IBM Workload Scheduler

Planning and Installation

Version 9 Release 4

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Note
Before using this information and the product it supports, read the information in "Notices" on page 441.

This edition applies to version 9, release 4, 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

Figures

Tables

About this publication

About this task

This *IBM Workload Scheduler Planning and Installation* provides information for planning, installing, migrating, and configuring an IBM Workload Scheduler network.

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 http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048863 and the Dynamic Workload Console Release Notes at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048864.

= New or changed content is marked with revision bars. For the PDF format, new or
= changed V9.4 content is marked in the left margin with a pipe (|) character and
= new or changed V9.4FP1 content is marked with an equal sign (=).

Who should read this publication

Learn the audience of this publication.

About this task

This guide is intended for the following audience:

- IBM Workload Scheduler IT administrators who plan for and install the network
- Dynamic Workload Console IT administrators who plan for and install the product
- Specialists who plan the network topology
- IT administrators who install the network
- System architects

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*.

Part 1. Planning

An overview of the IBM Workload Automation environment and describes how to plan for the installation.

Chapter 1. Known problems and limitations

For information about installation limitations, problems, and their workarounds see the IBM Workload Scheduler release notes: http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048863 and the Dynamic Workload Console release notes: http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048864.

Chapter 2. Network planning

Network planning on IBM Workload Automation.

About this task

How to plan your IBM Workload Scheduler network.

IBM Workload Scheduler environment

A IBM Workload Scheduler network consists of a set of linked workstations on which you perform job processing. A network is composed of one or more domains, each having a *domain manager* workstation acting as a management hub, and one or more *agent* workstations.

About this task

Using IBM Workload Scheduler you can run your workload in one of the following ways:

Statically
To run existing job types, for example docommand and scripts on specific workstations of fault-tolerant agent or standard agent type.

Dynamically
To run existing job types and job types with advanced options, allowing the product to assign it to the workstation that best meets both the hardware and software requirements needed to run it.

Job types with advanced options are both those supplied with the product and the additional types implemented through the custom plug-ins. For example, those supplied with the product are DB2®, file transfer, and web services. Those implemented through the custom plug-ins are the ones you developed using the Integration Workbench of the Software Development Kit (SDK).

Depending on how you want to run your workload you have to install and configure different components in your network.

Figure 1 on page 6 gives a graphical overview of a typical IBM Workload Scheduler environment to run static workload:

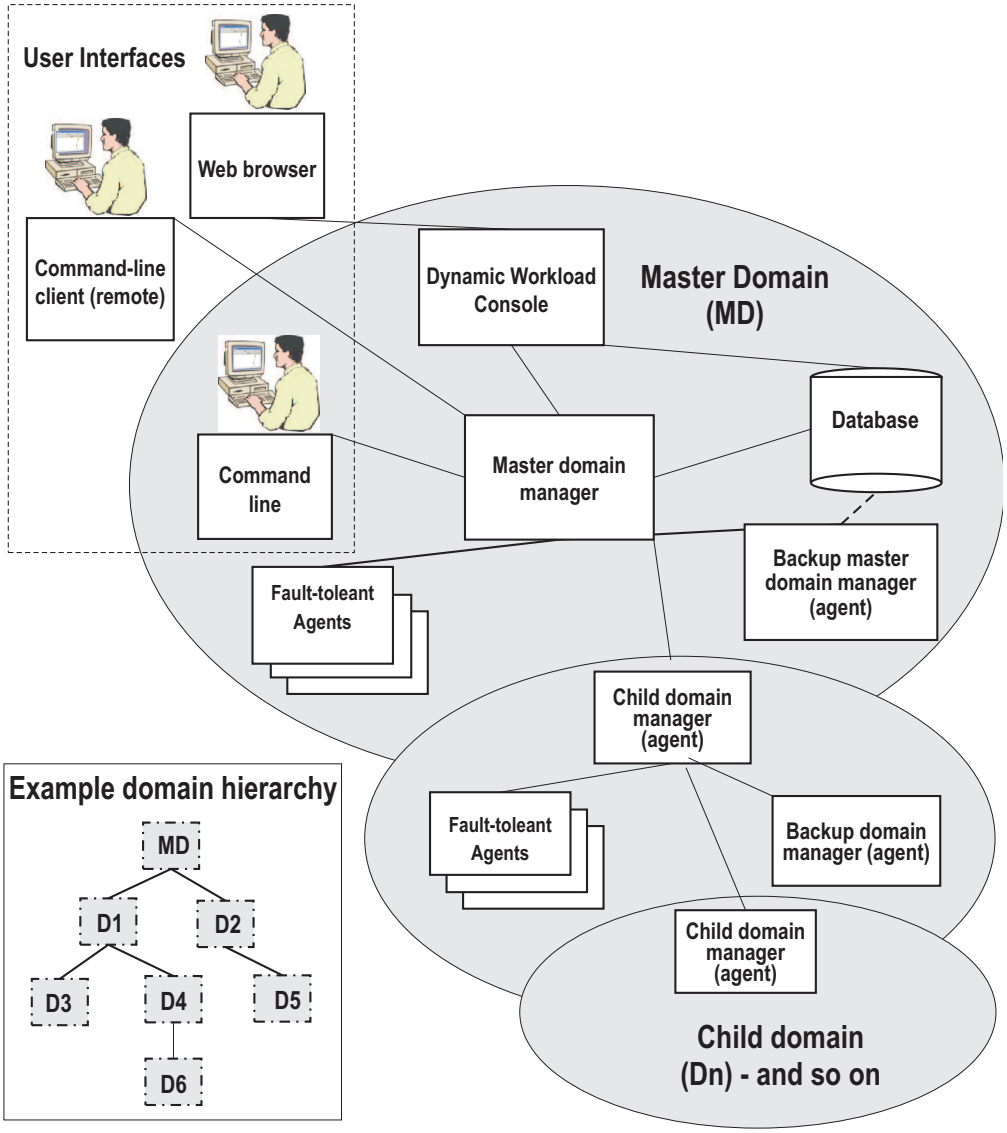


Figure 1. Graphical overview of IBM Workload Scheduler environment to run static workload

In Figure 1 the master domain is shown with the principle components to run workload statically, and two levels of subdomain. The available user interfaces are also indicated. An example is provided of the basic domain hierarchical structure, where each domain is named "D1", "D2, and so on. All of these concepts are explained in the following section:

To run your workload statically install the following components:

Master domain manager

The master domain manager is the highest level workstation of a IBM Workload Scheduler network. It contains or connects to the relational database that stores scheduling object definitions. It creates or updates a production file when the plan is created or extended and then distributes the file to the network. It performs all logging and reporting for the network. It can perform the role of event processing server for the event-driven workload automation feature.

Backup master domain manager

Define a backup master domain manager at installation to point to either the database being used by the master domain manager or to a mirror of that database. In this way the backup master domain manager has the latest data available to it at all times.

Domain manager
Install this component if you need a multi-domain network and you want to manage workload by assigning it to a predefined workstation that is to run your workload statically. In a multi-domain network all domains below the master domain have fault-tolerant agents configured to be a domain manager to manage the workstations in its domain. A domain manager can manage fault-tolerant, standard, and extended agents. Each domain manager is a fault-tolerant agent in the domain of the next higher level. To define a domain manager, install a fault-tolerant agent on your workstation and then define it as **manager** in the workstation definition.

Backup domain manager
Install this component if you want a backup to your domain manager. If your domain manager experiences problems, you can configure any fault-tolerant agent as the domain manager and switch to it with a simple procedure.

Agent An agent is a workstation in the network that runs the jobs which are controlled by the IBM Workload Scheduler master domain manager. After installing an agent, you define its type by using the workstation definition.

Fault-tolerant agent
An fault-tolerant agent can resolve local dependencies and launch jobs in the absence of a domain manager. It has a copy of the production control file. This allows fault-tolerant agents to continue processing even if the dynamic domain manager or the network connection is down. With a simple reconfiguration, they can serve as subordinate *domain managers*. To define a fault-tolerant agent, install a fault-tolerant agent on your workstation and then define it as fault-tolerant in the workstation definition.

Standard agent
An agent that launches jobs only under the direction of its domain manager. It is not fault-tolerant. To define a standard agent, install a fault-tolerant agent on your workstation and then define it as a standard agent in the workstation definition.

Extended agent
Extended agents are logical definitions (hosted by a physical workstation) used to extend job processing to selected applications (SAP R/3, PeopleSoft, and z/OS®). For information about installing an extended agent, see *IBM Workload Automation: Scheduling Applications with IBM Workload Automation*.

Note: All agents with special roles (master domain manager, backup master domain manager, domain manager, backup domain manager) can also work as fault-tolerant agents with jobs scheduled on them.

Figure 2 on page 8 gives a graphical overview of a typical IBM Workload Scheduler environment to run dynamic workload:

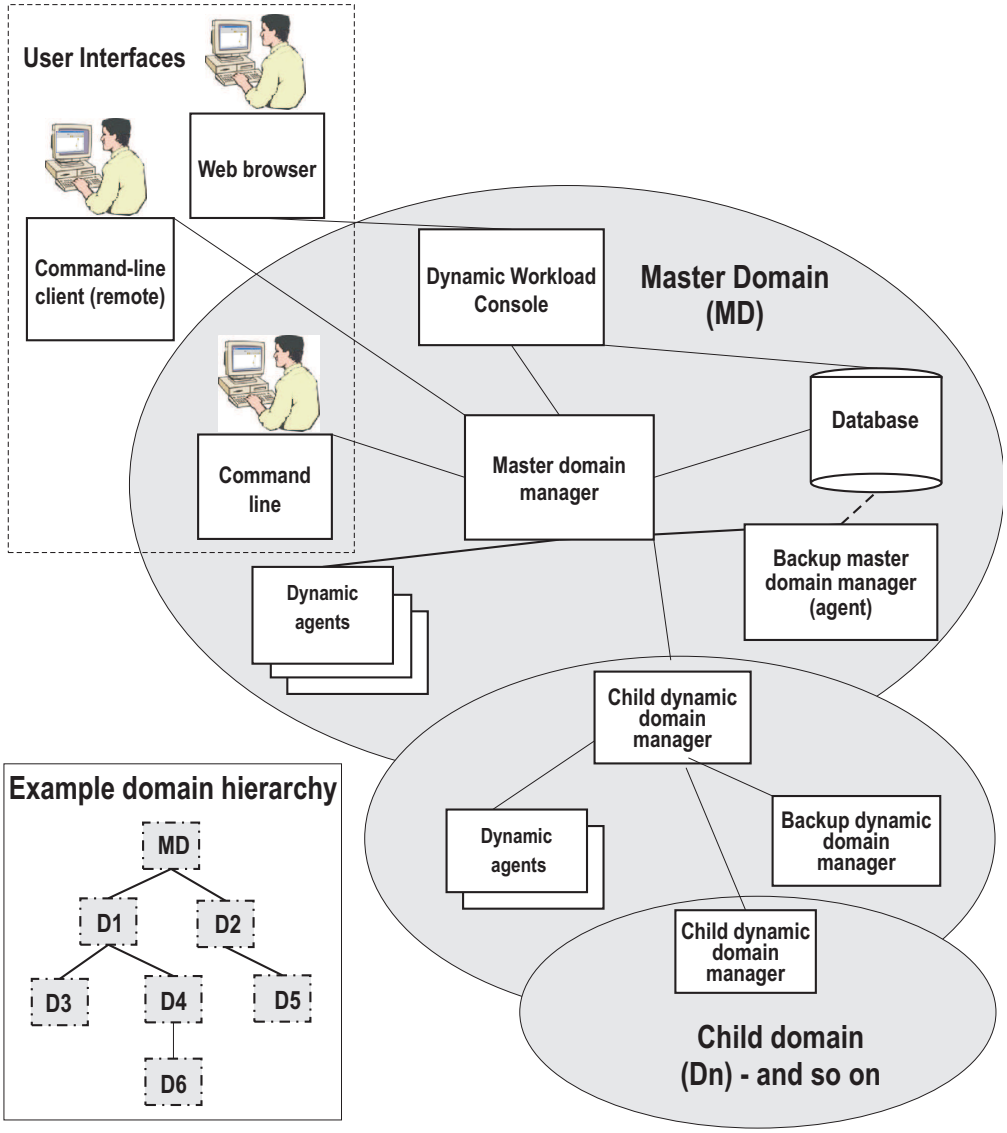


Figure 2. Graphical overview of IBM Workload Scheduler dynamic environment

In Figure 2 the master domain is shown with the principle components to run workload dynamically, and two levels of dynamic subdomain. The available user interfaces are also indicated. An example is provided of the basic domain hierarchical structure, where each domain is named "D1", "D2, and so on. All of these concepts are explained in the following section.

If you want to run your workload dynamically install the following components:

Master domain manager

The master domain manager is the highest level workstation of a IBM Workload Scheduler network. It contains or connects to the relational database that stores scheduling object definitions. It creates or updates a production file when the plan is created or extended and then distributes the file to the network. It performs all logging and reporting for the network. It can perform the role of event processing server for the event-driven workload automation feature.

Backup master domain manager

Define a backup master domain manager at installation to point to either the database being used by the master domain manager or to a mirror of that database. In this way the backup master domain manager has the latest data available to it at all times.

Dynamic Domain manager
Install this component if you need a multi-domain network and you want to manage your workload both statically that dynamically. All domains below the master domain have dynamic domain managers to manage the workstations in its domain. Each dynamic domain manager is an agent in the domain of the next higher level. To define a dynamic domain manager, install a dynamic domain manager and then perform the "Configuring a dynamic domain manager" on page 241 procedure.

Backup dynamic domain manager
Install this component if you want a backup to your dynamic domain manager. If your dynamic domain manager experiences problems, you can switch to it with a simple procedure.

Agent An agent is a workstation in the network that runs the jobs which are controlled by the IBM Workload Scheduler master domain manager.

Dynamic agent
An agent that has the following capabilities:

Run workload dynamically
It communicates with the server the status of its resources. In this way the product is able to dynamically run your workload to the best available resources by:
- Automatically discovering scheduling environment resources.
- Automatically following resource changes
- Requesting additional resources when needed
- Matching job requirements to available resources
- Controlling and optimizing use of resources

The characteristics listed above provide high availability and load balancing potentialities to your environment and well suit virtualized environments.

When a job is submitted, either as part of a job stream in the plan or through ad hoc submission, IBM Workload Scheduler checks the job requirements, the available resources and the related characteristics and submits the job to the resource that best meets the requirements to run it.

Run both existing job types and job types with advanced options
It can run:
- Existing job types. For example docommand and scripts.
- Job types with advanced options, both those supplied with the product and the additional types implemented through the custom plug-ins. For example, those supplied with the product are DB2, file transfer, and web services. Those implemented through the custom plug-ins are the ones you developed using the

Integration Workbench of the Software Development Kit (SDK). To run these job types you must also install the Java™ run time.

Manage dynamic workload broker logical resource
It can remotely run, from the agent, the dynamic workload broker **resource** command on the server. To manage the **resource** command you must also install the Java run time.

After installing the agent, you define its type by using "Configuring a dynamic agent" on page 243.

In a simple configuration, dynamic agents connect directly to the master domain manager or to the dynamic domain manager. However, in more complex network topologies, if the network configuration prevents the master domain manager or the dynamic domain manager from directly communicating with the dynamic agent, for example, if the agents are behind a firewall and need to communicate through the internet, or if they need to communicate with a Network Address Translation (NAT) process, then you can configure your dynamic agents to use a local or remote gateway. In this way, communication is concentrated in a single connection, reducing the number of connections to the master domain manager or to the dynamic domain manager. For more information about the gateway parameters specified when installing a dynamic agent, see "Agent installation parameters - twsinst script" on page 143. For more information about gateway configuration, see the network communications information in the *Administration Guide*.

Extended agent
Extended agents are logical definitions (hosted by a physical workstation) used to extend job processing to selected applications (SAP R/3, PeopleSoft, and z/OS). For information about installing an extended agent, see *IBM Workload Automation: Scheduling Applications with IBM Workload Automation*.

IBM Workload Scheduler interfaces

The IBM Workload Scheduler has user interfaces from which you can manage your production environment.

About this task

You can manage your production environment from the following user interfaces:

Master domain manager command lines
The master domain manager command lines are installed automatically when you install the master domain manager. This command lines interface are run only from the workstation serving as the master domain manager. From the command lines, you can administer the master specific binaries and options. A backup master domain manager command lines also exist on the master domain manager configured as backup instance.

Dynamic Workload Console
The web-based interface for creating, modifying, monitoring, controlling, and deleting IBM Workload Scheduler objects. You can interface with the console from any system in the network where a supported web browser is installed. When you install a Dynamic Workload Console also the **z/OS**

Connector is installed, which is a component that connects IBM Workload Scheduler for z/OS and the Dynamic Workload Console. For more information, see *IBM Workload Scheduler for z/OS: Planning and Installation Guide*.

Command-line client
A component of IBM Workload Scheduler installed only with a fault-tolerant agent that allows you to implement the following commands on the master domain manager from another workstation: The commands you can use are the following:

- Composer
- Optman
- Planman showinfo and unlock (the other planman commands must be run locally on the master domain manager)

dynamic workload broker command line
Installed and configured automatically when you install a master domain manager. It includes commands to directly submit and manage jobs for dynamic scheduling, manage job JSDL definitions and resources, and more. See *IBM Workload Scheduler: Scheduling Workload Dynamically* for reference.

Job Brokering Definition Console
A structured editing tool that you use to create and modify Job Submission Description Language (JSDL) files. These files are saved in the Job Repository as job definitions and become available for submission. The JSDL files adhere to the XML syntax and semantics as defined in the JSDL schema. For more information, see the *IBM Workload Scheduler: User's Guide and Reference, SC32-1274*.

For a more detailed description of the IBM Workload Scheduler components, see *IBM Workload Automation: Overview*.

Planning the environment

Typical installation scenarios for products and components.

These typical scenarios for IBM Workload Automation show how to deploy specific solutions on the minimum possible system resources.

Distributed workload environment with static scheduling capabilities

Configuration to run workload statically across your distributed network.

Use this configuration to run workload statically across your distributed network. Figure 3 on page 12 shows the system resources needed to install a fully-working IBM Workload Scheduler environment for managing your distributed workload.

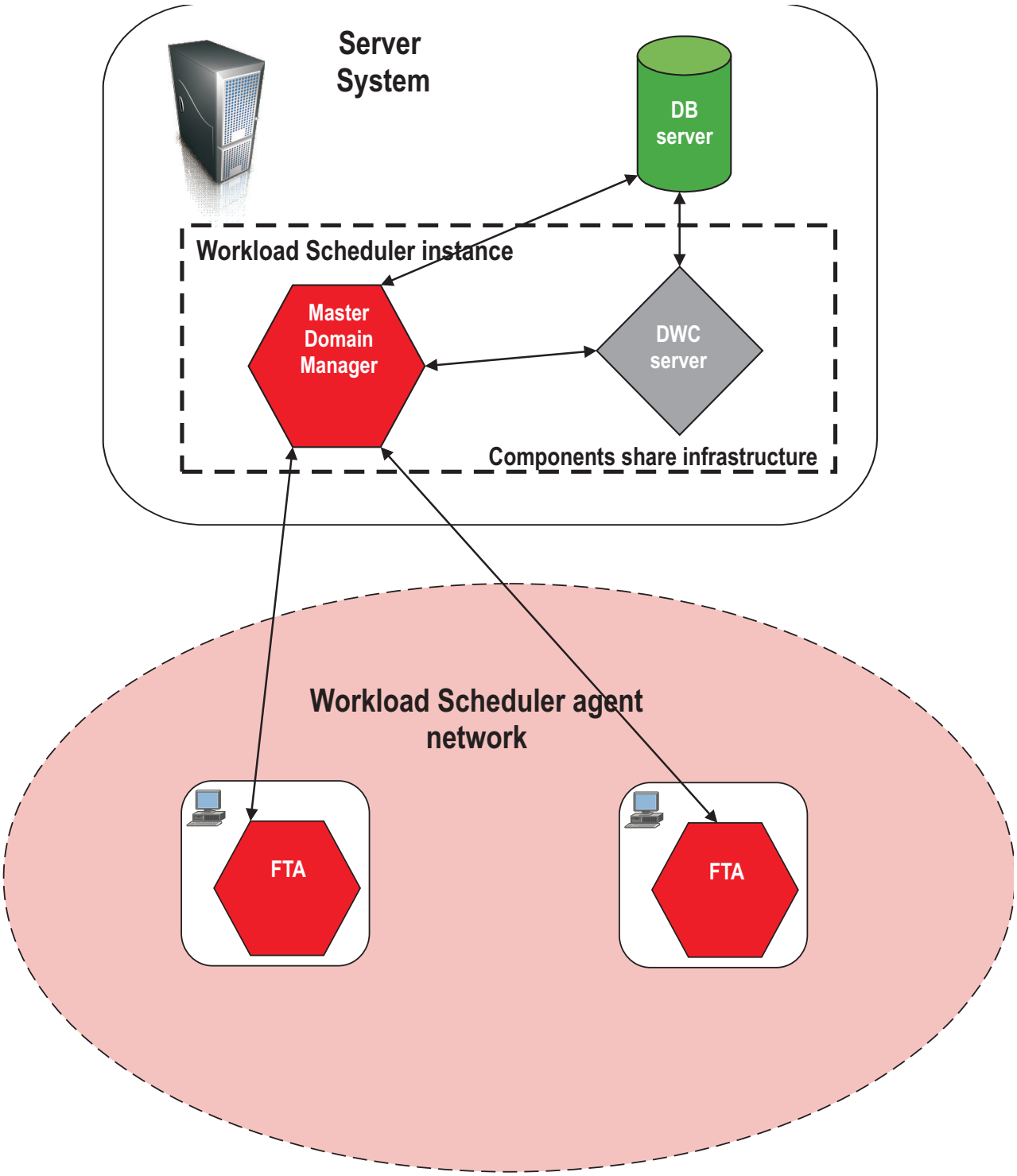


Figure 3. Distributed workload environment with static scheduling capabilities

Distributed workload environment with dynamic scheduling capabilities

Use this configuration to run workload dynamically across your distributed network.

The run time environment is used to:

- Run on the agent job types with advanced options, both those supplied with the product and the additional types implemented through the custom plug-ins.
- Enable the capability to remotely run, from the agent, the dynamic workload broker resource command on the server.

For information about dynamic scheduling, how to run application job plug-ins and the dynamic workload broker resource command on the server, see *IBM Workload Scheduler: Scheduling Workload Dynamically*.

In this configuration, you can choose whether or not to add the run time environment for Java jobs to the agent.

Figure 4 on page 14 shows the system resources required to install a fully working IBM Workload Scheduler environment for running your distributed workload dynamically.

