Lenovo Networking Plug-in for VMware vRealize Orchestrator

Deployment and User Guide

Version 1.3

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.

First Edition (August 2017)

Contents

Chapter 1. Overview

The *Lenovo Networking Plug-in* leverages the open plug-in architecture of vRealize Orchestrator product to support the management of Lenovo Networking products. Through the use of Actions and Workflows, it allows management of key features in Lenovo switches, such as:

- VLANs
- Static & LACP Link Aggregation Groups (LAGs)
- Ports
- Connectivity to server adapters
- Virtual LAGs (vLAGs)
- Unified Fabric Port (UFP)
- Server/uplink ports
- Firmware updates
- Switch reload
- Automatic Discovery of Switches

Lenovo Networking Plug-in version 1.3 offers the following features:

- Support for Lenovo Cloud Network Operating System (CNOS)
- Meeting VMware vRealize Orchestrator 7.2.0 requirements
- Added the “Unregister Switch” workflow
- IP and MAC address format validation across all workflows
- Inventory objects:
  - Stores registered switch details including switch type, OS (ENOS, CNOS), and feature flags (UFP, vLAG)
  - Enables switch selection based on IP address when running workflows

Requirements

Following are the software and hardware components needed to run the *Lenovo Networking Plug-in* for VMware vRealize Orchestrator.

VMware vRealize Orchestrator

This version of the *Lenovo Networking Plug-in* is supported on the following VMware vRealize Orchestrator releases:

- VMware vRealize Orchestrator 7.2.0 that support:
  - **ISslService** - decouples the configuration of SSLContext from the plug-in's code. In version 7.1 or later the trust store is stored in the database to enable cluster scenarios and ISslService hides the complexity to retrieve the trust store.
  - **IEndpointConfigurationService** - provides access to the database storage for configuration data. This is done for also for cluster readiness of the plug-in.

Memory and CPU Utilization

The memory and CPU utilization of this plug-in have been characterized and has been determined that none of the workflows or actions cause significant usage of these resources.

Supported Lenovo Networking Products

The following Lenovo Networking products are supported by the current version of the *Lenovo Networking Plug-in*:

- Lenovo Cloud NOS version 10.4 or later:
  - Lenovo RackSwitch G8272
  - Lenovo RackSwitch G8296
  - Lenovo RackSwitch G8332
  - Lenovo ThinkSystem NE1032 RackSwitch
  - Lenovo ThinkSystem NE1032T RackSwitch
  - Lenovo ThinkSystem NE1072T RackSwitch
  - Lenovo ThinkSystem NE10032 RackSwitch
  - Lenovo ThinkSystem NE2572 RackSwitch
- Lenovo Enterprise NOS version 8.4 or later:
  - Lenovo Flex System Interconnect Fabric
  - Lenovo Flex System Fabric EN4093R 10Gb Scalable Switch
  - Lenovo Flex System Fabric CN4093 10Gb Converged Scalable Switch
  - Lenovo Flex System Fabric SI4093 System Interconnect Module
  - Lenovo Flex System SI4091 10Gb System Interconnect Module
  - Lenovo RackSwitch G7028
  - Lenovo RackSwitch G7052

- Lenovo RackSwitch G8052
- Lenovo RackSwitch G8124-E
- Lenovo RackSwitch G8264
- Lenovo RackSwitch G8264CS
- Lenovo RackSwitch G8272
- Lenovo RackSwitch G8296
- Lenovo RackSwitch G8332

Workflows Not Supported

The following workflows are not supported in Cloud NOS (CNOS) for the current version of the *Lenovo Networking Plug-in*:

- Create UFP Port
- Modify UFP Port Bandwidth
- UFP Enable
- Create Port Channel Admin Key
- Remove Port Channel Admin Key
- Remove VLAG LACP Admin Key
- Remove VLAN from STG
- Add VLAN to STG
- Remove Server Port
- Get Server Ports
- Add Server Ports
- Change Port Name
- Enable-Disable Port channel

Workflows involving UFP (*Enable UFP*, *Create UFP Port*, and *Modify UFP Port Bandwidth*) are not supported on the following switches, regardless of the Networking OS:

- Lenovo Flex System SI4091 10Gb System Interconnect Module
- Lenovo RackSwitch G7028
- Lenovo RackSwitch G7052
- Lenovo RackSwitch G8052
- Lenovo RackSwitch G8124-E
- Lenovo RackSwitch G8264CS
- Lenovo RackSwitch G8332

Workflows involving vLAG (*Create vLAG Admin Key*, *Enable vLAG Admin Key*, *Create Portchannel*, *Create Single VLAN on vLAG Port*, *Create Single VLAN on LACP vLAG Port*, and *Enable vLAG Portchannel*) are not supported on the following switches, regardless of the Networking OS:

- Lenovo Flex System Fabric SI4093 System Interconnect Module
- Lenovo Flex System SI4091 10Gb System Interconnect Module

Licensing

The *Lenovo Networking Plug-in* for VMware vRealize Orchestrator comes in two forms:

- Non-warranted version that is free to anyone and downloadable from the VMware Solution Exchange website
- Warranted version that is purchased under the vRealize Subscription and Support Package and is downloadable by the customer from Lenovo Support Portal

Although the functionality of the two plug-ins is identical, each contains a different End User License Agreement (EULA). The EULA is presented to the user upon import, where they must accept the terms.

- Non-warranted displays Lenovo's ILAN license. First line of license: *International License Agreement for Non-Warranted Programs*
- Warranted displays Lenovo's IPLA license. First line of license: *International Program License Agreement*

Enhancements

Workflow Presentation Enhancements

Forms where you enter input parameters for workflows are enhanced for better usability. These includes:

- Using drop-down boxes when the set of possible input values are known
- Marking input fields that are required with an asterisk

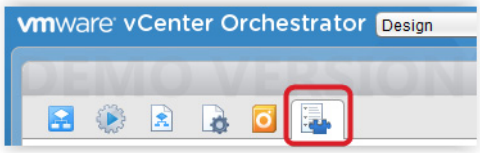
CNOS Switch Support

The plug-in actions and workflows function as before. The only change is to the implementation of the back-end device communication.

When the application tries to communicate with the switch, the relevant calls are made based on the network operating system: REpresentational State Transfer (REST) API if the switch is running CNOS, or Simple Network Management Protocol (SNMP) for ENOS.

Inventory Objects

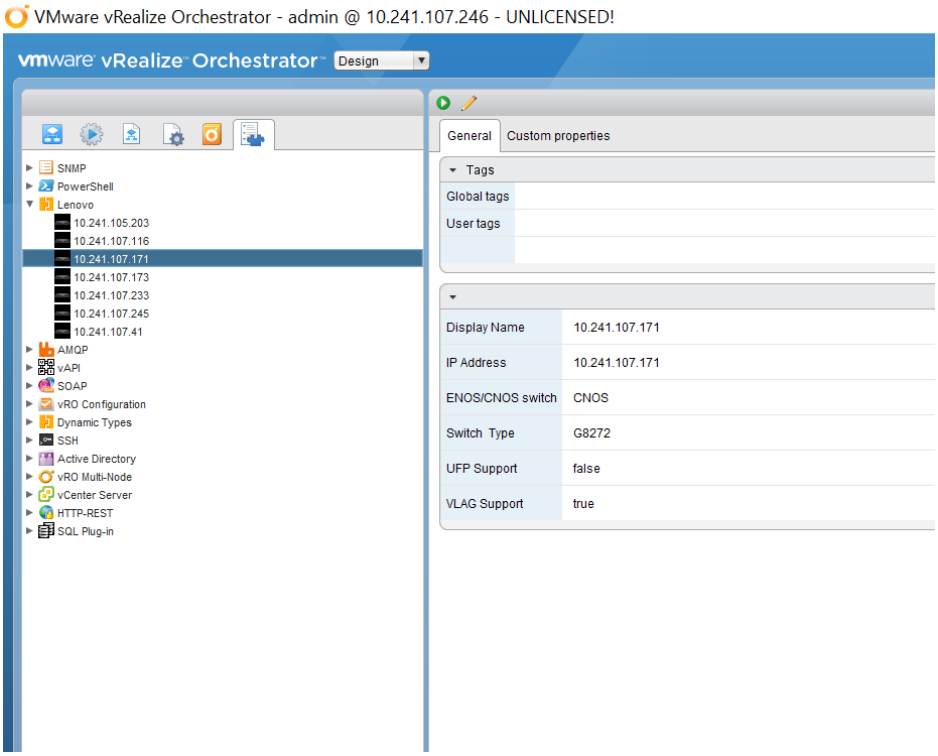
Registered switches are now associated with inventory objects. Inventory objects are found under the `Inventory` tab (highlighted below) in the vRO Console application.



Under the `Inventory` tab, there is a list of inventory objects for the registered Lenovo switches.

When you register a switch for the first time, a new inventory Switch Object gets added with the following attributes:

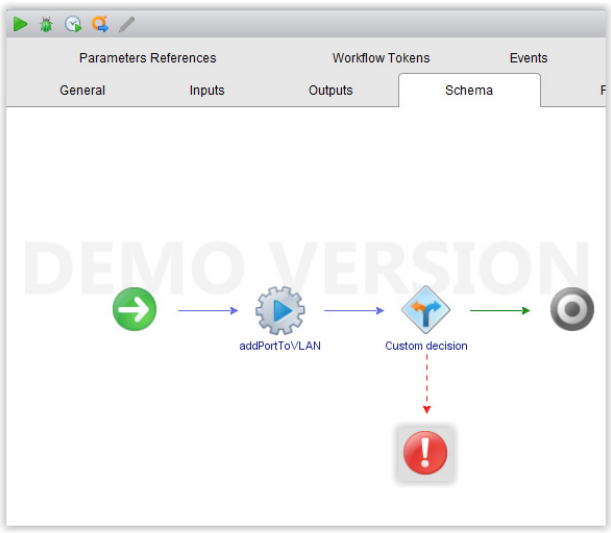
- IP address
- Switch type
- Operating system - ENOS or CNOS
- UFP support flag, indicating if the switch supports UFP or not
- VLAG support flag, indicating if the switch supports vLAG or not



Note: Cloud NOS 10.4 does not support UFP.

Schema Changes

Failure results are depicted in the schema with an exclamation point, as shown below.



Chapter 2. Plug-in Installation

To install or update the plug-in follow the steps described below:

Prerequisites

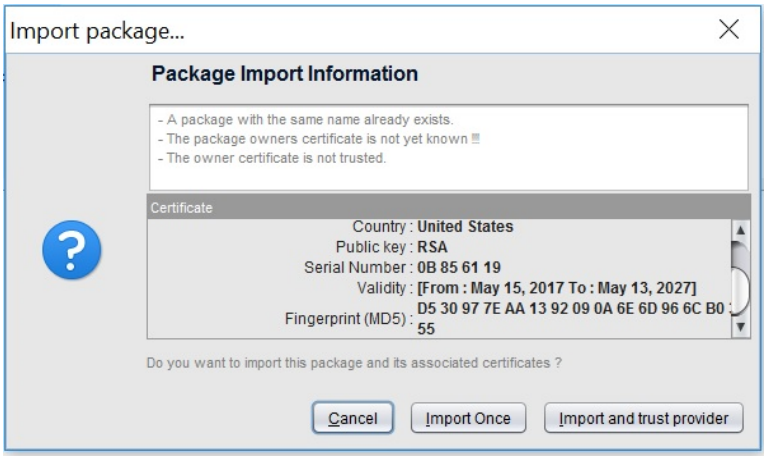
1. Install VMware vRealize Orchestrator 7.2.0.
2. Download the Lenovo Networking Plug-in for VMware vRealize Orchestrator from any of the following:
   - VMware Solution Exchange website
   - Lenovo Support Portal

Package Installation

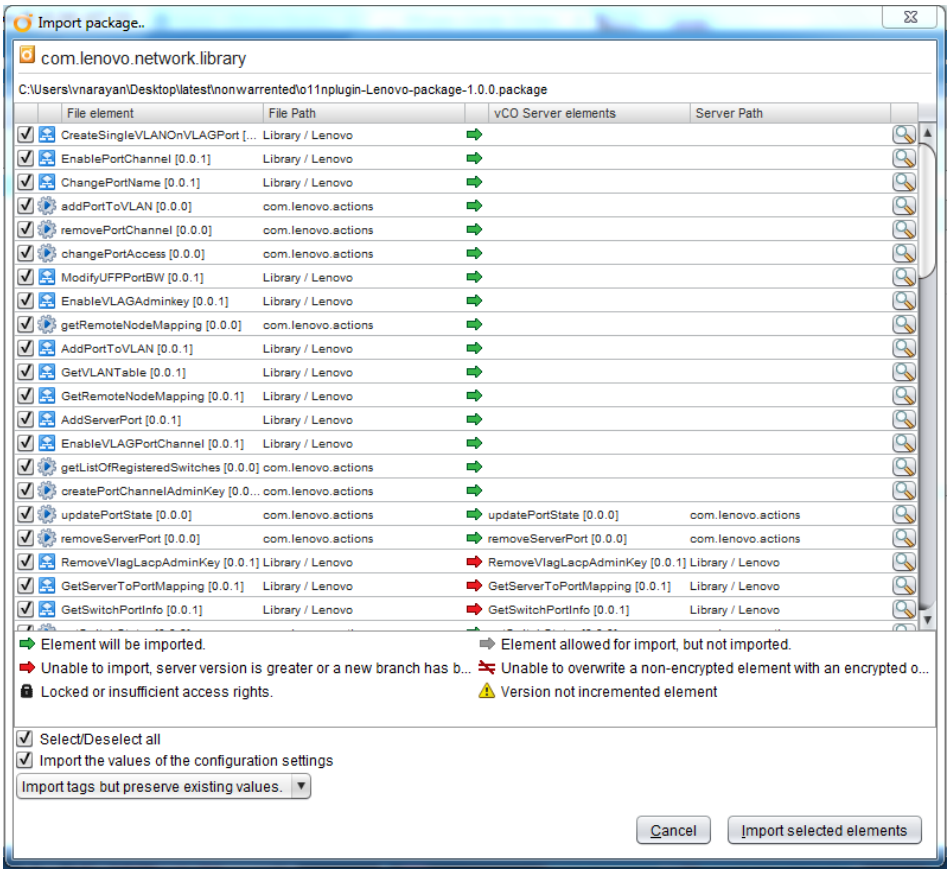
The following package installation instructions are also available on the VMware vRealize Orchestrator Documentation website.

The procedure below has to be followed only the first time when the vRealize Orchestrator (vRO) plug-in is installed on the vRO Virtual Machine (VM) so that the certificate is registered. Subsequently, the package is installed automatically when updating the plug-in.

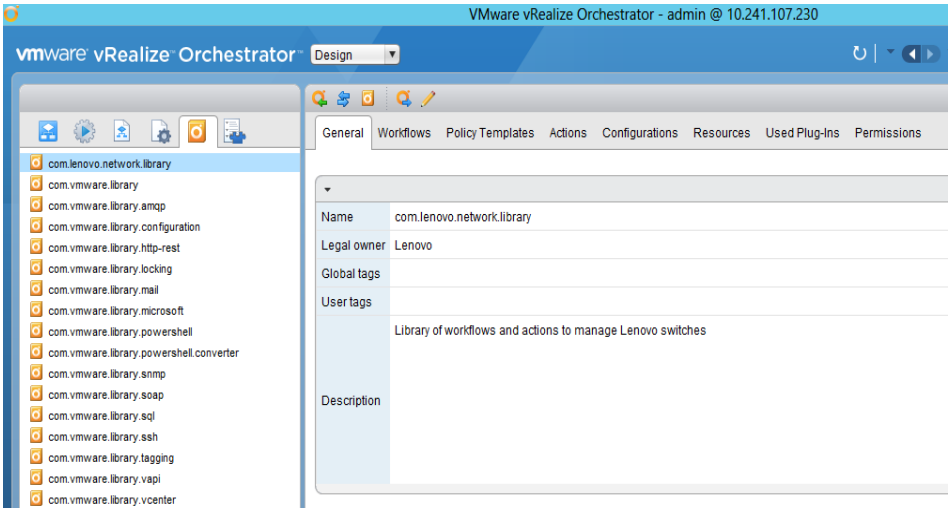
1. Log into the vRO Client.
2. Go to the **Design** mode.
3. Go to **Packages** tab.
4. Right-click on the open space present on the left side of the tab. A menu is then displayed.
5. Click on the **import package** option. Choose the .package file included with the plug-in and click **Open** button and then import all the actions and workflows into vRealize Orchestrator.



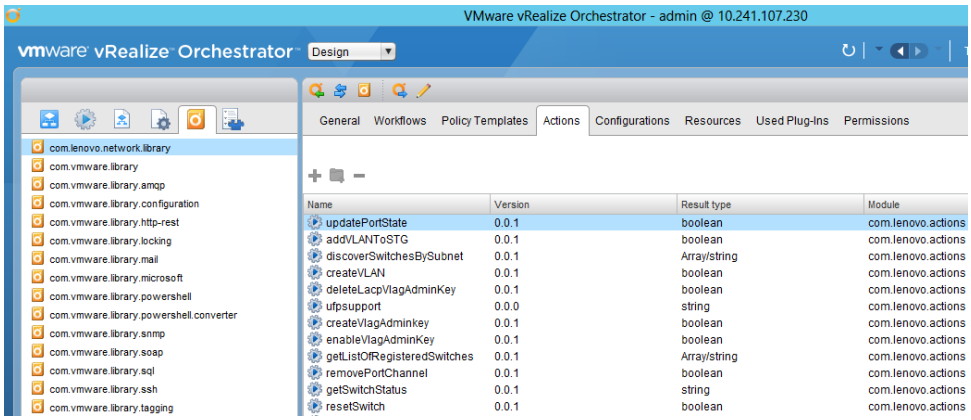
6. Check **Select/Deselect All** box to ensure all Actions get selected.



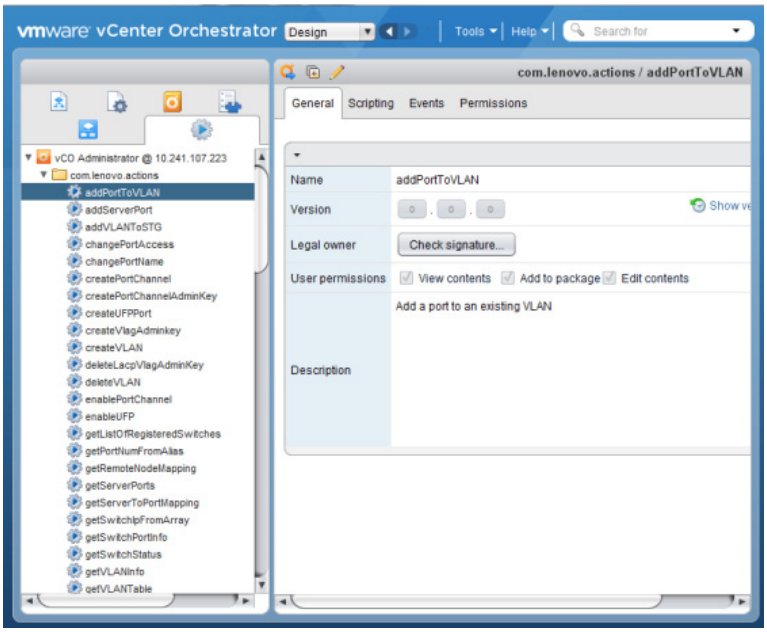
7. After this step, the package that is imported will be shown in the **packages** tab. Click on the package **com.lenovo.network.library** and see the actions and workflows listed on the right side.



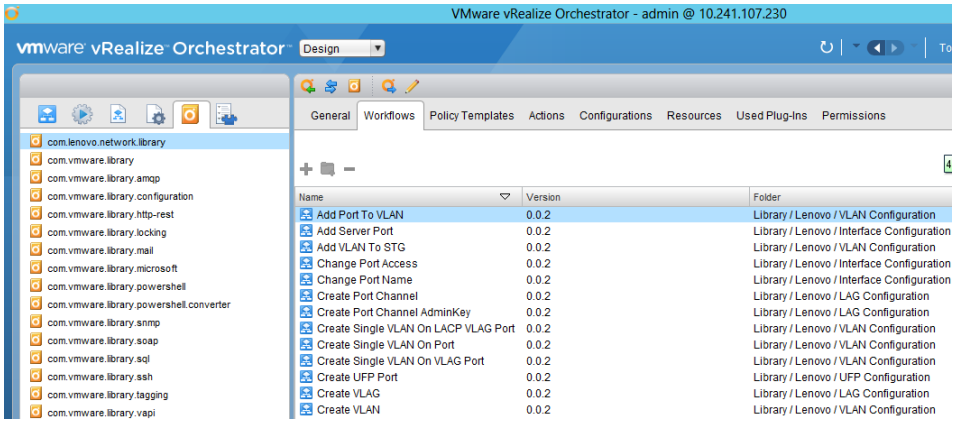
8. Verify if the package contents are properly installed after the import is over. Click on the **Actions** tab in the right panel.



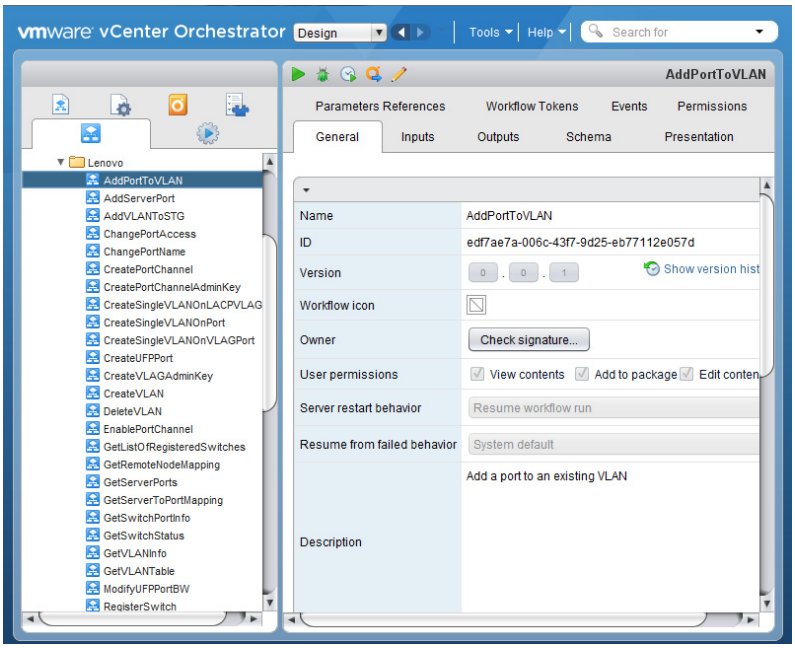
9. Click on the **Actions** tab in the left panel and expand the **com.lenovo.actions** folder to view the imported actions.



10. Click on the **Workflows** tab in the right panel.



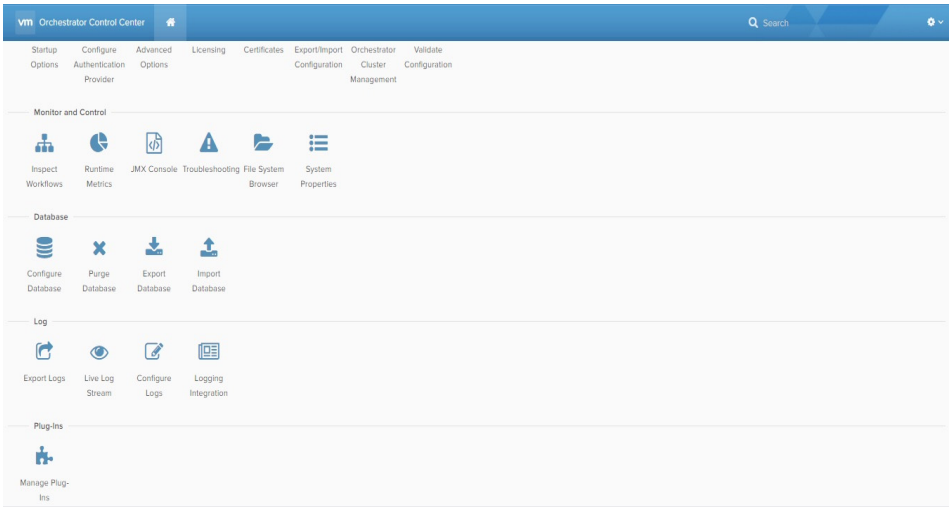
11. Click on the **Workflows** tab in the left panel and expand the **Lenovo** folder to view the imported workflows.



Plug-in Installation

The following plug-in installation instructions are also available on the VMware vRealize Orchestrator Documentation website.

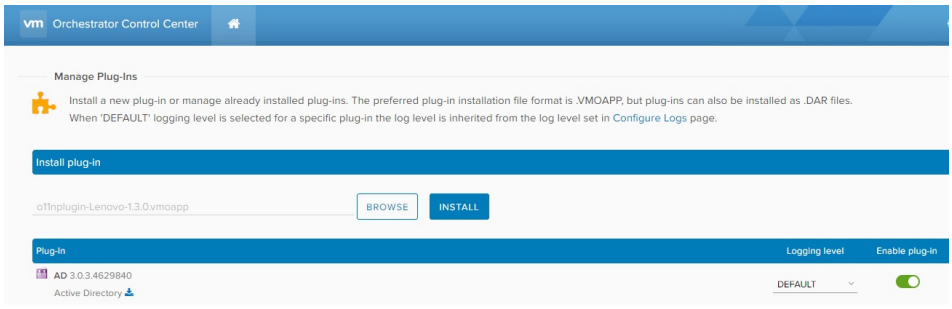
1. Log into the vRealize Orchestrator Control Center Page.



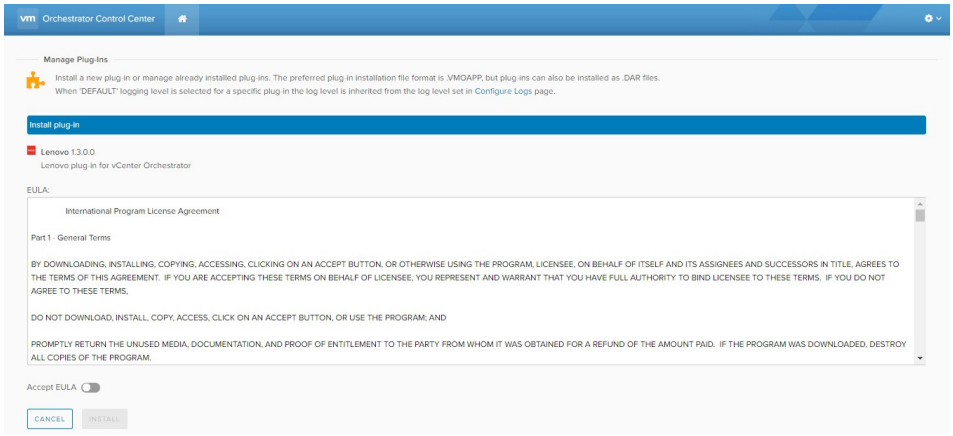
2. *Lenovo Networking Plug-in* for VMware vRealize Orchestrator is provided as a VMware vCenter Orchestrator application (.vmoapp) file. Use the **Manage Plug-ins** tab on the Control Center Page to install the plug-in.

