IBM

IBM Workload Scheduler
Integrating with Other Products
Version 9.5 Fix Pack 7

Note

Before using this information and the product it supports, read the information in .

This edition applies to version 9, release 5, modification level 0 of IBM Workload Scheduler (program number 5698-WSH) and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

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About this publication

This publication documents integration scenarios to show how you can integrate IBM Workload Scheduler with other products.

For the most up-to-date information about supported product versions for these integrations, you can generate a **Related software report** of type **Matrix between specific products and selected related software** from the Software Product Compatibility Reports web site: http://www-969.ibm.com/software/reports/compatibility/clarity/softwarePrereqsMatrix.html.

This manual contains the following sections:

- Integrating with IBM Tivoli Monitoring on page 9

   Describes how IBM Workload Scheduler integrates with IBM Tivoli® Monitoring.
- Integrating with Tivoli NetView on page 50

   Describes how IBM Workload Scheduler on UNIX™ integrates with Tivoli® NetView® for AIX®.
- Integrating with Tivoli Enterprise Console on page 69

   Describes how IBM Workload Scheduler integrates with Tivoli® Enterprise Console.
- Integrating with Tivoli License Compliance Manager on page 94

   Describes how IBM Workload Scheduler integrates with Tivoli® License Compliance Manager.
- Integrating with Tivoli Storage Manager on page 95

   Describes how IBM Workload Scheduler integrates with Tivoli Storage Manager.
- Integrating Dynamic workload broker with Tivoli Provisioning Manager on page 104

   Describes how to use dynamic workload broker and Tivoli Provisioning Manager together to dynamically create the resources necessary to run workload in your IT environment.
- Integrating with HCL BigFix on page 106

   Describes how IBM Workload Scheduler integrates with HCL BigFix.

What is new in this release

Learn what is new in this release.

For information about the new or changed functions in this release, see *IBM Workload Automation: Overview*, section *Summary of enhancements*.

For information about the APARs that this release addresses, see the IBM Workload Scheduler Release Notes at IBM Workload Scheduler Release Notes and the Dynamic Workload Console Release Notes at Dynamic Workload Console Release Notes. For information about the APARs addressed in a fix pack, refer to the readme file for the fix pack.

New or changed content is marked with revision bars.

What is new in this publication

Learn what is new in this publication.

Apars and defects have been fixed.

All changes are marked with revision bars.

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 full information, see the Accessibility Appendix in the *IBM Workload Scheduler User's Guide and Reference*.

Technical training

Cloud & Smarter Infrastructure provides technical training.

For Cloud & Smarter Infrastructure technical training information, see: http://www.ibm.com/software/tivoli/education

Support information

IBM provides several ways for you to obtain support when you encounter a problem.

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 the appendix about support information in *IBM Workload Scheduler: Troubleshooting Guide*.

Chapter 1. Integrating with IBM® Tivoli® Monitoring

IBM Workload Scheduler integrates with IBM Tivoli® Monitoring through the installation of a customizable agent, the IBM Tivoli® Monitoring agent that collects and distributes data to the Tivoli® Enterprise Monitoring Server.

You can integrate IBM Workload Scheduler with IBM Tivoli® Monitoring using data providers that are the interfaces of the IBM Tivoli® Monitoring agent. They enable the collection of data from data sources, client programs, URLs, scripts, relation tables, or SNMP agents and the transfer of the collected data to the custom IBM Tivoli® Monitoring agent, an agent that monitors any collected data.

For supported product versions of this integration, you can generate a **Related software report** of type **Matrix between specific products and selected related software** from the Software Product Compatibility Reports web site: http://www-969.ibm.com/software/reports/compatibility/clarity/softwarePrereqsMatrix.html.

The IBM Tivoli® Monitoring agent uses two different data providers to integrate with IBM Workload Scheduler:

- The script data provider collects the IBM Workload Scheduler data by running a script at regular intervals and parsing the script output to look for errors, anomalies, and threshold conditions. For details about this integration, see Integrating with IBM Tivoli Monitoring using a script data source on page 10.
- The file data provider monitors data in a sequential text file. For details about this integration, see Integrating with Tivoli Enterprise Portal using the agent log file data source on page 14.

For the most up-to-date information about supported product versions for this integration, you can generate a **Related software report** of type **Matrix between specific products and selected related software** from the Software Product Compatibility Reports web site: http://www-969.ibm.com/software/reports/compatibility/clarity/softwarePrereqsMatrix.html

1. Specify the IBM Workload Scheduler product version for which you want to display supported related software integrations:
   a. On the Rows: product list tab, type "workload scheduler" in the Full or partial product name text box and click the search icon.
   b. In the Search results box, select IBM Workload Scheduler.
   c. Select the product version. Optional select **Show fix packs** if you want to include fix pack levels in the matrix and then select one or more fix packs and versions.
   d. Click **Add selected**.
2. Specify the product version for the related software that integrates with IBM Workload Scheduler:
   a. On the Columns: related software list tab, type "tivoli monitoring" in the Full or partial product name text box and click the search icon.
   b. In the Search results box, select Tivoli Monitoring.
   c. Select the product version. Optionally select **Show fix packs** if you want to include fix pack levels in the matrix and then select one or more fix packs and versions.
   d. Click **Add selected**.

   On the Verify & submit tab, verify your selections and click **Submit** to generate the matrix.

Integrating with IBM® Tivoli® Monitoring using a script data source

The main prerequisite for this integration is the installation of the Tivoli Monitoring agent for IBM Workload Scheduler on the same workstation where theIBM Workload Scheduler instance is to be monitored and is installed.

If you are working in a remote environment where IBM Workload Scheduler is physically installed on a workstation different from the Tivoli® Enterprise Monitoring Server, the collection and control point for the events received from the agents, then before installing the Tivoli Monitoring agent for IBM Workload Scheduler, you must install the Tivoli Monitoring OS agent on the workstation hosting IBM Workload Scheduler.

The IBM Workload Scheduler installation is monitored by the Tivoli Monitoring agent for IBM Workload Scheduler that uses script data providers. For information about the operating systems supported by this integration, refer to the IBM Tivoli® Monitoring documentation at: http://www-01.ibm.com/support/knowledgecenter/SSTFXA/welcome.

Resources monitored in IBM Workload Scheduler

The following resources are monitored by the custom Tivoli Monitoring agent for IBM Workload Scheduler:

- Host availability on page 10
- Application status on page 11
- IBM Workload Scheduler used space on page 12
- IBM Workload Scheduler available disk space on page 13
- Page-outs on page 13
- Swap space available on page 14
- IBM Workload Scheduler Message file size on page 14

Host availability

The Tivoli Monitoring agent for IBM Workload Scheduler monitors if the parent workstation that can respond to a ping request is available on the network.
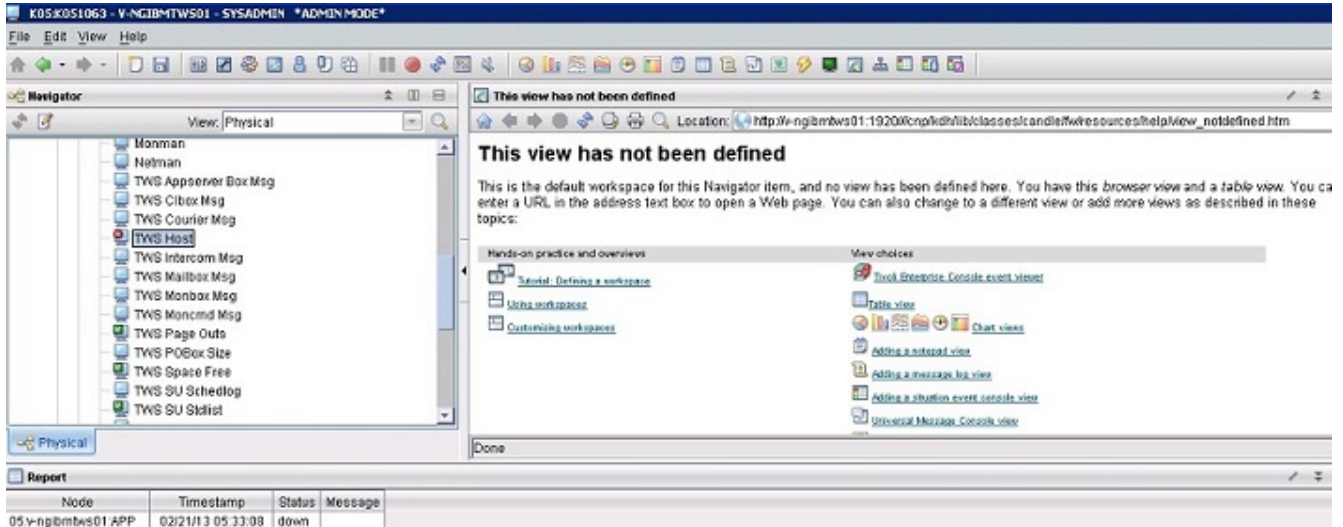
Application status

The Tivoli Monitoring agent for IBM Workload Scheduler monitors if a process is up and running.

The following scheduling processes are monitored:

- appserverman
- batchman
- jobman
- mailman
- monman
- netman
- WebSphere® Application Server

These are the versions of the application status monitor:

- JOBMAN for Windows™
- jobman for UNIX™

The next figure shows the IBM Workload Scheduler monitored applications:
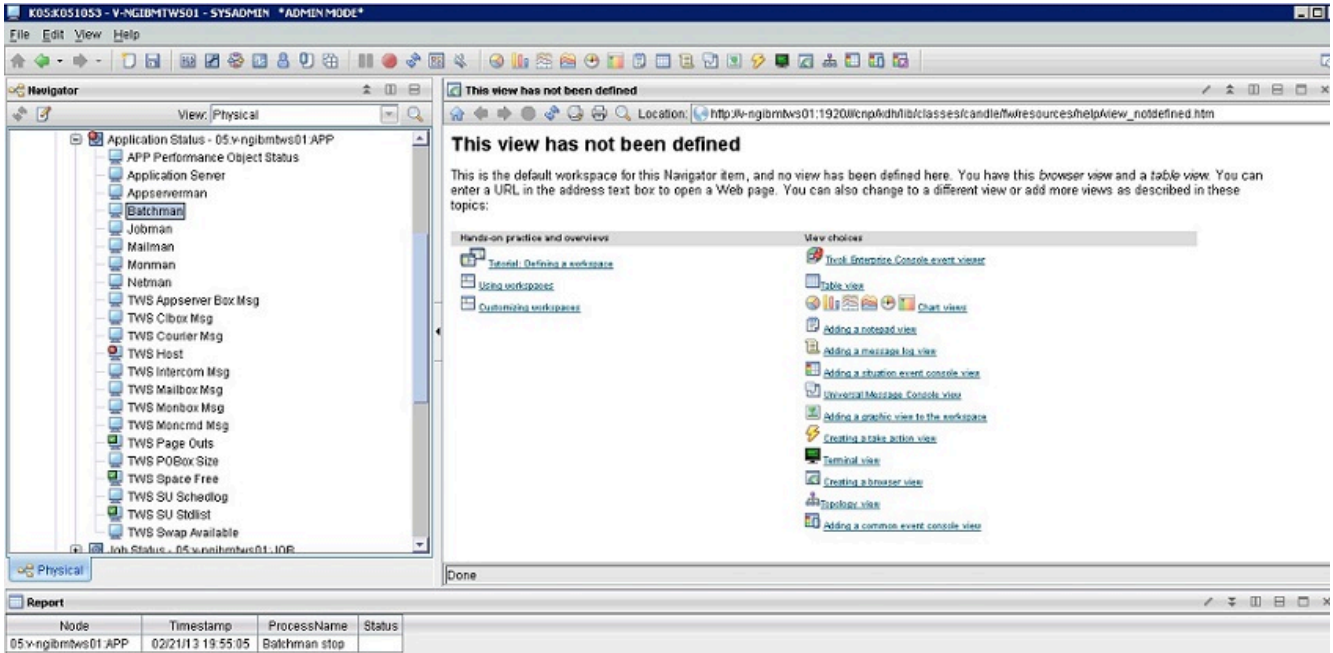
IBM Workload Scheduler used space

The Tivoli Monitoring agent for IBM Workload Scheduler monitors the number of megabytes used by a specific directory. The default IBM Workload Scheduler directories are:

- stdlist
- schedlog
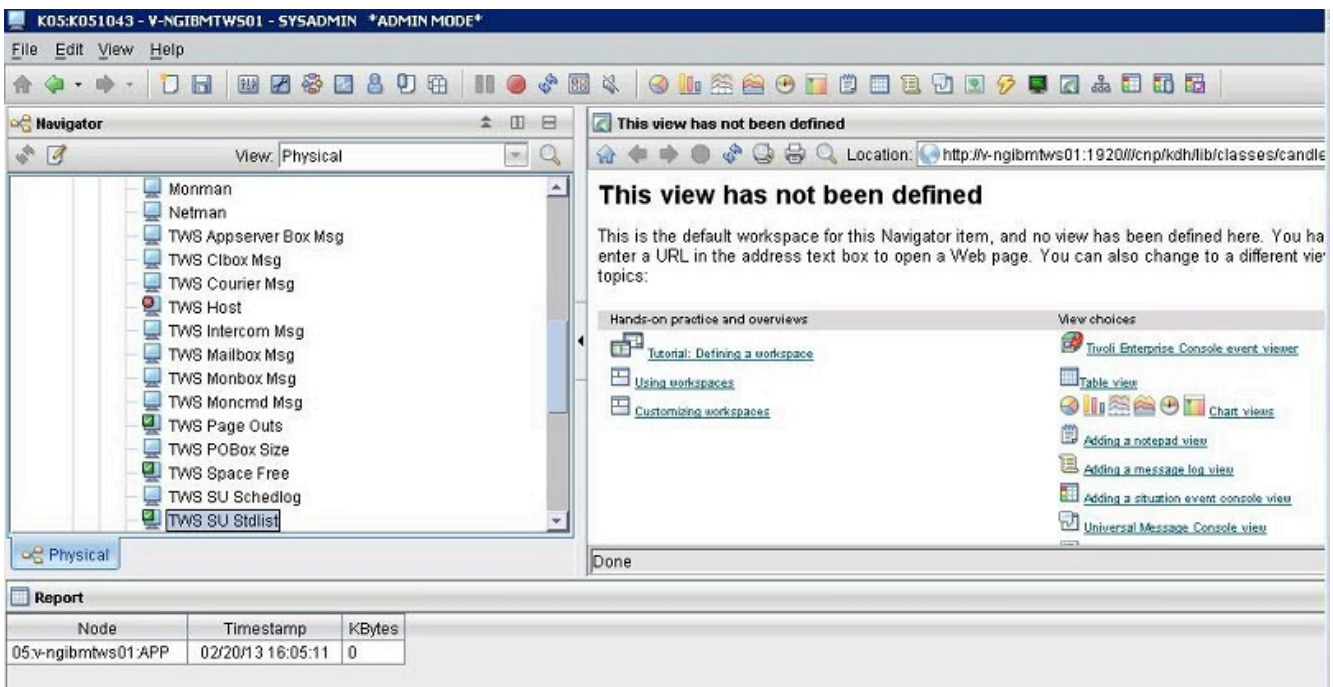
IBM Workload Scheduler available disk space

The Tivoli Monitoring agent for IBM Workload Scheduler monitors the amount of free disk space in the IBM Workload Scheduler directory.

Page-outs

The Tivoli Monitoring agent for IBM Workload Scheduler monitors the number of kilobytes per second paged out on a workstation.

Swap space available

The Tivoli Monitoring agent for IBM Workload Scheduler monitors the amount of available swap space.
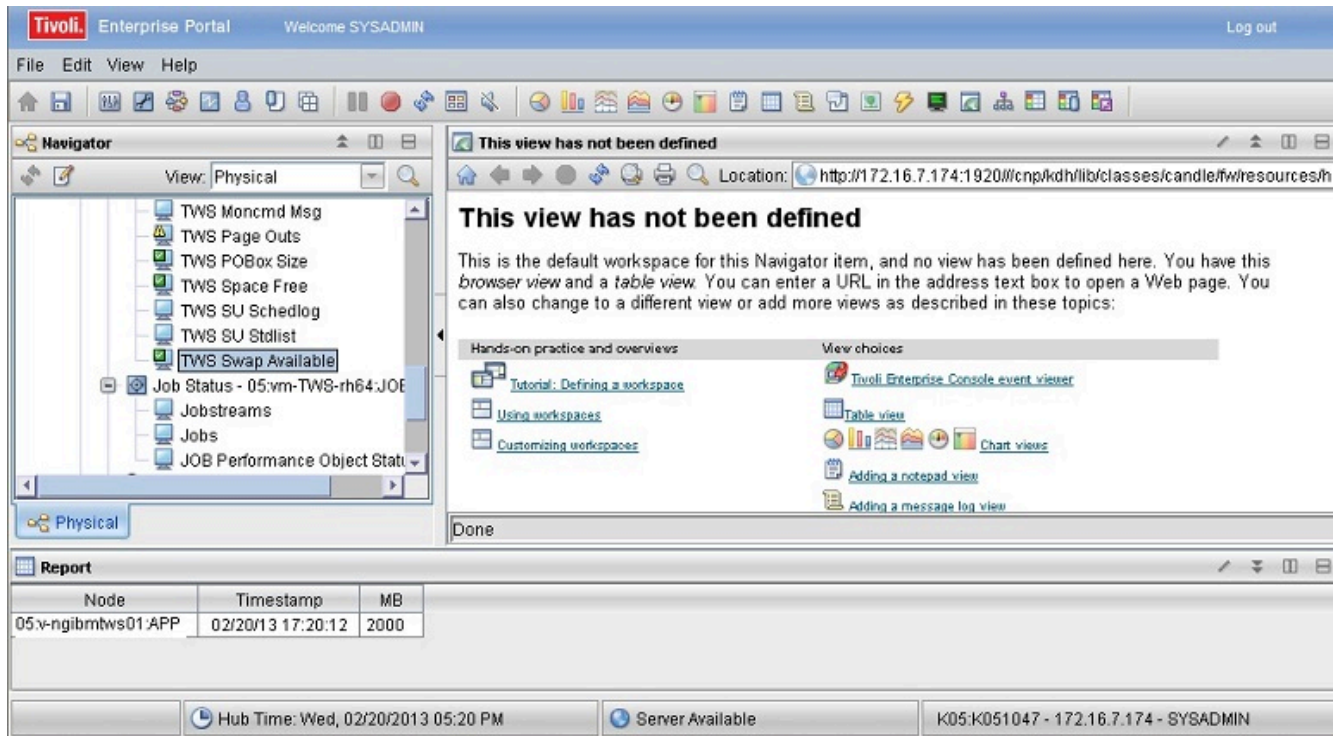
IBM Workload Scheduler Message file size

The Tivoli Monitoring agent for IBM Workload Scheduler monitors the number of megabytes used by a specific message file and can send an event if the percentage written of the size allocated exceeds a predefined limit. By default, the following IBM Workload Scheduler files are monitored:

- Appserverbox.msg
- Clbox.msg
- Courier.msg
- Intercom.msg
- Mailbox.msg
- Monbox.msg
- Moncmd.msg
- Pobox files
- All files in the Pobox directory

Integrating with Tivoli® Enterprise Portal using the agent log file data source

About this task

IBM Workload Scheduler integrates with the Tivoli® Enterprise Portal through the Tivoli Monitoring agent log file data source.

For information about the integration of IBM Workload Scheduler with the Tivoli® Enterprise Portal, see .

Integrating IBM Workload Scheduler with Tivoli® Enterprise Portal

IBM Workload Scheduler integrates with the Tivoli® Enterprise Portal, a component of IBM Tivoli® Monitoring, through the Tivoli Monitoring agent for IBM Workload Scheduler.

The following topics are addressed:

Architecture of the integration

About this task

IBM Tivoli® Monitoring monitors and manages system and network applications on a variety of platforms and keeps track of the availability and performance of all parts of your enterprise. IBM Tivoli® Monitoring provides reports you can use to track trends and troubleshoot problems.

IBM Workload Scheduler sends events to IBM Tivoli® Monitoring using the log file data source of the Tivoli Monitoring agent for IBM Workload Scheduler.

IBM Workload Scheduler creates and writes events for all the monitored objects (jobs and job streams) into a predefined event file that is accessed by the Tivoli Monitoring agent for IBM Workload Scheduler at a set interval. The Tivoli Monitoring agent for IBM Workload Scheduler reads the events from the event file. The Tivoli Monitoring agent for IBM Workload Scheduler stores this event information in its internal cache that is consolidated by the Tivoli® Enterprise Monitoring Server. The collected data is then retrieved and displayed by a component called Tivoli® Enterprise Portal.

The following components of IBM Tivoli® Monitoring must be installed on one of the supported platforms to allow the integration with IBM Workload Scheduler:

- A Tivoli® Enterprise Monitoring Server (referred to as the monitoring server), which acts as a collection and control point for the events received from the agents.
- A Tivoli® Enterprise Portal (referred to as the portal server) placed between the client and the monitoring server that enables retrieval, manipulation, and analysis of data from the agents.
- A Tivoli® Enterprise Portal client with a Java-based user interface for viewing and monitoring your enterprise. Tivoli® Enterprise Portal offers two modes of operation: desktop and browser.

- The Tivoli Monitoring agent for IBM Workload Scheduler installed on the systems that you want to monitor. In your IBM Workload Scheduler environment, this component must be installed on the master domain manager system. This agent collects and distributes data to the monitoring server.
- The Tivoli Monitoring OS agent: if you are working in a remote environment where IBM Workload Scheduler is physically installed on a workstation different from the Tivoli® Enterprise Monitoring Server, then before installing the Tivoli Monitoring agent for IBM Workload Scheduler, you must install the Tivoli Monitoring OS agent on the workstation hosting IBM Workload Scheduler.