Note: A dynamic agent can be directly connected to its master domain manager or through a dynamic domain manager as shown in "Distributed workload environment with static and dynamic scheduling capabilities" on page 15. In more complex network topologies where the master domain manager or the dynamic domain manager cannot directly communicate with the dynamic agent, you can configure your dynamic agents to use a local or remote gateway. For more information about the gateway parameters specified when installing a dynamic agent, see "Agent installation parameters - twsinst script" on page 143. For more information about the gateway parameters specified when installing a dynamic agent, see "Agent installation parameters - twsinst script" on page 143.

For more information about gateway configuration, see the network communications information in the *Administration Guide*.

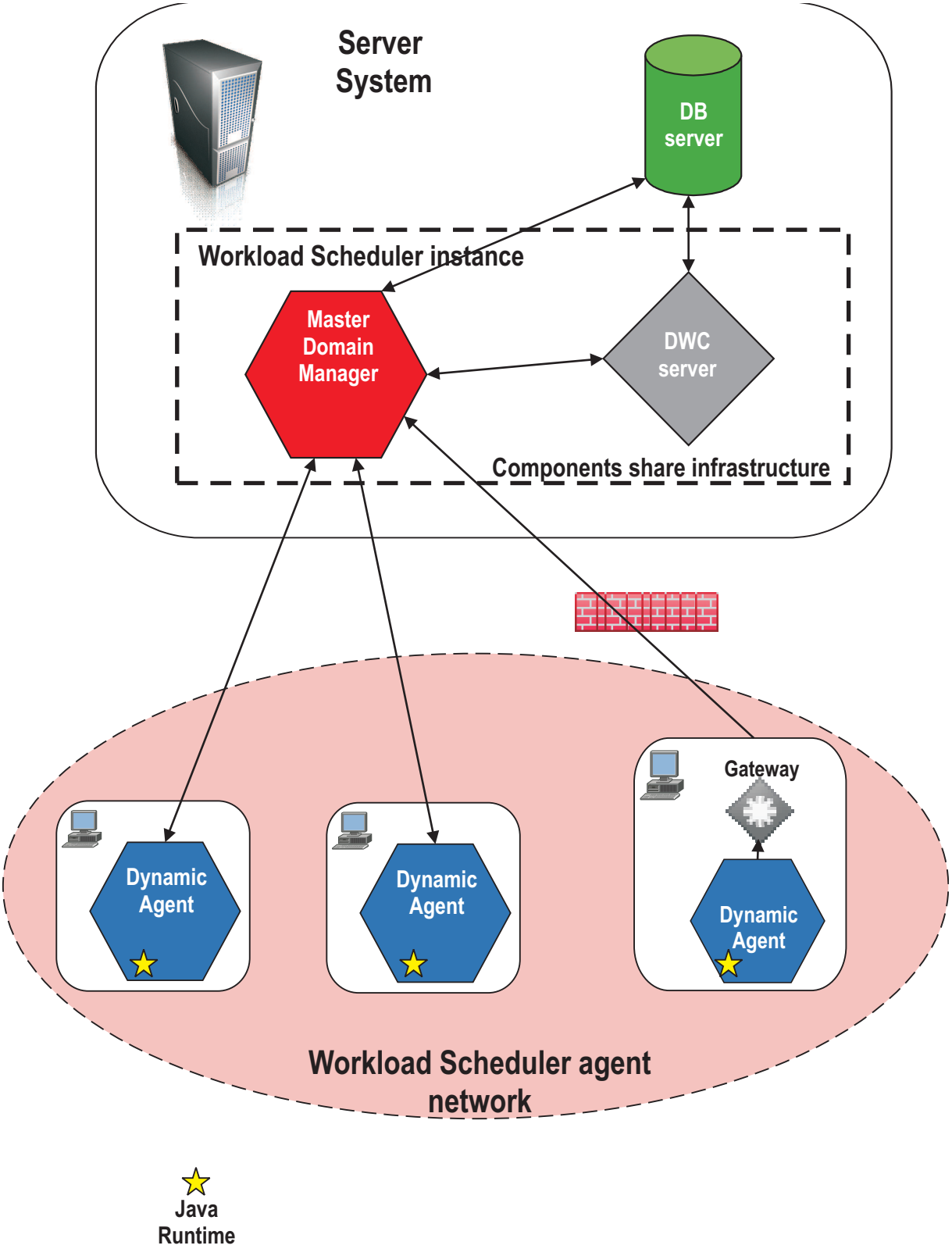


Figure 4. Distributed workload environment with dynamic scheduling capabilities

Dynamic scheduling supports most of the IBM Workload Scheduler features for static scheduling. The Table 1 on page 15 lists some features or properties that are partially or not supported.

Table 1. Features partially or not supported for dynamic scheduling

Feature	agent and IBM Workload Scheduler for z/OS agent
Event-driven workload automation. **Note:** For more details about the events type, see *IBM Workload Scheduler User's Guide and Reference: Appendixes - Event-driven workload automation event and action definitions*	`TivoliWorkloadSchedulerObjectMonitor` events supported.
	`FileMonitor` events supported, except for IBM i systems.
	`TivoliWorkloadSchedulerApplicationMonitor` events not supported.
Utility commands (datecalc, jobinfo, and so on).	Not supported.

Distributed workload environment with static and dynamic scheduling capabilities

Use this configuration to run workload both statically and dynamically across your distributed network.

The run time environment is used to:

- Run on the agent job types with advanced options, both those supplied with the product and the additional types implemented through the custom plug-ins.
- Enable the capability to remotely run, from the agent, the dynamic workload broker resource command on the server.

For information about dynamic scheduling, how to run application job plug-ins and the dynamic workload broker resource command on the server, see *IBM Workload Scheduler: Scheduling Workload Dynamically*.

In this configuration, you can choose whether or not to add the run time environment for Java jobs to the agent.

Figure 5 on page 16 shows the system resources required to install a fully working IBM Workload Scheduler environment for running your distributed workload both statically and dynamically. IBM Workload Scheduler requires a fault-tolerant agent and a dynamic agent to be installed on every system where jobs are to scheduled statically or dynamically.

Note: A dynamic agent can be directly connected to its master domain manager or through a dynamic domain manager as shown in Figure 5 on page 16. In more complex network topologies where the master domain manager or the dynamic domain manager cannot directly communicate with the dynamic agent, you can configure your dynamic agents to use a local or remote gateway. For more information about the gateway parameters specified when installing a dynamic agent, see "Agent installation parameters - twsinst script" on page 143.

For more information about gateway configuration, see the network communications information in the *Administration Guide*.

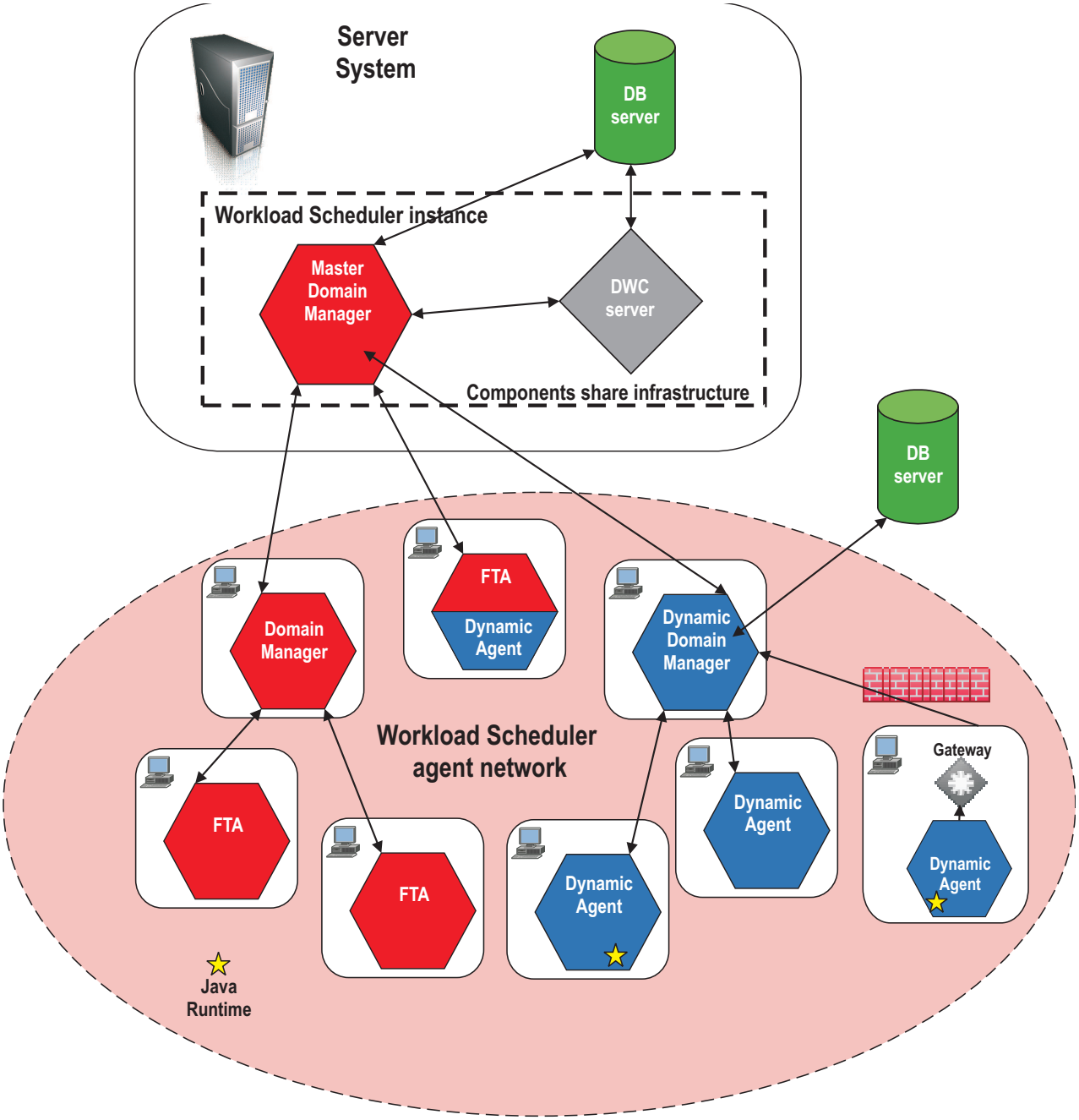


Figure 5. Distributed workload environment with static and dynamic scheduling capabilities

For a list of features partially or not supported in a mixed environment, see Table 1 on page 15.

End-to-end workload environment

In an End-to-end workload environment (agent connected to the z/OS system), you can define the types of configurations.

You can define the following types of configurations:

To run your workload statically:

Using fault-tolerant agents

Use the fault-tolerant end-to-end scheduling environment to schedule and control static workload from the mainframe to distributed systems. On the distributed system, you install fault-tolerant agents and connect them to the z/OS server. See *IBM Workload Scheduler for z/OS: Scheduling End-to-end with Fault Tolerance Capabilities* for more details.

Using IBM Workload Scheduler for z/OS Agents (z-centric)

Use the z-centric end-to-end scheduling environment to schedule and control static workload from the mainframe to distributed systems with a low cost of ownership. On the distributed system, you install IBM Workload Scheduler for z/OS Agents and connect them to the z/OS controller. For information about how to install it see *IBM Workload Scheduler for z/OS: Planning and Installation Guide* for information about how to use it see *IBM Workload Scheduler for z/OS: Scheduling End-to-end with z-centric Capabilities* for more details.

To run your workload dynamically:

Using IBM Workload Scheduler for z/OS Agents (z-centric) with dynamic capabilities

Use the z-centric end-to-end scheduling environment to schedule and control dynamic workload from the mainframe to distributed systems with a low cost of ownership. On the distributed system, you install IBM Workload Scheduler for z/OS Agents , add dynamic scheduling capabilities and connect them to a dynamic domain manager that must be connected to the z/OS controller. For information about how to:

- Install a dynamic domain manager see "Installing a dynamic domain manager or its backup" on page 122
- Install IBM Workload Scheduler for z/OS agents see *IBM Workload Scheduler for z/OS: Planning and Installation Guide*
- Use IBM Workload Scheduler for z/OS agents see*IBM Workload Scheduler for z/OS: Scheduling End-to-end with z-centric Capabilities* for more details.

Workload environment integrated with external systems

Configuration to extend IBM Workload Scheduler capabilities for scheduling on external applications.

Use this configuration to extend IBM Workload Scheduler capabilities for scheduling on external applications, such as SAP R/3 and PeopleSoft using IBM Workload Scheduler.

Figure 6 on page 18 shows a sample environment including the agents needed to extend IBM Workload Scheduler scheduling capabilities on one or more external applications using IBM Workload Scheduler. You can install IBM Workload Scheduler on the master domain manager, on a fault-tolerant agents, on dynamic agents, and on IBM Workload Scheduler for z/OS Agents.

For information about IBM Workload Scheduler, see the *IBM Workload Scheduler: User's Guide* documentation.

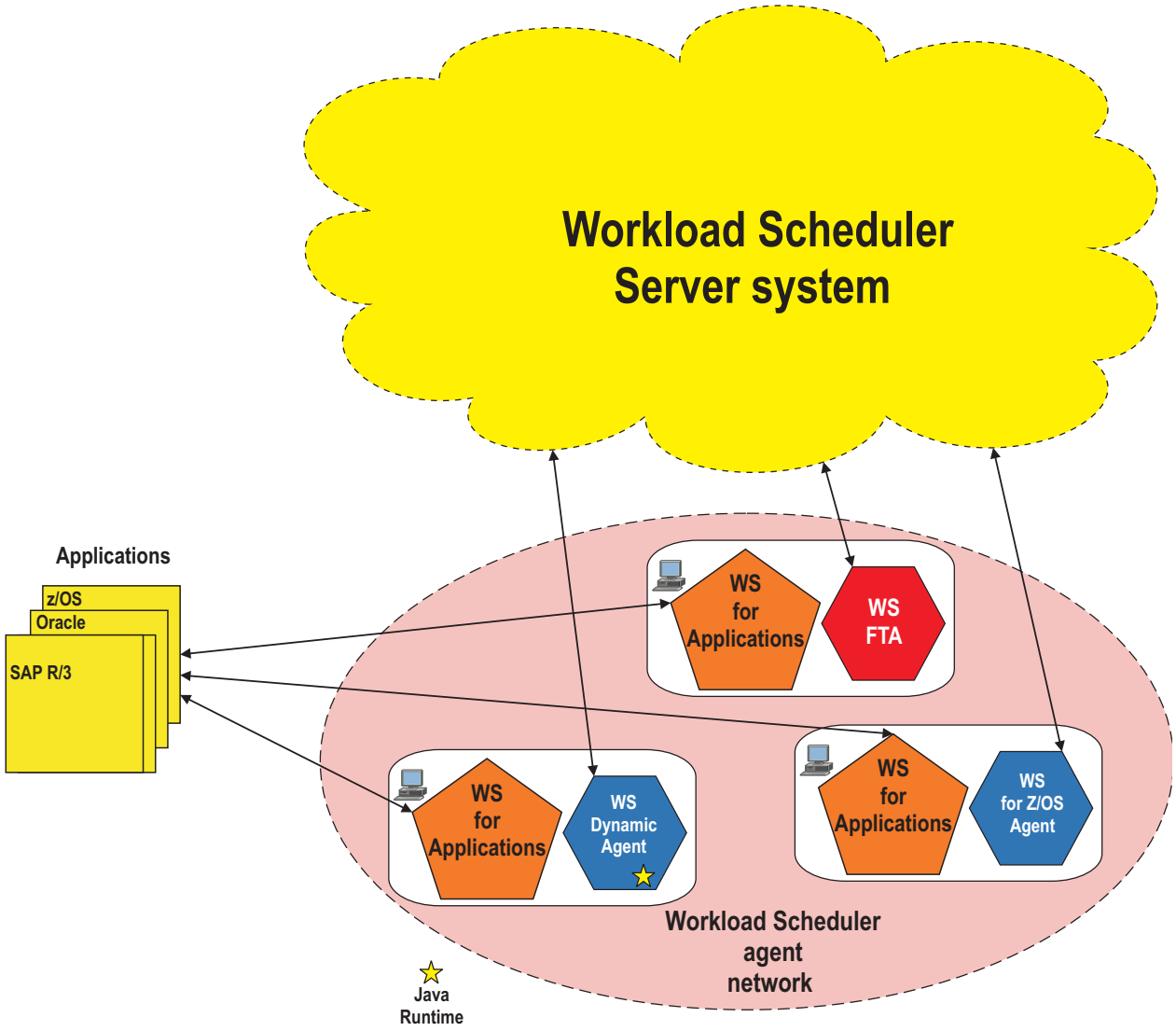


Figure 6. Workload environment integrated with external systems

Note: Installing IBM Workload Scheduler on an agent (master domain manager, domain manager, fault-tolerant agent, standard agent, dynamic agent, IBM Workload Scheduler for z/OS Agent) is the correct deployment scenario in an end-to-end environment.

Distributed-driven workload environment for z/OS

Configuration used when submitting from the IBM Workload Scheduler.

Use this configuration to submit from the IBM Workload Scheduler (using the dynamic workload broker component installed with the master domain manager or the dynamic domain manager) workload to be processed by JES2, without having to define the workload on the z/OS system.

Figure 6 shows the minimum system resources needed to install a distributed-driven environment, where the IBM Workload Scheduler

distributed-Agent for z/OS represents a lightweight end-to-end scheduling solution where you define and manage on the distributed side the workload that is to be processed by JES2.

For information about IBM Workload Scheduler distributed-Agent for z/OS, see the *IBM Workload Scheduler: Scheduling with the Agent for z/OS* documentation.

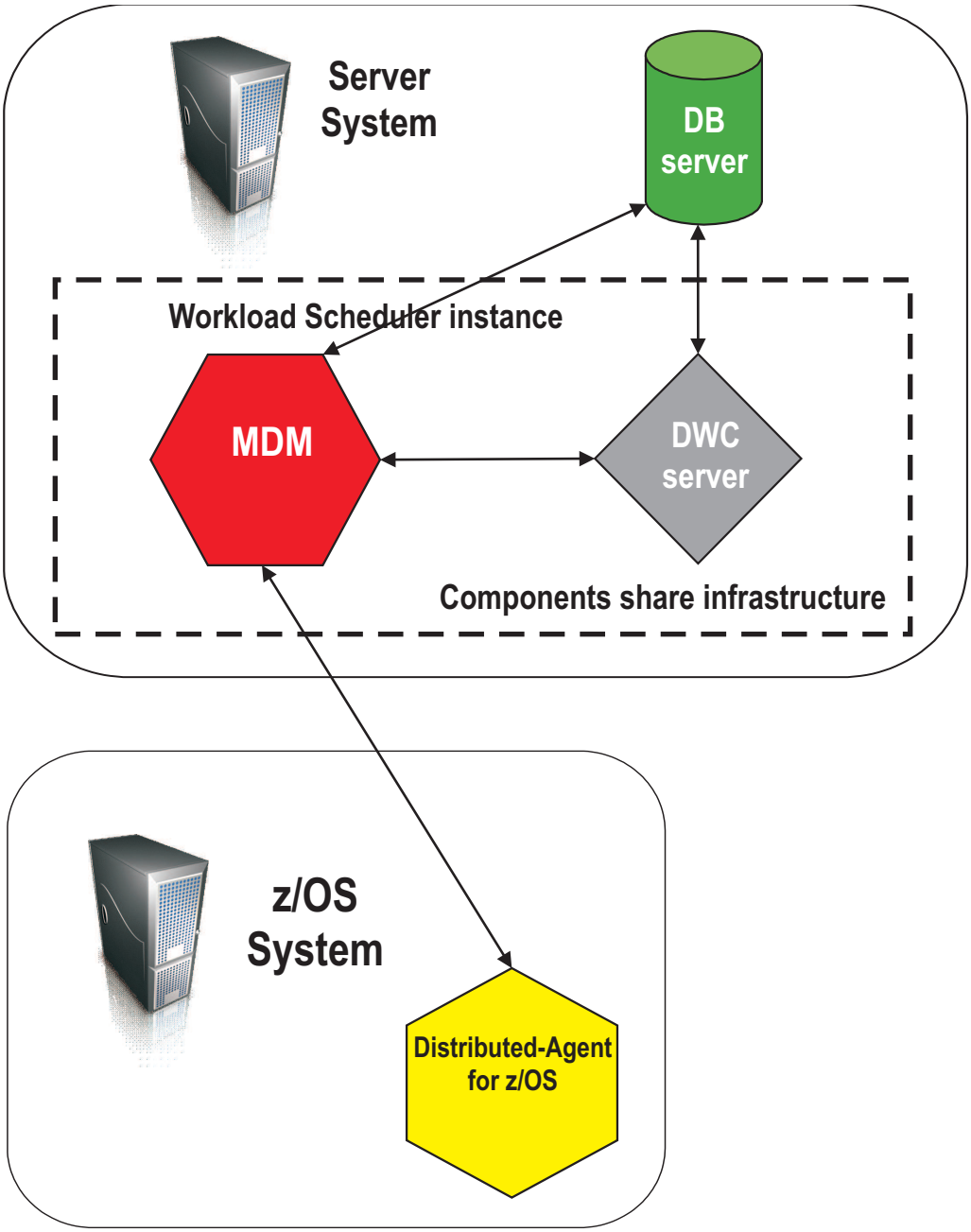


Figure 7. Distributed-driven workload environment for z/OS

Planning domains

A IBM Workload Scheduler network contains at least one master domain manager that acts as a management hub for the product. Additional domains can be used to divide a widely-distributed network into locally-managed groups of workstations.

In a single domain configuration, the master domain manager maintains communications with all of the workstations in the network.

In a multiple domain configuration, the master domain manager communicates with the workstations in its domain and all immediately subordinate domain managers. The subordinate domain managers communicate with the workstations in their domains and their immediately subordinate domain managers, and so on. Domain managers report all of the activities of the domain to the master. Using multiple domains reduces network traffic and the load on the master by reducing the number of direct communications between the master domain manager and workstations. Multiple domains also provide fault-tolerance by limiting the outage caused by losing a domain manager in a single domain. To limit the effects further, you can designate backup domain managers to take over if domain managers fail.

When you define a new domain, you must identify the parent domain and the domain manager. The parent domain is the domain directly above the new domain in the domain hierarchy. All communications to and from a domain are routed through the parent domain manager.

Localized processing in your domain

Localized processing is separating your scheduling needs based on a common set of characteristics, such as geographical locations, business functions, and application groupings.

Group related processing can limit the amount of interdependency information that needs to be communicated between domains. The benefits of localized domains are:

Decreased network traffic
Keeping processing localized to domains eliminates the need for frequent inter-domain communication.

Tighter security and simplified administration
Security and administration can be defined at and limited to the domain level. Instead of network-wide or workstation-specific administration, you can have domain administration.

Optimized network and workstation fault-tolerance
In a multiple domain network, you can define backups for each domain manager so that problems in one domain do not disrupt operations in other domains.

Considerations in planning domains

There are a number of considerations that are to be taken into account when planning domains.

