Plus Module User’s Guide
Note
Before using this information and the product it supports, read the information in "Notices" on page 65.

Third Edition (December 2004)
This edition applies to version 8, release 2, modification 0 of IBM Tivoli Workload Scheduler (program number 5698-WSH) and to all subsequent releases and modifications until otherwise indicated in new editions.
This edition replaces SC32-1276-01.

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## Notices

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About this guide

The Tivoli Workload Scheduler Plus Module User’s Guide provides information on how to set up and use the Tivoli Workload Scheduler Plus Module. This module provides the management instrumentation for specific use with the Tivoli Management Framework environment.

What’s new in this edition

This section describes the modifications made to this guide since the previous edition.

The entire guide has been restructured and new sections and descriptions have been added to explain in more detail how to integrate Tivoli Workload Scheduler into the Tivoli® environment.

The guide is divided into seven chapters and two appendixes. The chapters and appendixes are now listed together with a description, for each chapter, of the major changes that were applied to that chapter:

- **Chapter 1, “IBM Tivoli Workload Scheduler Plus Module overview,” on page 1.** This chapter contains the following new sections:
  - “Mapping your scheduling environment into the Tivoli environment” on page 2 describes the architecture of the integrated mixed scheduling and Tivoli environment.
  - “Quick start” on page 6 describes the steps to install and set up the Tivoli Workload Scheduler Plus Module.

- **Chapter 2, “Installing, upgrading, and uninstalling,” on page 9.** This chapter contains two new sections:
  - “Verifying if Tivoli Distributed Monitoring and TEC are installed” on page 9 describes how to check if these two products are present in your Tivoli environment.
  - “Synchronizing gateways” on page 15 describes how to update gateways managing endpoints installed on Tivoli Workload Scheduler workstations.

- **Chapter 3, “Setting up the environment,” on page 17.** This chapter contains a new in depth description of how the integration with TEC is set up with specific information on the configuration files involved and settings.

- **Chapter 5, “Using monitors,” on page 33.** This chapter contains a new detailed description of the Tivoli Distributed Monitoring resources provided with the Tivoli Workload Scheduler Plus Module and of the monitoring information flow. The monitors have been reorganized by monitor type rather than by monitored resource type.

- **Chapter 6, “Using events,” on page 41.** This chapter contains a new detailed description of the logic that is used when generating job scheduling events. The setup information, that was contained in this chapter in the previous edition of the guide, has been moved to Chapter 3, “Setting up the environment,” on page 17.

- **Chapter 4, “Using tasks,” on page 27.** No additional information has been added to this chapter.
Who should read this guide

This guide is for system administrators who use the Tivoli Plus for Workload Scheduler module to monitor the Workload Scheduler job scheduling environment.

Users of the guide should have some knowledge of:

• The Tivoli environment
• Tivoli Plus modules
• The Tivoli Workload Scheduler application environment
• UNIX® and Windows NT® operating systems

What this guide contains

The Tivoli Workload Scheduler Plus Module User’s Guide contains the following sections:

• Chapter 1, “IBM Tivoli Workload Scheduler Plus Module overview,” on page 1
  Provides an introduction to the product and general considerations.
• Chapter 2, “Installing, upgrading, and uninstalling,” on page 9
  Describes how to install, upgrade, and uninstall Tivoli Workload Scheduler Plus Module.
• Chapter 3, “Setting up the environment,” on page 17
  Contains information to configure the integrated environment and to set up the integration with TEC.
• Chapter 5, “Using monitors,” on page 33
  Provides information about pre-configured monitors available for monitoring Tivoli Workload Scheduler resources status and availability with Tivoli Distributed Monitoring.
• Chapter 6, “Using events,” on page 41
  Provides information on pre-configured events available to be triggered to TEC.
• Chapter 4, “Using tasks,” on page 27
  Provides information on pre-configured tasks provided by the Tivoli Workload Scheduler Plus Module to manage Tivoli Workload Scheduler resources.
• Appendix A, “Job scheduling events format,” on page 57
  Provides detailed information on the format of the events supported by the Tivoli Workload Scheduler Plus Module.
• Appendix B, “Support information,” on page 61
  Describes how to get support for IBM products.

Chapter 7, “Troubleshooting,” on page 53. This is a new chapter. It describes how to solve known Tivoli Workload Scheduler Plus Module problems and how to cleanup manually a Tivoli Workload Scheduler Plus Module installation.

Appendix A, “Job scheduling events format,” on page 57. In this appendix the Table 3 on page 57 describing the format of job scheduling events has a new structure and contents.

Appendix B, “Support information,” on page 61. This new appendix describes how to get assistance for IBM® products.
Publications

This section lists publications in the Tivoli Workload Scheduler library and any other related documents. It also describes how to access Tivoli publications online and how to order Tivoli publications.

Tivoli Workload Scheduler library
Tivoli Workload Scheduler comprises several separate products available on a variety of platforms, and the library is similarly divided:

IBM Tivoli Workload Scheduling suite library
This library contains all cross-platform and cross-product publications for Tivoli Workload Scheduler.

IBM Tivoli Workload Scheduler distributed library
This library contains all of the publications that refer to using Tivoli Workload Scheduler on platforms other than z/OS®.

IBM Tivoli Workload Scheduler for z/OS library
This library contains all publications that apply only to IBM Tivoli Workload Scheduler for z/OS.

IBM Tivoli Workload Scheduler for Applications library
This library contains all publications that apply only to IBM Tivoli Workload Scheduler for Applications.

IBM Tivoli Workload Scheduler for Virtualized Data Centers library
This library contains all publications that apply only to IBM Tivoli Workload Scheduler for Virtualized Data Centers.

IBM Tivoli Workload Scheduling suite library
The following publications are available in the IBM Tivoli Workload Scheduling suite library. This includes publications which are common to all products, platforms, and components.

• IBM Tivoli Workload Scheduler: General Information, SC32-1256
  Provides general information about all Tivoli Workload Scheduler products. It gives an overview of how they can be used together to provide workload management solutions for your whole enterprise.

• IBM Tivoli Workload Scheduler: Job Scheduling Console User’s Guide, SC32-1257
  Describes how to work with Tivoli Workload Scheduler, regardless of platform, using a common GUI called the Job Scheduling Console.

• IBM Tivoli Workload Scheduler: Job Scheduling Console Release Notes®, SC32-1258
  Provides late-breaking information about the Job Scheduling Console.

• IBM Tivoli Workload Scheduler: Warehouse Enablement Pack Version 1.1.0 Implementation Guide for Tivoli Enterprise™ Data Warehouse, Version 1.1,
  Provides information about enabling Tivoli Workload Scheduler for Tivoli Data Warehouse.

  Note: This guide is only available on the product CD. It is not possible to access it online, as you can the other books (see “Accessing publications online” on page xiii).

IBM Tivoli Workload Scheduler Distributed library
The following publications are available in the IBM Tivoli Workload Scheduler distributed library. This includes publications which refer to using the product on all platforms except z/OS.
• **IBM Tivoli Workload Scheduler: Release Notes, SC32-1277**
  Provides late-breaking information about Tivoli Workload Scheduler on platforms other than z/OS.

• **IBM Tivoli Workload Scheduler: Planning and Installation Guide, SC32-1273**
  Describes how to plan for and install IBM Tivoli Workload Scheduler on platforms other than z/OS, and how to integrate Tivoli Workload Scheduler with NetView®, Tivoli Data Warehouse, and IBM Tivoli Business Systems Manager.

• **IBM Tivoli Workload Scheduler: Reference Guide, SC32-1274**
  Describes the Tivoli Workload Scheduler command line used on platforms other than z/OS, and how extended and network agents work.

• **IBM Tivoli Workload Scheduler: Administration and Troubleshooting, SC32-1275**
  Provides information about how to administer Tivoli Workload Scheduler on platforms other than z/OS, and what to do if things go wrong. It includes help on many messages generated by the main components of Tivoli Workload Scheduler.

• **IBM Tivoli Workload Scheduler: Limited Fault-tolerant Agent for OS/400®, SC32-1280**
  Describes how to install, configure, and use Tivoli Workload Scheduler limited fault-tolerant agents on AS/400®.

• **IBM Tivoli Workload Scheduler: Plus Module User’s Guide, SC32-1276**
  Describes how to set up and use the Tivoli Workload Scheduler Plus module.


**IBM Tivoli Workload Scheduler for z/OS library**
The following documents are available in the Tivoli Workload Scheduler for z/OS library:

• **IBM Tivoli Workload Scheduler for z/OS: Getting Started, SC32-1262**
  Discusses how to define your installation data for Tivoli Workload Scheduler for z/OS and how to create and modify plans.

• **IBM Tivoli Workload Scheduler for z/OS: Installation Guide**
  Describes how to install Tivoli Workload Scheduler for z/OS.

• **IBM Tivoli Workload Scheduler for z/OS: Customization and Tuning, SC32-1265**
  Describes how to customize Tivoli Workload Scheduler for z/OS.

• **IBM Tivoli Workload Scheduler for z/OS: Managing the Workload, SC32-1263**
  Explains how to plan and schedule the workload and how to control and monitor the current plan.

• **IBM Tivoli Workload Scheduler for z/OS: Quick Reference, SC32-1268**
  Provides a quick and easy consultation reference to operate Tivoli Workload Scheduler for z/OS.

• **IBM Tivoli Workload Scheduler for z/OS: Diagnosis Guide and Reference, SC32-1261**
  Provides information to help diagnose and correct possible problems when using Tivoli Workload Scheduler for z/OS.

• **IBM Tivoli Workload Scheduler for z/OS: Messages and Codes, SC32-1267**
  Explains messages and codes in Tivoli Workload Scheduler for z/OS.

• **IBM Tivoli Workload Scheduler for z/OS: Programming Interfaces, SC32-1266**
  Provides information to write application programs for Tivoli Workload Scheduler for z/OS.
• IBM Tivoli Workload Scheduler for z/OS: Licensed Program Specifications, GI11-4208
  Provides planning information about Tivoli Workload Scheduler for z/OS.
• IBM Tivoli Workload Scheduler for z/OS: Memo for program 5697-WSZ, GI11-4209
  Provides a summary of changes for the current release of the product.
• IBM Tivoli Workload Scheduler for z/OS: Program Directory for program 5697-WSZ, GI11-4203
  Provided with the installation tape for Tivoli Workload Scheduler for z/OS (program 5697-WSZ), describes all of the installation materials and gives installation instructions specific to the product release level or feature number.
• IBM Tivoli Workload Scheduler for z/OS: Program Directory for program 5698-WSZ, GI11-4207
  Provided with the installation tape for Tivoli Workload Scheduler for z/OS (program 5698-WSC), describes all of the installation materials and gives installation instructions specific to the product release level or feature number.


IBM Tivoli Workload Scheduler for Applications library
The following manuals are available in the IBM Tivoli Workload Scheduler for Applications library:
• IBM Tivoli Workload Scheduler for Applications: Release Notes, SC32-1279
  Provides late-breaking information about the Tivoli Workload Scheduler extended agents.
• IBM Tivoli Workload Scheduler for Applications: User’s Guide, SC32-1278
  Describes how to install, use, and troubleshoot the Tivoli Workload Scheduler extended agents.


IBM Tivoli Workload Scheduler for Virtualized Data Centers library
The following manuals are available in the IBM Tivoli Workload Scheduler for Virtualized Data Centers library:
• IBM Tivoli Workload Scheduler for Virtualized Data Centers: Release Notes, SC32-1453
  Provides late-breaking information about Tivoli Workload Scheduler for Virtualized Data Centers.
• IBM Tivoli Workload Scheduler for Virtualized Data Centers: User’s Guide, SC32-1454
  Describes how to extend the scheduling capabilities of Tivoli Workload Scheduler to workload optimization and grid computing by enabling the control of IBM LoadLeveler® and IBM Grid Toolbox jobs.


Related publications
• IBM Redbooks™: High Availability Scenarios with IBM Tivoli Workload Scheduler and IBM Tivoli Framework
  This IBM Redbook, shows you how to design and create highly available IBM Tivoli Workload Scheduler and IBM Tivoli Management Framework (Tivoli server, Managed Nodes and Endpoints) environments. It presents High
Availability Cluster Multiprocessing (HACMP™) for AIX® and Microsoft® Windows® Cluster Service (MSCS) case studies.

This Redbook can be found on the Redbooks Web site at [http://www.redbooks.ibm.com/abstracts/sg246632.html](http://www.redbooks.ibm.com/abstracts/sg246632.html)

- **IBM Redbooks: Customizing IBM Tivoli Workload Scheduler for z/OS V8.2 to Improve Performance**

  This IBM Redbook covers the techniques that can be used to improve the performance of Tivoli Workload Scheduler for z/OS (including end-to-end scheduling).

  This Redbook can be found on the Redbooks Web site at [http://www.redbooks.ibm.com/abstracts/sg246352.html](http://www.redbooks.ibm.com/abstracts/sg246352.html)

- **IBM Redbooks: End-to-End Scheduling with IBM Tivoli Workload Scheduler Version 8.2**

  This IBM Redbook covers how best to provide end-to-end scheduling using Tivoli Workload Scheduler Version 8.2, both distributed (previously known as Maestro™) and mainframe (previously known as OPC) components.

  This Redbook can be found on the Redbooks Web site at [http://www.redbooks.ibm.com/abstracts/sg246624.html](http://www.redbooks.ibm.com/abstracts/sg246624.html)

- **IBM Redbooks: IBM Tivoli Workload Scheduler Version 8.2: New Features and Best Practices**

  This IBM Redbook covers the new features of Tivoli Workload Scheduler 8.2, focusing specifically on the Tivoli Workload Scheduler 8.2 Distributed product. In addition to new features and real-life scenarios, you will find a whole chapter on best practices (mostly version independent) with lots of tips for fine tuning your scheduling environment.

  This Redbook can be found on the Redbooks Web site at [http://www.redbooks.ibm.com/abstracts/sg246628.html](http://www.redbooks.ibm.com/abstracts/sg246628.html)


  Tivoli Enterprise Installation Guide, Version 3.7.1, GC32-0395

  Describes how to install and upgrade Tivoli Enterprise™ software.


  Tivoli Management Framework Reference Manual, Version 3.7.1, SC31-8434

  Provides detailed information about Tivoli Management Framework commands and documents Tivoli-provided policy scripts.


  Describes the concepts and procedures for using Tivoli Management Framework services. It provides instructions for performing tasks from the Tivoli desktop and from the command line.

- **Tivoli Management Framework Maintenance and Troubleshooting Guide, Version 4.1, GC32-0807**

  Provides help and guidance for solving problems with Tivoli Management Framework.


  Provides task-oriented information on how to use Tivoli Distributed Monitoring to monitor system and application resources.


  Provides task-oriented information on how to use Tivoli Distributed Monitoring for Windows to monitor system and application resources.
• Tivoli Distributed Monitoring Collection Reference, Version 3.7, SC31-5118
  Describes how to install and use the monitoring collections for Tivoli Distributed Monitoring.
• IBM Tivoli Enterprise Console® Installation Guide, Version 3.8, GC32-0823
  Describes how to install, upgrade, and remove TEC components.
  Describes how to plan for and configure your event database environment and describes components, roles, and other general information specific to for using the TEC product.
• IBM Tivoli Enterprise Console Adapters Guide, Version 3.8, GC32-0668
  Provides information about the currently available adapters.
• IBM Tivoli Enterprise Console Rule Builder’s Guide, Version 3.8, GC32-0669
  Provides information about using the TEC rule editor and graphical rule builder to modify existing rules and create new rules to match your specific event management needs.
  Describes how to install, upgrade, and remove TEC components. Provides details about using the event database installation assistant.

The Tivoli Software Glossary includes definitions for many of the technical terms related to Tivoli software. The Tivoli Software Glossary is available at the following Tivoli software library Web site:

http://publib.boulder.ibm.com/tividd/glossary/tivoliglossarymst.htm

Accessing publications online
The product CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both. To access the publications using a Web browser, open the infocenter.html file. The file is in the appropriate publications directory on the product CD.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli software information center Web site. Access the Tivoli software information center by first going to the Tivoli software library at the following Web address:


Scroll down and click the Product manuals link. In the Tivoli Technical Product Documents Alphabetical Listing window, click the appropriate Tivoli Workload Scheduler product link to access the product’s libraries at the Tivoli software information center. All publications in the Tivoli Workload Scheduler suite library, distributed library and z/OS library can be found under the entry Tivoli Workload Scheduler.

