Mar2008_235901. Note: If not supplied in the command input, the system prompts you to specify the following: (i) FTP/SFTP/TFTP host address (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server). (iii) Timeout value (if not specified, the default value is used). (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

Command Syntax and Usage

```
firmware panic_dump -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Downloads the panic dump, if any, from all the switches listed in the domain and saves them on the specified FTP/SFTP/TFTP server. The domain refers to the groups/domains created in SNSC UI.

The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `panicdump_<IP Address>_ddMMMyyyy_HHmms`. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `panicdump_192.168.1.1_07Mar2008_235901`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

Command Syntax and Usage

```
firmware panic_dump -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Downloads the panic dump, if any, from given list of switches and saves them on the specified FTP/SFTP/TFTP server.

The panic dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `panicdump_<IPAddress>_ddMMMyyyy_HHmms`. For example, the panic dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `panicdump_192.168.1.1_07Mar2008_235901`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Panic Dump

firmware reset

Command Syntax and Usage
firmware reset Displays the usage information.
firmware reset -ip <i><IP address></i> [- timeout <i><value></i>] Resets (reboots) the specified switch. Note: If timeout is not specified, the CLI prompts you to specify the timeout or use the default. SNSC UI Equivalent: Device > Actions > Reboot Switch
firmware reset -domain <i><name></i> [- timeout <i><value></i>] Resets (reboots) all the switches that are listed in the domain. The domain refers to the groups/domains created in SNSC UI. Note: If timeout is not specified, the CLI prompts you to specify the timeout or use the default. SNSC UI Equivalent: Group Operations > Group Actions > Reboot Switch
firmware reset -list <i><IP addresses as comma separate values></i> [- timeout <i><value></i>] Resets (reboots) the given list of switches. Note: If timeout is not specified, the CLI prompts you to specify the timeout or use the default. SNSC UI Equivalent: Group Operations > Group Actions > Reboot Switch

firmware save

Command Syntax and Usage
firmware save Displays the usage information.
firmware save -ip <i><IP address></i> Saves the current configuration changes to the Flash memory on the given switch. SNSC UI Equivalent: Device > Actions > Save

Command Syntax and Usage

firmware save -domain *<name>*

Saves the current configuration changes to the Flash memory on all the switches listed in the specified domain. The domain refers to the groups/domains created in SNSC UI.

SNSC UI Equivalent: Group Operations > Group Actions > Save

firmware save -list *<IP addresses as comma separate values>*

Saves the current configuration changes to the Flash memory on the given list of switches.

SNSC UI Equivalent: Group Operations > Group Actions > Save

firmware tsdump

Command Syntax and Usage
firmware tsdump Displays the usage information.
firmware tsdump -ip <i><IP address></i> [-host <i><FTP/SFTP/TFTP Server address></i>] [-user <i><FTP username></i>] [-password <i><FTP password></i>] [-port {data|mgt|ext}] [-timeout <i><value></i>] Generates the tech support dump on the given switch and saves it on the specified FTP/SFTP/TFTP server. The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is <code>tsdump_<IP Address>_ddMMMyyyy_HHmms</code> . For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as <code>tsdump_192.168.1.1_07Mar2008_235901</code> . Note: If not supplied in the command input, the system prompts you to specify the following: <ul style="list-style-type: none">(i) FTP/SFTP/TFTP host address(ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).(iii) Timeout value (if not specified, the default value is used).(iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

Command Syntax and Usage

```
firmware tsdump -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Generates the tech support dump on all the switches listed in the domain and saves them on the specified FTP/SFTP/TFTP server. The domain refers to the groups/domains created in SNSC UI.

The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `tsdump_<IPAddress>_ddMMMyyyy_HHmms`. For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `tsdump_192.168.1.1_07Mar2008_235901`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

Command Syntax and Usage

```
firmware tsdump -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Generates the tech support dump on the listed switches and saves them on the specified FTP/SFTP/TFTP server.

The tech support dump for the selected switch or switches is stored on the selected FTP, TFTP, or SFTP server. The default filename convention is `tsdump_<IP Address>_ddMMMyyy_HHmms`. For example, the tech support dump downloaded from the switch at 192.168.1.1 on 7th March 2008 at 23:59:01 hours is stored as `tsdump_192.168.1.1_07Mar2008_235901`.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) FTP/SFTP/TFTP host address
- (ii) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (iii) Timeout value (if not specified, the default value is used).
- (iv) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Tech Support Dump

firmware upload

Command Syntax and Usage
firmware upload Displays the usage information.
firmware upload -ip <IP address> [-host <FTP/SFTP/TFTP Server address>] [-file_name <firmware file to upload>] [-user <FTP username>] [-password <FTP password>] [-port {data|mgt|ext}] [-timeout <value>] Uploads the firmware from the specified FTP/SFTP/TFTP server to the given switch. Note: If not supplied in the command input, the system prompts you to specify the following: (i) Switch software image slot to use (image1, image2 or boot) (ii) FTP/SFTP/TFTP host address (iii) The firmware file to upload (iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server). (v) Timeout value (if not specified, the default value is used). (vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it). SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

Command Syntax and Usage

```
firmware upload -domain <name>  
[-host <FTP/SFTP/TFTP Server address>]  
[-file_name <firmware file to upload>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Uploads the firmware from the specified FTP/SFTP/TFTP server to the switches listed in the domain. The domain refers to the groups/domains created in SNSC UI.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) Switch software image slot to use (image1, image2 or boot)
- (ii) FTP/SFTP/TFTP host address
- (iii) The firmware file to upload
- (iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (v) Timeout value (if not specified, the default value is used).
- (vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