In planning your IBM Workload Scheduler network, consider the following:

Number of workstations, applications, and jobs
Consider the number of workstations that comprise the network and the

number of applications and jobs that the network runs. If you have a small number of workstations, or a small number of applications to control, you do not need multiple domains.

Number of geographic locations
Consider the number of geographic locations covered by your network and the reliability and efficiency of communication between the locations. Multiple geographic locations is one of the primary reasons for choosing a multiple domain architecture. One domain for each geographical location is a common configuration. A single domain architecture relies on the network maintaining continuous processing.

Time zones
When your network is spread across multiple geographic locations in different time zones, decide whether to activate the time zone feature. See "Time zone considerations" on page 25.

Centralized or decentralized management
You can manage single or multiple domain networks from a single master domain manager. If you want to manage multiple locations separately, you can consider the installation of a separate IBM Workload Scheduler network at each location. Some decentralized management is possible in a stand-alone IBM Workload Scheduler network by mounting or sharing file systems.

Types of applications
Consider the types of applications that are run by IBM Workload Scheduler. If you have multiple applications that are distinctly separate from each other, you might choose to put them in separate domains.

Windows network
When you have a Windows network, you might want your IBM Workload Scheduler domains to mirror your Windows domains.

System performance and other criteria
You can define multiple domains to localize systems based on performance or operating system type.

Amount of network traffic
If your network traffic is manageable, having multiple domains is less important.

Dependencies between jobs
Consider if you need to plan for job dependencies that cross system boundaries, geographical boundaries, or application boundaries. For example, does the start of Job1 on workstation1 depend on the completion of Job2 running on workstation2. The degree of interdependence between jobs is an important consideration when planning your network. If you use multiple domains, try to keep interdependent objects in the same domain to decrease network traffic and improve the use of the domain architecture. See *User's Guide and Reference*.

Level of fault-tolerance required
A disadvantage of the single domain configuration is the reliance on a single domain manager. In a multi-domain network, the loss of a single domain manager affects only the agents in its domain.

Firewalls
When your network contains firewalls, plan the structure of your domains around the firewalls. See *Administration Guide*.

Secure Sockets Layer (SSL) or IBM® Global Security Kit (GSKit) encryption
If you want to use SSL or GSKit encryption in your network, plan your domains in accordance with the protocol.

Note: If you want to be compliant with Federal Information Processing Standards (FIPS), you must use GSKit. See *Administration Guide*.

Single domain network

A single domain network consists of a master domain manager and any number of agents.

Figure 8 shows an example of a single domain network. A single domain network is well-suited to companies that have few locations and business functions. All communication in the network is routed through the master domain manager. With a single location, you are concerned only with the reliability of your local network and the amount of traffic it can handle.

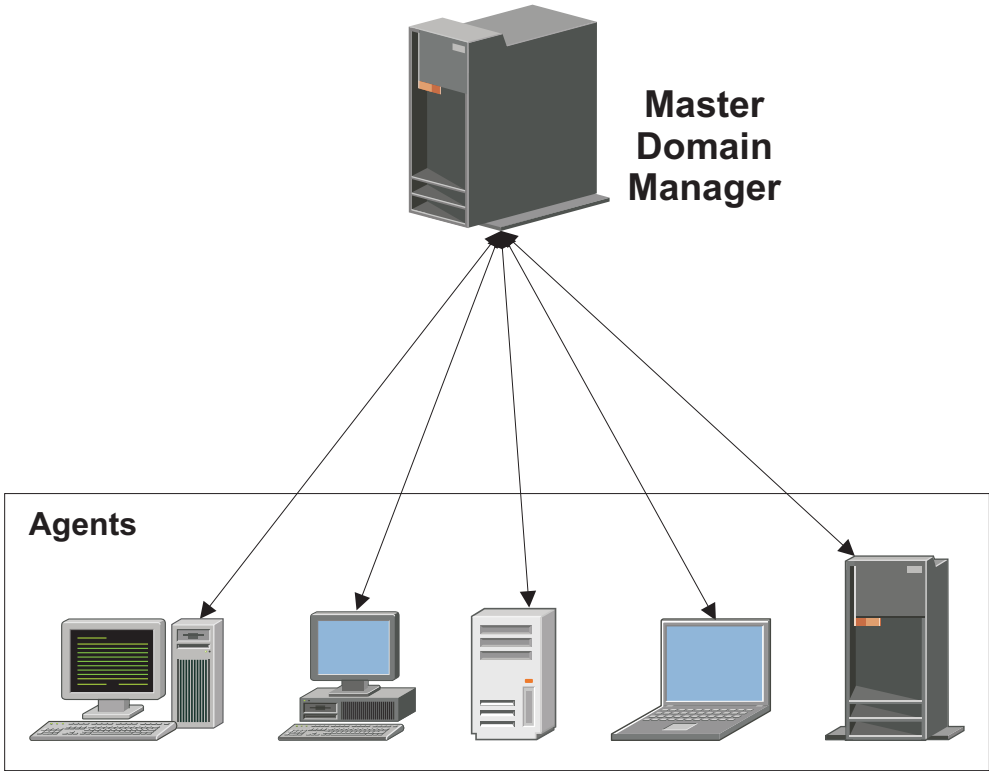
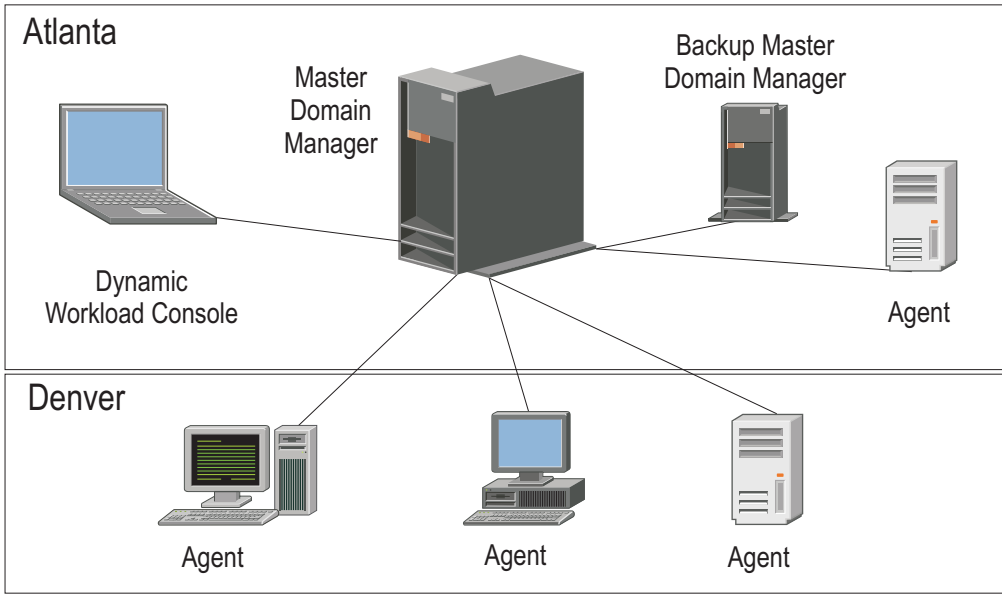


Figure 8. Single domain topology

Single domain networks can be combined with other networks, single or multiple domain, to meet multiple site requirements. IBM Workload Scheduler supports internetwork dependencies between jobs running on different networks.

Example 1



Or:

Example 2

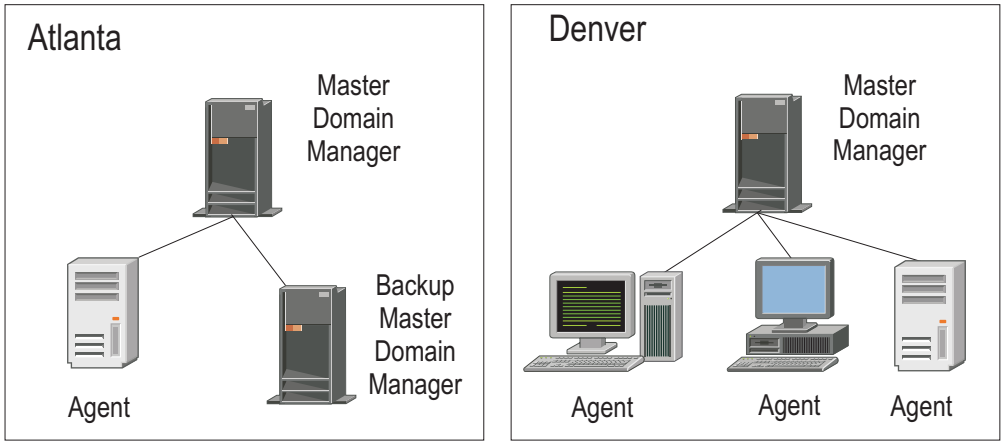


Figure 9. Single domain topology on multiple sites

Example 1 shows a single domain network. The master domain manager is located in Atlanta, along with several agents. There are also agents located in Denver. The agents in Denver depend on the master domain manager in Atlanta to resolve all interagent dependencies, even though the dependencies might be on jobs that run in Denver. An alternative would be to create separate single domain networks in Atlanta and Denver, as shown in example 2.

Multiple domain network

Multiple domain networks are especially suited to companies that span multiple locations, departments, or business functions.

A multiple domain network consists of a master domain manager, any number of lower tier domain managers, and any number of agents in each domain. Agents communicate only with their domain managers, and domain managers communicate with their parent domain managers. The hierarchy of domains can go down to any number of levels.

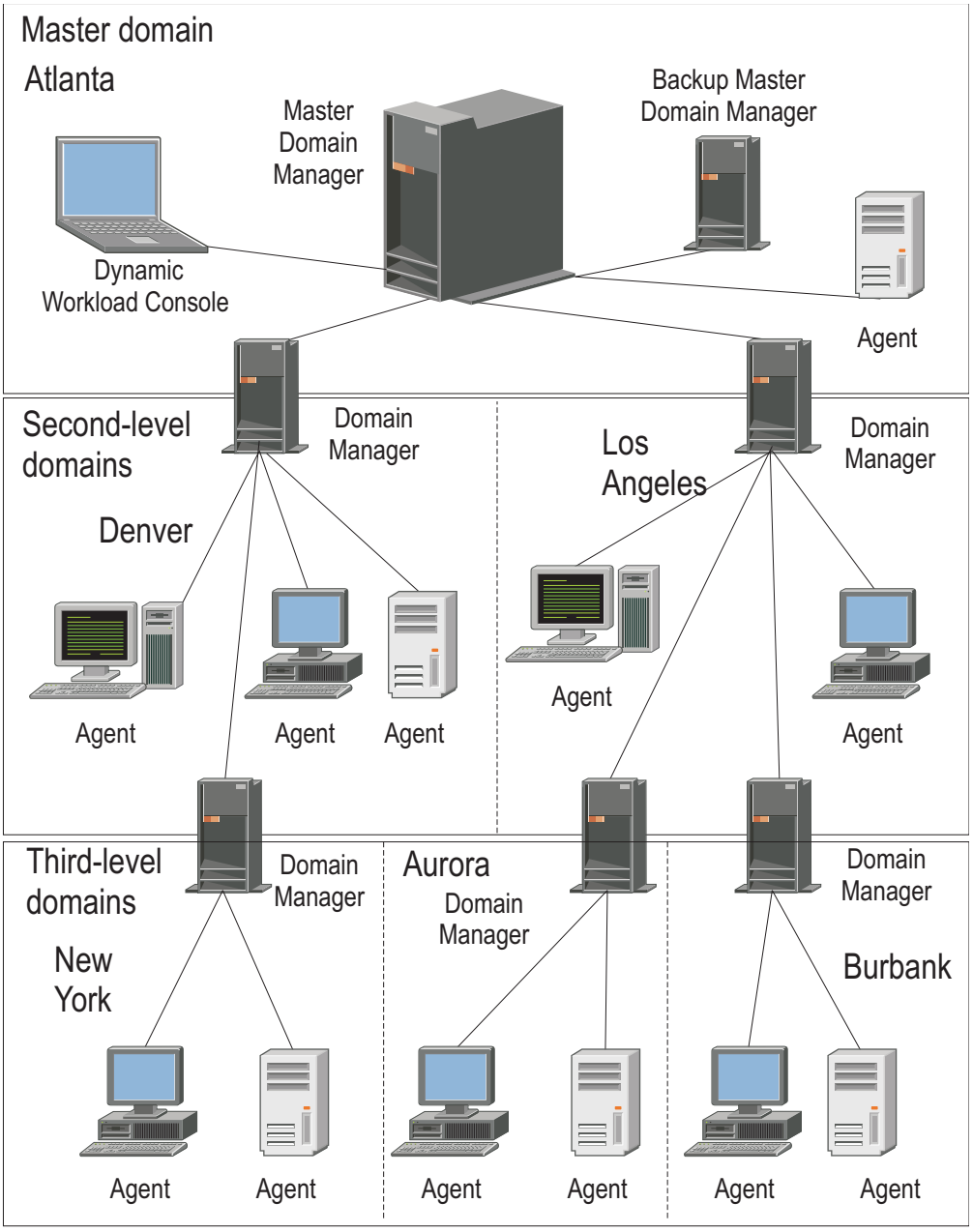


Figure 10. Multiple domain topology

As Figure 10 illustrates, the master domain manager is located in Atlanta. The master domain manager contains the database files used to document the scheduling objects, and distributes the Symphony file to its agents and the domain managers in Denver and Los Angeles. The Denver and Los Angeles domain managers then distribute the Symphony file to their agents and subordinate

domain managers in New York, Aurora, and Burbank. The master domain manager in Atlanta is responsible for broadcasting inter-domain information throughout the network.

All communication to and from the New York domain manager is routed through its parent domain manager in Denver. If there are schedules or jobs in the New York domain that are dependent on schedules or jobs in the Aurora domain, those dependencies are resolved by the Denver domain manager. Most inter-agent dependencies are handled locally by the lower tier domain managers, greatly reducing traffic on the network.

Workstation classes

Workstations are organized into domains to make your network management easier and more efficient. However, the domain name is not one of the selection criteria when choosing where to run a job or job stream.

If you want to group workstations together because they have similar job scheduling characteristics, use a workstation class. Any number of workstations can be grouped in a class, and a workstation can be in many classes. Jobs and job streams can be assigned to run on a specific workstation class.

For example, you could set up workstation classes to group workstations according to:

- Your internal departmental structure, so that you could define a job that would be run on all the workstations in a department
- The software installed on them, so that you could define a job that would be run on all the workstations that had a particular application installed
- The role of the user, so that you could define a job that would be run on all the workstations belonging to, for example, managers

In this example, an individual workstation could be in one workstation class for its department, another for its user, and several others for the software installed on it.

Time zone considerations

Time zone support is an optional feature that is enabled by default.

It allows you to manage workloads at a global level. For information about how to set the time zone, see *IBM Workload Scheduler: Administration Guide*.

Time zone implementation also enables easy scheduling across multiple time zones. For a description of how the time zone works, see the *IBM Workload Scheduler: User's Guide and Reference*.

Part 2. IBM Workload Scheduler

How to create or upgrade the IBM Workload Scheduler database tables before installing or upgrading IBM Workload Scheduler, and how to install, upgrade, configure, uninstall and troubleshoot IBM Workload Scheduler.

Chapter 3. Preparing for installation

An overview on preparing for installation.

About this task

A brief overview of an installation and some specific environment considerations.

Installation overview

Steps to prepare your environment to install and configure IBM Workload Scheduler.

About this task

Perform the following steps to prepare your environment to install and configure IBM Workload Scheduler:

1. Plan your IBM Workload Scheduler network to determine what type of workstation you need to install. See Chapter 2, "Network planning," on page 5.
2. Check the available installation media, see "Accessing the installation media" on page 33.
3. Check the installation prerequisites, see Chapter 4, "Prerequisites," on page 37.
4. If you are installing a component that needs a Relational Database, decide if you want to use a DB2 database, an Oracle database, an Informix® Dynamic Server database, or a Microsoft SQL Server database, and install it.
5. Optional, create or upgrade the IBM Workload Scheduler database tables before installing or upgrading, see Chapter 5, "Creating or upgrading the IBM Workload Scheduler database tables before installing or upgrading," on page 47. The database administrator runs this procedure only if the IT administrator who installs the product does not know all the confidential information related to the database. If instead the IT administrator can provide the database administrator user ID and password during the installation, the database administrator does not need to run these procedures because the installation automatically creates and upgrades the database tables.
6. Choose the available method that you want to use for installing or upgrading. For information about the available installation methods, see "Installation method" on page 30.
7. Collect the information necessary to type in the required fields during the installation.
8. Manage the IBM Workload Scheduler user for the instance that you are installing, see "IBM Workload Scheduler user" on page 40.
9. Install IBM Workload Scheduler by following the instructions provided in Chapter 6, "Installing," on page 93.
10. Perform any configuration required for the workstation type that you installed, see Chapter 9, "Configuring," on page 237.

Installation method

Installation methods

About this task

You can install IBM Workload Scheduler using several different methods, either starting the wizard or starting a silent installation. Both methods use Installation Manager.

Before you run Installation Manager, ensure you have checked the related prerequisites, as described in "Scanning system prerequisites for Installation Manager" on page 45.

Installation wizard

Installation wizard method for master domain manager or its backup, dynamic domain manager or its backup.

About this task

Install IBM Workload Scheduler master domain manager or its backup, dynamic domain manager or its backup, by using the Installation Manager wizard for each supported platform.

You can use the installation wizard in interactive or silent mode. In interactive mode, the wizard guides you through the installation steps. In silent mode, a response file provides the information relevant to the installation process, which is run in background.

Silent mode

Silent method for master domain manager or its backup, dynamic domain manager or its backup..

About this task

Install IBM Workload Scheduler master domain manager or its backup, dynamic domain manager or its backup, and the Dynamic Workload Console by using a customized *response file* by adding all the configuration settings to be used during installation.

From the command line, run the Installation Manager command to install in silent mode. Using this method you can run the installation unattended and in the background. For more information, see "Performing a silent installation" on page 113.

The twsinst script for agents

The twsinst script to install agents.

About this task

To install IBM Workload Scheduler agents you can use only the **twsinst** script.

The **twsinst** command is a very simple command that you can use both on UNIX and Windows operating systems. It saves disk space and RAM because it is not Java based.

For information about the **twsinst** script, see "Installing agents" on page 139.

Downloading installation images on your workstation

Steps to take when downloading images on your workstation.

About this task

You can download installation images by performing the following steps:

1. Ensure that your workstation has sufficient space to store both the files you download from IBM Passport Advantage and the extracted installation image. For more information about Systems requirements, see IBM Workload Scheduler System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
2. From IBM Passport Advantage, download all the required parts for the product image listed in Table 2 to a temporary directory.

Table 2. Required eImages

IBM Workload Scheduler components to install	**eImages to download**
• A dynamic agent • A fault-tolerant agent with remote command line	Agent eImage.
• A master domain manager or its backup • A dynamic domain manager or its backup	• IBM Workload Scheduler eImage. • WebSphere Application Server eImage. • DB2 eImage if you want to install and use the DB2 relational database.
Dynamic Workload Console	• IBM Workload Scheduler eImage. • WebSphere Application Server eImage.
Integration Workbench	Integration Workbench eImages.
Batch reports	IBM Workload Scheduler eImage.
Job Brokering Definition Console	IBM Workload Scheduler eImage.

3. Extract the installation image from the downloaded file and verify that the installation image is complete.

For more information about eImages, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843.

Creating a network repository

About this task

This scenario is valid only for master domain manager or dynamic domain manager and their backups, or Dynamic Workload Console that are installed by using the Installation Manager infrastructure.

Use the Installation Manager **Package Utility** to create the IBM Workload Scheduler eImages in network repository format. For more information about the **Package Utility** wizard, see *Installation Manager > Installing> Managing packages with Packaging Utility* in the Installation Manager Information center https://www.ibm.com/support/knowledgecenter/SSDV2W/im_family_welcome.html.

After you use the **Packaging Utility** to create a repository from the ESD images, you can use the Installation Manager to define this location as a repository. You can save the repository on a UNC drive on Windows operating systems or on a web server to make the directories and files available over HTTP.

To create an IBM Workload Scheduler network repository, perform the following procedure:

1. Download the eImages as described in "Downloading installation images on your workstation" on page 31.
2. Install Installation Manager on your workstation.
3. Install the **Package Utility** using Installation Manager on your workstation.
4. To create the ESD images in network format, run the following steps:
   a. Start the **Package Utility**.
   b. Click **Point to the ESD image**.
   c. Run the wizard. For more information about the **Package Utility** wizard, see *Installation Manager > Installing> Managing packages with Packaging Utility*.

After you created a repository in network format, define this location as anInstallation Manager repository. To add a repository, run the following steps:

1. Open the Installation Manager wizard.
2. Select **File** > **Preferences**. The Repositories page is displayed and shows available repositories, repository locations, and the connection status for the repositories.
3. Select **Add Repository**. The Add Repository page is displayed.
4. Enter the repository location or select **Browse**.
5. Go to the repository location where you saved the eImages content in network format and select the URL related to the product that you want to install.
6. Click **OK**. If you provided an HTTPS or restricted FTP repository location, you are prompted to enter a user ID and password. The new repository location is added to the list. If the repository is not connected, a red box is shown in the Connection column.
7. Click **OK**.

After you defined an Installation Manager repository, install the product:

IBM Workload Scheduler
See "Installing main components" on page 93 in *IBM Workload Scheduler: Planning and Installation*.

Dynamic Workload Console
See Chapter 20, "Installing," on page 355.

Accessing the installation media

Accessing the installation media

Access the installation media to download the installation files

Installation media

Content of the installation media.

About this task

The content of the installation media depends on the image that you downloaded.

Agents image

Depending on the operating system, the installation image contains some or all of the following directories:

TWS Contains the files required to install a IBM Workload Scheduler dynamic agent or a fault-tolerant agent with remote command line.

JavaExtension
Contains the files to install Java extension or to add Java extension to an installed IBM Workload Scheduler instance.

IBM Workload Scheduler Server image

Depending on the operating system, the installation image contains some or all of the following directories:

dbtools
Contains the files required to create or update the IBM Workload Scheduler database before installing or upgrading the product. For more information about managing IBM Workload Scheduler database before the installation process, see Chapter 5, "Creating or upgrading the IBM Workload Scheduler database tables before installing or upgrading," on page 47.

FULL Contains the repository required to install the product by using Installation Manager.

iim Contains the files required to install Installation Manager manually.

response_files
Contains the response files that install the IBM Workload Scheduler master domain manager, the backup master domain manager, the dynamic domain manager, the backup dynamic domain manager, or the Dynamic Workload Console.

DWC Contains the files required to install the Dynamic Workload Console.

TWS Contains the files required to install the IBM Workload Scheduler master domain manager or its backup, the dynamic domain manager or its backup.

Prerequisites
Contains the files needed to scan your system to verify that your environment has all the product system requirements necessary to perform a successful installation.