The following figure describes the architecture of the integration:
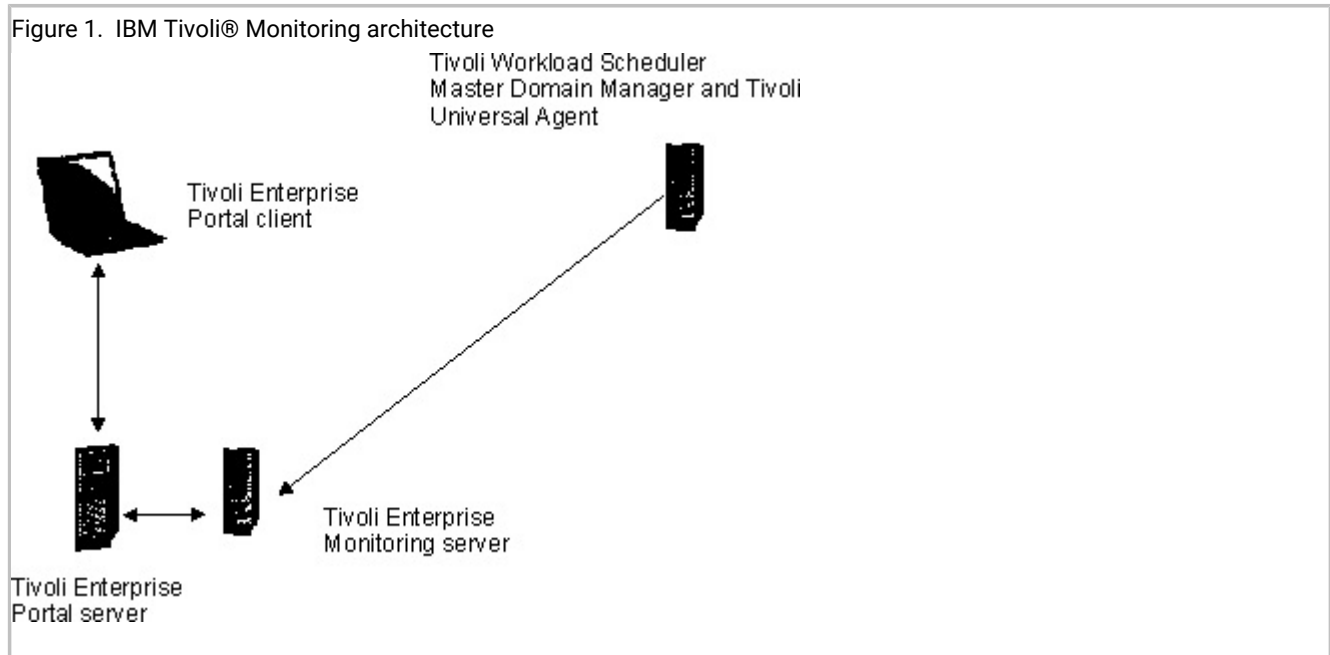
Figure 1. IBM Tivoli® Monitoring architecture

Installing and configuring the Tivoli Monitoring agent for IBM Workload Scheduler

Procedure to install the agent on Windows™ and non-Windows workstations.

About this task

Follow these steps to install and configure the Tivoli Monitoring agent for IBM Workload Scheduler.

Installing and configuring on Windows™ workstations

Before you begin

The workstation where you install the Tivoli Monitoring agent for IBM Workload Scheduler depends on how you set up your topology. Two environments are supported: remote and local.

In a local environment, the Tivoli® Enterprise Monitoring server and Tivoli Enterprise Portal server must be installed on the same workstation as the IBM Workload Scheduler master domain manager. The Tivoli Monitoring agent for IBM Workload Scheduler is installed on the same workstation as the IBM Workload Scheduler master domain manager.

In a remote environment, the Tivoli® Enterprise Monitoring server and Tivoli Enterprise Portal server are installed on different workstation than the IBM Workload Scheduler master domain manager. In this type of environment, you must first install the Tivoli Monitoring OS agent on the same workstation as the IBM Workload Scheduler master domain manager before installing the Tivoli Monitoring agent for IBM Workload Scheduler. When installing the OS agent, in addition to selecting the Tivoli® Enterprise Monitoring Agent for your OS, select all of the associated subcomponents in the list.

1. To install and configure the Tivoli Monitoring agent for IBM Workload Scheduler on Windows™ workstations in both a local and remote environment:

   Local environment

   a. To install the agent, submit the following command from the ITM folder located in
      <*TWS_HOME*>:

   ```
   installIra.bat <ITM_installation_directory>
    [[-h <HUB_TEMS_hostname>]
      -u <HUB_TEMS_username>
    [-p <HUB_TEMS_password>]] [-r]
   ```

   where:

   <ITM_ installation_directory>

   The Tivoli Monitoring installation directory. This value is optional and if it is not specified, then the value of the Tivoli® Enterprise Monitoring server installation directory is used. The default value for this directory is: C:\IBM\ITM.

   -h <HUB_TEMS_hostname>

   The host name of the Tivoli® Enterprise Monitoring server.

   -u <HUB_TEMS_username>

   The user name of the user accessing the Tivoli® Enterprise Monitoring server.

   -p <HUB_TEMS_password>

   The password for the user accessing the Tivoli® Enterprise Monitoring server.

   -r

   Restarts the Tivoli® Enterprise Portal server.

   In a local environment, even if the host name, username and password are not specified when you submit the command, the Tivoli Monitoring agent is installed successfully because it assumes the localhost as the host name and proceeds with the installation.

   Remote environment

   Before installing the Tivoli Monitoring agent for IBM Workload Scheduler you must first install the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server support files on the workstation where the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server are installed.

a. Copy the `ITM` folder located in *TWS_HOME>* to the workstation where the Tivoli® Enterprise Monitoring Server and Tivoli® Enterprise Portal server are installed.

b. Submit the following command to install the Tivoli® Enterprise Monitoring Server support files:

```
installIraAgentTEMS.bat <ITM_installation directory>
```

c. Submit the following command to install the Tivoli® Enterprise Portal server support files:

```
installIraAgentTEPS.bat <ITM_installation directory>
```

d. From the `ITM` folder located in your *TWS_HOME>* path, submit the following command to install the agent:

```
installIraAgent.bat <ITM_OS_agent_installation_directory>
```

where,

<ITM_installation_directory>

The Tivoli Monitoring installation directory. In a remote environment, this value is obligatory and corresponds to the installation directory of the Tivoli Monitoring OS agent. The default value for this directory is: `C:\IBM\ITM`.

<ITM_OS_agent_installation_directory>

The directory where the Tivoli Monitoring OS agent is installed. The Tivoli Monitoring OS agent is installed on the same workstation as the IBM Workload Scheduler master domain manager.

2. The Tivoli Monitoring agent for IBM Workload Scheduler is listed in the Manage Tivoli® Enterprise Monitoring Services.
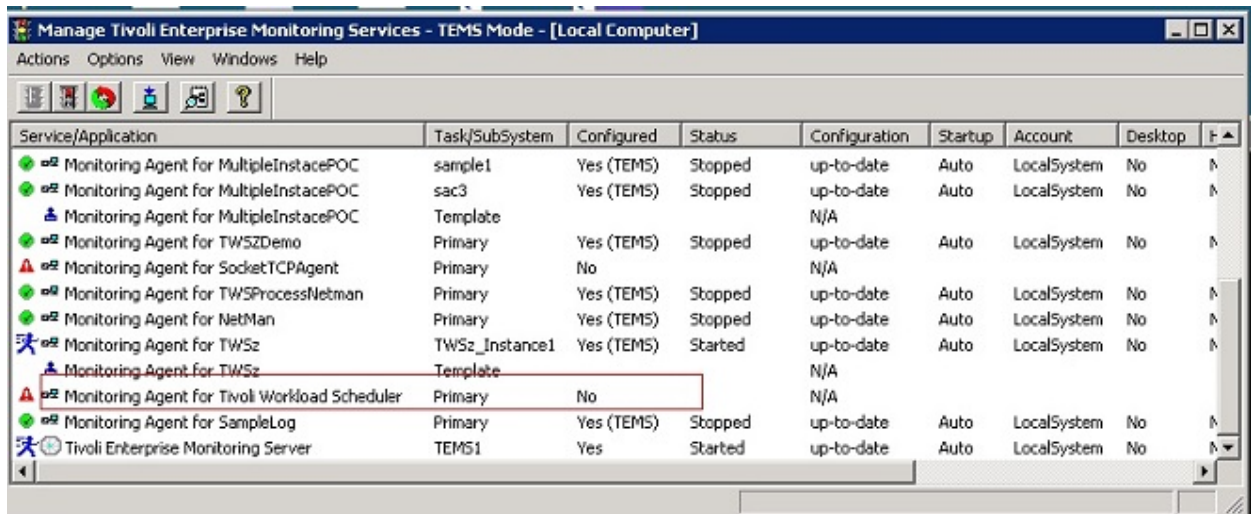
3. Right-click the entry **Monitoring Agent for IBM Workload Scheduler** and select **Configure Using Defaults**. The Monitoring Agent for Windows OS: Agent Advanced Configuration window is displayed.

4. In the **Primary TEMS Connection** section, leave the default setting for Protocol 1 to `IP.PIPE`.

5. In the Advanced settings section, specify the hostname or IP Address for the Tivoli® Enterprise Monitoring Server and then click **OK**. You are prompted to enter values for various agent configuration parameters.

6. Set the values for the following agent configuration parameters. Click **Next** to continue with the next set of parameters.

Table 1. Agent configuration parameters

Agent configuration parameters	Value
TWS HOME	The path to the IBM Workload Scheduler home directory. If you accepted the default values when you installed IBM Workload Scheduler then by default, this path is: `C:\Program Files\IBM\TWA\TWS`.
TWS LOG FILE	**TWS_LOG_FILE** The name of the log file, `event.log`, that is to be monitored for job events and workstation status. You must specify its complete path in the `BmEvents.conf` file.
TWS_INSTANCE	**TWS_MASTER_NAME** The value for the **thiscpu** attribute in the `localopts` file located in the IBM Workload Scheduler installation directory on the host. **TWS_INSTANCE_NAME** The name of your subdomain manager if you have one. If not, it is the same as TWS_MASTER_NAME. **TWS_MASTER_DOMAIN** The domain name of your master domain manager.
TWS_INFO	**TWS_MDM** The fully qualified host name of the master domain manager. **TWS_BMDM** The fully qualified host name of the backup master domain manager. **MDMPORT** The port number of the master domain manager. **TDWC1** The fully qualified host name of the primary Dynamic Workload Console. **TDWC2** Optional, the fully qualified host name of the secondary Dynamic Workload Console.

Agent configuration parameters	Value
Application Status	To monitor applications, click **New** for each application you want to monitor and enter the host short name of the workstation on which you want to monitor applications.
Job Status	If the BmEvents.conf file has been modified to write job, job stream, and workstation status to a file, then click **New** to monitor job, job stream and workstation status and enter the short host name of the workstation where the BmEvents.conf file is located.
Workstations	To monitor workstations, click **New** for each workstation you want to monitor and enter the short host name of the workstation.

Result

After you have finished specifying the agent configuration parameters, click **OK**. The status of the agent is Stopped.

7. By default, the Tivoli® Enterprise Portal shows a maximum of 100 events. To increase this number, right-click the entry **Monitoring Agent for IBM Workload Scheduler** and select **Advanced > Edit ENV File** to modify the following environment variable to the value you want:

```
CDP_PURE_EVENT_CACHE_SIZE
```

If you make this change while the IBM Workload Scheduler agent is running, to make it effective you must restart the agent.

8. To start the agent, from the Manage Tivoli® Enterprise Monitoring Services window, right-click the entry **Monitoring Agent for IBM Workload Scheduler** and select **Start**.

> ✎ **Note:** In a remote environment where IBM Workload Scheduler and Tivoli® Enterprise Monitoring server are installed on different workstations, ensure that the Tivoli Monitoring OS agent is started before you start the Tivoli Monitoring agent for IBM Workload Scheduler.

9. Launch the Tivoli® Enterprise Portal. The agent is displayed in the Navigator pane together with any agent configuration settings.
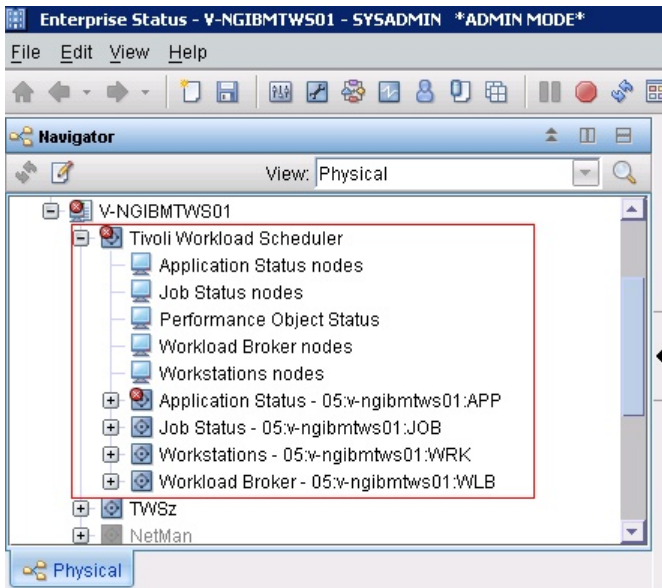
Installing and configuring on non-Windows workstations

Before you begin

The workstation where you install the Tivoli Monitoring agent for IBM Workload Scheduler depends on how you set up your topology. Two environments are supported: remote and local.

In a local environment, the Tivoli® Enterprise Monitoring server and Tivoli Enterprise Portal server must be installed on the same workstation as the IBM Workload Scheduler master domain manager. The Tivoli Monitoring agent for IBM Workload Scheduler is installed on the same workstation as the IBM Workload Scheduler master domain manager.

In a remote environment, the Tivoli® Enterprise Monitoring server and Tivoli Enterprise Portal server are installed on different workstation than the IBM Workload Scheduler master domain manager. In this type of environment, you must first install the Tivoli Monitoring OS agent on the same workstation as the IBM Workload Scheduler master domain manager before installing the Tivoli Monitoring agent for IBM Workload Scheduler. When installing the OS agent, in addition to selecting the Tivoli® Enterprise Monitoring Agent for your OS, select all of the associated subcomponents in the list.

About this task

The Tivoli Monitoring agent for IBM Workload Scheduler on non-Windows workstations:

1. To install and configure the Tivoli Monitoring agent for IBM Workload Scheduler on non-Windows™ workstations in both a local and remote environment:

   Local environment

   a. From the `ITM` folder located in your <*TWS_HOME*> path, submit the following command to install the agent:

   ```
   installIra.sh <ITM_installation_directory>
     [[-h <HUB_TEMS_hostname>]
       -u< HUB_TEMS_username>
     [-p <HUB_TEMS_password>]] [-r]
   ```

   where:

   <ITM_installation_directory>

   The Tivoli Monitoring installation directory. This value is optional and if it is not specified, then the value of the Tivoli® Enterprise Monitoring server installation directory is used. The default value for this directory is: `opt/IBM/ITM`.

   -h *<HUB_TEMS_hostname>*

   The host name of the Tivoli® Enterprise Monitoring server.

   -u *<HUB_TEMS_username>*

   The user name of the user accessing the Tivoli® Enterprise Monitoring server.

   -p *<HUB_TEMS_password>*

   The password for the user accessing the Tivoli® Enterprise Monitoring server.

   -r

   Restarts the Tivoli® Enterprise Portal server.

   In a local environment, even if the host name, username and password are not specified when you submit the command, the Tivoli Monitoring agent is installed successfully because it assumes the localhost as the host name and proceeds with the installation.

   Remote environment

   Before installing the Tivoli Monitoring agent for IBM Workload Scheduler you must first install the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server support files on the workstation where the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server are installed.

   a. Copy the `ITM` folder located in your <*TWS_HOME*> path to the workstation where the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server are installed.

   b. Submit the following command to install the Tivoli® Enterprise Monitoring Server support files:

   ```
   installIraAgentTEMS.sh <ITM_installation directory>
   ```

   c. Submit the following command to install the Tivoli® Enterprise Portal server support files:

   ```
   installIraAgentTEPS.sh <ITM_installation directory>
   ```

d. From the `ITM` folder located in your *TWS_HOME>* path, submit the following command to install the agent on the IBM Workload Scheduler master domain manager:

```
installIraAgent.sh <ITM_OS_agent_installation_directory>
```

where,

<ITM_installation_directory>

The Tivoli Monitoring installation directory. In a remote environment, this value is obligatory and corresponds to the installation directory of the Tivoli Monitoring OS agent. The default value for this directory is: `opt/IBM/ITM`.

<ITM_OS_agent_installation_directory>

The directory where the Tivoli Monitoring OS agent is installed. The Tivoli Monitoring OS agent is installed on the same workstation as the IBM Workload Scheduler master domain manager.

2. Configure the Tivoli Monitoring agent for IBM Workload Scheduler by submitting the following command from the `<ITM_OS_agent_installation_directory>/bin` directory:

```
./itmcmd config -A qs
```

where,

qs

Product code of the Tivoli Monitoring agent for IBM Workload Scheduler

Enter the host name or IP address of the remote workstation where Tivoli® Enterprise Monitoring Server and Tivoli® Enterprise Portal server are installed.

3. You are prompted to edit the settings for the following agent configuration parameters. Enter **1** to accept. After specifying each set of parameters, press **Enter** to continue to the next set.

Table 2. Agent configuration parameters

Agent configuration parameters	Value
TWS HOME	The path to the IBM Workload Scheduler home directory. If you accepted the default values when you installed IBM Workload Scheduler then by default, this path is: `/opt/IBM/TWA/TWS`.
TWS LOG FILE	**TWS_LOG_FILE** The path to the log file, event.log, that needs to be monitored for job events and workstation status. This is the value in the `BmEvents.conf` file.
TWS_INSTANCE	**TWS_MASTER_NAME** The value for the **thiscpu** attribute in the **localopts** file located in the IBM Workload Scheduler installation directory on the host.

Agent configuration parameters	Value
	TWS_INSTANCE_NAME
	The name of your subdomain manager if you have one, if not, it is the same as TWS_MASTER_NAME.
	TWS_MASTER_DOMAIN
	The name of your master domain manager.
TWS_INFO	**TWS_MDM**
	The fully qualified host name of the master domain manager.
	TWS_BMDM
	The fully qualified host name of the backup master domain manager.
	MDMPORT
	The port number of the master domain manager.
	TDWC1
	The fully qualified host name of the primary Dynamic Workload Console.
	TDWC2
	Optional, the fully qualified host name of the secondary Dynamic Workload Console.
Application Status	To monitor applications, enter **1** in the **Edit Application Status** settings section. For each application you want to monitor, enter the host short name of the workstation on which you want to monitor applications. If you do not want to monitor application status on this host, enter **4** to point to the application status of the newly created instance. Enter **5** to move to the Job Status settings section.
Job Status	If the BmEvents.conf file has been modified to write job, job stream, and workstation status to a file, then enter **1** to monitor job, job stream, and workstation status and enter the short host name of the workstation where the `BmEvents.conf` file is located. If you do not want to perform this type of monitoring, enter **5** to move to the next settings section.
Workstations	To monitor workstations, enter **1** for each workstation you want to monitor and enter the short host name of the workstation. If you do not want to perform this type of monitoring, enter **5** to move to the next settings section.

4. When asked if the agent will connect to a Tivoli® Enterprise Monitoring server, leave the default value `1=YES`.
5. When prompted to specify the Network Protocol, leave the default value `ip.pipe`.

6. By default, the Tivoli® Enterprise Portal shows a maximum of 100 events. To increase this number, edit the *ITM_installation_directory*>/config/qs.ini file to modify the following environment variable to the value you want:

```
CDP_PURE_EVENT_CACHE_SIZE
```

If you make this change while the IBM Workload Scheduler agent is running, to make it effective you must restart the agent.

7. The Tivoli Monitoring agent for IBM Workload Scheduler is installed and configured and is visible from the Tivoli® Enterprise Portal. Before starting the agent, ensure that the Tivoli Monitoring OS agent is started first. To start the Tivoli Monitoring OS agent on a Linux™ workstation, submit the following command:

```
./itmcmd agent start lz
```

where

lz

Product code of the Tivoli Monitoring OS agent On Linux™.

8. To start the agent, submit the following command from the *ITM_installation_directory*/bin directory in a local environment for from the *ITM_OS_agent_installation_directory*/bin directory in a remote environment:

```
./itmcmd agent start qs
```

where,

qs

Product code of the Tivoli Monitoring agent for IBM Workload Scheduler.