Note: If you print PDF documents on other than letter-sized paper, set the option in the File → Print window that allows Adobe Reader to print letter-sized pages on your local paper.
Tivoli Workload Scheduler online books
All the books in the Tivoli Workload Scheduler for z/OS library, are available in displayable softcopy form on CD-ROM in the IBM Online Library: z/OS Software Products Collection Kit, SK3T-4270. You can read the softcopy books on CD-ROMs using these IBM licensed programs:
- BookManager® READ/2 (program number 5601-454)
- BookManager READ/DOS (program number 5601-453)
- BookManager READ/6000 (program number 5765-086)

All the BookManager programs need a personal computer equipped with a CD-ROM disk drive (capable of reading disks formatted in the ISO 9660 standard) and a matching adapter and cable. For additional hardware and software information, refer to the documentation for the specific BookManager product you are using.

Updates to books between releases are provided in softcopy only.

Ordering publications
You can order many Tivoli publications online at the following Web site:

You can also order by telephone by calling one of these numbers:
- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, see the following Web site for a list of telephone numbers:
http://www.ibm.com/software/tivoli/order-lit/

Accessibility
Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

For additional information, see the Accessibility Appendix in the Tivoli Workload Scheduler Planning and Installation Guide.

Tivoli technical training
For Tivoli technical training information, refer to the following IBM Tivoli Education Web site:
http://www.ibm.com/software/tivoli/education

Support information
If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:
- Searching knowledge bases: You can search across a large collection of known problems and workarounds, Technotes, and other information.
• Obtaining fixes: You can locate the latest fixes that are already available for your product.
• Contacting IBM Software Support: If you still cannot solve your problem, and you need to work with someone from IBM, you can use a variety of ways to contact IBM Software Support.

For more information about these three ways of resolving problems, see Appendix B, “Support information,” on page 61.

Conventions used in this guide

This guide uses several conventions for special terms and actions, operating system-dependent commands and paths, common syntax, and margin graphics.

Typeface conventions

This guide uses the following typeface conventions:

Bold

• Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
• Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolon lists, containers, menu choices, menu names, tabs, property sheets), labels (such as Tip, and Operating system considerations)
• Keywords and parameters in text

Italic

• Words defined in text
• Emphasis of words (words as words)
• New terms in text (except in a definition list)
• Variables and values you must provide

Monospace

• Examples and code examples
• File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
• Message text and prompts addressed to the user
• Text that the user must type
• Values for arguments or command options

Operating system-dependent variables and paths

This guide uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace $variable with %variable% for environment variables and replace each forward slash (/) with a backslash (\) in directory paths. The names of environment variables are not always the same in Windows and UNIX. For example, %TEMP% in Windows is equivalent to $tmp in UNIX.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.
Command syntax

This guide uses the following syntax wherever it describes commands:

*Table 1. Command Syntax*

<table>
<thead>
<tr>
<th>Syntax convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brackets ([ ] )</td>
<td>The information enclosed in brackets ([ ]) is optional. Anything not enclosed in brackets must be specified.</td>
</tr>
<tr>
<td>Braces ( { } )</td>
<td>Braces ( { } ) identify a set of mutually exclusive options, when one option is required.</td>
</tr>
<tr>
<td>Underscore ( _ )</td>
<td>An underscore (_) connects multiple words in a variable.</td>
</tr>
<tr>
<td>Vertical bar (</td>
<td>)</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>Bold text designates literal information that must be entered on the command line exactly as shown. This applies to command names and non-variable options.</td>
</tr>
<tr>
<td><strong>Italic</strong></td>
<td>Italic text is variable and must be replaced by whatever it represents.</td>
</tr>
</tbody>
</table>
Chapter 1. IBM Tivoli Workload Scheduler Plus Module overview

This chapter describes how the IBM Tivoli Workload Scheduler takes advantage of the monitoring, events and task management capabilities provided by the IBM Tivoli Management Framework based products suite using the IBM Tivoli Workload Scheduler Plus Module.

This chapter is divided into the following subsections:

- “What is the Tivoli Workload Scheduler Plus Module”
- “Mapping your scheduling environment into the Tivoli environment” on page 2
- “Quick start” on page 6
- “Installation requirements” on page 7

What is the Tivoli Workload Scheduler Plus Module

The Tivoli Workload Scheduler Plus Module is a Tivoli Workload Scheduler feature available on the Tivoli Workload Scheduler installation media which allows you to integrate your Tivoli Workload Scheduler environment (from now on called scheduling environment) with your Tivoli Management Framework based environment (from now on called Tivoli environment).

The Tivoli Workload Scheduler Plus Module mainly consists of a set of predefined message formats, event classes, rules, monitors, indicators collections, actions that can be taken if triggering events are generated, and Tivoli tasks to run against the scheduling environment. These resources that are used by the Tivoli Enterprise Console (TEC), Tivoli Distributed Monitoring and Tivoli Management Framework provide you with these add-on capabilities:

Performing event management using the TEC for:

- All abended or failed jobs and job streams.
- Unanswered prompts.
- Jobs potentially missing the deadline warnings (Late Jobs).
- Tivoli Workload Scheduler agents that are unlinked or down.

To exploit these capabilities the TEC must be installed in your environment.

Monitoring of scheduling resources using the Tivoli Distributed Monitoring, such as:

- Disk space availability (stdlist, schedlog, and free space).
- Swap space availability.
- Page outs.
- Application status (batchman, netman, mailman, jobman).
- Host availability.

To exploit these capabilities the Tivoli Distributed Monitoring product must be installed in your environment.

Customizing the integration using the Tivoli tasks as follows:
What is the Tivoli Workload Scheduler Plus Module

- Tasks for enabling the TEC event server to manage events coming from the scheduling environment.
- Tasks for configuring the TEC logfile adapters.
- Tasks for integrating the scheduling environment into the Tivoli environment.

To exploit the first two capabilities the TEC must be installed in your environment.

Allowing the user logged onto the Tivoli Desktop to perform Tivoli Workload Scheduler actions such as:

- Tivoli tasks to display the formatted Tivoli Workload Scheduler standard reports (xref, rep1-4b, rep7, rep8, rep11, rept).
- Tivoli tasks to stop, start, link and unlink the Tivoli Workload Scheduler agents.
- Tivoli task to start the Job Scheduling Console.

Mapping your scheduling environment into the Tivoli environment

In the most general scenario you have a Tivoli environment and a scheduling environment that are completely separated. Figure 1 shows a sample of a separated scheduling and Tivoli environment.

This section gives you some examples of how the two environments can be integrated using the Tivoli Workload Scheduler Plus Module capabilities and based on whether the TEC or the Tivoli Distributed Monitoring or both these products are installed in the Tivoli environment. In any case, regardless of which Tivoli applications are installed, to map the scheduling environment into the Tivoli environment you have to install either managed nodes or endpoints on each workstation of the scheduling environment you want to integrate. You can decide not to integrate part of your scheduling environment into the Tivoli environment.
In Figure 2 the part of the scheduling environment that is not integrated into the Tivoli environment is shown in a grey box and the name of the Tivoli products to be installed or features to be configured on each system are written in bold black instead of being greyed out.

Neither the Tivoli Enterprise Console nor the Tivoli Distributed Monitoring are installed in the Tivoli environment

In this case, by integrating the scheduling environment into the Tivoli environment, you get add-on capabilities such as:

- Starting the Job Scheduling Console (in this case install a managed node on the master domain manager workstation)
- Linking or unlinking workstations
- Starting or stopping the Tivoli Workload Scheduler processes
- Perform reporting activities on jobs and plan

For more information, refer to Chapter 4, “Using tasks,” on page 27. To exploit these capabilities you need to:

- Install from the Tivoli environment, managed nodes or endpoints on the workstations in the scheduling environment
- Run the configuration tasks described in “Configuring the environment” on page 17.

Figure 2 shows an example of this kind of integration.

Figure 2. The Tivoli environment and scheduling environment integrated using the Framework only

Only the TEC is installed in the Tivoli environment

In this case, by integrating the scheduling environment into the Tivoli environment, you get add-on capabilities such as:

- Starting the Job Scheduling Console (in this case install a managed node on the master domain manager workstation)
- Linking or unlinking workstations
- Starting or stopping the Tivoli Workload Scheduler processes
Mapping your scheduling environment

- Run reporting activities on jobs and plan
- Perform event management and correlation via the TEC on events detected by the event adapters

For more information refer to [Chapter 4, “Using tasks,” on page 27](#) and to [“Job scheduling events” on page 41](#). To exploit these capabilities you need to:

- Install from the Tivoli environment, managed nodes or endpoints on the workstations in the scheduling environment
- Run the configuration tasks described in [Chapter 3, “Setting up the environment,” on page 17](#).

[Figure 3](#) shows an example result of this kind of integration.

**Figure 3. The Tivoli environment and the scheduling environment integrated using the Tivoli Enterprise Console**

Only the Tivoli Distributed Monitoring is installed in the Tivoli environment
In this case, by integrating the scheduling environment into the Tivoli environment, you get add-on capabilities such as:

- Starting the Job Scheduling Console (in this case install a managed node on the master domain manager workstation)
- Linking or unlinking workstations
- Starting or stopping the Tivoli Workload Scheduler processes
- Run reporting activities on jobs and plan
- Perform monitoring activities against scheduling resources using the Tivoli Distributed Monitoring without the possibility to send events to the TEC.

For more information refer to [Chapter 4, “Using tasks,” on page 27](#) and to [Chapter 5, “Using monitors,” on page 33](#). To exploit these capabilities you need to:

- Install from the Tivoli environment, managed nodes or endpoints on the workstations in the scheduling environment
Mapping your scheduling environment

- Run the configuration tasks described in “Configuring the environment” on page 17.
- Follow the instructions on setting up your monitoring environment described in “Setting up and activating monitoring” on page 33.

Figure 4 shows an example of this kind of integration.

Both the TEC and the Tivoli Distributed Monitoring are installed in the Tivoli environment

In this case, by integrating the scheduling environment into the Tivoli environment, you get add-on capabilities such as:

- Starting the Job Scheduling Console (in this case install a managed node on the master domain manager workstation)
- Linking or unlinking workstations
- Starting or stopping the Tivoli Workload Scheduler processes
- Run reporting activities on jobs and plan
- Perform monitoring activities against scheduling resources using the Tivoli Distributed Monitoring
- Perform event management and correlation using the TEC on both the events detected by the event adapters and on those generated by Tivoli Distributed Monitoring

For more information, refer to Chapter 4, “Using tasks,” on page 27, Chapter 5, “Using monitors,” on page 33, and Chapter 6, “Using events,” on page 41. To exploit these capabilities you need to:

- Install from the Tivoli environment, managed nodes or endpoints on the workstations in the scheduling environment
- Run the configuration tasks described in Chapter 3, “Setting up the environment,” on page 17
Mapping your scheduling environment

- Follow the instructions on setting up your monitoring environment described in “Setting up and activating monitoring” on page 33.

Figure 5 shows an example of this kind of integration.

Figure 5. The Tivoli environment and the scheduling environment integrated using the Tivoli Enterprise Console and the Tivoli Distributed Monitoring

Quick start

This section describes the steps that you follow to integrate the scheduling environment in the Tivoli environment and to customize the integration for exploiting the functionality provided by the Tivoli Management Framework, Tivoli Distributed Monitoring, and the TEC using the Tivoli Workload Scheduler Plus Module. The steps to perform are the following:

Deciding whether to integrate the entire scheduling environment or a part of it into the Tivoli environment.

For example, you might have your scheduling environment divided into a production environment and a test environment, and you decide to integrate only the production environment.

Installing a managed node or an endpoint on every scheduling workstation you want to manage

Most of the activities you can perform using the resources provided by the Tivoli Workload Scheduler Plus Module are based on running tasks and activating monitors, and the target for these are managed nodes or endpoints.

For information on how to create a new managed node or an endpoint see the Tivoli Enterprise: Installation Guide.

Installing the Tivoli Workload Scheduler Plus Module

Ensure you install the Tivoli Workload Scheduler Plus Module on the Tivoli server and on the TEC event server. For information on installing the Tivoli Workload Scheduler Plus Module see “Installing the Tivoli Workload Scheduler Plus Module” on page 11.
Quick start

Accessing the Tivoli Workload Scheduler Plus Module
Open the TWSPlus for Tivoli window in the Tivoli desktop to access all the resources installed with the Tivoli Workload Scheduler Plus Module.

Specifying scheduling environment information for every added managed node and endpoint
This is necessary when you use, across your scheduling environment, users or installation paths other than those defined for the master domain manager. This step is also needed to enable workstations where the Job Scheduling Console is installed to later run the task that starts the Job Scheduling Console from the Tivoli Desktop.

For more information see “Setting up the Tivoli Workload Scheduler Plus Module environment” on page 18.

Setting up the integration with TEC
Run the steps required to enable the integration with TEC. For more information see “Enabling TEC event server to receive events” on page 20.

Customizing groups of targets for monitoring and task management operations
Fill in the subscription lists provided by the Tivoli Workload Scheduler Plus Module installation with the endpoints and managed nodes representing the workstations of your scheduling environment where you want to run monitors or more tasks.

For more information see “The subscription lists” on page 34.

Customizing the monitoring profile settings
Check that the settings defined in the monitoring profiles provided by the Tivoli Workload Scheduler Plus Module satisfy your needs for monitoring your scheduling environment.

For more information see “Setting up and activating monitoring” on page 33 and “Available monitors” on page 36.

Installation requirements
The Tivoli Workload Scheduler Plus Module installation is supported on the subset of operating systems which support both the Tivoli Management Framework and the Tivoli Workload Scheduler master domain manager installation. For the latest information about operating systems supported, refer to IBM Software Support.

The Tivoli Workload Scheduler Plus Module installation requires a pre-existing Tivoli Management Framework based environment.

The disk space requirements are the same regardless of the role the system has in the Tivoli managed environment (Tivoli server rather than TEC event server). Moreover, the Tivoli Workload Scheduler Plus Module uses platform-independent shell and Perl scripts, which allow the module’s space requirements to be the same across all supported platforms. These values are:

<table>
<thead>
<tr>
<th>Needed Disk space</th>
<th>Data Stored</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>1575 KB</td>
<td>Binaries</td>
<td>$BINDIR/../../../genericUnix/TME/PLUS</td>
</tr>
<tr>
<td>568 KB</td>
<td>Message Catalogs</td>
<td>$BINDIR/../../../msg_cat</td>
</tr>
</tbody>
</table>

where $BINDIR is the Tivoli Management Framework binary directory. The value of $BINDIR is resolved in the shell where the Tivoli environment is set. For information about how to set the Tivoli environment see 9. This disk space is in
addition to the space requirements for the Tivoli Management Framework, the
Tivoli Management Framework based applications, and the Tivoli Workload
Scheduler engine.

Depending on the functionality you want to exploit you should have the following
products installed:
• Tivoli Distributed Monitoring 3.7 and Tivoli Distributed Monitoring Universal
  Monitors 3.7
• TEC 3.7.1 or 3.8

If any of these products is not installed, then the specific functionality requiring
that product will not work. However, if you install Tivoli Distributed Monitoring
and the TEC after installing the Tivoli Workload Scheduler Plus Module, you can
add the functionality requiring the product just installed by reinstalling the Tivoli
Workload Scheduler Plus Module.
Chapter 2. Installing, upgrading, and uninstalling

This chapter describes how to install, upgrade, and uninstall the Tivoli Workload Scheduler Plus Module in the Tivoli environment.

This chapter is divided into the following sections:
- “Verifying if Tivoli Distributed Monitoring and TEC are installed”
- “Double Byte Character Set language installation requirements” on page 11
- “Installing the Tivoli Workload Scheduler Plus Module” on page 11
- “Upgrading the environment” on page 14
- “Uninstalling the Tivoli Workload Scheduler Plus Module” on page 15

Verifying if Tivoli Distributed Monitoring and TEC are installed

This section describes how to verify if Tivoli Distributed Monitoring and TEC are installed in your Tivoli environment. This can help you understand which benefits you get if using Tivoli Workload Scheduler Plus Module resources. The output of the command described in step 2 of the list, refers to a sample environment where the Tivoli server and Tivoli Distributed Monitoring Version 3.7 are installed on a node named TMR_server and the Tivoli Enterprise Console Version 3.8 is installed on a managed node named My_Node.