Integration Workbench
Contains the files required to install IBM Workload Scheduler Integration Workbench.

DB2 images
Contains the files required to install DB2.

WebSphere Application Server images
Contains the files required to install WebSphere Application Server.

Jazz for Service Management extension for WebSphere images
Contains the files required to install Jazz for Service Management extension for WebSphere.

Installation considerations

Some considerations that need to be taken into account before installation.

About this task

Before you begin the installation using the installation wizard, consider the following items that might apply to your specific environment.

Installing on Windows operating systems

If you are installing on Windows, consider the following items.

- If you are using Windows Terminal Services, set the install user with the command: `change user /install`
- If <TWS_user> is a domain user, Microsoft Computer Browser Service must be active. This is required for IBM WebSphere Application Server authentication.
- If <TWS_user> is a domain user, the user performing the installation must be a domain administrator.

Choosing language settings and national characters
If you want to use characters of a specific language locale, the language you choose for the installation wizard must match the language locale settings of the workstation on which you are installing. You cannot use national characters in the installation path of a master domain manager or backup master domain manager. Additionally, you cannot add a distributed connector to an agent that has national characters in its installation path.

Performing silent installations
When you install the latest version of IBM Workload Scheduler, you can create a response file based on the parameters of the initial installation. You can then use this customized response file to run silent installations using the same parameters. Before running the initial installation, you might want to consider this feature. For more information, see "Performing a silent installation" on page 113.

Mapped drives
When you copy the image of a specific operating system onto the workstation for installation using the wizard, you must copy the complete contents of the DVD to the drive from where you run your installation. When the drive is a UNC mapped drive, the remote path must be mapped to a drive on the installation workstation. For a complete list of the supported operating systems and their prerequisites, see the IBM Workload

Scheduler System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Remote installation

You cannot install IBM Workload Scheduler on a Windows workstation from a remote Samba-mounted file system.

Installing for end-to-end scheduling

If you are installing IBM Workload Scheduler on a workstation used as a distributed agent (that is either a standard agent, fault-tolerant agent, or domain manager) for end-to-end scheduling, specify OPCMASTER as the name of the master domain manager during the installation process. For further information about installing for end-to-end scheduling, see *Scheduling End-to-end with Fault Tolerance Capabilities*.

Create symbolic links

UNIX and Linux. The installation wizard installs all executable files in its own `.bin` directory. Before running any IBM Workload Scheduler commands, you run a script that sets the command-line environment to access these files. To avoid having to set the environment each time you want to run any of the commands from within a script, you can select an installation option to create symbolic links to those commands or utilities most frequently used from within scripts. Table 3 shows the binary paths and the symbolic links.

Table 3. Symbolic link options

TWS binary path	Symbolic link
<TWS_home>/bin/at	usr/bin/mat
<TWS_home>/bin/batch	usr/bin/mbatch
<TWS_home>/bin/datecalc	usr/bin/datecalc
<TWS_home>/bin/jobstdl	usr/bin/jobstdl
<TWS_home>/bin/maestro	usr/bin/maestro
<TWS_home>/bin/mdemon	usr/bin/mdemon
<TWS_home>/bin/morestdl	usr/bin/morestdl
<TWS_home>/bin/muser	usr/bin/muser
<TWS_home>/bin/parms	usr/bin/parms

Directories created outside of *TWA_home* at installation time

The following list shows the directories that are created outside of *TWA_home* when you install IBM Workload Scheduler.

Windows operating systems

```
%WINDIR%\TWA
 %WINDIR%\TWS
 %WINDIR%\system32\TWSRegistry.dat (32 bits)
 %WINDIR%\sysWOW64\TWSRegistry.dat (32 bits on 64 bits)
 %WINDIR%\TWSRegistry.dat (64 bits on 64 bits)
 %WINDIR%teb
 %WINDiR%\cit
 %ProgramFiles%\tivoli\cit (or the path specified by %WINDiR%\cit\cit.ini)
```

UNIX

```
/etc/TWA
 /etc/TWS
 /etc/teb
```

```
/etc/cit
/etc/init.d/tebclt-tws_cpa_agent_<instance_name>
/usr/Tivoli/TWS
/usr/ibm/tivoli/common/CIT/logs
/opt/tivoli/cit (or the path specified by /etc/tivoli/cit/cit.ini)
```

Windows services

When installing on the Windows operating system the Windows Service Control Manager registers services.

About this task

An installation on Windows operating systems registers the following services on the Windows Service Control Manager:

- IBM Workload Scheduler (for <*TWS_user*>)
- Netman (for <*TWS_user*>)
- Token Service (for <*TWS_user*>) - includes the In-Flight Tracing facility service
- IBM Workload Scheduler SSM Agent (for <*TWS_user*>)
- WebSphere Application Server (for <*TWS_user*>)
- IBM Common Platform Agent: tws_cpa_agent_ (for <*TWS_user*>)

You can optionally create a Windows service for Jazz for Service Management. For more information, see the section about creating a Windows service for Jazz for Service Management in *IBM Workload Scheduler: Administration Guide*.

Note: An existing service that has the same name as the new service will be overwritten during installation.

The Service Control Manager maintains its own user password database. If the <*TWS_user*> password is changed after installation, you must use the Services applet in the Control Panel to assign the new password for the Token Service and IBM Workload Scheduler (for <*TWS_user*>). For more information, see the section about changing the password of the *TWS_User* in *IBM Workload Scheduler: Administration Guide*.

Chapter 4. Prerequisites

When installing a master domain manager or a dynamic domain manager consider the following prerequisites.

The master domain manager or a dynamic domain manager installation have the following prerequisites:

Relational Database
See "Relational database management systems."

WebSphere Application Server
If you do not have this product installed, the installation process automatically installs it.

WebSphere SDK Java Technology Edition
If you do not have this product installed, the installation process automatically installs it.

For a complete list of the correct versions to install, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Supported operating systems

How to obtain information about the supported operating systems.

About this task

To produce a dynamic report that lists the supported operating systems, click Supported operating systems.

For a complete list of system requirements (disk spaces, temporary spaces and RAM usage), see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Relational database management systems

A relational database management system (RDBMS) is a prerequisite of the master domain manager and dynamic domain manager and its backups.

About this task

You must install the RDBMS before installing IBM Workload Scheduler.

The RDBMS can be one of the following:

DB2 For more information, see "Installing DB2" on page 38.

Oracle For more information, see "Installing Oracle" on page 38.

Informix Dynamic Server
For more information, see "Installing Informix Dynamic Server" on page 39.

Microsoft SQL Server

For more information, see "Installing Microsoft SQL Server" on page 40.

Installing DB2

Before installing a master domain manager or a dynamic domain manager you must install a database.

About this task

You can install DB2 in the following ways:

DB2 Enterprise Server Edition

A version of DB2 is bundled with the installation image. You can install DB2 in the following ways:

Server Install DB2 Server and the master domain manager on the same workstation.

Client Install DB2 Server on one workstation. DB2 client and the master domain manager or the dynamic domain manager on a different workstation. The advantage of this configuration is that you can easily switch between your master domain manager and its backup or switch between your dynamic domain manager or its backup, if necessary.

You can install DB2 manually.

To install DB2 manually, run the DB2 server or client installation program on the product image. The setup files for DB2 are on the product images as follows:

Table 4. DB2 Setup files

Operating System	Setup file
AIX®, HP-UX/IA64, SunOS/SPARC, SunOS/SPARC64, all Linux operating systems	DB2/server/db2setup
SunOS/AMD64	DB2/wse/db2setup
Windows/x86 and Windows/AMD64	DB2\SERVER\setup.exe

Installing Oracle

Before installing a master domain manager or a dynamic domain manager you must install a database.

About this task

You can install Oracle in the following ways:

Oracle Enterprise Edition

The advantage of choosing Oracle Enterprise Edition is that you can implement the Oracle Partitioning feature to improve the performance of event-driven workload automation. This improves rule management performance, in particular the following queries: **event_rule_instance, action_run**, and **operator_messages**. For information about event-driven workload automation, see *Overview*.

Oracle Standard Edition
Oracle Standard Edition does not include the Oracle Partitioning feature. Installing this edition does not improve the performance of event-driven workload automation.

For supported versions, see the IBM Workload Scheduler System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672 &uid=swg27048858.

Note:

- When installing the product on a 64-bit library operating system, use an Oracle database on a 64-bit library otherwise you receive a warning during the installation and you cannot use the product unless you run the procedure "Master domain manager or dynamic domain manager installation completes with warning AWSJIM976W" on page 280.
- When upgrading:
  - If you already have an RDBMS installed and you want to upgrade it, you must upgrade it **after** you upgrade IBM Workload Scheduler.
  - If you are performing a parallel upgrade, use an Oracle database on a 64-bit library when installing the product on a 64-bit library, otherwise you receive a warning during the installation and you cannot use the product unless you run the procedure "Master domain manager or dynamic domain manager installation completes with warning AWSJIM976W" on page 280.
  - If you are performing a direct upgrade, use an Oracle database on a 64-bit library operating system when upgrading the product on a 64-bit library operating system, otherwise you receive a warning during the upgrade and you cannot use the product unless you run the procedure "After upgrading a master domain manager or a dynamic domain manager you cannot perform any operation" on page 296.

For information about upgrading the RDBMS, see the data maintenance chapter in the *IBM Workload Scheduler: Administration Guide*.

Installing Informix Dynamic Server

Before installing a master domain manager or a dynamic domain manager you must install a database.

About this task

You must have Informix Dynamic Server installed already before you install IBM Workload Scheduler for the first time. Also, before you create the IBM Workload Scheduler schema on the database, you must have created the following db and sb spaces:

- A db space sized 100 MB and with a page size of 8K or greater, referred to as **DBSPNAME** in the properties file customization steps.
- A db space space sized 20 MB, referred to as **TWS_DBSP_LOG** in the properties file customization steps.
- An sb space for blob and clob data, sized 100 MB, referred to as **TWS_SBSP** in the properties file customization steps.

To have a working IBM Workload Scheduler schema on your Informix Dynamic Server database, you must follow these steps:

1. Run the procedures described in "Creating or upgrading the database schema if you are using Informix Dynamic Server" on page 74.

2. Install a master domain manager, a dynamic domain manager, or their backups.
3. Configure the master domain manager, dynamic domain manager, or their backups to connect with the database as described in "Installing for an Informix Dynamic Server" on page 109.

Installing Microsoft SQL Server

About this task

Before you install IBM Workload Scheduler for the first time, you must have Microsoft SQL Server installed. Ensure you downloaded the JDBC driver for Microsoft SQL Server, including the following prerequisites libraries and class library files :

- sqljdbc_auth.dll
- sqljdbc4.jar
- sqljdbc.jar

Also, before you create the IBM Workload Scheduler schema on the database, you must have created the directory where the IBM Workload Scheduler table spaces will be placed when the IBM Workload Scheduler schema is created. The default is `C:\MSSQL`.

To have a working IBM Workload Scheduler schema on your Microsoft SQL Server database, you must follow these steps:

1. Run the procedures described in "Creating or upgrading the database schema if you are using Microsoft SQL Server" on page 82.
2. Install a master domain manager, a dynamic domain manager, or their backups.
3. Configure the master domain manager, dynamic domain manager, or their backups to connect with the database as described in "Installing for a Microsoft SQL Server database" on page 110.

IBM Workload Scheduler user

The IBM Workload Scheduler user management on UNIX and Windows operating systems

About this task

Consider the following constraints and properties for the IBM Workload Scheduler user:

On Windows operating systems:
The installation process automatically creates the IBM Workload Scheduler user. If your security policies do not allow user creation during the installation process, create the user and give it the necessary right as described in "Windows user domain rights and structure" on page 41.

On UNIX and Linux operating systems:
Regardless of the method of installation you choose, the IBM Workload Scheduler user must be created manually before running the installation. Use the appropriate UNIX and Linux operating system commands to create the user.

Note: Some operating systems require that for users with a password, the password must be changed at the first login. If this is your situation, for a successful installation, you will need to log in as the user and change the password for the first time.

Windows user domain rights and structure

About this task

If you install on Windows operating systems, consider the following information.

For the installation:

- You cannot have a local user and a domain user with the same name. For example, you cannot have **user1** as local user and at the same time **user1@domain1** and **domain\user1**.
- The Windows user performing an agent installation must:
  - For a local TWS user, be a member of the local administrative group
  - For a domain TWS user, be a member of the domain "users" group in the domain controller and be a member of the local administrative group.

For Windows IBM Workload Scheduler users:

All Windows IBM Workload Scheduler users must have the following user permissions. They can be granted locally. Domain level policies always override local policies, so you might be required to grant the permissions from the domain:

- Act as part of the operating system
- Allow log on locally
- Impersonate a client after authentication
- Log on as a batch job
- Log on as a service
- Replace a process level token
- Adjust memory quotas for a process (available on some configurations only)

Note: These rights are granted during the installation, but you can confirm them manually.

To run IBM Workload Scheduler command lines:

On Windows operating systems with UAC disabled:

In addition to standard Windows permissions, to log on to the machine, the user must have the "Impersonate a client after authentication" permission granted. By default, this is granted just to the "Administrators" group members. This permission is required to impersonate the TWS user and access the IBM Workload Scheduler Symphony and Mailbox.

On Windows operating systems with UAC enabled:

This is the default value. The "Impersonate a client after authentication" is not available to the user, unless the **cmd** shell is started with "Run as administrator" permission. To run IBM Workload Scheduler command lines, the user must have "Impersonate a client after authentication" permission defined and then start the shell with the "Run as administrator" permission authenticating with its own user ID.

For the Streamlogon user:
The user must have the "logon as batch" permission to allow IBM Workload Scheduler to create the job process. In addition, you must assign to the user "Read" and "Read & execute" permission to **cmd.exe**. You can assign "Read" and "Read & execute" permission to cmd.exe also to the BATCH built-in group instead of to a single user.

To manage IBM Workload Scheduler agents:
The user must be in the Administrators group or must be able to perform "Run as" as **twsuser** to reset the IBM Workload Scheduler files if a recovery is needed.

Considerations for Windows domain controllers running Microsoft Active Directory

If you want to install a IBM Workload Scheduler fault-tolerant agent on workstations where users who run jobs are domain users and the domain controller is running the Microsoft Active Directory, decide how to install the agents and configure the domain to have the**jobmon** process obtain the correct information to allow the users to run jobs.

About this task

Before running a job, **jobmon** retrieves information about the user running the job. If the user is a domain user and the domain controller is running Microsoft Active Directory, whether the user information can be retrieved depends on the information in the access control list (ACL) of that user. The main **jobmon** process that runs the job is started as the local system account (AUTHORITY\SYSTEM), but it immediately impersonates the <*TWS_user*> that owns the fault-tolerant agent. This means that for **jobmon** to successfully launch the job, the <*TWS_user*> must have an access control entry (ACE) in the ACL of the user for which it is trying to retrieve information.

Perform one of the following actions:

Enable the <*TWS_user*> **to access a set of users that run jobs**
On the domain server, edit the ACL of all users that run jobs on the workstation and add an ACE for each <*TWS_user*>. In this case, only specified users can run the jobs submitted by **jobmon**.

Allow all users to run jobs submitted by jobmon by using the TWS_BYPASS_DC=TRUE system variable
Create the TWS_BYPASS_DC=TRUE system variable, with a value not null, and reboot the workstation. In this case,**jobmon** obtains the user information without performing the security check for the ACE in the ACL of the user. All the local and domain users can run the jobs submitted by **jobmon**.

Allow all users to run jobs submitted by jobmon by setting the <*TWS_user*> **as a domain user**
Set up the <*TWS_user*> as a Windows domain user and install the instance of IBM Workload Scheduler using the <*TWS_user*>. In this case, all authenticated users on the domain controller can access the default ACL for a domain user. Jobs can then be launched by both local and the domain users. All the local and the domain users can run the jobs submitted by jobmon.

Exclude the workstation from the security check on users ACL
On the domain server, add the host name of the workstation where the

fault-tolerant agent is installed to the Pre-Windows 2000-Compatible Access Group. In this way, from a security point of view, the domain controller interacts with this workstation as if it is in a Windows domain that does not support Active Directory. In this case, all the local and domain users can run the jobs submitted by **jobmon**. In addition, the domain controller does not prevent any local or domain users from running other processes that are not controlled by IBM Workload Scheduler.

Checking environment settings for Windows Vista users

Before you install IBM Workload Scheduler on a Windows Vista workstation that does not belong to a Windows domain, the environment settings need to be checked.

About this task

Before installation make sure that the workstation name and the domain name are both registered in uppercase in the Windows environment settings. When the workstation is not in a Windows domain, the COMPUTERNAME and USERDOMAIN values are identical, but on Vista the USERDOMAIN value is sometimes in lowercase even if the COMPUTERNAME is in uppercase.

Perform the following actions:

1. Open a DOS command prompt shell.
2. Run the **set** command to display the Windows environment settings.
3. Check that the USERDOMAIN value is in uppercase. If not, follow this workaround to correct it:
4. Run the **set** command to change the value of COMPUTERNAME to a temporary host name of your choice:

   ```
   set /p COMPUTERNAME=MYTEMPHOST
   ```
5. Restart the system.
6. Run the **set** command again as in step 4 replacing the temporary host name with the original one.
7. Restart the system.
8. Check that the USERDOMAIN value is now in uppercase.

Umask settings for UNIX root user

About this task

If you install on UNIX operating systems, consider the following information.

If the umask settings for the UNIX root user are too restrictive, the temporary directories and files that are created during the installation are neither accessible nor executable by the DB2 user. Before installing IBM Workload Scheduler or one of its fix packs, ensure that umask is set to 022.

To verify that umask is set to the correct value, from a command prompt, run the following command:

```
umask
```

If the value is different from 022, modify it by running the following command:

```
umask 022
```

You can restore the desired umask setting for the root user after the product installation has been completed.

Scanning system prerequisites for IBM Workload Scheduler

Before installing or upgrading the product, IBM Workload Scheduler automatically runs a scan on your system.

About this task

Having an environment that meets the product system requirements ensures that an installation or upgrade succeeds without any delays or complications.

The scan verifies that:

- The operating system is supported for the product.
- On UNIX operating systems, the necessary product libraries are installed.
- There is enough permanent and temporary disk space to install both the product and its prerequisites.
- There is enough memory and virtual memory.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler. It does not check the requirements for other components, such as DB2. To verify the requirements for Installation Manager use the procedure described in "Scanning system prerequisites for Installation Manager" on page 45.

If any of these checks fails, IBM Workload Scheduler performs the following action:

For all the components installed by using Installation Manager:
Displays a notification of the requirement that was not met. In this case, stop the installation or the upgrade, analyze the log files, solve the error, and rerun the installation or upgrade. If you are performing an interactive installation, the errors are displayed on the screen. If you are performing a silent installation, the errors are written in the Installation Manager log files. For more information about log files, see "Installation Manager wizard, silent installation and uninstallation log files" on page 263 in *IBM Workload Scheduler: Planning and Installation*.

For agents
An error message is returned. In this case, analyze the log file, solve the error, and rerun the installation or upgrade. The log files are located:

On Windows operating systems:
%TEMP%\TWA\tws<*version_number*>\result.txt

On UNIX and Linux operating systems:
$tmp/TWA/tws<*version_number*>/result.txt

You can decide to rerun the installation or upgrade without executing the prerequisite scan. If you specify the **-skipcheckprereq** parameter, the **twsinst** installation script does not execute the prerequisite scan. If a problem occurs, an error is displayed, the agent is installed or upgraded, but might not work. For more information about the -skipcheckprereq option, see "Agent installation parameters - twsinst script" on page 143 in *IBM Workload Scheduler: Planning and Installation*.

For a detailed list of supported operating systems and product prerequisites, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Scanning system prerequisites for Installation Manager

Scanning system prerequisites for Installation Manager before you install or upgrade the IBM Workload Scheduler.

About this task

Before you install or upgrade the IBM Workload Scheduler, if you have not installed Installation Manager, run a scan on your system to verify that your workstation has all the system requirements needed for a successful installation. Having an environment that meets the product system requirements ensures that an installation succeeds without any delays or complications.

You can run a prerequisite scan for Installation Manager by using **checkPrereq** command:

On Windows operating systems:

Run the following command:

```
checkPrereq.bat
```

On UNIX or Linux operating systems:

Run the following command:

```
checkPrereq.sh
```

Specify the **-silent** option if you are not interested in installing Installation Manager by using the wizard. If you use the **-silent** option, the program does not check that the graphical libraries exist. If the scan fails, the program displays a notification of the requirement that was not met. In this case, stop the installation, solve the error, and rerun the installation.

Chapter 5. Creating or upgrading the IBM Workload Scheduler database tables before installing or upgrading

Depending on the IBM Workload Scheduler component you install, the following database tables must be created or upgraded:

Master domain manager or backup master domain manager:

- IBM Workload Scheduler tables
- Dynamic workload broker tables.

Dynamic domain manager or backup dynamic domain manager:
Dynamic workload broker tables.

For a DB2 and Oracle database, the database schema can be created or upgraded at the same time as when you install or upgrade the product component using either the Installation Manager wizard or the silent installation, or you can choose to create or update the database schema manually, and then install and upgrade the component at a later time. The database administrator must run the manual procedure to create or upgrade the IBM Workload Scheduler database tables before the installation of IBM Workload Scheduler only when the IT administrator who installs the product does not know the database administrator user ID and password. Otherwise, the IT administrator provides the database administrator user ID and password during the installation and the tables are automatically created and upgraded during the installation or the upgrade of the product. Otherwise, the IT administrator provides the database administrator user ID and password during the installation and the tables are automatically created and upgraded during the installation or the upgrade of the product.

For Informix Dynamic Server and Microsoft SQL Server databases, the database tables must be created or upgraded manually, and you must create or upgrade the IBM Workload Scheduler schema on these databases before you proceed to run the configuration script (described in "Installing for an Informix Dynamic Server" on page 109 or in "Installing for a Microsoft SQL Server database" on page 110) after installing or upgrading the product.

Using this procedure, the database administrator creates or upgrades the database tables before the IT administrator installs or upgrades the product with a user different from the database administrator user. The procedure ensures that only the database administrator manages all the confidential information related to the database, such as the administrator user ID and password, and the IT administrator can install or upgrade the product without knowing any confidential database information.

This section describes the procedures to follow for creating and upgrading the IBM Workload Scheduler and the dynamic workload broker database tables before installing or upgrading IBM Workload Scheduler when using one of the following databases:

DB2 See "Creating or upgrading the database schema if you are using DB2" on page 48.

Oracle See "Creating or upgrading the database tables if you are using Oracle" on page 59.

Informix Dynamic server
See "Creating or upgrading the database schema if you are using Informix Dynamic Server" on page 74.

Microsoft SQL Server
See "Creating or upgrading the database schema if you are using Microsoft SQL Server" on page 82.

To install IBM Workload Scheduler, the IT administrator can specify as the database administrator user name the user to be granted access by the administrator of the database server, to the IBM Workload Scheduler database.