To stop the agent, submit the following command:

```
./itmcmd agent stop qs
```

9. To ensure that the Tivoli Monitoring agent for IBM Workload Scheduler is running, submit the command:

```
./cinfo –r
```

10. Launch the Tivoli® Enterprise Portal. The agent is displayed in the Navigator pane together with any agent configuration settings.
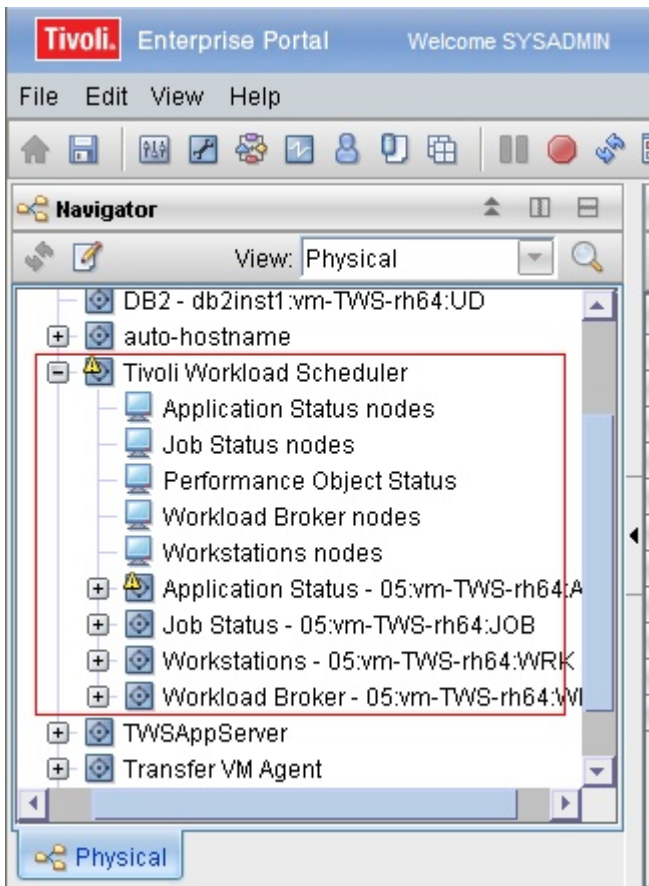
How to create IBM Workload Scheduler default situations

An easy assisted creation of the default situations in a new Tivoli Workload Scheduler view or a view of your choice in the Tivoli® Enterprise Portal console.

About this task

You can create and display IBM Workload Scheduler default situations in a new Tivoli Workload Scheduler or in a view of your choice in the Tivoli® Enterprise Portal console. The default situations are associated to a view in the Tivoli® Enterprise Portal with their respective severity.

1. Run the script to create the default situations.

   For UNIX™ operating systems

   ```
   <TWA_home>/TWS/ITM/ITMCreateSituations.sh
   ```

   For Windows™ operating systems

   ```
   <TWA_home>\TWS\ITM\ITMCreateSituations.cmd
   ```

   where ,`<TWA_home>` is the installation directory of IBM Workload Scheduler.

2. Copy this file and the `baseNameSituation.xml` file to the Tivoli® Enterprise Monitoring Server and run the script using the following syntax:

   For UNIX™ operating systems

   ```
   ITMCreateSituations.sh -ITMUser <user> -ITNPassword <password>
   -host <host> -ITMHome <ITM_Home> [-TWSHome <TWA_home>]
   ```

   For Windows™ operating systems

   ```
   ITMCreateSituations.cmd -ITMUser <user> -ITNPassword <password>
   -host <host> -ITMHome <ITM_Home> [-TWSHome <TWA_home>]
   ```

   where:

   <user>

   Specifies the user ID of the IBM Tivoli® Monitoring user.

   <password>

   Specifies the password of the IBM Tivoli® Monitoring user.

   <host>

   Specifies the hostname of the Tivoli® Enterprise Monitoring Server you log on to.

   <ITM_Home>

   Specifies the Candle home directory of the Tivoli® Enterprise Monitoring Server.

   <TWS_Home>

   Specifies the home directory of IBM Workload Scheduler. Use this option only if IBM Workload Scheduler is also installed on the same workstation where Tivoli® Enterprise Portal is installed.

   For example, to create default situations in a Windows™ operating system, without a severity, run the following command:

   ```
   ITMCreateSituations.cmd -ITMUser root -ITMPassword password
   -host nc050167 -ITMHome C:\IBM\ITM -TWSHome nc005093
   ```

3. You can associate these situations and the severity to a view of the Tivoli® Enterprise Portal, by using the following executable file:

   For UNIX™ operating systems

   ```
   <TWA_home>/TWS/ITM/ITMsetSeverity.sh
   ```

   For Windows™ operating systems

   ```
   <TWA_home>\TWS\ITM\ITMsetSeverity.cmd
   ```
   where `<TWA_home>` is the installation directory of IBM Workload Scheduler

   The script configures the associations of the Tivoli® Enterprise Portal console to create and display the IBM Workload Scheduler situations.

4. Copy this file to the Tivoli® Enterprise Monitoring Server and run the executable file using the following syntax:

For UNIX™ operating systems

```
ITMsetSeverity.sh -TEPUser <user> -TEPPassword <password>
-TEPhost host> -TEPHome <TEP_Home> {[-TWSHost <TWS_Host>
-TWSOSType <Linux|Unix|Windows>]|[-navigator <navigator_item>
[-view <Physical|Logical>]]}
```

For Windows™ operating systems

```
ITMsetSeverity.cmd -TEPUser <user> -TEPPassword <password>
-TEPhost host> -TEPHome <TEP_Home> {[-TWSHost <TWS_Host>
-TWSOSType <Linux|Unix|Windows>]|[-navigator <navigator_item>
[-view Physical|Logical>]]}
```

where:

<user>

Specifies the user ID of the Tivoli® Enterprise Portal user.

<password>

Specifies the password of the Tivoli® Enterprise Portal user.

<host>

Specifies the hostname of the Tivoli® Enterprise Portal you log on to.

<TEP_Home>

Specifies the Candle home directory of the Tivoli® Enterprise Portal server.

<TWS_Host>

Specifies the host name of the workstation where Tivoli® Enterprise Portal is configured. This parameter is case sensitive.

<TWOSType>

Specifies the type of operating system where the agent is installed. These values are case sensitive:
- Linux
- Unix
- Windows

<navigator_item>

Specifies the fully qualified name of the navigator item where to associate situations, or to assign the list of managed systems. This path is case sensitive.

-view

The name of the navigator view which the navigator item belongs to. The default value is `Physical`.

For example, to associate the severity to each situation in a Windows™ operating system, you can run one of the following commands:

```
ITMsetSeverity.cmd -TEPUser sysadmin -TEPPassword password
-TEPhost nc050167 -TEPHome C:\IBM\ITM -TWSHost nc004002
-TWSOSType Linux
```

To associate the severity for each situation with the navigator item to which to associate the situation and the name of the navigator view that the navigator item belongs to, run the command as follows:

```
TMsetSeverity.cmd –TEPUser sysadmin –TEPPassword password
–TEPhost nc050167 –TEPHome C:\IBM\ITM –navigator
“Enterprise/Windows Systems/NC005093/Tivoli Workload Scheduler
/Application Status -QS:nc005093:APP” –view Logical
```

5. When you log on to the Tivoli® Enterprise Portal for the first time, the following IBM Workload Scheduler associated situations are displayed:
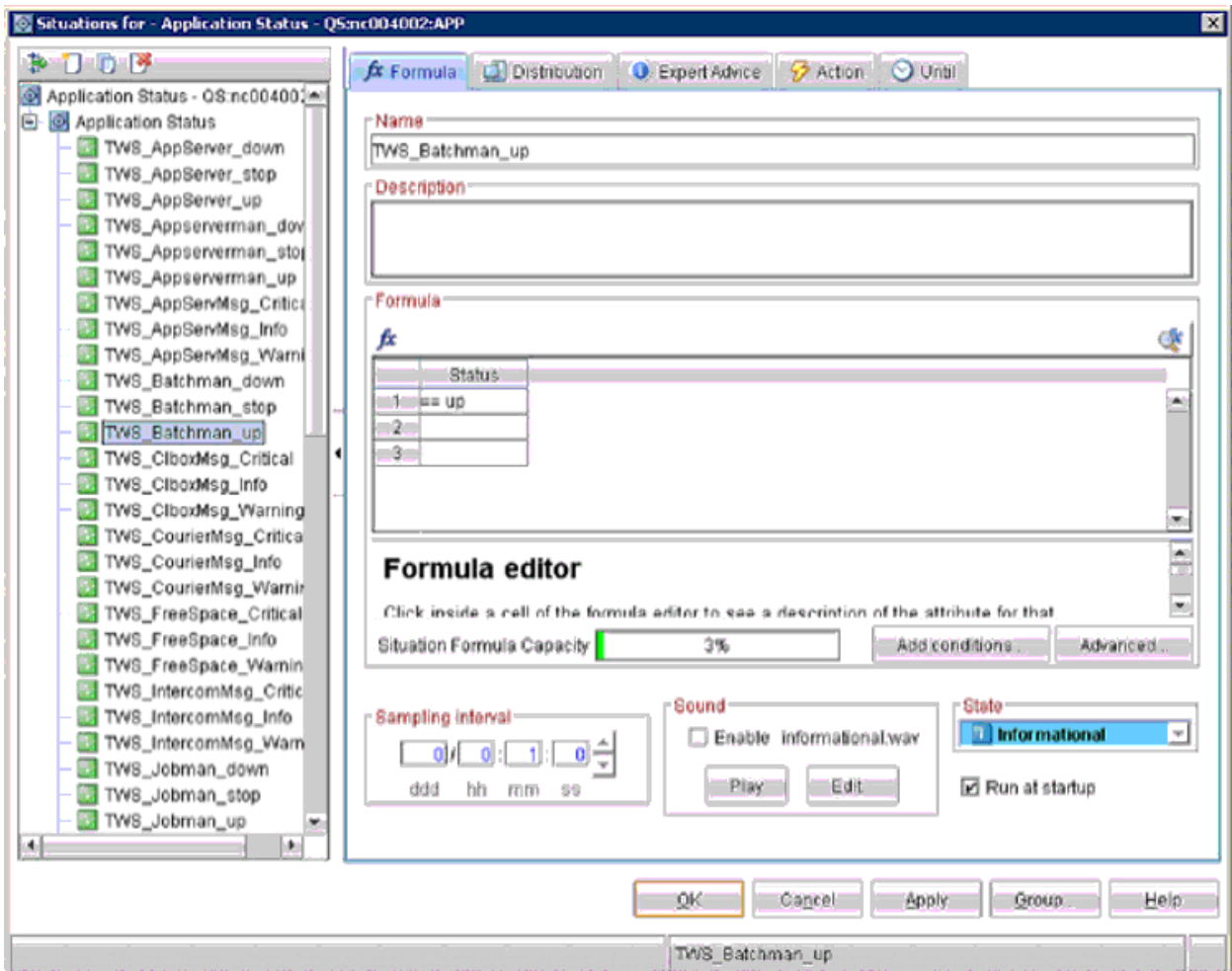
6. After the creation of the IBM Workload Scheduler situations, you can view the events associated to each situation in the Tivoli® Enterprise Portal desktop:
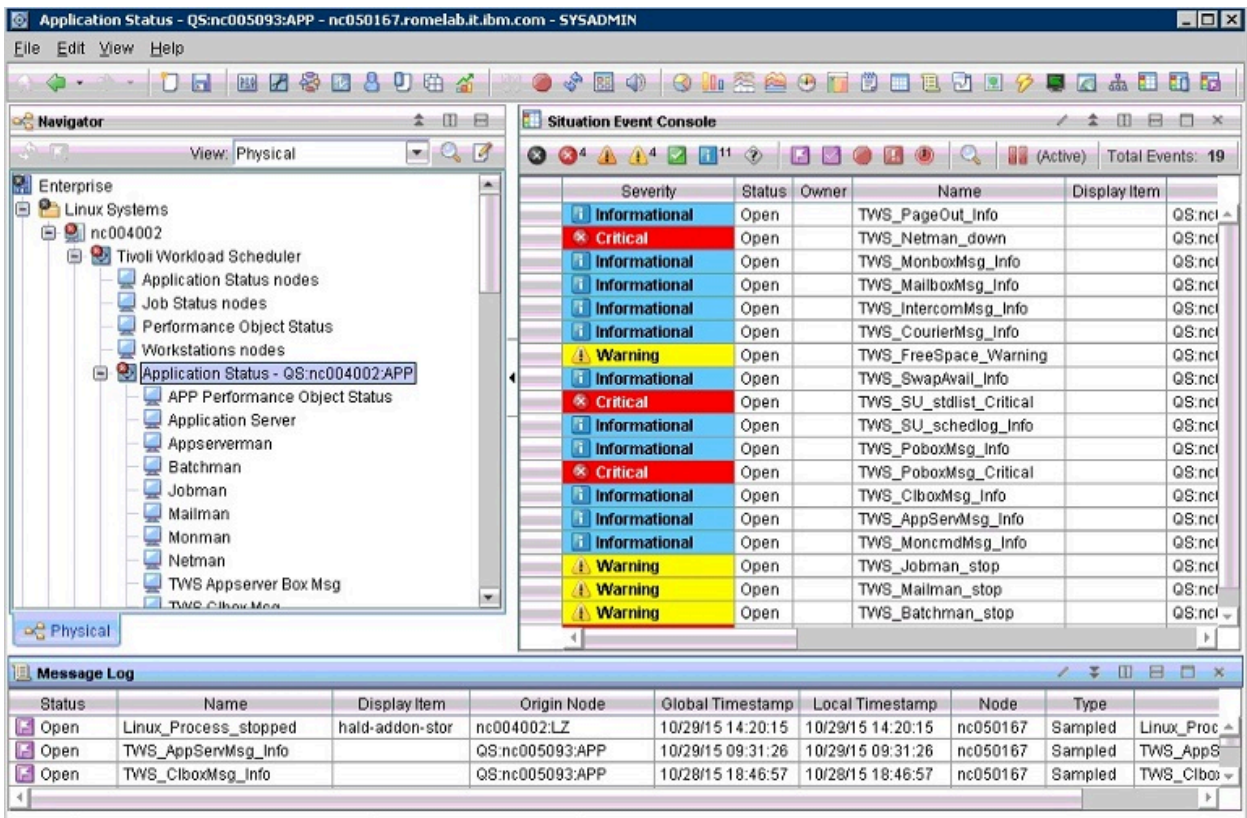
What to do next

To create your own situations or customize the IBM Workload Scheduler default situations, refer to the IBM Tivoli® Monitoring command line documentation at: http://www-01.ibm.com/support/knowledgecenter/SSTFXA_6.3.0.2/ com.ibm.itm.doc_6.3fp2/welcome.htm.

Configuring the integration with Tivoli® Enterprise Portal

About this task

This section describes the steps you must perform to enable monitoring by the Tivoli® Enterprise Portal.

1. Check if a `BmEvents.conf` file already exists in the IBM Workload Scheduler home directory. If the file exists, rename it to `BmEvents.conf.prev` to maintain any existing customizations. Make a new copy of `BmEvents.conf` in the home directory which includes the existing customizations and then add the new values needed for the integration with the Tivoli® Enterprise Portal. If the `BmEvents.conf` file is not found in the IBM Workload Scheduler home directory, then copy the `<TWA_home>\config\BmEvents.conf` (in Windows™ environments), or the `<TWA_home>/OV/ BmEvents.conf` (in UNIX™ environments) is to the IBM Workload Scheduler home directory and update accordingly.
2. Edit the `BmEvents.conf file` following the descriptions in .

Results

When the Tivoli® Enterprise Portal integration is enabled, for each production plan the IBM Workload Scheduler master domain manager logs events related to jobs and job streams in the specified event file. The Tivoli Monitoring agent for IBM Workload Scheduler retrieves the logged events from the event file. The monitored data is then passed by the Tivoli Monitoring agent for IBM Workload Scheduler to the Tivoli® Enterprise Monitoring Server and to the Tivoli® Enterprise Portal Server. The Tivoli® Enterprise Portal Client displays the collected data.

The BmEvents.conf file

Steps to enable monitoring by the Tivoli® Enterprise Portal.

About this task

The file `BmEvents.conf` is located in the following path:

On UNIX operating systems

< *TWA_DATA_DIR*>/BmEvents.conf

On Windows operating systems

< *TWA_home*>\BmEvents.conf

This configuration file determines what information the production processes (`batchman` and `mailman`) write in the `TWA_home`/agent_log_file_data_source_file file, and how this information is written.

You can change the name of the log file by modifying the **FILE** field in the `BmEvents.conf` and specifying the fully qualified path of the event log file. By default this file is named `event.log`. Restart the IBM Workload Scheduler processes, WebSphere® Application Server, and the database to implement the changes.

In the `BmEvents.conf` file, the hash # symbol represents a comment. Remove the # symbol to uncomment a line.

The options you can set in the `BmEvents.conf` file are described below:

OPTIONS=MASTER|OFF

Determines for which workstations the gathered events are reported. Possible values are:

MASTER

All job scheduling events gathered by that workstation are reported. If that workstation is the master domain manager or the backup master domain manager, with Full Status option switched on, then all scheduling events for all workstations are reported.

OFF

The job scheduling events are reported only if they relate to the workstation where the file is configured.

If commented, it defaults to `MASTER` on the master domain manager workstation, and to `OFF` on a workstation other than the master domain manager.

LOGGING=ALL|KEY

Disables or enables the key flag filter mechanism. Possible values are:

ALL

If set to this value, all events from all jobs and job streams are logged.

KEY

If set to this value, 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 job streams. To set it in the job or job stream properties use:

- The keywords `KEYSCHED` (for job streams) and `KEYJOB` (for jobs) from the IBM Workload Scheduler command-line interface.
- The job `Monitored` check box and job stream `Monitored` check box from the Dynamic Workload Console.

The **TEPConfig** script sets the value of this parameter to `KEY`.

SYMEVNTS=YES|NO

It determines whether events concerning jobs and job streams are to be reported immediately after a plan creation.

YES

If set to this value, it tells the production process, **batchman**, to report the jobs and job streams status events immediately after having generated the new production day plan. For the integration with Tivoli® Enterprise Portal, this value will cause a bulk discovery to be automatically performed after each new plan creation.

NO

Set to `NO` if report is not required.

The default value is `NO`.

CHSCHED=HIGH|LOW

Indicates which events are to be sent during the job stream lifetime.

During the lifetime of a job stream its status can change several times depending on the status of the jobs it contains. By using the **CHSCHED** option you choose how the job stream status change is reported.

HIGH

If you set tis value, during the job stream lifetime an event is sent any time the status of the job stream changes. Because the intermediate status of the job stream can change several times, several events can be sent, each reporting a specific status change. For example, a job stream may go into the READY state several times during its running because its status is related to the status of the jobs it contains. Each time the job stream goes into the READY state, event 153 is sent.

LOW

> If you set this value, during the job stream lifetime until the final status is reached, only the initial job stream state transaction is tracked. In this way the network traffic of events reporting job stream status changes is heavily reduced.

When the **CHSCHED** value is set to `LOW` these are the events that are sent only the first time during the job stream life time:

Table 3. CHSCHED filtered events

Event number	Event Class	Description
153	`TWS_Schedule_Started`	Job stream started
	Note: This event is not logged on MDM workstations.	
156	`TWS_Schedule_Submit`	Job stream submitted
158	`TWS_Schedule_Ready`	Job stream ready
159	`TWS_Schedule_Hold`	Job stream hold
160	`TWS_Schedule_Extern`	Job stream external
162	`TWS_Schedule`	Job stream properties changed

For final status of a job stream, regardless of the value set for **CHSCHED**, all events reporting the final status of the job stream are reported, even if the job stream has more than one final status. For example, if a job contained in the job stream completes with an ABEND state, event 151 is sent (Job stream abended). If that job is then rerun and completes successfully, the job stream completes with a SUCC state and event 154 is sent (Job stream completed).

The default value for **CHSCHED** is `HIGH`.

EVENT=_n_[_n_ ...]

Identifies which events to report in the `log_source_file`. Event numbers must be separated by at least one space. The events added by the configuration script are the following:

```
101 102 103 104 105 106 107 108 109 110 111 112 113 114 116 117 118 120
121 122 123 124 125 126 127 128 129 130 131 151 152 153 154 155 156 157
158 159 160 161 163 164 165 204
```

FILE= *filename*

> This is the path and file name of an ASCII log file where job scheduling events are written. This file is truncated whenever the **batchman** and **mailman** processes are restarted, for example at the end of each production day.

Events displayed by Tivoli® Enterprise Portal

About this task

lists the events logged for the integration with Tivoli® Enterprise Portal.

> **Note:** The Tivoli® Enterprise Portal console shows a maximum of 4500 events, meaning that when this limit is reached the oldest event is deleted and replaced by the latest event occurred. To keep a list of all the events that were shown, you must enable an History Collection on the Tivoli® Monitoring agent for IBM Workload Scheduler.

Table 4. IBM Workload Scheduler engine event formats for Tivoli® Enterprise Portal

Event	Number	Description
mstJobAbend	101	Job abended
mstJobFailed	102	Job failed
mstJobLaunch	103	Job launched
mstJobDone	104	Job done
mstJobUntil	105	Job suspended until expired
mstJobSubmit	106	Job submitted
mstJobCancel	107	Job cancelled
mstJobReady	108	Job in READY status
mstJobHold	109	Job in HOLD status
mstJobRestart	110	Job restarted
mstJobCant	111	Job Failed
mstJobSuccp	112	Job Successful pending
mstJobExtrn	113	Job extern
mstJobIntro	114	Job in INTRO status
mstJobWait	116	Job in WAIT status
mstJobWaitd	117	Job in wait deferred status
mstJobLate	120	Job is late

Table 4. IBM Workload Scheduler engine event formats for Tivoli® Enterprise Portal (continued)

Event	Number	Description
mstJobUntilCont	121	Job UNTIL time expired with Continue option
mstJobUntilCanc	122	Job UNTIL time expired with Cancel option
mstJobMaxDurationExceededContinue	123	Job maximum duration exceeded, job continues to run
mstJobMaxDurationExceededKill	124	Job maximum duration exceeded, Kill action triggered
mstJobMinDurationNotReachedContinue	125	Job minimum duration not reached, job continues to run
mstJobMinDurationNotReachedAbend	126	Job minimum duration not reached, Abend action triggered
mstJobMinDurationNotReachedConfirm	127	Job minimum duration not reached, Confirm action triggered
mstJobRisklevelHigh	128	Critical job with risk level set to high
mstJobRisklevelPotential	129	Critical job with risk level set to potential
mstJobRisklevelNone	130	Critical job with risk level set to either high or potential that is then removed from the plan
mstJobPromoted	131	Job in a critical network, that has not yet started, approaches the critical start time and gets promoted so that additional operating system resources are assigned and the submission of the job is prioritized
mstJobSuppress	132	The job is suppressed when the conditional dependencies associated to the job's predecessors are not satisfied.
mstSchedAbend	151	Job stream abended
mstSchedStuck	152	Job stream is stuck
mstSchedStart	153	Job stream started
Note: This event is not logged for Workstation Master.		
mstSchedDone	154	Job stream done
mstSchedUntil	155	Job Stream suspended, until time expired
mstSchedSubmit	156	Job stream submitted
mstSchedCancel	157	Job Stream cancelled
mstSchedReady	158	Job stream in READY status
mstSchedHold	159	Job stream in HOLD status

Table 4. IBM Workload Scheduler engine event formats for Tivoli® Enterprise Portal (continued)

Event	Number	Description
mstSchedExtrn	160	Job stream extern
mstSchedCnpend	161	Job Stream in CANCEL Pending status
mstSchedLate	163	Job Stream is late
mstSchedUntilCont	164	Job Stream Until time expired with continue option
mstSchedUntilCanc	165	Job Stream until time expired with cancel option
mstSchedSuppress	166	The job stream is suppressed when the conditional dependencies associated to the job stream's predecessors are not satisfied.
mstJobRecovPrompt	204	Job Recovery prompt issued
mstJobBound	308	For shadow jobs: the shadow job matched a remote job instance in the remote plan. For IBM Z Workload Scheduler agents: the job is on the JES queue.