To verify that Tivoli Distributed Monitoring and TEC are installed perform the following steps:

1. Login to your Tivoli server and set the Tivoli environment variables by running the following script:

   In a C shell on a UNIX system
   . /etc/Tivoli/setup_env.csh

   In a Korn shell on a UNIX system
   . /etc/Tivoli/setup_env.sh

   In a Windows command prompt window
   %SystemRoot%\system32\drivers\etc\Tivoli\setup_env.cmd

   In a Windows bash shell
   . %SystemRoot%\system32\drivers\etc\Tivoli\setup_env.sh

2. Run in that shell the following command:

   wlsinst -ah | more

   you will get an output similar to the following:

   *---------------------------------------------------------------*
   | Product List |
   *---------------------------------------------------------------*

   TME 10 Framework 4.1
   TMR_server    solaris2
   My_Node       aix4-r1

   Tivoli Distributed Monitoring 3.7
   TMR_server    solaris2

   Universal Monitors 3.7
   TMR_server    solaris2
Verifying installed products

3. Look in the output for the lines showing whether Tivoli Distributed Monitoring and TEC are installed. The following lines show that the TEC is installed on My_Node:

The following lines show that Tivoli Distributed Monitoring is installed on the TMR_server:

If the entries related to the Tivoli Distributed Monitoring do not appear in the output then the Tivoli Distributed Monitoring is not installed in the environment.


If the entries related to the TEC do not appear in the output then the TEC is not installed in the environment. If you want to install TEC ensure you install its components in the following order:

1. TEC Server
2. TEC User Interface Server
3. Tivoli Enterprise Console Sample Event Information
4. TEC Console
5. Tivoli Enterprise Adapter Configuration Facility

For information on how to install and configure TEC, refer to IBM Tivoli Enterprise Console User’s Guide.

Double Byte Character Set language installation requirements

The Tivoli Workload Scheduler Plus Module installation is supported only in C LANG. Before installing Tivoli Workload Scheduler Plus Module perform the following steps, on the system where you plan to install it, to set the Tivoli Management Framework locale to C:

1. Open a command window and set the Tivoli environment by running the setup_env Tivoli setup command.

2. Set and export the following environment variables as described below:
   
   ```
   LANG=C
   export LANG
   LC_ALL=C
   export LC_ALL
   locale=C
   export locale
   wsetlang -o
   ```

3. Ensure that no processes are running on the Tivoli server and that no Tivoli desktop is being used and then restart the object dispatcher using the command:

   ```
   odadmin reexec object_dispatcher_id
   ```

   For information on how to restart the object dispatcher see Tivoli Management Framework: Reference Manual.

Installing the Tivoli Workload Scheduler Plus Module

This section describes which methods you can use to install the Tivoli Workload Scheduler Plus Module. You can perform the installation in one of the following ways:

- "Installing from the Tivoli desktop” on page 12
- "Installing from the command line” on page 13
- "Installing from the Tivoli Workload Scheduler wizard” on page 14. Use this method only if you are installing on the same system as the Tivoli server.

If you decide to install either from the Tivoli Desktop or from the command line interface ensure that:

- You log in to a shell as a Tivoli Administrator with the install_product role
- You set up the Tivoli environment in that shell as described
- You do a full Tivoli database backup

For information on how to do a Tivoli Database backup see Tivoli Management Framework Maintenance and Troubleshooting Guide.

- You install the Tivoli Workload Scheduler Plus Module, which is divided into two installable portions, in the following order:
  1. Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r
  2. Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2
Installing the Tivoli Workload Scheduler Plus Module

Refer to section Chapter 7, “Troubleshooting,” on page 53 if you encounter any problem while installing this feature.

Installing from the Tivoli desktop

To install from the Tivoli Desktop perform the following steps:

1. Install
   Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r
   as follows:
   a. Open the Tivoli Desktop.
   b. From the menu, select Install → Install Product. The Install Product dialog is displayed.
   c. Select Tivoli Workload Scheduler Plus Module Support (Link binaries) – 3.2.r
      from the Select Product to Install list. If this entry is not displayed in the list then use the Select Media button to locate the Tivoli Workload Scheduler Plus Module images path.
   d. Specify the clients on which to install the image by moving the workstation names from the Available Clients field to the Clients to Install field.
   e. Click Install to continue with the Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r installation. The Product Install dialog is opened. Check if it warns you of any problems that you may want to correct before installing the software, then press the Continue Install button to begin the installation process, or press the Cancel button to abort the installation process.
   f. When the installation is complete, press the Close button to exit the installation.

2. Install
   Tivoli Workload Scheduler Plus Module for Tivoli version 8.2
   as follows:
   a. Select TWS Plus module for Tivoli Version 8.2
      from the Select Product to Install list.
   b. Specify the clients on which to install the image by moving the workstation names from the Available Clients field to the Clients to Install field.
   c. Click Install to install the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2.
      The installation process prompts you with the Install Options dialog. If you install on a managed node other than the one where the Tivoli Workload Scheduler master domain manager is installed then you can skip the Install Options dialog. You set these options when configuring the scheduling environment as described in “Setting up the Tivoli Workload Scheduler Plus Module environment” on page 18.
      This dialog allows you to specify the following values:

      **TWS User Name**
      The user name you specified when you installed the Tivoli Workload Scheduler on the workstation.
**TWS Installation Directory**

The path where the Tivoli Workload Scheduler is installed on the workstation.

**Job Scheduling Console Installation Directory**

The path where the Job Scheduling Console is installed if the Job Scheduling Console is installed on that workstation.

d. Click **Set and Close**. This returns you to the **Install Product** dialog.

e. Click **Install** to continue the Installation. The **Product Install** dialog warns you of any problems that you may want to correct before installing the software. Click **Continue Install** to begin the installation, or press **Cancel** to abort.

f. When the installation is complete, a completion message is displayed at the bottom of the **Product Install** dialog.

g. Click **Close** to exit the installation.

### Installing from the command line

To install Tivoli Workload Scheduler Plus Module from the command line on the Tivoli server use the following command:

```bash
winstall -c source_dir -s server -i index_file TWSUSER=TWS_user TWSDIR=TWS_homedir JSCONSOLE=JSC_homedir
```

where:

- **-c source_dir**
  Specifies the complete path to the directory containing the installation image.

- **-s server**
  Specifies the managed node to use as the installation server. If not specified, the Tivoli server is used.

- **-i index_file**
  Specifies the product index file from which the product is installed. Index files have an .IND extension. The Tivoli Workload Scheduler Plus Module image contains two index files:

  **LINK.IND**
  To use when installing the Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r

  **TWS.IND**
  To use when installing the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2

Run the **winstall** command first using the **LINK.IND** file and then again using the **TWS.IND** file.

**TWSUSER=**

Specifies the Tivoli Workload Scheduler user name. This is an optional parameter.

**TWSDIR=**

Specifies the directory where the Tivoli Workload Scheduler executable files are installed.

**JSCONSOLEDIR=**

Specifies the directory where the Tivoli Job Scheduling Console executable files are installed. This is optional. If you do not specify the Job scheduling...
Installing from the command line

Console home directory, then you can set it later using the "Set TWS Install Options" Tivoli Workload Scheduler Plus Module Configuration Task, see Chapter 4, “Using tasks,” on page 27 for additional information.

For additional information on the winstall command refer to Tivoli Management Framework: Reference Manual.

Installing from the Tivoli Workload Scheduler wizard

The Tivoli Workload Scheduler Installation wizard installs both the Tivoli Workload Scheduler Plus Module (Link Binaries) – 3.2.r and the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 in just one step. You can choose to install using this wizard when the Tivoli server reside on the same workstation as the Tivoli Workload Scheduler master domain manager.

You can install the Tivoli Workload Scheduler Plus Module using the wizard in either of these two cases:

When installing an instance of Tivoli Workload Scheduler
To do so this select the Custom installation option in the Tivoli Workload Scheduler installation wizard panel.

When adding the Tivoli Workload Scheduler Plus Module to an existing Tivoli Workload Scheduler installation
To do this run the Tivoli Workload Scheduler installation wizard and when prompted with a list of Tivoli Workload Scheduler instances already installed on that workstation, choose the one where you want to install the Tivoli Workload Scheduler Plus Module. Use the Add Feature option to add the Tivoli Workload Scheduler Plus Module feature.

For information on installation prerequisites and how to install Tivoli Workload Scheduler Plus Module using the Tivoli Workload Scheduler installation wizard, refer to the IBM Tivoli Workload Scheduler: Planning and Installation Guide.

Note: When you have installed the Tivoli Workload Scheduler Plus Module on both the Tivoli Workload Scheduler master domain manager and the Tivoli server, remember to install Tivoli Workload Scheduler Plus Module on the TEC server to complete the Tivoli Workload Scheduler Plus Module installation.

Upgrading the environment

This section describes how to successfully update the Tivoli Workload Scheduler Plus Module environment. It is divided into two parts:

• “Upgrading Tivoli Workload Scheduler Plus Module.”
• “Synchronizing gateways” on page 15.

Upgrading Tivoli Workload Scheduler Plus Module

To upgrade Tivoli Workload Scheduler Plus Module to a later version, perform the following steps:

• Make sure you make a backup copy to a temporary directory of any customization you made or modified script you created before upgrading the Tivoli Workload Scheduler Plus Module because the files in the default directories will be overwritten. Take note of the non-default subscription lists and monitor thresholds you set in your Tivoli Workload Scheduler Plus Module configuration.
Uninstalling Synchronizing

1. Before changing the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 to a patch. You can also perform this step from the command line by using the wpatch framework command. For information on how to use the wpatch command refer to the Tivoli Enterprise: Installation Guide.

2. Perform again the actions to set up the TEC event server, as described “Customizing Tivoli Enterprise Console event console” on page 20.

3. Run again the task to configure the TEC logfile adapters, as described “Setting Up the TEC logfile adapters” on page 23.

4. Restore the customized settings for the subscription lists and monitor thresholds and distribute the monitors again on the subscribed endpoints.

Synchronizing gateways

When you install the Tivoli Workload Scheduler Plus Module, one of the activities that is automatically performed by the installation procedure is to copy on each gateway a file named maestro.fmt (if the gateway is installed on a UNIX System) or maestront.fmt (if the gateway is installed on a Windows system). The FMT are provided by the Tivoli Workload Scheduler Plus Module. In these FMT files it is described how the TEC logfile adapters has to format the events to be sent to the TEC event server. Every time you run a Tivoli Workload Scheduler Plus Module task on an endpoint, the FMT file is downloaded from the gateway to the endpoint. This download is necessary to successfully run the task.

If a new gateway is created after the Tivoli Workload Scheduler Plus Module installation, however, that gateway does not contain a copy of the maestro.fmt and maestront.fmt because the FMT files are automatically downloaded only at installation time. To copy these files to that gateway, run the Tivoli Workload Scheduler Plus Module task **Synchronize Gateways**. This task is run concurrently on all gateways, it synchronizes the level of FMT files copied to the gateways, and copies for the first time these FMT files to new gateways. For further information about the **Synchronize Gateways** task, refer to Chapter 4, “Using tasks,” on page 27.

Uninstalling the Tivoli Workload Scheduler Plus Module

Before uninstalling the Tivoli Workload Scheduler Plus Module from a specific workstation, ensure you have set the Tivoli environment as described at page 9 and then perform these steps:

1. From the shell command line prompt, issue the following command to see which level of Tivoli Workload Scheduler Plus Module is installed:
   ```bash
   wlsinst -ah
   ```
   If you find entries in the Patch List output then you need to remove them first.

2. For each entry like 8.2-TWSPLEX-FP0X, where X is the fix pack number, that you see in the Patch List, issue the following command to remove the entry related to the installed Tivoli Workload Scheduler Plus Module fix pack from the Tivoli database:
   ```bash
   $BINDIR/..generic_unix/TME/PLUS/TWS/820X_Uninstall.sh
   ```

3. Move to directory $BINDIR/..generic_unix/TME/PLUS/LINK and uninstall the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 by running the following command:
   ```bash
   PLUSUninstall.sh ../TWS/PLUSProduct_info.sh
   ```

4. Run the Tivoli command:
Uninstalling the Tivoli Workload Scheduler Plus Module

```
wchkdb -ux
```

If you encounter problems when running the `PLUSuninstall.sh` command you can perform a cleanup manually. For information about how to do this see “Cleaning up manually a Tivoli Workload Scheduler Plus Module installation” on page 55.

For more information on the `wchkdb` command see the *Tivoli Management Framework Reference Manual*. 
Chapter 3. Setting up the environment

This chapter describes how to configure your environment using the Tivoli Workload Scheduler Plus Module capabilities.

The chapter is divided into the following subsections:
- “Configuring the environment”
- “Enabling TEC event server to receive events” on page 20

Configuring the environment

This section describes where the Tivoli Workload Scheduler Plus Module resources are in the Tivoli Desktop and how to use them to complete the Tivoli Workload Scheduler Plus Module setup. It is divided into the following subsections:
- “Accessing Tivoli Workload Scheduler Plus Module”
- “Setting up the Tivoli Workload Scheduler Plus Module environment” on page 18
- “Starting the Job Scheduling Console from the Tivoli desktop” on page 19

Accessing Tivoli Workload Scheduler Plus Module

To access the Tivoli Workload Scheduler Plus Module open the Tivoli Desktop and double-click the TivoliPlus icon.

![TivoliPlus Icon](image)

Figure 6. Tivoli Plus Icon

The TivoliPlus window is opened. This window contains one icon per each Tivoli Plus Module installed in your Tivoli environment. Once the Tivoli Workload Scheduler Plus Module is installed, the TWS Plus for Tivoli icon appears in this window.

![TWS Plus for Tivoli Icon](image)

Figure 7. TWS Plus for Tivoli icon.

Double-click the TWS Plus for Tivoli icon to open the TWS Plus for Tivoli window.

In this window you find all the icons representing the resources created by the Tivoli Workload Scheduler Plus Module installation for managing the scheduling
resources. They are monitors and indicators collections, subscription lists, and tasks.

![Image: Tivoli Workload Scheduler Task window]

**Figure 8. Tivoli Workload Scheduler Task window**

### Setting up the Tivoli Workload Scheduler Plus Module environment

For each endpoint and managed node representing workstations in your scheduling environment, you need to define the specific values for the Tivoli Workload Scheduler installation on that workstation to allow the tasks provided with this module to run properly. These values are used when running tasks.

To set these values, run the Set TWS Install Options task against each endpoint and managed node whose values differ from those set for the TWS master domain manager. To do this, click Set TWS Install Options and select **Modify job**.

The Set TWS Install Options window opens.
In the Set TWS Install Options window specify:

**TWS User Name**
The user name you specified when you installed the Tivoli Workload Scheduler on the workstation.

**TWS Installation Directory**
The path where the Tivoli Workload Scheduler is installed on the workstation.

**Job Scheduling Console Installation Directory**
Enter the path where the Job Scheduling Console is installed, if it is, on that workstation.

click Set and close and, to run the task, click Set TWS Install Options and select the Run on selected subscribers option. In the window that is opened select the subscribers the task and then Execute and Dismiss.

**Starting the Job Scheduling Console from the Tivoli desktop**
If your TWS master domain manager is installed on the same system as the Tivoli server, then, when you install the Tivoli Workload Scheduler Plus Module on that workstation, an icon that allows you to launch the Job Scheduling Console from the TWS Plus for Tivoli window is created.

For example, for a server named London the following icon appears:

![TWS@London](image)

When you right-click this server icon the Job Scheduling Console command is displayed. Select this command to open the Job Scheduling Console from within the Tivoli desktop.
Starting the Job Scheduling Console from the Tivoli desktop

If the TWS master domain manager is not installed on the same workstation as the Tivoli server then, to create the icon in the TWS Plus for Tivoli window, you have to perform the following steps:
1. Install a managed node on the TWS master domain manager system
2. Install the Tivoli Workload Scheduler Plus Module on that managed node
3. Run on that managed node the Set TWS Install Options task, specifying the Job Scheduling Console installation directory

If you do not need to have the icon displayed in the TWS Plus for Tivoli window, you can use the JSConsole task to launch the Job Scheduling Console from the Tivoli Desktop.