To upgrade IBM Workload Scheduler, the IT administrator can specify another user that has the same permissions as the user who installed the product.

Creating or upgrading the database schema if you are using DB2

To create or upgrade the IBM Workload Scheduler and the dynamic workload broker database tables if you are using DB2.

Creating the database tables for DB2

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using DB2, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for DB2" on page 50.
2. Generate the SQL files. See "Generating the SQL files for DB2" on page 53.
3. Create the SQL tables. See "Running scripts to create or upgrade the SQL tables for DB2" on page 53.

See "Creating the database tables if you are using DB2" on page 49 for the complete procedure.

Upgrading the database tables for DB2

A new method for upgrading the IBM Workload Scheduler and the dynamic workload broker database schema is provided for DB2. The update or upgrade can be performed manually before you install the product component or, using the Installation Manager wizard or silent installation, the schema is updated during the installation procedure.

If you typically update your database tables manually before updating the IBM Workload Scheduler components in your environment, then you can use this new method which includes a script that quickly generates the required SQL statements in an SQL file and optionally applies them directly to the database in a single step.

The advantages of this new update method are:

- A single script that dynamically generates the SQL statements and applies them directly to the database. Optionally, you can configure the script to generate only and then apply them at a later time but before installing the product component.
- The script can be run and rerun as many times as needed without any cleanup required between runs. For example, if for some reason a database object is corrupt, you can rerun the script to regenerate the SQL file and apply it.
- This method eliminates the requirement of installing a DB2 client to update a database located on a remote DB2 server. The script works using the JDBC

drivers and connecting directly to the database server minimizing the overhead in installing and maintaining a database client.

Important: If you already use a DB2 client and want to take advantage of this new method and eliminate it, ensure that you do not change the location of your JDBC driver. If you change the location, then remember to change it also in the WebSphere® Application Server. If instead your WebSphere Application Server does not point to the JDBC driver, then you can proceed to uninstall your DB2 client.

- Use this method as a standalone tool to check the consistency of the database schema. The database administrator can verify if the database schema has changed and repair any inconsistencies.

Upgrading the product components using either the Installation Manager wizard or the silent installation methods automatically upgrades the database tables using this same method.

Upgrading the database schema for DB2 using this method involves the following high-levels steps:

1. Modify the `upgradeDB2IWSDB.properties` file assigning the appropriate values to the parameters.
2. Run the `launchUpgradeIWSDB.bat` or the `launchUpgradeIWSDB.sh` script to generate and apply the SQL statements. Optionally, you can choose to only generate the statements and apply them later, but before installing the product component.

See "Upgrading the database tables if you are using DB2" on page 57 for the complete procedure.

Creating the database tables if you are using DB2

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using DB2.

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using DB2, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for DB2" on page 50.
2. Generate the SQL files. See "Generating the SQL files for DB2" on page 53.
3. Create the SQL tables. See "Running scripts to create or upgrade the SQL tables for DB2" on page 53.

Important:

- Run the procedure only if the database administrator manages all the confidential information that is related to the database, such as the database administrator user ID and password and the IT administrator who upgrades the product does not know them.
- After upgrading, to grant permissions to users on the updated database views, you must run the script:

  On Windows operating systems

  ```
  <TWA_home>/TWS/dbtools/DB2/scripts/dbgrant.bat
  <user_ID_to_be_granted> <database_name>
  [<database_admin_user> <password>]
  ```

On UNIX and Linux operating systems

```
/<TWA_home>/TWS/dbtools/DB2/scripts/dbgrant.sh
<user_ID_to_be_granted> <database_name>
[<database_admin_user> <password>]
```

Customizing the properties file for DB2

Steps that need to be taken to customize the property file for DB2.

To customize the properties file, perform the following steps:

1. From the eImage containing the master domain manager or the dynamic domain manager, open the following properties file:

   On Windows operating systems:

   <*images_dir*>\dbtools\customizeWinDB2Sql.properties

   On UNIX and Linux systems:

   <*images_dir*>/dbtools/customizeUnixDB2Sql.properties

   where *images_dir* specifies the directory where you extracted the product image.
2. Customize the SQL properties with the values appropriate for your needs:

   TWSTEMPDIR

   The directory where you want to store the SQL scripts to create or update the database tables. The default value is:

   On Windows operating systems:

   C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\TWA\tws

   On UNIX and Linux systems:

   /tmp/TWA/tws

   DB_USER

   If you are creating the database tables before installing the product:

   Specify the user to be granted access by the administrator of the DB2 server to access the IBM Workload Scheduler database.

   When the IT administrator installs the product, he must specify this value in the **DB2 server administrator user** field.

   On Windows operating systems:

   The default value is **db2admin**.

   On UNIX and Linux operating systems:

   The default value is **db2inst1**.

   On UNIX, verify that you can switch to this user and that it can load the DB2 environment.

   If you are upgrading the database tables before upgrading the product:

   Specify the user that you used when you installed the version of the product you are upgrading. When you later upgrade the product, you can specify a user different from the one you specified in the *DB_USER* field, but it must have database access permissions.

   TWS_USER

   Specify the IBM Workload Scheduler user name.

   It can contain alphanumeric, dash (-), and underscore (_) characters; it cannot contain national characters. The first character of the user name must be a letter.

When the IT administrator installs the product, he must specify this value in the **User name** field.

TWS_DB
The name of the DB2 database. The maximum length is five characters. The default value is **TWS**. If you are creating the SQL tables for a:

Master domain manager
Provide the name of a database that is not used by a dynamic domain manager.

Dynamic domain manager
Provide the name of a database that is not used by a master domain manager.

When the IT administrator installs the product, he must specify this value in the **Database name** field.

TWS_TS_NAME
The name of the DB2 instance table space. This table space is used to store scheduling objects and event rules. For information about DB2 table spaces, see the DB2 documentation. The default table space name is **TWS_DATA**.

When the IT administrator installs the product, he must specify this value in the **Table space name** field.

TWS_DATA_TS_PATH
The relative path of the DB2 table space. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path, the DB2 administrator user must have complete access rights to the directory where the table space is installed. The default table space path name is **TWS_DATA**. For UNIX and Linux operating systems, make sure that the DB2 administrator has write access to the directory above the table space directory.

When the IT administrator installs the product, he must specify this value in the **Table space path** field.

TWS_LOG_TS_NAME
Specify the name of the DB2 table space where IBM Workload Scheduler event logs are to be stored. These logs include data about event rule instances, triggered actions, and operator messages that are displayed by the Dynamic Workload Console. Data from the logs can be used to create reports. You can view report data by using the Dynamic Workload Console. The default name is **TWS_LOG**.

When the IT administrator installs the product, he must specify this value in the **Report tablespace name** field.

TWS_LOG_TS_PATH
Specify the path of the DB2 table space where IBM Workload Scheduler event logs are to be stored. The default path is **TWS_LOG**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, “DB2 tablespace relative paths,” on page 439.

Note: The report table space path cannot be the same as the table space path.

When the IT administrator installs the product, he must specify this value in the **Report table space path** field.

TWS_PLAN_TS_NAME
Specify the name of the DB2 table space where IBM Workload Scheduler stores the Plan. The default name is **TWS_PLAN**.

When the IT administrator installs the product, he must specify this value in the **Plan table space name** field.

TWS_PLAN_TS_PATH
Specify the path of the DB2 table space where the IBM Workload Scheduler Plan is stored. The default path is **TWS_PLAN**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, "DB2 tablespace relative paths," on page 439.

Note: The plan table space path cannot be the same as the table space path or the report table space path.

When the IT administrator installs the product, he must specify this value in the **Plan table space path** field.

COMPANY_NAME
The name of the company. You can use spaces and the maximum field length is 40 characters. The default is **MYCOMPANY**.

When the IT administrator installs the product, he must specify this value in the **Company** field.

EIF_PORT
The port used by the event management processor to receive events. The default value is **31131**. The valid range is from 1 to 65535.

When the IT administrator installs the product, he must specify this value in the **Event Processor** field.

HOST_NAME
The fully qualified host name or IP address on which the dynamic domain manager is contacted by the dynamic agent.

When the IT administrator installs the product, he must specify this value in the dynamic agent configuration information **Host name or IP address** field.

WAS_SEC_PORT
The WebSphere Application Server HTTPS transport port. The port for the secure HTTP transport. It is used by the **composer** command line and the Dynamic workload broker when this protocol is selected. The dynamic agent uses it to connect to the dynamic workload broker. The default value is **31116**. If you leave the field blank, it defaults to **0**. The valid range is from 1 to 65535.

When the IT administrator installs the product, he must specify this value in the WebSphere Application Server`HTTPS transport` port.

DB2LOCALADMINUSER

DB2 Server
Specify the user to be granted access by the administrator of

the DB2 server to access the IBM Workload Scheduler database. The value must be the same as the *DB_USER* variable.

DB2 Client
Specify the local DB2 administrator user of the DB2 client instance.

DB2DIR
Specify the path of the DB2 installation.

Generating the SQL files for DB2

Steps that need to be taken to generate the SQL files for DB2.

To generate the SQL files, you use the **customizeSQL** script which is located:

On Windows operating systems:
<*images_dir*>\dbtools\customizeSQL.bat

On UNIX and Linux operating systems:
<*images_dir*>/dbtools/customizeSQL.sh

Where <*images_dir*> is the directory where you stored the product images. If you want to use the eImage, download the one containing the master domain manager.

To show command usage, run:

```
customizeSQL -usage
```

The script has the following syntax:

On Windows operating systems:
customizeSQL.bat **-propertyFile** <property_file>

On UNIX and Linux operating systems:
customizeSQL.sh **-propertyFile** <property_file>

Where <property_file> is the absolute path of the directory where the property file is located.

On Windows operating systems:

If you store the properties file in the C:\Temp\ directory, run:

```
customizeSQL.bat
-propertyFile "C:\Temp\customizeDb2Sql.properties"
```

On UNIX and Linux operating systems:

If you store the properties file in the /tmp/ directory, run:

```
customizeSQL.sh
-propertyFile /tmp/customizeDB2SQL.properties
```

Note: The SQL files are created in the directory that you specified in the TWSTEMPDIR property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for DB2" on page 50.

Running scripts to create or upgrade the SQL tables for DB2

Which command to run when creating or upgrading the SQL tables.

The command you run depends on the task you are doing:

Creating the SQL tables before installing:

Master domain manager or its backup:

1. Run "Procedure to create the IBM Workload Scheduler SQL tables for DB2."
2. Run "Procedure to create the dynamic workload broker SQL tables for DB2" on page 56.

Dynamic domain manager or its backup:

Run "Procedure to create the dynamic workload broker SQL tables for DB2" on page 56.

.

Upgrading the SQL tables before upgrading the product:

Master domain manager and its backup:

1. Run "Procedure to upgrade the IBM Workload Scheduler SQL tables for DB2" on page 69.
2. Run "Procedure to upgrade the dynamic workload broker SQL tables for DB2" on page 70.

Dynamic domain manager and its backup

Run "Procedure to upgrade the dynamic workload broker SQL tables for DB2" on page 70.

..

Procedure to create the IBM Workload Scheduler SQL tables for DB2:

The procedure to create the IBM Workload Scheduler database.

To create the IBM Workload Scheduler database, perform the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws<*version_number*>\TWS\dbtools\db2\scripts

   On UNIX and Linux operating systems:

   TWSTEMPDIR/TWA/tws<*version_number*>/TWS/dbtools/db2/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for DB2" on page 50.
3. Run the following command:

   On Windows operating systems:

   ```
   createdb_root.bat
   <TWS_DB> <TWS_CLIENT_INSTALLATION>
   <TWS_NODE_NAME> <TWS_HOST>
   <TWS_SRVC_PORT> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW> <TWS_INSTANCE>
   <TWS_AGENT_TYPE> <IS_CHECK_ONLY>
   ```

On UNIX and Linux operating systems:

```
createdb_root.sh
<TWS_DB> <TWS_CLIENT_INSTALLATION>
<TWS_NODE_NAME> <TWS_HOST>
<TWS_SRVC_PORT> <TWS_ADMIN_USER>
<TWS_ADMIN_PW> <TWS_INSTANCE>
<TWS_AGENT_TYPE> <IS_CHECK_ONLY>
```

Where:

<TWS_DB>
The name of the DB2 database. The maximum length is five characters. You can use an existing DB2 database instance if its name does not exceed five characters. The default is `TWS`.

<TWS_CLIENT_INSTALLATION>
The DB2 you are using is client or server. Valid values are **true** for the client installation and **false** for the server installation. The default is **false**.

<TWS_NODE_NAME>
The name of the DB2 node. The node value is *<TWS_DB>_ND*. The default is `TWS_ND`.

<TWS_HOST>
The IP address or host name of the workstation where the DB2 server is installed.

<TWS_SRVC_PORT>
The TCP/IP port number that the remote DB2 server instance uses to communicate.

<TWS_ADMIN_USER>
The user name of the administrator of the DB2 server instance. This user can be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX systems, verify that you can switch to this user and that it can load the DB2 environment.

On Windows operating systems:
The default value is **db2admin**.

On UNIX and Linux operating systems:
The default value is **db2inst1**.

<TWS_ADMIN_PW>
The password of the DB2 server administrator user, or of the user with SYSADM or SYSCTRL authority.

<TWS_INSTANCE>
The DB2 instance name. The default is `DB2`.

<TWS_AGENT_TYPE>
The IBM Workload Scheduler agent type to specify:

Master domain manager:
MDM

Backup master domain manager:
BKM

<IS_CHECK_ONLY>
Always specify `FALSE`.

Procedure to create the dynamic workload broker SQL tables for DB2:

The procedure to create the dynamic workload broker database.

To create the dynamic workload broker database, run the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws<*version_number*>\TDWB\dbtools\db2\scripts

   On UNIX and Linux operating systems:

   TWSTEMPDIR/TWA/tws<*version_number*>/TDWB/dbtools/db2/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for DB2" on page 50.
3. Run the following command:

   On Windows operating systems:

   ```
   createdb_root.bat
   <TWS_DB> <TWS_CLIENT_INSTALLATION>
   <TWS_NODE_NAME> <TWS_HOST>
   <TWS_SRVC_PORT> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW> <TWS_INSTANCE>
   <TWS_AGENT_TYPE> <IS_CHECK_ONLY>
   ```

   On UNIX and Linux operating systems:

   ```
   createdb_root.sh
   <TWS_DB> <TWS_CLIENT_INSTALLATION>
   <TWS_NODE_NAME> <TWS_HOST>
   <TWS_SRVC_PORT> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW> <TWS_INSTANCE>
   <TWS_AGENT_TYPE> <IS_CHECK_ONLY>
   ```

   Where:

   <TWS_DB>
   The name of the DB2 database. The maximum length is five characters. You can use an existing DB2 database instance if its name does not exceed five characters. The default is TWS.

   <TWS_CLIENT_INSTALLATION>
   The DB2 you are using is client or server. Valid values are **true** for the client installation and **false** for the server installation. The default is **false**.

   <TWS_NODE_NAME>
   The name of the DB2 node. The node value is *<TWS_DB>_ND*. The default is TWS_ND.

   <TWS_HOST>
   The IP address or host name of the workstation where the DB2 server is installed.

   <TWS_SRVC_PORT>
   The TCP/IP port number that the remote DB2 server instance uses to communicate.

   <TWS_ADMIN_USER>
   The user name of the administrator of the DB2 server instance. This

user can be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX systems, verify that you can switch to this user and that it can load the DB2 environment.

On Windows operating systems:
The default value is **db2admin**.

On UNIX and Linux operating systems:
The default value is **db2inst1**.

<TWS_ADMIN_PW>
The password of the DB2 server administrator user, or of the user with SYSADM or SYSCTRL authority.

<TWS_INSTANCE>
The DB2 instance name. The default is `DB2`.

<TWS_AGENT_TYPE>
The IBM Workload Scheduler agent type to specify:

Master domain manager:
MDM

Backup master domain manager:
BKM

Dynamic domain manager:
DDM

Backup dynamic domain manager:
BDM

<IS_CHECK_ONLY>
Always specify `FALSE`.

Upgrading the database tables if you are using DB2

To upgrade the IBM Workload Scheduler and the dynamic workload broker database tables if you are using DB2.

Before you begin

This manual procedure requires an installation of Java Runtime Environment version 1.7 or later. If you already have a supported version installed, refer to the *JAVA_HOME* installation directory where required in this procedure. This manual procedure can also be run from a remote computer where the Java Runtime Environment is installed.

About this task

A new method for upgrading the IBM Workload Scheduler and the dynamic workload broker database schema is provided for DB2. The update or upgrade can be performed manually before you install the product component or, using the Installation Manager wizard or silent installation, the schema is updated during the installation procedure. For information about the benefits of upgrading the database schema using this method, see "Creating or upgrading the database schema if you are using DB2" on page 48

To upgrade the IBM Workload Scheduler and the dynamic workload broker database tables, run the following procedure:

Procedure

1. From the IBM Workload Scheduler eImage, locate the `dblighttool` directory and copy it to a path on the database server computer or on a remote computer.
2. Modify the `upgradeDB2IWSDB.properties` properties file located in the `IWSDBUpgrade` folder assigning values to the parameters as follows:

Table 5. Properties for DB2 upgrade procedure

Property	DB2
COMPONENT_TYPE	TheIBM Workload Scheduler component to be upgraded: MDM, BKM, DDM or BDM. The default value is MDM.
DB_NAME	The name of IBM Workload Scheduler database. The default value is `TWS`.
DB_HOST_NAME	The host name or IP address of the DB2 server.
DB_PORT	The port of the DB2 server. The default value is 50000.
DB_ADMIN_USER	The database administrator user that creates the IBM Workload Scheduler schema objects on the DB2 server.
DB_ADMIN_USER_PWD	The password of the database administrator user that creates the IBM Workload Scheduler schema objects on the DB2 server.
DB_USER	The user that has been granted access to the IBM Workload Scheduler tables on the DB2 server. The default value is `db2admin`.
DB_USER_PWD	N/A
IWS_TS_NAME	The name of the tablespace for IBM Workload Scheduler data (default: TWS_DATA)
IWS_LOG_TS_NAME	The name of the tablespace for the IBM Workload Scheduler log (default: TWS_LOG)
IWS_PLAN_TS_NAME	The name of the tablespace for the IBM Workload Scheduler plan (default: TWS_PLAN)
HOST_NAME	The host name of the IBM Workload Scheduler broker (no default).
WAS_SEC_PORT	The HTTPS port of the IBM Workload Scheduler broker. The default value is `31116`.
UPGRADE_DB	Set to `TRUE` to automatically apply the generated SQL statements to upgrade the IBM Workload Scheduler database schema. Set to `FALSE` to manually apply the generated statements in the customSQL.sql file. The default value is `TRUE`.

3. Run the upgrade script located in the `IWSDBUpgrade` folder specifying the usage and all of the required parameters as follows:

   On Windows operating systems

   ```
   launchUpgradeIWSDB.bat JAVA_HOME_PATH DB_PATH PROPERTY_FILE
   ```

For example,

DB2

```
launchUpgradeIWSDB.bat D:\TWS\JavaExt\jre\jre
D:\Program Files\IBM\SQLLIB\java
D:\IWSDBUpgrade\upgradeDB2IWSDB.properties
```

On UNIX and Linux operating systems

```
./launchUpgradeIWSDB.sh JAVA_HOME_PATH DB_PATH PROPERTY_FILE
```

For example,

DB2

```
 ./launchUpgradeIWSDB.sh /opt/TWS/JavaExt/jre/jre
/home/db2inst1/sqllib/java
/IWSDBUpgrade/upgradeDB2IWSDB.properties
```

Table 6. Upgrade script parameters

Parameter	Description
JAVA_HOME_PATH	The Java home directory, where the bin directory is present.
DB_PATH	The fully qualified directory path to the JDBC driver JAR file that contains the JDBC driver class. Specify only the path and not the JAR file name.
PROPERTY_FILE	The fully qualified name of the file that contains a number of properties, one on each line with an assigned value, that are required for the database upgrade: `upgradeDB2IWSDB.properties`

The script creates an SQL file with all the statements needed to upgrade the IBM Workload Scheduler database schema to the latest version. The SQL file is named: `IWSDBUpgrade/customSQL.sql`.

If the UPGRADE_DB parameter is set to `TRUE`, then the generated SQL statements are applied to the database automatically when the script is run.

If UPGRADE_DB parameter is set to `FALSE`, then the SQL statements are generated but not applied to the database. You can inspect the generated `customSQL.sql` and when you are ready to apply them to the database, set the value of the UPGRADE_DB parameter to `TRUE` in the `upgradeDB2IWSDB.properties/upgradeOracleIWSDB.properties` file and then rerun the `launchUpgradeIWSDB.bat/launchUpgradeIWSDB.sh` script to regenerate the SQL statements and apply the SQL statements .

What to do next

You can now proceed with upgrading the product component.

Creating or upgrading the database tables if you are using Oracle

To create or upgrade the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle.

When you are creating or upgrading the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle, run the following procedures:

Creating the database tables for Oracle

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for Oracle" on page 61.
2. Generate the SQL files. See "Generating the SQL files for Oracle" on page 62.
3. Create or upgrade the SQL tables. See "Running scripts to create or upgrade the SQL tables for Oracle" on page 63.

See "Creating the database tables if you are using Oracle" on page 61 for the complete procedure.

Upgrading the database tables for Oracle

A new method for upgrading the IBM Workload Scheduler and the dynamic workload broker database schema is provided for Oracle. The update or upgrade can be performed manually before you install the product component or, using the Installation Manager wizard or silent installation, the schema is updated during the installation procedure.

If you typically update your database tables manually before updating the IBM Workload Scheduler components in your environment, then you can use this new method which includes a script that quickly generates the required SQL statements in an SQL file and optionally applies them directly to the database in a single step.

The advantages of this new update method are:

- A single script that dynamically generates the SQL statements and applies them directly to the database. Optionally, you can configure the script to generate only and then apply them at a later time but before installing the product component.
- The script can be run and rerun as many times as needed without any cleanup required between runs. For example, if for some reason a database object is corrupt, you can rerun the script to regenerate the SQL file and apply it.
- Use this method as a stand-alone tool to check the consistency of the database schema. The database administrator can verify if the database schema has changed and repair any inconsistencies.

Upgrading the product components using either the Installation Manager wizard or the silent installation methods automatically upgrades the database tables using this same method.

Upgrading the database schema for Oracle using this method involves the following high-levels steps:

1. Modify the `upgradeOracleIWSDB.properties` file assigning the appropriate values to the parameters.
2. Run the `launchUpgradeIWSDB.bat` or the `launchUpgradeIWSDB.sh` script to generate and apply the SQL statements. Optionally, you can choose to only generate the statements and apply them later, but before installing the product component.

See "Upgrading the database tables if you are using Oracle" on page 71 for the complete procedure.

Creating the database tables if you are using Oracle

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle.