3. In the Install new plug-in area, click on the **browse** icon. Navigate to the folder where you have saved the .vmoapp file and select it. Then click **Open**.

4. Click **Upload and Install**.



5. Agree to the license terms. Depending whether you are installing the free, non-warranted plug-in or the for-fee, warranted plug-in the license that is displayed will be different.

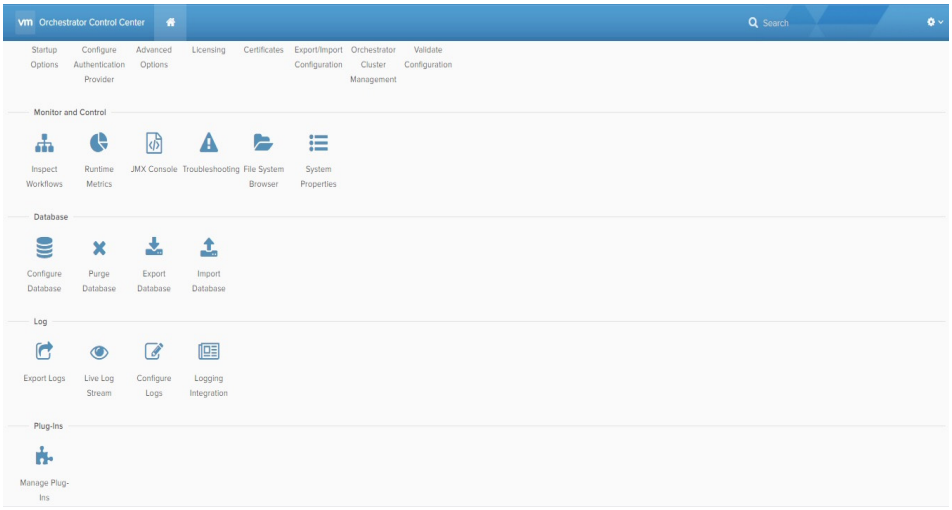


The *Lenovo Networking Plug-in* for VMware vRealize Orchestrator is installed.

Plug-in Activation

To activate the *Lenovo Networking Plug-in* for VMware vRealize Orchestrator, use the following steps:

1. Log into the vCenter Orchestrator Control Center page.



2. To activate the plug-in, select **Startup Options** on the left pane. Depending on whether the service has already started or not, the **Restart Service** or the **Start Service** option appears respectively. Click on the available option.

   The *Lenovo Networking Plug-in* for VMware vRealize Orchestrator is activated.

Plug-in Uninstallation

To uninstall the plug-in follow the steps described below:

1. Navigate to one of the following directories:
   - `/usr/lib/vco/app-server/plugins`
   - `/var/lib/vco/app-server/plugins`
2. Remove the `o11nplugin-Lenovo.dar` file.
3. Restart the servers.

The *Lenovo Networking Plug-in* for VMware vRealize Orchestrator is uninstalled.

Note: Instructions for general plug-in uninstallation provided by the VMware Knowledge Base can be found here:

Uninstalling a plug-in from VMware vRealize Orchestrator 5.5 and later

Chapter 3. Using the Plug-in

To start using the Lenovo Networking Plug-in, run and log into the vRealize Orchestrator (vRO) Client. The client allows you to run and schedule workflows, manage user permissions, and more. The client also enables you to develop workflows and actions.

For more information about using the vRO Client, refer to the following document on the vRealize Orchestrator Documentation page:

- Using the VMware vRealize Orchestrator Client

The client has three views:

- **Run** - Provides features that enable you to run and schedule workflows
- **Design** - Provides features that enable you to develop actions and workflows
- **Administer** - Provides features that enable you to manage users, packages etc.

Lenovo Networking Plug-in provides a diversity of Actions and Workflows.

Actions typically are individual tasks that have a single result and can be used to build Workflows.

Workflows typically provide a task or process that may involve many actions, decisions and results. A Workflow is a series of actions and decisions that you run sequentially. The vRealize Orchestrator provides a library of workflows that perform common management tasks according to best practices.

Actions

The following table lists all the Actions implemented by the Lenovo Networking Plug-in. In addition, a corresponding Workflow for each Action is provided. An Action begin with a lower case letter, whereas its corresponding Workflow begins with an upper case letter.

Table 1. *Actions*

OS Support	Action Name	Action Description
ENOS and CNOS	addPortToVLAN	Adds a port to an existing VLAN
ENOS	addServerPort	Designates a port on a RackSwitch as an server port
ENOS and CNOS	addSwitch	Inventory Objects (vRO)
ENOS and CNOS	addVLANToSTG	Adds a VLAN to a specific STG
ENOS and CNOS	changePortAccess	Changes the port mode of a switch interface to access or trunk
ENOS and CNOS	changePortName	Configures a custom name for a switch port for easy reference
CNOS	cnosRegisterswitch	Registers a switch running CNOS
ENOS and CNOS	createPortchannel	Creates a LAG (portchannel) on a set of ports
ENOS	createPortchannelAdminKey	Configures the LAG (portchannel) admin key
CNOS	createPortchannelCnos	Creates a LACP portchannel (LAG)
ENOS and CNOS	createSingleVLANOnLACP VLAGPort	Creates a VLAN on a switch based on the server MAC address and VLAN ID - the server port on the switch must belong to a LACP portchannel (LAG)
ENOS and CNOS	createSingleVLANOnPort	Creates a VLAN on a switch based on the server MAC address and VLAN ID
ENOS and CNOS	createSingleVLANOnVLAG Port	Creates a VLAN on a switch based on the server MAC address and VLAN ID - the server port on the switch must belong to a static LAG (portchannel)
ENOS	createUFPPort	Enables a specific UFP port

Table 1. *Actions*

OS Support	Action Name	Action Description
ENOS	createVLAGAdminkey	Configures the vLAG admin key
ENOS and CNOS	createVLAN	Creates a new VLAN on a switch
ENOS	deleteLACPVLAGAdminKey	Removes a vLAG portchannel (LAG) from a specific switch port
ENOS and CNOS	deleteVLAN	Removes an existing VLAN from a switch
ENOS and CNOS	discoverSwitchesByRange	Discovers network devices in the specified IP address range and returns their IP addresses, sysObjectID, sysDesc, and sysName if accessible via SNMP **Notes:** • The SNMP version must be specified as snmpv1, snmpv2, or snmpv3 • readCommunity and writeCommunity must be public or private • Range must have no more than 256 IP addresses, otherwise an error status is returned
ENOS and CNOS	discoverSwitchesBySubnet	Discovers devices in the specified subnet and returns their IP addresses, sysObjectID, sysDesc, and sysName if accessible via SNMP **Notes:** • SNMP version must be specified as snmpv1, snmpv2, or snmpv3 • readCommunity and writeCommunity must be public or private • Range must have no more than 256 IP addresses, otherwise an error status is returned
CNOS	downloadimage	Downloads a firmware image
ENOS	enablePortchannel	Enables the LAG (portchannel)

Table 1. *Actions*

OS Support	Action Name	Action Description
ENOS	enableUFP	Globally enables UFP on the switch
ENOS	enableVLAGAdminKey	Enables the vLAG admin key
ENOS and CNOS	enableVLAGPortChannel	Enables the vLAG portchannel (LAG)
ENOS and CNOS	getDeviceType	Identifies the type of network OS used by the switch - ENOS or CNOS
ENOS and CNOS	getLastTransferStatus	Returns the human readable string of the results of the last transfer action
ENOS and CNOS	getListOfRegisteredSwitches	Returns the list of registered switches within the vRO management domain
ENOS and CNOS	getMultipleServertoPortMapping	Determines which switches and which of their ports are connected to multiple servers
ENOS	getPortNumFromAlias	Returns the port numbers for the specified alias
ENOS and CNOS	getRemoteNodeMapping	Returns the remote system information for the specified port
ENOS	getServerPorts	Returns the list of active ports which are also server ports
ENOS and CNOS	getServerToPortMapping	Determines if a switch and one of its ports are connected to the specified server
ENOS and CNOS	getSwitchInfo	Returns various information about the switch
ENOS and CNOS	getSwitchIpFromArray	Returns the IP address of a switch
ENOS and CNOS	getSwitchPortInfo	Returns detailed information about a specific port
ENOS and CNOS	getSwitchStatus	Returns the value of the Global Health Status of the switch
ENOS and CNOS	getVLANInfo	Returns detailed information about a specific VLAN
ENOS and CNOS	getVLANTable	Returns the list of VLANs configured on a switch

Table 1. *Actions*

OS Support	Action Name	Action Description
ENOS and CNOS	macAddressArrayValidation	Validates the address format of an array of MAC addresses
ENOS and CNOS	macAddressValidation	Validates the address format of a single MAC address
ENOS	modifyUFPPortBW	Modifies the parameters of a UFP port
ENOS and CNOS	registerSwitch	Adds switches to the vRO management domain using the switch's IPv4 address and credentials **Notes:** • SNMP version must be specified as snmpv1, snmpv2, or snmpv3 • readCommunity and writeCommunity must be public or private
ENOS and CNOS	removePortchannel	Removes the specified LAG (portchannel)
ENOS	removePortchannelAdminKey	Removes the static ID assignment from a LACP portchannel
ENOS and CNOS	removePortFromVLAN	Removes a port from a VLAN
ENOS and CNOS	removePortsFromPortchannel	Removes ports from the LAG (portchannel)
ENOS	removeServerPort	Removes a port on a RackSwitch from being a server port
ENOS and CNOS	removeSwitch	Inventory Objects (vRO)
ENOS and CNOS	removeVLANFromSTG	Removes a VLAN from a specified STG
ENOS and CNOS	resetSwitch	Reloads the switch
ENOS and CNOS	saveConfiguration	Saves the running configuration over the startup configuration
ENOS	setSwitchDetails	Sets the SNMP credentials used for the communication with the switch

Table 1. *Actions*

OS Support	Action Name	Action Description
ENOS and CNOS	ufpSupport	Validates UFP support for the specified switch based on the Inventory Object flag
ENOS and CNOS	updatePortState	Administratively enables or disables a switch port
ENOS	updateSwitch	Updates the switch with a new firmware image
ENOS and CNOS	validation	Validates switch availability based on the Inventory Object flag
ENOS and CNOS	vlagSupportValidation	Validates vLAG support for the specified switch based on the Inventory Object flag

Workflows

Workflows consists of a schema, attributes, and input parameters. The Workflow schema: is the main component of a workflow as it defines all the workflow elements and the logical connections between them. The workflow attributes and parameters are the variables that workflows use to transfer data. vRealize Orchestrator saves a workflow token every time a workflow runs, recording the details of that specific run of the workflow.

The vRO Client allows you to run and schedule workflows on selected objects from your vRealize Inventory.

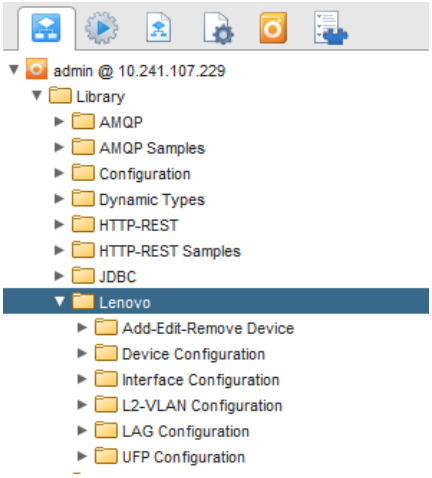
Most workflows require a certain set of input parameters to run. An input parameter is an argument that the workflow processes when it starts. The user, an application, or another workflow or action passes input parameters to a workflow, for the workflow to process when it starts. For example, if a workflow registers a switch, the workflow requires input parameter as the IP address or hostname of the switch.

The output parameters of a workflow represent the result from the workflow's execution. For example, if a workflow registers a switch, then the output parameter is the resulting IP registration success log.

When you start a workflow in the vRO Client, the client loads the workflow presentation, where you provide input parameters required to delivered the desired results for the workflow.

The Workflows provided by the Lenovo Networking Plug-in are arranged in folders in the order of steps followed for switch configuration:

- Add-Edit-Remove Device
- Device Configuration
- Interface Configuration
- L2-VLAN Configuration
- LAG Configuration
- UFP Configuration



Add-Edit-Remove Device

The **Add-Edit-Remove Device** folder has workflows to register (add), unregister (remove), and discover (IP/Subnet) network devices.

- **Discover Switches by Range**: Discovers switches on your network that are in a specific IP range
- **Discover Switches by Subnet**: Discovers switches on your network that are in a specific subnet
- **Register Switch**: Adds switches to the vRO management domain (Inventory Object)
- **Get List of Registered Switches**: Returns the list of registered switches on the vRO Management Domain
- **Set Switch Details**: Configures the SNMP (ENOS) and Login (CNOS) credentials used for the communication with a switch
- **Unregister Switch**: Removes registered switches from the vRO management domain

Discover Switches by Range

Discovers switches on your network that are in a specific IP range.

- Supported Network OS:
  - ENOS
  - CNOS
- Associated actions: discoverSwitchesbyRange
- Inputs:

Input	Field Type	Format/Options	Related Inputs
Starting IP Address	Text	Valid IPv4 Address	Switch OS
Ending IP Address	Text	Valid IPv4 Address	Switch OS
Time Out	Text	Milliseconds	Switch OS
Switch OS	Drop-down	ENOS	SNMP Version
		CNOS	Username
			Password
SNMP Version	Drop-down	SNMPv1	Read Community
			Write Community
		SNMPv2c	Read Community
			Write Community
		SNMPv3	Privacy Password
			Privacy Protocol
			Authentication Password
			Authentication Protocol
			User Name
Username	Text	Switch Username	Switch OS --> CNOS
Password	Text	Switch Password	Switch OS --> CNOS
Read Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c
Write Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c
Privacy Password	Text	SNMPv3 Privacy Password	Switch OS --> ENOS --> SNMPv3

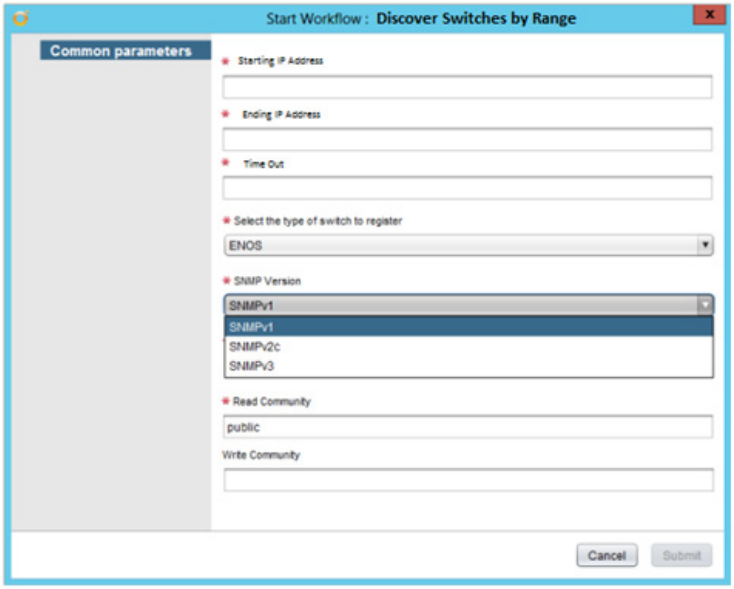
Input	Field Type	Format/Options	Related Inputs
Privacy Protocol	Drop-down	DES	Switch OS --> ENOS --> SNMPv3
		AES	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
Authentication Password	Text	SNMPv3 Authentication Password	Switch OS --> ENOS --> SNMPv3
Authentication Protocol	Drop-down	MD5	Switch OS --> ENOS --> SNMPv3
		SHA	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
User Name	Text	SNMPv3 User Name	Switch OS --> ENOS --> SNMPv3

- Output:

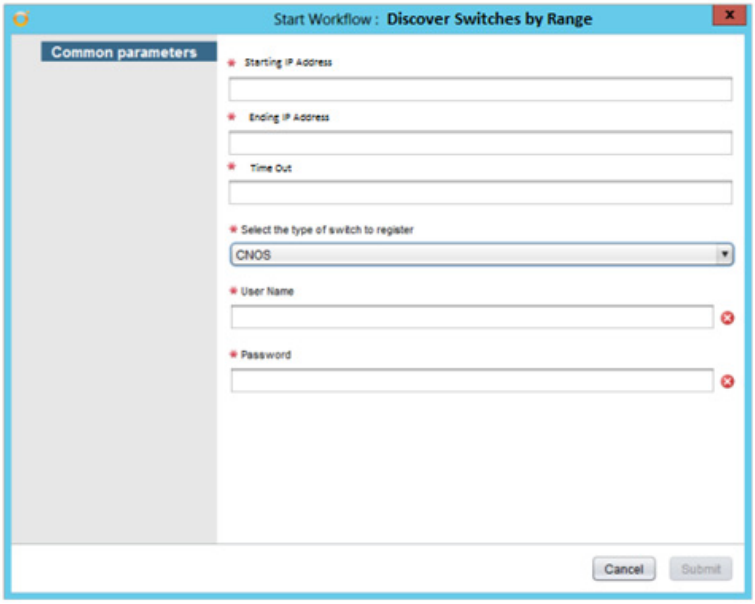
  Verify logs after workflow run is complete - returns available IP address with:

  - uboot, active, and standby image versions with time of download for switches running CNOS
  - SNMP OID and switch model for switches running ENOS
  - unavailable IP address as false

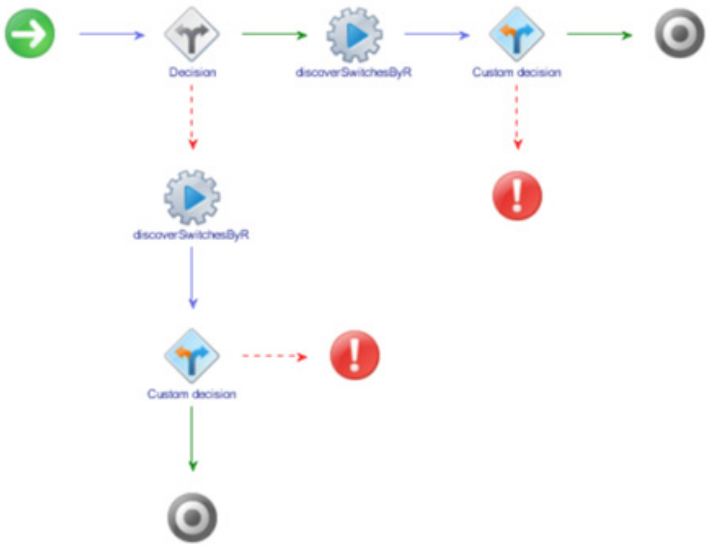
- Input fields:
  - ENOS



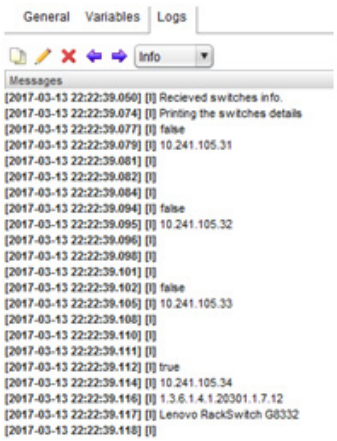
- CNOS



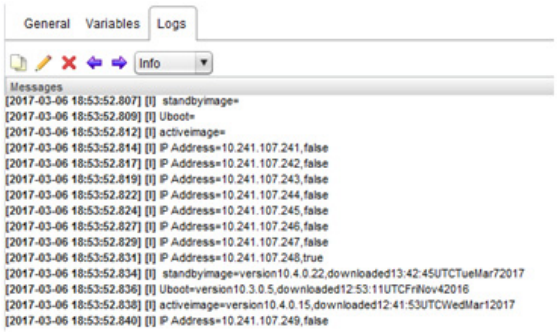
- Workflow schema:



- Workflow outputs:
  - ENOS



  - CNOS



Discover Switches by Subnet

Discovers switches on your network that are in a specific subnet.

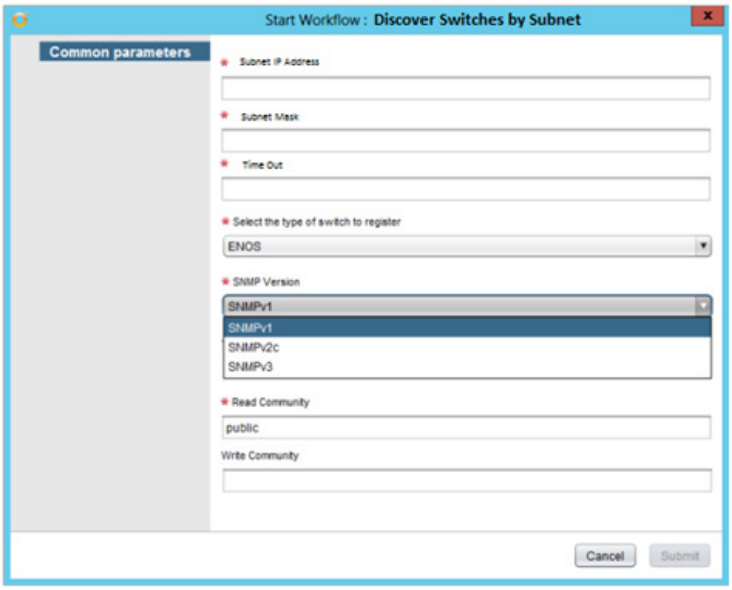
- Supported Network OS:
  - ENOS
  - CNOS
- Associated actions: discoverSwitchesbySubnet
- Inputs:

Input	Field Type	Format/Options	Related Inputs
Subnet IP Address	Text	Valid IPv4 Address	Switch OS
Subnet Mask	Text	Valid IPv4 subnet mask	Switch OS
Time Out	Text	Milliseconds	Switch OS
Switch OS	Drop-down	ENOS	SNMP Version
		CNOS	Username
			Password
SNMP Version	Drop-down	SNMPv1	Read Community
			Write Community
		SNMPv2c	Read Community
			Write Community
		SNMPv3	Privacy Password
			Privacy Protocol
			Authentication Password
			Authentication Protocol
			User Name
Username	Text	Switch Username	Switch OS --> CNOS
Password	Text	Switch Password	Switch OS --> CNOS
Read Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c
Write Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c
Privacy Password	Text	SNMPv3 Privacy Password	Switch OS --> ENOS --> SNMPv3

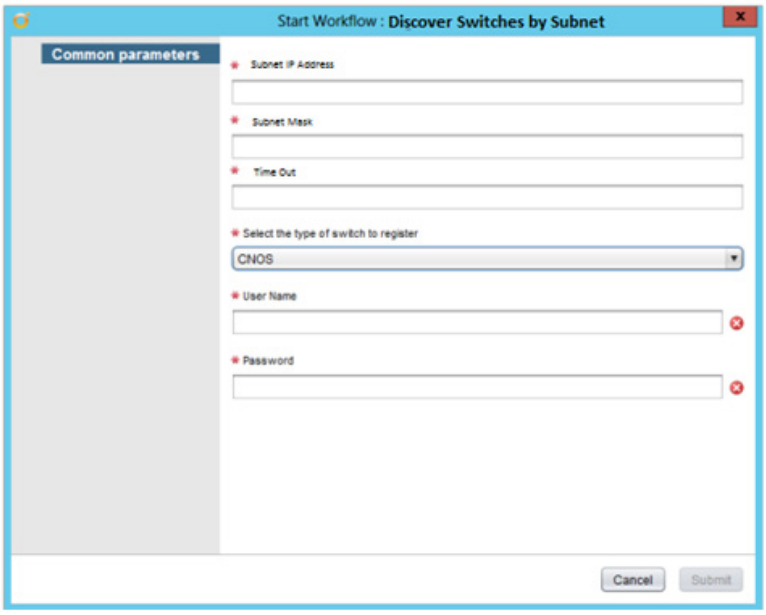
Input	Field Type	Format/Options	Related Inputs
Privacy Protocol	Drop-down	DES	Switch OS --> ENOS --> SNMPv3
		AES	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
Authentication Password	Text	SNMPv3 Authentication Password	Switch OS --> ENOS --> SNMPv3
Authentication Protocol	Drop-down	MD5	Switch OS --> ENOS --> SNMPv3
		SHA	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
User Name	Text	SNMPv3 User Name	Switch OS --> ENOS --> SNMPv3

- Output:

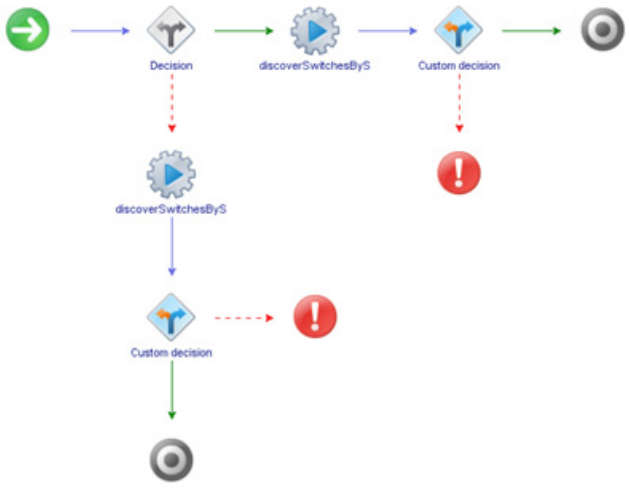
  Verify logs after workflow run is complete - returns available IP address with:
  - uboot, active, and standby image versions with time of download for switches running CNOS
  - SNMP OID and switch model for switches running ENOS
  - unavailable IP address as false
- Input fields:
  - ENOS



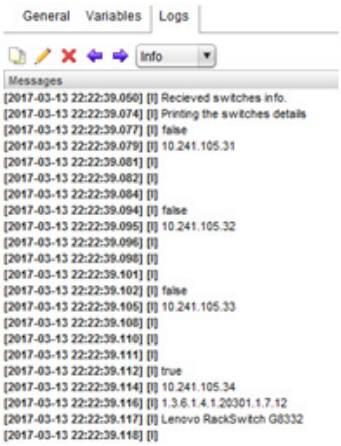
- CNOS



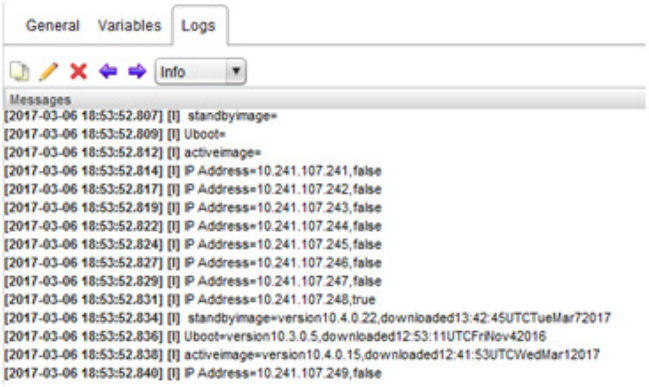
- Workflow schema:



- Workflow outputs:
  - ENOS



  - CNOS



Register Switch

Adds switches to the vRO management domain.