Enabling TEC event server to receive events

This section describes the configuration activity to do to exploit the Tivoli Enterprise Console capabilities using the Tivoli Workload Scheduler Plus Module. This activity is divided into three parts:

- "Customizing Tivoli Enterprise Console event console"
- "Setting Up the TEC logfile adapters” on page 23
- "Configuring the BmEvents.conf file” on page 25

Customizing Tivoli Enterprise Console event console

Some steps must be performed to prepare the TEC event server to manage the events coming from the scheduling environment. The Tivoli Workload Scheduler Plus Module Setup EventServer for TWS task allows you to automatically perform these setup activities. This task performs the following actions on the TEC event server:
1. Creates an empty rule base or clones an already existing one.
2. Imports into this rule base the new event classes provided to manage scheduling events by the Tivoli Workload Scheduler Plus Module in the following BAROC files:
   - Sentry.baroc
   - maestro.baroc
   - maestront.baroc
   - universal.baroc
   - TWS_Monitors.baroc
3. Imports the new set of rules containing predefined correlation rules and automatic responses to apply to the scheduling events. These new rule sets are provided by the Tivoli Workload Scheduler Plus Module in the following RLS files:
   - maestro_plus.rls
   - maestront_plus.rls
   - maestromon.rls
4. Compiles the rule base.
5. Loads the compiled rule base to activate it.
6. Creates a new event group named TWSPlus adding to it the following filters that allow the TEC event server to manage only the events triggered using the resources provided by the Tivoli Workload Scheduler Plus Module:
   - Events coming from the TEC logfile adapter on UNIX:
     - TWS_Base_Logfile_flt
Customizing TEC event console

- CLASS LIKE TWS_%
- Source = LOGFILE

• Events triggered by the Tivoli Distributed Monitoring monitors on UNIX:
  - TWS_Monitors_SENTRY FLT
  - CLASS = TWS_MONITORS
  - Source = SENTRY

• Events coming from the TEC logfile adapter on Windows:
  - TWS_NT_Base_NT FLT
  - CLASS = LIKE
  - TWS_NT% Source = NT

• Events triggered by the Tivoli Distributed Monitoring monitors on Windows:
  - TWS_Remote_Monitors FLT
  - CLASS = Sentry2_0_Base
  - Source = SENTRY
  - Sub-source = TWS Remote Monitors

7. Assigns the TWSPlus event group to a specific TEC event console.
8. Restarts the TEC event server.

Run the Setup EventServer for TWS job just once after Tivoli Workload Scheduler Plus Module installation and remember to rerun it after upgrading Tivoli Workload Scheduler Plus Module or after installing a fix pack.

To set up the TEC event server using the Tivoli Workload Scheduler Plus Module task, double-click Setup EventServer for TWS in the TWS Plus for Tivoli window. The Setup EventServer for TWS window is opened.
Customizing TEC event console

Fill in the fields as follows:

**New Rule Base Name**
Specify the name of the new rule base containing the information necessary to manage the events coming from the scheduling environment. If you type here the name of an existing rule base then, as the job is run, the old existing rule base is overwritten by the new one. Do not type **Default** in this field, because by doing so the default rule base is overwritten by the new one.

**Rule base to clone**
Type the name of the rule base to be cloned and modified to create the new rule base. If you are using the Default rule base specify **Default** in this field.

**Path for the new rule base**
If you are creating a new rule base, specify the path name to the directory on the Tivoli Enterprise Console server where you want to store the new rule base file.

**Name of the Event Console to configure**
Type the name of the TEC event console where you want to display the scheduling events. For information on creating TEC event console see *IBM Tivoli Enterprise Console User’s Guide*.

**Note:** You are required to type in this field the name of the TEC event console even if it is marked as optional.

**TEC UI Server host**
Type the hostname where the TEC User Interface Server is installed.
Customizing TEC event console

Note: You are required fill in this field to successfully run the Setup EventServer for TWS job.

TME® Administrator login
The TME Administrator user name.

Password
Type the TME Administrator password.

Note: Make sure you type the correct password to prevent the task from hanging.

Press Set and Close to run the job.

To verify the new rule base has been created and is active, from the Tivoli Desktop double-click the EventServer icon. The Event Server Rule Bases window is opened. This window shows all the available rule bases for that TEC event server. The red arrow on the icon identifies the active rule base among the available ones. The new rule base must be displayed in this window as the active one.

Setting Up the TEC logfile adapters

The TEC logfile adapter is used to relay events from the workstations in the scheduling environment to the TEC event server. Depending on the workstation in your scheduling environment where you decide to install and configure the TEC logfile adapter you can have different events displayed in the TEC event console. For more information on this refer to “Mapping your scheduling environment into the Tivoli environment” on page 2.

When you have installed the TEC logfile adapter on a workstation, a set of configuration steps must be performed to enable that adapter to manage the job scheduling events. For information on how to install the TEC logfile adapter, refer to the IBM Tivoli Enterprise Console Installation Guide.

The Tivoli Workload Scheduler Plus Module provides you with two tasks that allow you to automatically perform this setup activity: the Configure non-TME adapter task (if you installed a non-TME logfile adapter on the workstation) or the Configure non-TME adapter task (if you installed a TEC logfile adapter on the workstation). These tasks perform the following actions on the TEC logfile adapter:

1. Copies the BmEvents.conf file from TWS_Home/config directory (on Windows platforms) or TWS_Home/OV directory (on UNIX platforms) into the TWS_Home directory, if not already present

2. Adds into the BmEvents.conf file the following lines, if still commented:

   FILE = TWS_Home/event.log
   EVENTS = 51 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117
               118 119 120 121 122 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165
               201 202 203 204 251 252 301

   This file contains the configuration information used by the batchman process to determine which information must be logged and where. The value of the FILE field contains the path and name of the log file for the scheduling events while the EVENTS field contains all event numbers that will be logged by the batchman process.

3. Stops the TEC logfile adapter

4. Customizes the TEC logfile adapter Configuration file tec_adapter_installation_path/etc/tecad_logfile.conf
Setting up TEC logfile adapters

by adding the Tivoli Workload Scheduler log file specification in the Logsource field:

\texttt{LogSource=TWS\_Home/event.log}

and specifying the value for the \texttt{PollInterval} as follows:

\texttt{PollInterval=10}

This file contains the configuration information necessary for the TEC logfile adapter to gather the scheduling information logged by the batchman process.

5. Makes a backup copy named
\texttt{tec\_adapter\_installation\_path/etc/locale\_directory/tecad\_logfile.fmt.pre.MAESTRO}

of the TEC logfile adapter FMT file

\texttt{tec\_adapter\_installation\_path/etc/locale\_directory/tecad\_logfile.fmt}

and adds to this \texttt{tecad\_logfile.fmt} file the format definitions for scheduling events provided by the Tivoli Workload Scheduler Plus Module and stored in the \texttt{maestro.fmt} (if on Unix platform) or \texttt{maestro\_nt.fmt} (if on Windows platform). In this way the TEC logfile adapter is enabled to manage the new formats provided by the Tivoli Workload Scheduler Plus Module for the scheduling events.

6. Makes a backup copy named
\texttt{tec\_adapter\_installation\_path/etc/locale\_directory/tecad\_logfile.cds.pre.MAESTRO}

of the TEC logfile adapter Class Definition Statement (CDS) file

\texttt{tec\_adapter\_installation\_path/etc/locale\_directory/tecad\_logfile.cds}

and generates again the new CDS file from the \texttt{tecad\_logfile.fmt} updated with the formats provided by the Tivoli Workload Scheduler Plus Module. In this way the TEC logfile adapter is enabled to map incoming raw events to new scheduling event classes and to define these events' attributes before forwarding the events to the TEC event server.

7. Restarts the TEC logfile adapter to update it with the new configuration setup.

To perform these setup, activities using the tasks provided by the Tivoli Workload Scheduler Plus Module open the TWS Plus for Tivoli window and perform the instructions provided in the following sections according to the kind of TEC logfile adapter you installed on the workstation.

\textbf{Note:} Restart the Tivoli Workload Scheduler processes on the workstation to enable the batchman process to log the scheduling information in the log file.

\textbf{Configuring a TME logfile adapter}

1. Access the Modify subscribers window from the \textbf{Configure TME adapter} icon to check on which subscribers where the command is to run.

2. Run the \textbf{Configure TME adapter} command.

\textbf{Configuring a non-TME logfile adapter}

To configure a non-TME logfile adapter on a Tivoli Workload Scheduler system:

1. Run the \textbf{Configure non-TME adapter} command.

2. In the \textbf{Configure non-TME adapter} window, specify the path to the directory where you installed the non-TME logfile adapter on the system where you want to run the command.

3. Click set and close to run the command.
4. When prompted for a port number, type 5529 (required by default).

**Configuring the BmEvents.conf file**

The Configure Non-TME adapter and Configure TME adapter commands set up the file BmEvents.conf in the TWS_home directory. This configuration file determines which information the production processes (batchman and mailman) write in the TWS_home/log_source_file file, by default this file is the event.log file, and how this information is written.

You can change the name of the log file as follows:

- Modify the FILE field in the BmEvents.conf file and restart the Tivoli Workload Scheduler processes
- Modify the LogSource field in the tecad_logfile.conf file and restarting the TEC logfile adapter.

In the BmEvents.conf file the # sign represents a comment. Remove the # sign to uncomment a line.

The contents of this file are also used by other Tivoli applications, the Tivoli Workload Scheduler can interact with these managing events, such as IBM Tivoli NetView and IBM Tivoli Business Systems Management.

The options you can set for the Tivoli Workload Scheduler Plus Module activities are described below:

**OPTIONS=MASTER|OFF**

If the value is set to MASTER then all job scheduling events gathered by the workstation are reported. If the workstation is the master domain manager or the backup master domain manager, with Full Status option switched on, then all scheduling events from the entire scheduling environment are reported.

If the value is set to OFF, no job scheduling events are reported from the workstation.

If commented, it defaults to MASTER on the master domain manager workstation, but it allows all job scheduling events regarding the workstation to be reported on a workstation other than the master domain manager.

**LOGGING=ALL|KEY**

Disables or enables the key flag filter mechanism.

If set to ALL then all events from all jobs and job streams are logged.

If set to KEY the event logging is enabled only for those jobs and job streams that are marked as key. The key flag is used to identify the most critical jobs or jobs streams. To set it in the job or job stream properties use:

- The keywords KEYSCHED (for job streams) and KEYJOB (for jobs) from the Tivoli Workload Scheduler command line interface.
- The Job Is Monitored Job check box and job stream In Monitored Job Stream check box from the Job Scheduling Console.

**SYMEVNTS=YES|NO**

Tells the production process, batchman, to report the jobs and job streams status events immediately after having generated the new production day plan. This key is valid only if LOGGING=KEY. The default value is NO.
EVENT=n[ n ...]
Identifies which events to report. Event numbers must be separated by at least one space. If omitted, the events reported by default are:
51 101 102 105 111 151 152 155 201 202 203 204 251 252 301

Event 51 causes mailman and batchman to report the fact that they were restarted.

If the EVENT parameter is included, it completely overrides the defaults. To remove only event 102 from the list, for example, you must enter the following:
EVENT=51 101 105 111 151 152 155 201 202 203 204 251 252 301

FILE=filename
This option is used specifically when interacting with the TEC. Set it to the path and file name of an ASCII log file (see option FILE_NO_UTF8, below, how to specify that you want to use a local language log file). Job scheduling events are written to this ASCII log file which is truncated whenever the batchman and mailman processes are restarted, for example at the end of each production day.

or

FILE_NO_UTF8 =filename
Use this option instead of the FILE option when you want job scheduling events written to a local language file.
Chapter 4. Using tasks

The Tivoli Workload Scheduler Plus Module provides a number of task icons that allow you to run Tivoli Workload Scheduler commands on multiple workstations and operating systems in the scheduling environment and to configure features of the Tivoli Workload Scheduler Plus Module itself.

These tasks are ready to be run as soon as you have installed the Tivoli Workload Scheduler Plus Module. Simply double-click the task icon to run the Tivoli Workload Scheduler command against the default subscribers.

You can modify the default characteristics of a particular task, for example where the output of a task is displayed and on which workstations the task will run. You can specify whether a task runs sequentially on each workstation, in parallel on all workstations, or staged in groups of workstations.

This section is divided into the following subsections:
- “Managing Tivoli Workload Scheduler network”
- “Managing Tivoli Workload Scheduler reports” on page 28
- “Managing scheduling environment configuration” on page 28
- “Running task library jobs” on page 29
- “Modifying task library jobs” on page 29

Managing Tivoli Workload Scheduler network

This section provides a list of the network tasks represented by icons in the Tivoli Workload Scheduler Plus Module and the specific Tivoli Workload Scheduler commands that these icons run.

<table>
<thead>
<tr>
<th>Icon Name</th>
<th>TWS Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start TWS Servers</td>
<td>start</td>
<td>Starts the Tivoli Workload Scheduler production processes.</td>
</tr>
<tr>
<td>TWS CPU link</td>
<td>link</td>
<td>Opens Tivoli Workload Scheduler links for inter-workstation communications.</td>
</tr>
<tr>
<td>TWS CPU Unlink</td>
<td>unlink</td>
<td>Disables inter-workstation communication.</td>
</tr>
<tr>
<td>TWS Start CPU</td>
<td>link start</td>
<td>Starts the Tivoli Workload Scheduler production processes on a workstation.</td>
</tr>
<tr>
<td>TWS Stop CPU</td>
<td>unlink stop</td>
<td>Stops the Tivoli Workload Scheduler production processes on a workstation.</td>
</tr>
<tr>
<td>Shutdown TWS Servers</td>
<td>unlink @ stop shutdown</td>
<td>Unconditionally stops the Tivoli Workload Scheduler production processes.</td>
</tr>
<tr>
<td>TWS Limit Job Stream</td>
<td>limit sched</td>
<td>Changes the job limit for a schedule.</td>
</tr>
</tbody>
</table>
Managing Tivoli Workload Scheduler reports

This section provides a list of the reporting tasks represented by icons in the Tivoli Workload Scheduler Plus Module and the specific Tivoli Workload Scheduler report commands that these icons run.

<table>
<thead>
<tr>
<th>Icon Name</th>
<th>TWS Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS Job Details Listing</td>
<td>rep1</td>
<td>Prints the Tivoli Workload Scheduler Job Details Listing report.</td>
</tr>
<tr>
<td>TWS Prompt Messages Listing</td>
<td>rep2</td>
<td>Prints the Tivoli Workload Scheduler Prompt Messages Listing report.</td>
</tr>
<tr>
<td>TWS User Calendar Listing</td>
<td>rep3</td>
<td>Prints the Tivoli Workload Scheduler User Calendar Listing report.</td>
</tr>
<tr>
<td>TWS User Parameters Listing</td>
<td>rep4a</td>
<td>Prints the Tivoli Workload Scheduler User Parameters Listing report.</td>
</tr>
<tr>
<td>TWS Resource Listing</td>
<td>rep4b</td>
<td>Prints the Tivoli Workload Scheduler Resource Listing report.</td>
</tr>
<tr>
<td>TWS Job History Listing</td>
<td>rep7</td>
<td>Prints the Tivoli Workload Scheduler Report 07-Job History Listing report.</td>
</tr>
<tr>
<td>TWS Job Histogram</td>
<td>rep8</td>
<td>Prints the Tivoli Workload Scheduler Report 08-Job Histogram report.</td>
</tr>
<tr>
<td>TWS Plan Report</td>
<td>retr</td>
<td>Prints the Tivoli Workload Scheduler reports: 09A through 10B.</td>
</tr>
</tbody>
</table>

Managing scheduling environment configuration

This section provides a list of the default configuration tasks available with the Tivoli Workload Scheduler Plus Module. Several of these tasks are used to configure a specific feature of the Tivoli Workload Scheduler Plus Module itself.

<table>
<thead>
<tr>
<th>Icon Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>About TWS</td>
<td>Displays information about the installation of Tivoli Workload Scheduler, such as the version level and the installation directory.</td>
</tr>
<tr>
<td>Configure Non-TME Logfile Adapter</td>
<td>Configures 3.7.1 or 3.8 TEC log file adapters. This is part of the configuration process for event management. For more information refer to &quot;Configuring a non-TME logfile adapter&quot; on page 24.</td>
</tr>
<tr>
<td>Icon Name</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Configure TME Logfile Adapter</td>
<td>Configures 3.7.1 or 3.8 TEC log file adapters. This is part of the</td>
</tr>
<tr>
<td></td>
<td>configuration process for event management. For more information refer to</td>
</tr>
<tr>
<td></td>
<td>“Configuring a TME logfile adapter” on page 24.</td>
</tr>
<tr>
<td>Create TWS Subscriber List</td>
<td>Creates a subscription list similar to the TWS Server List.</td>
</tr>
<tr>
<td>Get TWS Installation Options</td>
<td>Displays installation options, such as Tivoli Workload Scheduler user name,</td>
</tr>
<tr>
<td></td>
<td>Tivoli Workload Scheduler home directory, and the Job Scheduling Console</td>
</tr>
<tr>
<td></td>
<td>installation directory.</td>
</tr>
<tr>
<td>JSConsole</td>
<td>Enables you to open the Job Scheduling Console from the Tivoli Framework</td>
</tr>
<tr>
<td></td>
<td>Desktop.</td>
</tr>
<tr>
<td>Set TWS Install Options</td>
<td>Specify the installation options Tivoli Workload Scheduler user name,</td>
</tr>
<tr>
<td></td>
<td>Tivoli Workload Scheduler home directory, and the Job Scheduling Console</td>
</tr>
<tr>
<td></td>
<td>installation directory.</td>
</tr>
<tr>
<td>Setup Event Server for TWS</td>
<td>Configures the TEC event server to recognize the Tivoli Workload Scheduler</td>
</tr>
<tr>
<td></td>
<td>events.</td>
</tr>
<tr>
<td>Synchronize gateways</td>
<td>Synchronizes the level of FMT files copied to the gateways and to copy for</td>
</tr>
<tr>
<td></td>
<td>the first time these FMT files to new gateways.</td>
</tr>
</tbody>
</table>

### Running task library jobs

All Tivoli Workload Scheduler Plus Module jobs can be run immediately after installation. You can run a task library job from the desktop only.