To create the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for Oracle."
2. Generate the SQL files. See "Generating the SQL files for Oracle" on page 62.
3. Create or upgrade the SQL tables. See "Running scripts to create or upgrade the SQL tables for Oracle" on page 63.

Customizing the properties file for Oracle

To customize the properties file, perform the following steps:

1. From the eImage containing the master domain manager or the dynamic domain manager, open the following properties file:

   On Windows operating systems:
   <*images_dir*>\dbtools\customizeWinOracleSql.properties

   On UNIX and Linux systems:
   <*images_dir*>/dbtools/customizeUnixOracleSql.properties

   where: <*images_dir*> specifies the directory where you extracted the product image.
2. Customize the SQL properties with the values appropriate for your needs:

   TWSTEMPDIR
   The directory where you want to store the SQL scripts to create the database tables. The default value is:

   On Windows operating systems:
   C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\TWA\tws

   On UNIX and Linux systems:
   /tmp/TWA/tws

   MDL_USER
   The Oracle user that will access the IBM Workload Scheduler database.

   TWS_PASSWORD
   The password of the *MDL_USER*.

   TWS_USER
   Specify the IBM Workload Scheduler user name.

   It can contain alphanumeric, dash (-), and underscore (_) characters; it cannot contain national characters. The first character of the user name must be a letter.

   When the IT administrator installs the product, he must specify this value in the **User_name** field.

   TWS_TS_NAME
   The name that identifies the IBM Workload Scheduler data table space. The default for this field is **USERS**.

   When the IT administrator installs the product, he must specify this value in the **IBM Workload Scheduler data tablespace** field.

TWS_LOG_TS_NAME
The name that identifies the IBM Workload Scheduler table space where report data is to be stored. You can view the report data by using the Dynamic Workload Console. The default value for this field is **USERS**.

When the IT administrator installs the product, he must specify this value in the **IBM Workload Scheduler reports tablespace** field.

TWS_TS_TEMP_NAME
The name that identifies the IBM Workload Scheduler temporary table space. The default value for this field is **TEMP**.

When the IT administrator installs the product, he must specify this value in the **IBM Workload Scheduler temporary tablespace** field.

COMPANY_NAME
The name of the company. You can use spaces and the maximum field length is 40 characters. The default is **MYCOMPANY**.

When the IT administrator installs the product, he must specify this value in the **Company** field.

EIF_PORT
The port used by the event management processor to receive events. The valid range is from 1 to 65535. The default value is **31131**.

When the IT administrator installs the product, he must specify this value in the **Event Processor** field.

HOST_NAME
The fully qualified host name or IP address on which the dynamic domain manager is contacted by the dynamic agent.

When the IT administrator installs the product, he must specify this value in the dynamic agent configuration information **Host name or IP address** field.

WAS_SEC_PORT
The HTTPS port of the dynamic workload broker. The dynamic agent uses it to connect to the dynamic workload broker. The valid range is from 1 to 65535. The default value is **31116**. If you leave the field blank, it defaults to **0**.

When the IT administrator installs the product, he must specify this value in the **dynamic workload brokerHTTPS port number** field.

ORACLE_HOME
Specify the path of the Oracle installation.

Generating the SQL files for Oracle

To generate the SQL files, you use the **customizeSQL** script which is located:

On Windows operating systems:
`<images_dir>\dbtools\customizeSQL.bat`

On UNIX and Linux operating systems:
`<images_dir>/dbtools/customizeSQL.sh`

Where *<images_dir>* is the directory where you stored the product images. If you want to use the eImage, download the one containing the master domain manager.

To show command usage, run:

```
customizeSQL -usage
```

The script has the following syntax:

On Windows operating systems:

```
customizeSQL.bat -propertyFile <property_file>
```

On UNIX and Linux operating systems:

```
customizeSQL.sh -propertyFile <property_file>
```

Where `<property_file>` is the absolute path of the directory where the property file is located.

On Windows operating systems:

If you store the properties file in the `C:\Temp\` directory, run:

```
customizeSQL.bat
-propertyFile "C:\Temp\customizeWinOracleSql.properties"
```

On UNIX and Linux operating systems:

If you store the properties file in the `/tmp/` directory, run:

```
customizeSQL.sh /tmp/customizeUnixOracleSql.properties
```

Note: The SQL files are created in the directory that you specified in the TWSTEMPDIR property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Oracle" on page 61.

Running scripts to create or upgrade the SQL tables for Oracle

This section describes the command that you run to create or upgrade the SQL tables. The command that you run depends on the task you are doing:

Creating the SQL tables before installing:

Master domain manager and its backup:

1. Run "Procedure to create the IBM Workload Scheduler SQL tables for Oracle."
2. Run "Procedure to create the dynamic workload broker SQL tables for Oracle" on page 65.

Dynamic domain manager and its backup:

Run "Procedure to create the dynamic workload broker SQL tables for Oracle" on page 65.

Upgrading the SQL tables before upgrading the product:

Master domain manager and its backup:

1. Run "Procedure to upgrade the IBM Workload Scheduler SQL tables for Oracle" on page 67.
2. Run "Procedure to upgrade the dynamic workload broker SQL tables for Oracle" on page 68.

Dynamic domain manager and its backup:

Run "Procedure to upgrade the dynamic workload broker SQL tables for Oracle" on page 68.

.

Procedure to create the IBM Workload Scheduler SQL tables for Oracle: To create the IBM Workload Scheduler database, perform the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws<*version_number*>\TWS\dbtools\ora\scripts

   On UNIX and Linux operating systems:

   TWSTEMPDIR/TWA/tws<*version_number*>/TWS/dbtools/ora/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Oracle" on page 61.
3. Run the following command:

   On Windows operating systems:

   ```
   createdb_root.bat
   <ORACLE_NETSERVICE_NAME> <ORACLE_ADMIN_USER>
   <ORACLE_ADMIN_PW> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_AGENT_TYPE>
   <IS_PARTITIONED> <IS_CHECK_ONLY>
   ```

   On UNIX and Linux operating systems:

   ```
   createdb_root.sh
   <ORACLE_NETSERVICE_NAME> <ORACLE_ADMIN_USER>
   <ORACLE_ADMIN_PW> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_AGENT_TYPE>
   <IS_PARTITIONED> <IS_CHECK_ONLY>
   ```

   Where:

   <ORACLE_NETSERVICE_NAME>

   The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection. A net service name is mapped to a port number and protocol. It is also known as a connect string, database alias, host string, or service name.

   If your Oracle database is:

   - Installed on the same system on which you are installing your master domain manager or a backup master domain manager, the net service name is the name of your Oracle database.
   - Installed on the same system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the name of your Oracle database.
   - Not installed on the system on which you are installing your master domain manager or a backup master domain manager, the net service name is the alias configured for the connection to the remote database.
   - Not installed on the system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the alias configured for the connection to the remote database.

   Contact your database administrator to obtain the correct net service name.

   <ORACLE_ADMIN_USER>

   The Oracle database administrator user name (such as SYSTEM) required to authenticate to the Oracle database. This account must already exist.

<ORACLE_ADMIN_PW>
The database administrator user password required to authenticate to the Oracle database.

<TWS_DB_USER>
The IBM Workload Scheduler Oracle user name that is the owner of the IBM Workload Scheduler schema.

<TWS_DB_PW>
The password for the IBM Workload Scheduler Oracle user. It must comply with the Oracle naming rules.

<TWS_AGENT_TYPE>
The IBM Workload Scheduler agent type to specify:

Master domain manager:
MDM

Backup master domain manager:
BKM

<IS_PARTITIONED>
If you are installing on Oracle Enterprise Edition, you can choose to implement the Oracle Partitioning option to improve the performance of event-driven workload automation. The possible values are `false` (Oracle Partitioning feature is not used when creating the IBM Workload Scheduler schema) or `TRUE` (Oracle Partitioning feature is used when creating the IBM Workload Scheduler schema). The default is `TRUE`.

<IS_CHECK_ONLY>
Always specify `FALSE`.

Procedure to create the dynamic workload broker SQL tables for Oracle: To create the dynamic workload broker database, run the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws94\TDWB\dbtools\ora\scripts

   On UNIX and Linux operating systems:
   TWSTEMPDIR/TWA/tws94/TDWB/dbtools/ora/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Oracle" on page 61.
3. Run the following command:

   On Windows operating systems:

   ```
   createdb_root.bat
   <ORACLE_NETSERVICE_NAME> <ORACLE_ADMIN_USER>
   <ORACLE_ADMIN_PW> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_AGENT_TYPE>
   <IS_PARTITIONED> <IS_CHECK_ONLY>
   ```

On UNIX and Linux operating systems:

```
createdb_root.sh
<ORACLE_NETSERVICE_NAME> <TWS_ADMIN_USER>
<TWS_ADMIN_PW> <TWS_DB_USER>
<TWS_DB_PW> <TWS_AGENT_TYPE>
<IS_PARTITIONED> <IS_CHECK_ONLY>
```

Where:

<ORACLE_NETSERVICE_NAME>
The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection. A net service name is mapped to a port number and protocol. It is also known as a connect string, database alias, host string, or service name.

If your Oracle database is:

- Installed on the same system on which you are installing your master domain manager or a backup master domain manager, the net service name is the name of your Oracle database.
- Installed on the same system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the name of your Oracle database.
- Not installed on the system on which you are installing your master domain manager or a backup master domain manager, the net service name is the alias configured for the connection to the remote database.
- Not installed on the system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the alias configured for the connection to the remote database.

Contact your database administrator to obtain the correct net service name.

<ORACLE_ADMIN_USER>
The Oracle database administrator user name (such as `SYSTEM`) required to authenticate to the Oracle database. This account must already exist.

<ORACLE_ADMIN_PW>
The database administrator user password required to authenticate to the Oracle database.

<TWS_DB_USER>
The IBM Workload Scheduler Oracle user name that is the owner of the IBM Workload Scheduler schema.

<TWS_DB_PW>
The password for the IBM Workload Scheduler Oracle user. It must comply with the Oracle naming rules.

<TWS_AGENT_TYPE>
The IBM Workload Scheduler agent type to specify:

Master domain manager:
MDM

Backup master domain manager:
BKM

Dynamic domain manager:
DDM

Backup dynamic domain manager:
BDM

<IS_PARTITIONED>
If you are installing on Oracle Enterprise Edition, you can choose to implement the Oracle Partitioning option to improve the performance of event-driven workload automation. The possible values are `false` (Oracle Partitioning feature is not used when creating the IBM Workload Scheduler schema) or `TRUE` (Oracle Partitioning feature is used when creating the IBM Workload Scheduler schema). The default is `TRUE`.

<IS_CHECK_ONLY>
Always specify `FALSE`.

Procedure to upgrade the IBM Workload Scheduler SQL tables for Oracle: To upgrade the IBM Workload Scheduler database, perform the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws94\TWS\dbtools\ora\scripts

   On UNIX and Linux operating systems:
   TWSTEMPDIR/TWA/tws94/TWS/dbtools/ora/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Oracle" on page 61.
3. Run the following command:

   On Windows operating systems:
   ```
   migratedb_root.bat
   <TWS_DB> <TWS_USER>
   <TWS_USER_PW> <IS_PARTITIONED>
   ```

   On UNIX and Linux operating systems:
   ```
   migratedb_root.sh
   <TWS_DB> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW> <IS_PARTITIONED>
   ```

   Where:

   <ORACLE_NETSERVICE_NAME>
   The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection. A net service name is mapped to a port number and protocol. It is also known as a connect string, database alias, host string, or service name.

   If your Oracle database is:

   - Installed on the same system on which you are installing your master domain manager or a backup master domain manager, the net service name is the name of your Oracle database.
   - Installed on the same system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the name of your Oracle database.

- Not installed on the system on which you are installing your master domain manager or a backup master domain manager, the net service name is the alias configured for the connection to the remote database.
- Not installed on the system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the alias configured for the connection to the remote database.

Contact your database administrator to obtain the correct net service name.

<TWS_DB_USER>
The IBM Workload Scheduler Oracle user name that is the owner of the IBM Workload Scheduler schema.

<TWS_DB_PW>
The password for the IBM Workload Scheduler Oracle user. It must comply with the Oracle naming rules.

<IS_PARTITIONED>
If you are installing on Oracle Enterprise Edition, you can choose to implement the Oracle Partitioning option to improve the performance of event-driven workload automation. The possible values are `false` (Oracle Partitioning feature is not used when creating the IBM Workload Scheduler schema) or `TRUE` (Oracle Partitioning feature is used when creating the IBM Workload Scheduler schema). The default is `TRUE`.

Procedure to upgrade the dynamic workload broker SQL tables for Oracle: To upgrade the dynamic workload broker database, run the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws94\TDWB\dbtools\ora\scripts

   On UNIX and Linux operating systems:

   TWSTEMPDIR/TWA/tws94/TDWB/dbtools/ora/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Oracle" on page 61.
3. Run the following command:

   On Windows operating systems:

   ```
   migratedb_root.bat
   <ORACLE_NETSERVICE_NAME> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_IS_DDM>
   <TWS_IS_BDM>
   ```

   On UNIX and Linux operating systems:

   ```
   migratedb_root.sh
   <ORACLE_NETSERVICE_NAME> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_IS_DDM>
   <TWS_IS_BDM>
   ```

   Where:

<ORACLE_NETSERVICE_NAME>
The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection. A net service name is mapped to a port number and protocol. It is also known as a connect string, database alias, host string, or service name.

If your Oracle database is:

- Installed on the same system on which you are installing your master domain manager or a backup master domain manager, the net service name is the name of your Oracle database.
- Installed on the same system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the name of your Oracle database.
- Not installed on the system on which you are installing your master domain manager or a backup master domain manager, the net service name is the alias configured for the connection to the remote database.
- Not installed on the system on which you are installing your dynamic domain manager or a backup dynamic domain manager, the net service name is the alias configured for the connection to the remote database.

Contact your database administrator to obtain the correct net service name.

<TWS_DB_USER>
The IBM Workload Scheduler Oracle user name that is the owner of the IBM Workload Scheduler schema.

<TWS_DB_PW>
The password for the IBM Workload Scheduler Oracle user.

<TWS_IS_DDM>
Specify if the IBM Workload Scheduler agent is a dynamic domain manager. Possible values are `TRUE` or `FALSE`.

Note: If you are managing a master domain manager or a backup dynamic domain manager, set the value to `FALSE`.

<TWS_IS_BDM>
Specify if the IBM Workload Scheduler agent is a backup dynamic domain manager. Possible values are `TRUE` or `FALSE`.

Note: If you are managing a master domain manager or a dynamic domain manager, set the value to `FALSE`.

Procedure to upgrade the IBM Workload Scheduler SQL tables for DB2

The procedure to upgrade the IBM Workload Scheduler database.

To upgrade the IBM Workload Scheduler database, perform the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR`\TWA\tws94\TWS\dbtools\db2\scripts`

On UNIX and Linux operating systems:

TWSTEMPDIR/TWA/tws94/TWS/dbtools/db2/scripts

Where *TWSTEMPDIR* is the directory that you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for DB2" on page 50.

3. Run the following command:

   On Windows operating systems:

   ```
   migratedb_root.bat
   <TWS_DB> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW>
   ```

   On UNIX and Linux operating systems:

   ```
   migratedb_root.sh
   <TWS_DB> <TWS_ADMIN_USER>
   <TWS_ADMIN_PW>
   ```

   Where:

   <TWS_DB>

   The name of the DB2 database. The maximum length is five characters. You can use an existing DB2 database instance if its name does not exceed five characters. The default is TWS.

   <TWS_ADMIN_USER>

   The user name of the administrator of the DB2 server instance. This user can be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX systems, verify that you can switch to this user and that it can load the DB2 environment.

   On Windows operating systems:

   The default value is **db2admin**.

   On UNIX and Linux operating systems:

   The default value is **db2inst1**.

   <TWS_ADMIN_PW>

   The password of the DB2 server administrator user, or of the user with SYSADM or SYSCTRL authority.

Procedure to upgrade the dynamic workload broker SQL tables for DB2

The procedure to upgrade the dynamic workload broker database.

To upgrade the dynamic workload broker database, run the following steps:

1. Log on as Administrator on Windows operating systems and as root on UNIX and Linux operating systems.
2. Go to the following directory:

   On Windows operating systems:

   TWSTEMPDIR\TWA\tws93\TDWB\dbtools\db2\scripts

   On UNIX and Linux operating systems:

   TWSTEMPDIR/TWA/tws93/TDWB/dbtools/db2/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for DB2" on page 50.

3. Run the following command:

On Windows operating systems:

```
migratedb_root.bat
<TWS_DB_ALIAS> <TWS_DB2ADMIN_USER>
<TWS_DB2ADMIN_PASSWORD> <TWS_IS_DDM>
<TWS_IS_BDM>
```

On UNIX and Linux operating systems:

a. Log on as root or database administrator

b. Go to the following directory:

```
TWSTEMPDIR/TDWB/dbtools/db2/scripts
```

Run the following:

```
dbmigrate.sh <TWS_DB_ALIAS>
<TWS_DB2ADMIN_USER>
<TWS_DB2ADMIN_PASSWORD>
<TWS_IS_DDM><TWS_IS_BDM>
```

Where:

<TWS_DB_ALIAS>
The name of the DB2 database. The maximum length is five characters. You can use an existing DB2 database instance if its name does not exceed five characters. The default is `TWS`.

<TWS_DB2ADMIN_USER>
The user name of the administrator of the DB2 server instance. This user can be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX operating systems, verify that you can switch to this user and that it can load the DB2 environment.

On Windows operating systems:
The default value is **db2admin**.

On UNIX and Linux operating systems:
The default value is **db2inst1**.

<TWS_DB2ADMIN_PASSWORD>
The password of the DB2 server administrator user, or of the user with SYSADM or SYSCTRL authority.

<TWS_IS_DDM>
Specify if the IBM Workload Scheduler agent is a dynamic domain manager. Possible values are `TRUE` or `FALSE`.

Note: If you are managing a master domain manager or a backup dynamic domain manager, set the value to `FALSE`.

<TWS_IS_BDM>
Specify if the IBM Workload Scheduler agent is a backup dynamic domain manager. Possible values are `TRUE` or `FALSE`.

Note: If you are managing a master domain manager or a dynamic domain manager, set the value to `FALSE`.

Upgrading the database tables if you are using Oracle

To upgrade the IBM Workload Scheduler and the dynamic workload broker database tables if you are using Oracle.

Before you begin

This manual procedure requires an installation of Java Runtime Environment version 1.7 or later. If you already have a supported version installed, refer to the *JAVA_HOME* installation directory where required in this procedure. This manual procedure can also be run from a remote computer where the Java Runtime Environment is installed.

About this task

A new method for upgrading the IBM Workload Scheduler and the dynamic workload broker database schema is provided for Oracle. The update or upgrade can be performed manually before you install the product component or, using the Installation Manager wizard or silent installation, the schema is updated during the installation procedure. For information about the benefits of upgrading the database schema using this method, see "Creating or upgrading the database tables if you are using Oracle" on page 59.

To upgrade the IBM Workload Scheduler and the dynamic workload broker database tables, run the following procedure:

Procedure

1. From the IBM Workload Scheduler eImage, locate the `dblighttool` directory and copy it to a path on the database server computer or on a remote computer.
2. Modify the `upgradeOracleIWSDB.properties` properties file located in the `IWSDBUpgrade` folder assigning values to the parameters as follows:

Table 7. Properties for Oracle upgrade procedure

Property	Oracle
COMPONENT_TYPE	The IBM Workload Scheduler component to be upgraded: MDM, BKM, DDM or BDM. The default value is MDM.
DB_NAME	The Oracle Service Name of the IBM Workload Scheduler database. The default value is `orcl`.
DB_HOST_NAME	The host name or IP address of the Oracle server.
DB_PORT	The port number of the Oracle server. The default value is 1521.
DB_ADMIN_USER	N/A
DB_ADMIN_USER_PWD	N/A
DB_USER	The database user that accesses the IBM Workload Scheduler tables on the Oracle server.
DB_USER_PWD	The password of the database user that will access to IBM Workload Scheduler tables on the Oracle server.
IWS_TS_NAME	The name of the tablespace for IBM Workload Scheduler data. The default value is `USERS`.

Table 7. Properties for Oracle upgrade procedure (continued)

Property	Oracle
IWS_LOG_TS_NAME	The name of the tablespace for the IBM Workload Scheduler log. The default value is `USERS`.
IWS_PLAN_TS_NAME	The name of the tablespace for IBM Workload Scheduler plan. The default value is `USERS`.
IWS_PLAN_TS_PATH	N/A
HOST_NAME	The host name of the IBM Workload Scheduler broker (no default).
WAS_SEC_PORT	The HTTPS port of the IBM Workload Scheduler broker. The default value is `31116`.
UPGRADE_DB	Set to `TRUE` to automatically apply the generated SQL statements to upgrade the IBM Workload Scheduler database schema. Set to `FALSE` to manually apply the generated statements in the customSQL.sql file. The default value is `TRUE`.

3. Run the upgrade script located in the `IWSDBUpgrade` folder specifying the usage and all of the required parameters as follows:

   On Windows operating systems

   ```
   launchUpgradeIWSDB.bat JAVA_HOME_PATH DB_PATH PROPERTY_FILE
   ```

   For example,

   Oracle
   ```
   launchUpgradeIWSDB.bat D:\TWS\JavaExt\jre\jre
   D:\oracle12\product\12.1.0\dbhome_1 D:\IWSDBUpgrade\
   upgradeOracleIWSDB.properties
   ```

   On UNIX and Linux operating systems

   ```
   ./launchUpgradeIWSDB.sh JAVA_HOME_PATH DB_PATH PROPERTY_FILE
   ```

   For example,

   Oracle
   ```
   ./launchUpgradeIWSDB.sh /opt/TWS/JavaExt/jre/jre
   /app/oracle/product/12.1.0/dbhome_1 /IWSDBUpgrade/
   upgradeOracleIWSDB.properties
   ```

Table 8. Upgrade script parameters

Parameter	Description
JAVA_HOME_PATH	The Java home directory, where the bin directory is present.
DB_PATH	The *ORACLE_HOME* directory.
PROPERTY_FILE	The fully qualified name of the file that contains a number of properties, one on each line with an assigned value, that are required for the database upgrade: `upgradeOracleIWSDB.properties`

The script creates an SQL file with all the statements needed to upgrade the IBM Workload Scheduler database schema to the latest version. The SQL file is named: `IWSDBUpgrade/customSQL.sql`.

If the UPGRADE_DB parameter is set to TRUE, then the generated SQL statements are applied to the database automatically when the script is run.

If UPGRADE_DB parameter is set to FALSE, then the SQL statements are generated but not applied to the database. You can inspect the generated customSQL.sql and when you are ready to apply them to the database, set the value of the UPGRADE_DB parameter to TRUE in the upgradeDB2IWSDB.properties/upgradeOracleIWSDB.properties file and then rerun the launchUpgradeIWSDB.bat/launchUpgradeIWSDB.sh script to regenerate the SQL statements and apply the SQL statements .