- Supported Network OS:
  - ENOS
  - CNOS
- Associated actions:
  - addSwitch
  - registerSwitch
  - cnosRegisterSwitch
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Text	Valid IPv4 Address	Switch OS
Switch OS	Drop-down	ENOS	SNMP Version
		CNOS	Username
			Password
SNMP Version	Drop-down	SNMPv1	Read Community
			Write Community
		SNMPv2c	Read Community
			Write Community
		SNMPv3	Privacy Password
			Privacy Protocol
			Authentication Password
			Authentication Protocol
			User Name
Username	Text	Switch Username	Switch OS --> CNOS
Password	Text	Switch Password	Switch OS --> CNOS
Read Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c
Write Community	Text	Public	Switch OS --> ENOS --> SNMPv1
			Switch OS --> ENOS --> SNMPv2c

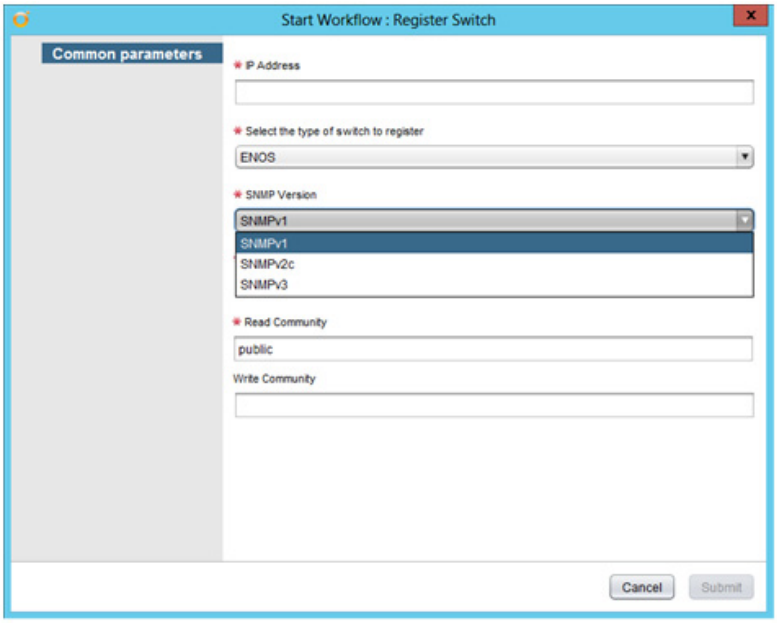
Input	Field Type	Format/Options	Related Inputs
Privacy Password	Text	SNMPv3 Privacy Password	Switch OS --> ENOS --> SNMPv3
Privacy Protocol	Drop-down	DES	Switch OS --> ENOS --> SNMPv3
		AES	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
Authentication Password	Text	SNMPv3 Authentication Password	Switch OS --> ENOS --> SNMPv3
Authentication Protocol	Drop-down	MD5	Switch OS --> ENOS --> SNMPv3
		SHA	Switch OS --> ENOS --> SNMPv3
		none	Switch OS --> ENOS --> SNMPv3
User Name	Text	SNMPv3 User Name	Switch OS --> ENOS --> SNMPv3

- Output:

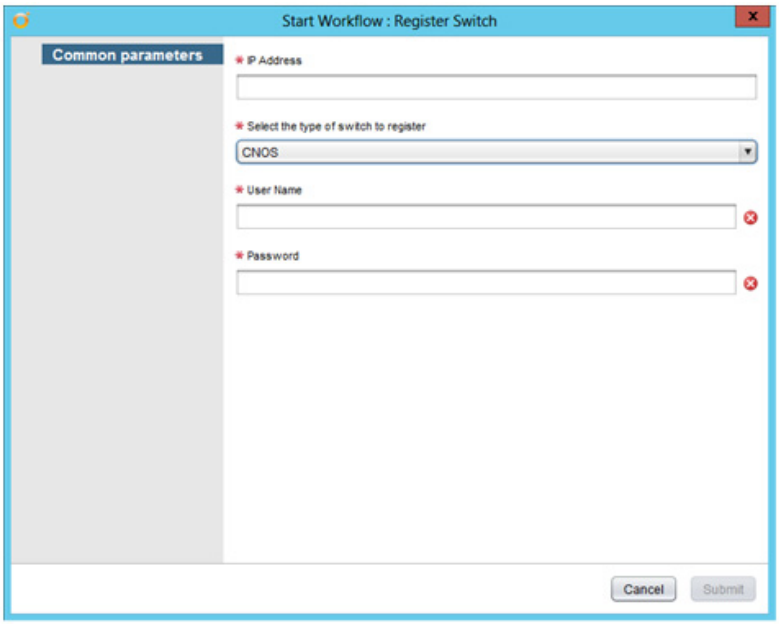
  Verify logs after workflow run is complete

  Verify Inventory Objects tab for successful addition:
  - attribute 1: Switch OS - ENOS or CNOS
  - attribute 2:
  - attribute 3: UFP support - true or false
  - attribute 4: vLAG support - true or false

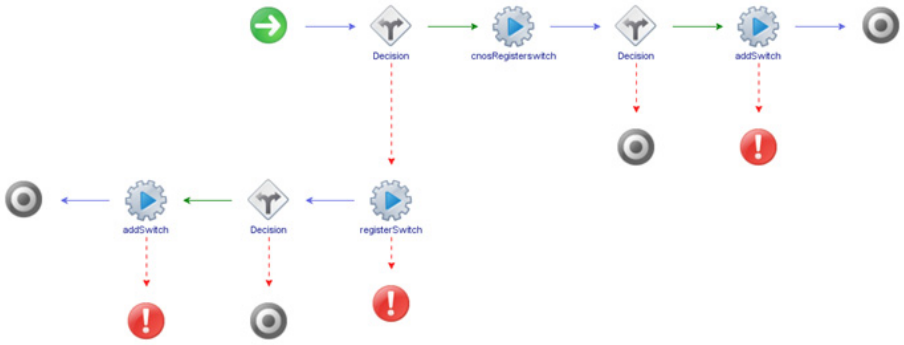
- Input fields:
  - ENOS



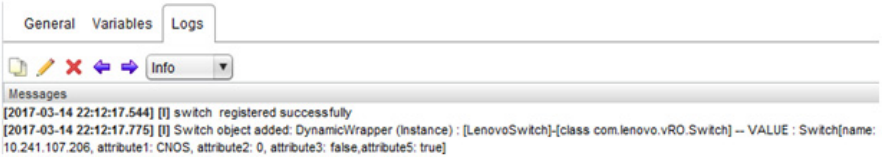
  - CNOS



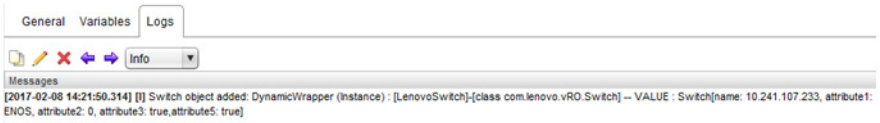
- Workflow schema:



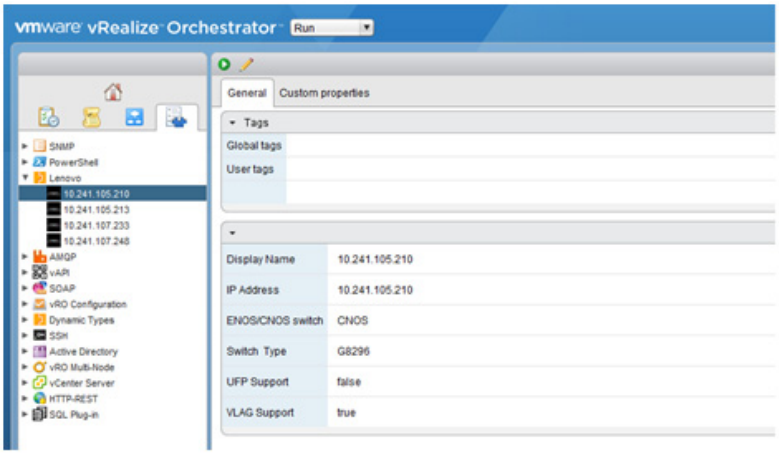
- Workflow outputs:
  - ENOS



  - CNOS



- Inventory Object:

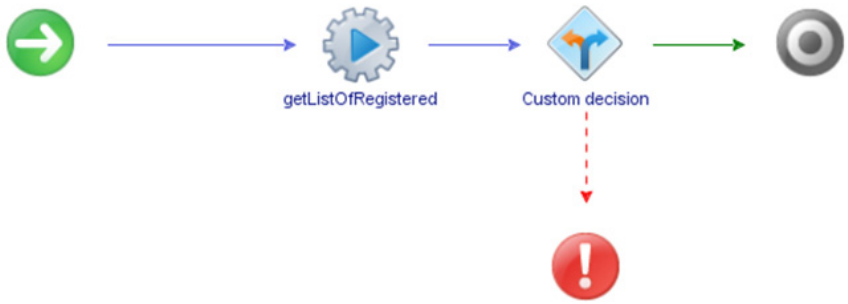


Get List of Registered Switches

Returns the list of registered switches on vRO management domain.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getListofRegisteredSwitches
- Output:

  Verify logs after workflow run is complete
  - SwitchType = <*marketing product name/model*>
  - SwitchIP - Management IP address
- Workflow schema:



- Workflow output:

Set Switch Details

Configures the SNMP (ENOS) and login (CNOS) credentials used for the communication with the switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Associated actions: setSwitchDetails
- Inputs:

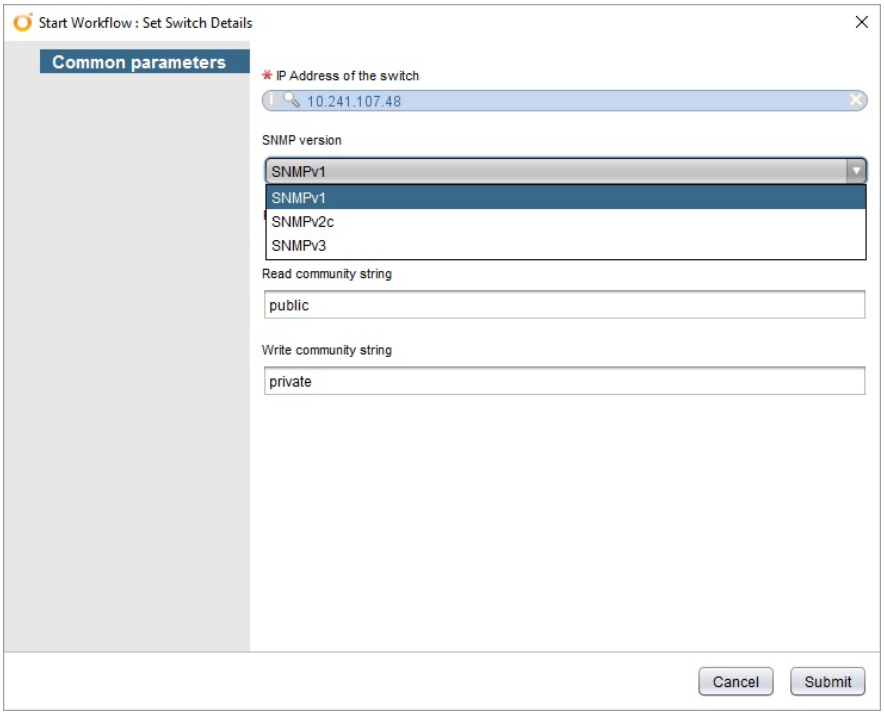
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
SNMP Version	Drop-down	SNMPv1	Read Community
			Write Community
		SNMPv2c	Read Community
			Write Community
		SNMPv3	Privacy Password
			Privacy Protocol
			Authentication Password
			Authentication Protocol
			User Name
Username	Text	Switch Username	Registered Switch is CNOS
Password	Text	Switch Password	Registered Switch is CNOS
Read Community	Text	Public	Registered Switch is ENOS
Write Community	Text	Public	Registered Switch is ENOS
Privacy Password	Text	SNMPv3 Privacy Password	Registered Switch is ENOS
Privacy Protocol	Drop-down	DES	Registered Switch is ENOS
		AES	Registered Switch is ENOS
		none	Registered Switch is ENOS
Authentication Password	Text	SNMPv3 Authentication Password	Registered Switch is ENOS

Input	Field Type	Format/Options	Related Inputs
Authentication Protocol	Drop-down	MD5	Registered Switch is ENOS
		SHA	Registered Switch is ENOS
		none	Registered Switch is ENOS
User Name	Text	SNMPv3 User Name	Registered Switch is ENOS

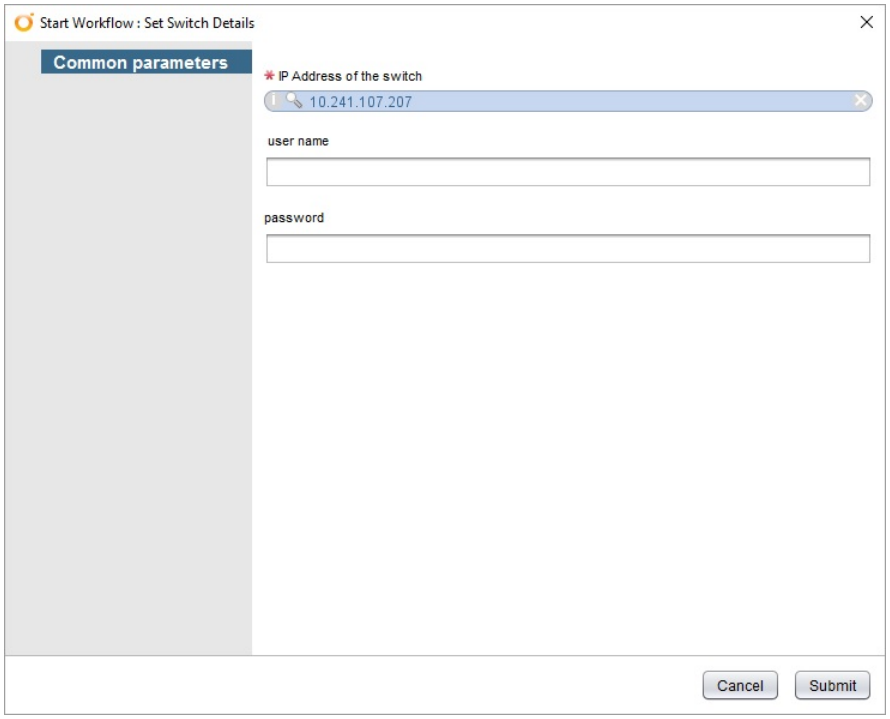
- Output:

  Verify logs after workflow run is complete

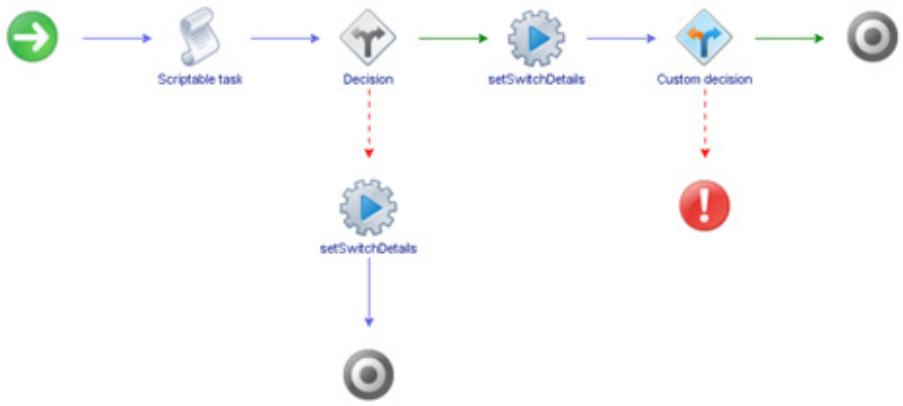
- Input fields:
  - ENOS



- CNOS



- Workflow schema:



- Workflow outputs:
  - ENOS

  - CNOS

Unregister Switch

Remove registered switches from the vRO management domain.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: removeSwitch
- Inputs:

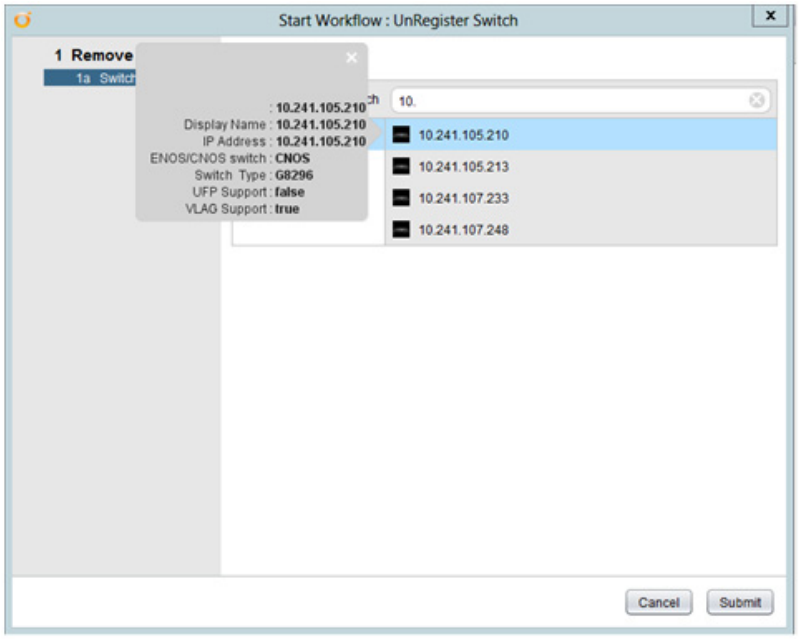
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None

- Output:

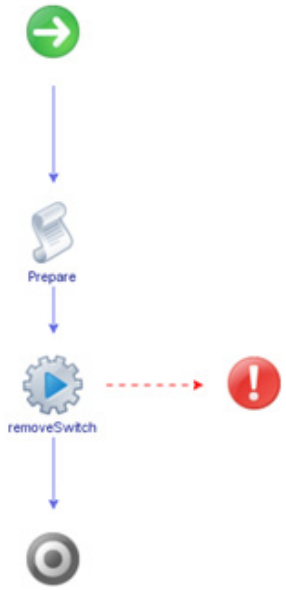
  Verify logs after workflow run is complete

  Verify Inventory Objects tab for successful removal

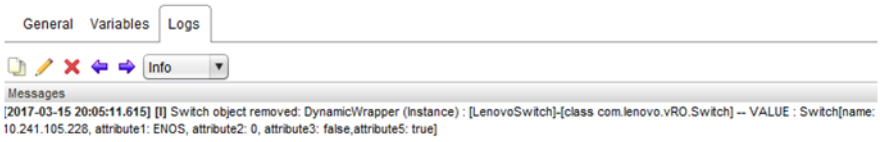
  Verify device_*data.xml* file to on vRO VM to validate successful removal of switch
  - attribute 1: switch OS - ENOS or CNOS
  - attribute 2:
  - attribute 3: UFP support - true or false
  - attribute 4: vLAG support - true or false
- Input fields:



- Workflow schema:



- Workflow outputs:
  - ENOS



  - CNOS

Device Configuration

The **Device Configuration** folder has workflows for the initial configuration of switches, firmware upgrades, switch discovery, and returning switch information.

- **Get Last Transfer Status**: Returns the human readable string of the results of the last transfer action (e.g. updateSwitch)
- **Get Switch Info**: Returns switch information, including firmware version and switch model
- **Get Switch Port Info**: Returns information about a specific switch port
- **Get Switch Status**: Returns switch health status
- **Reset Switch**: Reloads the switch
- **Save Configuration**: Saves the running configuration over the startup configuration
- **Update Switch**: Updates the switch firmware

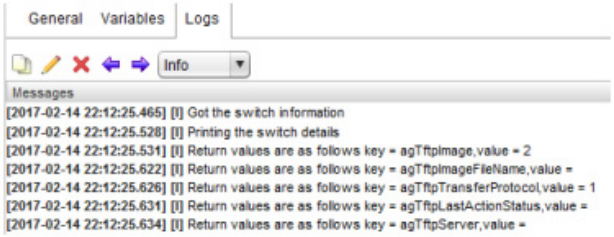
Get Last Transfer Status

Retrieves the human readable string of the results of the last transfer action (for example, updateSwitch).

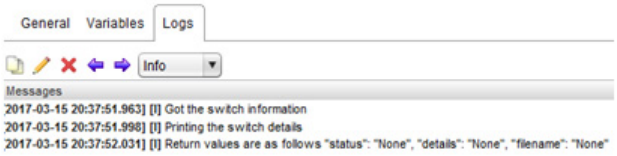
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getLastTransferStatus
- Output:

  Verify logs after workflow run is complete
- Workflow schema:

- Workflow output:
  - ENOS



  - CNOS



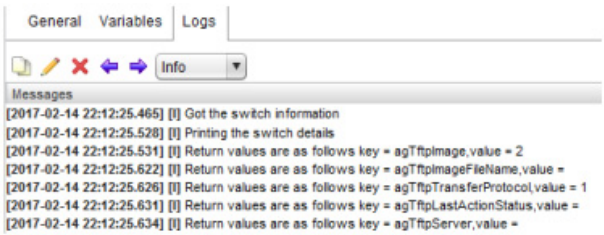
Get Switch Info

Returns switch information, such as firmware version and switch model.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getSwitchInfo
- Output:

  Verify logs after workflow run is complete
  - uboot, active, and standby image versions with time of download for switches running CNOS
  - boot, image1, image2 versions, bridge MAC address, configuration on next boot, image (1 or 2) for next boot, downloaded time of images for switches running ENOS
- Workflow schema:

- Workflow output:
  - ENOS



  - CNOS

Get Switch Port Info

Returns information about a specific port on a switch.