To run one of these Tivoli Workload Scheduler Plus Module jobs with the default execution characteristics double-click the icon or select **Run job** from the icon’s pop-up menu.

If Tivoli Workload Scheduler Plus Module requires further information to run the job, a pop-up dialog appears prompting you for the information. The job output is displayed on the desktop or sent to a file as specified.

### Modifying task library jobs

You can modify the execution characteristics of a Tivoli Workload Scheduler Plus Module job for each occurrence of the job from then on of for one particular occurrence of the job. How to do this is described in the following subsections:

- “Modifying a job for each run”
- “Modifying a job for a single run” on page 30

#### Modifying a job for each run

Use the following steps to modify a Job each time it is run:

1. Select the **Modify job** option from the task’s pop-up menu.
Modifying a job for each run

2. Make any changes in the Edit Job window. Online help is available to assist you.

   **Note:** Make sure you specify on which managed nodes and endpoints the job is to run.

3. Click Change & Close.
4. Double-click the task icon to run the modified job.

Modifying a job for a single run

Use the following steps to modify a job for only one execution of the job. The next time you run the same job, it will return to the default execution characteristics.

1. Select the **Run on selected subscribers** option from the task’s pop-up menu.
2. Make the necessary changes in the Execute Task window. Online help is available to assist you.

3. Click Execute.
Modifying a job for a single run
Chapter 5. Using monitors

This section describes how to exploit Tivoli Distributed Monitoring capabilities to quickly identify and proactively respond to potential problems using the monitoring resources provided by the Tivoli Workload Scheduler Plus Module. These resources are:

- The TWS Central Monitor and TWS Remote monitors monitoring profiles
- An Indicators Collection named Indicators for TWS Monitors

**Note:** These resources are not present in your environment if, at Tivoli Workload Scheduler Plus Module installation time, the Tivoli Distributed Monitoring is not installed in your Tivoli environment. In this case you can re-install the Tivoli Workload Scheduler Plus Module after having added Tivoli Distributed Monitoring to your Tivoli environment to perform the integration and have these resources available.

The section is divided in the following subsections:

- “Setting up and activating monitoring”
- “Viewing the status of monitored resources” on page 35
- “Available monitors” on page 36

### Setting up and activating monitoring

The monitoring profiles are the objects Tivoli Distributed Monitoring uses to check the status of resources on the endpoints that are subscribers of the monitoring profile distribution. Within the monitoring profile you can define the following:

- Which monitors you want to distribute, and, for each monitor:
  - When an alarm is triggered
  - Which response severity is assigned to the triggered alarm
  - Who is notified about the alarm and how
  - If a program is run in response to a triggered alarm
  - When the monitor is active
  - What is the time interval for checking the status of a monitored resource on the subscribers
- Who are the subscribers of the distribution
- If the monitors are enabled or disabled
- Which Indicators Collection shows the current status of the monitors after the distribution has occurred.

The Tivoli Workload Scheduler Plus Module provides you with TWS Central Monitors and TWS Remote Monitors monitoring profiles.

![Figure 14. The TWS Remote Monitors and TWS Central Monitors profiles](image)
Setting up and activating monitoring

The TWS Central Monitors profile is initially empty so that you can fill it by adding the monitors you want to distribute and the subscribers you want to monitor, according to your specific needs.

The TWS Remote Monitors profile contains all the monitors the Tivoli Workload Scheduler Plus Module installation provides you with. You can modify the settings of these monitors, delete monitors from the profile, add to the monitoring profile other monitors from the Tivoli Distributed Monitoring standard collection to check the status of processes, disk space, directory size, and so forth.

The following commands are displayed when right-clicking the TWS Central Monitors icon.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properties</td>
<td>Displays the Distributed Monitoring Profile Properties panel. It includes functions for adding, deleting, and editing monitors.</td>
</tr>
<tr>
<td>Distribute</td>
<td>Displays the Distribute Profiles panel for distributing monitors to the monitor’s subscription list.</td>
</tr>
<tr>
<td>Subscribers</td>
<td>Displays the Subscribers panel to specify to which subscription list the monitor is to be distributed.</td>
</tr>
</tbody>
</table>

Before distributing the profile to the subscribers, ensure that the subscribers are correct and that the monitors you want to run on the subscribers are set as enabled. This option activates the monitoring on the subscribers once the distribution has occurred. To verify this, access the monitoring profile you want to distribute by clicking the monitoring profile icon and selecting Properties with the right mouse button and checking that the status of the monitors you want to run on the subscribers is enabled.

To distribute a monitor, therefore, you need to distribute a monitoring profile containing that monitor, whose status is enabled, for the subscribers.

To distribute the monitoring profile, double-click its icon in the TWS Plus for Tivoli window and select Distribute Now in the pop-up window that appears.

![Distribute Profiles window](image)

Figure 15. Distribute Profiles window

The subscription lists

Tivoli Workload Scheduler Plus Module provides you with two subscription lists, the TWS Client List and the TWS Server List.
The subscription lists

They are initially empty because you need to fill them with the endpoints or managed nodes installed on the workstations you want to monitor in your scheduling environment.

Use them as two sample subscription lists to identify the set of scheduling environment workstations you want to address your profile monitor distributions to. For example, you can add to the TWS Server List the endpoint installed on your master domain manager or domain managers to be able to see whether these systems are available or not. To do this distribute to the TWS Server List a monitoring profile containing the Host Availability monitor set as enabled.

Viewing the status of monitored resources

The Indicators Collections provide you with an easy, centralized method to check the status of all the monitored resources by showing the alarm information that comes from the monitors activated on the subscribers by the distributed monitoring profile.

The Tivoli Workload Scheduler Plus Module provides you with a predefined Indicators Collections named Indicators for TWS Monitors icon to allow you to view the status of the current monitored scheduling environment.

Double-click the icon to open the Indicators for TWS Monitors window. This window shows you an icon representing a thermometer for each monitoring profile where the Indicators for TWS Monitors is set as Indicators Collection.
Viewing the status of monitored resources

Since in both monitoring profiles, TWS Central Monitors or TWS Remote Monitors, the Indicators for TWS Monitors is set as the default Indicators Collection, you will see two icons in the window. The thermometer on the icons rises as the status of a resource monitored by that monitoring profile changes from a “normal” to a “warning,” “severe,” or “critical” status.

Open the TWS Central Monitors or TWS Remote Monitors icon to view the status of the monitored resources on the selected subscribers. For each monitored resource, you see reported the most urgent status received within a recent time frame. The list of reported alarms is organized so that the most urgent status level appears at the top of the report.

In addition, an indicator collection allows you to do the following:

- Save a log to a file, or e-mail it to a specified recipient
- Reset the status of a monitored resource from alarmed to non-alarmed state.

**Available monitors**

The following table shows you the resources that you can monitor using the default setting provided by the Tivoli Workload Scheduler Plus Module.

<table>
<thead>
<tr>
<th>Monitored Resource</th>
<th>Monitoring Profile Icon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Availability</td>
<td>TWS Remote Monitors</td>
</tr>
<tr>
<td>Application status (batchman)</td>
<td></td>
</tr>
<tr>
<td>Application status (netman)</td>
<td></td>
</tr>
<tr>
<td>Application status (mailman)</td>
<td></td>
</tr>
<tr>
<td>Application status (JOBMAN) (Windows NT only)</td>
<td></td>
</tr>
<tr>
<td>Application status (jobman) (UNIX only)</td>
<td></td>
</tr>
<tr>
<td>TWS SpaceFree ()</td>
<td></td>
</tr>
<tr>
<td>TWS SpaceUsed (stdlist)</td>
<td></td>
</tr>
<tr>
<td>TWS SpaceUsed (schedlog)</td>
<td></td>
</tr>
<tr>
<td>Page-outs ()</td>
<td></td>
</tr>
<tr>
<td>Swap space available ()</td>
<td></td>
</tr>
</tbody>
</table>
As an alarm triggers the delivery of a critical event to the TEC event server, an event highlighted in red is displayed on the TEC event console. When the situation that triggered the alarm ends, an informational event is sent to the TEC event server. This informational event, named clearing event, automatically terminates the alert status generated by the critical event on the TEC event console.

**Host availability**

Monitors, both hosts and resources on the network that can respond to a ping request, are either available or not on the network. This check is made by default every hour.

The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Critical</td>
<td>Becomes unavailable</td>
<td>Send event to the Tivoli Enterprise Console. Change icon.</td>
</tr>
<tr>
<td>Severe</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Warning</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Informational</td>
<td>Becomes available</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Normal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Normal zero</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Always</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>

Monitors that are defined with this monitoring source use status operators to evaluate data. You can select the trigger when pop-up menu of the Edit Distributed Monitoring Monitor dialog to see a list of the available operators.

**Application status**

Monitors whether a process is up and running.

This monitoring source is customized by default to monitor the following scheduling processes:
- batchman
- netman
- mailman
- jobman.

There are two versions of this event monitor:
- JOBMAN for Windows
- jobman for UNIX

This monitor runs once a minute. The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>
### Tivoli Workload Scheduler SpaceFree

Monitors the amount of free disk space in the Tivoli Workload Scheduler directory. You specify the Tivoli Workload Scheduler directory when you run the **Set TWS Install Options** task on each scheduling workstation where you installed the endpoint.

This monitor runs every 15 minutes. The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>becomes unavailable</td>
<td>Send event to the Tivoli Enterprise Console. Change icon.</td>
</tr>
<tr>
<td>Severe</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Warning</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Informational</td>
<td>Becomes available</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Normal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Normal-zero</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Always</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>

### Tivoli Workload Scheduler SpaceUsed

Monitors the amount of disk blocks used by a specific directory. This monitoring source is customized by default to monitor the following Tivoli Workload Scheduler directories:

- `vstdlist`
- `v schedlog`

This monitor runs every 15 minutes. The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Critical</td>
<td>Less than 2 MB</td>
<td>Send event to the Tivoli Enterprise Console. Change icon.</td>
</tr>
<tr>
<td>Severe</td>
<td>Less than 4 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Warning</td>
<td>Less than 6 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Informational</td>
<td>Greater than 6 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Normal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Normal-zero</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Always</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>
### Page-outs

Monitors the number of kilobytes per second paged out on a workstation.

This monitor runs every 5 minutes. The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Critical</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Severe</td>
<td>Greater than 100 KB</td>
<td>Send event to the Tivoli Enterprise Console. Change icon</td>
</tr>
<tr>
<td>Warning</td>
<td>Greater than 50 KB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Informational</td>
<td>Less than 50 KB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Normal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Normal-zero</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Always</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>

### Swap space available

Monitors the amount of available swap space.

This monitor runs every 15 minutes. The following table lists the pre-configured actions for this monitoring source:

<table>
<thead>
<tr>
<th>Severity</th>
<th>Trigger When</th>
<th>Default Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Critical</td>
<td>Less than 10 MB</td>
<td>Send event to the Tivoli Enterprise Console. Change icon</td>
</tr>
<tr>
<td>Severe</td>
<td>Less than 20 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Warning</td>
<td>Less than 25 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Informational</td>
<td>Greater than 25 MB</td>
<td>Send event. Change icon</td>
</tr>
<tr>
<td>Normal</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Normal-zero</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Always</td>
<td>N/A</td>
<td>None</td>
</tr>
</tbody>
</table>
Swap space available
Chapter 6. Using events

Event management provides a predefined or automated response to specific events, so that potential problems are identified and addressed before causing system down time or lack of availability of resources. For example, if a process fails, the Tivoli Enterprise Console can automatically restart the process. It can also notify the system administrator about repeated process failures that may severely affect an application or network availability.

For some events there is no automated response other than that the event being displayed on the Tivoli Enterprise Console.

An event is any significant change in the state of system resources or applications. In the case of the Tivoli Workload Scheduler Plus Module, an event is a change in a monitored resource that affects the scheduling environment. Examples of events are the starting and stopping of a process or a host going down.

After performing the configuration steps described in the "Enabling TEC event server to receive events" on page 20, use the events the Tivoli Workload Scheduler Plus Module provides you with to perform event management and correlation using the TEC in your scheduling environment.

These events are divided into two kinds: the job scheduling events, gathered from the log file using the TEC logfile adapter, and the Tivoli Distributed Monitoring events, triggered by the Tivoli Distributed Monitoring monitors provided by the Tivoli Workload Scheduler Plus Module. These two kinds of events are described in two separate subsections:

- "Job scheduling events"
- "Distributed monitoring events" on page 49

Job scheduling events

This section describes the events that are generated by using to the information stored in the log file specified in the BmEvents.conf configuration file stored on the system where you installed the TEC logfile adapter.

An important aspect to be considered when configuring the integration with the TEC using event adapters is whether to monitor only the master domain manager or every Tivoli Workload Scheduler agent.

If you integrate only the master domain manager, all the events coming from the entire scheduling environment are reported because the log file on a master domain manager logs the information from the entire scheduling network. On the TEC event server and TEC event console all events will therefore look as if they come from the master domain manager, regardless of which Tivoli Workload Scheduler agent they originate from. The workstation name, job name, and job stream name are still reported to TEC, but as a part of the message inside the event.

If, instead, you install a TEC logfile adapter on every Tivoli Workload Scheduler agent, this results in a duplication of events coming from the master domain manager, and from each agent. Creating and using a TEC that detects these...
Job scheduling events

duplicated events, based on job_name, job_cpu, schedule_name, and schedule_cpu, and keeps just the event coming from the log file on the Tivoli Workload Scheduler agent, helps you to handle this problem. The same consideration also applies if you decide to integrate the backup master domain manager, if defined, because the log file on a backup master domain manager logs the information from the entire scheduling network. For information on creating new rules for the TEC refer to the IBM Tivoli Enterprise Console Rule Builder’s Guide. For information on how to define a backup master domain manager refer to IBM Tivoli Workload Scheduler: Planning and Installation Guide.

Figure 19 describes how an event is generated. It shows the TEC logfile adapter installed on the master domain manager. This is to ensure that all the information about the job scheduling execution across the entire scheduling environment is available inside the log file on that workstation. You can decide, however, to install the TEC logfile adapter on another workstation in your scheduling environment, depending on your environment and business needs, refer to “Mapping your scheduling environment into the Tivoli environment” on page 2 for additional information.

Figure 19. Event Generation Flow

The logic that is used to generate job scheduling events is the following:

- The information logged during the job scheduling process has an event number for each type of logged activity or problem.
- Each item of information marked with an event number that appears in the EVENT field of the BmEvents.conf file is written into the log file specified in the FILE field of the BmEvents.conf file.
- The TEC logfile adapter reads this information inside the log file, formats it using the structure stored in the FMT file (maestro.fmt for UNIX, maestro_nt.fmt for Windows) and forwards it to the TEC event server, using the TEC gateway defined on the managed node of the Tivoli environment.
- On the TEC event server, the structure of the formatted information is checked using the information stored in the BAR0C files and, if correct, is accepted. Otherwise a parsing failure is prompted, refer to Chapter 7, “Troubleshooting,” on page 53 to see how an event parsing failure is detected on the TEC event server.
• Once the event is accepted by the TEC event server, a check on possible predefined correlation rules or automatic responses for that event number is made using the information stored in the RL$ files.

• If defined, the correlation rules and/or automatic responses are triggered and the event is sent to the TEC event console to be displayed on the defined Event Console. See [Customizing Tivoli Enterprise Console event console” on page 20] for details on how to select the Event Console.

For some error conditions on event informing that the alarm condition is ended is also stored in the log file and passed to the TEC event server via the TEC logfile adapter. This kind of event is called a clearing event. It ends on the TEC event console any related problem events.

The following table describes the events and rules provided by the Tivoli Workload Scheduler Plus Module.

The text of the message that is assigned by the FMT file to the event is shown in bold. The text message is the one that is sent by the TEC logfile adapter to TEC event server and then to the TEC event console. The percent sign (%) in the messages indicates a variable. The name of each variable follows the message between brackets.