What to do next

You can now proceed with upgrading the product component.

Creating or upgrading the database schema if you are using Informix Dynamic Server

To create or upgrade the IBM Workload Scheduler and the dynamic workload broker database schema if you are using Informix Dynamic Server, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for Informix Dynamic Server."
2. Generate the SQL files. See "Generating the SQL files on Informix" on page 76.
3. Create or upgrade the SQL schema. See "Running scripts to create or upgrade the SQL schema on Informix" on page 76.

Customizing the properties file for Informix Dynamic Server

Unless you are upgrading the IBM Workload Scheduler schema, before you proceed to customize the properties file, you must have created the following db and sb spaces:

- A db space sized 100 MB and with a page size of 8K or greater, referred to as **DBSPNAME** in the properties file customization steps.
- A db space space sized 20 MB, referred to as **TWS_DBSP_LOG** in the properties file customization steps.
- An sb space for blob and clob data, sized 100 MB, referred to as **TWS_SBSP** in the properties file customization steps.

To customize the properties file, perform the following steps:

1. From the eImage containing the master domain manager or the dynamic domain manager, open the following properties file:

   On Linux systems:
   <*images_dir*>/dbtools/customizeUnixIDSSql.properties

   where: <*images_dir*> specifies the directory where you extracted the product image.
2. Customize the SQL properties with the values that best fit your needs:

   TWSTEMPDIR
   The directory where you want to store the SQL scripts to create the database tables. The default value is:

On Linux systems:
/tmp/TWA/tws

DB_USER
The database administrator user name (such as `Informix`) that accesses the IBM Workload Scheduler and the dynamic workload broker database.

When you run the customization script ("Installing for an Informix Dynamic Server" on page 109), you must specify this value in the **dbUser** field.

TWS_USER
Specify the IBM Workload Scheduler user name.

When you run the customization script ("Installing for an Informix Dynamic Server" on page 109), you must specify this value in the **twsUser** field.

TWS_DB
The name of the IBM Workload Scheduler database. The default value is **TWS**.

When you run the customization script ("Installing for an Informix Dynamic Server" on page 109), you must specify this value in the **dbName** field.

COMPANY_NAME
The name of the company. You can use spaces and the maximum field length is 40 characters. The default is **MYCOMPANY**.

EIF_PORT
The port used by the event management processor to receive events. The valid range is from 1 to 65535. The default value is **31131**.

HOST_NAME
The fully qualified host name or IP address of the dynamic workload broker.

WAS_SEC_PORT
The HTTPS port of the dynamic workload broker. The dynamic agent uses it to connect to the dynamic workload broker. The valid range is from 1 to 65535. The default value is **31116**.

TWS_SBSP
The name that identifies the IBM Workload Scheduler sb space. The default for this field is **twssbspace**.

TWS_DBSP_LOG
The name that identifies the IBM Workload Scheduler db space where log data is to be stored. The default value for this field is **twsdbs**.

TWS_DBSP_LOG_RULE
The name of the db space for LOG RULE. The default value for this field is **twsdbs<*version_number*>**.

TWS_DBSP_LOG_ACTION
The name of the db space for LOG ACTION. The default value for this field is **twsdbs<*version_number*>**.

TWS_DBSP_LOG_MESSAGE
The name of the db space for LOG MESSAGE. The default value for this field is **twsdbs<*version_number*>**.

TWS_DBSP_LOG_AUDIT
The name of the db space for LOG AUDIT. The default value for this field is **twsdbs<*version_number*>**.

TWS_DBSP_LOG_AUDIT_S
The name of the db space for LOG AUDIT_S. The default value for this field is **twsdbs<*version_number*>**.

DBSPNAME
The name of the db space for the database. The default value for this field is **twsdbs<*version_number*>**.

DB_USE
The value for this field is **IDS**. Do not change it or the customization process will fail.

MASTERDOM_NAME
The value for this field is **MASTERDM**. Do not change it or the customization process will fail.

Generating the SQL files on Informix

To generate the SQL files, you use the **customizeSQL** script which is located in:

```
<images_dir>/dbtools/customizeSQL.sh
```

Where <*images_dir*> is the directory where you stored the product images.

To show command usage, run:

```
customizeSQL -usage
```

The script has the following syntax:

```
customizeSQL.sh -propertyFile <property_file>
```

Where <property_file> is the absolute path of the directory where the property file is located.

If you store the properties file in the /tmp/ directory, run:

```
customizeSQL.sh /tmp/customizeUnixIDSSql.properties
```

Note: The SQL files are created in the directory that you specified in the TWSTEMPDIR property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Informix Dynamic Server" on page 74.

Running scripts to create or upgrade the SQL schema on Informix

This section describes the command that you run to create or upgrade the SQL schema. The command that you run depends on the task that you are doing:

Creating the SQL schema before installing:

Master domain manager and its backup:
Run "Procedure to create the IBM Workload Scheduler SQL schema on Informix" on page 77.

Dynamic domain manager and its backup:
Run "Procedure to create the dynamic workload broker SQL schema on Informix" on page 78.

Upgrading the SQL schema before upgrading the product:

Master domain manager and its backup:
Run "Procedure to upgrade the IBM Workload Scheduler SQL schema on Informix" on page 79.

Dynamic domain manager and its backup:
Run Procedure to upgrade the dynamic workload broker SQL schema on Informix .

Procedure to create the IBM Workload Scheduler SQL schema on Informix

To create the IBM Workload Scheduler database, perform the following steps:

1. Log on as root on your Linux system and go to the following directory:

   TWSTEMPDIR/TWS/dbtools/ids/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Informix Dynamic Server" on page 74.

2. Run the following command:

   ```
   createdb_root.sh
   <TWS_HOST> <TWS_SRVC_PORT>
   <TWS_DB_USER> <TWS_DB_PW>
   <TWS_DB> <TWS_DBSP_NAME>
   <IS_BKM> <IS_PARTITIONED>
   <TWS_GRANT_USER>
   ```

   Where:

   <TWS_HOST>
   The IP address or host name of the workstation where Informix Dynamic Server is installed.

   <TWS_SRVC_PORT>
   The TCP/IP port number that the remote Informix Dynamic Server instance uses to communicate.

   <TWS_DB_USER>
   The user name of the database administrator that has access to the IBM Workload Scheduler schema on the database.

   <TWS_DB_PW>
   The password of the database administrator user. It must comply with the Informix Dynamic Server naming rules.

   <TWS_DB>
   The name of the database. The default value is **TWS**.

   <TWS_DBSP_NAME>
   The name of the db space used to store scheduling objects and event rules.

   <IS_BKM>
   Specify `TRUE` if the workstation where you are creating the database is an IBM Workload Scheduler backup master domain manager. Otherwise, specify `FALSE`.

   <IS_PARTITIONED>
   Specify `TRUE` if you use fragmentation on the Informix Dynamic Server database. Otherwise, specify `FALSE`.

<TWS_GRANT_USER>
Always specify `TRUE`.

Procedure to create the dynamic workload broker SQL schema on Informix

To create the dynamic workload broker database, run the following steps:

1. Log on as root on your Linux system and go to the following directory:

   TWSTEMPDIR/TDWB/dbtools/ids/scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Informix Dynamic Server" on page 74.

2. Run the following command:

   ```
   createdb_root.sh
   <TWS_DB> <TWS_HOST>
   <TWS_SRVC_PORT> <TWS_DB_USER>
   <TWS_DB_PW> <TWS_AGENT_TYPE>
   <TWS_DBSP_NAME>
   ```

   Where:

   <TWS_DB>
   The name of the database. The default value is **TWS**.

   <TWS_HOST>
   The IP address or host name of the workstation where Informix Dynamic Server is installed.

   <TWS_SRVC_PORT>
   The TCP/IP port number that the remote Informix Dynamic Server instance uses to communicate.

   <TWS_DB_USER>
   The user name of the database administrator that has access to the IBM Workload Scheduler schema on the database.

   <TWS_DB_PW>
   The password of the database administrator user. It must comply with the Informix Dynamic Server naming rules.

   <TWS_AGENT_TYPE>
   Specify the IBM Workload Scheduler workstation type where the database is being created:

   MDM The dynamic workload broker database is to be created on the master domain manager.

   Attention: Start this procedure only after the master domain manager database is created.

   BKM The dynamic workload broker database is to be created on the backup master domain manager.

   Attention: Start this procedure only after the backup master domain manager database is created.

   DDM The dynamic workload broker database is to be created on a dynamic domain manager.

   BDM The dynamic workload broker database is to be created on a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is created.

<TWS_DBSP_NAME>
The name of the db space used to store scheduling objects and event rules.

Procedure to upgrade the IBM Workload Scheduler SQL schema on Informix

Before upgrading the IBM Workload Scheduler database, complete the following steps:

1. Do not change the master domain manager workstation name (the `This workstation name` field in the IBM Workload Scheduler master configuration panel when you install IBM Workload Scheduler) from the previous installation, otherwise the migration of the database will end with errors. If you want to change this name, do so after the completion of the upgrade process.
2. If your database is based on a database space less than 8K, you must run the following steps to increase the DBSPACE to 8K before you upgrade the IBM Workload Scheduler schema.
   a. Take a LEVEL 0 backup of the database for security.
   b. Run the `dbexport` command to unload the database to a text file while you increase the DBSPACE. Run the command with the `-ss` option. For example:
      ```
      dbexport -d <tws_db_name> -ss -o <path_to_export>
      ```
   c. Run the `onspaces` command to create a DBSPACE with a page size of at least 8K. For example:
      ```
      onspaces -c -d DBSPNAME -k 8 -p /usr4/dbspaces/DBSPNAME
               -o 0 -s 80000
      ```
   d. Drop or rename the existing database.
   e. Run the `dbimport` command to recreate the database, making sure you specify the new 8K (or greater) DBSPACE as well as the `-ansi` option. For example:
      ```
      dbimport <tws_db_name> -d DBSPNAME -ansi -l -i <path_of_exported_db>
      ```
3. Verify the current Informix Dynamic Server properties file, and generate the SQL files for the upgrade:
   a. Verify the current properties file and customize the SQL properties with the values that best fit your needs. See "Customizing the properties file for Informix Dynamic Server" on page 74.
   b. Generate the SQL files. See "Generating the SQL files on Informix" on page 76.

To upgrade the IBM Workload Scheduler database, complete the following steps:

1. Log on as root on your Linux system and go to the following directory:
   ```
   TWSTEMPDIR/TWS/dbtools/ids/scripts
   ```
   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file.
2. Run the following command:
   ```
   migratedb_root.sh
   <TWS_HOST> <TWS_SRVC_PORT>
   <TWS_DB_USER> <TWS_DB_PW>
   <TWS_DB> <IS_PARTITIONED>
   ```
   Where:

<TWS_HOST>
The IP address or host name of the workstation where Informix Dynamic Server is installed.

<TWS_SRVC_PORT>
The TCP/IP port number that the remote Informix Dynamic Server instance uses to communicate.

<TWS_DB_USER>
The user name of the database administrator that has access to the IBM Workload Scheduler schema on the database.

<TWS_DB_PW>
The password of the database administrator user. It must comply with the Informix Dynamic Server naming rules.

<TWS_DB>
The name of the database that you are upgrading.

<IS_PARTITIONED>
Specify `TRUE` if you used fragmentation on the previous version of the database. Otherwise, specify `FALSE`.

Procedure to upgrade the dynamic workload broker SQL schema on Informix

Before upgrading the dynamic workload broker database, complete the following steps:

1. Do not change the master domain manager or dynamic domain manager workstation name (the `This workstation name` field in the master domain manager or dynamic domain manager configuration panel when you install IBM Workload Scheduler) from the previous installation, otherwise the migration of the database will end with errors. If you want to change this name, do so after the completion of the upgrade process.
2. If your database is based on a database space less than 8K, before you upgrade the dynamic workload broker schema you must run the following steps to increase the DBSPACE to 8K:
   a. Take a LEVEL 0 backup of the database for security.
   b. Run the `dbexport` command to unload the database to a text file while you increase the DBSPACE. Run the command with the `-ss` option. For example:
      ```
      dbexport -d <tdwb_db_name> -ss -o <path_to_export>
      ```
   c. Run the `onspaces` command to create a DBSPACE with a page size of at least 8K. For example:
      ```
      onspaces -c -d DBSPNAME -k 8 -p /usr4/dbspaces/DBSPNAME
               -o 0 -s 80000
      ```
   d. Drop or rename the existing database.
   e. Run the `dbimport` command to recreate the database, making sure you specify the new 8K (or greater) DBSPACE as well as the `-ansi` option. For example:
      ```
      dbimport <tdwb_db_name> -d DBSPNAME -ansi -l -i <path_of_exported_db>
      ```

To upgrade the dynamic workload broker database, complete the following steps:

1. Log on as root on your Linux system and go to the following directory:
   TWSTEMPDIR`/TDWB/dbtools/ids/scripts`
   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file.

2. Run the following command:

```
migratedb_root.sh
<TWS_DB> <TWS_HOST>
<TWS_SRVC_PORT> <TWS_DB_USER>
<TWS_DB_PW> <TWS_AGENT_TYPE>
<TWS_DBSP_NAME>
```

Where:

<TWS_DB>
The name of the database that you are upgrading.

<TWS_HOST>
The IP address or host name of the workstation where Informix Dynamic Server is installed.

<TWS_SRVC_PORT>
The TCP/IP port number that the remote Informix Dynamic Server instance uses to communicate.

<TWS_DB_USER>
The user name of the database administrator that has access to the IBM Workload Scheduler schema on the database.

<TWS_DB_PW>
The password of the database administrator user. It must comply with the Informix Dynamic Server naming rules.

<TWS_AGENT_TYPE>
Specify the IBM Workload Scheduler workstation type where the database is being upgraded:

MDM The dynamic workload broker database is to be upgraded on the master domain manager.

Attention: Start this procedure only after the master domain manager database is upgraded.

BKM The dynamic workload broker database is to be upgraded on the backup master domain manager.

Attention: Start this procedure only after the backup master domain manager database is upgraded.

DDM The dynamic workload broker database is to be upgraded on a dynamic domain manager.

BDM The dynamic workload broker database is to be upgraded on a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is upgraded.

<TWS_DBSP_NAME>
The name of the db space used to store scheduling objects and event rules.

Creating or upgrading the database schema if you are using Microsoft SQL Server

This chapter describes how to create or upgrade the IBM Workload Scheduler and the dynamic workload broker database schema if you are using Microsoft SQL Server.

When you are creating or upgrading the IBM Workload Scheduler and the dynamic workload broker database schema if you are using Microsoft SQL Server, run the following procedures:

1. Customize the properties file. See "Customizing the properties file for Microsoft SQL Server."
2. Generate the SQL files. See "Generating the SQL files on Microsoft SQL Server" on page 84.
3. Create or upgrade the SQL schema. See "Running scripts to create or upgrade the SQL schema on Microsoft SQL Server" on page 84.

Customizing the properties file for Microsoft SQL Server

Before you proceed to customize the properties file, you must have created the directories where the `TWS_TS_NAME`, `TWS_LOG_TS_NAME`, and `TWS_TS_PLAN_NAME` table spaces will be placed when the IBM Workload Scheduler schema is created. Default directories are:

- `C:\MSSQL\TWS_DATA` for `TWS_TS_NAME` table space.
- `C:\MSSQL\TWS_LOG` for `TWS_LOG_TS_NAME` table space.
- `C:\MSSQL\TWS_PLAN` for `TWS_TS_PLAN_NAME` table space.

To customize the properties file, perform the following steps:

1. From the eImage containing the master domain manager or the dynamic domain manager, open the following properties file:

   `<images_dir>\dbtools\customizeWinMSSQLSql.properties`

   where: <*images_dir*> specifies the directory where you extracted the product image.
2. Customize the SQL properties with the values appropriate for your needs:

   TWSTEMPDIR
   The directory where you want to store the SQL scripts to create the database tables. The default value is:

   `C:\DOCUME~1\ADMINI~1\LOCALS~1\Temp\TWA\tws`

   DB_USER
   The ID of the user that accesses the IBM Workload Scheduler and the dynamic workload broker database. The default is the DB administrator.

   When you run the customization script ("Installing for a Microsoft SQL Server database" on page 110), you must specify this value in the **dbUser** field.

   TWS_USER
   The IBM Workload Scheduler user name specified also when installing the master domain manager or the dynamic domain manager.

When you run the customization script ("Installing for a Microsoft SQL Server database" on page 110), you must specify this value in the **twsUser** field.

TWS_DB
The name of the IBM Workload Scheduler database. The default value is **TWS**.

When you run the customization script ("Installing for a Microsoft SQL Server database" on page 110), you must specify this value in the **dbName** field.

COMPANY_NAME
The name of the company. You can use spaces and the maximum field length is 40 characters. The default is **MYCOMPANY**.

EIF_PORT
The port used by the event management processor to receive events. The valid range is from 1 to 65535. The default value is **31131**.

HOST_NAME
The fully qualified host name or IP address of the dynamic workload broker.

WAS_SEC_PORT
The HTTPS port of the dynamic workload broker. The dynamic agent uses it to connect to the dynamic workload broker. The valid range is from 1 to 65535. The default value is **31116**.

TWS_TS_NAME
The name that identifies the IBM Workload Scheduler data table space. The default for this field is **TWS_DATA**.

TWS_DATA_TS_PATH
The path to the IBM Workload Scheduler data table space. The default is **C:\MSSQL\TWS_DATA**. The `C:\MSSQL\TWS_DATA` path must already exist in the filesystem.

TWS_LOG_TS_NAME
The name of the tablespace for the IBM Workload Scheduler log. The default value for this field is **TWS_LOG**.

TWS_LOG_TS_PATH
The path to the IBM Workload Scheduler log table space. The default is **C:\MSSQL\TWS_LOG**. The `C:\MSSQL\TWS_LOG` path must already exist in the filesystem.

TWS_PLAN_TS_NAME
The name of the tablespace for the IBM Workload Scheduler plan. The default value for this field is **TWS_PLAN**.

TWS_PLAN_TS_PATH
The path to the IBM Workload Scheduler plan table space. The default is **C:\MSSQL\TWS_PLAN**. The `C:\MSSQL\TWS_PLAN` path must already exist in the filesystem.

DB_USE
The value for this field is **MSSQL**. Do not change it or the customization process will fail.

MASTERDOM_NAME
The value for this field is **MASTERDM**. Do not change it or the customization process will fail.

Generating the SQL files on Microsoft SQL Server

To generate the SQL files, you use the **customizeSQL** script which is located in:
`<images_dir>\dbtools\customizeSQL.bat`

Where <*images_dir*> is the directory where you stored the product images.

To show command usage, run:
`customizeSQL -usage`

The script has the following syntax:
`customizeSQL.bat -propertyFile <property_file>`

Where `<property_file>` is the absolute path of the directory where the property file is located.

If you store the properties file in the C:\tmp\ directory, run:
`customizeSQL.bat \tmp\customizeWinMSSQLSql.properties`

Note: The SQL files are created in the directory that you specified in the TWSTEMPDIR property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.

Running scripts to create or upgrade the SQL schema on Microsoft SQL Server

This section describes the command that you run to create or upgrade the SQL schema on Microsoft SQL Server. The command that you run depends on the task you are doing and on the type of authentication that you use to connect to the SQL Server.

Creating the SQL schema before installing the product

When using SQL Server Authentication

Master domain manager and its backup

1. Run "Procedure to create the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 85
2. Run "Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 86

Dynamic domain manager and its backup

Run "Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 86.

When using Windows Authentication

Master domain manager and its backup

1. Run "Procedure to create the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using Windows Authentication" on page 87
2. Run "Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication" on page 87.

Dynamic domain manager and its backup

Run "Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication" on page 87.

Upgrading the SQL schema before upgrading the product

When using SQL Server Authentication

Master domain manager and its backup

1. Run "Procedure to upgrade the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 88
2. Run "Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 89

Dynamic domain manager and its backup

Run "Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication" on page 89.

When using Windows Authentication

Master domain manager and its backup

1. Run "Procedure to upgrade the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using Windows Authentication" on page 90
2. Run "Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication" on page 91.

Dynamic domain manager and its backup

Run "Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication" on page 91.

Procedure to create the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using SQL Server Authentication

To create the IBM Workload Scheduler database when using SQL Server Authentication, perform the following steps:

1. Go to the following directory:

   TWSTEMPDIR\TWS\dbtools\mssql\scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.

2. Run the following command:

   ```
   createdb_root.bat
   <sqlServerInstance> <windowsAuthMode>
   <twsDatabase> <adminUser>
   <adminPwd> <agentType>
   ```

   Where:

   <sqlServerInstance>

   The name of the SQL Server instance.

<windowsAuthMode>
Specifies if Windows authentication is used to connect to SQL Server. Enter FALSE if you are authenticating as SQL Server user.

<twsDatabase>
The name of the database. The default value is **TWS**.

<adminUser>
The user name of the database administrator.

<adminPwd>
The password of the database administrator.

<agentType>
The type of IBM Workload Scheduler component for which you are creating the SQL tables. Enter MDM for a master domain manager, or BKM for a backup master domain manager.

Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication

To create the dynamic workload broker database when using SQL Server Authentication, run the following steps:

1. Go to the following directory:

   TWSTEMPDIR\TDWB\dbtools\mssql\scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.

2. Run the following command:

   ```
   createdb_root.bat
   <sqlServerInstance> <windowsAuthMode>
   <twsDatabase> <adminUser>
   <adminPwd> <agentType>
   ```

   Where:

   <sqlServerInstance>
   The name of the SQL Server instance.

   <windowsAuthMode>
   Specifies if Windows authentication is used to connect to SQL Server. Enter FALSE if you are authenticating as SQL Server user.

   <twsDatabase>
   The name of the database. The default value is **TWS**.

   <adminUser>
   The user name of the database administrator.

   <adminPwd>
   The password of the database administrator.

   <agentType>
   The type of IBM Workload Scheduler component for which you are creating the SQL tables. Enter:

   MDM If the dynamic workload broker for which you are creating the SQL tables resides in a master domain manager.

   Attention: Start this procedure only after the master domain manager database is created.

BKM If the dynamic workload broker for which you are creating the SQL tables resides in a backup master domain manager.

Attention: Start this procedure only after the backup master domain manager database is created.

DDM If the dynamic workload broker for which you are creating the SQL tables resides in a dynamic domain manager.

BDM If the dynamic workload broker for which you are creating the SQL tables resides in a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is created.

Procedure to create the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using Windows Authentication

To create the IBM Workload Scheduler database when using Windows Authentication, perform the following steps:

1. From the workstation where the Microsoft SQL Server is installed, start a shell in which you impersonate the domain user that will later be the owner of the IBM Workload Scheduler instance.
2. Go to the following directory:

   TWSTEMPDIR\TWS\dbtools\mssql\scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.
3. Run the following command:

   ```
   createdb_root.bat
   <sqlServerInstance> <windowsAuthMode>
   <twsDatabase> <agentType>
   ```

   Where:

   <sqlServerInstance>
   The name of the SQL Server instance.