Positional event variables

About this task

This section defines the positional event variables.

Table 5. Positional variables for events 101-118,120-127, 204 (job events)

Variable	Description
1	Event number
2	Job stream cpu
3	Job Stream id
4	Job name
5	Job CPU
6	Job number
7	Job status
8	Real name (different from job name only for MPE jobs)
9	Job user
10	Jcl name (script name or command name)
11	Every time
12	Recovery status

Table 5. Positional variables for events 101-118,120-127, 204 (job events) (continued)

Variable	Description
13	Time stamp (yyyymmddhhmm0000)
14	Message number (not equal to zero only for job recovery prompts)
15	Eventual text message (delimited by '\t')
16	Record number
17	Key flag
18	Effective start time
19	Estimated start time
20	Estimated duration
21	Deadline time (epoch)
22	Return code
23	Original schedule name (schedule name for schedules not (yet) carried forward)
24	Head job record number (different from record number for rerun/every jobs)
25	Job stream name
26	Job stream scheduled time (yyyymmddhhmm00)
27	Event Version
28	Resource Name
29	Resource Type
30	Job external status
31	Job ID
32	Name space
33	Submitter
34	Job end time
35	Job submit time
36	Cpu usage
37	Memory usage
38	Operation number
39	Job error code
40	Critical job identifier

Table 6. Positional variables for events 151-161, 163-165 (job stream events)

Variable	Description
1	Event number
2	Job stream CPU
3	Job stream ID
4	Job stream status
5	Record number
6	Key flag
7	Original job stream name (job stream name for job streams not (yet) carried forward)
8	Time stamp (yyyymmddhhmm0000)
9	Job stream name
10	Job stream scheduled time (yyyymmddhhmm00)
11	Event version

Collecting and reloading monitoring data

About this task

When the integration is enabled, the IBM Workload Scheduler engine starts to log monitoring events after each new plan production. To reload all monitoring data, or to obtain the initial status of your monitored objects, use the conman bulk_discovery command. This command checks the current status of all the monitored objects (jobs and job streams) within the Symphony® file and writes the corresponding events in the event.log file for retrieval by the Tivoli Enterprise™ Portal.

> **Note:**

1. If a JnextPlan is requested while a bulk_discovery is in progress, some events related to jobs and job streams may no longer be visible from the Tivoli® Enterprise Portal console views when the new plan is built. Inconsistencies might occur because the JnextPlan process deletes and reallocates the event file at the end of its activity. If the Tivoli Monitoring agent for IBM Workload Scheduler has not read all records of the event file before the file is reallocated, it is not aware of any missing job or job stream status until a new change of status occurs. To ensure consistency, issue a bulk_discovery command at the end of the JnextPlan, or set **SYMEVNTS=YES** in the **BmEvents.conf** file so that a bulk discovery is performed automatically after every JnextPlan activity.

2. If you recycle the Tivoli Monitoring agent for IBM Workload Scheduler, events are lost. If the agent is stopped for any reason, also as a result of a TCP/IP connection failure, events are lost unless you have saved them using the agent history function. In these cases, issue a bulk discovery to refresh the status of all monitored objects.

For details about the syntax and output of the bulk_discovery command, see *IBM Workload Scheduler: User's Guide and Reference*.

Uninstalling the agent

Uninstalling the Tivoli® Monitoring agent for IBM Workload Scheduler.

About this task

Perform the following steps to uninstall the agent:

1. Run the following script:

    On Windows™ systems

        32-bit

```
cd ITM_AGENT_FOR_TWS_INSTALL_DIR/TMAITM6
kxx_uninstall.vbs ITM_INSTALL
```

        64-bit

```
cd ITM_AGENT_FOR_TWS_INSTALL_DIR/TMAITM6_x64
kxx_uninstall.vbs ITM_INSTALL
```

    where

    ITM_AGENT_FOR_TWS_INSTALL_DIR

        The installation directory for the Tivoli® Monitoring agent for IBM Workload Scheduler.

    xx

        The product code for the agent. The product code of the Tivoli Monitoring agent for IBM Workload Scheduler is `qs`.

    On Linux™ systems

        Run the uninstall.sh script located in the `ITM_INSTALL_DIR`/bin path as follows:

```
uninstall.sh [-f] [-i] [-h ITM_INSTALL_DIR] [product platformCode]
```

        where,

        -f

            Force delete, suppressing confirmation messages and prompts.

        -i

            Ignore all running processes .

-**h** *ITM_INSTALL_DIR*

The Tivoli Monitoring installation directory.

product

A two-letter code for the product to be uninstalled.

platformCode

Platform code, for example, aix513, sol286, hp11, for the product.

For example, `uninstall.sh -f -i -h /opt/IBM/ITM 36 lx8266`

2. Remove the situations from the Tivoli® Enterprise Monitoring Server.

   a. From a command-line prompt, go the *ITM_INSTALL_DIR*/bin directory.

   b. Log in to the Tivoli® Enterprise Monitoring Server to view the situations and workspaces of the Tivoli Monitoring agent for IBM Workload Scheduler by submitting the following command:

      ```
      tacmd login -s <TEMS_hostname> -u <username> -p <password>
      ```

      For example, `tacmd login -s localhost -u sysadmin -p abcd1234`

   c. Submit the `tacmd listsit` command to display all the situations installed on the Tivoli® Enterprise Monitoring Server. The list includes the Tivoli Monitoring agent for IBM Workload Scheduler situations that can be identified by the "`KQS`" prefix in the situation name.

   d. Remove the Tivoli Monitoring agent for IBM Workload Scheduler situations by submitting the following command:

      ```
      tacmd deleteSit -s <situation_name> -f
      ```

   e. Resubmit the `tacmd listsit` command to verify if the situations have been removed from the list.

3. Remove offline entries from Tivoli® Enterprise Portal server portal. After removing the agent, perform the following steps to clear the agent from the portal:

   a. Ensure your Tivoli® Enterprise Monitoring server and Tivoli® Enterprise Portal server are up and running.

   b. Log into the Tivoli® Enterprise Portal client.

   c. From the Physical Navigator views in the Tivoli® Enterprise Portal client, right-click **Enterprise** and select **Workspace > Managed System Status**. The Managed System Status workspace is displayed.

   d. Select IBM® Tivoli® Managed Systems for your agent.

   e. Right-click and select **Clear off-line entry**, which clears all of the entries from that table.

4. To complete the uninstallation, manually delete the files and folders located in the *ITM_INSTALL_DIR* on the computer where the Tivoli® Enterprise Monitoring Server and the Tivoli® Enterprise Portal server are installed, related to the Tivoli Monitoring agent for IBM Workload Scheduler.

Scenario: integrating with Tivoli® Enterprise Portal

This scenario describes how IBM Workload Scheduler and the Dynamic Workload Console integrate with Tivoli Monitoring, the IBM® solution for controlling and managing the performance and availability of distributed operating systems and

applications, and its Java-based user interface, the Tivoli® Enterprise Portal. You can perform these operations from a centralized point instead of having to combine and integrate data from different products.

This integration allows you to control from the Tivoli® Enterprise Portal, jobs and job streams that are critical to run your business, and to quickly and easily manage them from the Dynamic Workload Console.

With just one click, you launch the Dynamic Workload Console from the Tivoli® Enterprise Portal interface and access specific job or job stream details without having to create customized queries.

Starting from IBM Workload Scheduler V8.6, the launching in context with the Dynamic Workload Console can be useful especially to rapidly view more details about the new job types. From the Tivoli® Enterprise Portal, in fact, you can directly open the job log to view the JSDL definition of these JSDL-based job types.

The integration also allows you to monitor the state and health of the IBM Workload Scheduler workstations that are critical in your environment so that, when unavailability or malfunctioning impacts the job scheduling capability, you are alerted on the Tivoli® Enterprise Portal interface.

In this scenario you use:

Tivoli Monitoring

> To control the status and the health of your core business environment. You also out source to a third-party company the monitoring of your environment from the Tivoli® Enterprise Portal user interface.

IBM Workload Scheduler

> To run, within a selected time frame, a daily backup of the Tivoli Monitoring data and configuration to ensure the monitoring reliability and availability required to satisfy the SLAs agreed with the third party company. This daily backup ensures your core business runs successfully.

Dynamic Workload Console

> To access specific job or job stream details.

Scenario goal

Your goal is to ensure that the activities critical for your core business run successfully. When a critical job, used to run the daily backup, stops running unexpectedly, you interact with that job by launching Dynamic Workload Console from the Tivoli® Enterprise Portal interface. You can restart processing to ensure that the backup activity is completed successfully within the selected time frame.

Required roles and skills
The role and the required skill level of the user running the scenario are the following:

For the setup phase:

> **For Tivoli Monitoring:**

>> Either a user in the ADMINISTRATOR user group or a user in the OPERATOR user group, with the following permissions:

- List and modify permission on Managed System List.
- Modify permission on Situation.
- Modify permission on Launch Application.

For IBM Workload Scheduler:

Either the IBM Workload Scheduler administrator or a IBM Workload Scheduler user allowed in the `security.conf` file to run the listed steps. For more information about how to set the authorization in the `security.conf` file, see the *Administration Guide*.

For the using phase:

For Tivoli Monitoring:

Either a user in the ADMINISTRATOR user group or a user in the OPERATOR user group, with the following permissions:

- Launch permission on Launch Application.
- View permission on Event.
- Logon Permitted on User Administration.

For Dynamic Workload Console:

A user belonging to a group that has either the *TWSWEBUIAdministrator* or *TWSWEBUIOperator* role assigned.

For more information, see the *Administration Guide*.

In this scenario, we assume that the Single Sign-On method has been configured between Dynamic Workload Console and the IBM Workload Scheduler master domain manager and that the user who logs in to the IBM Workload Scheduler master domain manager through the engine connection is allowed to run the steps specified in Running the scenario on page 48.

Software requirements

Install the following software before starting the scenario:

- IBM Workload Scheduler V9.1 or later (master domain manager, agents, Dynamic Workload Console).
- The following components of a supported version of Tivoli Monitoring for the purpose of this integration. For information about how to generate a dynamic report containing a matrix of supported product versions see the short procedure in Integrating with IBM Tivoli Monitoring on page 9:

Tivoli Monitoring agent for IBM Workload Scheduler

It is an Tivoli Monitoring agent that can be configured to monitor any data collected from two data providers: script data provider and a file data provider.

Tivoli® Enterprise Monitoring Server

It is the core component of the Tivoli Monitoring product. It collects and controls the events received from the agents. It uses a proprietary database to store the monitoring information.

Tivoli® Enterprise Portal Server

It enables retrieval, manipulation, and analysis of data from the agents. It uses an external relational database, such as DB2®, to store the data.

Tivoli® Enterprise Portal

It is the Java-based Tivoli® Enterprise Portal Server user interface for viewing and monitoring your enterprise.

The following figure shows the information flow as a result of the integration. In this scenario, we assume that each block represents a different workstation where you install and set up the indicated components. You can decide where to install each of these blocks in your environment according to your environment requirements and workstation resources. For information about system requirements for each component, see the *Planning and Installation Guide*. The IBM Workload Scheduler components and their information flows are indicated in yellow, the Tivoli Monitoring components and their information flows are indicated in blue.

Figure 2. Information flow
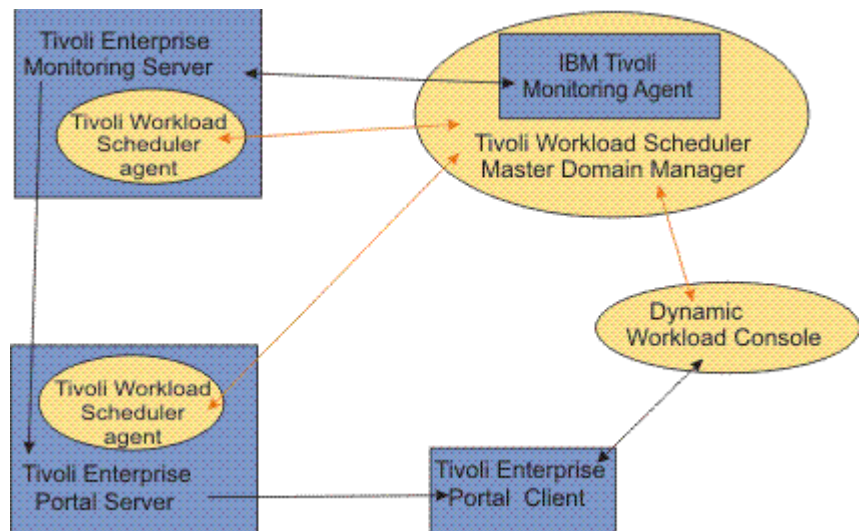
These are the descriptions of the main information flows:

Information about the IBM Workload Scheduler master domain manager state and health

A script data provider runs on the IBM Workload Scheduler master domain manager to collect information about errors, anomalies, and threshold conditions. This information is saved in a file that is parsed by the Tivoli Monitoring agent for IBM Workload Scheduler. The result of the parsing is retrieved on timely basis by the Tivoli® Enterprise Monitoring Server and then displayed on the Tivoli® Enterprise Portal client interface.

Information about the processing of the scheduled backup activity

The IBM Workload Scheduler engines installed on the Tivoli® Enterprise Monitoring Server and Tivoli® Enterprise Portal Server run jobs to perform the requested the backup activity on these two servers. For specific states (for example HOLD) of a job and job stream that might represent an issue for a successful backup activity completion, events are triggered from the IBM Workload Scheduler agent where the job or job stream is processing.

Forwarding of selected events about the job processing status and issues to the Tivoli® Enterprise Portal Server

Each time one of these events is triggered, it is saved by the IBM Workload Scheduler master domain manager, parsed by the Tivoli Monitoring agent for IBM Workload Scheduler, retrieved by the Tivoli® Enterprise Monitoring Server, and then passed to the Tivoli® Enterprise Portal Server.

Situation events informing about the specific job or job stream issue are displayed on the Tivoli® Enterprise Portal client user interface.

The user logged into the Tivoli® Enterprise Portal Client user interface sees the situation event on the navigation tree informing about the specific job or job stream issue. The severity of the situation event is specified when setting up the Tivoli® Enterprise Monitoring Server.

The Dynamic Workload Console is launched from the Tivoli® Enterprise Portal client user interface to view and solve the issue

The user logged into the Tivoli® Enterprise Portal client user interface selects the job or job stream instance marked with the situation event and launches the Dynamic Workload Console to access that specific job or job stream details and fix the problem, to ensure the backup activity is successfully completed within the selected time frame. When the problem has been solved, an event informing about the new state of the job or job stream is generated on the IBM Workload Scheduler workstation processing the job and the situation event is removed from the Tivoli® Enterprise Portal navigation tree.

Setting up the environment

For details about how to run the steps listed in this section to configure the integration with Tivoli® Enterprise Portal, see Integrating with IBM Tivoli Monitoring on page 9.

When the required software is installed, you must complete the following tasks before starting the scenario:

To enable Tivoli Monitoring to monitor IBM Workload Scheduler master domain manager processes and data to look for errors, anomalies, and threshold conditions.

On the IBM Workload Scheduler master domain manager:

1. Install and configure the Tivoli Monitoring agent for IBM Workload Scheduler to monitor the IBM Workload Scheduler master domain manager, see Installing and configuring the Tivoli Monitoring agent for IBM Workload Scheduler on page 16.

2. Run the `ITMCreateSituations` script to configure the Tivoli® Enterprise Portal Console to create and display the IBM Workload Scheduler situations.

To enable IBM Workload Scheduler events for all the monitored objects (jobs and job streams) to be passed to the Tivoli® Enterprise Portal client user interface.

On the IBM Workload Scheduler master domain manager:

1. Enable monitoring by the Tivoli® Enterprise Portal, see Configuring the integration with Tivoli Enterprise Portal on page 30.

2. IBM Workload Scheduler creates and writes events for all the monitored objects (jobs and job streams) into a predefined event file that is accessed by the Tivoli Monitoring agent for IBM Workload Scheduler at a set interval. Make sure that the `TWA_home>/BmEvents.conf` file is set to create and write the information about the following events:

```
Job is in abend state (event 101)
Job is in hold (event 109)
Job stream hold (event 159)
```

3. Recycle the IBM Workload Scheduler engine.

On the Tivoli® Enterprise Monitoring Server:

Create situations by assigning the highest severity (Critical) when the following events are detected:

```
Job is in abend state (event 101)
Job is in hold (event 109)
Job stream hold (event 159)
```

When you complete these steps, the Tivoli Monitoring agent for IBM Workload Scheduler is ready to retrieve and parse the logged events from the event file. The monitored data is then retrieved from the Tivoli Monitoring agent for IBM Workload Scheduler by the Tivoli® Enterprise Monitoring Server and displayed to the Tivoli® Enterprise Portal.

To run the critical activity, the daily backup of the Tivoli Monitoring data and configuration, using IBM Workload Scheduler

On the Tivoli® Enterprise Monitoring Server and on the Tivoli® Enterprise Portal Server:

Install a IBM Workload Scheduler engine

On the IBM Workload Scheduler master domain manager:

1. Create a job stream scheduled to run daily on the IBM Workload Scheduler engine installed on the Tivoli® Enterprise Monitoring Server system during the time frame dedicated to the backup operations. The job stream must run in sequence the steps needed to run the backup of the Tivoli Monitoring configuration and data. In this scenario you use a job stream named **BACKUP** containing such a sequence of jobs:

Table 7. Jobs implementing the backup procedure

Job name	Operation to run	Dependencies	IBM Workload Scheduler engine where the job runs
JOB1	Stop Tivoli® Enterprise Portal Server	None	Engine installed on Tivoli® Enterprise Portal Server system
JOB2	Stop Tivoli® Enterprise Monitoring Server	JOB1 completed	Engine installed on Tivoli® Enterprise Monitoring Server system
JOB3	tar -cvf *TEMS_installdir*	JOB2 completed. Needed disk space available on Tivoli® Enterprise Monitoring Server system.	Engine installed on Tivoli® Enterprise Monitoring Server system
JOB4	tar -cvf *TEPS_installdir*	JOB1 completed. Needed disk space available on Tivoli® Enterprise Portal Server system.	Engine installed on Tivoli® Enterprise Portal Server system
JOB5	db2backup *TEPS_db*	JOB1 completed. Needed disk space available on Tivoli® Enterprise Portal Server system.	Engine installed on Tivoli® Enterprise Portal Server system
JOB6	Start Tivoli® Enterprise Monitoring Server	JOB3 completed	Engine installed on Tivoli® Enterprise Monitoring Server system
JOB7	Start Tivoli® Enterprise Portal Server.	JOB6, JOB4 and JOB5 completed	Engine installed on Tivoli® Enterprise Portal Server system

The job stream and its jobs must be marked as *Monitored*. By doing so you ensure that, whenever an event among those specified in the `BmEvents.conf` file occurs on one of these jobs and job stream, it is parsed by the Tivoli Monitoring agent for IBM Workload Scheduler, retrieved by the Tivoli® Enterprise Monitoring Server and displayed on the Tivoli® Enterprise Portal interface.

For details about how to run the steps to configure the jobs and job stream definitions, see the *User's Guide and Reference*.

2. Run **JnextPlan** to add the new job stream and its jobs to the current plan.

To access specific job or job stream details, enable the Dynamic Workload Console launch in context from the Tivoli® Enterprise Portal interface

In the navigation tree of the Tivoli® Enterprise Portal client:

1. From the **Agent** drill down to both the **JOBS** and the **JOBSTREAMS** entries.
2. Click a job or job stream instance and select **Create or Edit Launch Definitions**.
3. Select **Create New**.
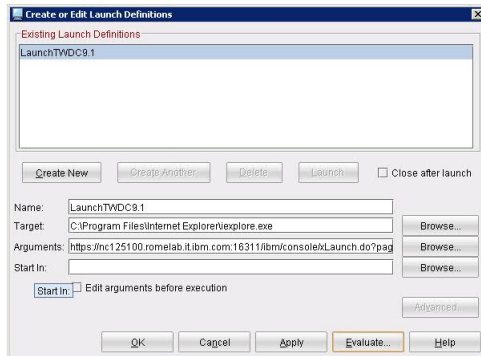
4. Specify for each Launch Definition the following information:
   ◦ The name
   ◦ The full path of the browser executable file to use when running the Dynamic Workload Console.
   ◦ The URL to open using this format:

   ```
   https://{WebUIHostname:adminSecurePort}
   /ibm/console/xLaunch.do?pageID=com.ibm.tws.
   WebUI.External.navigation&showNavArea=false
   ```

   where:

   WebUIHostname

   The fully qualified hostname or the IP address of the computer where the Dynamic Workload Console is installed.

   adminSecurePort

   The number of the port on which the Dynamic Workload Console is listening.