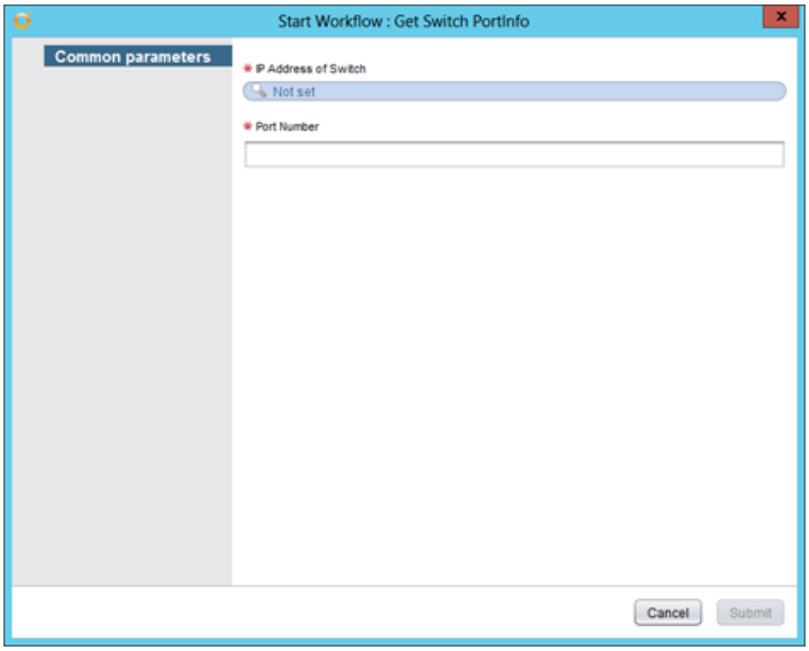
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getSwitchPortInfo
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text/Number	CNOS: ethernet"chassis/port" (for example, *ethernet1/15*)	Switch OS
		ENOS: portnumber (for example, *15*)	

- Output:

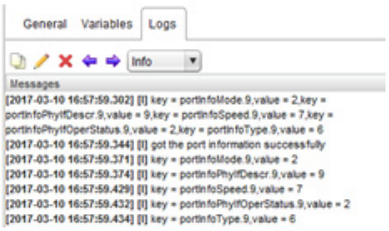
  Verify logs after workflow run is complete

- Input fields:

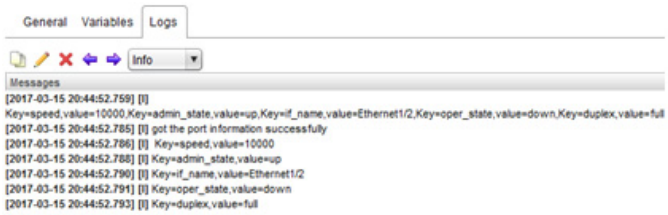


- Workflow schema:

- Workflow output:
  - ENOS



  - CNOS



Get Switch Status

Returns switch health status.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getSwitchStatus
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None

- Output:

  Verify logs after workflow run is complete
  - critical
  - normal
- Workflow schema:

- Workflow output:

Reset Switch

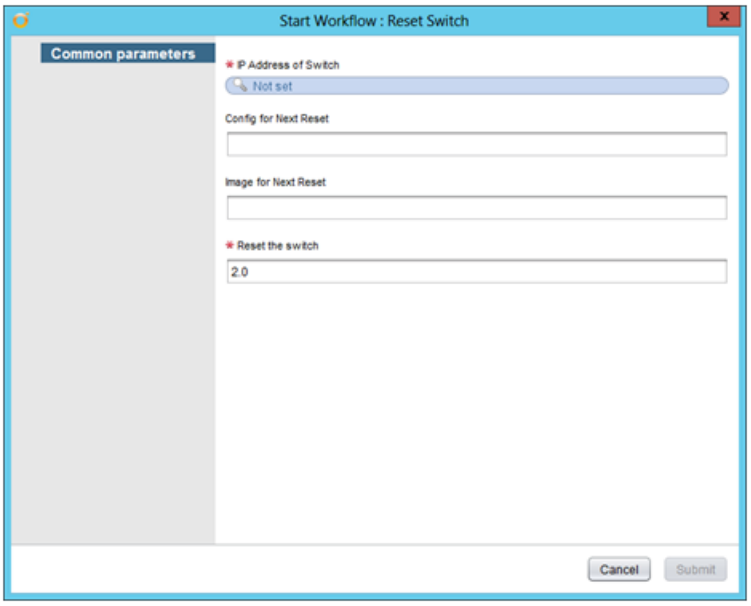
Reloads the switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: resetSwitch
- Inputs:

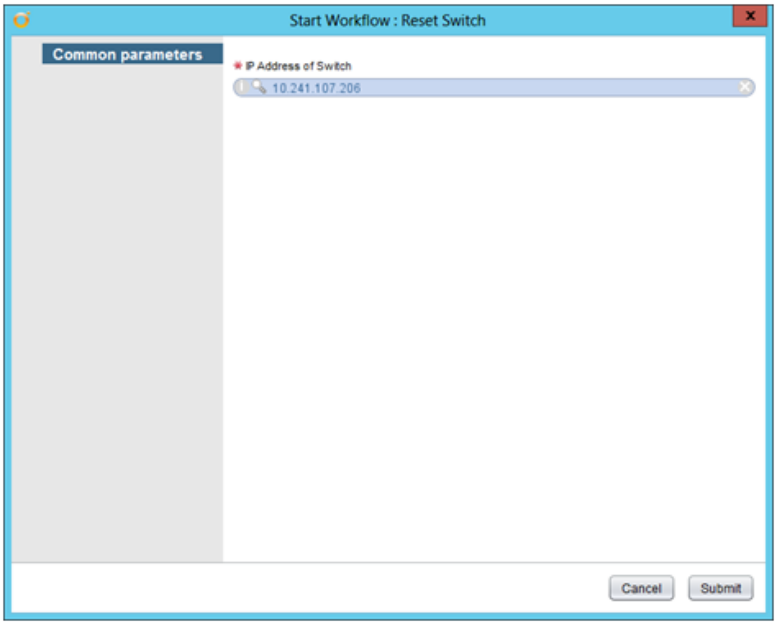
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	
Image for Next Reset	Text		
Config for Next Reset	Text		
Reset the Switch	Text		

- Output:

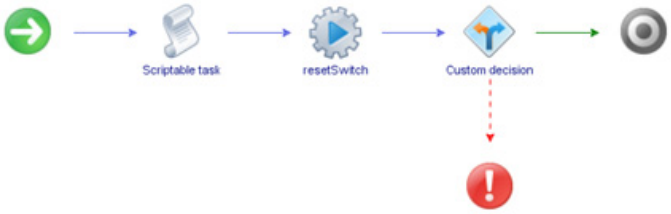
  Verify logs after workflow run is complete
- Input fields:
  - ENOS:



- CNOS:



- Workflow schema:



- Workflow output:

Save Configuration

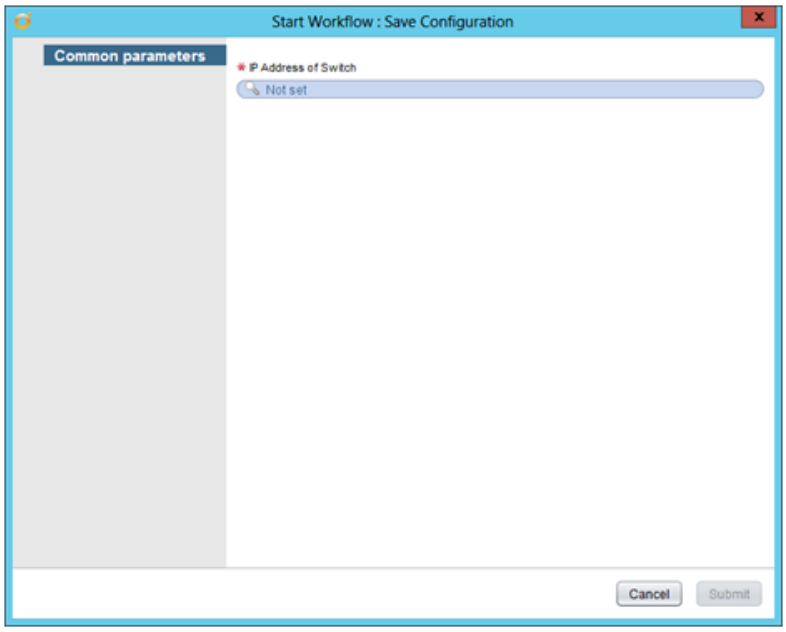
Save the running configuration over the startup configuration.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: saveConfiguration
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None

- Output:

  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:

Update Switch

Updates the firmware of the switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Associated actions:
  - updateSwitch
  - downloadimage
- Inputs:

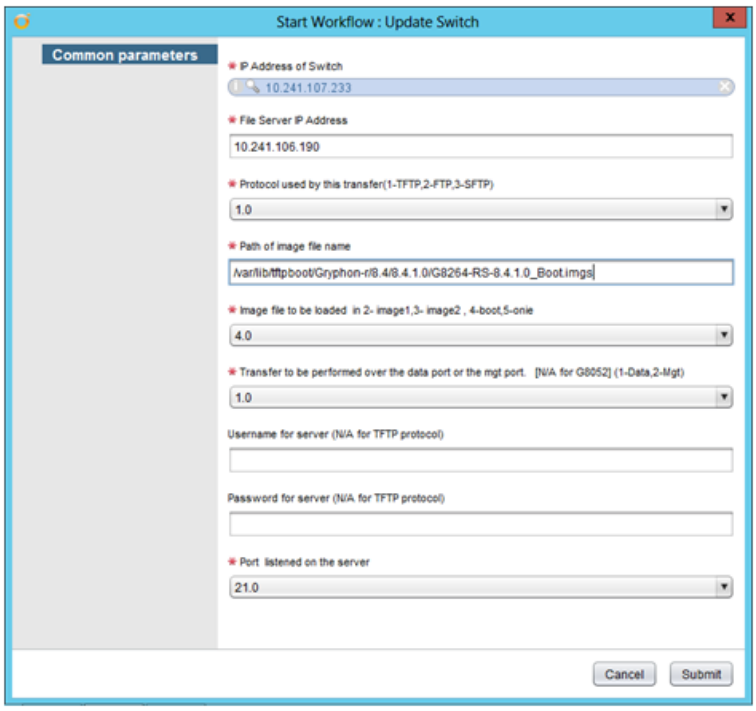
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Username	Text	Switch Username	Registered Switch is CNOS
Password	Text	Switch Password	Registered Switch is CNOS
Read Community	Text	Public	Registered Switch is ENOS
Write Community	Text	Public	Registered Switch is ENOS
File Server IP Address	Text	IPv4 Address	Registered Switch is ENOS
			Registered Switch is CNOS
Protocol Used for Transfer	Drop-down	1.0 - TFTP	Registered Switch is ENOS
		2.0 - FTP	
		3.0 - SFTP	
Transfer Protocol	Text		Registered Switch is CNOS
Image filename	Text		Registered Switch is CNOS
Image Type	Text		Registered Switch is CNOS
VRF name	Text		Registered Switch is CNOS
Path of Image File name	Text	Path to Image filename	Registered Switch is ENOS
			Registered Switch is CNOS

Input	Field Type	Format/Options	Related Inputs
Image file to be Loaded in	Drop-down	2.0 - Image 1	Registered Switch is ENOS
		3.0 - Image 2	
		4.0 - Boot	
		5.0 - ONIE	
Port to use for download	Drop-down	1.0 - Data	Registered Switch is ENOS
		2.0 - MGT	
Port Listened on the Server	Text	21 - Telnet	Registered Switch is ENOS
		22 - SSH	
User Name for Server	Text	FTP/TFTP/SFTP User Name	Registered Switch is ENOS
			Registered Switch is CNOS
Password for Server	Text	FTP/TFTP/SFTP Password	Registered Switch is ENOS
			Registered Switch is CNOS

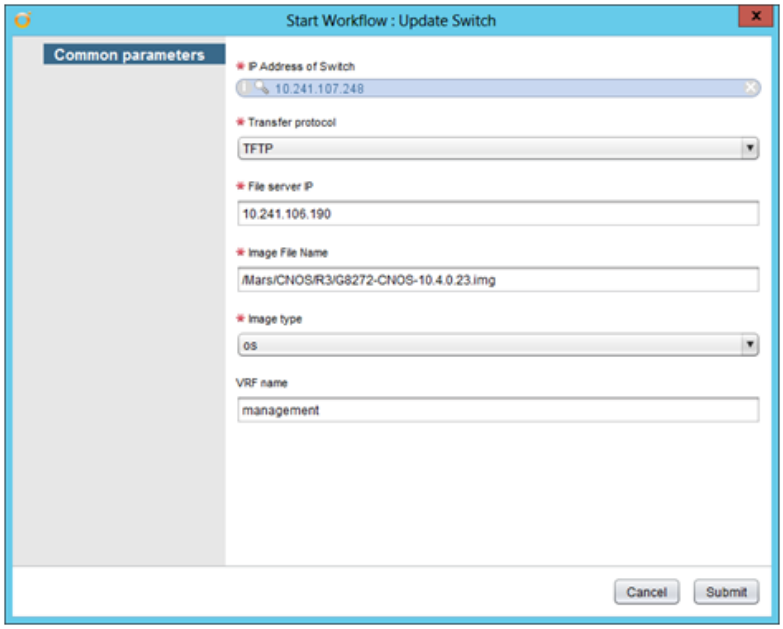
- Output:

  Verify logs after workflow run is complete

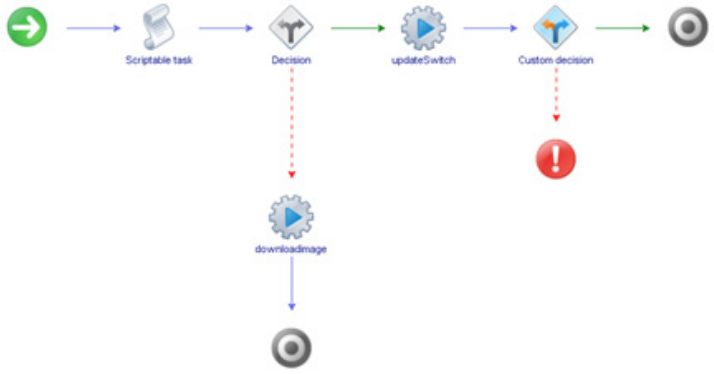
- Input fields:
  - ENOS:



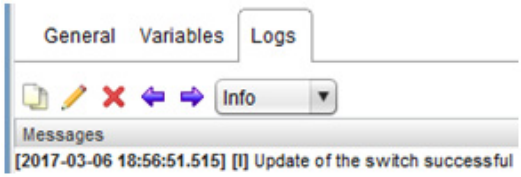
- CNOS:



- Workflow schema:



- Workflow output:



Interface Configuration

The **Interface Configuration** folder has workflows for configuring switch interfaces and mapping network nodes.

- **Add Server Port**: Designates the port on a RackSwitch as a server port

  Note: Not applicable to Flex System devices and switches running CNOS

- **Change Port Access**: Changes the port mode of a switch interface to access (tagged) or trunk (untagged) mode
- **Change Port Name**: Configures a custom name for a port

  Note: Not applicable for switches running CNOS

- **Get Multiple Server to Port Mapping**: Determines which switches and which of their ports are connected to multiple servers
- **Get Remote Node Mapping**: Returns the remote system information for a specific port
- **Get Server Ports**: Returns the list of active ports that are server ports

  Note: Not applicable to Flex System devices and switches running CNOS

- **Get Server to Port Mapping**: Determines if a switch and one of its ports are connected to a specific server
- **Remove Server Port**: Removes a RackSwitch port from being a server port

  Note: Not applicable for switches running CNOS

- **Update Port State**: Administratively enables or disables a switch port

Add Server Port

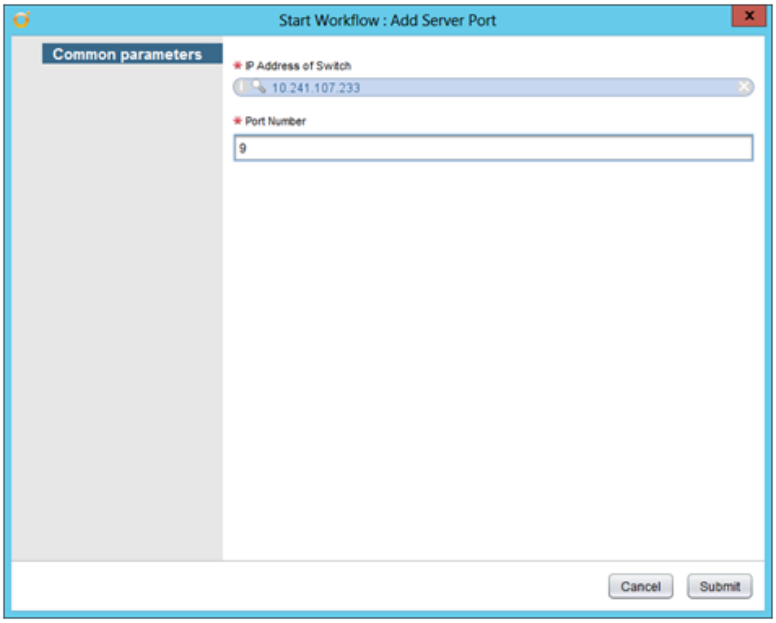
Designates the port on a RackSwitch as a server port.

Note: Not supported on Flex System devices.

- Supported Network OS: ENOS
- Dependent workflows: Register Switch
- Associated actions: addServerPort
- Inputs:

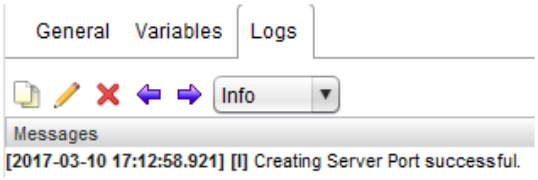
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text	*<portnumber>*	IP Address

- Output:
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:



Change Port Access

Changes the port mode of a switch interface to access (tagged) or trunk (untagged) mode.

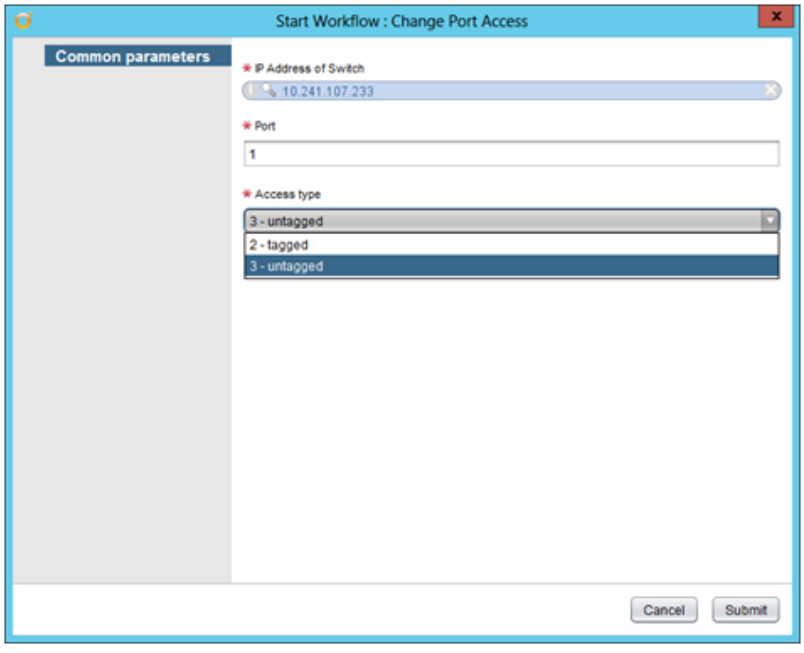
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: changePortAccess
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text/Number	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	IP Address
		ENOS: *portnumber* (for example, *15*)	
Access Type	Drop-down	2 - tagged	Port Number
		3 - untagged	

- Output:

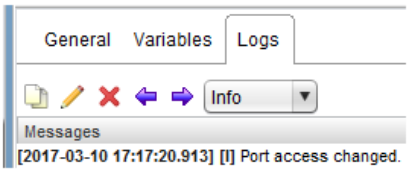
  Verify logs after workflow run is complete

- Input fields:



- Workflow schema:

- Workflow output:



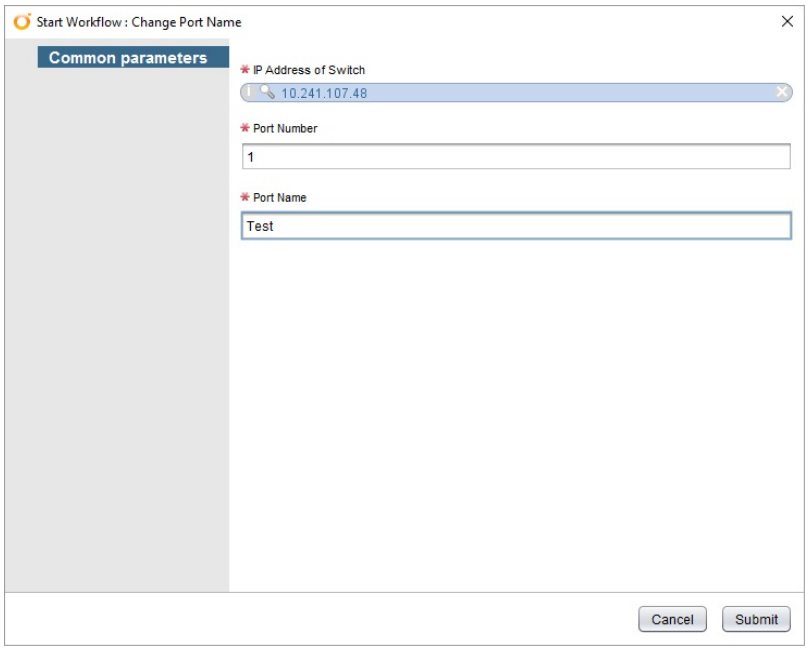
Change Port Name

Configures a custom name for a port.

- Supported Network OS: ENOS
- Dependent workflows: Register Switch
- Associated actions: changePortName
- Inputs:

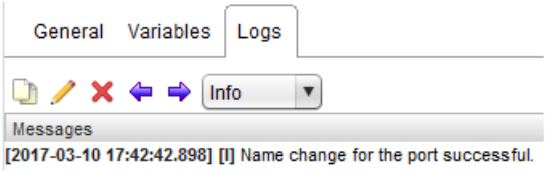
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text	*<portnumber>*	IP Address
Port Name	Text	Port Name	Port Number

- Output:
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:



Get Multiple Server to Port Mapping

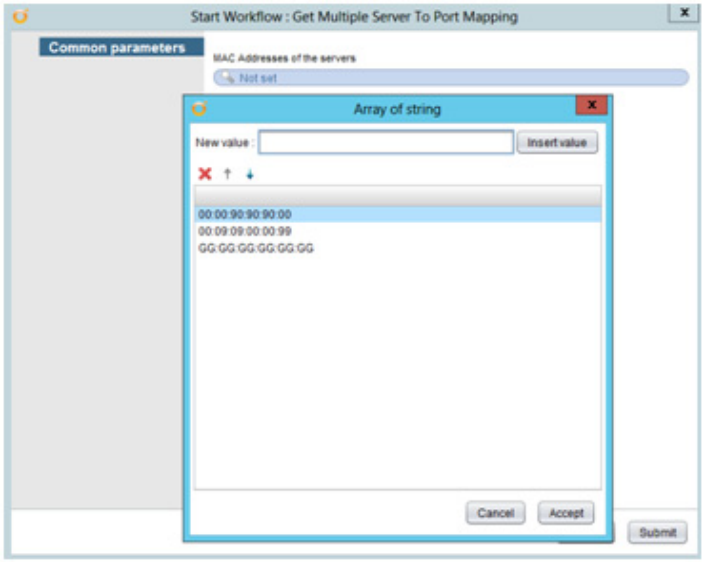
Determines which switches and which of their ports are connected to multiple servers.

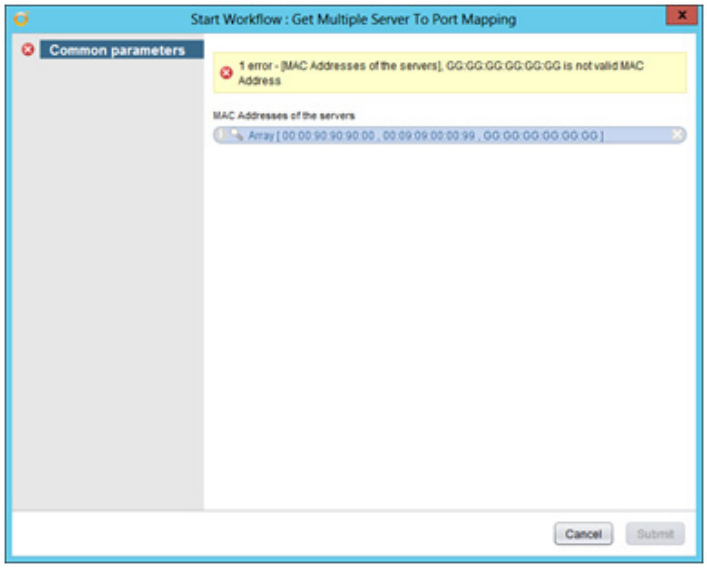
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getMultipleServertoPortMapping
- Inputs:

Input	Field Type	Format/Options	Related Inputs
MAC Address	Select	XX-XX-XX-XX-XX-XX	Array of String Dialog

- Output:

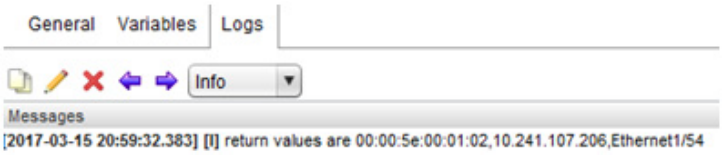
  Verify logs after workflow run is complete
- Input fields:





- Workflow schema:

- Workflow output:



Get Remote Node Mapping

Returns the remote system information for a specific port.

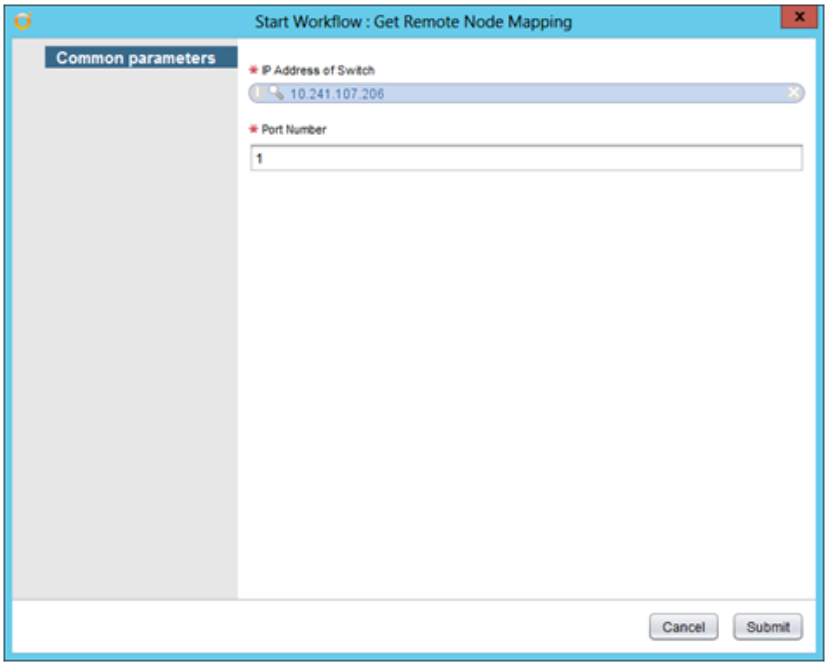
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getRemoteNodeMapping
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	IP Address
		ENOS: *portnumber* (for example, *15*)	

- Output:

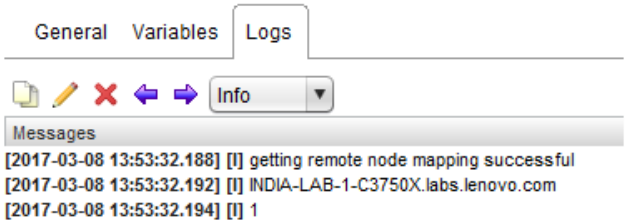
  Verify logs after workflow run is complete

- Input fields:



- Workflow schema:

- Workflow output:



Get Server Ports

Returns the list of active ports that are server ports.

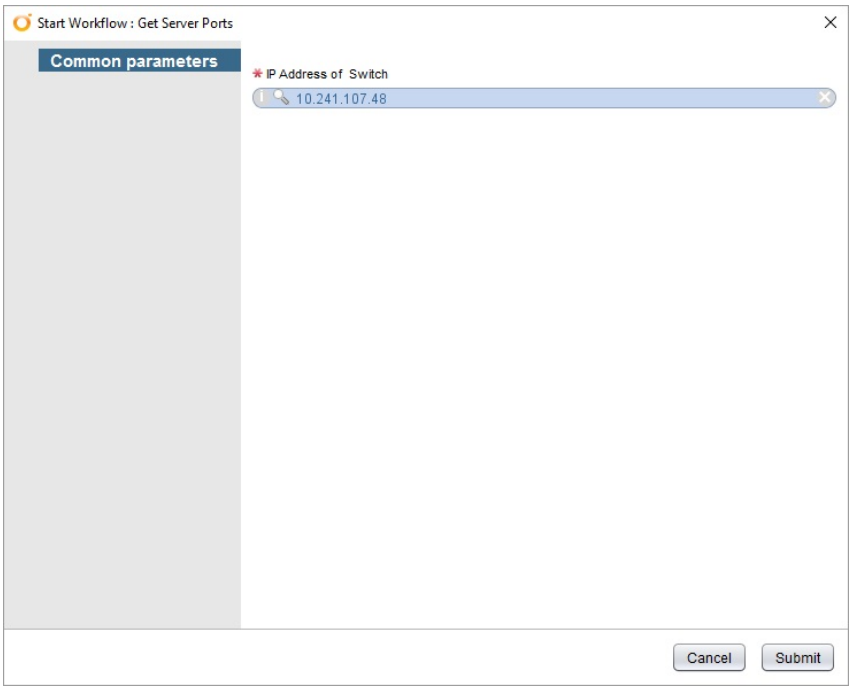
Note: Not supported on Flex System devices.