<table>
<thead>
<tr>
<th>&quot;TWS process %s has been reset on host %s&quot; (program_name, host_name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong> TWS_Process_Reset.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong> HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong> TWS daemon process reset.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;TWS process %s has been reset on host %s&quot; (program_name, host_name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong> TWS_Process_Reset.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong> HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong> TWS NT daemon process reset.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;TWS process %s is gone on host %s&quot; (program_name, host_name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong> TWS_Process_Gone.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong> CRITICAL.</td>
</tr>
<tr>
<td><strong>Event Description:</strong> TWS process gone.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;TWS process %s has abended on host %s&quot; (program_name, host_name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong> TWS_Process_Abend.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong> CRITICAL.</td>
</tr>
<tr>
<td><strong>Event Description:</strong> TWS process abends.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;Job %s.%s failed, no recovery specified&quot; (schedule_name, job_name)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong> TWS_Job_Abend.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong> CRITICAL.</td>
</tr>
<tr>
<td><strong>Automated Action (UNIX only):</strong> Send job stdlist to user TWS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong> Job failed, no recovery specified.</td>
</tr>
<tr>
<td><strong>Correlation Activity:</strong> If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;Job %s.%s failed, recovery job will be run then schedule %s will be stopped&quot; (schedule_name, job_name, schedule_name)</th>
</tr>
</thead>
</table>
### Job scheduling events

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed, recovery job runs, and schedule stops</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

*Job %s.%s failed, this job will be rerun* (schedule_name, job_name)

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed, the job is rerun.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

*Job %s.%s failed, this job will be rerun after the recovery job* (schedule_name, job_name)

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed, recovery job is run, and the job is run again.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

*Job %s.%s failed, continuing with schedule %s* (schedule_name, job_name, schedule_name)

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed, the schedule proceeds.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

*Job %s.%s failed, running recovery job then continuing with schedule %s* (schedule_name, job_name, schedule_name)

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed, recovery job runs, schedule proceeds</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

*Failure while rerunning failed job %s.%s* (schedule_name, job_name)
### Job scheduling events

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td></td>
<td>Rerun of abended job abends.</td>
</tr>
<tr>
<td>Event Description:</td>
<td></td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

**"Failure while recovering job %s.%s" (schedule_name, job_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Abend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Automated Action (UNIX only):</td>
<td>Send job stdlist to user TWS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td></td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>If this job had abended more than once within a 24 hour time window, send a TWS_Job_Repeated_Failure event.</td>
</tr>
</tbody>
</table>

**"Multiple failures of Job %s.#%s in 24 hour period" (schedule_name, job_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Repeated_Failure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Same job fails more than once in 24 hours.</td>
</tr>
</tbody>
</table>

**"Job %s.%s did not start" (schedule_name, job_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Failed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job failed to start.</td>
</tr>
</tbody>
</table>

**"Job %s.%s has started on CPU %s" (schedule_name, job_name, cpu_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Launched.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>HARMLESS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job started.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>Clearing Event - Close open job prompt events related to this job.</td>
</tr>
</tbody>
</table>

**"Job %s.%s has successfully completed on CPU %s" (schedule_name, job_name, cpu_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Done.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>HARMLESS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job completed successfully.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>Clearing Event - Close open job started events for this job and auto-acknowledge this event.</td>
</tr>
</tbody>
</table>

**"Job %s.%s suspended on CPU %s" (schedule_name, job_name, cpu_name)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Suspended.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>WARNING.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job suspended, the until time expired (default option suppress).</td>
</tr>
</tbody>
</table>

**"Job %s.%s is late on CPU %s" (scheduler_name, job_cpu)**

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Job_Late.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>WARNING.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Job late, the deadline time expired before the job completed.</td>
</tr>
</tbody>
</table>
Job scheduling events

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Job_Until_Cont.</td>
<td>Job until time expired (option continue).</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Job_Until_Canc.</td>
<td>Job until time expired (option cancel).</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

(TWS Prompt Message)

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Susp.</td>
<td>Schedule suspended, the until time expired (default option suppress).</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Late.</td>
<td>Schedule late, the deadline time expired before the schedule completion.</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Until_Cont.</td>
<td>Schedule until time expired (option continue).</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Until_Canc.</td>
<td>Schedule until time expired (option cancel).</td>
</tr>
<tr>
<td>WARNING</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Abend.</td>
<td>Schedule abends.</td>
</tr>
<tr>
<td>CRITICAL</td>
<td>If event is not acknowledged within 15 minutes, send mail to TWS_user (UNIX only).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Stuck.</td>
<td>Schedule stuck.</td>
</tr>
<tr>
<td>CRITICAL</td>
<td>If event is not acknowledged within 15 minutes, send mail to TWS_user (UNIX only).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Schedule_Started.</td>
<td>Schedule started.</td>
</tr>
<tr>
<td>CRITICAL</td>
<td>If event is not acknowledged within 15 minutes, send mail to TWS_user (UNIX only).</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Schedule_Started.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>Schedule started.</td>
</tr>
<tr>
<td><strong>Correlation Activity:</strong></td>
<td>Clearing Event - Close all related pending schedule, or schedule abend events related to this schedule.</td>
</tr>
</tbody>
</table>

**“Schedule %s has completed”** (schedule_name)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Schedule_Done.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>Schedule completed successfully.</td>
</tr>
<tr>
<td><strong>Correlation Activity:</strong></td>
<td>Clearing Event - Close all related schedule started events and auto-acknowledge this event.</td>
</tr>
</tbody>
</table>

**Global Prompt Message**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Global_Prompt.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>WARNING.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>Global prompt issued.</td>
</tr>
</tbody>
</table>

**Schedule Prompt’s Message**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Schedule_Prompt.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>WARNING.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>Schedule prompt issued.</td>
</tr>
</tbody>
</table>

**Job Recovery Prompt’s Message**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Job_Prompt.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>WARNING.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>Job recovery prompt issued.</td>
</tr>
</tbody>
</table>

**“Comm link from %s to %s unlinked for unknown reason”** (hostname, to_cpu)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Link_Dropped.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>WARNING.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>TWS link to CPU dropped for unknown reason.</td>
</tr>
</tbody>
</table>

**“Comm link from %s to %s unlinked via unlink command”** (hostname, to_cpu)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Link_Dropped.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>TWS link to CPU dropped by unlink command.</td>
</tr>
</tbody>
</table>

**“Comm link from %s to %s dropped due to error”** (hostname, to_cpu)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Link_Dropped.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>CRITICAL.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>TWS link to CPU dropped due to error.</td>
</tr>
</tbody>
</table>

**“Comm link from %s to %s established”** (hostname, to_cpu)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Event Class:</strong></td>
<td>TWS_Link_Established.</td>
</tr>
<tr>
<td><strong>Event Severity:</strong></td>
<td>HARMLESS.</td>
</tr>
<tr>
<td><strong>Event Description:</strong></td>
<td>TWS CPU link to CPU established.</td>
</tr>
<tr>
<td><strong>Correlation Activity:</strong></td>
<td>Close related TWS_Link_Dropped or TWS_Link_Failed events and auto-acknowledge this event.</td>
</tr>
</tbody>
</table>

**“Comm link from %s to %s down for unknown reason”** (hostname, to_cpu)
### Job scheduling events

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Link_Failed.</td>
<td>TWS link to CPU failed for unknown reason.</td>
</tr>
<tr>
<td>CRITICAL.</td>
<td></td>
</tr>
<tr>
<td>TWS_link to CPU failed due to unlink.</td>
<td></td>
</tr>
<tr>
<td>HARMLESS.</td>
<td></td>
</tr>
<tr>
<td>TWS_CPU link to CPU failed due to error.</td>
<td></td>
</tr>
<tr>
<td>TWS_Domain_Manager_Switch.</td>
<td>TWS domain manager switch has occurred.</td>
</tr>
<tr>
<td>WARNING.</td>
<td></td>
</tr>
<tr>
<td>If after a time equal to estimated duration, the job is still in exec status, a new message is generated.</td>
<td></td>
</tr>
<tr>
<td>TWS_Job_Launched.</td>
<td></td>
</tr>
<tr>
<td>WARNING.</td>
<td></td>
</tr>
<tr>
<td>If the job has a deadline and the sum of job estimated start time and estimated duration is greater than the deadline time, a new message is generated.</td>
<td></td>
</tr>
<tr>
<td>TWS_Job_Ready, TWS_Job_Hold</td>
<td></td>
</tr>
<tr>
<td>WARNING.</td>
<td></td>
</tr>
<tr>
<td>If the job has a deadline and the sum of job estimated/effective start time and estimated duration is greater than the deadline time, a new message is generated.</td>
<td></td>
</tr>
<tr>
<td>TWS_Job_Ready, TWS_Job_Hold.</td>
<td></td>
</tr>
<tr>
<td>WARNING.</td>
<td></td>
</tr>
<tr>
<td>Start delay of Job is greater than the deadline time, a new message is generated.</td>
<td></td>
</tr>
<tr>
<td>TWS_Job_Hold.</td>
<td></td>
</tr>
<tr>
<td>WARNING.</td>
<td></td>
</tr>
</tbody>
</table>

Default criteria that control the correlation of events and the automatic responses can be changed by editing the file maestro_plus.rls (in UNIX environments) or maestront_plus.rls (in Windows environments) file. These RLS files are created during Tivoli Workload Scheduler Plus Module installation and compiled with the BAROC file containing the event classes for the Tivoli Workload Scheduler events on the TEC event server when the **Setup Event Server for TWS** task is run. Before
modifying either of these two files, make a backup copy of the original file and
test the modified copy in your sample test environment.

For example, in the last event described in the table you can change the n value,
the number of seconds the job has to be in ready state to trigger a new message,
by modifying the rule job_ready_open set for the TWS_job_Ready event class.

rule: job_ready_open : (  
description: 'Start a timer rule for ready',  
event: _event of_class 'TWS_Job_Ready'  
where [  
   status: outside ['CLOSED'],  
   schedule_name: _schedule_name,  
   job_cpu: _job_cpu,  
   job_name: _job_name  
],  
reception_action: (  
   set_timer(_event,600,'ready event')  
)).

For example, by changing the value from 600 to 1200 in the set_timer predicates
of the reception_action action, and then by recompiling and reloading the Rule Base
you change from 600 to 1200 the number of seconds the job has to be in ready
state to trigger a new message.

Refer to Tivoli Workload Scheduler Planning and Installation Guide for additional
information about maestro_plus.rls and maestront_plus.rls files. Refer to Tivoli
details about rules commands.

---

## Distributed monitoring events

The following is an example of a Tivoli Distributed Monitoring message:

```
Distributed Monitoring TWS Remote
Monitors/Application status on host noonan Tues June 02
08:00:00 1998
Status: >>> critical <<<
Application status (jobman) Changes to down
(Previous: up Current: down Effective: down)
Daemon: jobman
```

In the following table the Tivoli Distributed Monitoring monitors provided by
Tivoli Workload Scheduler Plus Module are shown in **bold** and, for each of these
monitors, there is a description of the event triggered to TEC with its
---
**Distributed monitoring events**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
<th>Correlation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal_application</td>
<td>HARMLESS.</td>
<td>Batchman, mailman, netman, or jobman become available.</td>
<td>Clearing Event - Close the corresponding application status down events.</td>
</tr>
</tbody>
</table>

**Host Availability**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
<th>Correlation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal_host</td>
<td>CRITICAL.</td>
<td>Host becomes unavailable.</td>
<td>Clearing Event - Close the corresponding host availability down events.</td>
</tr>
</tbody>
</table>

**TWS SpaceUsed (stdlist)**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
<th>Automatic Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Diskused</td>
<td>CRITICAL.</td>
<td>TWS stdlist directory gets larger than 50000 blocks.</td>
<td>Mail message to “TWS” user.</td>
</tr>
</tbody>
</table>

**TWS SpaceUsed (stdlist)**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING.</td>
<td>TWS stdlist directory becomes larger than 40000 blocks.</td>
<td></td>
</tr>
</tbody>
</table>

**TWS SpaceUsed (stdlist)**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
<th>Correlation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Diskused</td>
<td>HARMLESS.</td>
<td>TWS stdlist directory becomes smaller than 40000 blocks.</td>
<td>Clearing Event - Close all open Distributed Monitoring events related to size of stdlist directory on this host.</td>
</tr>
</tbody>
</table>

**TWS SpaceUsed (schedlog)**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
<th>Automatic Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWS_Diskused</td>
<td>CRITICAL.</td>
<td>TWS schedlog directory becomes larger than 50000 blocks.</td>
<td>Mail message to “TWS” user.</td>
</tr>
</tbody>
</table>

**TWS SpaceUsed (schedlog)**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event Severity</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING.</td>
<td>TWS schedlog directory becomes larger than 40000 blocks.</td>
<td></td>
</tr>
</tbody>
</table>
### Distributed monitoring events

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>TWS_Diskused.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>HARMLESS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>TWS schedlog directory becomes smaller than 40000 blocks.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>Clearing Event - Close all open Distributed Monitoring events related to size of schedlog directory on this host.</td>
</tr>
</tbody>
</table>

#### Swap Space Available

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_swapavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Swap space decreases below 10 MB on a workstation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_swapavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>MINOR.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Swap space decreases below 20 MB on a workstation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_swapavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>WARNING.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Swap space decreases below 25 MB on a workstation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_swapavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>HARMLESS.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Swap space increases above 25 MB on a workstation.</td>
</tr>
<tr>
<td>Correlation Activity:</td>
<td>Clearing Event - Close all open Distributed Monitoring events related to swap space available on this host.</td>
</tr>
</tbody>
</table>

#### TWS SpaceFree

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_diskavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>CRITICAL.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Disk space available in the TWS directory decreases below 2 MB on a workstation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_diskavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>MINOR.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Disk space available in the TWS directory decreases below 4 MB on a workstation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Class:</th>
<th>Universal_diskavail.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event Severity:</td>
<td>WARNING.</td>
</tr>
<tr>
<td>Event Description:</td>
<td>Disk space available in the TWS directory decreases below 6 MB on a workstation.</td>
</tr>
</tbody>
</table>
**Distributed monitoring events**

| Event Class: | Universal_diskavail. |
| Event Severity: | HARMLESS. |
| Event Description: | Disk space available in the TWS directory increases above 6 MB on a workstation. |
| Correlation Activity: | Clearing Event - Close all open Distributed Monitoring events related to space free on TWS directory on this host. |

**Page-Outs**

| Event Class: | Universal_pageouts. |
| Event Severity: | CRITICAL. |
| Event Description: | Kilobytes paged out per second increases above 100 on a workstation. |

| Event Class: | Universal_pageouts. |
| Event Severity: | MINOR. |
| Event Description: | Kilobytes paged out per second increases above 50 on a workstation. |

| Event Class: | Universal_pageouts. |
| Event Severity: | HARMLESS. |
| Event Description: | Kilobytes paged out per second decreases below 50 on a workstation. |
| Correlation Activity: | Clearing Event: Close all open Distributed Monitoring events related to page-outs on this host. |
Chapter 7. Troubleshooting

This chapter describes how to solve known problems when using Tivoli Workload Scheduler Plus Module and how clean up manually a Tivoli Workload Scheduler Plus Module installation. It is divided into the following subsections:

- “Solving known problems”
- “Cleaning up manually a Tivoli Workload Scheduler Plus Module installation” on page 55.

Solving known problems

This section describes solutions for common problems that you might encounter when using Tivoli Workload Scheduler Plus Module.