5. Specify the action that you want to run, by specifying the corresponding parameter:

   &action

   It indicates the action that you want to perform and can have one of the following values:
   ◦ BrowseJobs
   ◦ ZBrowseJobs
   ◦ BrowseJobStreams

- BrowseCriticalJobs
- BrowseWorkstation
- InternalTask

6. Specify the engine on which you want to run the query, by entering its parameters:

&hostname

For distributed environments, it is the host name or TCP/IP address of the computer on which the IBM Workload Scheduler engine is installed. For z/OS® environments, it is the host name or TCP/IP address of the computer on which the Z connector is installed.

&port

The port number that is used to connect to the computer on which the IBM Workload Scheduler engine or the Z connector is installed. Typically, the default port numbers are:

Table 8. Default port numbers

Port number	Engine
31117	IBM Workload Scheduler distributed engine
31127	IBM Z Workload Scheduler engine with Z connector V8.3
31217	IBM Z Workload Scheduler engine with Z connector V8.5 or later

&server

It applies to z/OS® systems only and is mandatory. It is the name of the remote server of the engine as it was specified in the Z connector.

The following is an example of a complete URL:

```
https://mypc:29443/ibm/console/xLaunch.do?pageID=
com.ibm.tws.WebUI.External.navigation/&showNavArea=false
/&action=BrowseJobs/&hostname=webuidev/&port=31117
```

7. To start the Dynamic Workload Console, click **Evaluate**.

Running the scenario

This section lists the steps to run to complete the scenario.

About this task

In this scenario, the daily backup stops running because there is a lack of required free disk space available on the Tivoli® Enterprise Portal Server system. The **BACKUP** job stream stops processing and remains in HOLD state. As a result, in the Tivoli® Enterprise Portal client interface you see a red icon displayed in the navigation tree as follows:

Perform these steps to run the scenario:

1. Drill down the tree to open the **JOBSTREAM** view marked with the red icon.
2. Click the job stream **BACKUP** and select **Launch**.
3. In the Existing Launch Definition pane, select the Tivoli® Workload Dynamic Console launch definition that you created to run the **BrowseJobStreams** action.
4. Enter the Tivoli® Workload Dynamic Console credentials. A panel showing the details about that job stream run is displayed.
5. Access the jobs in that job stream by clicking **Jobs**. In the list, you can see that **JOB4** is in HOLD. Select that job and click **Dependencies** to see which unresolved dependency is holding up the job. You see that a resource dependency caused by a shortage of available disk space needed to save the tar copy on the Tivoli® Enterprise Portal Server system prevents **JOB4** from running.
6. Either free the required disk space or ask the Tivoli® Monitoring administrator to do so.
7. Run a refresh of the Dynamic Workload Console panel and check that the new job state is READY. Also check that the **BACKUP** job stream state is READY.
8. Return to the Tivoli® Enterprise Portal client interface. As soon as the events information is parsed by the Tivoli Monitoring agent for IBM Workload Scheduler and retrieved by the Tivoli® Enterprise Monitoring server, you can see that the critical state icon disappears from the navigation tree.
9. All remaining jobs included in the **BACKUP** job stream complete running and the job stream ends successfully.

Chapter 2. Integrating with Tivoli® NetView®

How IBM Workload Scheduler on UNIX™ integrates with Tivoli® NetView® for AIX®.

About this task

This chapter describes how IBM Workload Scheduler on UNIX™ integrates with Tivoli® NetView® for AIX® version 7.1x. It is divided into the following sections:

For a description of Tivoli® NetView®, see the Tivoli® NetView® documentation.

IBM Workload Scheduler/NetView overview

IBM Workload Scheduler/NetView consists of manager and agent software. The manager runs on NetView® management nodes and the agent runs on managed nodes. All the nodes must have IBM Workload Scheduler installed. The manager polls its agents periodically to obtain information about scheduler processing. If the information returned during a poll is different from that of the preceding poll, the color of the corresponding symbol changes to indicate a state change. After you take action to remedy condition, the state of the corresponding symbol returns to normal at the next poll. The process that runs on the management node is called mdemon.

Agents generate SNMP traps to inform the manager of asynchronous events, such as job abends, stuck schedules, and restarted scheduler processes. Although polling and traps are functionally independent, the information that accompanies a trap can be correlated with symbol state changes. If, for example, a scheduled job abends, the symbol for the workstation changes color and a job abend trap is logged in the NetView® event log. By scanning the log, you can isolate the problem and take the appropriate action.

The muser process runs commands issued by a NetView® user, and updates the user's map. An muser is started for each NetView® user whose map has the IBM Workload Scheduler/NetView application activate.

Installing the integration software

About this task

IBM Workload Scheduler/NetView is delivered as part of IBM Workload Scheduler. Before installing IBM Workload Scheduler/ NetView, make sure that IBM Workload Scheduler is correctly installed on the management node (server and clients) and on each managed node and make sure it is successfully scheduling and tracking jobs.

Use the customize script to install the integration software. The customize script has the following syntax:

```
customize [-uname name] [-prev3] [-noinst] [-client] [-manager host ]
```

where:

[-uname name]

    IBM Workload Scheduler user name.

-prev3

    Include this option if your version of NetView® is prior to version 3.

-noinst

    Do not overwrite existing NetView® configuration files.

-client

    For NetView® version 6.x and later, include this option for management clients.

-manager

    The host name of the management node. For NetView® version 6.x and above, this is the host name of the NetView® server. This is required for managed nodes and NetView® clients. Do not use this option on the management node or NetView® server.

Installing on managed nodes and NetView® clients

About this task

The management node can also be a managed node. For the management node or NetView® server, skip this step and perform step Installing on the management node or NetView server on page 52.

1. Make certain that no IBM Workload Scheduler processes are running. If necessary, issue a conman shutdown command.
2. Log in as root.
3. For managed nodes, including those that are also NetView® clients that are not used to manage IBM Workload Scheduler, run the customize script as follows:

   ```
   /bin/sh <TWShome>/OV/customize -manager host
   ```

   where:

   host is the host name of the management node.

4. For NetView® clients that are used to manage IBM Workload Scheduler, run customize as follows:

   ```
   /bin/sh <TWShome>/OV/customize -client [-manager host]
   ```

   where:

host is the host name of the management node.

5. Run StartUp:

```
<TWShome>/StartUp
```

Installing on the management node or NetView® server

About this task

1. Make certain that no IBM Workload Scheduler processes are running. If necessary, issue a conman shutdown command.
2. Log in as root.
3. Run the customize script as follows:

```
/bin/sh <TWShome>/OV/customize
```

4. If you do not want the IBM Workload Scheduler/NetView agent to run on this node, edit <TWShome>/StartUp, and remove the run of magent.
5. If you want IBM Workload Scheduler to run on this node, run StartUp:

```
<TWShome>/StartUp
```

6. Start the IBM Workload Scheduler/NetView daemon (mdemon) as follows:

```
/usr/OV/bin/ovstart Unison_Maestro_Manager
```

or, for NetView® versions below 3, stop and start as follows:

```
/usr/OV/bin/ovstop
```

```
/usr/OV/bin/ovstart
```

Setting up IBM Workload Scheduler/NetView

About this task

To setup IBM Workload Scheduler/NetView, perform the following steps:

1. On each managed node, enter the host name of the management node in the user's $HOME/.rhosts file.
2. Add a user definition to the scheduler security file. For more information about IBM Workload Scheduler security, refer to the *IBM Workload Scheduler Reference Guide*.
3. On the management node, run NetView®.
4. Select **Describe Map** from the File menu.
5. Select **Maestro-Unison Software (c)** from the Configurable Applications list, and click **Configure For This Map**.
6. Click **True** under Enable Maestro™ for this map.
7. Click **Verify**.
8. Click **OK** to close the Configuration dialog box. Click **OK** to close the Map Description dialog box.

Results

If you want to use the MIB browser, perform the following steps:

1. Select **Load/Unload MIBs:SNMP** from the Options menu.
2. Click **Load**.
3. When Load MIB From File opens, type:

   ```
   /usr/OV/snmp_mibs/Maestro.mib
   ```

   in MIB File to Load. Click **OK**.
4. Click **Close**.

If the management node is not also a IBM Workload Scheduler managed node, or if you manage more than one IBM Workload Scheduler network, use the NetView® object description function to identify the managed nodes where IBM Workload Scheduler/NetView agents are running. To identify the managed nodes, perform the following steps:

1. Move down the IP Internet tree to the IP segment submap showing all the nodes.
2. Select a node where a IBM Workload Scheduler/NetView agent is running. Press **Ctrl-O** to open the Object Description dialog.
3. On the Object Description dialog, select **General Attributes** from the Object Attributes list, and click **View/Modify Object Attributes**.
4. On the Attributes for Object dialog, click **True** under the isUTMaestroAgent attribute.
5. Click **OK** to close the Attributes for Object dialog. Click **OK** to close the Object Description dialog.
6. Repeat steps for each node where a IBM Workload Scheduler/NetView agent is running.
7. Return to the Root submap.
8. Select **IBM Workload Scheduler**, from the Tools menu.
9. Select **Re-discover**.
10. When the Unison Software(c) symbol appears, double-click it to open the Unison Software(c) submap displaying a symbol for each IBM Workload Scheduler network. Double-click a network symbol to open a Network submap.

On the master domain issue a *conman start* @ command to start IBM Workload Scheduler in the network. This can be done in NetView® on the IBM Workload Scheduler Network submap as follows:

1. Select all of the nodes in the network.
2. From the Tools menu, select **IBM Workload Scheduler**.
3. Select **Start**.

Menu actions

About this task

To use IBM Workload Scheduler/NetView menu actions, select **IBM Workload Scheduler** from the **Tools** menu. These actions are also available from the object context menu by right clicking a symbol.

The menu actions are:

View

Open a child submap for a IBM Workload Scheduler/NetView symbol. Choosing View after selecting a workstation symbol on the submap opens the monitored processes submap. Choosing View after selecting a workstation symbol on the IP node submap returns to the IBM Workload Scheduler network submap.

Master conman

Run the conman command-line on the IBM Workload Scheduler master. Running on the master lets you run conman commands (except shutdown) for any workstation in the network. For information about conman commands, see *User's Guide and Reference*.

Acknowledge

Acknowledge the status of selected symbols. When acknowledged, the status of a symbol returns to normal. It is not necessary to acknowledge critical or marginal states for a monitored process symbol, as it returns to normal when the monitored process itself is running. Acknowledge critical or marginal states for workstation symbols, otherwise they do not return to normal.

Conman

Run the conman command-line on the selected IBM Workload Scheduler workstations. Running on a workstation other than the master, lets you run all conman commands on that workstation only. For information about conman commands, see *User's Guide and Reference*. For an extended agent, conman is run on its host.

Start

Issue a conman start command for the selected workstations. By default, the command for this action is:

```
remsh %H %P/bin/conman 'start %c'
```

Down (stop)

Issue a conman stop command for the selected workstations. By default, the command for this action is:

```
remsh %H %P/bin/conman 'stop %c'
```

StartUp

Run the IBM Workload Scheduler StartUp script on the selected workstations. By default, the command for this action is:

```
remsh %h %P/StartUp
```

For an extended agent, conman is run on its host.

Rediscover

Locate new agents and new IBM Workload Scheduler objects, and update all IBM Workload Scheduler/NetView sub-maps.

Note: Run Rediscover each time you change the IBM Workload Scheduler workstation configuration.

The substituted parameters in the command-lines are:

%c

> The IBM Workload Scheduler workstation name of a selected workstation symbol.

%D

> The current DISPLAY name.

%h

> The host name of a selected workstation symbol.

%H

> The host name of the IBM Workload Scheduler master.

%p

> The process name of a selected process symbol, or "MAESTRO" if it is not a process.

%P

> The maestro user's home directory (usually /usr/lib/maestro).

Events

About this task

Events 1-53 indicate the status of critical processes that are monitored by the IBM Workload Scheduler/NetView agents, including the agents themselves (event 1). Events 101-25) indicate the status of the job scheduling activity.

The listed events can result in SNMP traps generated by the IBM Workload Scheduler/NetView agents. Whether or not traps are generated is controlled by options set in the configuration files of the agents. See IBM Workload Scheduler/NetView configuration files on page 58 for more information.

The Additional Actions column lists the actions available. The actions can be initiated by selecting **Additional Actions** from the **Options** menu, then selecting an action from the Additional Actions panel.

> ✏️ **Note:** You need the appropriate IBM Workload Scheduler security access to perform the chosen action. See *Administration Guide*.

Table 9. IBM Workload Scheduler/NetView events

Trap #	Name	Description	Additional Actions
1 *	uTtrapReset	The magent process was restarted.	
51	uTtrapProcessReset	A monitored process was restarted. This event is reported by default in the `BmEvents.conf` file	
52 *	uTtrapProcessGone	A monitored process is no longer present.	
53 *	uTrapProcessAbend	A monitored process abended.	

Table 9. IBM Workload Scheduler/NetView events (continued)

Trap #	Name	Description	Additional Actions
54 *	uTrapXagentConnLost	The connection between a host and xagent has been lost.	
101 *	uTtrapJobAbend	A scheduled job abended.	Show Job Rerun Job Cancel Job
102 *	uTtrapJobFailed	An external job is in the *error* state.	Show Job Rerun Job Cancel Job
103	uTtrapJobLaunch	A scheduled job was launched successfully.	Show Job Rerun Job Cancel Job
104	uTtrapJobDone	A scheduled job finished in a state other than ABEND.	Show Job Rerun Job Cancel Job
105*	uTtrapJobUntil	A scheduled job's UNTIL time has passed, it will not be launched.	Show Job Rerun Job Cancel Job
111	TrapJobCant	A scheduled job could not be launched.	Show Job Rerun Job Cancel Job
151 *	uTtrapSchedAbend	A schedule ABENDed.	Show Schedule Cancel Schedule
152 *	uTtrapSchedStuck	A schedule is in the STUCK state.	Show Schedule Cancel Schedule
153	uTtrapSchedStart	A schedule has started execution.	Show Schedule Cancel Schedule
154	uTtrapSchedDone	A schedule has finished in a state other than ABEND.	Show Schedule Cancel Schedule

Table 9. IBM Workload Scheduler/NetView events (continued)

Trap #	Name	Description	Additional Actions
155*	uTtrapSchedUntil	A schedule's UNTIL time has passed, it will not be launched.	Show Schedule Cancel Schedule
201 *	uTtrapGlobalPrompt	A global prompt has been issued.	Reply
202 *	uTtrapSchedPrompt	A schedule prompt has been issued.	Reply
203 *	uTtrapJobPrompt	A job prompt has been issued.	Reply
204 *	uTtrapJobRerunPrompt	A job rerun prompt has been issued.	Reply
251	uTtrapLinkDropped	The link to a workstation has closed.	Link
252 *	uTtrapLinkBroken	The link to a workstation has closed due to an error.	Link
261	TWS_Stop_Monitoring	Sent when the monitoring status of an agent is set to off (for stopmon command or because the agent is unable to send events to the `event processing server`)	
262	TWS_Start_Monitoring	Sent when the monitoring status of an agent is set to on (for startmon command or because the agent has re-started to send events to the `event processing server`)	
* These traps are enabled by default.			

Polling and SNMP traps

About this task

Because SNMP uses an unreliable transport protocol (UDP), IBM Workload Scheduler/NetView does not rely on SNMP traps to indicate the status of its symbols. The manager polls its agents periodically, requesting specific MIB values. The returned values are compared with those returned by the previous poll, and differences are indicated as status changes in IBM Workload Scheduler/NetView symbols. The default polling interval is one minute. See IBM Workload Scheduler/NetView configuration options for information about changing the polling interval.

To obtain critical process status, the manager polls all of its agents. For job scheduling status, the manager determines which of its agents is most likely to have the required information, and polls only that agent. The choice is made in the following order of precedence:

1. The agent running on the IBM Workload Scheduler master
2. The agent running on a IBM Workload Scheduler backup master
3. The agent running on any IBM Workload Scheduler fault-tolerant agent that has full status on in its workstation definition

Enabling traps provides the following advantages:

1. Event-specific variables are included with each trap
2. Traps are logged in NetView's event log.

If job abend traps (101) are enabled, for example, sufficient information is collected to identify an abended job, its schedule, and the workstation on which it runs. This is useful when deciding what actions to take to remedy a problem.

You might choose to disable some or all of the IBM Workload Scheduler/NetView traps for the following reasons:

1. To reduce network traffic
2. To prevent NetView® user's from receiving logged events that are not relevant

For more information about the Unison Software's enterprise-specific traps and their variables, see Re-configuring enterprise-specific traps on page 64.

IBM Workload Scheduler/NetView configuration files

About this task

On each managed node (each node running a IBM Workload Scheduler/NetView agent), the selection of events and how they are reported is controlled by setting variables in two configuration files:

- The BmEvents configuration file controls the reporting of job scheduling events (101-252 in Table 9: IBM Workload Scheduler/NetView events on page 55) by the mailman and batchman production processes. These events are passed on to the agent, which might convert them to SNMP traps, depending on the settings in its configuration file.
- The MAgent configuration file controls reporting by the IBM Workload Scheduler/NetView agent, magent. Events selected in this file are turned into SNMP traps, which are passed to NetView® by the IBM Workload Scheduler/NetView manager, mdemon, on the management node. The traps can also be processed by other network management systems.

The BmEvents configuration file

About this task

The BmEvents configuration file is named *TWA_DATA_DIR*/BmEvents.conf. Use it to configure IBM Workload Scheduler production processes on each workstation that has an agent installed. Its contents are described below.

comment

A comment line.

OPTIONS=MASTER|OFF

If the value is set to MASTER then all job scheduling events gathered by that workstation are reported. If that workstation is the master domain manager or the backup master domain manager with full status on, then all scheduling events from the scheduling environment are reported. If the value is set to OFF, no job scheduling events are reported from that workstation. If commented, it defaults to MASTER on the master domain manager workstation, while it allows to report all job scheduling events regarding that workstation only on a workstation different from the master domain manager.

EVENT= *n* [*n* ...]

The list of events to be reported. Event numbers must be separated by at least one space. If omitted, the events reported by default are:

```
51 101 102 105 151 152 155 201 202 203 204 251 252
```

Event 51 causes mailman and batchman to report the fact that they were restarted. Events 1, 52, and 53 are not valid in this file (see The MAgent configuration file on page 61).