```
firmware upload -list <IP addresses as comma separate values>  
[-host <FTP/SFTP/TFTP Server address>]  
[-file_name <firmware file to upload>]  
[-user <FTP username>]  
[-password <FTP password>]  
[-port {data|mgt|ext}]  
[-timeout <value>]
```

Uploads the firmware from the specified FTP/SFTP/TFTP server to the listed switches.

Note: If not supplied in the command input, the system prompts you to specify the following:

- (i) Switch software image slot to use (image1, image2 or boot)
- (ii) FTP/SFTP/TFTP host address
- (iii) The firmware file to upload
- (iv) User Name and Password in case of FTP server (user can choose to press Enter without a value to indicate TFTP server).
- (v) Timeout value (if not specified, the default value is used).
- (vi) Port to use on the switch (this is an optional and is prompted only if the given switch supports it).

SNSC UI Equivalent: Group Operations > Deployment > Image Upgrade

data backup

Command Syntax and Usage
<p>maint databackup -path <directory></p> <p>Backs up SNSC's critical data in the given directory.</p> <p>SNSC uses the standard ZIP format to compress the contents in backup file. The backup file is named as follows: SNSC_<version>_<date>_<time>.zip</p> <p>Where:</p> <p><version> is the SNSC version in a.b.c.d format, <date> is the date on the SNSC server system in yyyymmdd format, on which the backup operation was initiated <time> is the time on the SNSC server system in HHMMSS format, at which the backup operation was initiated.</p> <p>For example, if the backup operation is initiated in SNSC 5.2.1.0 on 23rd July 2010 at 14:01:43 hrs, the backup file is named as follows: SNSC_5.2.1.0_20100723_140143.zip</p> <p>SNSC UI Equivalent: Maintenance > Data Backup > Take Data Backup</p>

support dump

Command Syntax and Usage
<p>maint supportdump [-include_db] -path <directory></p> <p>Saves the SNSC's support dump in the given repository. If - include_db is specified, the database will also get included in the support dump.</p> <p>The support dump file is named as follows: SNSC_SupportDump_<version>_<date>_<time>.zip</p> <p>Where:</p> <p><version> is the SNSC version in a.b.c.d format, <date> is the date on the SNSC server system in yyyymmdd format, on which the backup operation was initiated. <time> is the time on the SNSC server system in HHMMSS format, at which the backup operation was initiated.</p> <p>For example, if the support dump is initiated in SNSC 5.2.1.0 on 23rd July 2010 at 14:01:43 hrs, the support dump file is named as follows: SNSC_SupportDump_5.2.1.0_20100723_140143.zip</p> <p>SNSC UI Equivalent: Maintenance > Data Backup > SNSC Support Dump</p>

Appendix A. Externally Launching Switch Center

System Networking Switch Center (SNSC) can be launched from an external application using a specialized URL, which allows you to specify additional parameters such as device IP address and a specific page of Switch Center.

The specialized URL is in the following form:

- **HTTP**

`http://<SNSC system>:40080/snsc/jsp/Launch.jsp?ipaddress=<address>&sysname=<string>&pageid=<id>`

- **HTTPS**

`https://<SNSC system>:40443/snsc/jsp/Launch.jsp?ipaddress=<address>&sysname=<string>&pageid=<id>`

where

ipaddress	The IP address of the switch that is discovered in SNSC, and for which you want to launch the Device Console page.
sysname	The sysName of the device. This parameter enables SNSC to search for the discovered device matching the sysName, if for example, a search based on the IP address fails.
pageid	Enables you to specify which page SNSC should open when it launches for the specified device.

Note: The additional parameters namely `ipaddress`, `sysname`, and `pageid` are optional. If not specified, Switch Center opens the Summary Page.

List of Page IDs

The following table lists the pageid used for various Monitoring and Configuration pages of Switch Center:

Tab Reference	Page ID
Monitor > Summary > Health Status	mon_sum_hs
Monitor > Summary > Information	mon_sum_inf
Monitor > Summary > Port Status	mon_sum_pstat
Monitor > Summary > Port Summary	mon_sum_psum
Monitor > Summary > Events	mon_sum_ev
Monitor > Summary > Syslog	mon_sum_syslog
Monitor > Switch > Information	mon_sw_inf
Monitor > Switch > SNMP Statistics	mon_sw_snmp
Monitor > Switch > Packet Statistics	mon_sw_pkt
Monitor > Switch > STP Statistics	mon_sw_stpstat
Monitor > Switch > MP CPU Statistics	mon_sw_mpcpustat
Monitor > Switch > UFD Statistics	mon_sw_ufdstat
Monitor > Switch > UFD information	mon_sw_ufdinfo
Monitor > Switch > NTP Statistics	mon_sw_ntpstat
Monitor > Switch > Trunk Groups	mon_sw_trnkgrps
Monitor > Switch > Trunk Group Ports	mon_sw_trnkgrppts
Monitor > Switch > TACACS Authentication Statistics	mon_sw_tac_auth_stat
Monitor > Ports > Summary	mon_prt_sum
Monitor > Ports > Interface Statistics	mon_prt_ifstat
Monitor > Ports > 802.1x Statistics	mon_prt_8021x
Monitor > Ports > LACP Statistics	mon_prt_lacpstat
Monitor > Ports > LACP Aggregator	mon_prt_lacpagrtor
Monitor > Ports > LACP Port Aggregator	mon_prt_lacpprtagrtor
Monitor > Ports > Bridge Statistics	mon_prt_brdgstat
Monitor > Ports > Ethernet Error Statistics	mon_prt_etherstat
Monitor > Ports > Transceiver Info	mon_prt_transinfo
Monitor > Ports > IP Statistics	mon_prt_ipstat

Tab Reference	Page ID
Monitor > Ports > Authenticator Diagnostics Statistics	mon_prt_authdiagstat
Monitor > Layer 2 > Bridge > Forwarding Statistics	mon_brdg_fwdstat
Monitor > Layer 2 > Bridge > Forwarding Database Information	mon_brdg_fwddbinfo
Monitor > Layer 2 > Bridge > Base Port Information	mon_brdg_bprtinfo
Monitor > Layer 2 > Bridge > CIST Bridge Information	mon_brdg_cistbrdginfo
Monitor > Layer 2 > Bridge > CIST Port Information	mon_brdg_cistprtinfo
Monitor > Layer 2 > Bridge > STP	mon_brdg_stp
Monitor > Layer 2 > LLDP > LLDP Port Info	mon_lldp_portinfo
Monitor > Layer 2 > Failover > General	mon_failovr_gen
Monitor > Layer 2 > Failover > Trigger Information	mon_failovr_trgrinfo
Monitor > Layer 2 > Failover > Monitor Port Status	mon_failovr_monprtstat
Monitor > Layer 2 > Failover > Control Port Status	mon_failovr_ctrlprt
Monitor > Layer 2 > Hot Links > Summary	mon_hotlnk_sum
Monitor > Layer 2 > Hot Links > Statistics	mon_hotlnk_stat
Monitor > Layer 2 > Hot Links > Info	mon_hotlnk_info
Monitor > Layer 2 > 802.1x/p > 802.1x/p General	mon_802_gen
Monitor > Layer 2 > 802.1x/p > 802.1x/p Priority COSq	mon_802_pricosq
Monitor > Layer 2 > 802.1x/p > Port Priority	mon_802_pprior
Monitor > Layer 3 > IP > IP Interface Statistics	mon_ip_ipifstat
Monitor > Layer 3 > IP > Interface Information	mon_ip_ifinfo
Monitor > Layer 3 > IP > TCP Statistics	mon_ip_tcpstat
Monitor > Layer 3 > IP > TCP Connections	mon_ip_tcpcon
Monitor > Layer 3 > IP > UDP Statistics	mon_ip_udpstat
Monitor > Layer 3 > IP > UDP Information	mon_ip_udpinfo
Monitor > Layer 3 > IP > IP Statistics	mon_ip_ipstat

Tab Reference	Page ID
Monitor > Layer 3 > IP > ICMP In Statistics	mon_ip_icmpinstat
Monitor > Layer 3 > IP > ICMP Out Statistics	mon_ip_icmpoutstat
Monitor > Layer 3 > IP > DNS Statistics	mon_ip_dnsstat
Monitor > Layer 3 > IP > Routes	mon_ip_routes
Monitor > Layer 3 > IP > Routes Standard	mon_ip_routesstd
Monitor > Layer 3 > IP > Route Statistics	mon_ip_routesstat
Monitor > Layer 3 > IP > ARP	mon_ip_arp
Monitor > Layer 3 > IP > ARP Statistics	mon_ip_arpstat
Monitor > Layer 3 > IP > Gateway Information	mon_ip_gtwinfo
Monitor > Layer 3 > IP > IP Address Information	mon_ip_ipaddinfo
Monitor > Layer 3 > BGP > Peers Summary	mon_bgp_peersum
Monitor > Layer 3 > BGP > Routing Table	mon_bgp_routtable
Monitor > Layer 3 > RIP > RIP V2 Statistics	mon_rip_ripstat
Monitor > Layer 3 > RIP > RIP Route Information	mon_rip_riprouinfo
Monitor > Layer 3 > OSPF > General OSPF Statistics	mon_ospf_genospfstat
Monitor > Layer 3 > OSPF > OSPF Area Statistics	mon_ospf_areastat
Monitor > Layer 3 > OSPF > OSPF Area Neighbor Statistics	mon_ospf_areaneighstat
Monitor > Layer 3 > OSPF > OSPF Area Interface Statistics	mon_ospf_areaifstat
Monitor > Layer 3 > OSPF > OSPF Area Receive Error Statistics	mon_ospf_arearecverrstat
Monitor > Layer 3 > OSPF > OSPF Area Interface Receive Error Statistics	mon_ospf_areaifrecvrrstat
Monitor > Layer 3 > OSPF > OSPF Interface Change Statistics	mon_ospf_ifchngstat
Monitor > Layer 3 > OSPF > OSPF Interface Transmission Statistics	mon_ospf_iftransstat
Monitor > Layer 3 > OSPF > OSPF Interface Neighbor Statistics	mon_ospf_ifneighstat
Monitor > Layer 3 > OSPF > OSPF Area Information	mon_ospf_areainfo

Tab Reference	Page ID
Monitor > Layer 3 > OSPF > OSPF Interface Information	mon_ospf_ifinfo
Monitor > Layer 3 > OSPF > OSPF Neighbor Interface Information	mon_ospf_neighifinfo
Monitor > Layer 3 > OSPF > OSPF Virtual Interface Information	mon_ospf_virtifinfo
Monitor > Layer 3 > OSPF > OSPF Stats2 Information	mon_ospf_stat2finfo
Monitor > Layer 3 > OSPF > OSPF Link-State DB Information	mon_ospf_lnkdbinfo
Monitor > Layer 3 > OSPF > OSPF External Link-State DB Information	mon_ospf_extlnkdbinfo
Monitor > Layer 3 > OSPF > OSPF Summary Range Information	mon_ospf_sumrnginfo
Monitor > Layer 3 > OSPF > OSPF Routes Information	mon_ospf_routesinfo
Monitor > Layer 3 > IGMP > IGMP Information	mon_igmp_info
Monitor > Layer 3 > IGMP > Multicast Router Information	mon_igmp_multirouteinfo
Monitor > Layer 3 > IGMP > IGMP Snooping Statistics	mon_igmp_snoopstat
Monitor > Layer 3 > Virtual Routing > Virtual Routing	mon_vr_virtrouting
Monitor > Layer 3 > Virtual Routing > Virtual Routing State	mon_vr_virtroutingstate
Monitor > Access Control List > ACL Statistics	mon_acl_aclstat
Monitor > Access Control List > MAC ACL Statistics	mon_acl_macaclstat
Monitor > Access Control List > IP ACL Statistics	mon_acl_ipaclstat
Monitor > FCoE > FIP Snooping Information	mon_fcoe_fipsnoopinfo
Monitor > FCoE > FIP Snooping Statistics	mon_fcoe_fipsnoopstat
Monitor > Virtualization > VMReady Port Info	mon_virt_vmreadyportinfo
Monitor > Virtualization > VMReady VM Info	mon_virt_vmreadyvminfo
Monitor > EVB > VDP TLV Info	mon_evb_vdptlvinfo
Monitor > EVB > VSI Information	mon_evb_vsiinfo

Tab Reference	Page ID
Monitor > EVB > ECP Channel Info	mon_evb_ecbchannelinfo