- Supported Network OS: ENOS
- Dependent workflows: Register Switch
- Associated actions: getServerPorts
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	

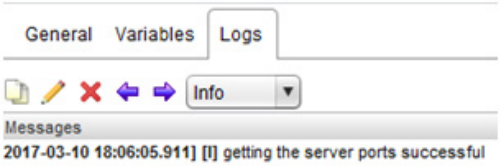
- Output:

  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:



Get Server to Port Mapping

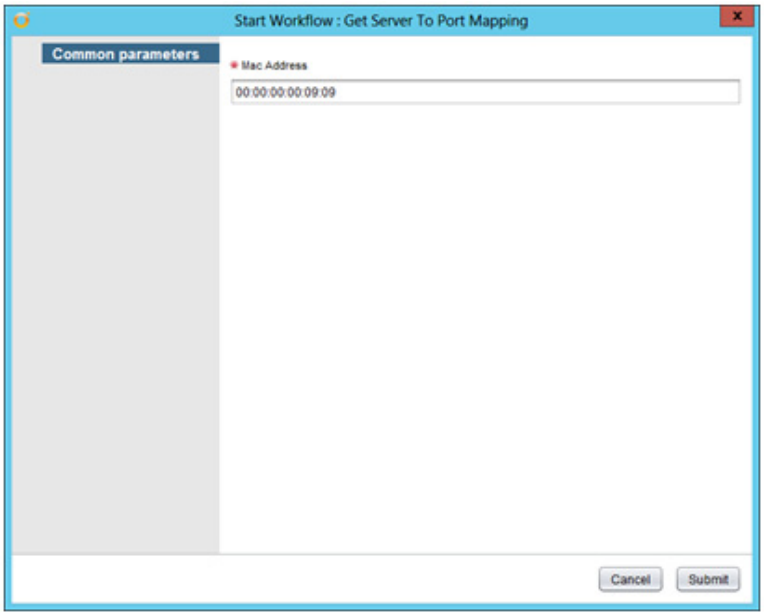
Determines if a switch and one of its ports are connected to a specific server.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: getServertoPortMapping
- Inputs:

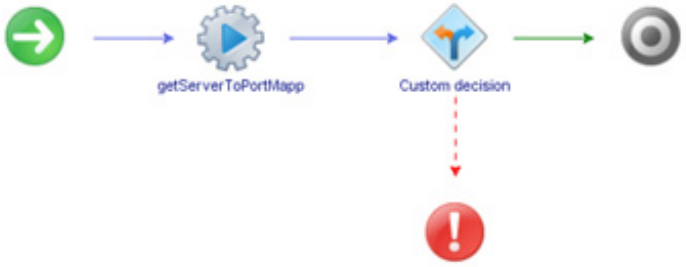
Input	Field Type	Format/Options	Related Inputs
MAC Address	Text	XX-XX-XX-XX-XX-XX	

- Output:

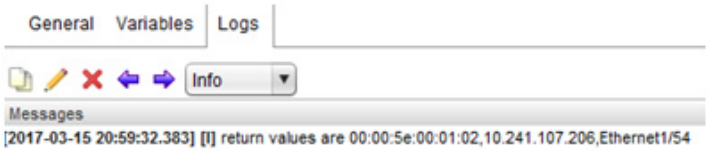
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow output:



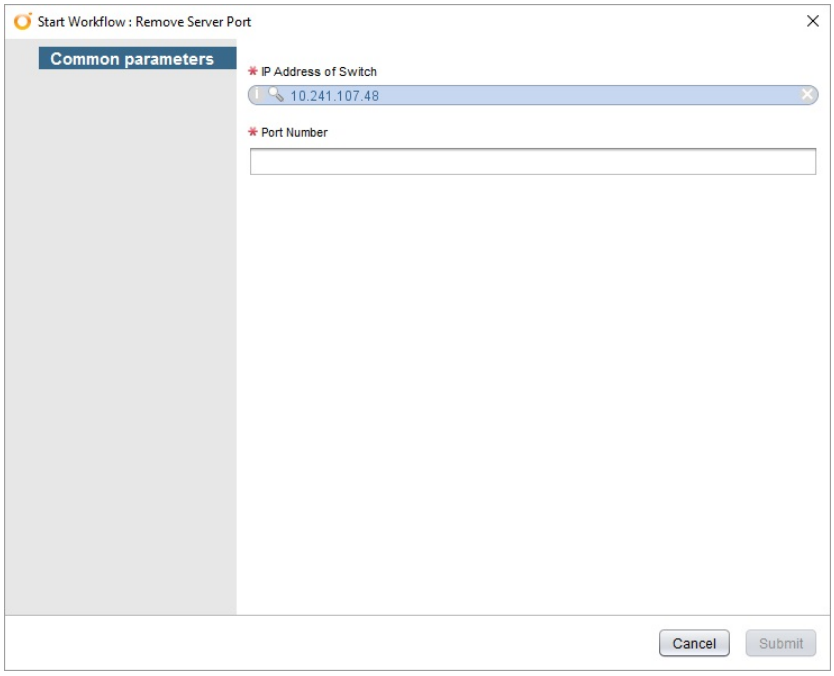
Remove Server Port

Removes a RackSwitch port from being a server port.

- Supported Network OS: ENOS
- Dependent workflows: Register Switch
- Associated actions: removeServerPort
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text	*<portnumber>*	IP Address

- Output:
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:

Update Port State

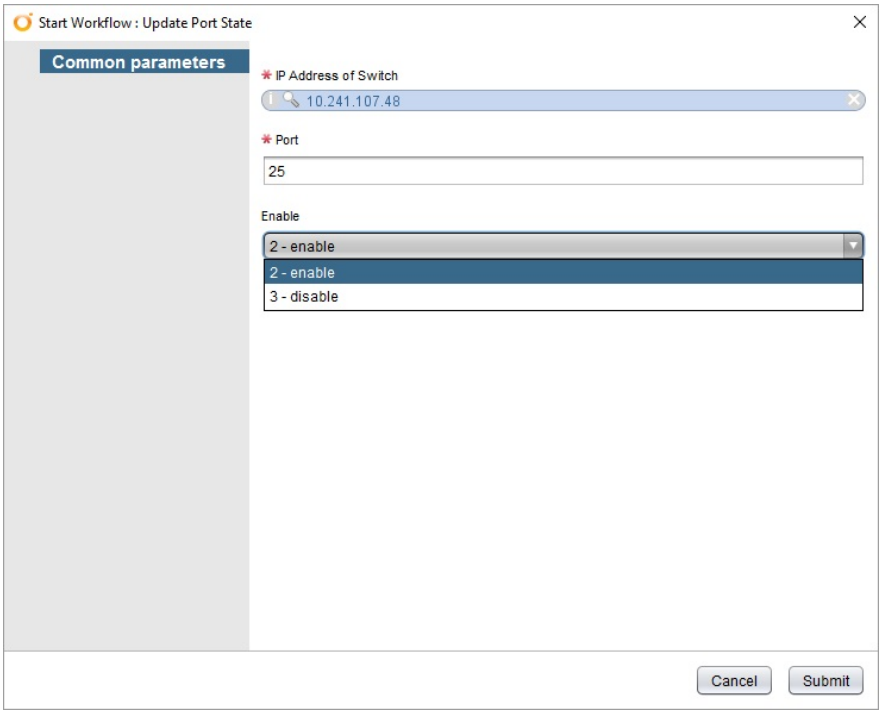
Administratively enables or disables a switch port.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflows: Register Switch
- Associated actions: updatePortState
- Inputs:

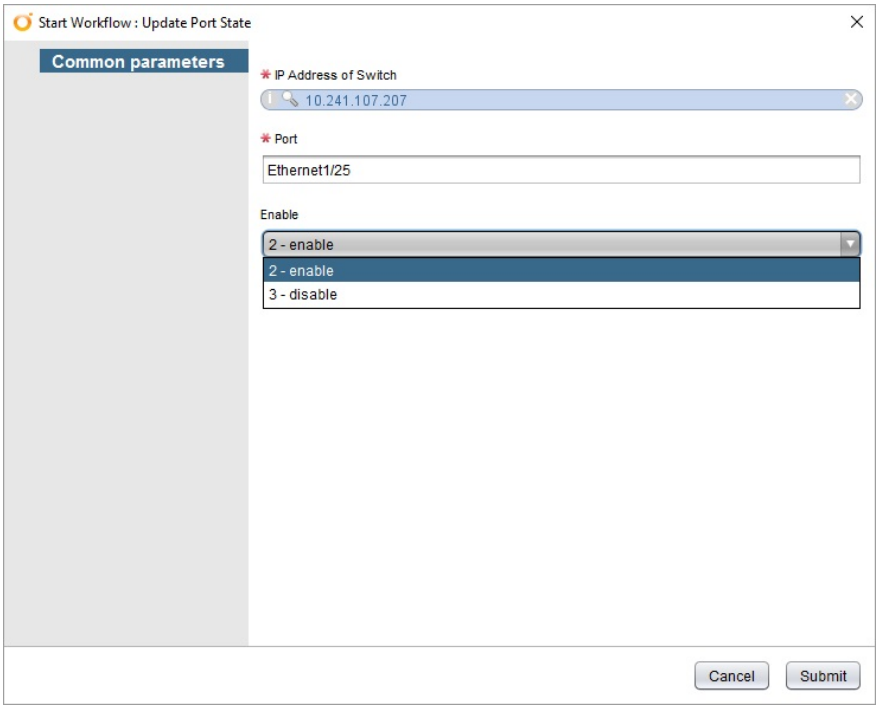
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	IP Address
		ENOS: *portnumber* (for example, *15*)	
Enable	Drop-down	2 - enable	Port Number
		3 - disable	

- Output:

  Verify logs after workflow run is complete
- Input fields:
  - ENOS:

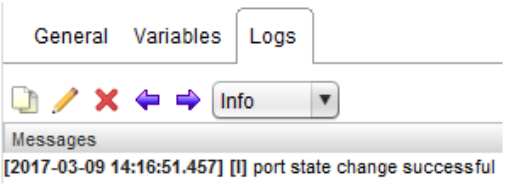


- CNOS:



- Workflow schema:

- Workflow output:



L2-VLAN Configuration

The **L2-VLAN Configuration** folder has workflows for configuring VLANs.

- **Add Port to VLAN**: Adds a switch port to a specific VLAN

  Note: For CNOS, you need to enable tagging on the specified port using the **Change Port Access** workflow before running this workflow

- **Add VLAN to STG**: Adds a VLAN to a specific STG

  Note: Not applicable for switches running CNOS

- **Create Single VLAN on LACP VLAG Port**: Creates a VLAN on a switch based on the server MAC address and VLAN ID, with the server port on the switch belonging to a LACP LAG (portchannel)
- **Create Single VLAN on Port**: Creates a VLAN on a switch based on the server MAC address and VLAN ID
- **Create Single VLAN on VLAG Port**: Creates a VLAN on a switch based on the server MAC address and VLAN ID, with the server port on the switch belonging to a static LAG (portchannel)
- **Create VLAN**: Creates a VLAN on a Switch
- **Delete VLAN**: Deletes a VLAN on a Switch
- **Get VLAN Info**: Returns information about a specific VLAN
- **Get VLAN Table**: Returns a list of the VLANs configured on a switch
- **Remove Port from VLAN**: Removes a port from a VLAN

  Note: For CNOS, you need to enable tagging on the specified port using the **Change Port Access** workflow before running this workflow

- **Remove VLAN from STG**: Removes a VLAN tagged to a specific STG

  Note: Not applicable for switches running CNOS

Add Port to VLAN

Adds a switch port to a specific VLAN.

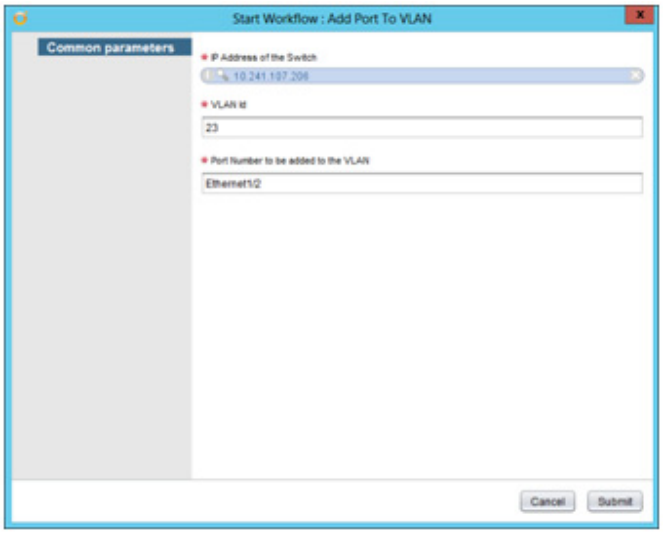
Note: For CNOS, you need to enable tagging on the specified port using the Change Port Access workflow before running this workflow.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
  - Change Port Access
- Associated actions: addPorttoVLAN
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
VLAN ID	Number	1 to 4096	Port Number
Port Number	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	IP Address
		ENOS: *portnumber* (for example, *15*)	

- Output:

  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow output:

Add VLAN to STG

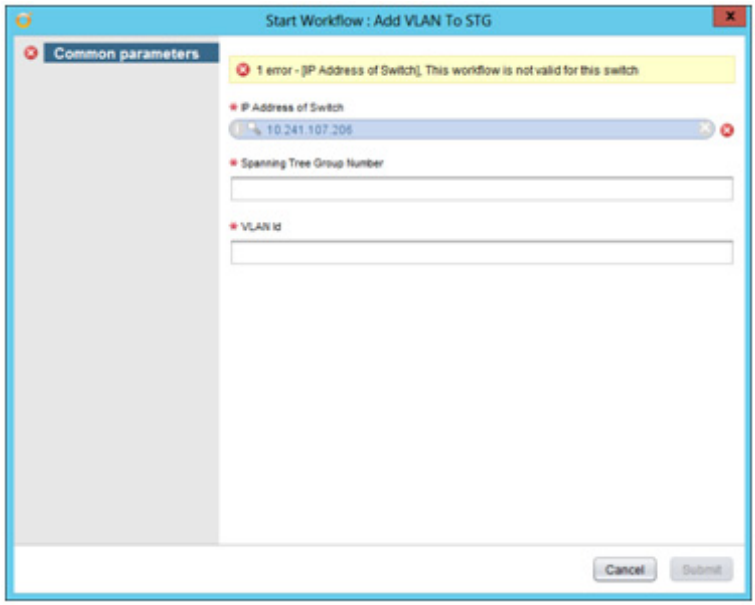
Adds a VLAN to a specific STG.

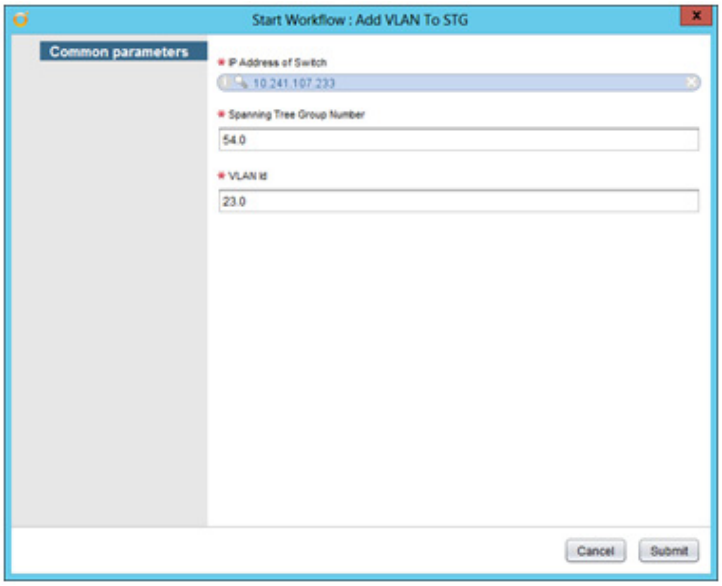
- Supported Network OS: ENOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
- Associated actions: addVLANtoSTG
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
STG ID	Number	1 to 128	VLAN ID
VLAN ID	Number	1 to 4096	STG

- Output:

  Verify logs after workflow run is complete
- Input fields:





- Workflow schema:

- Workflow output:

Create Single VLAN on LACP VLAG Port

Creates a VLAN on a switch based on the server MAC address and VLAN ID, with the server port on the switch belonging to a LACP LAG (portchannel).

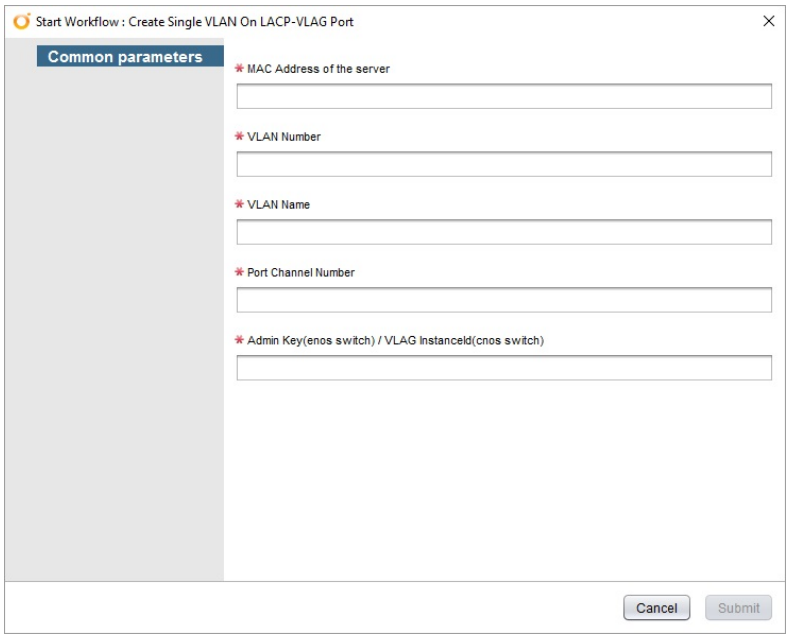
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Create Portchannel
- Associated actions:
  - CreateLACPAdminKey
  - CreateVLAN
  - CreatePortChannelAdminKey
  - CreateVLAGAdminKey
  - AddPortToVLAN
- Inputs:

Input	Field Type	Format/Options	Related Inputs
MAC Address of Server	Text	XX-XX-XX-XX-XX-XX	VLAN ID
VLAN ID	Number	1 to 4096	VLAN Name
VLAN Name	Text	Text	Portchannel Number
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	Admin Key/vLAG Instance ID
		CNOS: 1 to 4096	
Admin Key/vLAG Instance ID	Number	ENOS: AdminKey - 1 to 65535	Portchannel Number
		CNOS: vLAG Instance ID - 1 to 64	

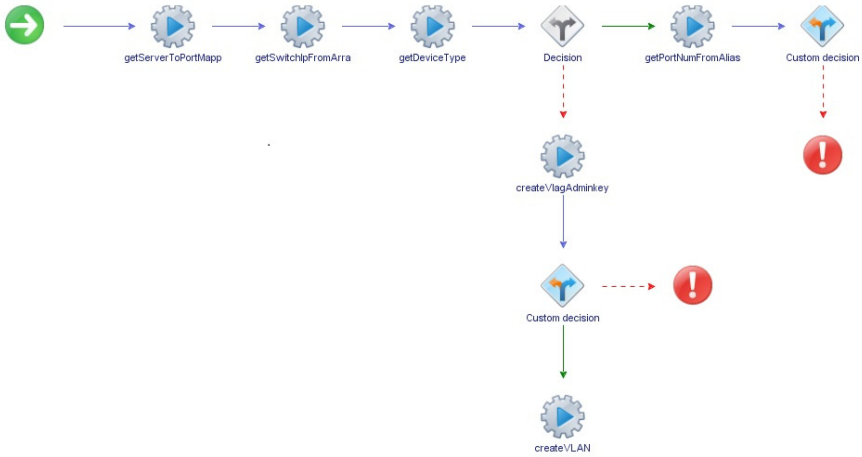
- Output:

  Verify logs after workflow run is complete

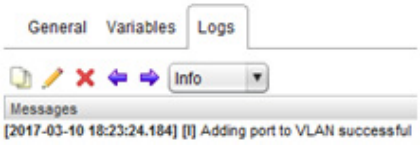
- Input fields:



- Workflow schema:



- Workflow outputs:



Create Single VLAN on Port

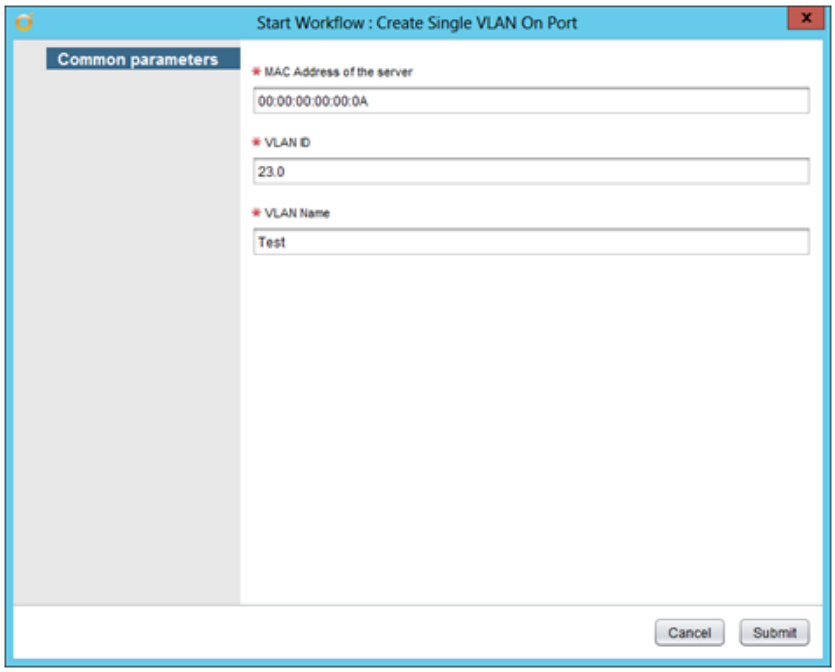
Creates a VLAN on a switch based on the server MAC address and VLAN ID.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Create VLAN
  - Add Port to VLAN
- Associated actions:
  - createVLAN
  - addPortToVLAN
- Inputs:

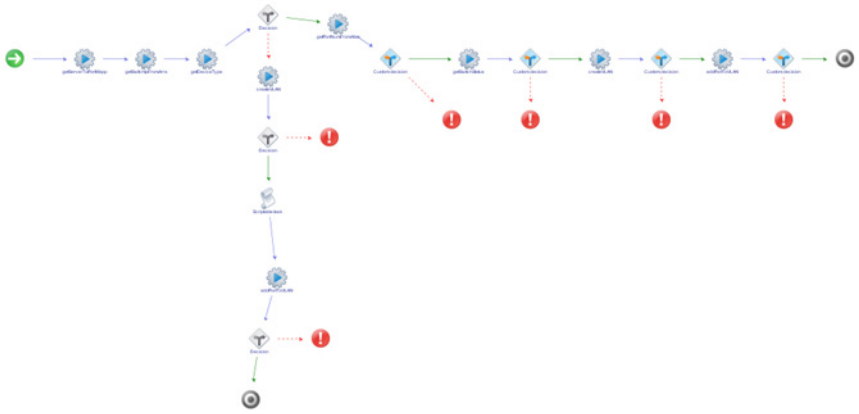
Input	Field Type	Format/Options	Related Inputs
MAC Address of Server	Text	XX-XX-XX-XX-XX-XX	VLAN ID
VLAN ID	Number	1 to 4096	VLAN Name
VLAN Name	Text	Text	Portchannel Number

- Output:

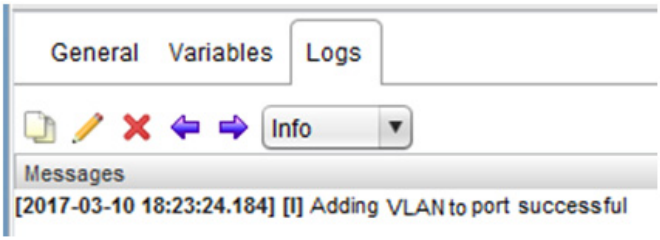
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow output:



Create Single VLAN On VLAG Port

Creates a VLAN on a switch based on the server MAC address and VLAN ID, with the server port on the switch belonging to a static LAG (portchannel).