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=51 101 105 151 152 155 201 202 203 204 251 252
```

See Table 9: IBM Workload Scheduler/NetView events on page 55 for a description of events.

PIPE=*filename*

If set, job scheduling events are written to a FIFO file. To have events sent to the IBM Workload Scheduler/ NetView agent, the setting must be:

```
PIPE=MAGENT.P
```

CHSCHED=HIGH|LOW

When set to HIGH, batchman sends an event for any schedule status transaction. When set to LOW, batchman only tracks the initial schedule status transactions. For the lifetime of schedule jobs no change of status is reported until the final state is reached. When a job has more than one final state, an event is sent for each. For example, a schedule completes with an ABEND state and event 151 is sent (schedule abended). The job is then rerun and completes successfully. The schedule is completed with a SUCC state and event 154 is sent (schedule completed). The default is HIGH. Table 10: Events filtered by CHSCHED on page 59 lists the events that are filtered by CHSCHED when it is set to LOW.

Table 10. Events filtered by CHSCHED

Event	Description	Filtered on LOW
151	Schedule abended	NO
152	Schedule is stuck	NO
153	Schedule started	YES

Table 10. Events filtered by CHSCHED (continued)

Event	Description	Filtered on LOW
📝 **Note:** This event is not logged for Workstation Master.		
154	Schedule ended	NO
155	Until time expired onuntil = suppr	NO
156	Schedule submitted	YES
157	Schedule cancelled	NO
158	Schedule ready	YES
159	Schedule hold	YES
160	Schedule extrn	YES
161	Schedule is cancel pending	NO
162	Schedule properties changed	YES
163	Schedule is late	NO
164	Until time expired onuntil = continue	NO
165	Until time expired onuntil = cancel	NO

A BmEvents configuration file is included with the IBM Workload Scheduler software. It contains several comment lines, and a single parameter setting:

```
PIPE=MAGENT.P
```

This causes events to be reported as follows:

- If installed on the master, it will report all job scheduling events (101-252) for all workstations in the network. If installed on any other workstation, no job scheduling events will be reported. The process restart event (51) is reported regardless of the workstation type.
- The following events are reported:

```
51 101 102 105 151 152 155 201 202 203 204 251 252
```

- Event information is written to a FIFO file named MAGENT.P, which is read by the IBM Workload Scheduler/NetView agent.

The MAgent configuration file

About this task

The MAgent configuration file is named `/MAgent.conf`. Use it to configure the agent on each workstation. The file is located in the following path:

On UNIX operating systems

> *<TWA_DATA_DIR>*`/MAgent.conf`

On Windows operating systems

> *<TWA_home>*`\MAgent.conf`

Its contents are described below.

 # *comment*

> A comment line.

OPTIONS=MASTER|OFF

> If set to MASTER, the agent on this workstation sends the job scheduling events read from the MAGENT.P file as SNMP traps. If set to OFF , no job scheduling traps are generated by this workstation. If omitted, it defaults to MASTER on the master, and OFF on other workstations.

> This variable is required only if the master will not be used to generate job scheduling traps for the network. For example, if the master is not a managed node (no agent is installed), you should set this variable to MASTER on a backup master that has an agent installed.

EVENT= *n* [*n* ...]

> The list of events to be sent as SNMP traps. With the exception of events 1, 52, and 53, traps will not be generated unless the corresponding events are turned on in the BmEvents configuration file. Event numbers must be separated by at least one space. If omitted, the events sent as traps by default are:

```
1 52 53 54 101 102 105 151 152 155 201 202 203 204 252
```

> Event 1 (magent restarted) cannot be turned off.

> If this parameter is included, it completely overrides the defaults. To remove only event 102 from the list, for example, you must enter the following:

```
EVENT=1 52 53 54 101 105 151 152 155 201 202 203 204 252
```

> See for a description of events.

+name [*pidfilename*]

> By default, the list of processes monitored by the IBM Workload Scheduler/NetView agent contains the following processes: magent, netman, mailman, batchman, jobman, all mailman servers, all writers, and all extended agent connections. Use this syntax to add processes to the list. If it is not a IBM Workload Scheduler process, you must include its PID file name. Some examples are:

```
+SENDMAIL /etc/sendmail.pid
```

```
+SYSLOG /etc/syslogd.pid
```

-name

Use this syntax to remove processes from the list of monitored processes. To remove writer processes, use this form:

```
- cpuid :writer
```

For example, to remove the writers for all workstations with ids starting with SYS, enter:

```
−SYS@:WRITER
```

To remove all writers, enter:

```
−@:WRITER
```

To remove mailman servers 5 and A, enter:

```
−SERVER5
```

```
−SERVERA
```

To remove all mailman servers, enter:

```
−SERVER@
```

An MAgent configuration file is included with the IBM Workload Scheduler/NetView software. It contains only comment lines with no parameters set. This causes SNMP traps to be generated as follows:

- If installed on the master, traps are generated for job scheduling events (101-252) on all workstations in the network. If installed on any other workstation, no job scheduling traps are generated.
- The following events result in SNMP traps:

```
1 52 53 54 101 102 105 151 152 155 201 202 203 204 252
```

- The following processes are monitored: magent, netman, mailman, batchman, jobman, all mailman servers, all writers, and all extended agent connections.

Monitoring writers and servers

About this task

writer and mailman server processes are started and stopped when workstations are linked and unlinked. Their transitory nature and the resulting number of status changes in NetView® can cause confusion, particularly in large networks where linking and unlinking is common. For this reason, you can remove writer and mailman server processes from the list of monitored processes.

IBM Workload Scheduler/NetView configuration options

About this task

IBM Workload Scheduler/NetView submaps, symbols, and objects can be modified like others in NetView®. The following topics describe some specific configuration options for IBM Workload Scheduler/NetView.

Agent scan rate

About this task

By default, the agents scan and update the status of their monitored processes every 60 seconds. To change the rate:

1. Login on the managed node and edit the file <TWShome>/StartUp.
2. Add the -timeout option to the magent command line.

For example, to change the rate to 120 seconds, make the following change:

```
<TWShome>/bin/magent -peers hosts -timeout 120
```

Manager polling rate

About this task

The mdemon manager polls its agents to retrieve status information about the managed nodes. The rate is defined in the file /usr/OV/lrf/Mae.mgmt.lrf on the management node. Unless otherwise specified, the polling rate defaults to 60 seconds.

To change the rate:

1. Edit the file to add the -timeout option to the mdemon command line. For example, to change the rate to 120 seconds, make the following change:

   ```
   Unison_Software_Maestro_Manager: <TWShome>/bin/mdemon:
   OVs_YES_START:pmd,ovwdb:-pmd,-timeout,120:OVs_WELL_BEHAVED
   ```

2. After making a change, delete the old registration by running the ovdelobj command.
3. Register the manager by running the ovaddobj command and supplying the name of the lrf file.

For more information, review the man pages for ovaddobj(8) and lrf(4). See also Configuring agents in NetView on page 63.

Configuring agents in NetView®

About this task

To change the configuration of IBM Workload Scheduler/NetView agents in NetView®, follow these steps:

1. Move down the IP Internet tree to the IP Segment submap showing all the nodes.
2. Select a node where a IBM Workload Scheduler/NetView agent is running. Enter **Ctrl-O** to open the Object Description panel.
3. In the Object Description panel, select **Maestro - Unison Software(c)** from the Object Attributes list.
4. Click **View/Modify Object Attributes**.
5. On the Attributes for Object panel:

      a. To ignore this agent altogether, click **False** under Does a Maestro agent exist on this cpu?.

      b. To change the rate at which mdemon polls this agent, enter the number of seconds under Enter the number of seconds between polling. If this number is other than zero, it overrides the rate defined for the mdemon process (see).

      c. To close the Attributes for Object panel, click **Verify** and then **OK**.

6. To close the Object Description panel, click **OK**.

Configuring workstation status in NetView®

About this task

To modify the way status is indicated for a IBM Workload Scheduler workstation symbol, follow these steps:

1. Select a workstation symbol on the IBM Workload Scheduler network submap.
2. To open the Object Description panel, enter **Ctrl-O**.
3. On the Object Description dialog, select **IBM Workload Scheduler** from the Object Attributes list.
4. Click **View/Modify Object Attributes**.
5. On the Attributes for Object dialog: Click **True** or **False** to ignore or recognize the various job scheduling events. For example, to ignore job abend events, click **True** under IBM Workload Scheduler should ignore JobAbend Events.
6. To close the Attributes for Object panel, click **Verify** and then **OK**.
7. To close the Object Description panel, click **OK**.

Unison software MIB

For a complete listing of the Unison Software enterprise MIB, see the file *TWShome*/OV/Maestro.mib.

Re-configuring enterprise-specific traps

The IBM Workload Scheduler/NetView enterprise-specific traps are configured with default messages that will serve most users' needs. To re-configure the traps, choose Event Configuration from the Options menu. For instructions, refer to your NetView® documentation or online help. It might also be helpful to review the man page for *trapd.conf(4)*.

The enterprise-specific traps and their positional variables are listed in . Trap descriptions are listed in .

lists enterprise-specific traps.

Table 11. Enterprise-specific traps

Trap	Identifier	Positional variables
1 *	uTtrapReset	1. Agent identifier number 2. Software version 3. IBM Workload Scheduler message string, if any

Table 11. Enterprise-specific traps (continued)

Trap	Identifier	Positional variables
51 52 * 53 *	uTtrapProcessReset uTtrapProcessGone uTrapProcessAbend	1. Process pid 2. Program name 3. IBM Workload Scheduler message string, if any
54 *	uTrapXagentConnLost	1. Program name 2. IBM Workload Scheduler message string, if any
101 * 102 * 103 104 105 * 204 *	uTtrapJobAbend uTtrapJobFailed uTtrapJobLaunch uTtrapJobDone uTtrapJobUntil uTtrapJobRerunPrompt	1. workstation name of the schedule. 2. Schedule name. 3. Job name. For jobs submitted with *at* or *batch* , if the name supplied by the user is not unique, this is the IBM Workload Scheduler-generated name, and the name supplied by the user appears as variable 7. 4. workstation name on which the job runs. 5. Job number (pid). 6. 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 (abenp), 24 (succp), 25 (pend). 7. 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 Maestro™ appears as variable 3. 8. User name under which the job runs. 9. Name of the job's script file, or the command it executes. White space is replaced by the octal equivalent; for example, a space appears as 040. 10. The rate at which an *every* job runs, expressed as *hhmm* . If *every* was not specified for the job, this is -32768. 11. Job recovery step, indicated by an integer: 1 (stop), 2 (stop after recovery job), 3 (rerun), 4 (rerun after 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). 12. An event timestamp, expressed as: *yyyymmddhhmm0000* (that is, year, month, day, hour, minute, seconds always zeroes, hundredths always zeroes).

Table 11. Enterprise-specific traps (continued)

Trap	Identifier	Positional variables
		13. The prompt number, or zero if there is no prompt. 14. The prompt text, or IBM Workload Scheduler error message.
151 * 152 * 153 154 155 *	uTtrapSchedAbend uTtrapSchedStuck uTtrapSchedStart uTtrapSchedDone uTtrapSchedUntil	1. Workstation name of the schedule. 2. Schedule name. 3. Schedule state, indicated by an integer: 1(ready), 2 (hold), 3 (exec), 4 (stuck), 5 (abend), 6 (succ), 7 (cancl). 4. IBM Workload Scheduler error message, if any.
201 *	uTtrapGlobalPrompt	1. Prompt name. 2. Prompt number. 3. Prompt text.
202 *	uTtrapSchedPrompt	1. Workstation name of the schedule. 2. Schedule name. 3. Prompt number. 4. Prompt text.
203 *	uTtrapJobPrompt	1. Workstation name of the schedule. 2. Schedule name. 3. Job name. 4. Workstation name of the job. 5. Prompt number. 6. Prompt text.
251 *	uTrapLinkDropped	1. The to workstation name. 2. Link state, indicated by an integer: 1 (unknown), 2 (down due to an unlink), 3 (down due to an error), 4 (up). 3. IBM Workload Scheduler error message. uTrapLinkDropped corresponds to link state 2) only.

Table 11. Enterprise-specific traps (continued)

Trap	Identifier	Positional variables
252 *	uTrapLinkBroken	1. The to workstation name. 2. Link state, indicated by an integer: 1 (unknown), 2 (down due to an unlink), 3 (down due to an error), 4 (up). 3. IBM Workload Scheduler error message. uTrapLinkBroken corresponds to link state 3) only.

* These traps are enabled by default. Link states **1) unknown** and **4) up** are not used, as they are not relative to traps 251 and 252.

IBM Workload Scheduler/NetView program reference

The following information is provided for those who want to run the IBM Workload Scheduler/NetView programs manually. The manager program, mdemon, is normally started with NetView® as part of the ovstart sequence, and its run options are included in the /usr/OV/lrf/Mae.mgmt.lrf file. The agent program, magent, is normally started within the IBM Workload Scheduler StartUp script (<TWShome>/bin/StartUp).

mdemon synopsis

mdemon [**-timeout** *<secs>*] [**-pmd**] [**-port** *<port>*] [**-retry** *<secs>*]

where,

  -timeout

   The rate at which agents are polled, expressed in seconds. The default is 60 seconds. See Manager polling rate on page 63 and Configuring agents in NetView on page 63 for more information about changing the rate.

  -pmd

   This option causes mdemon to run under NetView® pmd (Port Map Demon). Otherwise, it must be run manually. This option is included by default in the file /usr/OV/lrf/Mae.mgmt.lrf file.

  -port

   For HP-UX agents only. This identifies the port address on the managed nodes on which the HP-UX agents will respond. The default is 31112.

  -retry

   The period of time mdemon waits before trying to reconnect to a non-responding agent. The default is 600 seconds.

magent synopsis

The syntax of magent is:

magent -peers *<host>* [, *<host>* [,...]] [**-timeout** *<secs>*] [**-notraps**] [**-port** *<port>*]

where:

  -peers

> For HP-UX agents only. This defines the hosts (names or IP addresses) to which the agent will send its traps. The default is 127.0.0.1 (loopback).
>
> For AIX® agents, the /etc/snmpd.conf file must be modified to define the hosts to which the agent will send its traps. To add another host, for example, duplicate the existing trap line and change the host name:

```
# This file contains IBM Workload Scheduler

# agent registration.

#

trap    public host1   1.3.6.1.4.1.736 fe

trap    public host2   1.3.6.1.4.1.736 fe
```

  -timeout

> The rate at which the agent checks its monitored processes, expressed in seconds. The default is 60 seconds.

  -notraps

> If included, the agent will not generate traps.

  -port

> For HP-UX agents only. This defines the port address on which this agent responds. The default is 31112.

Chapter 3. Integrating with Tivoli® Enterprise Console

How IBM Workload Scheduler integrates with Tivoli® Enterprise Console.

About this task

This chapter describes how IBM Workload Scheduler integrates with Tivoli® Enterprise Console versions 3.8 and 3.9. It is divided into the following sections:

Configuring the Tivoli® Enterprise Console adapter

About this task

This section describes how to enable Tivoli Enterprise Console® to receive IBM Workload Scheduler events.

The Tivoli Enterprise Console logfile adapter is used to relay events from the workstations in the scheduling environment to the Tivoli® Enterprise Console event server. Depending on the workstation in your scheduling environment where you decide to install and configure the Tivoli Enterprise Console logfile adapter, you can have different events displayed in the event console.

When you have installed the Tivoli Enterprise Console 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 about how to install the Tivoli Enterprise Console logfile adapter, refer to the *IBM® Tivoli Enterprise Console® Installation Guide*.

Use the **config_teclogadapter** script to configure the Tivoli® Enterprise Console adapter installed on the IBM Workload Scheduler system that you want to monitor. Perform the following steps:

1. Set the environment variables for the Tivoli® endpoint by running the lcf_env script.
2. Run the **config_teclogadapter** script to configure the adapter. For example:

   ```
   config_teclogadapter [-tme] PATH [Adapter ID] [TWS Installation Path]
   ```

   where:

   -tme

   > The Tivoli® Enterprise Console adapter is a TME adapter.

   PATH

   > Specify the Tivoli® Enterprise Console adapter directory when you did not specify the **-tme** option. Otherwise it is the endpoint directory.

Adapter ID

Specify the Tivoli® Enterprise Console Adapter identifier (only for Tivoli® Enterprise Console 3.9 and later). If you do not specify an ID, it is ignored.

TWS Installation Path

Specify the path where the IBM Workload Scheduler you want to monitor is installed.

The script performs the following configuration steps:

1. If no IBM Workload Scheduler installation path was specified, it uses the home directory where it is installed.
2. Copies the config/BmEvents.conf into the home directory if it does not already exist.
3. Configures the config/BmEvents.conf adding the list of events if not already specified and defines the event.log file as an event output.
4. Configures the configuration file of the Tivoli® Enterprise Console adapter to read from the event.log file.
5. Appends the maestro.fmt file to the format file of the Tivoli® Enterprise Console adapter and rigenerate the cds file.
6. Restarts the Tivoli® Enterprise Console adapter.

After you run the script, perform a **conman stop** and **conman start** to apply the changes.

Configuring the Tivoli® Enterprise Console server

About this task

In addition to configuring the Tivoli® Enterprise Console adapter, you must also configure the Tivoli® Enterprise Console server.

Use the **config_tecserver** script to configure the Tivoli® Enterprise Console server to enable the server to receive events from the Tivoli® Enterprise Console adapter. It must be run on the system where the Tivoli® Enterprise Console Server is installed or on a ManagedNode of the same TME network. On the Windows™ platform, a TME bash is required to run the script. For example:

```
config_tecserver.sh { -newrb RuleBase name=""> RuleBase
Path=""> -clonerb RuleBase name=""> | -userb RuleBase
name=""> }
EventConsole> [TECUIServer host] USER PASSWORD
```

where:

-newrb

Specify a new RuleBase with the specified name and path.

-clonerb

Specify the rule base to be cloned into the new Rule base.

-userb

Customize an already existing RuleBase.

EventConsole

Specify the EventConsole to be created and configured.

TECUIServer host

Specify the host name where the Tivoli® Enterprise Console UI server is installed.

USER PASSWORD

Specify the user name and password needed to access the EventConsole.

The script performs the following configuration steps:

1. If specified, creates the new RuleBase from the cloned one.
2. Adds the IBM Workload Scheduler baroc events definition to the specified RuleBase.
3. Adds the IBM Workload Scheduler rules to the RuleBase.
4. Compile the RuleBase.
5. Put the RuleBase as the Active RuleBase.
6. Configures the specified EventConsole with IBM Workload Scheduler filters.
7. Restarts the Tivoli® Enterprise Console server.

Event formats

lists the engine event formats.

Table 12. IBM Workload Scheduler engine events format

Event	Number
mstReset	1
mstProcessGone	52
mstProcessAbend	53
mstXagentConnLost	54
mstJobAbend	101
mstJobFailed	102
mstJobLaunch	103
mstJobDone	104
mstJobUntil	105
mstJobSubmit	106
mstJobCancel	107
mstJobReady	108
mstJobHold	109

Table 12. IBM Workload Scheduler engine events format (continued)

Event	Number
mstJobRestart	110
mstJobCant	111
mstJobSuccp	112
mstJobExtrn	113
mstJobIntro	114
mstJobWait	116
mstJobWaitd	117
mstJobSched	118
mstJobModify	119
mstJobLate	120
mstJobUntilCont	121
mstJobUntilCanc	122
mstJobMaxDurationExceededContinue	123
mstJobMaxDurationExceededKill	124
mstJobMinDurationNotReachedContinue	125
mstJobMinDurationNotReachedAbend	126
mstJobMinDurationNotReachedConfirm	127
mstJobRisklevelHigh	128
mstJobRisklevelPotential	129
mstJobRisklevelNone	130
mstJobPromoted	131
mstSchedAbend	151
mstSchedStuck	152
mstSchedStart	153
mstSchedDone	154
mstSchedUntil	155
mstSchedSubmit	156
mstSchedCancel	157

Table 12. IBM Workload Scheduler engine events format (continued)

Event	Number
mstSchedReady	158
mstSchedHold	159
mstSchedExtrn	160
mstSchedCnpend	161
mstSchedModify	162
mstSchedLate	163
mstSchedUntilCont	164
mstSchedUntilCanc	165
mstGlobalPrompt	201
mstSchedPrompt	202
mstJobPrompt	203
mstJobRecovPrompt	204
mstLinkDropped	251
mstLinkBroken	252
mstDomainMgrSwitch	301

Positional event variables

This subsection defines the positional event variables.

Table 13. Positional variables for events 101-118,120-122 (job events)

Variable	Description
1	event number
2	schedule cpu
3	schedule id
4	job name
5	job cpu
6	job number
7	job status
8	real name (different from job name only for MPE jobs)

Table 13. Positional variables for events 101-118,120-122 (job events) (continued)

Variable	Description
9	job user
10	jcl name (script name or command name)
11	every time
12	recovery status
13	time stamp (yyyymmddhhmm0000)
14	message number (not equal to zero only for job recovery prompts)
15	eventual text message (delimited by '\t')
16	record number
17	key flag
18	effective start time
19	estimated start time
20	estimated duration
21	deadline time (epoch)
22	return code
23	original schedule name (schedule name for schedules not (yet) carried forward)
24	head job record number (different from record number for rerun/every jobs)
25	Schedule name
26	Schedule input arrival time (yyyymmddhhmm00)

Table 14. Positional variables for event 119 (job property modified)

Variable	Description
1	event number
2	schedule cpu
3	schedule id
4	job name
5	job cpu
6	job number
7	property type: StartTime = 2,

Table 14. Positional variables for event 119 (job property modified) (continued)

Variable	Description
	StopTime = 3,
	Duration = 4,
	TerminatingPriority = 5,
	KeyStatus = 6
8	property value
9	record number
10	key flag
11	head job record number (different from record number for rerun/every jobs)
12	real name (different from job name only for MPE jobs)
13	original schedule name (schedule name for schedules not (yet) carried forward)
14	message number (not equal to zero only for job recovery prompts)
15	**Schedule name**
16	**Schedule input arrival time (yyyymmddhhmm00)**

Table 15. Positional variables for events 151-161, 163-165 (schedule events)

Variable	Description
1	event number
2	schedule cpu
3	schedule ID
4	schedule status
5	record number
6	key flag
7	original schedule name (schedule name for schedules not (yet) carried forward)
8	time stamp
9	**Schedule name**
10	**Schedule input arrival time (yyyymmddhhmm00)**

Table 16. Positional variables for event 162 (schedule property modified)

Variable	Description
1	event number
2	schedule cpu
3	schedule id
4	property type: StartTime = 2 StopTime = 3
5	property value
6	record number
7	original schedule name (schedule name for schedules not (yet) carried forward)
8	time stamp
9	**Schedule name**
10	**Schedule input arrival time (yyyymmddhhmm00)**

Table 17. Positional variables for event 202 (schedule prompt)

Variable	Description
1	event number
2	schedule cpu
3	schedule id
4	**Schedule name**
5	**Schedule input arrival time (yyyymmddhhmm00)**

Table 18. Positional variables for events 203 (job prompt) and 204 (job recovery prompt)

Variable	Description
1	event number
2	schedule cpu
3	schedule id
4	job name
5	job cpu
6	prompt number

Table 18. Positional variables for events 203 (job prompt) and 204 (job recovery prompt) (continued)

Variable	Description
7	prompt message
8	**Schedule name**
9	**Schedule input arrival time (yyyymmddhhmm00)**

Re-loading monitoring data

The **Configure Non-TME adapter** and **Configure TME® adapter** commands set up the file **BmEvents.conf** in the `TWShome` directory. This configuration file determines the information that the production processes (`batchman` and `mailman`) write in the `TWSHome/log_source_file` file and how this information is written. By default, this file is the `event.log` file, .

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

- Modify the **FILE** field in the `BmEvents.conf` file and restart the IBM Workload Scheduler processes
- Modify the **LogSource** field in the `tecad_logfile.conf` file and restarting the Tivoli Enterprise Console 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 that manage events, that IBM Workload Scheduler can interact with, such as IBM® Tivoli® NetView® and IBM® Tivoli® Business Systems Management.

The options you can set in the `BmEvents.conf` file are described below:

OPTIONS=MASTER|OFF

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

If the value is set to `OFF`, the job scheduling events are reported only if they relate to the workstation where the file is configured.

If commented, it defaults to `MASTER` on the master domain manager workstation, and to `OFF` 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 job streams. To set it in the job or job stream properties use:

- The keywords `KEYSCHED` (for job streams) and `KEYJOB` (for jobs) from the IBM Workload Scheduler command line interface.
- The job `Monitored` check box and job stream `Monitored` check box from the Dynamic Workload Console.

SYMEVNTS=YES|NO

If set to `YES` it tells the production process, **batchman**, to report the jobs and job streams status events immediately after having generated the new production day plan. .

Set to `NO`, if report is not required.

The default value is `NO`.

CHSCHED=HIGH|LOW

Indicates which events are to be sent during the job stream lifetime.

During the lifetime of a job stream its status can change several times depending on the status of the jobs it contains.

By using the **CHSCHED** option you choose how the job stream status change is reported.

If you set it to `HIGH`, during the job stream lifetime an event is sent any time the status of the job stream changes. Because the intermediate status of the job stream can change several times, several events can be sent, each reporting a specific status change. For example, a job stream may go into the READY state several times during its running because its status is related to the status of the jobs it contains. Each time the job stream goes into the READY state, event 153 is sent.

If you set it to `LOW`, during the job stream lifetime until the final status is reached, only the initial job stream state transaction is tracked. In this way the network traffic of events reporting job stream status changes is heavily reduced. When the **CHSCHED** value is set to `LOW` these are the events that are sent only the first time during the job stream life time:

Table 19. CHSCHED event filtered

Event number	Event Class	Description
153	`TWS_Schedule_Started`	Job stream started
156	`TWS_Schedule_Submit`	Job stream submitted
158	`TWS_Schedule_Ready`	Job stream ready
159	`TWS_Schedule_Hold`	Job stream hold
160	`TWS_Schedule_Extern`	Job stream external
162	`TWS_Schedule`	Job stream properties changed

For final status of a job stream, regardless of the value set for **CHSCHED**, all events reporting the final status of the job stream are reported, even if the job stream has more than one final status. For example, if a job contained in the job stream completes with an ABEND state, event 151 is sent (Job stream abended). If that job

is then reruns and completes successfully, the job stream completes with a SUCC state and event 154 is sent (Job stream completed).

The default value for **CHSCHED** is `HIGH`.

EVENT=_n_**[** _n_ **...]**

Identifies which events to report in the `log_source_file`. 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
```