Table 2. Troubleshooting common problems

<table>
<thead>
<tr>
<th>Task</th>
<th>Problem description and solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation:</td>
<td><strong>Problem:</strong> Do you need to remove the Tivoli Workload Scheduler Plus Module Support (Link Binaries) = 3.2.r part when reinstalling Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 after a failed installation?</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> If you successfully installed Tivoli Workload Scheduler Plus Module Support (Link Binaries) = 3.2.r, but the installation of the Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 failed, then you do not need to uninstall Tivoli Workload Scheduler Plus Module Support (Link Binaries) = 3.2.r before trying to reinstall Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2.</td>
</tr>
<tr>
<td>Installation:</td>
<td><strong>Problem:</strong> How can you double-check that the Tivoli Workload Scheduler Plus Module was successful?</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> Whatever method you use to install the Tivoli Workload Scheduler Plus Module you can double-check the installation was successful by verifying that the two log files TWSPLUS_ALIDB_after.output and TWSPLUS_ALIDB_after.error do not exist. These two files are deleted when the installation is successfully. If, instead, the installation fails, you can look in these two files for additional information about the failure.</td>
</tr>
<tr>
<td>Installation:</td>
<td><strong>Problem:</strong> How can you find out why a Tivoli Workload Scheduler Plus Module installation failed?</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> The TWSPLUS_ALIDB_after.output and the TWSPLUS_ALIDB_after.error files are useful if the installation fails because they trace the execution of the 'postinstall' scripts of Tivoli Workload Scheduler Plus Module. If the installation fails before the 'postinstall' scripts run then it is necessary to set the Tivoli Management Framework traces on by using the command: odadmin odtrace objcalls all. The command wtrace -jk $DBDIR produces the logs of the Tivoli Management Framework methods and APIs displaying input and output parameters.</td>
</tr>
</tbody>
</table>
## Troubleshooting common problems

<table>
<thead>
<tr>
<th>Task</th>
<th>Problem description and solution</th>
</tr>
</thead>
</table>
| **Installation:**  | **Problem:** The following error is displayed when installing the feature on a Windows 2000 system: **Distributing machine independent Generic Binaries --> acme12**  
mkdir: **C:/Tivoli371-94/bin/generic_unix/TME/PLUS/TWS/: File exists**  
Completed (with errors)  
**Solution:** This is a misleading error message generated by a known problem impacting the Tivoli feature used to build the Plus Module and it is displayed regardless of whether or not the installation directory exists. This message is displayed only when installing on a Windows 2000 platform. After this message is displayed the installation proceeds, the installation directory is created, if it does not already exist, and the Tivoli Workload Scheduler Plus Module is successfully installed. |
| **Running tasks:** | **Problem:** How can you understand why a task execution failed?  
**Solution:** If you encounter a problem while running a Tivoli Workload Scheduler Plus Module task then you need to run it again in debug mode. To do this create a directory named `.plusdebug` under:  
`$DBDIR/tmp` if you are on a Windows platform  
`/tmp` if you are on a UNIX system  
and run the task again. A file with the same name as the shell script that the task launches is created under the `.plusdebug` directory. This file traces the complete task execution.  
This is also useful if you want to redirect all task execution logs to this directory and not to the Tivoli desktop. |
| **Running tasks:** | **Problem:** Tivoli Tasks fail on endpoints after having installed Tivoli Workload Scheduler Plus Module on the Tivoli server or if you are trying to run a task on an endpoint logged into a new gateway.  
**Solution:** This occurs on endpoints logged into a gateway installed on a managed node where Tivoli Workload Scheduler Plus Module was not installed. When you try to run any task against that endpoint, it fails saying the  
aemstr.fmt file if you are on a UNIX system,  
aemstrnt.fmt file if you are on a Windows system is not found. To solve this problem launch the Tivoli Workload Scheduler Plus Module Synchronize Gateways task on that managed node. |
Solving known problems

Table 2. Troubleshooting common problems (continued)

<table>
<thead>
<tr>
<th>Task</th>
<th>Problem: Job scheduling events are not displayed in the TEC event console.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events:</td>
<td><strong>Solution:</strong> Check the following:</td>
</tr>
<tr>
<td></td>
<td><strong>If the event.log is produced while mailman and batchman are active</strong></td>
</tr>
<tr>
<td></td>
<td>If not, BmEvents.conf might be configured incorrectly. Remember to stop and</td>
</tr>
<tr>
<td></td>
<td>start the Tivoli Workload Scheduler engine after changing BmEvents.conf for the</td>
</tr>
<tr>
<td></td>
<td>modifications to take effects.</td>
</tr>
<tr>
<td></td>
<td><strong>If the events are parsed by the TEC logfile adapter.</strong></td>
</tr>
<tr>
<td></td>
<td>Launch the TEC logfile adapter in debug mode to see if errors occur using the</td>
</tr>
<tr>
<td></td>
<td>command init.tecad_logfile -d start</td>
</tr>
<tr>
<td></td>
<td><strong>If the events are received by the TEC event server</strong></td>
</tr>
<tr>
<td></td>
<td>From a shell on the system where the TEC event server is installed, run the</td>
</tr>
<tr>
<td></td>
<td>following command:</td>
</tr>
<tr>
<td></td>
<td>wtdumprl -o desc</td>
</tr>
<tr>
<td></td>
<td>The output of this command shows which events reach the TEC event server.</td>
</tr>
<tr>
<td></td>
<td>Look for the job scheduling events you expect to receive. If you see them with</td>
</tr>
<tr>
<td></td>
<td>a notation that says Parsing Failed then this means that the event has been</td>
</tr>
<tr>
<td></td>
<td>produced on the endpoint side with a format that is not compatible with the</td>
</tr>
<tr>
<td></td>
<td>format the TEC event server expects to receive. In this case, check the</td>
</tr>
<tr>
<td></td>
<td>maestro.fmt or maestront.fmt files on the endpoints and the definitions in the</td>
</tr>
<tr>
<td></td>
<td>BAROC file on the TEC event server for that event to see if there are</td>
</tr>
<tr>
<td></td>
<td>discrepancies and fix them if necessary. If you see that the event does not</td>
</tr>
<tr>
<td></td>
<td>carry a failure message in the command output then the problem relates to the</td>
</tr>
<tr>
<td></td>
<td>event management part involving the communication between the TEC event server</td>
</tr>
<tr>
<td></td>
<td>and the TEC event console. In this case, see the IBM Tivoli Enterprise Console</td>
</tr>
<tr>
<td>Events:</td>
<td>**Problem: Errors in the way the TEC logfile adapter matches job scheduling</td>
</tr>
<tr>
<td></td>
<td>events.</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> To solve this problem compare the $TECADHOME/etc/&lt;locale&gt;/&lt;tecad&gt;</td>
</tr>
<tr>
<td></td>
<td>.fmt and the $TECADHOME/etc/&lt;tecad&gt;.cds files. The same events, in the same</td>
</tr>
<tr>
<td></td>
<td>order should be listed in both of them. If they are not completely aligned then:</td>
</tr>
<tr>
<td></td>
<td>• Stop the TEC logfile adapter</td>
</tr>
<tr>
<td></td>
<td>• Rename all the *.fmt.pre.MAESTRO files to *.fmt</td>
</tr>
<tr>
<td></td>
<td>• Edit these files and remove any remaining job scheduling event definitions</td>
</tr>
<tr>
<td></td>
<td>• Copy the $TECADHOME/etc/&lt;tecad&gt;.conf.pre.MAESTRO into the $TECADHOME/etc/&lt;tecad&gt;</td>
</tr>
<tr>
<td></td>
<td>• Delete the $TECADHOME/etc/&lt;tecad&gt;.cds file</td>
</tr>
<tr>
<td></td>
<td>• Run the task Configure Non-TME adapter or Configure TME adapter against that</td>
</tr>
<tr>
<td></td>
<td>endpoint.</td>
</tr>
</tbody>
</table>

Cleaning up manually a Tivoli Workload Scheduler Plus Module installation

This is the procedure you can use to manually clean up the Tivoli Workload Scheduler Plus Module installation. After successfully uninstalling the Tivoli Workload Scheduler Plus Module the result of the framework command:

```
    wlsinst -ah
```

does not return any entry, either in the Product List or in the Patch List sections, referring to Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 or Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r. If,
Cleaning up a Tivoli Workload Scheduler Plus Module installation

after having run the uninstallation as described in "Uninstalling the Tivoli Workload Scheduler Plus Module" on page 15, you still see entries referring to the Tivoli Workload Scheduler Plus Module in the output of the wlsinst command or if you cannot reinstall the Tivoli Workload Scheduler Plus Module on the same system then you need to run the clean up procedure described in the steps below to restart from a clean situation. This procedure also explains how to remove the related patches.

There are essentially no differences, except for the paths, between running this procedure on a UNIX system or on a Windows system. These are the steps you need to perform:

1. Set the Tivoli environment variables in the working shell. See for details.
2. Verify that the files in the $BINDIR/../generic_unix/TME/PLUS/TWS directory have been removed.
3. Remove TWSPLUS* files (including patches) stored in the following directories:
   - $BINDIR/../msg_cat/.installed
   - $BINDIR/../generic_unix/.installed
   - $DBDIR/.installed
4. Run the following Tivoli Management Framework command to verify if information about the Tivoli Workload Scheduler Plus Module is still stored into the Tivoli Management Framework database:
   
   and, if there is, take note of the product oid and remove it using, for each oid, the command:
   
   objcall oid _delete
5. If you either upgraded the Tivoli Workload Scheduler Plus Module or installed fix packs on the Tivoli Workload Scheduler Plus Module installation then repeat the previous steps, looking for Patch Info instead of Product Info.

Run these steps both for Tivoli Workload Scheduler Plus Module for Tivoli Version 8.2 and for Tivoli Workload Scheduler Plus Module Support (Link Binaries) – 3.2.r to complete the product cleanup.
Appendix A. Job scheduling events format

The Tivoli Workload Scheduler Plus Module provides the means to identify and manage a set of predefined job scheduling events. These are the events that are managed using the TEC logfile adapter installed on the scheduling workstations. These events are listed in the following table together with the values of their positional fields. These positional fields are the ones used by the FMT files to define the event structure which, once filled up with the information stored for that specific event number in the log file, is sent by the TEC logfile adapter to the TEC event server. For additional information, refer to “Job scheduling events” on page 41.

Table 3. Events formats table

<table>
<thead>
<tr>
<th>Event Number</th>
<th>Event Class</th>
<th>Positional Fields Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>TWS_Process_Reset</td>
<td>Positional Fields for Process Reset Events/only for batchman:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Event number.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Process name.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Local workstation name.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Master workstation name.</td>
</tr>
<tr>
<td>Positional Fields for Job Events:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Event number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Schedule workstation name.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Schedule name.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Job name. For jobs submitted with at or batch, if the name supplied by the user is not unique, this is the Tivoli Workload Scheduler-generated name, and the name supplied by the user appears as variable 8 below.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Workstation name on which the job runs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Job number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Job state, indicated by an integer: 1 (ready), 2 (hold), 3 (exec), 5 (abend), 6 (succ), 7 (cancl), 8 (done), 13 (fail), 16 (intro), 23 (abemp), 24 (succp), 25 (pend).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Job’s submitted (real) name. For jobs submitted with at or batch, this is the name supplied by the user if not unique. The unique name generated by Tivoli Workload Scheduler appears as variable 4 above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Name of the job’s script file, or the command it runs. White space is replaced by the octal equivalent; for example, a space appears as \040.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The rate at which an “every” job runs, expressed as hhmm. If every was not specified for the job, this is -32768.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Job recovery step, indicated by an integer: 1 (stop), 2 (stop after recovery job), 3 (rerun), 4 (rerunafter recovery job), 5 (continue), 6 (continue after recovery job), 10 (this is the rerun of the job), 20 (this is the run of the recovery job).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. An event timestamp. This is the local time on the workstation where the job event occurred. It is expressed as: yyyymmddhhmmss00 (that is, year, month, day, hour, minute, second, hundredths always zeros).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Message number (not zero only for job recovery prompts).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. The prompt number delimited by ‘\t’, or zero if there is no prompt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Job record number. Identifies in the plan the record associated to the job (not for Event number 204).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Job keyflag: 0 (no key flag), 1 (key flag) (not for Event number 204).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Effective start time of the job (not for Event number 204). It has a valid time if it occurred in the event.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Estimated start time of the job (not for Event number 204). It has a valid time if an Estimated Start time has been provided by the user.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Estimated duration of the job (not for Event number 204). Time estimated by the TWS engine based on statistics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Deadline in Epoch (not for Event number 204). It has a valid time if a deadline time has been provided by the user.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. The prompt text, or Tivoli Workload Scheduler error message.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Original schedule name (for schedules not (yet) carried forward).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Head job record number (different from record number for rerun/every jobs).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Events formats table (continued)

<p>| 101  | TWS_Job_Abend          |
| 102  | TWS_Job_Failed         |
| 103  | TWS_Job_Launched       |
| 104  | TWS_Job_Done           |
| 105  | TWS_Job_Suspended      |
| 106  | TWS_Job_Submitted      |
| 107  | TWS_Job_Cancel         |
| 108  | TWS_Job_Ready          |
| 109  | TWS_Job_Hold           |
| 110  | TWS_Job_Restart        |
| 111  | TWS_Job_Failed         |
| 112  | TWS_Job_SuccP          |
| 113  | TWS_Job_Extern         |
| 114  | TWS_Job_INTRO          |
| 115  | TWS_Job_Stuck          |
| 116  | TWS_Job_Wait           |
| 117  | TWS_Job_Waitd          |
| 118  | TWS_Job_Sched          |
| 120  | TWS_Job_Late           |
| 121  | TWS_Job_Until_Cont     |
| 122  | TWS_Job_Until_Canc     |
| 204  | TWS_Job_Recovery_Prompt |
|------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 119        | TWS_Job               | 1. Event number.                                                                                                       | 1. Event number.                                                                                                   | 1. Event number.                                                                                                           | 1. Event number.                           |
|            |                       | 2. Schedule workstation name.                                                                                                                                                     | 2. Schedule workstation name.                                                                                      | 2. Schedule workstation name.                                                                                              | 2. Prompt name.                            |
|            |                       | 4. Job name.                                                                                                            | 4. Property type indicated by an integer: 1 (CurrEstComplete), 2 (StartTime), 3 (StopTime), 4 (Duration), 5 (TerminatingPriority), 6 (KeyStatus). | 4. Property type indicated by an integer: 2 (StartTime), 3 (StopTime), 4 (Duration).                                      | 4. Prompt text.                            |
|            |                       | 5. Workstation name on which the job runs.                                                                             | 5. Property value.                                                                                                | 5. Property value.                                                                                                         |                                            |
|            |                       | 7. Property type indicated by an integer: 1 (CurrEstComplete), 2 (StartTime), 3 (StopTime), 4 (Duration), 5 (TerminatingPriority), 6 (KeyStatus). | 7. Original schedule name (for schedules not (yet) carried forward).                                                | 7. Original schedule name (for schedules not (yet) carried forward).                                                     |                                            |
|            |                       | 10. Key flag.                                                                                                          | 10. Head job record number (different from record number for rerun/every jobs).                                   | 10. Head job record number (different from record number for rerun/every jobs).                                           |                                            |
|            |                       | 11. Job’s submitted (real) name. For jobs submitted with at or batch, this is the name supplied by the user if not unique. The unique name generated by Tivoli Workload Scheduler appears as variable 4 above. | 11. Job’s submitted (real) name. For jobs submitted with at or batch, this is the name supplied by the user if not unique. The unique name generated by Tivoli Workload Scheduler appears as variable 4 above. | 11. Job’s submitted (real) name. For jobs submitted with at or batch, this is the name supplied by the user if not unique. The unique name generated by Tivoli Workload Scheduler appears as variable 4 above. |                                            |
|            |                       | 12. Original schedule name (for schedules not (yet) carried forward).                                                   | 12. Original schedule name (for schedules not (yet) carried forward).                                               | 12. Original schedule name (for schedules not (yet) carried forward).                                                     |                                            |</p>
<table>
<thead>
<tr>
<th>Table 3. Events formats table (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>202</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
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<tr>
<td></td>
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<tr>
<td>203</td>
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<td>251</td>
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<td>252</td>
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<tr>
<td>301</td>
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</tbody>
</table>
Appendix B. Support information

This section describes the following options for obtaining support for IBM products:

- “Searching knowledge bases”
- “Obtaining fixes” on page 62
- “Contacting IBM Software Support” on page 62

Searching knowledge bases

If you have a problem with your IBM software, you want it resolved quickly. Begin by searching the available knowledge bases to determine whether the resolution to your problem is already documented.

Search the information center on your local system or network

IBM provides extensive product documentation that can be installed on your local computer or on an intranet server. The documentation is supplied on the publications CD available with the product, can be downloaded from IBM as described in “Accessing publications online” on page xiii, or ordered in hardcopy from IBM as described in “Ordering publications” on page xiv.

Open the pdf versions of documents and use the built-in search facilities of Adobe Reader to find the information you require.

Search the information center at the IBM support Web site

The IBM software support Web site has many documents available online, one or more of which may provide the information you require:

2. Under Products A - Z, select your product name: select "I" for IBM and then scroll down to the product entries that commence "IBM Tivoli Workload Scheduler". These open product-specific support sites.
3. Under Self help and Learn, choose from the list of different types of product support documentation:
   - Manuals
   - Redbooks
   - White papers
   - Readme files and other documentation

To access some documents you need to register (indicated by a key icon beside the document title). To register, select the document you wish to look at, and when asked to sign in follow the links to register yourself. There is also a FAQ available on the advantages of registering.

Search the Internet

If you cannot find an answer to your question in the information center, search the Internet for other information that might help you resolve your problem.
Obtaining fixes

A product fix might be available to resolve your problem. You can determine what fixes are available for your IBM software product by checking the product support Web site:

2. Under Products A - Z, select your product name: select "I" for IBM and then scroll down to the product entries that commence "IBM Tivoli Workload Scheduler". These open product-specific support sites.
3. Under Self help, follow the link to Search all Downloads, where you will find a list of fixes, fix packs, and other service updates for your product.
4. Click the name of a fix to read the description and optionally download the fix.