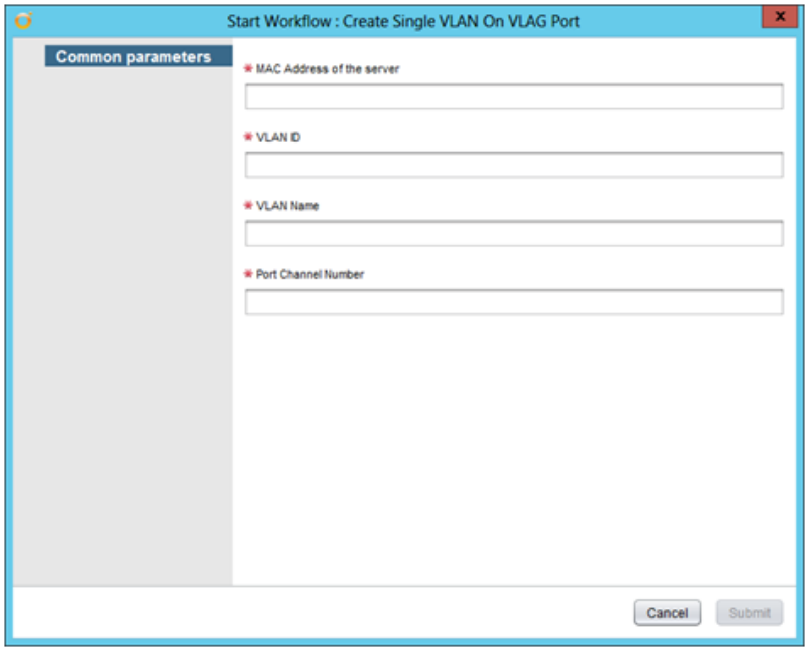
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Create VLAN
  - Create Portchannel
  - Create vLAG
  - Add Port to VLAN
- Associated actions:
  - createVLAN
  - createPortChannel
  - createVLAG
  - addPortToVLAN
- Inputs:

Input	Field Type	Format/Options	Related Inputs
MAC Address of Server	Text	XX-XX-XX-XX-XX-XX	VLAN ID
VLAN ID	Number	1 to 4096	VLAN Name
VLAN Name	Text	Text	Portchannel Number
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	VLAN ID
		CNOS: 1 to 4096	

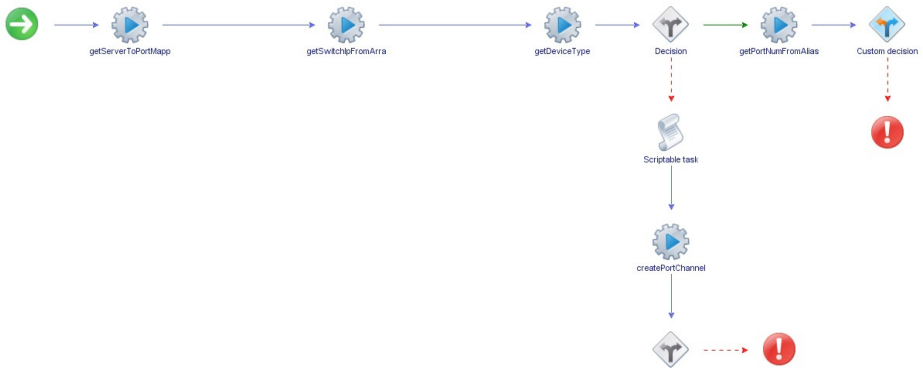
- Output:

  Verify logs after workflow run is complete

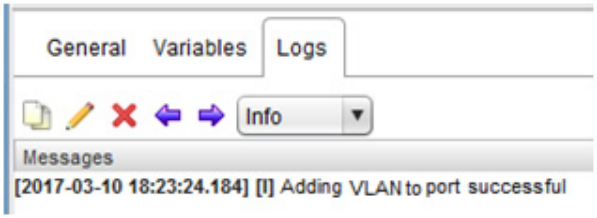
- Input fields:



- Workflow schema:



- Workflow outputs:



Create VLAN

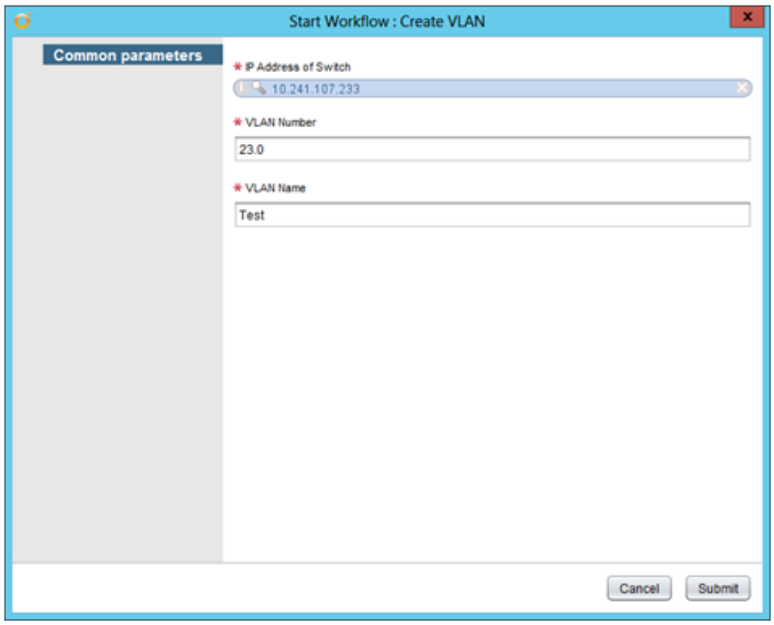
Creates a VLAN on a Switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: createVLAN
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	VLAN ID
VLAN ID	Number	1 to 4096	VLAN Name
VLAN Name	Text	Text	VLAN ID

- Output:

  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow outputs:

Delete VLAN

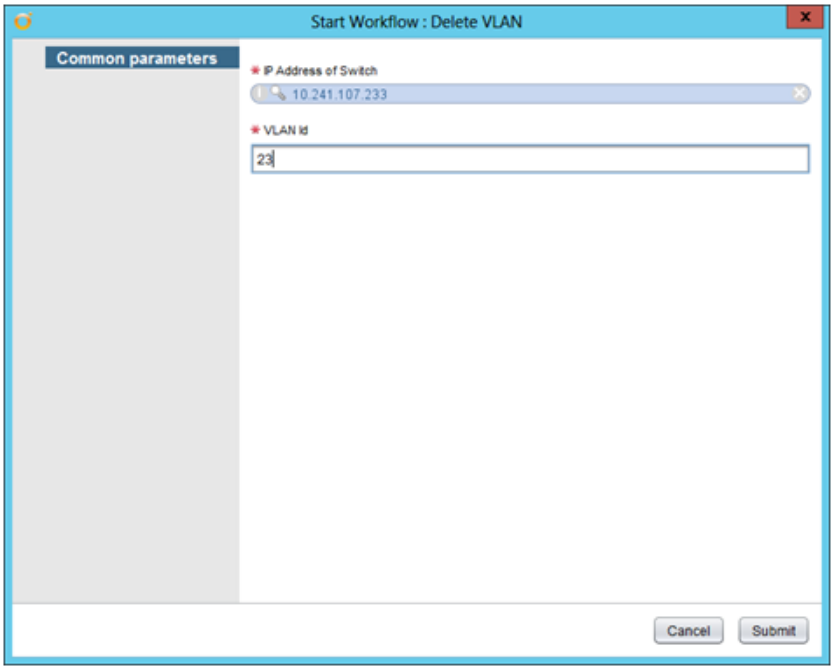
Deletes a VLAN on a Switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: deleteVLAN
- Inputs:

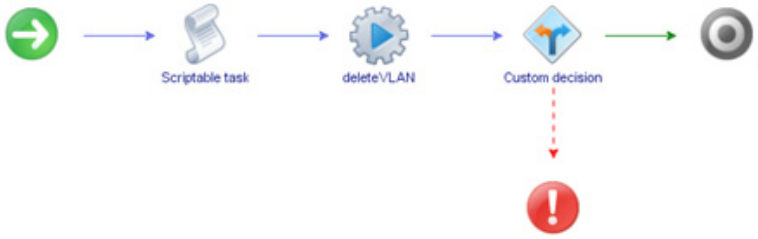
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	VLAN ID
VLAN ID	Number	1 to 4096	IP Address

- Output:

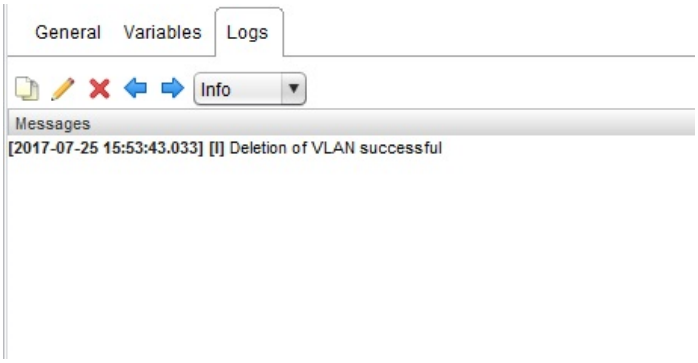
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



Get VLAN Info

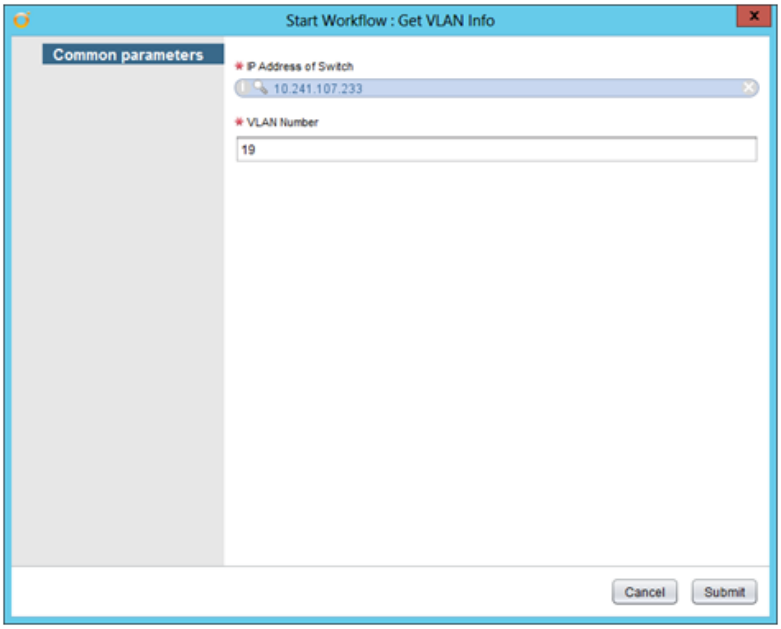
Returns information about a specific VLAN.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
- Associated actions: getVLANInfo
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	VLAN ID
VLAN ID	Number‘	1 to 4096	IP Address

- Output:

  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow outputs:

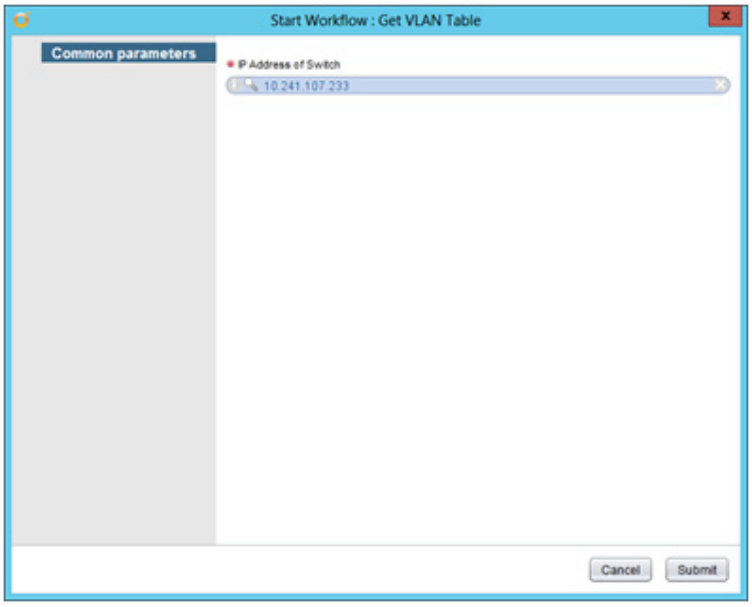
Get VLAN Table

Returns a list of the VLANs configured on a switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: getVLANTable
- Inputs:

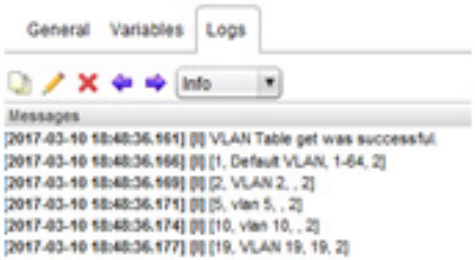
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	

- Output:
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:

- Workflow outputs:



Remove Port from VLAN

Removes a port from a VLAN.

Note: For CNOS, you need to enable tagging on the specified port using the Change Port Access workflow before running this workflow

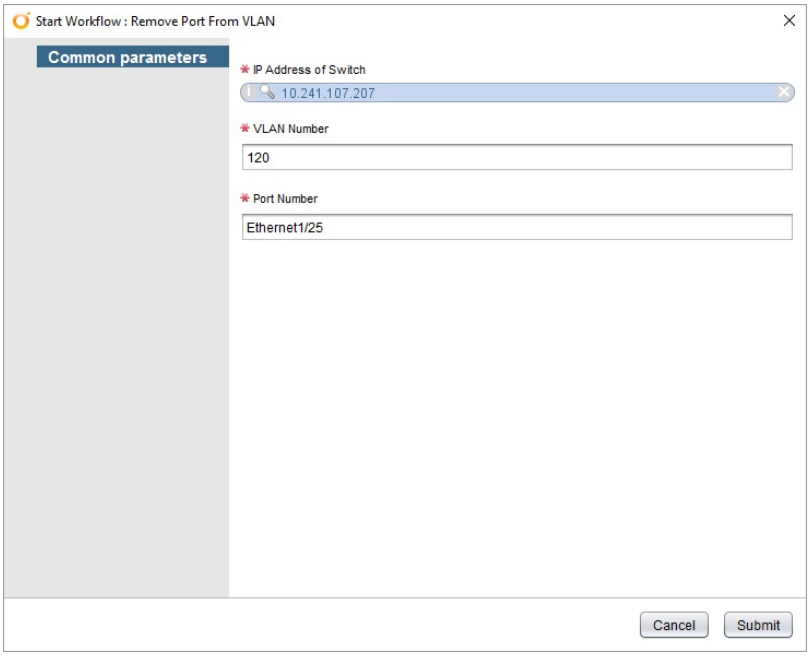
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
- Associated actions: removePortFromVLAN
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	VLAN ID
VLAN ID	Number	1 to 4096	Port Number
Port Number	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	VLAN ID
		ENOS: *portnumber* (for example, *15*)	

- Output:

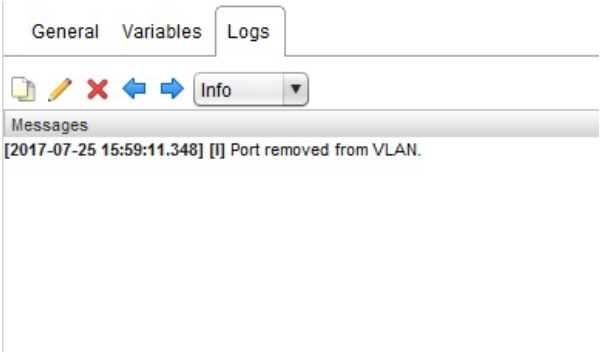
  Verify logs after workflow run is complete

- Input fields:



- Workflow schema:

- Workflow outputs:



Remove VLAN from STG

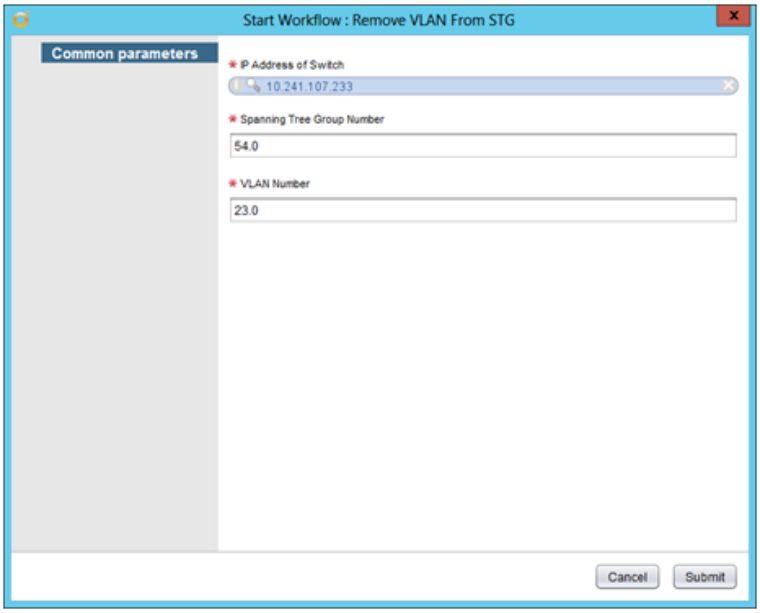
Removes a VLAN tagged to a specific STG.

- Supported Network OS: ENOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
- Associated actions: removeVLANtoSTG
- Inputs:

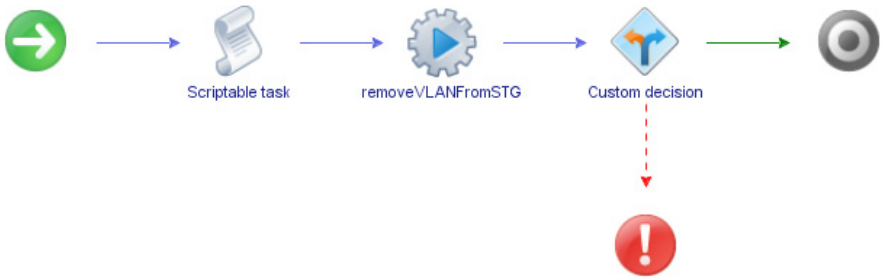
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
STG ID	Number	1 to 128	VLAN ID
VLAN ID	Number	1 to 4096	STG

- Output:

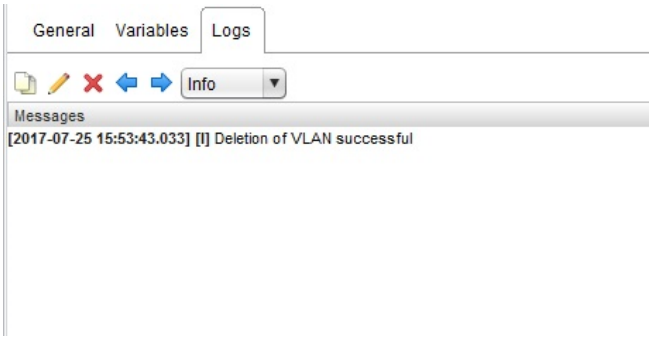
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



LAG Configuration

The **LAG Configuration** folder has workflows for configuring LAGs.

- **Create PortChannel**: Creates a LAG on a switch
- **Create PortChannel AdminKey**: Creates a LACP portchannel on a ENOS switch

  Note: Not applicable for switches running CNOS
- **Create VLAG**: Creates a vLAG on a switch
- **Enable-Disable PortChannel**: Enables or disables LAG on a ENOS switch

  Note: Not applicable for switches running CNOS
- **Enable-Disable VLAG**: Enables or disables a vLAG
- **Enable-Disable VLAG PortChannel**: Enables or disables a vLAG portchannel
- **Remove PortChannel**: Removes a LAG from a switch
- **Remove PortChannel AdminKey**: Removes the static ID assignment from a LACP portchannel

  Note: Not applicable for switches running CNOS
- **Remove Ports from Port Channel**: Removes ports from a LAG
- **Remove VLAG LACP AdminKey**: Removes ports from a vLAG

Create Portchannel

Creates a LAG on a switch.

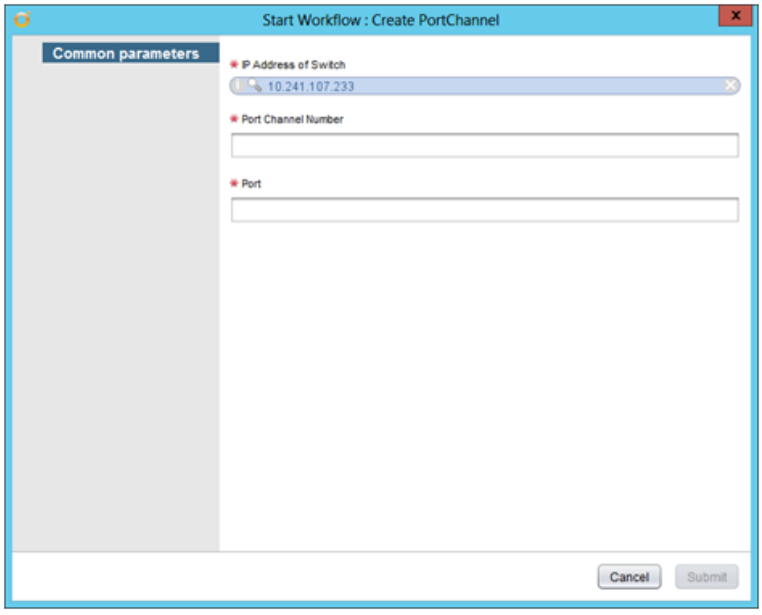
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions:
  - createPortChannel
  - enablePortChannel
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	Registered Switch is CNOS or ENOS
		CNOS: 1 to 4096	
Port	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	Registered Switch is CNOS or ENOS
		ENOS: *portnumber* (for example, *15*)	
lagmode	drop-down	lacp_active	Registered Switch is CNOS
		lacp_passive	
		no_lacp	

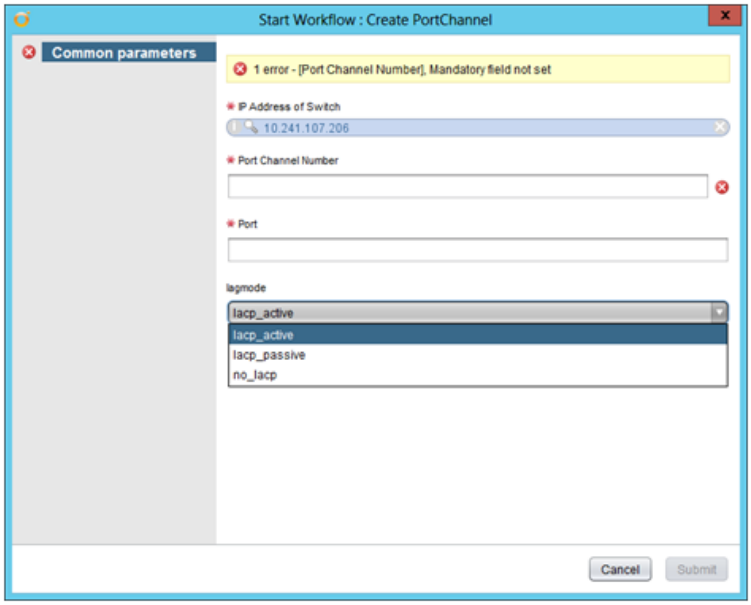
- Output:

  Verify logs after workflow run is complete

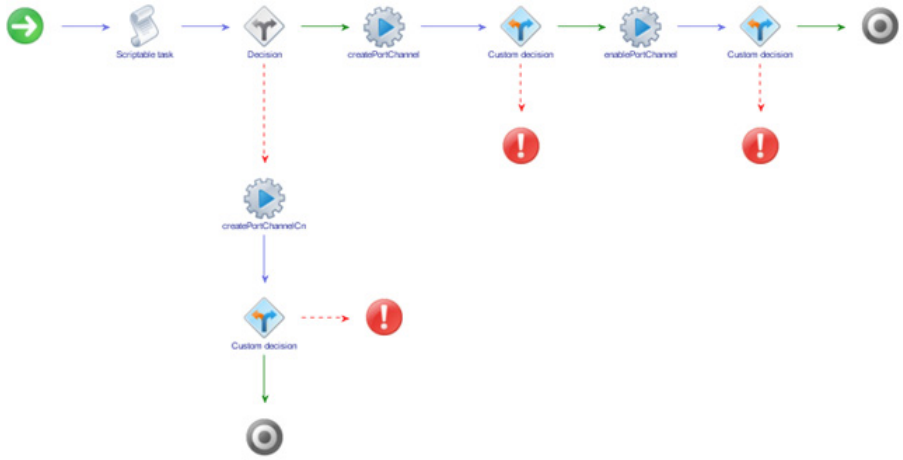
- Input fields:
  - ENOS:



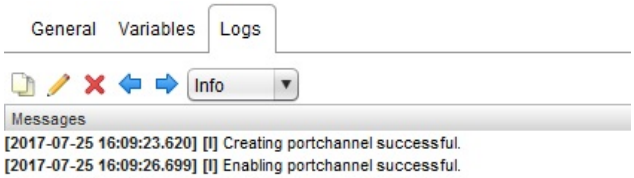
  - CNOS:



- Workflow schema:



- Workflow outputs:



Create Portchannel AdminKey

Creates a LACP portchannel on a ENOS switch.

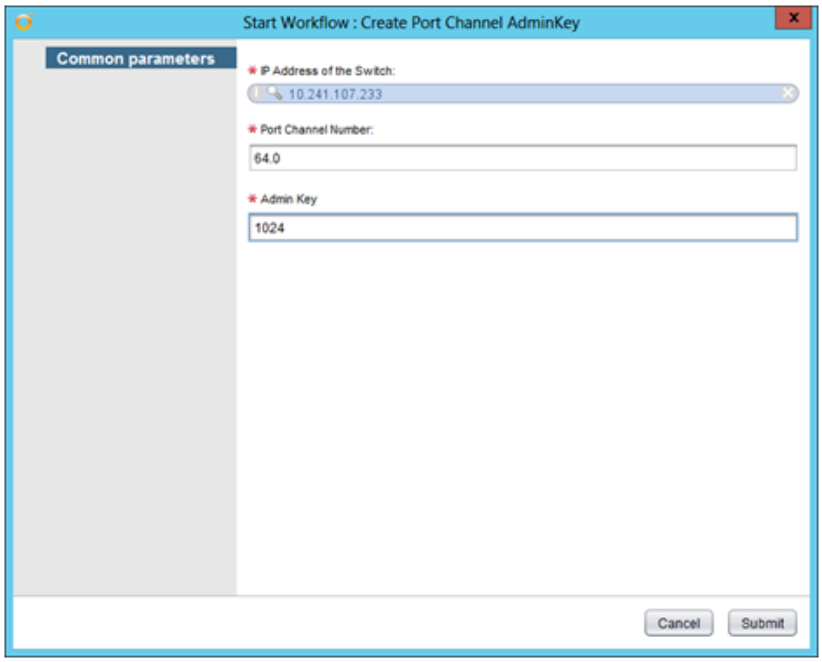
- Supported Network OS: ENOS
- Dependent workflow: Register Switch
- Associated actions: createPortChannel
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	73 to 144 - LACP	Registered Switch is ENOS
Admin Key	Number	1 to 65535	Registered Switch is ENOS

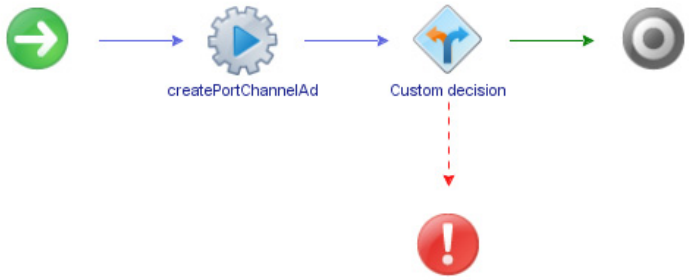
- Output:

  Verify logs after workflow run is complete

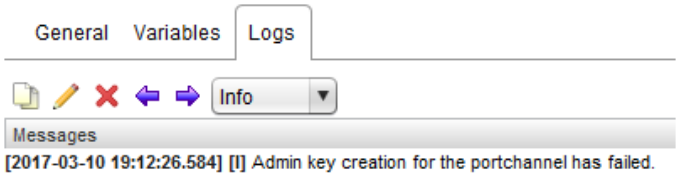
- Input fields:



- Workflow schema:



- Workflow outputs:



Create vLAG

Creates a vLAG on a switch.