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
```

> **Note:** Event 51 is always reported each time **mailman** and **batchman** are restarted, regardless of the filters specified in the **EVENT** parameter. If you do not wish to notify this event to the TEC event console, you must manually edit the `maestro.fmt` file or, for Windows™ environments, the `maestro_nt.fmt` file and comment out the following section:
>
> ```
> // TWS Event Log
>       FORMAT TWS_Reset
>       1 %s %s %s*
>       event_type 1
>       hostname DEFAULT
>       origin DEFAULT
>       agent_id $1
>       software_version $2
>       msg PRINTF("TWS has been reset on host %s",hostname)
>       severity HARMLESS
>       END
> ```
>
> When this section is commented out, the TEC adapter will not send event 51 to the TEC event console.

FILE=_filename_

This option is used specifically when interacting with the Tivoli® Enterprise Console. Set it to the path and file name of an ASCII 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 in the local language file specified by this parameter.

Job scheduling events

After performing the configuration steps described in the Configuring the Tivoli Enterprise Console adapter on page 69, use the events gathered from the IBM Workload Scheduler log file using the Tivoli Enterprise Console logfile adapter to perform event management and correlation using the Tivoli® Enterprise Console in your scheduling environment.

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 Tivoli Enterprise Console logfile adapter.

An important aspect to be considered when configuring the integration with the Tivoli® Enterprise Console using event adapters is whether to monitor only the master domain manager or every IBM 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 Tivoli® Enterprise Console event server and TEC event console all events will therefore look as if they come from the master domain manager, regardless of which IBM Workload Scheduler agent they originate from. The workstation name, job name, and job stream name are still reported to Tivoli® Enterprise Console, but as a part of the message inside the event.

If, instead, you install a Tivoli Enterprise Console logfile adapter on every IBM Workload Scheduler agent, this results in a duplication of events coming from the master domain manager, and from each agent. Creating and using a Tivoli® Enterprise Console that detects these 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 IBM 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 Tivoli® Enterprise Console 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 Workload Scheduler: Planning and Installation Guide*.

Figure 3: Event generation flow on page 81 describes how an event is generated. It shows the Tivoli Enterprise Console 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 Tivoli Enterprise Console logfile adapter on another workstation in your scheduling environment, depending on your environment and business needs.

Figure 3. Event generation flow
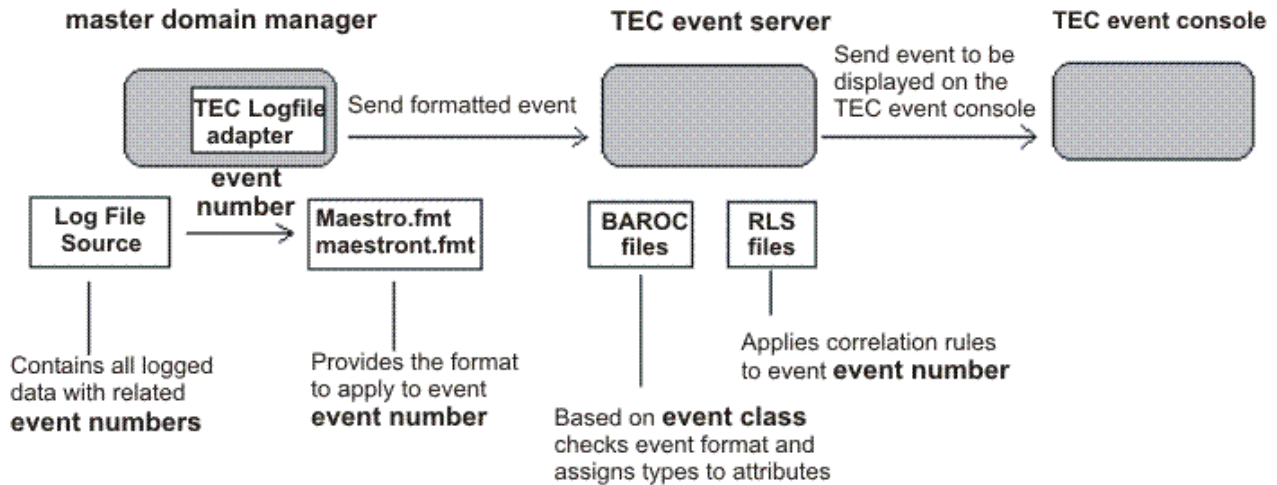
The logic that is used to generate job scheduling events is the following:

- 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 Tivoli Enterprise Console 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 `BAROC` files and, if correct, is accepted. Otherwise a parsing failure is prompted.
- 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 `RLS` 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.

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 Tivoli Enterprise Console 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 IBM Workload Scheduler.

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 Tivoli Enterprise Console logfile adapter to TEC event server and then to the TEC event console. The percent sign (%s) in the messages indicates a variable. The name of each variable follows the message between brackets.

Table 20. IBM Workload Scheduler events

Event	Characteristic	Description
"TWS process %s has been reset on host %s" (program_name, host_name)	*Event Class:*	`TWS_Process_Reset`
	Event Severity:	HARMLESS
	Event Description:	IBM Workload Scheduler daemon process reset.
"TWS process %s is gone on host %s" (program_name, host_name)	*Event Class:*	`TWS_Process_Gone`
	Event Severity:	CRITICAL
	Event Description:	IBM Workload Scheduler process gone.
"TWS process %s has abended on host %s" (program_name, host_name)	*Event Class:*	`TWS_Process_Abend`
	Event Severity:	CRITICAL
	Event Description:	IBM Workload Scheduler process abends.
"Job %s.%s failed, no recovery specified" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.
	Event Description:	Job failed, no recovery specified.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Job %s.%s failed, recovery job will be run then schedule %s will be stopped" (schedule_name, job_name, schedule_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_ user*.
	Event Description:	Job failed, recovery job runs, and schedule stops.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Job %s.%s failed, this job will be rerun" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
	Event Description:	Job failed, the job is rerun.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Job %s.%s failed, this job will be rerun after the recovery job" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.
	Event Description:	Job failed, recovery job is run, and the job is run again.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Job %s.%s failed, continuing with schedule %s" (schedule_name, job_name, schedule_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to user *TWS_user*.
	Event Description:	Job failed, the schedule proceeds.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Job %s.%s failed, running recovery job then continuing with schedule %s" (schedule_name, job_name, schedule_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.
	Event Description:	Job failed, recovery job runs, schedule proceeds.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Failure while rerunning failed job %s.%s" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.
	Event Description:	Rerun of abended job abends.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
"Failure while recovering job %s.%s" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Abend`
	Event Severity:	CRITICAL
	Automated Action (UNIX™ only):	Send job **stdlist** to the *TWS_user*.
	Event Description:	Recovery job abends.
	Correlation Activity:	If this job has abended more than once within a 24 hour time window, send a `TWS_Job_Repeated_Failure` event.
"Multiple failures of Job %s#%s in 24 hour period" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Repeated_Failure`
	Event Severity:	CRITICAL
	Event Description:	Same job fails more than once in 24 hours.
"Job %s.%s did not start" (schedule_name, job_name)	*Event Class:*	`TWS_Job_Failed`
	Event Severity:	CRITICAL
	Event Description:	Job failed to start.
"Job %s.%s has started on CPU %s" (schedule_name, job_name, cpu_name)	*Event Class:*	`TWS_Job_Launched`
	Event Severity:	HARMLESS
	Event Description:	Job started.
	Correlation Activity:	Clearing Event - Close open job prompt events related to this job.
"Job %s.%s has successfully completed on CPU %s" (schedule_name, job_name, cpu_name)	*Event Class:*	`TWS_Job_Done`
	Event Severity:	HARMLESS
	Event Description:	Job completed successfully.
	Correlation Activity:	Clearing Event - Close open job started events for this job and auto-acknowledge this event.
"Job %s.%s suspended on CPU %s" (schedule_name, job_name, cpu_name)	*Event Class:*	`TWS_Job_Suspended`
	Event Severity:	WARNING
	Event Description:	Job suspended, the until time expired (default option suppress).
"Job %s.%s is late on CPU %s" (scheduler_name, job_cpu)	*Event Class:*	`TWS_Job_Late`
	Event Severity:	WARNING
	Event Description:	Job late, the deadline time expired before the job completed.

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
"Job %s.%s:until (continue) expired on CPU %s", schedule_name, job_name, job_cpu	*Event Class:*	`TWS_Job_Until_Cont`
	Event Severity:	WARNING
	Event Description:	Job until time expired (option continue).
"Job %s.%s:until (cancel) expired on CPU %s", schedule_name, job_name, job_cpu	*Event Class:*	`TWS_Job_Until_Canc`
	Event Severity:	WARNING
	Event Description:	Job until time expired (option cancel).
(TWS Prompt Message)	*Event Class:*	`TWS_Job_Recovery_Prompt`
	Event Severity:	WARNING
	Event Description:	Job recovery prompt issued.
"Schedule %s suspended", (schedule_name)	*Event Class:*	`TWS_Schedule_Susp`
	Event Severity:	WARNING
	Event Description:	Schedule suspended, the until time expired (default option suppress).
"Schedule %s is late", (schedule_name)	*Event Class:*	`TWS_Schedule_Late`
	Event Severity:	WARNING
	Event Description:	Schedule late, the deadline time expired before the schedule completion.
"Schedule %s until (continue) expired", (schedule_name)	*Event Class:*	`TWS_Schedule_Until_Cont`
	Event Severity:	WARNING
	Event Description:	Schedule until time expired (option continue).
"Schedule %s until (cancel) expired", (schedule_name)	*Event Class:*	`TWS_Schedule_Until_Canc`
	Event Severity:	WARNING
	Event Description:	Schedule until time expired (option cancel).
"Schedule %s has failed" (schedule_name)	*Event Class:*	`TWS_Schedule_Abend`
	Event Severity:	CRITICAL
	Event Description:	Schedule abends.
	Correlation Activity:	If event is not acknowledged within 15 minutes, send mail to *TWS_user* (UNIX™ only).

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
"Schedule %s is stuck" (schedule_name)	*Event Class:*	TWS_Schedule_Stuck
	Event Severity:	CRITICAL
	Event Description:	Schedule stuck.
	Correlation Activity:	If event is not acknowledged within 15 minutes, send mail to *TWS_user* (UNIX™ only).
"Schedule %s has started" (schedule_name)	*Event Class:*	TWS_Schedule_Started
	Event Severity:	HARMLESS
	Event Description:	Schedule started.
	Correlation Activity:	Clearing Event - Close all related pending schedule, or schedule abend events related to this schedule.
"Schedule %s has completed" (schedule_name)	*Event Class:*	TWS_Schedule_Done
	Event Severity:	HARMLESS
	Event Description:	Schedule completed successfully.
	Correlation Activity:	Clearing Event - Close all related schedule started events and auto-acknowledge this event.
(Global Prompt Message)	*Event Class:*	TWS_Global_Prompt
	Event Severity:	WARNING
	Event Description:	Global prompt issued.
(Schedule Prompt's Message)	*Event Class:*	TWS_Schedule_Prompt
	Event Severity:	WARNING
	Event Description:	Schedule prompt issued.
(Job Recovery Prompt's Message)	*Event Class:*	TWS_Job_Prompt
	Event Severity:	WARNING
	Event Description:	Job recovery prompt issued.
"Comm link from %s to %s unlinked for unknown reason" (hostname, to_cpu)	*Event Class:*	TWS_Link_Dropped
	Event Severity:	WARNING
	Event Description:	IBM Workload Scheduler link to CPU dropped for unknown reason.

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
"Comm link from %s to %s unlinked via unlink command" (hostname, to_cpu)	Event Class:	`TWS_Link_Dropped`
	Event Severity:	HARMLESS
	Event Description:	IBM Workload Scheduler link to CPU dropped by unlink command.
"Comm link from %s to %s dropped due to error" (hostname, to_cpu)	Event Class:	`TWS_Link_Dropped`
	Event Severity:	CRITICAL
	Event Description:	IBM Workload Scheduler link to CPU dropped due to error.
"Comm link from %s to %s established" (hostname, to_cpu)	Event Class:	`TWS_Link_Established`
	Event Severity:	HARMLESS
	Event Description:	IBM Workload Scheduler CPU link to CPU established.
	Correlation Activity:	Close related `TWS_Link_Dropped` or `TWS_Link_Failed` events and auto-acknowledge this event.
"Comm link from %s to %s down for unknown reason" (hostname, to_cpu)	Event Class:	`TWS_Link_Failed`
	Event Severity:	CRITICAL
	Event Description:	IBM Workload Scheduler link to CPU failed for unknown reason.
"Comm link from %s to %s down due to unlink" (hostname, to_cpu)	Event Class:	`TWS_Link_Failed`
	Event Severity:	HARMLESS
	Event Description:	IBM Workload Scheduler link to CPU failed due to unlink.
"Comm link from %s to %s down due to error" (hostname, to_cpu)	Event Class:	`TWS_Link_Failed`
	Event Severity:	CRITICAL
	Event Description:	IBM Workload Scheduler CPU link to CPU failed due to error.
"Active manager % for domain %" (cpu_name, domain_name)	Event Class:	TWS_Domain_Manager_Switch
	Event Severity:	HARMLESS
	Event Description:	IBM Workload Scheduler domain manager switch has occurred.
Long duration for Job %s.%s on CPU %s. (schedule_name, job_name, job_cpu)	Event Class:	`TWS_Job_Launched`
	Event Severity:	WARNING
	Event Description:	If after a time equal to estimated duration, the job is still in exec status, a new message is generated.

Table 20. IBM Workload Scheduler events (continued)

Event	Characteristic	Description
Job %s.%s on CPU %s, could miss its deadline. (schedule_name, job_name, job_cpu)	*Event Class:*	`TWS_Job_Ready`, `TWS_Job_Hold`
	Event Severity:	WARNING
	Event Description:	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.
Start delay of Job %s.%s on CPU %s. (schedule_name, job_name, job_cpu)	*Event Class:*	`TWS_Job_Ready`
	Event Severity:	WARNING
	Event Description:	If the job is still in ready status, after *n* minutes a new message is generated. The default value for *n* is 10.

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 the installation of IBM Workload Scheduler and compiled with the BAROC file containing the event classes for the IBM 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 Enterprise Console® User's Guide* and *Tivoli Enterprise Console® Rule Builder's Guide* for details about rules commands.

Job scheduling events format

The integration between IBM Workload Scheduler and Tivoli® Enterprise Console (TEC) provides the means to identify and manage a set of predefined job scheduling events. These are the events that are managed using the Tivoli Enterprise Console 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 Tivoli Enterprise Console logfile adapter to the TEC event server.

Note that since Tivoli® Enterprise Console handles blank (white) spaces as delimiters, if the IBM Workload Scheduler events include prompts (like the one generated as CarryForward prompt), the prompts might be split in different fields in the event itself.

For additional information, refer to .

Table 21. Event formats

Event Number	Event Class	Positional Fields Values
51	`TWS_Process_Reset`	1. Event number. 2. Process name. 3. Local workstation name. 4. Master workstation name.
101	`TWS_Job_Abend`	1. Event number.
102	`TWS_Job_Failed`	2. Job stream workstation name.
103	`TWS_Job_Launched`	3. Job stream identified.
104	`TWS_Job_Done`	4. Job name. For jobs submitted with `at` or `batch`, if the name supplied by the user is not unique, this is the IBM Workload
105	`TWS_Job_Suspended`	Scheduler-generated name, and the name supplied by the user
106	`TWS_Job_Submitted`	appears as variable 8 below.
107	`TWS_Job_Cancel`	5. Workstation name on which the job runs.
108	`TWS_Job_Ready`	6. Job number.
109	`TWS_Job_Hold`	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 (abenp),
110	`TWS_Job_Restart`	24 (succp), 25 (pend).
111	`TWS_Job_Failed`	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
112	`TWS_Job_SuccP`	generated by IBM Workload Scheduler appears as variable 4 above.
113	`TWS_Job_Extern`	9. Job user.
114	`TWS_Job_INTRO`	

Table 21. Event formats (continued)

Event Number	Event Class	Positional Fields Values
116	`TWS_Job_Wait`	10. 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.
117	`TWS_Job_Waitd`	
120	`TWS_Job_Late`	11. The rate at which an "every" job runs, expressed as hhmm. If every was not specified for the job, this is -32768.
121	`TWS_Job_Until_Cont`	
122	`TWS_Job_Until_Canc`	12. Job recovery status, 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).
120	`TWS_Job_Late`	

13. An event timestamp. This is the local time on the workstation where the job event occurred. It is expressed as: yyyymmddhhmm0000 (that is, year, month, day, hour, minute, seconds always zeroes, hundredths always zeroes).

14. Message number (not zero only for job recovery prompts).

15. The prompt number delimited by '\t', or zero if there is no prompt.

16. Job record number. Identifies in the plan the record associated to the job (not for Event number 204).

17. Job keyflag: 0 (no key flag), 1 (key flag) (not for Event number 204).

18. Effective start time of the job (not for Event number 204). It has a valid time if it occurred in the event.

19. 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.

20. Estimated duration of the job (not for Event number 204). Time estimated by the IBM Workload Scheduler engine based on statistics.

21. Deadline in Epoch (not for Event number 204). It has a valid time if a deadline time has been provided by the user.

22. The prompt text, or IBM Workload Scheduler error message.

23. Original schedule name (for schedules not (yet) carried forward).

24. Head job record number (different from record number for rerun?every jobs).

25. Job stream name.

26. Job stream input arrival time expressed as: yyyymmddhhmm00.

Event Number	Event Class	Positional Fields Values
119	`TWS_Job`	

1. Event number.

2. Job stream workstation name.

3. Job stream identifier.

Table 21. Event formats (continued)

Event Number	Event Class	Positional Fields Values
		4. Job name.
		5. Workstation name on which the job runs.
		6. Job number.
		7. Property type indicated by an integer: 1 (CurrEstComplete), 2 (StartTime), 3 (StopTime), 4 (Duration), 5 (TerminatingPriority), 6 (KeyStatus).
		8. Property value.
		9. Record number.
		10. Key flag.
		11. Head job record number (different from record number for rerun?every jobs).
		12. 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 IBM Workload Scheduler appears as variable 4 above.
		13. Original schedule name (for schedules not (yet) carried forward).
		14. Time stamp.
		15. Job stream name.
		16. Job stream input arrival time expressed as: yyyymmddhhmm00.
151	`TWS_Schedule_Abend`	
152	`TWS_Schedule_Stuck`	1. Event number.
153	`TWS_Schedule_Started`	2. Job stream workstation name.
		3. Job stream identifier.
154	`TWS_Schedule_Done`	4. Job stream state, indicated by an integer: 1 (ready), 2 (hold), 3 (exec), 4 (stuck), 5 (abend), 6 (succ),7 (cancl).
155	`TWS_Schedule_Susp`	
156	`TWS_Schedule_Submit`	5. Record number.
		6. Key flag.
157	`TWS_Schedule_Cancel`	7. Original schedule name (for schedules not (yet) carried forward).
158	`TWS_Schedule_Ready`	8. Time stamp.
159	`TWS_Schedule_Hold`	9. Job stream name.
		10. Job stream input arrival time expressed as: yyyymmddhhmm00.
160	`TWS_Schedule_Extern`	
161	`TWS_Schedule_CnPend`	
163	`TWS_Schedule_Late`	
164	`TWS_Schedule_Until_Cont`	
165	`TWS_Schedule_Until_Canc`	

Table 21. Event formats (continued)

Event Number	Event Class	Positional Fields Values
162	`TWS_Schedule`	1. Event number. 2. Job stream workstation name. 3. Job stream identifier. 4. Property type indicated by an integer: 2 (StartTime), 3 (StopTime), 4 (Duration), 5. Property value. 6. Record number. 7. Original schedule name (for schedules not (yet) carried forward). 8. Time stamp. 9. Job stream name. 10. Job stream input arrival time expressed as: yyyymmddhhmm00.
201	`TWS_Global_Prompt`	1. Event number. 2. Prompt name. 3. Prompt number. 4. Prompt text.
202	`TWS_Schedule_Prompt`	1. Event number 2. Job stream workstation name. 3. Job stream identifier. 4. Job stream name. 5. Job stream input arrival time expressed as: yyyymmddhhmm00.
203 204	`TWS_Job_Prompt` `TWS_Job_Recovery_Prompt`	1. Event number. 2. Job stream workstation name. 3. Job stream identifier. 4. Job name. 5. Workstation name of the job. 6. Prompt number. 7. Prompt text. 8. Job stream name. 9. Job stream input arrival time expressed as: yyyymmddhhmm00.

Table 21. Event formats (continued)

Event Number	Event Class	Positional Fields Values
251	`TWS_Link_Dropped`	
252	`TWS_Link_Failed`	1. Event number. 2. The "to" workstation name. 3. Link state, indicated by an integer: 1 (unknown), 2 (down due to an unlink), 3 (down due to an error), 4 (up). `TWS_Link_Dropped` can match link state 2 only. `TWS_Link_Failed` can match link state 3 only. Link states 1 and 4 do not apply to these events.
301	`TWS_Domain_Manager_Switch`	1. Event number. 2. New manager. 3. The domain name. 4. Event time stamp.

Chapter 4. Integrating with Tivoli® License Compliance Manager

How IBM Workload Scheduler integrates with Tivoli® License Compliance Manager on all operating systems.

This chapter describes how IBM Workload Scheduler integrates with Tivoli® License Compliance Manager version 2.3.

Integration with Tivoli® License Compliance Manager is supported on all operating systems.

When you install IBM Workload Scheduler on a master domain manager, a backup master domain manager, a domain manager, a fault-tolerant agent, a standard agent, or an extended agent, depending on the operating system, the following signature files are copied to the `TSW_HOME` directory:

- `ITWSS0805.SYS2` on Oracle
- `ITWSX0805.SYS2` on AIX®
- `ITWSH0805.SYS2` on HP-UX
- `ITWSL0805.SYS2` on Linux™
- `ITWSW0805.SYS2` on Windows™

The new signatures are used to detect if IBM Workload Scheduler is installed or in use on a workstation. Before updating the Tivoli® License Compliance Manager catalog with these new signatures, verify that the size of the each of these files is at least of 1 KB.

Chapter 5. Integrating with Tivoli Storage Manager

How IBM Workload Scheduler integrates with Tivoli® Storage Manager.

This chapter describes how IBM Workload Scheduler integrates with Tivoli Storage Manager version 5.4 and later, an enterprise-wide storage management application that provides automated storage management services to workstations, personal computers, and file servers from a variety of vendors, with a variety of operating systems.

For the most up-to-date information about supported product versions, run a dynamic Data Integration report from the Software Product Compatibility Reports web site: Data Integration.

Integration with Tivoli Storage Manager is supported only on UNIX™ and Linux™ systems.

Tivoli Storage Manager administrators perform several types of operations regularly each day using a built-in scheduling facility, which provides a simple mechanism to automate routine tasks. This scheduling facility, however, does not provide the ability to assign dependencies among scheduled tasks, to assign limits or priorities, or to define workstation classes.

Using the extended agent, you can integrate Tivoli Storage Manager with IBM Workload Scheduler and assign dependencies among Tivoli Storage Manager scheduled tasks or assign limits or priorities.

You can schedule the following Tivoli Storage Manager tasks using IBM Workload Scheduler:

- Server administrative tasks
    - Database backup
    - Volume history backup
    - Device configuration backup
    - Delete volume history
    - Inventory expiration
    - All the other administrative tasks. For details see the *IBM® Tivoli® Storage Manager Administrator's Reference*.

    These tasks are run in the Tivoli® Storage Manager Command Line Administrative Interface, which must be active.
- Client backup task

This task is run in the Tivoli® Storage Manager Command Line Backup/Archive Client Interface, which must be active.

To integrate Tivoli Storage Manager with IBM Workload Scheduler you must set up your environment and define appropriate jobs, as described in the following sections.

Setting up the environment

To integrate Tivoli Storage Manager with IBM Workload Scheduler, a specific extended agent, the tsmxagent, is needed to run Tivoli® Storage Manager commands. The tsmxagent runs only on UNIX™ and Linux™ systems.

When you install the IBM Workload Scheduler, the `tsmxagent.sh` script, representing the Tivoli Storage Manager access method, and its method options file, `tsmxagent.opts`, are copied to the `TWS_HOME/methods` directory.

To schedule a job in IBM Workload Scheduler to run Tivoli Storage Manager commands for administrative and client backup purposes, perform the following steps:

1. Type the user ID of the Tivoli® Storage Manager administrator that accesses the Tivoli Storage Manager server in the `tsmAdmin` variable of the `tsmxagent.opts` file. The default value is `admin`.
2. Set the password of the Tivoli® Storage Manager administrator, defined in the previous step, in the `TSMPASS` parameter defined using the IBM Workload Scheduler `parms` utility.
3. Define an extended agent workstation that uses the `tsmxagent` access method. This logical workstation definition must be hosted by a IBM Workload Scheduler physical workstation, either a master domain manager, a domain manager, or a fault-tolerant agent workstation. An example is the following:

```
CPUNAME TSMXAGENT
OS UNIX
NODE dontcare
TCPADDR 31111
FOR MAESTRO
 HOST TWSFTA
 ACCESS "tsmxagent"
 TYPE X-AGENT
END
```

In this case, `TSMXAGENT` is the name of the extended agent workstation, `dontcare` is the node name, `31111` is the TCP address, `TWSFTA` is the host, and `tsmxagent` is the name of the access method referred to the `tsmxagent.sh` script. The `tsmxagent.sh` must be present in all the agents `TWS_HOME/methods` directory. The `NODE` and `TCPADDR` definitions are ignored.

Defining jobs for Tivoli® Storage Manager tasks

You can schedule the following Tivoli Storage Manager tasks using IBM Workload Scheduler. The Tivoli® Storage Manager tasks must be specified in the task string for the tsmxagent job.

Server administrative tasks

- Database backup (`BACKUP DB`).
- Volume history backup (`BACKUP VOLHISTORY`).
- Device configuration backup (`BACKUP DEVCONFIG`).
- Delete volume history (`DELETE VOLHISTORY`).
- Inventory expiration (`EXPIRE INVENTORY`).
- All the other administrative tasks. For details see the *IBM® Tivoli® Storage Manager Administrator's Reference*.

You can use Tivoli® Storage Manager commands syntax for every Server administrative task. For the tasks listed above you can also use the alternative IBM Workload Scheduler key word listed in the following table:

Table 22. Mapping table between Tivoli Storage Manager and IBM Workload Scheduler administrative tasks

Tivoli Storage Manager command	IBM Workload Scheduler keyword
backup db	DBBACKUP
backup volhistory	VHBACKUP
backup devconfig	DCBACKUP
delete volhistory	DELVOLHIST
expire inventory	EXPIREINV
any Tivoli® Storage Manager admin command	

Client backup task

- Client backup task:
  - Client backup (`DEFINE SCHEDULE`, `DEFINE ASSOCIATION`, and `DEFINE CLIENTACTION`).

Client backup task can be performed using different commands. The following command uses positional syntax:

- **CLIENT** *DOMAIN SCHEDULE CLIENT* [*optional_parms*]

where:

Table 23. Positional client backup task syntax table

IBM Workload Scheduler option	Description
DOMAIN	Specifies the name of the Tivoli® Storage Manager policy domain to which this schedule belongs.
SCHEDULE	Specifies the name of the schedule that you want to associate with one or more clients.
CLIENTS	Specifies the name of a server-prompted Tivoli® Storage Manager client ready for scheduling a backup.
OPTION ARGS	Specifies the optional parameters supported by the Tivoli® Storage Manager.

The syntax of the **CLIENTACT** and **CLIENTSCHED** commands does not use positional syntax, but uses parameters to specify Tivoli® Storage Manager options values, as follows:

- ```
  CLIENTACT -action <action name> [-domain <policy domain> ]
  [-node <TSM node name>] [-script <value>] [--  <TSM options>]
  ```

- ```
  CLIENTSCHED -action <action name> -domain <policy domain>
  -node <TSM node name> [-polling <value>]
  [-script <value>] [-timeout <value>]
  ```

```
[-schedname  <TSM schedule name> | -schedprefix
          <TSM prefix schedule name>]
[-nodel] [--  <TSM options>]
```

where:

Table 24. Parameter client backup task syntax table

Parameter	Description	Default value
<`-action` action name>	Tivoli® Storage Manager Define Schedule action (see *IBM® Tivoli® Storage Manager Administrator's Reference*).	
<`-domain` policy domain>	Tivoli® Storage Manager Policy Domain.	
<`-node` TSM node name>	Name of the Tivoli® Storage Manager client on which to run the script.	
<`-polling` value>	Time to wait before the next status poll.	60 seconds
<`-script` value>	The script to run when the **-action** command is specified. Use '\\' instead of '\'. 📝 **Note:** Due to script name parsing, avoid using " -" in the script path\name.	
<`-timeout`< value>	Number of polls to complete before timing out.	0 = Poll Forever
<`-schedname` tm tmtype="reg" trademark="Tivoli">Tivoli/tm> Storage Manager <schedule name>	The name of the Tivoli® Storage Manager schedule. If the length of the name is more than **MAX_TSM_SUPPORTED_LENGTH**, the access method will truncate the name.	<TWSJOB_*JOB_ID*>
<`-schedprefix` Tivoli® Storage Manager prefix schedule name>	The prefix of the Tivoli® Storage Manager schedule. The schedule name is: *TSM prefix name>_JOB_ID*. If the length of the prefix is more than: **MAX_TSM_SUPPORTED_LENGTH − LENGTH_JOB_ID + 1** the access method will truncate the prefix.	<TWSJOB_*JOB_ID*>
`-nodel`	Specifies that, at job completion, the Tivoli® Storage Manager schedule is not deleted.	By default the schedule is deleted
`--` <TSM options>	Any **Tivoli®Storage Manager** options you want to add to the**Tivoli®**Storage Manager Define Schedule command to	

Table 24. Parameter client backup task syntax table (continued)

Parameter	Description	Default value
	be run.Note: When multiple values are required for a **Tivoli**® Storage Manager option, enclose the values in escaped double quotes, for example \"values>\".This is true if you are not specifying client options (https://www.ibm.com/docs/en/tsm/7.1.0?topic=options-client-reference). In case any of the options above are used, then the correct sintax is: options=<TSM options>	

The differences between the types of the client task commands are the following:

- The **CLIENT** and **CLIENTSCHED** options define a Tivoli® Storage Manager schedule and associate it to the specified NODE. The Tivoli® Storage Manager commands are run asynchronously. Use the **CLIENTSCHED** option when you want to trace the Tivoli® Storage Manager scheduled commands which have run, because it is possible to define a unique schedule name.
- The **CLIENTACT** option allows you to launch client commands synchronously, without explicitly defining a Tivoli® Storage Manager schedule. Use it when Tivoli® Storage Manager is configured to automatically purge asynchronous schedules at midnight, so that you do not have to purge them manually. Tivoli® Storage Manager is unable to return status information for jobs after midnight if they start before midnight.

The names of the Tivoli® Storage Manager schedules must be unique to run multiple IBM Workload Scheduler instances of the same job at the same time. To manage the concurrency and traceability, the **tsmxagent** access method has been changed. Using the **CLIENTSCHED** command, it is possible to define a unique name for the Tivoli® Storage Manager schedule. There are two possibilities:

- Choose no name and allow the access method to automatically generate the Tivoli® Storage Manager schedule name. This choice creates a schedule name which has the following format: "TWSJOB"_*JOB_ID*>, where JOB_ID is the unique identifier assigned by IBM Workload Scheduler to the job.
- Choose a prefix to concatenate to the *JOB_ID*> to create the Tivoli® Storage Manager schedule name. This choice creates a schedule name which has the following format: schedule_prefix>_*JOB_ID*>, where the schedule_prefix> is defined by passing the new parameter `-schedprefix` to the **CLIENTSCHED** command and *JOB_ID*> is the unique identifier assigned by IBM Workload Scheduler to the job.

It is also possible to choose a non-unique schedule name. In this case, concurrency and traceability are not supported. This choice is enabled passing the parameter `-schedname` to the **CLIENTSCHED** command. The Tivoli® Storage Manager schedule is defined with the name <schedule_name>.

Using the **CLIENT** option, concurrency and traceability are not supported because, running the same IBM Workload Scheduler job on the x-agent, you have the following results:

- Tivoli® Storage Manager schedules created with the same name are not allowed and so the IBM Workload Scheduler job ends unsuccessfully.
- After the unsuccessful completion of one of the IBM Workload Scheduler job which must run concurrently, the Tivoli® Storage Manager schedule is deleted and so all the other jobs end unsuccessfully.
- The entries produced in the log files have the same name and you cannot distinguish between them.

To allow the rerun of a IBM Workload Scheduler job that uses the Tivoli® Storage Manager extended agent, the Tivoli® Storage Manager schedule must be deleted after its completion, otherwise the rerun of the IBM Workload Scheduler job fails because Tivoli® Storage Manager recognizes that a schedule with the same name already exists. Make one of the following choices depending on which CLIENT option is used in the IBM Workload Scheduler job:

- Using the **CLIENTSCHED** option, the `-nodel` parameter can be used. If you pass it to the command, the job is deleted after its completion. If this argument is not passed to the command, the default behavior is that the Tivoli® Storage Manager schedule is deleted. This behavior is valid both when `-schedname` or `-schedprefix` is used and when the Tivoli® Storage Manager schedule name is automatically generated (no `-schedname` or `-schedprefix` are passed).
- Using the **CLIENT** option, the Tivoli® Storage Manager schedule is always deleted after completion.
- Using the **CLIENTACT** option, the Tivoli® Storage Manager schedule is produced automatically by Tivoli® Storage Manager itself, using an internal unique name, and it is not deleted after it has run.

How to create a job

The following sections show how to create jobs for all the classes specified in the above section. IBM Workload Scheduler shows standard output and return codes of the task that ran on its interfaces. Some jobs send the full job logs to the Tivoli® Storage Manager command line window, so you check the Tivoli® Storage Manager logs to verify that the commands ran successfully. The tsmxagent always returns the return code that the Tivoli® Storage Manager command line returns. If the return code is different from zero it is interpreted as an abend code. If you want to manage return codes different from zero you can change the x-agent jobs status using the **RCCONDSUCC** option.

Back up a database

To back up a Tivoli Storage Manager database to sequential access volumes, type the following command:

```
ADMIN DBBACKUP devclass=DEVCLASS [optional_parms]
```

where:

DEVCLASS

Specifies the name of the sequential access device class to use for the backup.

optional_parms

> Specifies the optional parameters supported by the Tivoli Storage Manager.

Back up sequential volume history information

To back up sequential volume history information to one or more files, type the following command:

```
ADMIN VHBACKUP [optional_parms]
```

where:

> **optional_parms**
>
> > Specifies the optional parameters supported by the Tivoli® Storage Manager.

Back up IBM® Tivoli® Storage Manager device information

To back up IBM® Tivoli® Storage Manager device information to one or more files, type the following command:

```
ADMIN DCBACKUP [optional_parms]
```

where:

> **optional_parms**
>
> > Specifies the optional parameters supported by the Tivoli® Storage Manager.

Delete volume history file records

To delete volume history file records that are no longer needed (for example, records for obsolete database backup volumes), type the following command:

```
ADMIN DELVOLHIST type=TYPE todate=TODATE [optional_parms]
```

where:

> **TYPE**
>
> > Specifies the type of records, which also meet the date and time criteria, to delete from the volume history file. You must specify the parameters in the order shown. For details about the possible values see *IBM® Tivoli® Storage Manager: Administrator's Reference*.

> **TODATE**
>
> > Specifies the date to use to select sequential volume history information to be deleted. Tivoli® Storage Manager deletes only those records with a date on or before the date you specify. You can specify the date using the following format: MM/DD/YYYY.

> **optional_parms**
>
> > Specifies the optional parameters supported by the Tivoli® Storage Manager.

Start inventory expiration processing

To start inventory expiration processing, type the following command:

```
ADMIN EXPIREINV [optional_parms]
```

where:

optional_parms

Specifies the optional parameters supported by the Tivoli® Storage Manager. For details, see *IBM® Tivoli® Storage Manager: Administrator's Reference*.

Run any other administrating task

To run any other administrating task:

```
ADMIN [TSM_command]
```

where:

TSM_command

Specifies the command supported by the Tivoli® Storage Manager. For details, see the *IBM® Tivoli® Storage Manager Administrator's Reference*.

Schedule a client backup

To schedule a client backup, type the following commands:

- ```
  CLIENT DOMAIN SCHEDULE CLIENT [optional_parms]
  ```

  For details about optional parameters (*optional_parms*), see the *IBM® Tivoli Storage Manager Administrator's Reference* guide.

- ```
  CLIENTSCHED -action <action name> -domain <policy domain>
  -node <TSM node name> [-polling <value>] [-script <value>]
  [-timeout <value>] [-schedname  TSM schedule name> | -schedprefix
   <TSM prefix schedule name>] [-nodel] [--  <TSM options>]
  ```

- ```
  CLIENTACT -action <action name> [-domain <policy domain> ]
  [-node <TSM node name>] [-script <value>] [--  <TSM options>]
  ```

> **Note:** For the parameter descriptions see Table 23: Positional client backup task syntax table on page 97 and Table 24: Parameter client backup task syntax table on page 98.

Chapter 6. Tivoli® System Automation for Multiplatforms

How IBM Workload Automation integrates with Tivoli® System Automation for Multiplatforms.

The recovery features of Tivoli® System Automation for Multiplatforms reduce downtime that can be caused by various kinds of problems. You achieve high availability by applying the automation policies where you define common relationships between the various components. As a result, the overall time that is required to recover from an outage is significantly improved.

IBM Workload Scheduler consists of multiple built-in high-availability features that you use to switch components to other workstations in the IBM Workload Scheduler network. When combined with Tivoli® System Automation for Multiplatforms, the recovery operations:

- Are regulated by a third-party, which has more insight into the state of all critical components in the IBM Workload Scheduler network.
- Are issued in an automatic fashion, while maintaining dependencies and relationships between all components.
- Require less time, compared with a manual failover of all components.

For more information about how to integrate IBM Workload Scheduler with Tivoli® System Automation for Multiplatforms, please refer to Automation Hub, a new automation command center that empowers your IBM Workload Scheduler by continuously delivering new plug-ins.

Chapter 7. Integrating Dynamic workload broker with Tivoli Provisioning Manager

How dynamic workload broker integrates with Tivoli Provisioning Manager version 7.1.1.

Tivoli Provisioning Manager is an automated resource management solution for corporate and Internet data centers. Through orchestrated provisioning, it provides the ability to manage the IT environment in real time, according to defined business policies, to achieve the desired business goals. Using this integration you can interact with Tivoli Provisioning Manager to dynamically create the resource necessary to run your workload in your IT environment. In this way you can:

- Ensure that during peak periods the jobs in the critical path are run in the required time frame.
- Automatically transfer entire workloads and update policies across multiple platforms.
- Assign to the job the appropriate resources that it needs to run, based on the job requirements and on the administration polices.
- Optimize the use of the resources by assigning to the job the required resources based on the SLA.
- Manage and control the resource usage and load.
- Dispatch jobs to target resources that meet the requirements to run the job.
- Respond to any unexpected and unplanned-for demands; individual jobs can be added ad hoc to the scheduling plan at any time.

The integration with Tivoli Provisioning Manager can be installed when installing the dynamic workload broker server. For more information about installing the Tivoli Provisioning Manager enablement, see *Tivoli Provisioning Manager Installation and Configuration Guide.*

For the most up-to-date information about supported product versions, run a dynamic Data Integration report from the Software Product Compatibility Reports web site: Data Integration.

Configuring the integration with Tivoli Provisioning Manager

The TPMConfig.properties file defines the integration with Tivoli Provisioning Manager and is created when the extension is installed. You can modify the file. Restart the WebSphere® Application Server to implement the changes.

The TPMConfig.properties file is installed in the following path:

installation_directory/`config`

The following parameters are available in the TPMConfig.properties file:

TPMAddress.hostname

Specifies the host name of the Tivoli Provisioning Manager server to be used when running the recovery action.

TPMAddress.port

Specifies the port number of the Tivoli Provisioning Manager server to be used when running the recovery action.

TPM.user

> Specifies the user name of a user with the authority to run workflows.

TPM.pwd

> Specifies the password for the user to be used when running a Tivoli Provisioning Manager workflow.

The parameters defined in this file can be overwritten in a single job when creating the job with the Job Brokering Definition Console. For more information, see the online help for the **Scheduling** page.

Log and trace information for this integration is stored in the WebSphere® Application Server logs and traces, stored in the following path: *WAS_profile_root* /AppSrv01/logs/ server1.

Chapter 8. Integrating with HCL BigFix

IBM Workload Scheduler integrates with HCL BigFix on all supported operating systems.

HCL BigFix provides unified, real-time visibility and enforcement to deploy and manage upgrades to all endpoints from a single console.

For more information about upgrading IBM Workload Scheduler using HCL BigFix, see the topic about Upgrading agents using HCL BigFix in the *Planning and Installation Guide*.

For the most up-to-date information about supported product versions, run a dynamic Data Integration report from the Software Product Compatibility Reports web site: Data Integration.

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