To receive weekly e-mail notifications about fixes and other news about IBM products, follow these steps:

1. From the support page for any IBM product, click My support in the panel on the left of the page.
2. If you have already registered, skip to the next step. If you have not registered, click register in the upper-right corner of the support page to establish your user ID and password.
3. Sign in to My support.
4. On the My support page, select the Edit profile tab and click Subscribe to email. Select a product family and check the appropriate boxes for the type of information you want.
5. Click Update.
6. For e-mail notification for other product groups, repeat Steps 4 and 5.

For more information about types of fixes, see the Software Support Handbook [http://techsupport.services.ibm.com/guides/handbook.html].

Contacting IBM Software Support

IBM Software Support provides assistance with product defects.

Before contacting IBM Software Support, your company must have an active IBM software maintenance contract, and you must be authorized to submit problems to IBM. The type of software maintenance contract that you need depends on the type of product you have:

- For IBM distributed software products (including, but not limited to, Tivoli, Lotus®, and Rational® products, as well as DB2® and WebSphere® products that run on Windows or UNIX operating systems), enroll in Passport Advantage® in one of the following ways:
  - **Online**: Go to the Passport Advantage Web page [http://www.lotus.com/services/passport.nsf/WebDocs/Passport_Advantage_Home] and click How to Enroll
  - **By phone**: For the phone number to call in your country, go to the IBM Software Support Web site [http://techsupport.services.ibm.com/guides/contacts.html] and click the name of your geographic region.
- For IBM eServer™ software products (including, but not limited to, DB2 and WebSphere products that run in zSeries®, pSeries®, and iSeries™ environments), you can purchase a software maintenance agreement by working directly with

If you are not sure what type of software maintenance contract you need, call 1-800-IBM-SERV (1-800-426-7378) in the United States or, from other countries, go to the contacts page of the IBM Software Support Handbook on the Web [http://techsupport.services.ibm.com/guides/contacts.html](http://techsupport.services.ibm.com/guides/contacts.html) and click the name of your geographic region for phone numbers of people who provide support for your location.

Follow the steps in this topic to contact IBM Software Support:
1. Determine the business impact of your problem.
2. Describe your problem and gather background information.
3. Submit your problem to IBM Software Support.

### Determine the business impact of your problem

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you need to understand and assess the business impact of the problem you are reporting. Use the following criteria:

<table>
<thead>
<tr>
<th>Severity 1</th>
<th>Critical business impact: You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity 2</td>
<td>Significant business impact: The program is usable but is severely limited.</td>
</tr>
<tr>
<td>Severity 3</td>
<td>Some business impact: The program is usable with less significant features (not critical to operations) unavailable.</td>
</tr>
<tr>
<td>Severity 4</td>
<td>Minimal business impact: The problem causes little impact on operations, or a reasonable circumvention to the problem has been implemented.</td>
</tr>
</tbody>
</table>

### Describe your problem and gather background information

When explaining a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently. To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can the problem be re-created? If so, what steps led to the failure?
- Have any changes been made to the system? (For example, hardware, operating system, networking software, and so on.)
- Are you currently using a workaround for this problem? If so, please be prepared to explain it when you report the problem.

### Submit your problem to IBM Software Support

You can submit your problem in one of two ways:

- **Online:** Go to the "Submit and track problems" page on the IBM Software Support site [http://www.ibm.com/software/support/probsub.html](http://www.ibm.com/software/support/probsub.html). Enter your information into the appropriate problem submission tool.
• **By phone:** For the phone number to call in your country, go to the contacts page of the IBM Software Support Handbook on the Web (http://techsupport.services.ibm.com/guides/contacts.html) and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround for you to implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM product support Web pages daily, so that other users who experience the same problem can benefit from the same resolutions.

For more information about problem resolution, see [Searching knowledge bases](#) and [Obtaining fixes](#).
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Glossary

A

Access method. An access method is an executable used by extended agents to connect and control job execution on other operating systems (for example, MVS) and applications (for example, Oracle Applications, Peoplesoft, and Baan). The access method must be specified in the workstation definition for the extended agent.

B

Batchman. Batchman is a process started at the beginning of each Tivoli Workload Scheduler processing day to launch jobs in accordance with the information in the Symphony file.

C

Calendar. A calendar is a defined object in the Tivoli Workload Scheduler database that contains a list of scheduling dates. Because it is a unique object defined in database, it can be assigned to multiple job streams. Assigning a calendar to a job stream causes that job stream to be run on the days specified in the calendar. Note that a calendar can be used as an inclusionary or exclusionary run cycle.

Conman. Conman (console manager) is a legacy command-line application for managing the production environment. Conman performs the following tasks: start and stop production processes, alter and display schedules and jobs in the plan, and control workstation linking in a network.

Composer. Composer is a legacy command-line application for managing the definitions of your scheduling objects in the database.

D

Database. The database contains all the definitions you have created for scheduling objects (for example, jobs, job streams, resources, workstations, etc). In addition, the database holds other important information such as statistics of job and job stream execution, information on the user ID who created an object, and an object’s last modified date. In contrast, the plan contains only those jobs and job streams (including dependent objects) that are scheduled for execution in today’s production.

Deadline. The last moment in time that a job or job stream can begin execution. This corresponds to the Until time in legacy Maestro.

Dependency. A dependency is a prerequisite that must be satisfied before the execution of a job or job stream can proceed. The maximum number of dependencies permitted for a job or job stream is 40. The four types of dependencies used by Tivoli Workload Scheduler are follows dependencies, resource dependencies, file dependencies, and prompt dependencies.

Domain. A domain is a named group of Tivoli Workload Scheduler workstations consisting of one or more agents and a domain manager acting as the management hub. All domains have a parent domain except for the master domain.

Domain Manager. The management hub in a Tivoli Workload Scheduler domain. All communications to and from the agents in the domain are routed through the domain manager.

Duration. The time you expect the job to take to complete. In the Timeline view of jobs in the database, the duration is represented by a light blue bar at the center of the activity bar or by a light blue diamond.

E

Earliest start time. The time before which the job or job stream cannot start. The earliest start time is an estimate based on previous experiences running the job or job stream. However, the job or job stream can start after the time you specify as long as all other dependencies are satisfied. In the timeline, the start time is represented by the beginning (left edge) of the navy blue activity bar. For job instances, the start time that OPC calculates is represented by a light blue bar. See also “Actual start time” and “Planned start time”.

Exclusionary run cycle. A run cycle that specifies the days a job stream cannot be run. Exclusionary run cycles take precedent over inclusionary run cycles.

Expanded database. Expanded databases allow longer names for database objects such as jobs, job streams, workstations, domains, and users. Expanded databases are configured using the dbexpand command or as an option during installation. Do not expand your database before understanding the implications and impact of this command.

Extended agent. Extended agents are used to integrate Tivoli Workload Scheduler’s job control features with
other operating systems (for example, MVS) and applications (for example, Oracle Applications, Peoplesoft, and Baan). Extended agents use scripts called access methods to communicate with external systems.

External job. A job from one job stream that is a predecessor for a job in another job stream. An external job is represented by a place holder icon in the Graph view of the job stream.

Fault-tolerant agent. An agent workstation in the Tivoli Workload Scheduler network capable of resolving local dependencies and launching its jobs in the absence of a domain manager.

Fence. The job fence is a master control over job execution on a workstation. The job fence is a priority level that a job or job stream’s priority must exceed before it can run. For example, setting the fence to 40 prevents jobs with priorities of 40 or less from being launched.

Final Job Stream. The FINAL job stream should be the last job stream that is run in a production day. It contains a job that runs the script file Jnextday.

Follows dependency. A dependency where a job or job stream cannot begin execution until other jobs or job streams have completed successfully.

Global options. The global options are defined on the master domain manager in the globalopts file, and these options apply to all workstations in the Tivoli Workload Scheduler network. See also “Local options”.

Host. A Workload Scheduler workstation required by extended agents. It can be any Tivoli Workload Scheduler workstation except another extended agent.

Inclusionary Run Cycle. A run cycle that specifies the days a job stream is scheduled to run. Exclusionary run cycles take precedent over inclusionary run cycles.

Interactive jobs. A job that runs interactively on a Windows NT desktop.

Internal status. Internal status reflects the current status of jobs and job streams in the Tivoli Workload Scheduler engine. Internal status is unique to Tivoli Workload Scheduler. See also Status.

Internet (INET) dependencies. A dependency between jobs or job streams in separate Tivoli Workload Scheduler networks. See also “Network agent”.

Internet (INET) job / job stream. A job or job stream from a remote Tivoli Workload Scheduler network that is a predecessor to a job or job stream in the local network. An Internetwork job is represented by a place holder icon in the Graph view of the job stream. See also “Network agent”.

Jnextday job. Pre- and post-production processing can be fully automated by scheduling the Jnextday job to run at the end of each day. A sample jnextday job is provided as TWShome\Jnextday. The Jnextday job does the following: sets up the next day’s processing (contained in the Symphony file), prints reports, carries forward unfinished job streams, and stops and restarts Tivoli Workload Scheduler.

Job. A job is a unit of work that is processed at a workstation. The job definition consists of a unique job name in the Tivoli Workload Scheduler database along with other information necessary to run the job. When you add a job to a job stream, you can define its dependencies and its time restrictions such as the estimated start time and deadline.

Job Instance. A job scheduled for a specific run date in the plan. See also “Job”.

Job status. See “Status”.

Job Stream. A Job Stream consists of a list of jobs that run as a unit (such as a weekly backup application), along with times, priorities and other dependencies that determine the exact order of job execution.

Job stream instance. A job stream that is scheduled for a specific run date in the plan. See also “Job stream”.

Limit. Job limits provide a means of allocating a specific number of job slots into which Tivoli Workload Scheduler is allowed to launch jobs. A job limit can be set for each job stream, and for each workstation. For example, setting the workstation job limit to 25 permits Tivoli Workload Scheduler to have no more than 25 jobs executing concurrently on the workstation.

List. A list displays job scheduling objects. You must create separate lists for each job scheduling object. For each job scheduling object, there are two types of lists: one of definitions in the database and another of instances in the plan.
Local options. The local options are defined in the locaopts file. Each workstation in the Tivoli Workload Scheduler network must have a locaopts file. The settings in this file apply only to that workstation. See also "Global options".

M

Master Domain Manager. In a Tivoli Workload Scheduler network, the master domain manager maintains the files used to document the scheduling objects. It creates the plan at the start of each day, and performs all logging and reporting for the network.

N

Network agent. A type of extended agent used to create dependencies between jobs and job streams on separate Tivoli Workload Scheduler networks. See also "Internetwork (INET) dependency".

P

Parameter. Parameters are used to substitute values into your jobs and job streams. When using a parameter in a job script, the value is substituted at run time. In this case, the parameter must be defined on the workstation where it will be used. Parameters cannot be used when scripting extended agent jobs.

Plan. The plan contains all job scheduling activity planned for a period of one day. In Tivoli Workload Scheduler, the plan is created every 24 hours and consists of all the jobs, job streams, and dependency objects that are scheduled to run for that day. All job streams for which you have created run cycles are automatically scheduled and included in the plan. As the production cycle progresses, the jobs and job streams in the plan are run according to their time restrictions and other dependencies. Any jobs or job streams that do not run successfully are rolled over into the next day’s plan.

Planned Start Time. The time that Tivoli Workload Scheduler estimates a job instance will start. This estimate is based on start times of previous executions.

Predecessor. A job that must complete successfully before successor jobs can begin execution.

Priority. Tivoli Workload Scheduler has a queuing system for jobs and job streams in the plan. You can assign a priority level for each job and job stream from 0 to 101. A priority of 0 will not run.

Prompt. Prompts can be used as dependencies for jobs and job streams. A prompt must be answered affirmatively for the dependent job or job stream to launch. There are two types of prompts: predefined and ad hoc. An ad hoc prompt is defined within the properties of a job or job stream and is unique to that job or job stream. A predefined prompt is defined in the Tivoli Workload Scheduler database and can be used by any job or job stream.

R

Resource. Resources can represent either physical or logical resources on your system. Once defined in Tivoli Workload Scheduler database, they can be used as dependencies for jobs and job streams. For example, you can define a resource named "tapes" with a unit value of two. Then, define jobs that require two available tape drives as a dependency. Jobs with this dependency cannot run concurrently because each time a job is run the “tapes” resource is in use.

Run cycle. A run cycle specifies the days that a job stream is scheduled to run. In Tivoli Workload Scheduler there are three types of run cycles you can specify for a job stream: a Simple run cycle, a Weekly run cycle, or a Calendar run cycle (commonly called a calendar). Note that each type of run cycle can be inclusionary or exclusionary. That is, each run cycle can define the days a job stream is included in the production cycle, or the days a job stream is excluded from the production cycle. When you define multiple run cycles to a job stream, and inclusionary and exclusionary run cycles specify the same days, the exclusionary run cycles take precedent.

S

Simple Run Cycle. A simple run cycle is a specific set of user-defined days a job stream is run. A simple run cycle is defined for a specific job stream and cannot be used by multiple job streams. For more information see Run Cycle.

Status. Status reflects the current job or job stream status within the Job Scheduling Console. The Job Scheduling Console status is common to Tivoli Workload Scheduler and OPC. See also Internal status.

stdlist file. A standard list file is created for each job launched by Tivoli Workload Scheduler. Standard list files contain header and trailer banners, echoed commands, errors, and warnings. These files can be used to troubleshoot problems in job execution.

Successor. A job that cannot start until all of the predecessor jobs on which it is dependent are completed successfully.

Symphony file. This file contains the scheduling information needed by the Production Control process (batchman) to run the plan. The file is built and loaded during the pre-production phase. During the production phase, it is continually updated to indicate the current status of production processing: work completed, work in progress, work to be done. To
manage production processing, the contents of the Symphony file (plan) can be displayed and altered with the Job Scheduling console.

T

Time restrictions. Time restrictions can be specified for both jobs and job streams. A time can be specified for execution to begin, or a time can be specified after which execution will not be attempted. By specifying both, you can define a window within which a job or job stream will run. For jobs, you can also specify a repetition rate. For example, you can have Tivoli Workload Scheduler launch the same job every 30 minutes between the hours of 8:30 a.m. and 1:30 p.m.

Tivoli Management Framework (TMF). The base software that is required to run the applications in the Tivoli product suite. This software infrastructure enables the integration of systems management applications from Tivoli Systems Inc. and the Tivoli Partners. The Tivoli Management Framework includes the following:

- Object request broker (oserv)
- Distributed object database
- Basic administration functions
- Basic application services
- Basic desktop services such as the graphical user interface

In a Tivoli environment, the Tivoli Management Framework is installed on every client and server. However, the Tivoli server is the only server that holds the full object database.

Tivoli Management Region (TMR). In a Tivoli environment, a Tivoli server and the set of clients that it serves. An organization can have more than one TMR. A TMR addresses the physical connectivity of resources whereas a policy region addresses the logical organization of resources.

Tree view. The view on the left side of the Job Scheduling Console that displays the Tivoli Workload Scheduler server, groups of default lists, and groups of user created lists.

W

Weekly Run Cycle. A run cycle that specifies the days of the week that a job stream is run. For example, a job stream can be specified to run every Monday, Wednesday, and Friday using a weekly run cycle. A weekly run cycle is defined for a specific job stream and cannot be used by multiple job streams. For more information see Run Cycle.

Wildcards. The wildcards for Tivoli Workload Scheduler are:

- ? Replaces one alphanumeric character.
- % Replaces one numeric character.
- * Replaces zero or more alphanumeric characters in the Tivoli Job Scheduling console.
- @ Replaces zero or more alphanumeric characters in the Tivoli Workload Scheduler command line.

Wildcards are generally used to refine a search for one or more objects in the database. For example, if you want to display all workstations, you can enter the asterisk (*) wildcard. To get a listing of workstations site1 through site8, you can enter site%.

Workstation. A workstation is usually an individual computer on which jobs and job streams are run. They are defined in the Tivoli Workload Scheduler database as a unique object. A workstation definition is required for every computer that runs jobs or job streams in the Workload Scheduler network.

Workstation class. A workstation class is a group of workstations. Any number of workstations can be placed in a class. Job streams and jobs can be assigned to run on a workstation class. This makes replication of a job or job stream across many workstations easy.

X

X-agent. See “Extended agent”.

U

User. For Windows NT only, the user name specified in a job definition’s “Logon” field must have a matching user definition. The definitions furnish the user passwords required by Tivoli Workload Scheduler to launch jobs.

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