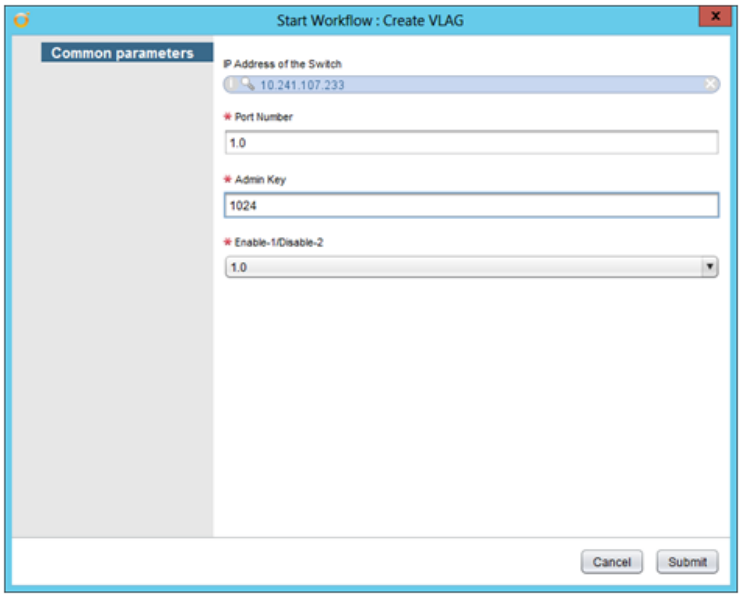
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: createVLAG
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Port Number	Number	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	Registered Switch is ENOS and CNOS
		ENOS: *portnumber* (for example, *15*)	
vLAG Instance ID	Number	1 to 64	Registered Switch is CNOS
Admin Key	Number	1 to 65535	Registered Switch is ENOS
Enable	Drop-down	Enable	Registered Switch is ENOS and CNOS
		Disable	

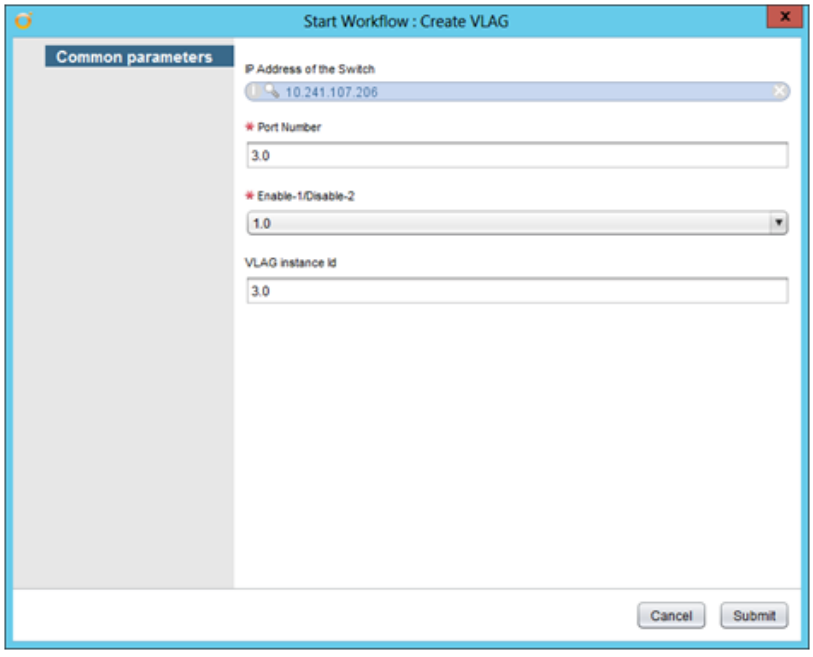
- Output:

  Verify logs after workflow run is complete

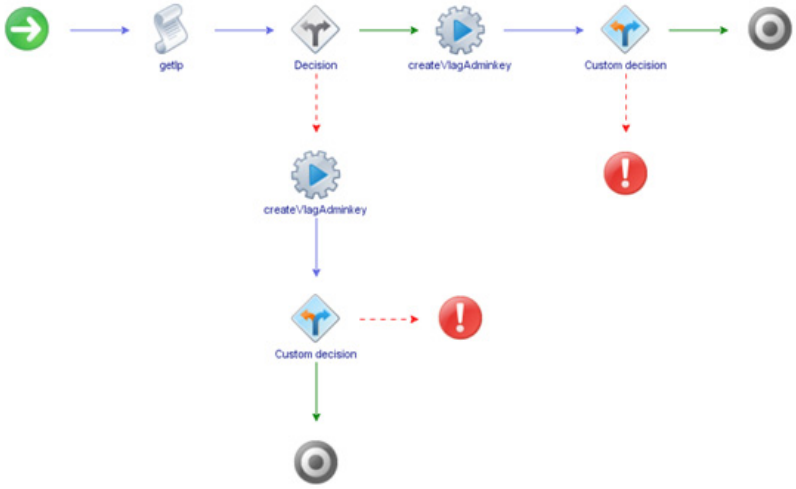
- Input fields:
  - ENOS:



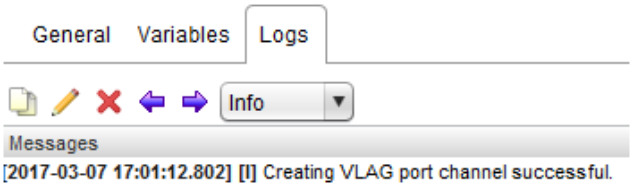
  - CNOS:



- Workflow schema:



- Workflow outputs:



Enable-Disable Portchannel

Enables or disables LAG on a switch.

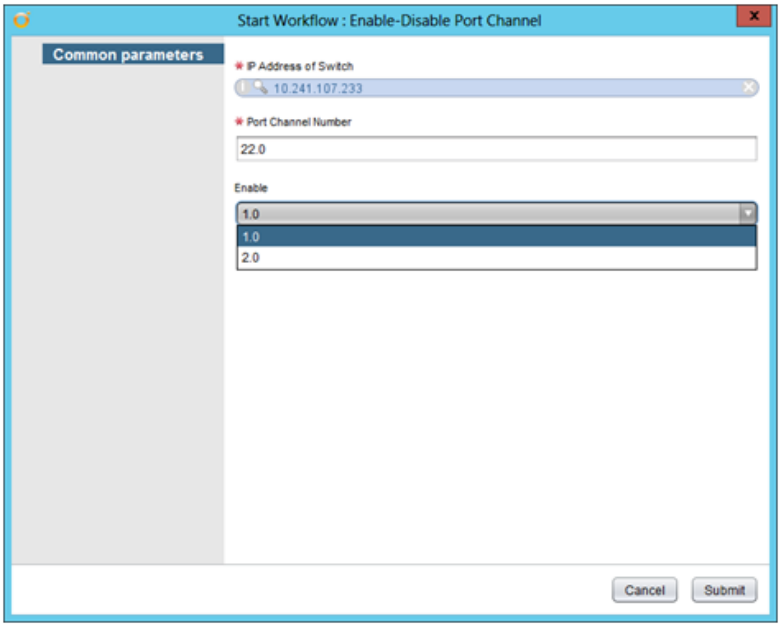
- Supported Network OS: ENOS
- Dependent workflow: Register Switch
- Associated actions: enablePortChannel
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	1 to 72 - static	Registered switch is ENOS
		73 to 144 - LACP	
Enable	Drop-down	Enable	Registered switch is ENOS
		Disable	

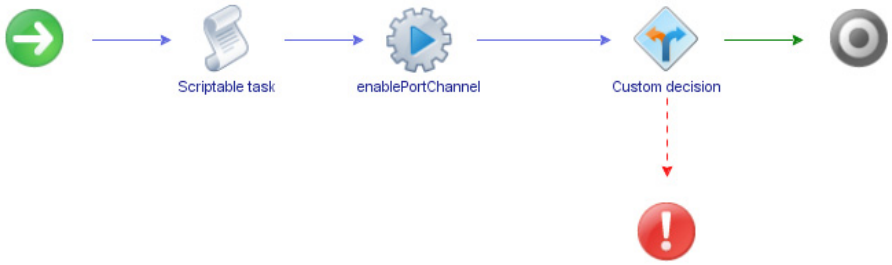
- Output:

  Verify logs after workflow run is complete

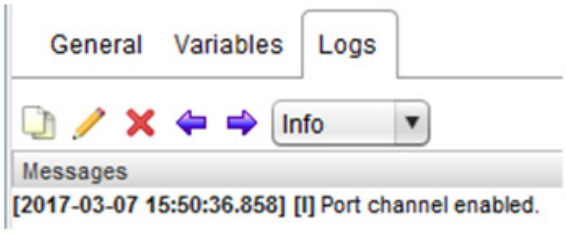
- Input fields:



- Workflow schema:



- Workflow outputs:



Enable-Disable vLAG

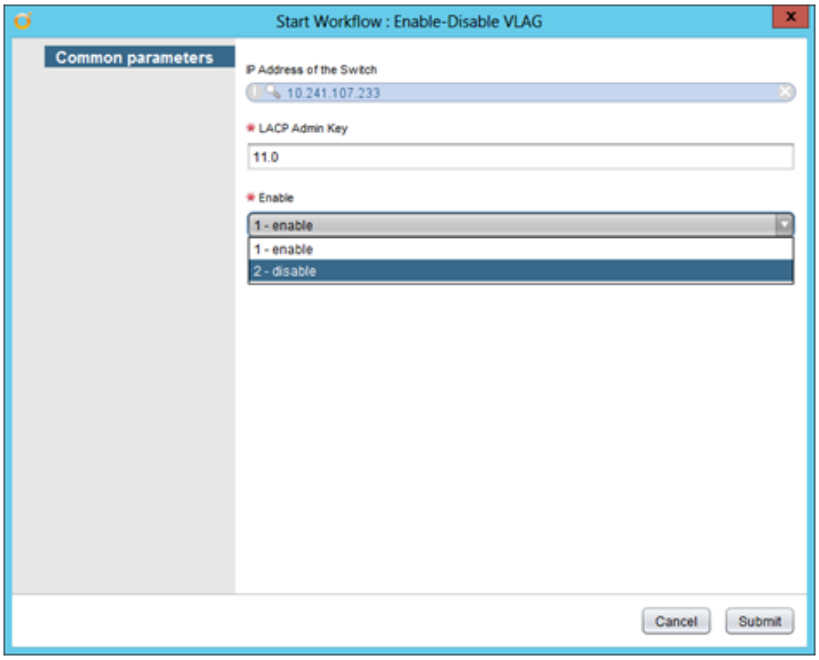
Enables or disables a vLAG.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: enableVLAGPortChannel
- Inputs:

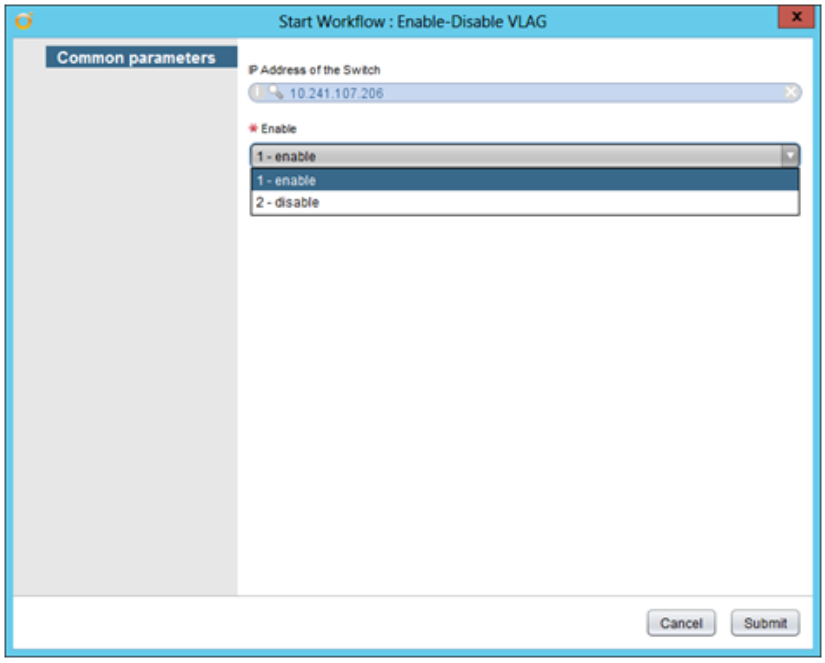
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
LACP Admin Key	Number	1 to 65535	Registered switch is ENOS
Enable	Drop-down	Enable	Registered switch is ENOS and CNOS
		Disable	

- Output:

  Verify logs after workflow run is complete
- Input fields:
  - ENOS:

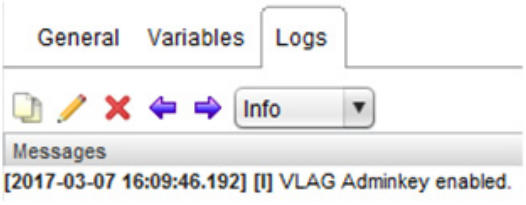


- CNOS:



- Workflow schema:

- Workflow outputs:
  - ENOS:



  - CNOS:

Enable-Disable vLAG Portchannel

Enables or disables a vLAG portchannel.

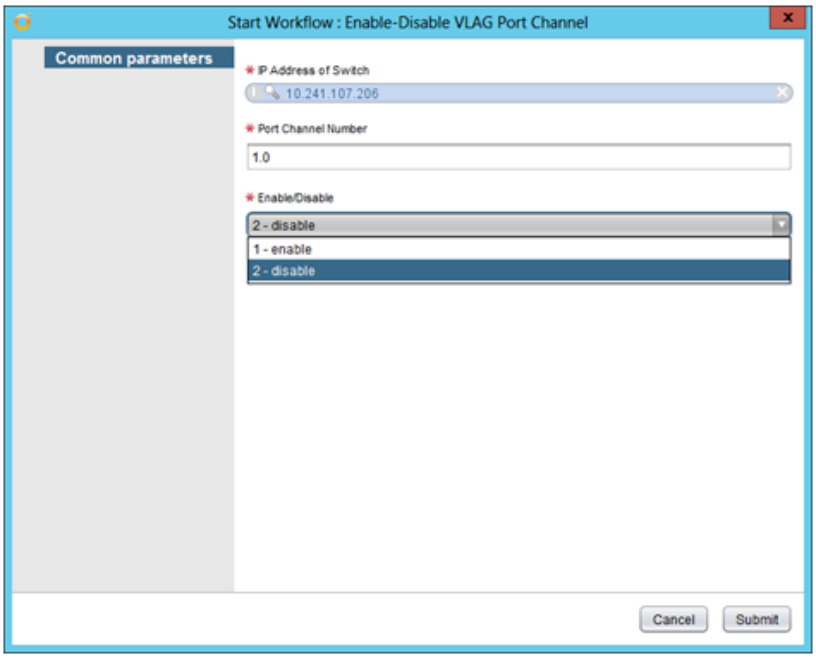
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create Portchannel
- Associated actions: enableVLAGPortChannel
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	Registered switch is ENOS and CNOS
		CNOS: 1 to 4096	
Enable	Drop-down	Enable	Registered switch is ENOS and CNOS
		Disable	

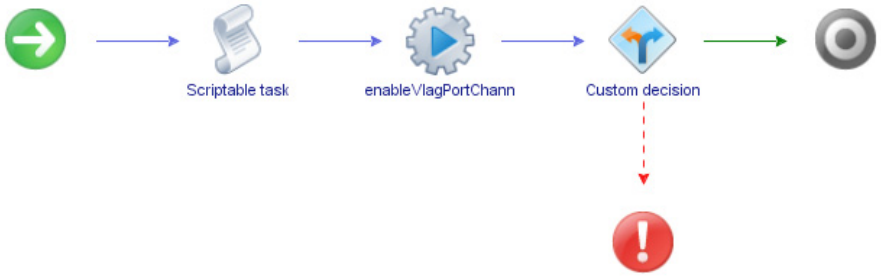
- Output:

  Verify logs after workflow run is complete

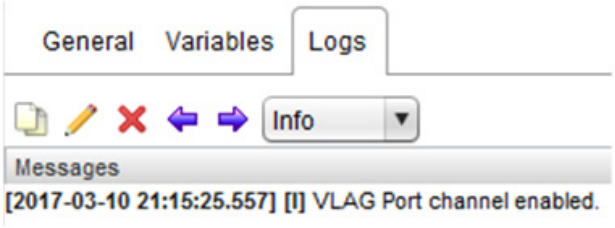
- Input fields:



- Workflow schema:



- Workflow outputs:



Remove Portchannel

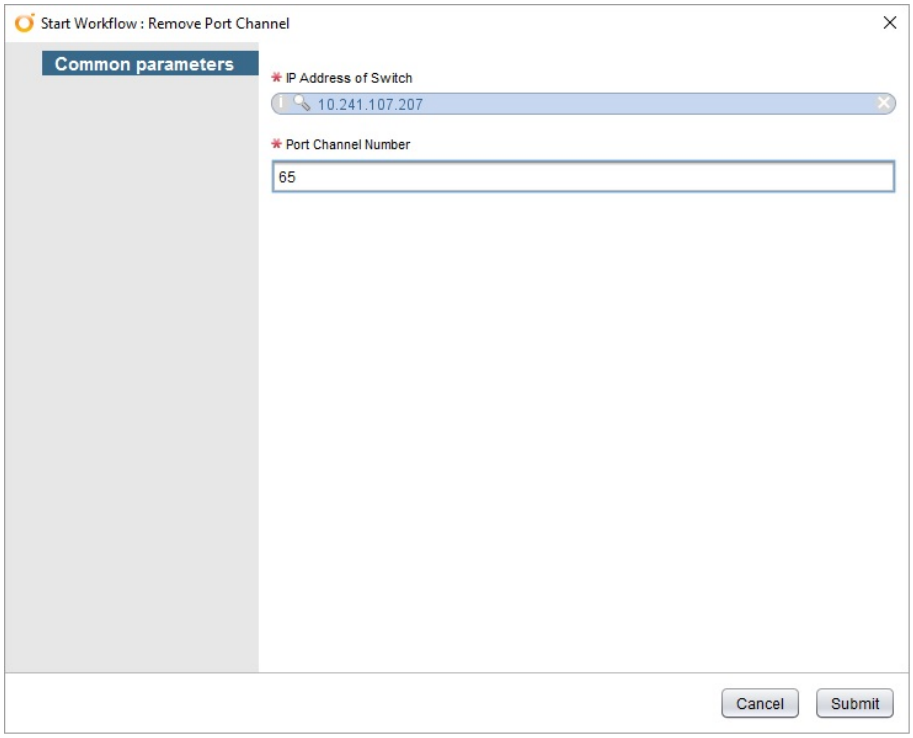
Removes a LAG from a switch.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create Portchannel
- Associated actions: removePortChannel
- Inputs:

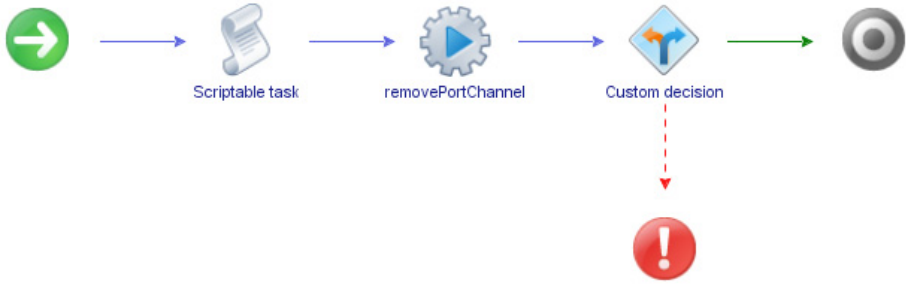
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	Registered switch is ENOS and CNOS
		CNOS: 1 to 4096	

- Output:

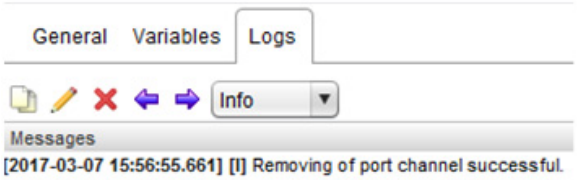
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



Remove Portchannel Adminkey

Removes the static ID assignment from a LACP portchannel.

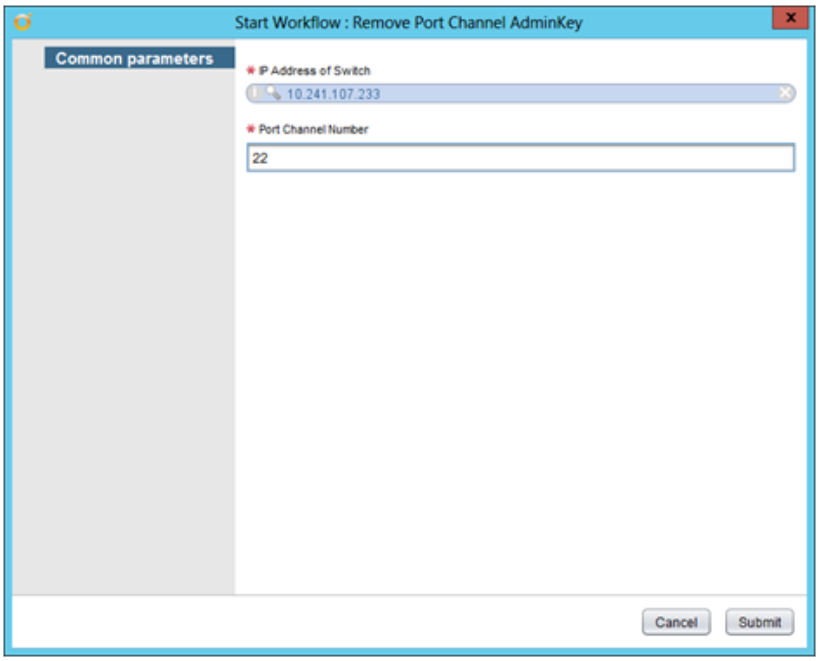
- Supported Network OS: ENOS
- Dependent workflow: Register Switch
- Associated actions: enablePortChannelAdminKey
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	73 to 144 - LACP	Registered switch is ENOS

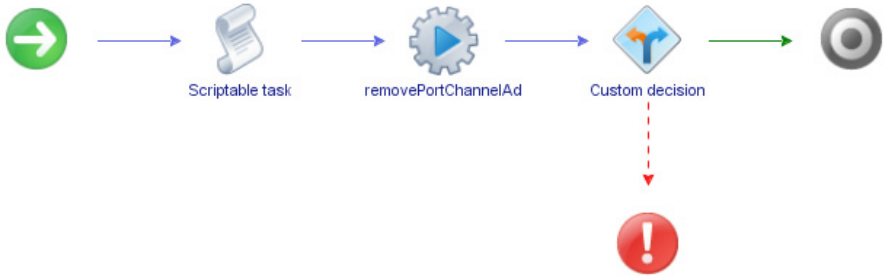
- Output:

  Verify logs after workflow run is complete

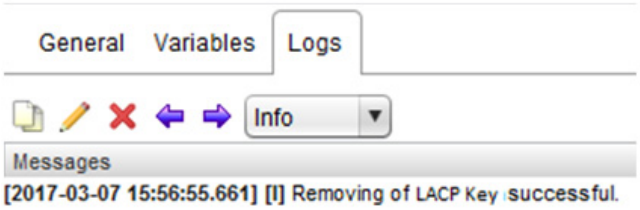
- Input fields:



- Workflow schema:



- Workflow outputs:



Remove Ports from Portchannel

Removes ports from a LAG.

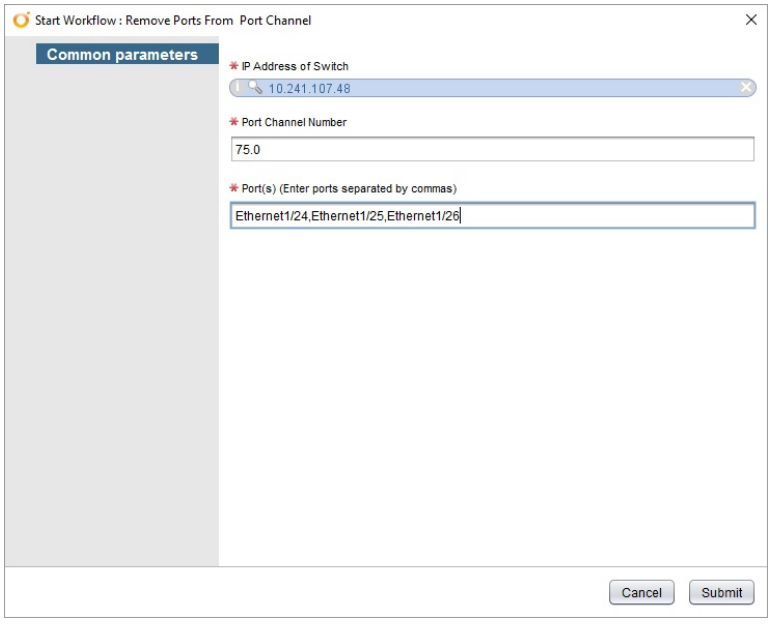
- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow:
  - Register Switch
  - Create Portchannel
- Associated actions: removePortsFromPortchannel
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Portchannel Number	Number	ENOS: 1 to 72 - static 73 to 144 - LACP	Registered switch is ENOS and CNOS
		CNOS: 1 to 4096	
Ports	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	Registered switch is ENOS and CNOS
		ENOS: *portnumber* (for example, *15*)	

- Output:

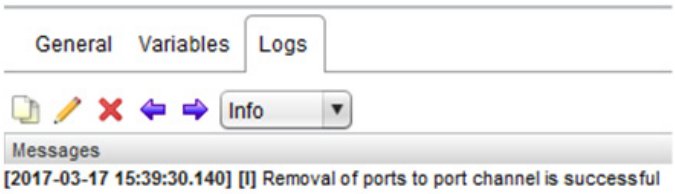
  Verify logs after workflow run is complete

- Input fields:



- Workflow schema:

- Workflow outputs:



Remove vLAG LACP AdminKey

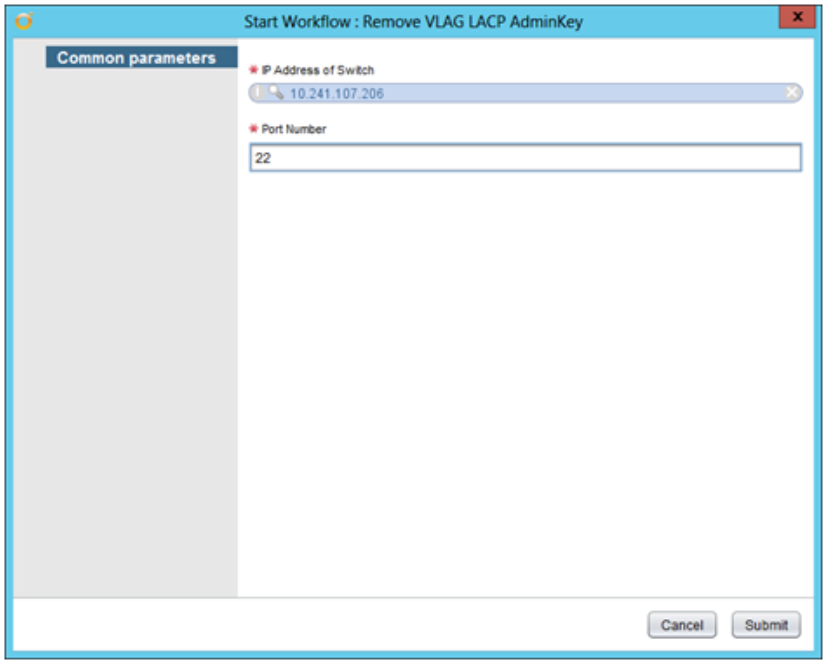
Removes ports from a vLAG.