Monitor > EVB > EVB Local Info	mon_evb_evblocalinfo
Monitor > EVB > EVB Remote Info	mon_evb_evbremoteinfo
Monitor > EVB > VM Info	mon_evb_vminfo
Monitor > EVB > VSI DB Info	mon_evb_vsldbinfo
Monitor > EVB > VSI DB ACL Info	mon_evb_vsldbacinfo
Monitor > iSwitch > Port Information	mon_iswitch_portinfo
Monitor > iSwitch > Host Uplink Information	mon_iswitch_hostuplink_info
Configure > Switch > General	cfg_sw_gen
Configure > Switch > Firmware	cfg_sw_fw
Configure > Switch > Syslog Hosts	cfg_sw_syshost
Configure > Switch > Trap Settings	cfg_sw_trapsettings
Configure > Switch > RADIUS Server	cfg_sw_radserv
Configure > Switch > RADIUS General	cfg_sw_radgen
Configure > Switch > TACACS Server	cfg_sw_tacacserv
Configure > Switch > TACACS - User Map	cfg_sw_tacacusrmap
Configure > Switch > TACACS General	cfg_sw_tacacsgen
Configure > Switch > TACACS Command Auth	cfg_sw_tacacscmdauth
Configure > Switch > NTP Service	cfg_sw_ntpservc
Configure > Switch > Management Network	cfg_sw_mgmtntwrk
Configure > Switch > Port Mirroring	cfg_sw_portmirr
Configure > Switch > System Trap Settings	cfg_sw_systrapsettings
Configure > Config/Image/Dump Control > Config/Image/Dump Control	cfg_cfgimgdumpctrl
Configure > Access User > Access User	cfg_accessuser
Configure > Layer 2 > General > General	cfg_l2_general
Configure > Layer 2 > Trunk > Trunk Hash	cfg_l2_trnk_hash
Configure > Layer 2 > Trunk > Trunk Groups	cfg_l2_trnk_grps
Configure > Layer 2 > LACP > LACP General	cfg_l2_lacp_gen
Configure > Layer 2 > LACP > LACP Ports	cfg_l2_lacp_ports
Configure > Layer 2 > 802.1x > General	cfg_l2_8021x_gen

Tab Reference	Page ID
Configure > Layer 2 > 802.1x > Global	cfg_l2_8021x_global
Configure > Layer 2 > 802.1x > Guest VLAN	cfg_l2_8021x_guestvlan
Configure > Layer 2 > 802.1x > Ports	cfg_l2_8021x_ports
Configure > Layer 2 > MSTP/RSTP > MSTP	cfg_l2_mstprstp_mstp
Configure > Layer 2 > CIST > CIST Bridge	cfg_l2_cist_bridge
Configure > Layer 2 > CIST > CIST Port	cfg_l2_cist_ports
Configure > Layer 2 > Spanning Tree Protocol > STP Groups	cfg_l2_stp_grps
Configure > Layer 2 > Spanning Tree Protocol > STP Port	cfg_l2_stp_ports
Configure > Layer 2 > Spanning Tree Protocol > Spanning Tree	cfg_l2_stp_tree
Configure > Layer 2 > Forwarding Database > FDB General	cfg_l2_fdb_gen
Configure > Layer 2 > Forwarding Database > FDB Static	cfg_l2_fdb_static
Configure > Layer 2 > Forwarding Database > Static Multicast	cfg_l2_fdb_mcast
Configure > Layer 2 > VLAG > General	cfg_l2_vlag_gen
Configure > Layer 2 > VLAG > Trunk	cfg_l2_vlag_trunk
Configure > Layer 2 > VLAG > LACP	cfg_l2_vlag_lacp
Configure > Layer 2 > VLAG > ISL	cfg_l2_vlag_isl
Configure > Layer 2 > Hot Links > General Configuration	cfg_l2_hl_gencfg
Configure > Layer 2 > Hot Links > Triggers	cfg_l2_hl_triggers
Configure > Layer 2 > Virtual LANs > VLAN Memberships	cfg_l2_virtlans_vlanmem
Configure > Layer 2 > Virtual LANs > VMAP for Non Server Ports	cfg_l2_virtlans_vmap_nsrports
Configure > Layer 2 > Virtual LANs > VMAP for Server Ports	cfg_l2_virtlans_vmap_srports
Configure > Layer 2 > Virtual LANs > VMAP for All Ports	cfg_l2_virtlans_vmapallports
Configure > Layer 2 > Virtual LANs > Private Vlan	cfg_l2_virtlans_privlan

Tab Reference	Page ID
Configure > Layer 2 > Virtual LANs > Protocol Vlan	cfg_l2_virtlans_protovlan
Configure > Layer 2 > LLDP > General	cfg_l2_lldp_gen
Configure > Layer 2 > LLDP > LLDP Port	cfg_l2_lldp_ports
Configure > Layer 2 > AMP > General	cfg_l2_amp_gen
Configure > Layer 2 > AMP > Group	cfg_l2_amp_group
Configure > Layer 3 > IP > Interfaces	cfg_l3_if
Configure > Layer 3 > IP > Forwarding	cfg_l3_ip_fwd
Configure > Layer 3 > IP > Network Filters	cfg_l3_ip_nwf
Configure > Layer 3 > IP > Loopback Interfaces	cfg_l3_ip_loopbackif
Configure > Layer 3 > IP > Static ARP	cfg_l3_ip_statarp
Configure > Layer 3 > Gateways > Gateways	cfg_l3_gw
Configure > Layer 3 > ARP > ARP	cfg_l3_arp
Configure > Layer 3 > OSPF > General	cfg_l3_ospf_gen
Configure > Layer 3 > OSPF > Areas	cfg_l3_ospf_area
Configure > Layer 3 > OSPF > Interfaces	cfg_l3_ospf_if
Configure > Layer 3 > OSPF > Summary Ranges	cfg_l3_ospf_sumrange
Configure > Layer 3 > OSPF > Virtual Interfaces	cfg_l3_ospf_virtif
Configure > Layer 3 > OSPF > Host Table	cfg_l3_ospf_hosttab
Configure > Layer 3 > OSPF > MD5 Key	cfg_l3_ospf_md5key
Configure > Layer 3 > OSPF > Loopback Interface	cfg_l3_ospf_loopbackif
Configure > Layer 3 > OSPF > Static Routes	cfg_l3_ospf_staticroute
Configure > Layer 3 > OSPF > Fixed Routes	cfg_l3_ospf_fixedroute
Configure > Layer 3 > OSPF > RIP	cfg_l3_ospf_rip
Configure > Layer 3 > OSPF > BGP External Route Redistribute	cfg_l3_ospf_bgpext
Configure > Layer 3 > OSPF > BGP Internal Route Redistribute	cfg_l3_ospf_bgpint
Configure > Layer 3 > VRRP > General	cfg_l3_vrrp_gen
Configure > Layer 3 > VRRP > Virtual Router	cfg_l3_vrrp_virtrouter
Configure > Layer 3 > VRRP > Virtual Interface	cfg_l3_vrrp_virtif

Tab Reference	Page ID
Configure > Layer 3 > VRRP > Virtual Router Group	cfg_l3_vrrp_virtroutegrp
Configure > Layer 3 > DHCP > Snooping	cfg_l3_dhcp_snooping
Configure > Layer 3 > DHCP > Snooping VLAN	cfg_l3_dhcp_snoopingvlan
Configure > Layer 3 > Flooding > Flooding	cfg_l3_flooding
Configure > Ports > Ports	cfg_ports
Configure > Ports > Ports General	cfg_ports_gen
Configure > Ports > Threshold Rate	cfg_ports_threshold
Configure > Ports > Gigabit Link	cfg_ports_gigabitlink
Configure > Ports > UDLD	cfg_ports_udld
Configure > Ports > OAM	cfg_ports_oam
Configure > Ports > ACL/QOS	cfg_ports_aclqos
Configure > Ports > STP	cfg_ports_stp
Configure > Ports > Port Priority	cfg_ports_priority
Configure > Ports > DHCP Snooping	cfg_ports_dhcpsnooping
Configure > Access Control List > ACL	cfg_acl
Configure > Access Control List > ACL Groups	cfg_acl_aclgrps
Configure > Access Control List > VMAP	cfg_acl_vmap
Configure > Access Control List > Log	cfg_acl_log
Configure > Access Control List > MAC ACL	cfg_acl_mac
Configure > Access Control List > IP ACL	cfg_acl_ip
Configure > CEE > General	cfg_cee_gen
Configure > CEE > Priority Allocation	cfg_cee_prioalloc
Configure > CEE > Bandwidth Allocation	cfg_cee_bwallocc
Configure > CEE > PFC	cfg_cee_pfc
Configure > CEE > PFC Status	cfg_cee_pfcstatus
Configure > CEE > Port PFC	cfg_cee_portpfc
Configure > CEE > Port PFC Status	cfg_cee_portpfcstatus
Configure > CEE > DCBX	cfg_cee_dcbx
Configure > FCoE > FIP Snooping	cfg_fcoe_fipsnoop
Configure > FCoE > FIP Snooping Port	cfg_fcoe_fipsnoopport

Tab Reference	Page ID
Configure > Virtualization > VMready > General	cfg_virt_vmready_gen
Configure > Virtualization > VMready > VMware vCenter Access	cfg_virt_vmready_vmvcnt raccess
Configure > Virtualization > VMready > Profiles	cfg_virt_vmready_profiles
Configure > Virtualization > VMready > Groups	cfg_virt_vmready_grps
Configure > Virtualization > VMready > Bandwidth	cfg_virt_vmready_bw
Configure > Virtualization > VMready > Ports	cfg_virt_vmready_ports
Configure > Virtualization > VMready > Virtual Machines	cfg_virt_vmready_virtma chine
Configure > Virtualization > VMready > Advanced Pre-Provisioning	cfg_virt_vmready_advpre provision
Configure > vNIC > General	cfg_vnic_gen
Configure > vNIC > vNICs	cfg_vnic_vnics
Configure > vNIC > vNICs Groups	cfg_vnic_vnicsgrps
Configure > EVB > General	cfg_evb_gen
Configure > EVB > Profiles	cfg_evb_prof
Configure > EVB > VSI DB Host	cfg_evb_vsldbhost
Configure > iSwitch > vCenter	cfg_iswitch_vcenter
Configure > iSwitch > Virtual Data Station	cfg_iswitch_vds
Virtualization Tools > VSI DB Console	vsi_manager

Appendix B. Integrating with Tivoli Network Manager

System Networking Switch Center (SNSC) can be integrated with IBM Tivoli Network Manager (ITNM) IP Edition 3.9 and above so that it can be launched from Tivoli Integrated Portal (TIP) GUI. SNSC supports Launch-In-Context (LIC) and Single Sign-On (SSO) based launch from Tivoli Network Manager. This section describes various steps involved in configuring both SNSC and Tivoli Network Manager for enabling LIC and SSO of SNSC from Tivoli Network Manager.

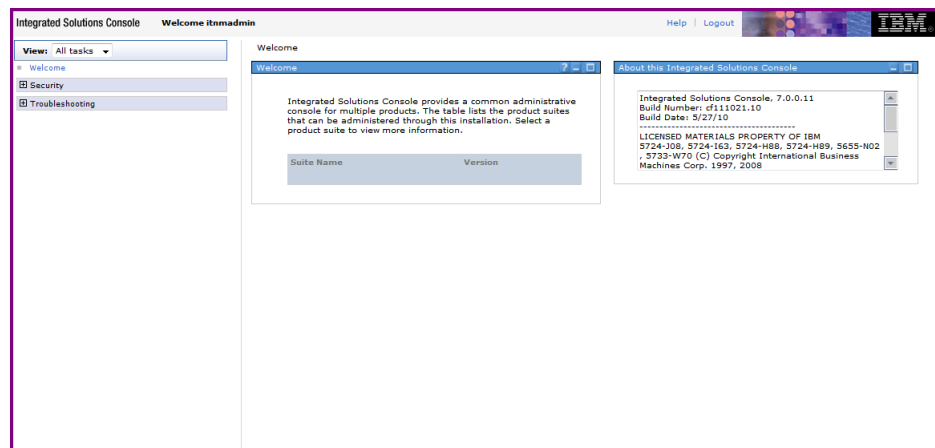
Requirements

- Tivoli Network Manager 3.9 or above installed
- SNSC 6.1
- Tivoli Network Manager has discovered at least one switch.

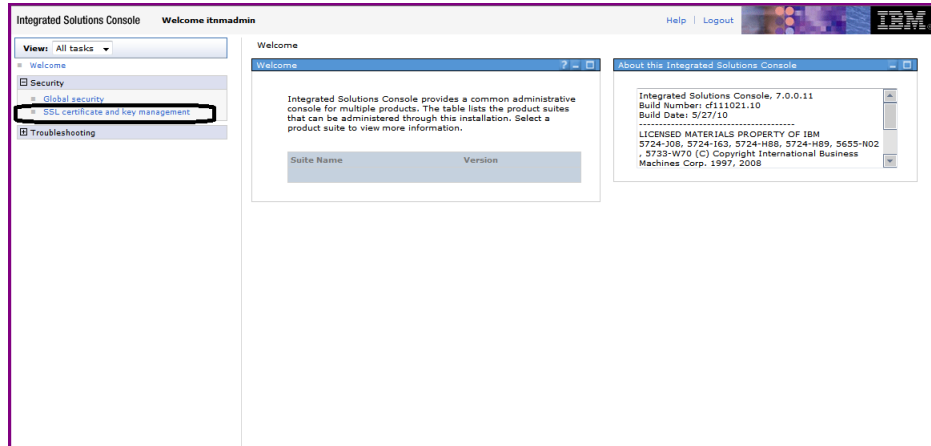
Step 1: Generate Signer Certificate

SNSC needs Tivoli Network Manager Signer Certificate for creating the key store. This key store is required for single sign-on. The following steps describe signer certificate generation:

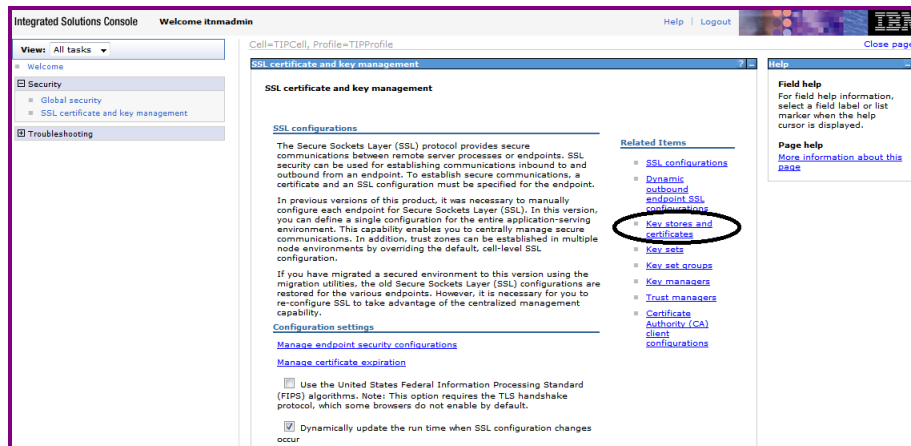
1. Launch Tivoli Network Manager's WebSphere console:
 - a. You can directly launch WebSphere Console (Integrated Solutions Console) using the following URL:
`https://<Tivoli Network Manager IP Address>:16316/ibm/console/login.jsp`
 - b. Alternatively, launch Tivoli Network Manager TIP (`https://<Tivoli Network Manager IP Address>:16311/ibm/console`) and then select **Settings > WebSphere Administrative Console**.



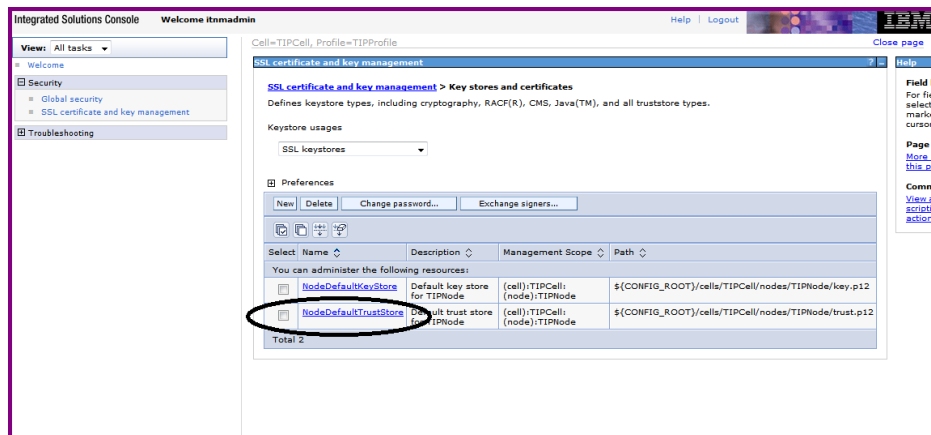
2. On the left pane, select **Security > SSL certificate and key management**.



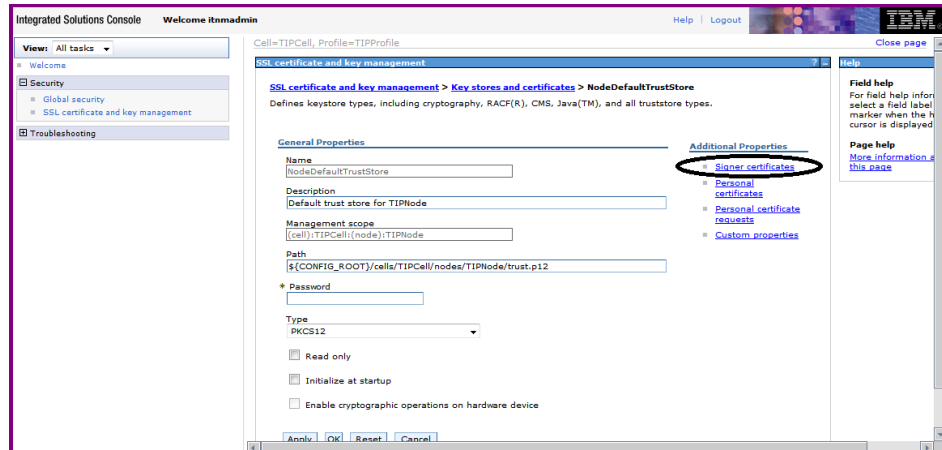
3. Under Related Items, click **Key stores and certificates**.



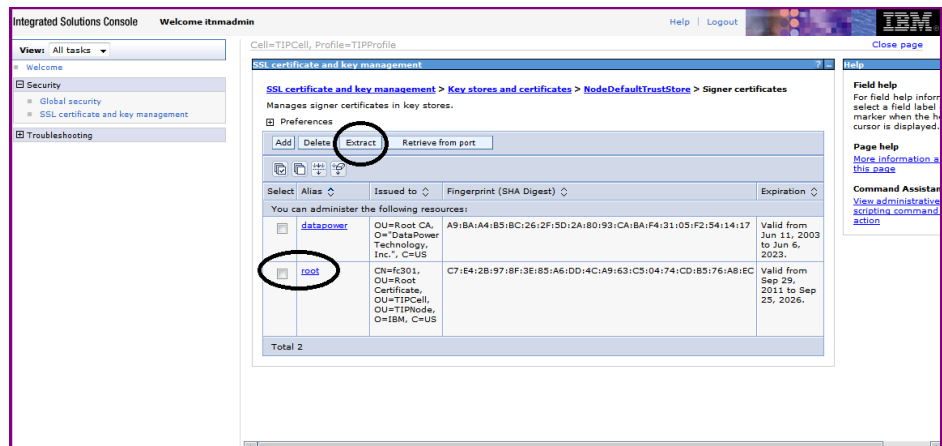
4. Click **NodeDefaultTrustStore**.



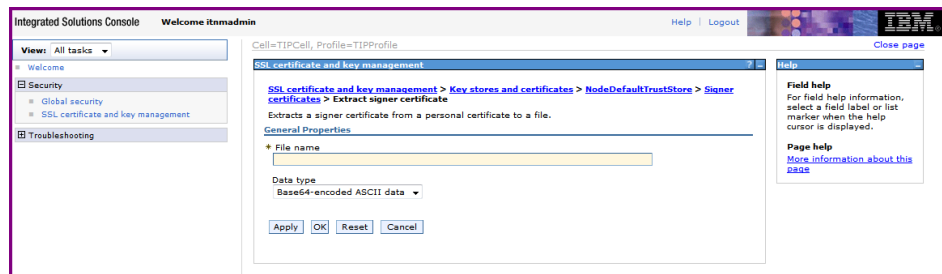
5. Under Additional Properties, click **Signer certificates**.



6. Select the **default** or **root** certificate box, then click **Extract**.



7. In the dialog box, enter a file name for the signer certificate and select the following data type: Base64-encoded ASCII data. Click **OK**.



Note: The contents are extracted onto the system where Tivoli Network Manager is running, so the file name should be specific to that system, including the path.

Step 2: Create Key Store

1. Login to the system where SNSC is installed.
2. Download or copy the Signer certificate file created in [“Step 1: Generate Signer Certificate” on page 647](#) to a directory (for Linux, use /tmp). If SNSC is installed on the same system where Tivoli Network Manager is also installed, then you just have to copy the file.
3. Change the directory to *<installation directory>/conf/auth*. For example:

```
# cd /opt/ibm/SNSC/conf/auth
```

4. Create key store using the JRE keytool bundled in SNSC. Use the following command:

```
<installation directory>/j2re/bin/keytool -import -keystore  
ess_ts.jks -storepass <password> -file <signer certificate file> -alias  
<alias>
```

where:

<i><password></i>	The password required for protecting the integrity of the keystore.
<i><signer certificate file></i>	The file path of the signer certificate file.
<i><alias></i>	An alias for the keystore. This should be unique within the trust store. If it is a new file, you may use any name, for example, default.

For example, to create the keystore with the following parameters:

- signer certificate is /tmp/signer_cert
- password is pass123
- alias is default

issue the following command:

```
# /opt/ibm/SNSC/j2re/bin/keytool -import -keystore ess_ts.jks  
-storepass pass123 -file /tmp/signer_cert -alias default
```

Step 3: Configure SNSC for LIC & SSO

1. Login as root to Linux system where SNSC is running.
2. Stop SNSC:

```
# /opt/ibm/SNSC/bin/shutdown.sh
```

- Update the file `/opt/ibm/SNSC/conf/auth/ess_auth.properties` by editing the following fields:

<code>itnm.server.address</code>	The IP Address of the system where Tivoli Network Manager is installed (example: <code>itnm.server.address=snc.foo.net</code>).
<code>itnm.server.port</code>	The port number where Tivoli Network Manager can be accessed (example: <code>itnm.server.port=16311</code>).
<code>snc.keystore.password</code>	The password that was used to generate the keystore (example: <code>snc.keystore.password=pass123</code>).
<code>itnm.ess.username</code>	The username for accessing the ESS Server. This can be an Tivoli Network Manager login user name (example: <code>itnm.ess.username=tipadmin</code>).
<code>itnm.ess.password</code>	The password for <code>itnm.ess.username</code> (example: <code>itnm.ess.password=xxxxx</code>).

- Start SNSC:

```
# /opt/ibm/SNSC/bin/startup.sh
```

Note: Though the passwords are entered in clear text, when SNSC is restarted, the clear text passwords in the `ess_auth.properties` file are replaced with encrypted passwords.

Step 4: Create SNSC User Groups in IBM Tivoli Network Manager

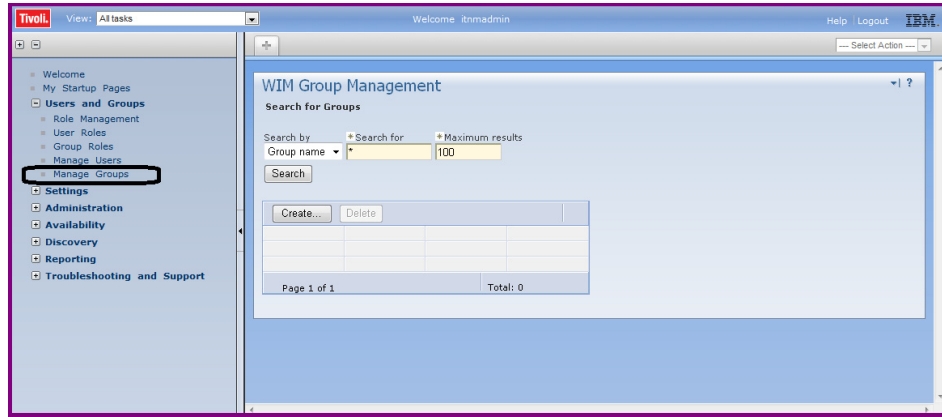
SNSC uses User Groups information for determining the role (admin, oper, user) associated with a user when the user tries to launch SNSC from Tivoli Network Manager TIP.

The following list shows the mapping of SNSC roles with SNSC User Groups in Tivoli Network Manager:

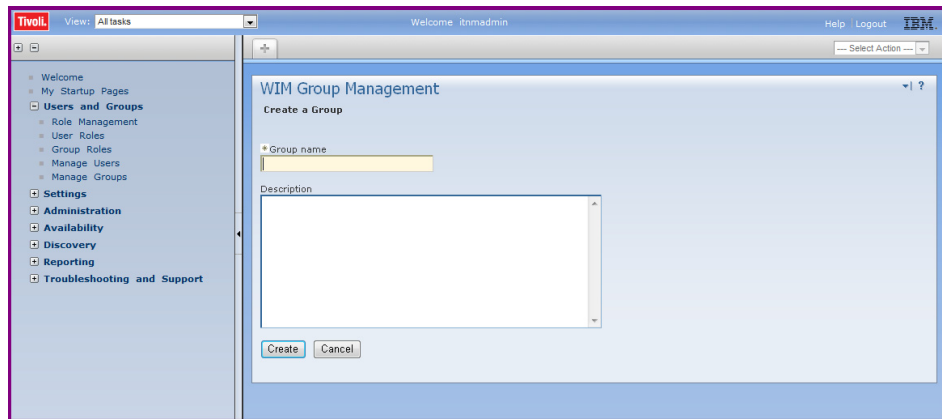
User Groups in Tivoli Network Manager	SNSC Role
<code>sncadmin</code>	admin
<code>sncoper</code>	oper
<code>sncuser</code>	user

Use the following steps to create SNSC User Groups in Tivoli Network Manager:

1. Login to Tivoli Network Manager using an administrative privileged user (for example, `itnadmin`).
2. Select **Users and Groups** > **Manage Groups** to open the WIM Group Management window.

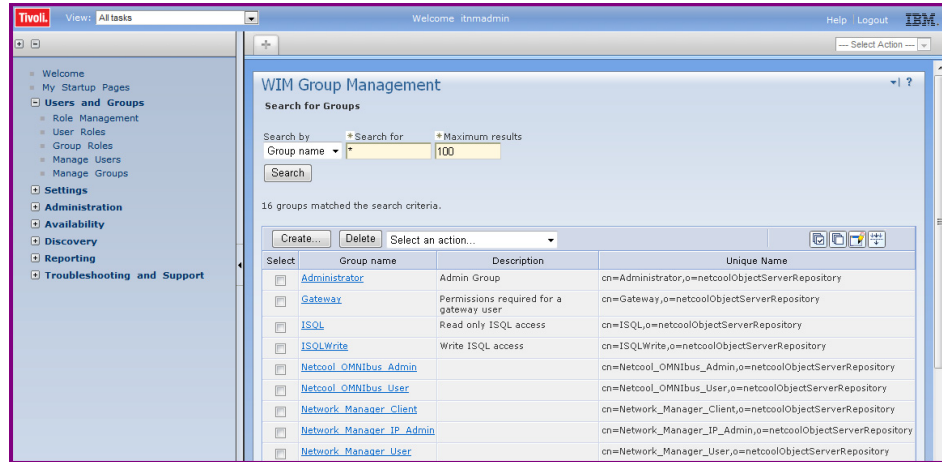


3. Click **Create...** in WIM Group Management panel to open the Group creation dialog.

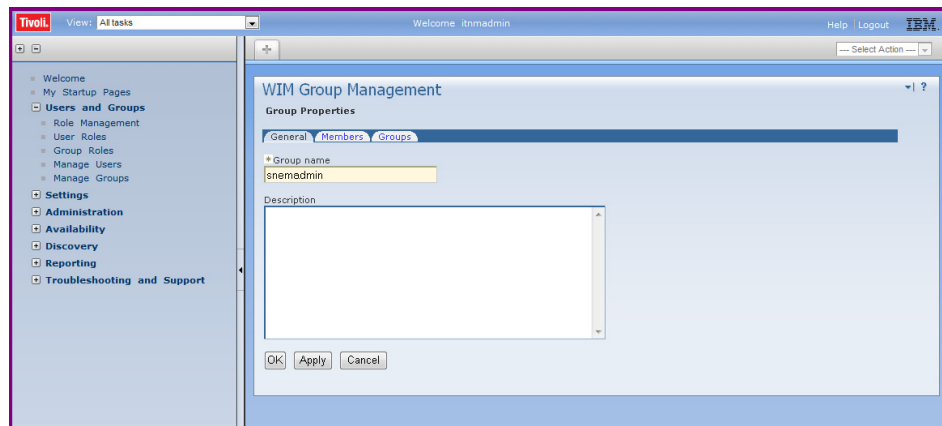


4. Enter the text `snsadmin` in Group name field and click **Create** to create the `snsadmin` User Group.
5. Repeat the previous step for the `snscooper` and `snsuser` User Groups.

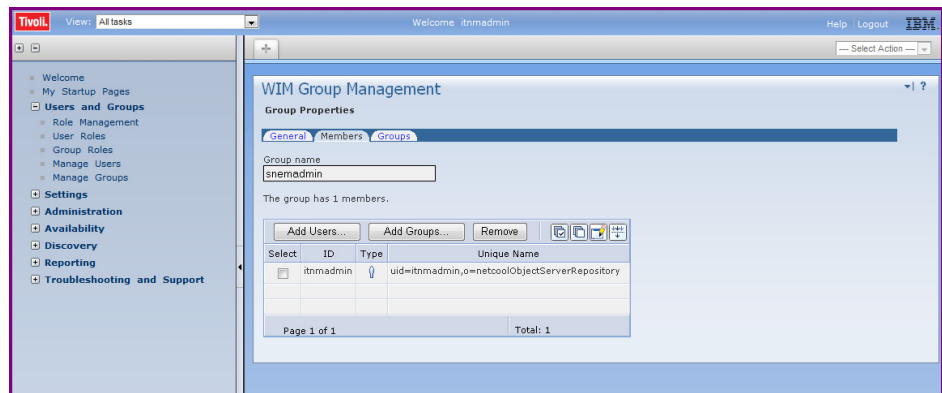
6. Select **Users and Groups > Manage Groups** and click **Search** to list all the configured User Groups.



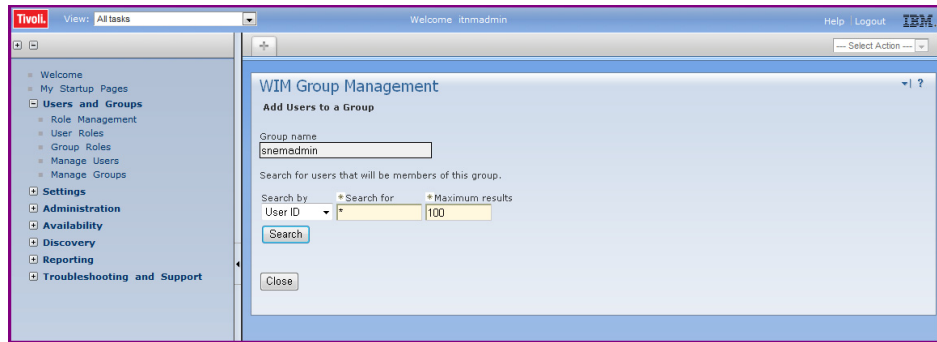
7. Select the **sncadmin** Group name hyperlink for which you want to add users. The **Group Properties** dialog opens.



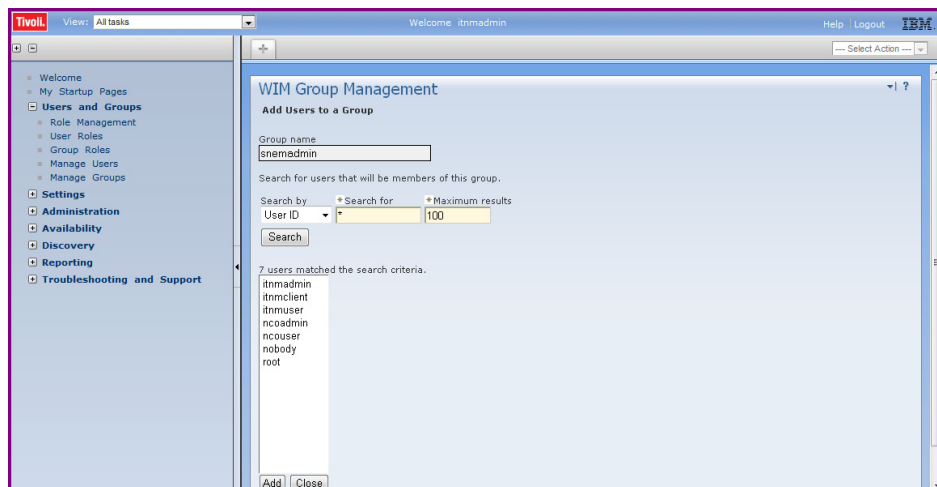
8. Select the **Members** tab to add users.



9. Click **Add Users...** to open the Add Users to a Group dialog.



10. Click **Search** to list all of the configured users.



To list only those users matching the search pattern, type the user name in the * **Search for** field and click **Search**.

11. Select the user you want to add to the SNSC User Group and click **Add**.
12. Repeat steps 7-11 to add other users to other SNSC User Groups.

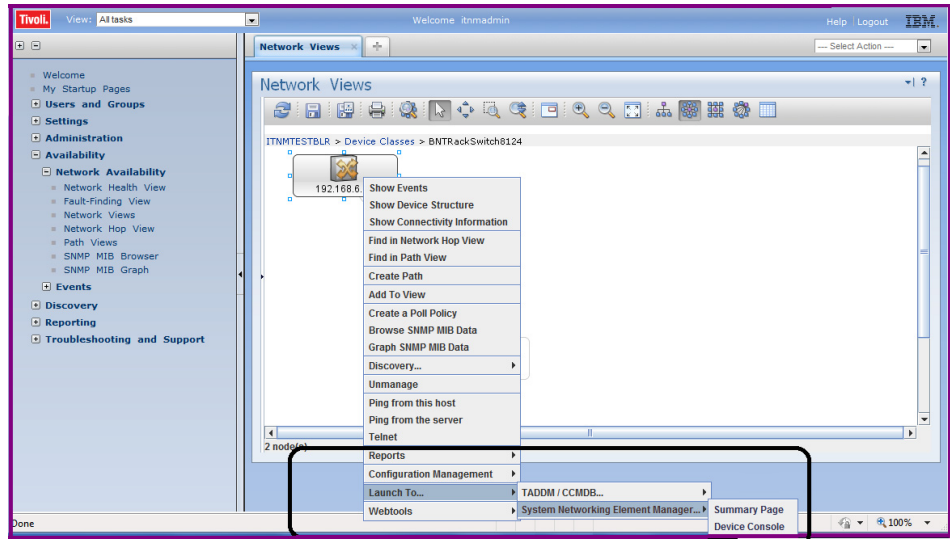
Note: You can add multiple SNSC User Groups for a user. However, SNSC selects the highest User Group privilege while launching the screens (for example, if a user is assigned with sncadmin and sncoper Groups, SNSC picks sncadmin, the highest privileged User Group, for operations).

Step 5: Edit IBM Tivoli Network Manager tools and menu configuration files

The following steps describe the configuration changes required for creating the following SNSC launch menus (see [Figure 99](#)).

1. To launch SNSC's Device Console > Monitor > Summary > Health Status page, right-click the switch icon, and choose menu **Launch To... > SNSC... > SNSC > Device Console**.
2. To launch SNSC's Summary page (Main page), right-click the switch icon, and choose menu **Launch To... > SNSC... > SNSC > Summary Page**.

Figure 99. TIP GUI showing SNSC launch menus



Step 5.1: IBM Tivoli Network Manager – TNM Properties

Edit Tivoli Network Manager’s `tnm.properties` file to add SNSC host information.

1. Login to Tivoli Network Manager system as an Administrator or root.
2. Open `$ITNMHOME/profiles/TIPProfile/etc/tnm/tnm.properties`.

On Linux system, the path is as follows:

```
/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tnm.properties
```

3. Add the following two properties:

```
tnm.snc.serverName=<Host Name/IP address of SNSC System>
tnm.snc.serverPort=<HTTPs port on which SNSC is listening>
```

For example, if SNSC is running on 192.168.1.1 on HTTPs port 40443, then the following lines should be added in the `tnm.properties` file:

```
tnm.snc.serverName=192.168.1.1
tnm.snc.serverPort=40443
```

Step 5.2: IBM Tivoli Network Manager – Create SNSC Launch-In-Context Tools Files

1. Create Device Specific SNSC Launch Tools File.

Note: In this example menu, the rules are configured to launch SNSC’s **Device Console > Monitor > Health Status** tab.

Create the tools file, for example `ncp_snc_device.xml`, under the following directory: `$ITNMHOME/profiles/TIPProfile/etc/tnm/tools`

On Linux system, the path is as follows:

/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tools/ncp_snc_device.xml

2. Add the following details and save the contents of the file:

```
<ncp_tool id="ncp_snc_device" label="Device Console" type="url">
<url
value="https://{%prop:tnm.snc.serverName}:{%prop:tnm.snc.serverPort}/snc/jsp/Launch.jsp"
target="_blank" method="GET">
<parameter name="ipaddress" valueType="ncim" table="chassis"
column="accessIPAddress"
runOnMainNode="true"/>
<parameter name="sysname" valueType="ncim" table="chassis"
column="sysName"
runOnMainNode="true"/>
<parameter name="pageid" valueType="text" text="mon_sum_hs"/>
</url>
<context>
<attribute id="sysName" valueType="ncim" table="chassis"
column="accessIPAddress">
<notequals value=""/>
</attribute>
</context>
</ncp_tool>
```

Refer to [“Externally Launching Switch Center” on page 637](#) for details about ipaddress, sysname and pageid parameters.

Create SNSC Summary Page (Main Page) Launch Tools File

1. Create the tools file, for example ncp_snc_main.xml, under the following directory: \$ITNMHOME/profiles/TIPProfile/etc/tnm/tools

On Linux system, the path is as follows:

/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/tools/ncp_snc_main.xml

2. Add the following details and save the contents of the file:

```
<ncp_tool id="ncp_snc_main" label="Summary Page" type="url">
<url
value="https://{%prop:tnm.snc.serverName}:{%prop:tnm.snc.serverPort}/snc/jsp/Launch.jsp"
target="_blank" method="GET" omitDefaultParameters="true">
</url>
</ncp_tool>
```

Step 5.3: IBM Tivoli Network Manager – Create SNSC Launch-In-Context Menu File

Create SNSC specific LIC Menu files by providing references to SNSC Launch Tools File created in [“Step 5.2: IBM Tivoli Network Manager – Create SNSC Launch-In-Context Tools Files” on page 655](#).

1. Create the menu file, for example `ncp_snsc_lic.xml`, under the following directory: `$ITNMHOME/profiles/TIPProfile/etc/tnm/menus`

On Linux system, the path is:

```
/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/menus/ncp_snsc_lic.xml
```

2. Add the following details and save the contents of the file:

```
<ncp_menu id="ncp_snsc_lic" label="SNSC...">
<definition>
<tool id="ncp_snsc_device"/>
<tool id="ncp_snsc_main"/>
</definition>
</ncp_menu>
```

Step 5.4: IBM Tivoli Network Manager – Update Global Launch-In-Context Menu File

Edit Tivoli Network Manager's Global Launch-In-Context file (`ncp_wt_lic.xml`) to add the SNSC launch-in-context menu created in [“Step 5.3: IBM Tivoli Network Manager – Create SNSC Launch-In-Context Menu File”](#) on page 656:

1. Open `$ITNMHOME/profiles/TIPProfile/etc/tnm/menus/ncp_wt_lic.xml`

On a Linux system, the path is:

```
/opt/IBM/tivoli/netcool/precision/profiles/TIPProfile/etc/tnm/menus/ncp_wt_lic.xml
```

2. Add the following line inside the `<definition>` tag:

```
<menu id="ncp_snsc_lic"/>
```

After adding the above line, the contents of the file should look somewhat similar to the below listing:

```
<ncp_menu id="ncp_wt_lic" label="Launch To...">
<context>
<attribute id="licURL" valueType="launchInContext">
<exists/>
</attribute>
</context>
<definition>
<menu id="ncp_wt_lic_sdnc"/>
<menu id="ncp_wt_lic_taddm"/>
<menu id="ncp_wt_lic_tpc"/>
<menu id="ncp_snsc_lic"/>
</definition>
</ncp_menu>
```

Step 6: Re-login to IBM Tivoli Network Manager TIP GUI

Tivoli Network Manager TIP takes a couple of minutes to load the newly created SNSC Launch-In-Context menus.

1. [Optional] If you are logged in to the TIP GUI, logout.
2. Wait approximately two minutes.
3. Login to Tivoli Network Manager TIP GUI as a Tivoli Network Manager user belonging to an SNSC User Group (see [“Step 4: Create SNSC User Groups in IBM Tivoli Network Manager”](#) on page 651).
4. Click **Availability** > **Network Availability** > **Network Views** to open the network view showing the discovered switch (see [“Requirements”](#) on page 647).
5. Right-click the discovered switch and select one of the following:
 - **Launch To..** > **SNSC...** > **SNSC** to launch the Device Console's Monitor > Summary > Health Status page.
 - **Launch To..** > **SNSC...** > **SNSC Summary Page** to launch SNSC Summary page (Main page).

Appendix C. Integrating with IBM Systems Director

System Networking Switch Center (SNSC) can be integrated with IBM Systems Director 6.3 and above so that SNSC can be launched from IBM Systems Director GUI. SNSC supports Launch-In-Context (LIC) and Single Sign-On (SSO) based launch from IBM Systems Director. This section describes various steps involved in configuring IBM Systems Director required for integrating SNSC.

Note: Before you start working on different steps, make sure to discover the host, where SNSC is installed, in IBM Systems Director.

Step 1: Create External App Launch Template File

The template file provides the information necessary to register an external application. A template file defines one or more external launch points for a single external application. The template file is written using JavaScript Object Notation (JSON) format.

Note: Though the template file lets you to define one or more external launch points, but it is preferable to define only one launch point per template file since IBM Systems Director uses `applicationID` and `browserWindowID` for identifying the browser window in which the application is launched. So if you define multiple launch points in a single template file, the newly launched external application replaces the previously launched external application contents in the window.

The following sample template file defines the rules for launching SNSC's **Device Console > Monitor > Summary > Health Status, Summary Page** and **Virtualization Tools > VSI DB Console** pages:

1. Login as an Administrator (in case of Windows) or as root (in case of Linux) to the system where IBM Systems Director is installed.
2. Create the following template file in any directory. For example, you can create a file named `snc.json`

```
{
  "version": "6.2.0.0",
  "type": "URI",
  "applicationID": "IBMSNSC",
  "browserWindowID": "SNSC001",
  "resolveURI": false,
  "uriBase": "https://<IBM
System_Networking_Element_Manager_Server
Address>:40443/snc/jsp",
  "binding": {
    "objectType" : "Switch"
  },
  "security": {
    "ssoEnabled" : true,
    "ssoType" : "UserCredential",
    "authRegType": "LocalOS",
    "credPassing": "POST_ENCODED_TEXT",
    "userNameKey": "login-user-name",
```

```

        "passwordKey": "login-password"
    },
    "launchpoints" : [
    {
        "launchPointID" : "SNSC01",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC Device Co
nsole" }
        ],
        "description": [
            { "lang": "default", "text": "IBM SNSC Device Co
nsole launch point" }
        ],
        "uriExtension": "/Launch.jsp",
        "uriParameters": {
            "encoding": "base64",
            "pageid": "mon_sum_hs",
            "ipaddress": "{Switch.DeviceName}"
        }
    },
    {
        "launchPointID" : "SNSC02",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC Summary"
}
        ],
        "description": [
            { "lang": "default", "text": "IBM SNSC Summary l
aunch point" }
        ],
        "uriExtension": "/Launch.jsp",
        "uriParameters": {
            "encoding": "base64",
        }
    },
    {
        "launchPointID" : "SNSC03",
        "displayName": [
            { "lang": "default", "text": "IBM SNSC VSI Manag
er" }
        ],
        "description": [
            { "lang": "default", "text": "IBM SNSC VSI Manag
er launch point" }
        ],
        "uriExtension": "/Launch.jsp",
        "uriParameters": {
            "encoding": "base64",
            "pageid": "vsi_manager"
        }
    },
    ],
}

```

Table 505. *Template File field descriptions*

Field	Type	Required	Description
version	String	Yes	Value representing the version of the template schema used to define the launch points. This value coincides with the version of the SDK where the template schema is defined.
type	String	Yes	Value representing the type of launch points defined. Valid values are: URI
applicationID	String	Optional	Application identifier for the grouping of launch points defined in the template file. This unique value is used as a reference for IBM® Systems Director when performing internal operations. The applicationID/launchPointID combination must be unique among all registered launch points. Specifying this value is optional; if it is not specified, a unique applicationID will be generated dynamically. If a specified applicationID already exists, registration will fail and an error will be returned. Note: Application ID string cannot contain a blank (white) space character.
browserWindowID	String	Optional	An ID to associate the browser window to use for the launch point. Launch points with the same browserWindowID will be launched into the same browser window. If this value is not defined, it will be automatically generated such that all launch points for given application will share the same browser window. In addition, if resolveURI is true, then unless specified, all launch points for a given targeted managed resource will share the same browser window.
resolveURI	Boolean	Optional	Indicates if the launch point URI value should be resolved before launching. Resolving the URI involves replacing the variable {hostname} with the targeted resource hostname value. This value can only be true if the launch point URI has the variable {hostname} included in it, and the launch point has binding information specified (making it targeted). If this value is false, the launch point URI is launched as is.
uriBase	String	Yes	Note: The base URL to the external Web-based application associated with this launch point. This value cannot include the "?" character. This value can have the following special substring included as part of its value: {hostname}. If the {hostname} substring is included, the launch point must be targeted (by specifying a binding). The uriBase value will be concatenated with the uriExtension to form the final URI value. This value is overridden if a fully qualified uriExtension value is defined for a launch point. See uriExtension information for more details. Note: If security is enabled, the endpoint represented by the hostname included in the uriBase value must be discovered and managed by IBM Systems Director.

Table 505. *Template File field descriptions (continued)*

binding	Object	Yes	Launch points defined in template can be associated with resources in IBM® Systems Director environment using binding criteria.
objectType	String	Yes, if binding is present	Part of the binding specification, this value identifies the objectType value within IBM Systems Director this launch point is bound to. Example: OperatingSystem. This value must be a valid ObjectType as defined by the IBM Systems Director Data Model. By specifying this value, the launch point(s) associated with this objectType binding become targeted. The binding specification can be specified at the application level (in effect for ALL launch points defined) or at the individual launch point level. If this binding value is specified at the launch point level, it overrides the value defined at the application level.
security	Object	Yes	Defines the security credentials for the application launch.
ssoEnabled	Boolean	Yes, if SSO is enabled	Indicates whether SSO is enabled for all launch points.
ssoType	String	Yes	The SSO credential type. Valid values are: UserCredential
authRegType	String	Optional	The type of authentication registry to use for authentication. Valid values are as follows: <ul style="list-style-type: none"> ● LocalOS - Local OperatingSystem registry ● LDAP - Lightweight Directory Access Protocol registry ● DOMAIN - Windows Active Directory (DOMAIN) registry
credPassing	String	Optional	The technique used to pass credentials (username and password). The username is always passed URLencoded using UTF-8 encoding. The password is encoded using base64 encoding whenever POST_ENCODED_TEXT is specified. The password is sent URLencoded using UTF-8 encoding whenever POST_PLAIN_TEXT is specified. Allowed values are as follows: <ul style="list-style-type: none"> ● POST_PLAIN_TEXT - Indicates username and password be sent as part of the HTTP request header when launching the external application. ● POST_ENCODED_TEXT - Indicates username and password (base64 encoded) be sent as part of the HTTP request header when launching the external application.
userNameKey	String	Optional	The key to associate with the username value when passing information to the launch point application. The username key and value are passed either as part of the query string or as a variable in the HTTP POST message.

Table 505. *Template File field descriptions (continued)*

passwordKey	String	Optional	The key to associate with the password value when passing information to the launch point application. The password key and value are passed either as part of the query string or as a variable in the HTTP POST message.
launchpoints	Object	Yes	An array of launch points to the application.
launchPointID	String	Yes	Unique name/ID for a specific launch point entry. This value is used as a reference for IBM Systems Director when performing internal operations. The applicationID/launchPointID combination must be unique among all registered launch points. If a specified launchpointID already exists under a given applicationID, registration will fail and an error will be returned.
displayName	String	Yes	An array of localized text representing the display name for the launch point. The default text value must be specified; all other supported languages are optional.
description	String	Optional	An array of localized text representing the description for the launch point. The primary intent of this field is to enable an administrator to understand the purpose of the launch point, as the display name may not fully describe the intent of the entry. The default text value must be specified; all other supported languages are optional.
uriExtension	String	Optional	The string to concatenate to the base URL defined by uriBase to form the fully qualified URI value. This value cannot include the ? (question mark) character. If the value is a fully qualified URL (example: <code>ht tp : // <address></code>), then the uriBase value is disregarded and the uriExtension becomes the fully qualified URI for the launch point.
uriParameters	String	Optional	A list of parameters values to be passed to the launch point application. The parameters themselves are specified in the format "key" : "value", where key is the parameter name and value is the parameter value. Parameter values are passed URLEncoded using UTF-8. Options for the parameter value are as follows: <ul style="list-style-type: none"> • Static: A static parameter value is passed as-is to the launch point application. This parameter has the same value regardless of targeted resource. • Dynamic: A dynamic parameter value is resolved at runtime using data from IBM Systems Director. The parameter value is based on the context of the targeted resource.

Table 505. *Template File field descriptions (continued)*

encoding	String	Yes	Determines whether the credentials are encoded or not. Possible values are as follows: <ul style="list-style-type: none"> ● plain: If 'credPassing' in security object is defined as POST_PLAIN_TEXT ● base64: If 'credPassing' in security object is defined as POST_ENCODED_TEXT Note: The encoding field should be set by the user, depending on the type of credPassing setting. Make sure you assign the correct value. For example, if credPassing is set to POST_PLAIN_TEXT, but encoding is set to base64, the authentication will fail.
pageid	String	Yes	Indicates the page/tab in SNSC's UI to be launched. For various pageid mappings, refer to “Externally Launching Switch Center” on page 637 .
ipaddress	String	Yes, if device-specific page is the launch point	If the external application launch needs to be associated with the IP address/device address, set this field to {Switch.DeviceName}, which enables IBM Systems Director to pass either the IP address or the sysName assigned to the selected device.

Step 2: Register External App Launch Template File

The template file created in [“Step 1: Create External App Launch Template File” on page 659](#) should be registered with IBM Systems Director. You can register the template file using IBM Systems Director's `smcli` command utility.

To register the template file:

1. Login as an Administrator (in case of Windows) or as root (in case of Linux) to the system where IBM Systems Director is installed and the template file was created.
2. Register the template file:

```
smcli importextlps -f <template file path>
```

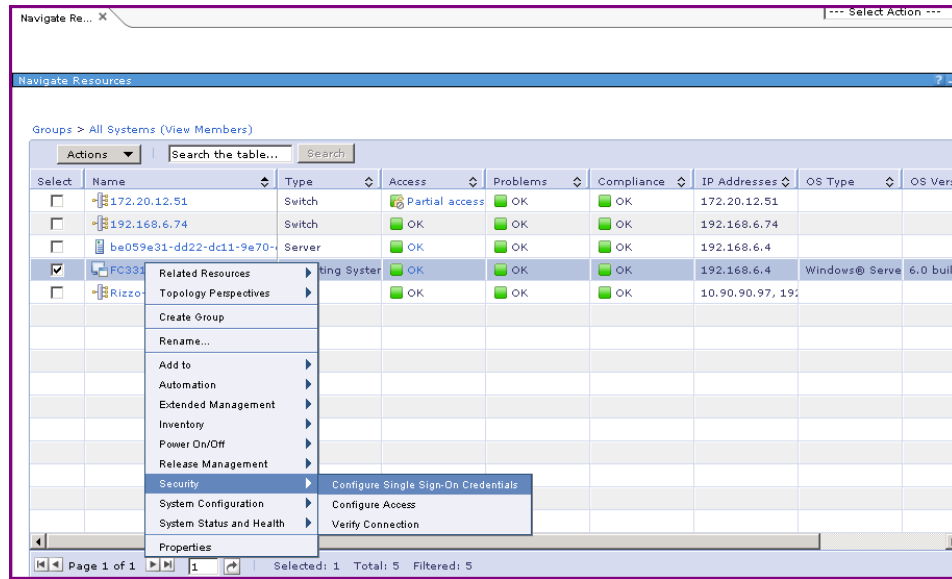
Notes:

- You can view the registered launch points by executing the following command:
`smcli listextlps`
- You can remove (unregister) an external launch point by executing the following command: `smcli removeextlps -A <applicationID>`
where *<applicationID>* is the ID used in the template JSON file.

Step 3: Configure Single Sign-On Credentials

1. Login to IBM Systems Director.
2. From the task list in the left pane, select **Navigate Resources**.
3. From the Groups table on the Navigate Resources tab, select **All Systems**.
4. In the **Group > All Systems** table, right-click the SNSC server entry.

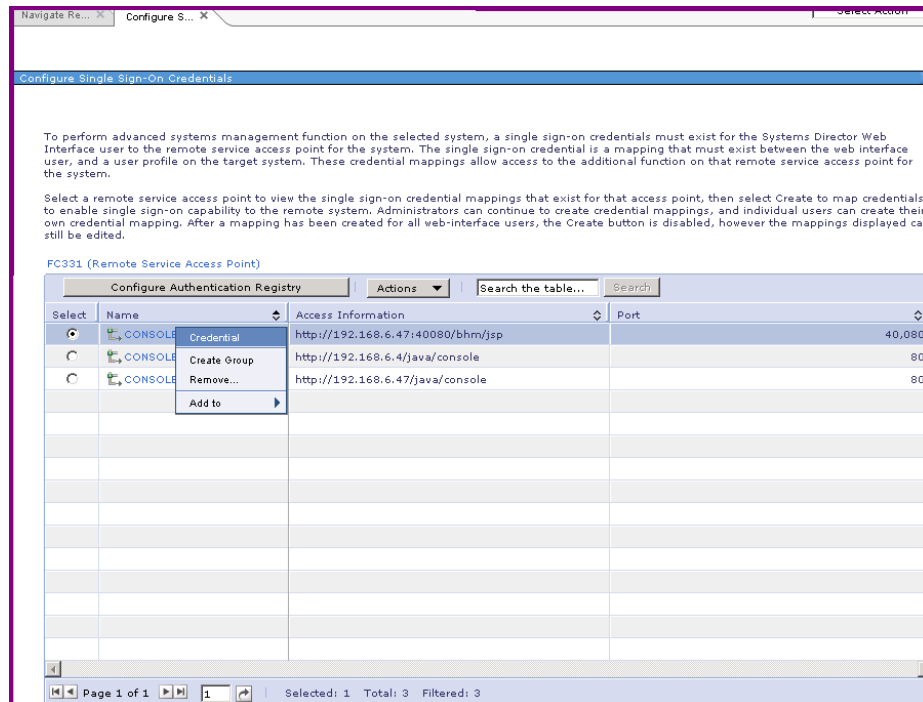
5. Choose menu **Security > Configure Single Sign-On Credentials**.



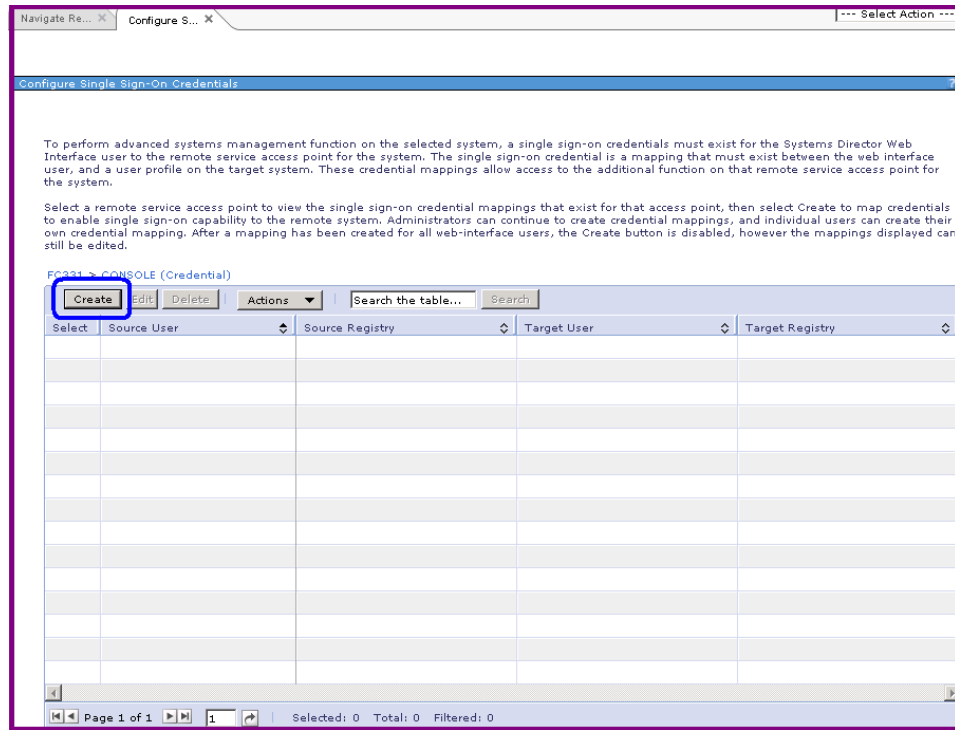
6. Right-click the entry that contains the Access Information:

`http://<IBM SNSC IP>:<Port>/sncs/jsp`

7. Choose menu **Credential**.



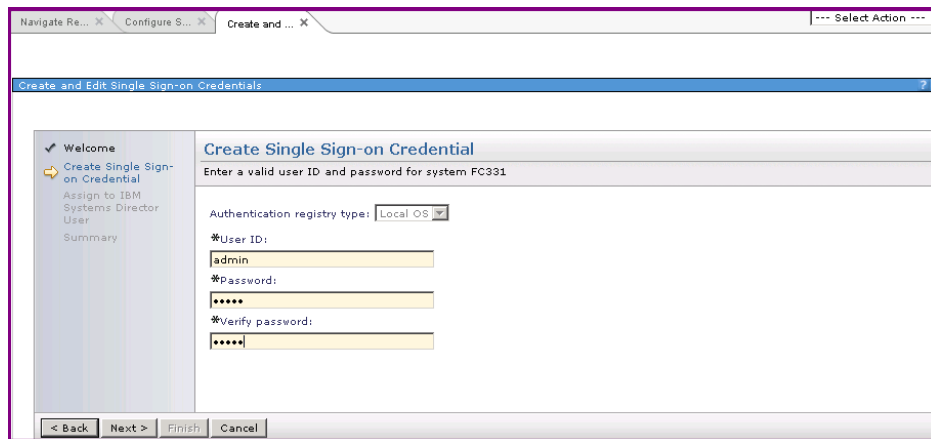
8. Click **Create**.



9. Click **Next**.

10. Type the user ID and password with the values of the Login ID and Password fields of the user account configured in SNSC.

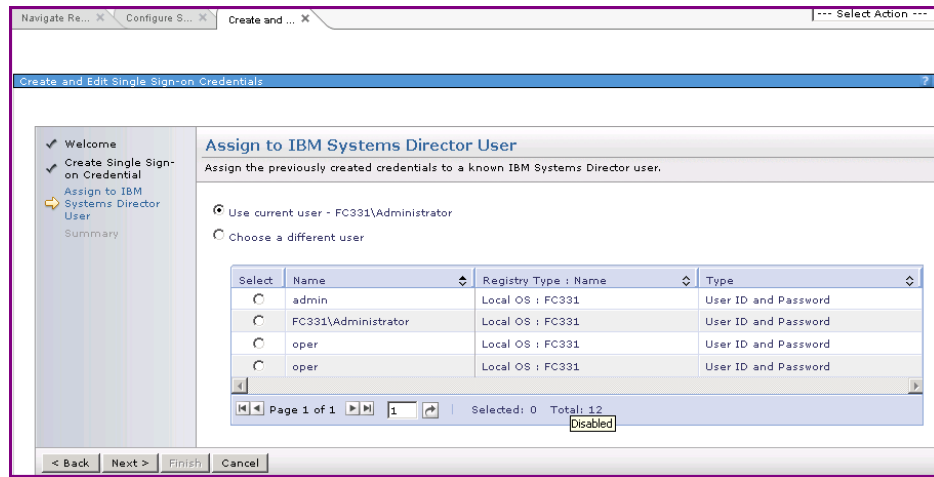
11. Click **Next**.



12. Do not modify the default Use current user option.

13. Click **Next**.

14. On the Summary page, click **Finish**.



Appendix D. Using Third-Party JDBC/ODBC Tools

The SNSC component uses the IBM Derby database for data storage. IBM Derby is configured to run in Network Server mode, which enables accessing SNSC DB through multiple connections. This section describes the steps that can be used for retrieving the data from SNSC Database using third-party JDBC/ODBC tool such as EasySoft ODBC-JDBC Gateway.

Note: The steps given in this section pertains to third party tools installed on Microsoft Windows XP/7 OS.

Requirements

- Java Runtime Environment (JRE) 1.5 or above installed.
- EasySoft ODBC-JDBC Gateway v 2.3 for Microsoft Windows platform (http://www.easysoft.com/products/data_access/odbc_jdbc_gateway/index.html) installed.
- ODBC Test Utility (<http://media.datadirect.com/download/files/Tools/odbctest.zip>) is installed. Note that ODBC Test Utility is packaged as a Windows Zip file. Extract the contents of the zip file to install ODBC Test Utility.
- IBM Derby client JAR file copied to a directory on the system where you have installed EasySoft ODBC-JDBC Gateway. You can find IBM Derby client (`derbyclient.jar`) under the following directory:
<SNSC Installation Directory>/derby/lib/

Task 1: EasySoft ODBC-JDBC Gateway – Configuring JVM

1. Click **Start > Programs > EasySoft > ODBC-JDBC Gateway > Configure Java Interface** to open the Setup Java Interface window.
2. Set the JVM Library path.
 - a. Click the elipsis button (...) next to JVM Library path text field to open the Select JVM window.
 - b. By default, Select JVM window lists the known JVM libs (<Java Install Path>\bin\client\jvm.dll). You can also click the **Browse** or **Search** buttons to find other JVM library paths.
 - c. Select the appropriate JVM library by double-clicking the listed library path.
 - d. (Optional) Click **Test** and **Save if OK** button to test the selected JVM library and save only if the test was successful.
 - e. Click **OK** to save the changes.

Task 2: EasySoft ODBC-JDBC Gateway – Configuring Data Source (DSN)

1. Select **Start > Control Panel > Administrative Tools** and click **Data Source (ODBC)** to open the ODBC Data Source Administrator window.
2. Select System DSN tab and click **Add...** to open the Create New Data Source window.
3. Select **EasySoft ODBC-JDBC Gateway** option and click **Finish** to open the EasySoft ODBC-JDBC Gateway DSN Setup window.

4. In EasySoft ODBC-JDBC Gateway DSN Setup window, complete the fields as follows and then click **OK**.

- a. DSN

Enter the DSN name for this entry. For example, SNSC DB.

- b. Description

(Optional) Enter any descriptive text.

- c. Driver Class

Specify the IBM Derby network driver class
(`org.apache.derby.jdbc.ClientDriver`)

- d. Class Path

Specify the patch where you have copied IBM Derby client JAR file (see [“Requirements” on page 670](#)).

For example, if IBM Derby client JAR (`derbyclient.jar`) is located under `c:\tools\derby\` directory, then type `c:\tools\derby\derbyclient.jar`

- e. URL

Specify the SNSC DB URL as follows:

```
jdbc:derby://<SNSC Host IP Address>:41527/<SNSC Install Path>/database/snc;create=false
```

For example, if SNSC is installed on RHEL 5.0 system 192.168.1.1, enter:

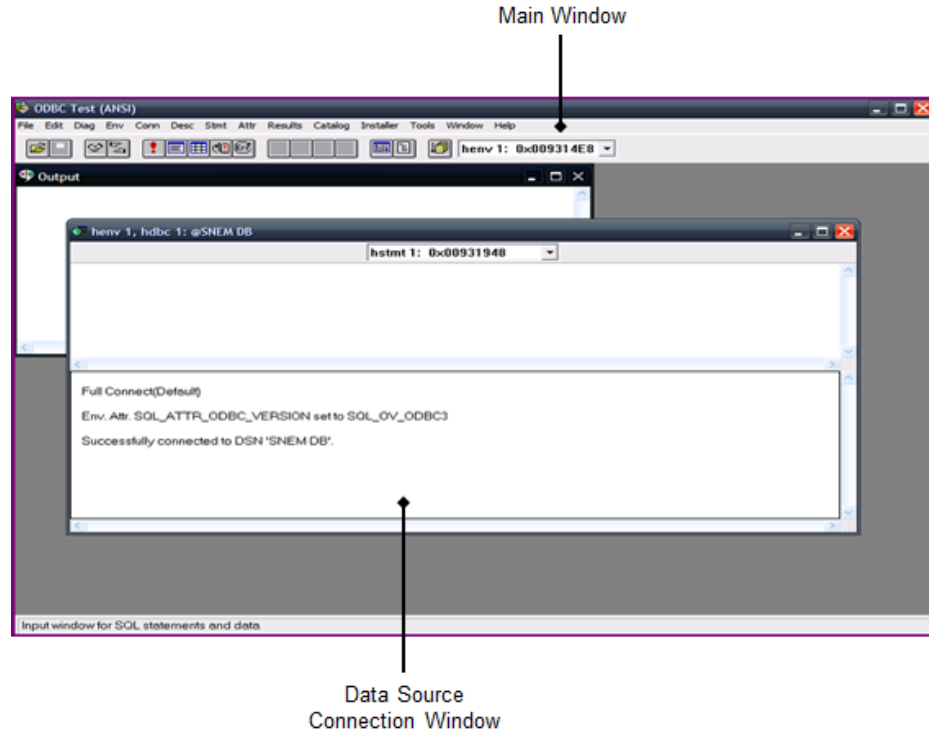
```
jdbc:derby://192.168.1.1:41527//opt/ibm/SNSC/database/snc;create=false
```

5. Once the Data Source is created and listed, click **OK** to complete.

Task 3: ODBC Test Utility – Connecting to Data Source

1. Navigate to the directory in which you have extracted ODBC Test Utility contents.
2. Double-click `OdbcTE32.exe` to bring ODBC Test Utility window.
3. Select **Conn > Full Connect...** to bring up Full Connect window.
4. In Full Connect window, select the ODBC datasource (for example, SNSC DB) that you created (see [“Task 2: EasySoft ODBC-JDBC Gateway – Configuring Data Source \(DSN\)” on page 670](#)).
5. Click **OK** to establish the connection with the database. A successful connection to Data Source brings up another window ([Figure 100](#)) enabling you to execute database queries.

Figure 100. ODBC Test Utility window



Task 4: ODBC Test Utility – Retrieving the Data from the Database and Viewing

After successfully establishing the connection with the Data Source, you can retrieve and view the data using the following steps:

1. In Data Source Connection Window's upper panel ([Figure 100](#)), enter the SQL query associated with the DB table you want to query.

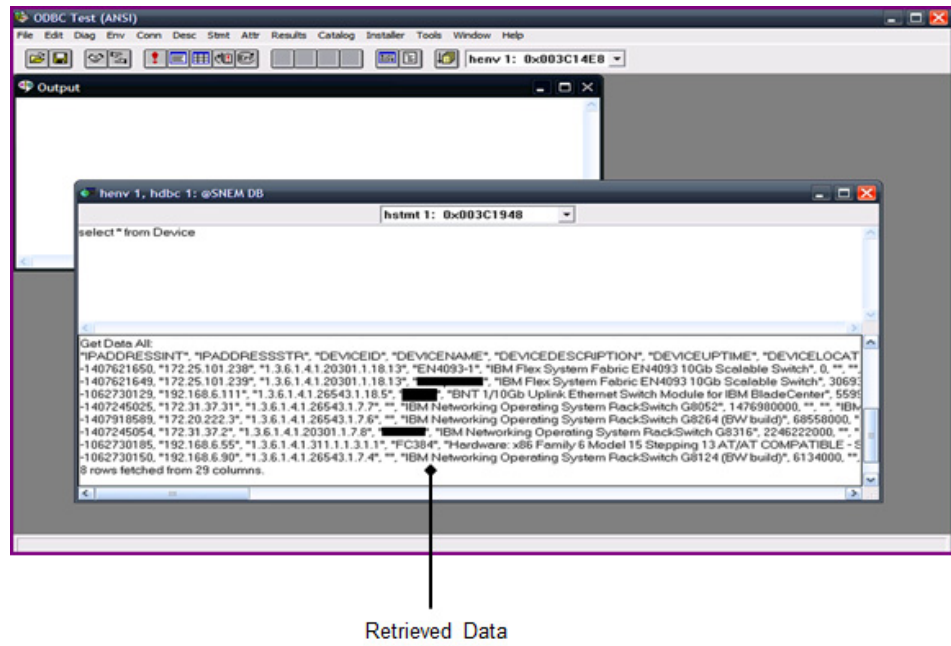
For example, to retrieve and view all the data from the Device table, type `select * from Device`.

Note: Refer to the following file for complete list of database tables used by SNSC for storing the data: `<SNSC Install Path>/database/snsbdb.sql`

2. In the Main Window ([Figure 100](#)), select **Stmt>SQLExecDirect...** to execute the SQL statement.
3. In the Main Window, choose menu **Results > Get Data All** for listing the retrieved data ([Figure 101](#)).

Note: You can also view the data in tabular format. For details, you can refer ODBC Test Utility documents.

Figure 101. ODBC Test Utility window with retrieved data



Index

A

- ACL Groups 451
- ACL VMAPs 453
- ACLs 445, 448
- Actions (device-specific) 553
- admin, oper and user passwords 36
- Administrator 37
- Alerts report 112
- Apply 557
- apply configuration 140
- applying configuration changes 313
- authentication 75
- Auto Discovery 40
- auto discovery configuration tasks 40
- Auto Discovery Log 44

B

- backup firmware 128
- Bandwidth configuration (VMs) 480
- BBI 558
- Browser-Based Interface 558

C

- CEE (Converged Enhanced Ethernet) 461
- Chart 145
- chart statistics 303
- CIST Bridge 349
- CIST Port 350
- Clear Counter 146
- Clear Statistics 146
- CLI commands 134
- collect data 136
- concurrent limit setting 125
- Config Dump 557
- configuration
 - ACL Groups 451
 - ACLs 445, 448
 - applying changes 313
 - Auto Discovery 40
 - CIST Bridge 349
 - CIST Port 350
 - FDB 355
 - FDB Static 356
 - firmware 316
 - general 314
 - LACP 343
 - LACP Ports 344
 - LACP trunk groups 341
 - Management Network 333
 - MSTP 348
 - NTP service 331
 - Port Mirroring 333

- Ports 432
- RADIUS General 324
- RADIUS Server 325
- RSTP 348
- saving 313
- STP 351
- STP Groups 353
- STP Port 354
- submitting changes 313
- synchronizing 554
- Syslog Hosts 318
- TACACS General 327
- TACACS+ Server 328
- TACACS+ User Map 330
- Trunk groups 341
- Trunk hash 340
- Virtualization 476
- VLAN 334
- VLAN Memberships 362
- VM Bandwidth 480
- VM Groups 479
- VM OUI MAC 486, 487
- VM Ports 484
- VM Pre-Provisioning 485
- VM profiles 478
- VMAPs 365
- VMs 484
- VMware vCenter 477
- configuring the switch 309
- Converged Enhanced Ethernet (CEE) 461
- CSV file
 - exporting 50
 - importing 46

D

- data collection 72, 136
- database purge 74
- Default Passwords 37
- Delete Switch 557
- Device Console page 65
- Device List
 - importing 48
- Device List page 56
- Device List pane 57
- Device-Specific Actions 553
- Diff Config 557
- Diff Flash 557
- disk space 24
- Domains pane 56
- download configuration file 129
- Downloads window 305

E

Enabling JavaScript 25
Event List report 110
Exclude Address Range 42
Export 145
export statistical data 305

F

FCoE (Fiber Channel over Ethernet) 467
FDB 355
FDB Static 356
Fiber Channel over Ethernet (FCoE) 467
Filter Type 41
Firmware configuration 316
firmware download 126
Form pane 311
Forwarding Database 355
FTP configuration 79

G

General configuration 314
Google Chrome 25
group operations 125

H

Help 145
home page 52
HTTP 26
HTTPs 26

I

image download 126
information
 general 90
IP address 25

J

JavaScript 25

L

LACP 343
LACP Ports 344
LACP trunk groups 341
Launching the BBI 558
Levels of Severity 320
Link Layer Discovery Protocol 366
LLDP 366
log archive 92
log viewer 92

M

maint_critical_data_backup_dir_setup 560
maint_critical_data_backup_init 561
Management Network 333
Manual Discovery 45
menu bar
 Device Console page 67
 Device List page 57
Microsoft Internet Explorer 25
monitored port 333
Mozilla Firefox 25
MSTP 348
multi-homed system configuration 35

N

NTP Service 331

O

Operator 37
OUI/MAC 486, 487

P

panic dump 131
Port 146
Port Bridge
 monitoring 169
Port configuration 432
Port Ethernet Statistics
 monitoring 170
Port Group (VMready) 520
Port Mirroring 333
port monitor 333
Port Synchronization 555
Port Trunk Groups 341
Pre-provisioning 485
Print 145
print statistical summary 307
properties
 general 70

R

RADIUS general 324
RADIUS Server 325
RAM 24
Read Community 41
Reboot Switch 557
Refresh 145
refresh configuration 71
reports
 viewing 109
RESTful API 527
Retries 41
Revert 557
Revert Apply 557

RMI Service 26
RSTP 348

S

Save 557
save configuration 140
saving the configuration 313
scheduled jobs 132
SDN-VE
 monitoring 290
SDN-VE gateway
 configuring 493
 monitoring 290
Selection windows 312
severity levels 320
SNMP access 25
SNMPv1 26
software download 126
Spanning Tree 351
Spanning Tree Groups 353
Spanning Tree Port 354
stacking
 monitoring 296
static FDB 356
statistical data export 305
Statistical Summary 305
statistics chart 303
STP 351
STP Groups 353
STP Port 354
submitting configuration changes 313
Subnet 42
Subnet Mask 42
subnet mask range 41
Summary Status window 56
switch summary 148
switch version report 114
Sync Config 554
synchronizing the configuration 554
Syslog Dump 557
Syslog Hosts 318
Syslog List report 111
Syslog severity levels 320
System Networking Switch Center home page 52
system requirements 24

T

Tabular pane 312
TACACS general 327
TACACS+ Server 328
TACACS+ User Map 330
tech support dump 132
TFTP configuration 79
Timeout 41
transceiver information report 116
Trunk groups 341

Trunk hash 340

U

upgrade configuration file 129
upgrade firmware 127
Use SNMPv3 46
User 37
User Map (TACACS+) 330

V

vCenter 502
vCenter Access 477
Virtual Machines 507
Virtual Machines configuration 484
Virtual Machines discovered 282
Virtual Switch Instance (VSI) 527
virtualization 476
VLAN 334
VLAN Maps (VMAPs) 510
VLAN Memberships 362
VLAN Synchronization 555
VM 484
VM Bandwidth 480
VM configuration 476
VM Data Center Report 117
VM Groups 479, 505
VM management server 502
VM OUI MAC 486, 487
VM Ports 484
VM pre-provisioning 485
VM profiles 478
VMAP 365, 453
VMAPs (VLAN Maps) 510
VMready VM Reports 119
VMready Wizard 497
VMs (virtual machines) 507
VMs discovered 282
VMware 477
vNIC configuration 487
vNIC groups 488
VSI Database 527

W

web session 558
Wizard
 VMready 497
Write Community 41