- Supported Network OS:
  - ENOS
  - CNOS
- Dependent workflow: Register Switch
- Associated actions: createPortChannel
- Inputs:

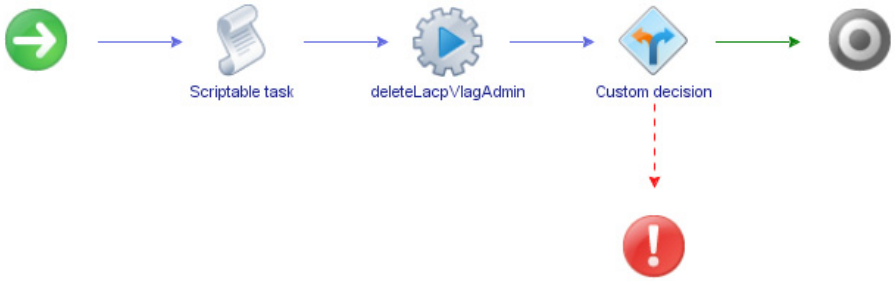
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	None
Ports	Text	CNOS: *ethernet"chassis/port"* (for example, *ethernet1/15*)	Registered switch is ENOS and CNOS
		ENOS: *portnumber* (for example, *15*)	

- Output:

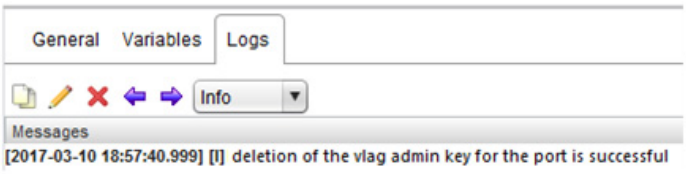
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



UFP Configuration

The **UFP Configuration** folder has workflows for configuring UFP.

Note: This feature is not supported on switches running CNOS.

- **Create UFP Port**: Enables a specific UFP port
- **Modify UFP PortBW**: Modifies the parameters of a UFP port
- **UFP Enable**: Globally enables UFP on the switch

Create UFP Port

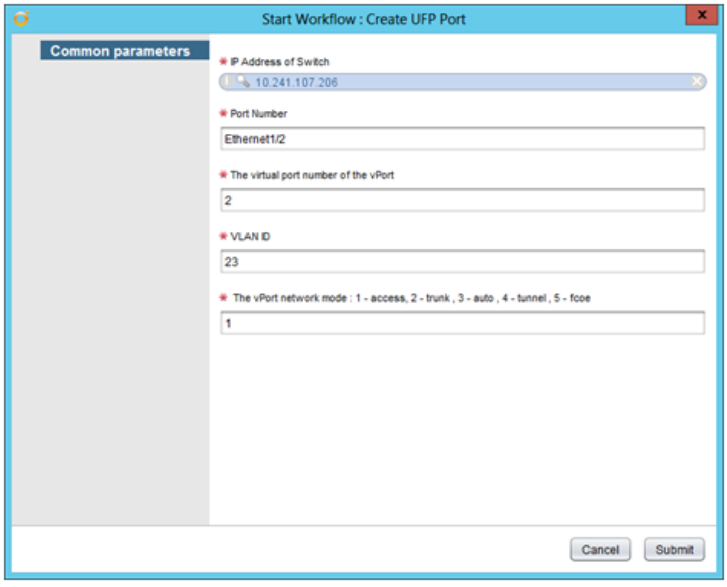
Enables a specific UFP port.

- Supported Network OS: ENOS
- Dependent workflow:
  - Register Switch
  - Create VLAN
- Associated actions: enableUFP
- Inputs:

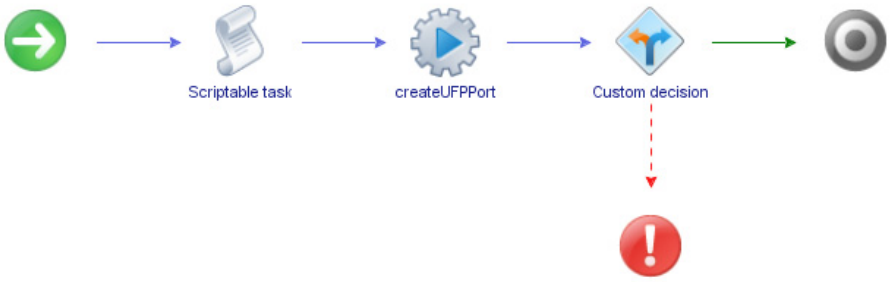
Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Number	ENOS: *portnumber* (for example, *15*)	
Port Number of the vPort	Number	1 to 4	Port Number
VLAN ID	Number	1 to 4096	vPort Number
vPort Network Mode	Select	1 - Access	vPort Number
		2 - Trunk	
		3 - Auto	
		4 - Tunnel	
		5 - FCoE	

- Output:

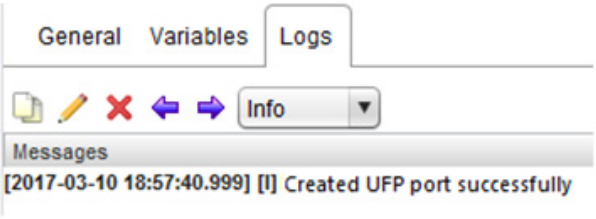
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



Modify UFP Port Bandwidth

Modifies the bandwidth limitations of a UFP port.

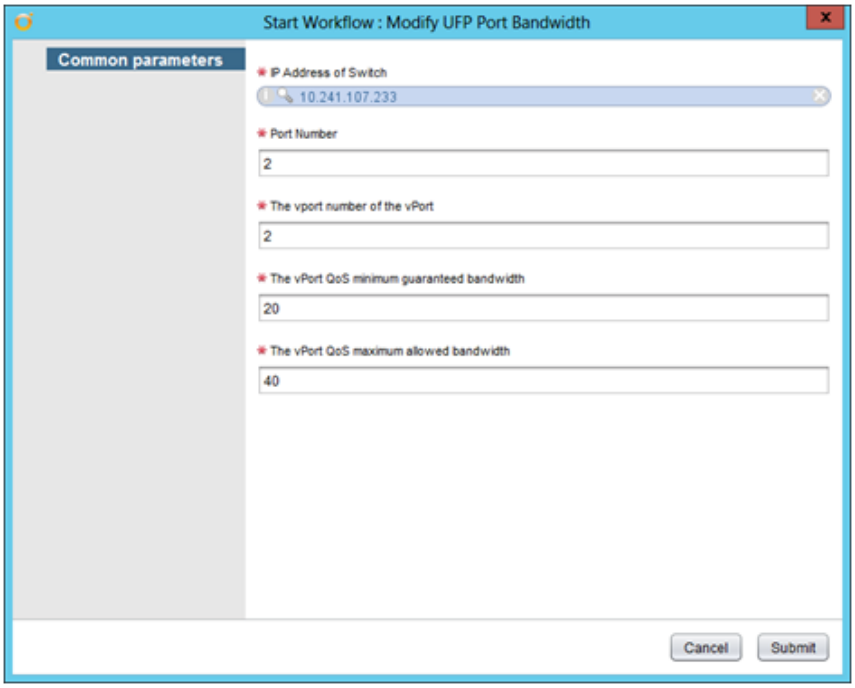
- Supported Network OS: ENOS
- Dependent workflow: Register Switch
- Associated actions: enableUFP
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number
Port Number	Number	ENOS: *portnumber* (for example, *15*)	
Port Number of the vPort	Number	1 to 4	Port Number
vPort QoS minimum guaranteed BW	Number	Between 10 to 100	vPort Number
vPort QoS maximum guaranteed BW	Number	Between 10 to 100	vPort Number

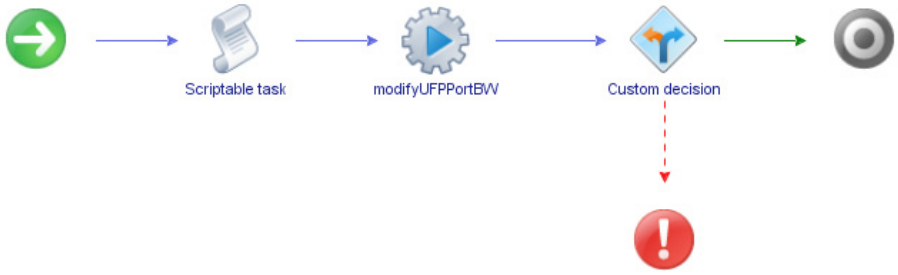
- Output:

  Verify logs after workflow run is complete

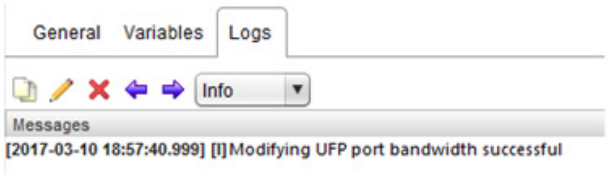
- Input fields:



- Workflow schema:



- Workflow outputs:



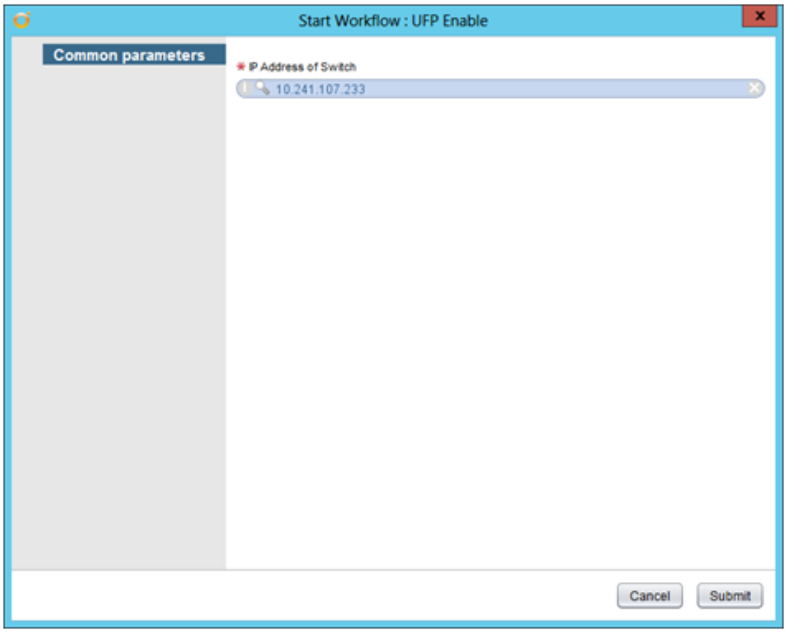
UFP Enable

Globally enables UFP on the switch.

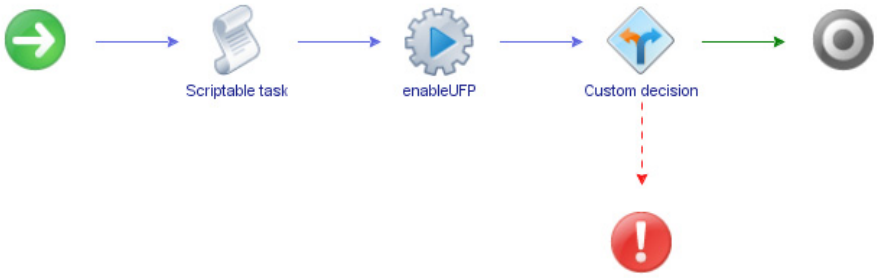
- Supported Network OS: ENOS
- Dependent workflow: Register Switch
- Associated actions: enableUFP
- Inputs:

Input	Field Type	Format/Options	Related Inputs
IP Address	Select	From Inventory Objects	Port Number

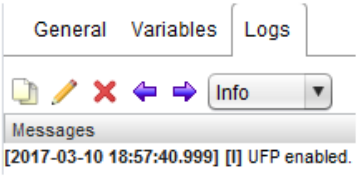
- Output:
  Verify logs after workflow run is complete
- Input fields:



- Workflow schema:



- Workflow outputs:



Advanced Workflows

The following table lists Advanced Workflows that combine multiple Actions to perform a task.

Table 2. *Advanced Workflows*

Workflow name	Description	Input	Output	Preconditions	Notes
CreateSingleVLAN OnPort	This will create a VLAN on a switch based on server MAC address and VLAN number.	String serverMacAddress, String VLANNum, String VLANName	Status message on the console log and the highlighted green end point in the workflow path.	Switch is registered. LLDP is enabled on the switch.	Use actions: 1. Get Server Port Mapping 2. Verify Active Switch 3. Create VLAN 4. Apply VLAN to Port 5. Apply Configuration
CreateSingleVLAN OnVLAGPort	This will create a VLAN on switch based on server MAC address and VLAN number with the server port on the switch belonging to a Static Portchannel.	String serverMacAddress, String VLANNum, String VLANName, String portChannelNumber	Status message on the console log and the highlighted green end point in the workflow path.	Switch is registered. LLDP is enabled on the switch.	Use actions: 1. Get Server Port Mapping 2. Verify Active Switch 3. Create Port Channel on the server port. 4. Enable Port Channel 5. Create VLAN 6. Apply VLAN to Static Port Channel vLAG Port 7. Apply Configuration
CreateSingleVLAN OnLACPVLAGPort	This will create a VLAN on switch based on server MAC address and VLAN number with the server port on the switch belonging to a LACP Portchannel.	String serverMacAddress, String VLANNum, String VLANName, String portChannelNumber	Status message on the console log and the highlighted green end point in the workflow path.	Switch is registered. LLDP is enabled on the switch.	Use actions: 1. Get Server Port Mapping 2. Verify Active Switch 3. Create LACP Port Channel. 4. Create LACP Port using LACP Port Channel adminKey. 5. Create VLAN 6. Apply VLAN to LACP Port Channel Port 7. Apply Configuration

Chapter 4. Troubleshooting

vRealize Orchestrator provides an extensive logging facility for troubleshooting issues. Refer to the following document on the vRealize Orchestrator Documentation page for details on how to enable logging, change log levels and where to access the log files: *Installing and Configuring VMware vRealize Orchestrator*

The Lenovo Networking Plug-in for VMware vRealize Orchestrator supports the following log levels:

- INFO
- DEBUG
- ERROR

The following table lists the various log levels that are supported:

Table 3. *Logging Messages*

LOG_INFO	2015-05-25 07:15:23.237+0000 [WorkflowExecutorPool-Thread-18] INFO {vcoadmin:RegisterSwitchUsingAction:8a71eb5b4d89bd6d014d89ed0373009c:3d3ebb73-6413-42e6-858a-539fed85e849:[3d3ebb73-6413-42e6-858a-539fed85e849]} [RegisterSwitch] sysInfo is [1, Discovered device info... IP Address = 10.241.105.239 sysDescr = Lenovo Flex System Fabric EN4093R 10Gb Scalable Switch sysObjectID = 1.3.6.1.4.1.20301.1.18.18 sysName = compassr SNMP Version = 1 SNMP Port = 161 Security Model = v1v2 Read Community = public Write Community = private]
LOG_INFO	2015-05-25 10:28:35.430+0000 [WorkflowExecutorPool-Thread-1] INFO {vcoadmin:RegisterSwitchUsingAction:8a71eb7b4d8a9ac2014d8a9de41f0004:3d3ebb73-6413-42e6-858a-539fed85e849:[3d3ebb73-6413-42e6-858a-539fed85e849]} [SCRIPTING_LOG] [RegisterSwitchUsingAction (5/25/15 10:28:32)] Registration of the switch successful
LOG_INFO	2015-05-25 10:39:43.801+0000 [WorkflowExecutorPool-Thread-7] INFO {vcoadmin:CreateVLAN:8a71eb7b4d8a9ac2014d8aa8034b0034:5ec1d57a-3e00-4b86-a025-96c0741d1fa7:[5ec1d57a-3e00-4b86-a025-96c0741d1fa7]} [SCRIPTING_LOG] [CreateVLAN (5/25/15 10:39:36)] VLAN creation has been successful

Table 3. *Logging Messages*

LOG_INFO	2015-05-25 10:46:42.213+0000 [WorkflowExecutorPool-Thread-10] INFO {vcoadmin:AddPortToVLAN:8a71eb7b4d8a9ac2014d8aae6c7a0050:26de7650-eab1-4cfa-b0b6-2f2acf60f5e2:[26de7650-eab1-4cfa-b0b6-2f2acf60f5e2]} [SCRIPTING_LOG] [AddPortToVLAN (5/25/15 10:46:36)] Adding port to VLAN successful
LOG_INFO	2015-05-25 10:46:42.169+0000 [WorkflowExecutorPool-Thread-10] INFO {vcoadmin:AddPortToVLAN:8a71eb7b4d8a9ac2014d8aae6c7a0050:26de7650-eab1-4cfa-b0b6-2f2acf60f5e2:[26de7650-eab1-4cfa-b0b6-2f2acf60f5e2]} [AddPortToVLAN] Applying configuration after SET DONE
LOG_INFO	2015-05-25 10:50:20.175+0000 [WorkflowExecutorPool-Thread-11] INFO {vcoadmin:GetListOfRegisteredSwitches:8a71eb7b4d8a9ac2014d8ab1d1710058:3a9b700c-2bb5-4323-b060-0f1eaa97fa29:[3a9b700c-2bb5-4323-b060-0f1eaa97fa29]} [SCRIPTING_LOG] [GetListOfRegisteredSwitches (5/25/15 10:50:18)] Got the registered switches
LOG_INFO	2015-05-25 10:59:08.787+0000 [WorkflowExecutorPool-Thread-15] INFO {vcoadmin:GetMarsSwitchStatus:8a71eb7b4d8a9ac2014d8ab9d8da007e:52711401-2600-45af-94b7-7255f1a3a250:[52711401-2600-45af-94b7-7255f1a3a250]} [SCRIPTING_LOG] [GetMarsSwitchStatus (5/25/15 10:59:05)] getting the switch health status successful
LOG_ERROR	2015-05-25 07:24:30.955+0000 [WorkflowExecutorPool-Thread-21] ERROR {vcoadmin:CreateVLAGAdminKey:8a71eb5b4d89bd6d014d89f562ce00b3:9fc0ef8d-3b9c-419b-8063-41ef6b12f5c8:[9fc0ef8d-3b9c-419b-8063-41ef6b12f5c8]} [CreatePortChannel] ip address is not valid
LOG_ERROR	2015-05-25 10:32:06.735+0000 [WorkflowExecutorPool-Thread-3] ERROR {vcoadmin:UFPEnable:8a71eb7b4d8a9ac2014d8aa122cf0013:bfbeba47-d593-496e-af1f-156da77ccbc9:[bfbeba47-d593-496e-af1f-156da77ccbc9]} [UFPEnable] ip address is not valid
LOG_ERROR	2015-05-25 10:33:40.354+0000 [WorkflowExecutorPool-Thread-4] ERROR {vcoadmin:CreateUFPPort:8a71eb7b4d8a9ac2014d8aa29095001b:6c95e358-8d71-4434-a5f7-e33ea164c55e:[6c95e358-8d71-4434-a5f7-e33ea164c55e]} [UFPPortEnable] UFP port parameters are invalid

Table 3. *Logging Messages*

LOG_ERROR	2015-05-25 10:35:47.032+0000 [WorkflowExecutorPool-Thread-5] ERROR {vcoadmin:RemovePortChannel:8a71eb7b4d8a9ac2014d8aa47f8f0024:63150e59-36cf-4e07-b193-68d24dc4c085:[63150e59-36cf-4e07-b193-68d24dc4c085]} [RemovePortChannel] port channel number is invalid
LOG_ERROR	2015-05-25 10:37:18.799+0000 [WorkflowExecutorPool-Thread-6] ERROR {vcoadmin:ModifyUFPPortBW:8a71eb7b4d8a9ac2014d8aa5e613002c:7cae3d5e-6084-4398-a555-c6cab36c58b0:[7cae3d5e-6084-4398-a555-c6cab36c58b0]} [ModifyUFPPortBW] UFP port params are invalid
LOG_ERROR	2015-05-25 10:44:47.502+0000 [WorkflowExecutorPool-Thread-9] ERROR {vcoadmin:GetRemoteNodeMapping:8a71eb7b4d8a9ac2014d8aacbe9d0048:c36a11ae-6d12-4547-978b-24fcf659c075:[c36a11ae-6d12-4547-978b-24fcf659c075]} [GetRemoteNodeMapping] switch port is not valid
LOG_DEBUG	2015-05-25 10:41:38.751+0000 [WorkflowExecutorPool-Thread-8] DEBUG {vcoadmin:GetVLANInfo:8a71eb7b4d8a9ac2014d8aa9dce5003c:73f2b9dd-1df3-4b9e-893e-7d622dc17349:[73f2b9dd-1df3-4b9e-893e-7d622dc17349]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=array, type=Array/string, value=#{#string#key = vlanInfoStatus.1300,value = 2#;#string#key = vlanInfoPorts.1300,value = 13;43-44#;#string#key = vlanInfoName.1300,value = VLAN 1300#}#]
LOG_DEBUG	2015-05-25 10:46:37.495+0000 [WorkflowExecutorPool-Thread-10] DEBUG {vcoadmin:AddPortToVLAN:8a71eb7b4d8a9ac2014d8aae6c7a0050:26de7650-eab1-4cfa-b0b6-2f2acf60f5e2:[26de7650-eab1-4cfa-b0b6-2f2acf60f5e2]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=portNum, type=string, value=6] 2015-05-25 10:46:37.495+0000 [WorkflowExecutorPool-Thread-10] DEBUG {vcoadmin:AddPortToVLAN:8a71eb7b4d8a9ac2014d8aae6c7a0050:26de7650-eab1-4cfa-b0b6-2f2acf60f5e2:[26de7650-eab1-4cfa-b0b6-2f2acf60f5e2]} [WorkflowScriptRunner] Fetching portNum

Table 3. *Logging Messages*

LOG_DEBUG	2015-05-25 10:50:20.150+0000 [WorkflowExecutorPool-Thread-11] DEBUG {vcoadmin:GetListOfRegisteredSwitches:8a71eb7b4d8a9ac2014d8ab1d1710058:3a9b700c-2bb5-4323-b060-0f1eaa97fa29:[3a9b700c-2bb5-4323-b060-0f1eaa97fa29]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=returnVals, type=Array/string, value=#{#string#switchIp=10.241.105.239,switchType=compassr#}#]
LOG_DEBUG	2015-05-25 10:52:06.365+0000 [WorkflowExecutorPool-Thread-12] DEBUG {vcoadmin:GetSwitchPortInfo:8a71eb7b4d8a9ac2014d8ab36cb20061:9028ba38-6619-4399-9deb-7311036b35da:[9028ba38-6619-4399-9deb-7311036b35da]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=retArray, type=Array/string, value=#{#string#key = portInfoType.5,value = 7#;#string#key = portInfoMode.5,value = 2#;#string#key = portInfoPhyIfDescr.5,value = INTA5#;#string#key = portInfoSpeed.5,value = 5#;#string#key = portInfoPhyIfOperStatus.5,value = 2#}#]
LOG_DEBUG	2015-05-25 10:56:07.479+0000 [WorkflowExecutorPool-Thread-13] DEBUG {vcoadmin:GetSwitchPortInfo:8a71eb7b4d8a9ac2014d8ab71e8c006d:9028ba38-6619-4399-9deb-7311036b35da:[9028ba38-6619-4399-9deb-7311036b35da]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=retArray, type=Array/string, value=__NULL__]
LOG_DEBUG	2015-05-25 10:59:08.785+0000 [WorkflowExecutorPool-Thread-15] DEBUG {vcoadmin:GetMarsSwitchStatus:8a71eb7b4d8a9ac2014d8ab9d8da007e:52711401-2600-45af-94b7-7255f1a3a250:[52711401-2600-45af-94b7-7255f1a3a250]} [WorkflowHandler] getAttributeFromCache WorkflowTokenAttribute [name=result, type=string, value=critical]

Chapter 5. Known Issues

Problem:

The EnableVLAGAdminkey workflow fails on the RackSwitch G8332 when enabling an LACP portchannel group.

Cause:

Presence of a VLAN on the trunk port which is part of the portchannel.

Workaround:

Remove the VLAN on the trunk port.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

Use this information to obtain additional information about Lenovo and Lenovo products, and determine what to do if you experience a problem with your Lenovo system or optional device.

Note: This section includes references to IBM web sites and information about obtaining service. IBM is Lenovo's preferred service provider for the System X, Flex System, and NeXtScale System products.

Before you call, make sure that you have taken these steps to try to solve the problem yourself.

If you believe that you require warranty service for your Lenovo product and you have purchased the plug-in through the “Lenovo Networking Bundle for vRealize”, the service technicians will be able to assist you more efficiently if you prepare before you call.

- Go to the Lenovo Support portal to check for information to help you solve the problem.
- Gather the following information to provide to the service technician. This data will help the service technician quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.
  - Pertinent information such as error messages and logs
- Start the process of determining a solution to your problem by making the pertinent information available to the service technicians. The IBM service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

You can solve many problems without outside assistance by following the troubleshooting procedures that Lenovo provides in the online help or in the Lenovo product documentation. The Lenovo product documentation also describes the diagnostic tests that you can perform. The documentation for most systems, operating systems, and programs contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Appendix B. Notices

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