   <windowsAuthMode>
   Specifies if Windows authentication is used to connect to SQL Server. Enter TRUE if you are authenticating as Windows user.

   <twsDatabase>
   The name of the database. The default value is **TWS**.

   <agentType>
   The type of IBM Workload Scheduler component for which you are creating the SQL tables. Enter MDM for a master domain manager, or BKM for a backup master domain manager.

Procedure to create the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication

To create the dynamic workload broker database when using Windows Authentication, run the following steps:

1. From the workstation where the Microsoft SQL Server is installed, start a shell in which you impersonate the domain user that will later be the owner of the IBM Workload Scheduler instance.
2. Go to the following directory:

TWSTEMPDIR\TDWB\dbtools\mssql\scripts

Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.

3. Run the following command:

```
createdb_root.bat
<sqlServerInstance> <windowsAuthMode>
<twsDatabase> <agentType>
```

Where:

<sqlServerInstance>
The name of the SQL Server instance.

<windowsAuthMode>
Specifies if Windows authentication is used to connect to SQL Server. Enter TRUE if you are authenticating as Windows user.

<twsDatabase>
The name of the database. The default value is **TWS**.

<agentType>
The type of IBM Workload Scheduler component for which you are creating the SQL tables. Enter:

MDM If the dynamic workload broker for which you are creating the SQL tables resides in a master domain manager.

Attention: Start this procedure only after the master domain manager database is created.

BKM If the dynamic workload broker for which you are creating the SQL tables resides in a backup master domain manager.

Attention: Start this procedure only after the backup master domain manager database is created.

DDM If the dynamic workload broker for which you are creating the SQL tables resides in a dynamic domain manager.

BDM If the dynamic workload broker for which you are creating the SQL tables resides in a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is created.

Procedure to upgrade the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using SQL Server Authentication

Before upgrading the IBM Workload Scheduler database schema, perform the following steps:

1. Verify the current properties file and customize the SQL properties with the values appropriate for your needs. See "Customizing the properties file for Microsoft SQL Server" on page 82.
2. Generate the SQL files. See "Generating the SQL files on Microsoft SQL Server" on page 84.

To upgrade the IBM Workload Scheduler database schema when using SQL Server Authentication, perform the following steps:

1. Go to the following directory:

TWSTEMPDIR\TWS\dbtools\mssql\scripts

Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file.

2. Run the following command:

```
migratedb_root.bat
<sqlServerInstance> <windowsAuthMode>
<twsDatabase> <adminUser>
<adminPwd> <agentType>
```

Where:

<sqlServerInstance>
The name of the SQL Server instance.

<windowsAuthMode>
Specifies if Windows authentication is used to connect to SQL Server. Enter FALSE if you are authenticating as SQL Server user.

<twsDatabase>
The name of the database.

<adminUser>
The user name of the database administrator.

<adminPwd>
The password of the database administrator.

<agentType>
The type of IBM Workload Scheduler component for which you are upgrading the SQL tables. Enter MDM for a master domain manager, or BKM for a backup master domain manager.

Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using SQL Server Authentication

To upgrade the dynamic workload broker database when using SQL Server Authentication, run the following steps:

1. Go to the following directory:

TWSTEMPDIR\TDWB\dbtools\mssql\scripts

Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.

2. Run the following command:

```
migratedb_root.bat
<sqlServerInstance> <windowsAuthMode>
<twsDatabase> <adminUser>
<adminPwd> <agentType>
```

Where:

<sqlServerInstance>
The name of the SQL Server instance.

<windowsAuthMode>
Specifies if Windows authentication is used to connect to SQL Server. Enter FALSE if you are authenticating as SQL Server user.

<twsDatabase>
The name of the database.

<adminUser>
The user name of the database administrator.

<adminPwd>
The password of the database administrator.

<agentType>
The type of IBM Workload Scheduler component for which you are upgrading the SQL tables. Enter:

MDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a master domain manager.

Attention: Start this procedure only after the master domain manager database is upgraded.

BKM If the dynamic workload broker for which you are upgrading the SQL tables resides in a backup master domain manager.

Attention: Start this procedure only after the backup master domain manager database is upgraded.

DDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a dynamic domain manager.

BDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is upgraded.

Procedure to upgrade the IBM Workload Scheduler SQL schema on Microsoft SQL Server when using Windows Authentication

Before upgrading the IBM Workload Scheduler database schema, perform the following steps:

1. Verify the current properties file and customize the SQL properties with the values appropriate for your needs. See "Customizing the properties file for Microsoft SQL Server" on page 82.
2. Generate the SQL files. See "Generating the SQL files on Microsoft SQL Server" on page 84.

To upgrade the IBM Workload Scheduler database schema when using Windows Authentication, perform the following steps:

1. From the workstation where the Microsoft SQL Server is installed, start a shell in which you impersonate the domain user that is the owner of the IBM Workload Scheduler instance.
2. Go to the following directory:

   ```
   TWSTEMPDIR\TWS\dbtools\mssql\scripts
   ```

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file.
3. Run the following command:

   ```
   migratedb_root.bat
   <sqlServerInstance> <windowsAuthMode>
   <twsDatabase> <agentType>
   ```

   Where:

   <sqlServerInstance>
   The name of the SQL Server instance.

<windowsAuthMode>
Specifies if Windows authentication is used to connect to SQL Server. Enter TRUE if you are authenticating as Windows user.

<twsDatabase>
The name of the database.

<agentType>
The type of IBM Workload Scheduler component for which you are upgrading the SQL tables. Enter MDM for a master domain manager, or BKM for a backup master domain manager.

Procedure to upgrade the dynamic workload broker SQL schema on Microsoft SQL Server when using Windows Authentication

To upgrade the dynamic workload broker database when using Windows Authentication, run the following steps:

1. From the workstation where the Microsoft SQL Server is installed, start a shell in which you impersonate the domain user that is the owner of the IBM Workload Scheduler instance.
2. Go to the following directory:

   TWSTEMPDIR\TDWB\dbtools\mssql\scripts

   Where *TWSTEMPDIR* is the directory you specified in the *TWSTEMPDIR* property of the configuration file. For more information about how to customize the property file, see "Customizing the properties file for Microsoft SQL Server" on page 82.
3. Run the following command:

   ```
   migratedb_root.bat
   <sqlServerInstance> <windowsAuthMode>
   <twsDatabase> <agentType>
   ```

   Where:

   <sqlServerInstance>
   The name of the SQL Server instance.

   <windowsAuthMode>
   Specifies if Windows authentication is used to connect to SQL Server. Enter TRUE if you are authenticating as Windows user.

   <twsDatabase>
   The name of the database.

   <agentType>
   The type of IBM Workload Scheduler component for which you are upgrading the SQL tables. Enter:

   MDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a master domain manager.

   Attention: Start this procedure only after the master domain manager database is upgraded.

   BKM If the dynamic workload broker for which you are upgrading the SQL tables resides in a backup master domain manager.

   Attention: Start this procedure only after the backup master domain manager database is upgraded.

DDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a dynamic domain manager.

BDM If the dynamic workload broker for which you are upgrading the SQL tables resides in a backup domain manager.

Attention: Start this procedure only after the dynamic domain manager database is upgraded.

Chapter 6. Installing

How to install the current version of IBM Workload Scheduler

About this task

This chapter describes how to perform a first-time installation of the current version of IBM Workload Scheduler.

Changing temporary directory when installing using Installation Manager

When you install the IBM Workload Scheduler using Installation Manager, you can change the default path of the temporary directory.

To change the location of the default directory where temporary files are stored during the installation of the IBM Workload Scheduler using the IBM Installation Manager, perform the following actions:

1. Go to the Installation Manager installation path, edit the `IBMIM.ini` file and after line:

   ```
   -vmargs
   ```

   add the following line:

   ```
   -Djava.io.tmpdir=<new_temp_folder>
   ```

   where *<new_temp_folder>* is the full path to the new temporary directory.
2. Restart the Installation Manager and install the IBM Workload Scheduler.

Examples:

On Windows operating systems:

```
-vmargs
-Djava.io.tmpdir=C:\NewDir
```

On UNIX operating systems:

```
-vmargs
-Djava.io.tmpdir=/tmp/NewDir
```

Installing main components

Choose which component you want to install; a master domain manager or its backup, a dynamic domain manager or its backup, the agents.

About this task

Selecting installation methods

The methods to install a master domain manager or its backup, a dynamic domain manager or its backup

About this task

You can install IBM Workload Scheduler using any of the following methods:

Installation wizard
To start the installation by using this method, see:

master domain manager or its backup
"Installation procedure for master domain manager and its backup."

dynamic domain manager or its backup
"Installation procedure for a dynamic domain manager or its backup" on page 123

Silent installation
To start the installation by using this method, see:

master domain manager or its backup
"Performing a silent installation" on page 113.

dynamic domain manager or its backup
"Performing a silent installation" on page 113.

Installing a master domain manager or its backup

Start the installation of a master domain manager or its backup.

About this task

Start the installation of a master domain manager or its backup.

During the master domain manager installation process the following workstation types are created in the database:

master
For the master domain manager

broker
For the broker server

agent For the dynamic agent

During the master domain manager installation, the license model to be applied to the environment is defined. The license model determines the criteria by which your license compliance is calculated. The following pricing models are supported: **byWorkstation**, **perServer**, **perJob**. The default value is **perServer**. To determine the current value of this global option, enter the following command: **optman show ln** or **optman show licenseType**. To modify the pricing model, use the **optman chg ln** or **optman chg licenseType** command. For more information about licensing, see the section about license management in IBM License Metric Tool in *Administration Guide*.

Note: When installing a backup master domain manager, ensure that the IBM Workload Scheduler user name defined on the backup master domain manager is also present in the security file on the master domain manager. This ensures that the IBM Workload Scheduler user works on both master domain manager and backup master domain manager.

Installation procedure for master domain manager and its backup

Install the master domain manager or its backup and all the prerequisites by using the wizard.

About this task

To install a IBM Workload Scheduler master domain manager or its backup and all the prerequisites, perform the following steps:

1. Run the installation process, as follows:
   a. From the eImage that contains the IBM Workload Scheduler master domain manager, run:

      Windows operating systems:
      From the `root` directory of the eImage, run `setupTWS.bat`.

      UNIX operating systems:
      From the `root` directory of the eImage, run `setupTWS.sh`.

      The Installation Packages Installation Manager panel opens.

   Note: If you want to install a master domain manager and a Dynamic Workload Console at the same time in two different directories, from the `root` directory of the eImage, run the following command:

   Windows operating systems:
   `setupALL.bat`

   UNIX operating systems:
   `setupALL.sh`.

   and follow the procedure described in this topic for the master domain manager, and the procedure described in "Installation procedure for Dynamic Workload Console" on page 356 for the Dynamic Workload Console.
2. In the Installation Packages Installation Manager panel, the installation process selected all the IBM Workload Scheduler prerequisites packages and the **"IBM Workload Scheduler"** > **"Version 9.4.0.0"** product package.

   Note: If you have already installed IBM Workload Scheduler or its prerequisites products a warning panel is displayed. Click **Continue** to install the package in a new group or click **Cancel** to clear the package that is already installed.
   Click **Next**.
3. On the Licenses page, read the license agreement for the selected package. If you selected to install the IBM Workload Scheduler package and the IBM Workload Scheduler prerequisites packages, you must accept the license agreement for each package. On the left side of the License page, click each package to see its license agreement. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**.
4. Click **Next**. The Location panel is displayed. The Location panel lists the IBM Workload Scheduler and the prerequisites packages that will be installed.
5. On the Location panel, perform the following actions:

   For each prerequisite package:
   Select the prerequisite package and accept the default path, or type, or **Browse** the path to use as the installation directory on which to install the prerequisite instance.

   For the IBM Workload Scheduler package:
   Select the package and accept the default path or type, or **Browse** the path to use as the installation directory for the specific user.

   Installation directory

The maximum field length is 46 characters. You cannot use national characters.

On Windows operating systems:

- The following characters are not valid:
  ! # $ % & { } [ ] = ? ' < > , ; ( )
- The name must be longer than three characters, the second character must be: and the third character must be \.
- The default directory is C:\Program Files\IBM\TWA

On UNIX and Linux operating systems:

- The following characters are not valid:
  ! " # $ % & { } [ ] = ? ' < > , ; ( ) *blank_space*
- The name must be longer than one character and the first character must be /.
- The default directory is /opt/IBM/TWA

Note: If you are installing on a Windows server 2008 follow the instructions in the message about virtualized directories.

6. Click **Next**. On the Features page, select the languages for which the corresponding WebSphere Application Server packages will be installed. The language translations for the user interface and documentation are installed. You have the option to select languages only the first time that you install a package to a package group. You can install other language translations for all the packages in a package group with the Modify wizard.
7. Click **Next** and perform the following actions:

   For the prerequisites packages:

   To see a description of the feature, click the feature name. In the Details section you see a short description.

   Ensure that you leave the default prerequisites features selected by the installation process.

   For the IBM Workload Scheduler package:
   Leave selected

   Master domain manager
8. Click **Next**.
9. Enter the information in the following panels:

   For each prerequisite package:
   On the prerequisites product panels, enter the information related to the product you are installing. For more information about the field values, see the prerequisite product documentation.

   For the IBM Workload Scheduler package:
   Enter the information described in the following panels:

   User information:
   See “IBM Workload Scheduler user information” on page 97.

   Master Configuration:
   See “IBM Workload Scheduler master configuration” on page 98

Database Configuration:
See "Database configuration" on page 100.

WebSphere profile Configuration:
See "WebSphere Application Server profile configuration" on page 111

WebSphere ports Configuration:
See "WebSphere Application Server ports configuration" on page 112

Disk space check:
See "Disk space check" on page 113.

10. On the Summary page, review your choices before installing the product package and its prerequisites. To change any choices that you made on previous pages, click **Back** and make the changes. Click **Install** to install the IBM Workload Scheduler package and its prerequisites.

Note: If you installed the WebSphere Application Server prerequisite, after the installation do not create a profile because the IBM Workload Scheduler installation already created its own profile.

After a successful installation, wait a few minutes for internal processes to complete and then perform one of the following configuration tasks, depending on whether you installed a master domain manager or its backup:

- "Configuring a master domain manager" on page 238.
- "Configuration steps for a master domain manager configured as backup" on page 239.

IBM Workload Scheduler user information:
About this task

Complete the following IBM Workload Scheduler data fields.

User name
Specify the IBM Workload Scheduler user name. User name can contain alphanumeric, dash (-), and underscore (_) characters; it cannot contain national characters. The first character of the user name must be a letter. The default value is **twsuser**.

On Windows operating systems:

- If this user account does not already exist, it is automatically created by the installation wizard.
- If installing on a Windows server in a domain, do not define a domain and local ID with the same user name.
- If you specify a domain user, define the name as *domain_name\user_name*.
- If you specify a local user, define the name as *system_name\user_name*. Type and confirm the password.

On UNIX and Linux operating systems:
This user account must be created manually before running the installation. Create a user with a home directory and group. For more information, see "IBM Workload Scheduler user" on page 40.

Note: The IBM Workload Scheduler user name and password are also used as the WebSphere Application Server administrator user name and password.

Password
Specify the IBM Workload Scheduler password. The password must comply with the password policy in your Local Security Settings. Spaces are not permitted.

On Windows operating systems:
Passwords for users can include any alphanumeric characters and ()!?=^*/~[]$_+;:.,@`-#.

On UNIX and LINUX systems:
Passwords for users can include any alphanumeric characters and ()!?=*~_+.-.

Confirm password
Confirm the IBM Workload Scheduler password that you entered.

Validate user
Click to validate that the user was defined successfully and with the correct permissions.

IBM Workload Scheduler master configuration:
About this task

Note: This panel appears for the installation and upgrade processes, if you are performing an upgrade, you are not required to insert or you cannot see some of the following fields.

Complete the following IBM Workload Scheduler data fields.

Master domain manager configuration information

Configure this master domain manager as backup
Configure this master domain manager as backup. By default, this box is deselected. If you select this check box, the installation process configures the master domain manager installation as backup.

Company
The name of the company. Spaces are allowed and the maximum field length is 40 characters. The default is `MYCOMPANY`.

This workstation name
The name of the workstation on which you are installing the instance. The default is the host name of the workstation.

For a master domain manager, the name you specify here is the name of the IBM Workload Scheduler workstation known in the database as **master**.

For a master domain manager configured as backup, the name you specify here is the name of the IBM Workload Scheduler workstation known in the database as **fta**.

Spaces are not allowed and the maximum field length is 16 characters. If the host name is longer than 16 characters, an alternative name must be provided for a successful installation. It can contain alphanumeric, dash (-), and underscore (_) characters. The first character must be a letter.

Master domain manager workstation name

If you are installing a master domain manager, this field is grayed out. This field is required if you are installing a master domain manager configured as backup.

The name of the master domain manager workstation. Spaces are not allowed and the maximum field length is 16 characters. The first character cannot be numeric.

Master domain manager port (used by Netman)
The port used by the Netman process to manage distributed scheduling. Netman is the network process that controls the production environment. The default value is **31111**. The valid range is from 1 to 65535.

Note: If you change this value, all default port number values in the application server port information panel are changed to reflect the new range. For example, if you specify 42111 as TCP/IP port number, the default for HTTP transport becomes **42125**, the default for HTTPS becomes **42126**, and so on.

Configuration information for dynamic scheduling

Host name or IP address
The fully qualified host name or IP address of the dynamic agent. The dynamic workload broker uses this address to connect to the dynamic agent. The default is the <HOSTNAME> where HOSTNAME is the host name of the workstation on which you are installing.

Dynamic agent workstation name
The name of the dynamic agent workstation definition. The default is the <HOSTNAME_1> where HOSTNAME is the host name of the workstation on which you are installing.

JobManager port number
The dynamic agent secure port number (SECUREADDR). The dynamic workload broker uses this port to contact the IBM Workload Scheduler dynamic agent. The default value is **31114**. The valid range is from 1 to 65535.

Add the "FINAL" job stream to the database to automate the production cycle
This option is available only if you are installing a master domain manager. Add the *FINAL* and *FINALPOSTREPORTS* job streams definition to the database. This option allows automatic production plan extension at the end of each current production plan processing. By default, this box remains unchecked.

Note: During the installation, if you identified an existing IBM Workload Scheduler database that has a final job stream, the installation does not overwrite it.

Create symbolic link
Only on UNIX and Linux systems. Check this option to create symbolic links to `/usr/bin`. Any existing IBM Workload Scheduler symbolic link are overwritten. For more information about symbolic links, see Table 3 on page 35.

Event driven workload automation configuration information

Event Processor port number
The port used by the event management processor to receive events. The default value is **31131**. The valid range is from 1 to 65535. This parameter is not requested if you are installing a backup master domain manager.

Dynamic workload broker configuration information

Dynamic workload broker workstation name
The definition of the dynamic workload broker workstation created in the IBM Workload Scheduler database. Its type is **broker**. The master domain manager name followed by `_DWB`. You can modify this value by including `_DWB`. Spaces are not allowed and the maximum field length is 16 characters. It can contain alphanumeric, dash (-), and underscore (_) characters. The first character must be a letter.

Dynamic workload broker Netman port
The port on the dynamic workload broker workstation. The master domain manager or backup master domain manager use this port to communicate with dynamic workload broker. The default value is **41114**. The valid range is from 1 to 65535.

Database configuration:
About this task

To complete the `Database configuration` panel, perform the following steps. The database configuration panels for an installation and an upgrade are similar.

1. Select the database management system type. Select:

   DB2 Database Enterprise Edition
   If you will use this database.

   Oracle Database
   If you will use this database.

   Other Databases
   If you will use **Informix Dynamic Server** or **Microsoft SQL Server**.

2. If you selected **DB2 Database Enterprise Edition** or **Oracle Database**:
   a. Specify the installation path of the database in the **Database path** field.
   b. Click **Retrieve database information** to load the information for the database system selected. For more information about how to configure the RDBMS you selected, see the following sections:
      - Installing and upgrading for a DB2 database server
      - Installing and upgrading for a DB2 database client
      - Installing and upgrading for an Oracle database

   If you selected **Other Databases**, no **Informix Dynamic Server** or **Microsoft SQL Server** configuration panels will display, as for the other two RDBMSs, but you will have to go on with the other installation steps (namely WebSphere configuration and Disk space check) and complete the installation process, before you manually run a command that starts a configuration script as described in:
   - "Installing for an Informix Dynamic Server" on page 109
   - "Installing for a Microsoft SQL Server database" on page 110

Attention: Before you run the configuration script, make sure you created or upgraded the IBM Workload Scheduler schema, as described in "Creating or upgrading the database schema if you are using Informix Dynamic Server" on page 74 or in "Creating or upgrading the database schema if you are using Microsoft SQL Server" on page 82.

Installing and upgrading for a DB2 database server:
About this task

The following list describes the fields that you might need to complete during the installation. Many of these fields are in common with the upgrade installation.

Database path
Type, or **Browse** for the directory in which the existing DB2 instance is installed.

On Windows operating systems:
This path must be an absolute path to the `sqllib` directory. If you have more than one DB2 instance installed, make sure that you provide the fully qualified path to the DB2 instance you want. The default is `%ProgramFiles%\IBM\sqllib`.

On UNIX and Linux operating systems:

This path must be an absolute path to the `sqllib` directory. If you have more than one DB2 instance installed, make sure you provide the fully qualified path to the DB2 instance you want.

The default is `/home/<db2_instance_admin>/sqllib` where *<db2_instance_admin>* is the administrator of the DB2 instance. For example, if the *db2inst1* user is the DB2 instance administrator, the path is `/home/db2inst1/sqllib`.

Instance name
The name of the DB2 server instance.

Instance port
The TCP/IP port number used to communicate with the DB2 instance. The default is **50000**.

DB2 server administrator user
The user name of the administrator of the DB2 server instance. This user can also be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX systems, verify that you can switch to this user and that it can load the DB2 environment.

If the DB2 administrator already created the database tables using the procedure "Creating or upgrading the database schema if you are using DB2" on page 48, the user name is the one that the DB2 administrator specified in the **DB_USER** property in the `customizeDB2SQL.properties` file.

On Windows operating systems
The default value is **db2admin**.

On UNIX and Linux operating systems
The default value is **db2inst1**.

DB2 server administrator password
The password of the DB2 server administrator user or of the user with SYSADM or SYSCTRL authority.

Database name
The name of the DB2 database. The maximum length is five characters. This happens because IBM Workload Scheduler adds the **_DB** suffix to the database name, thereby reaching the maximum supported length for DB2, that is eight characters. You can use an existing DB2 database instance if its name does not exceed five characters. The default is `TWS`. When you are installing:

Master domain manager
Provide the name of a database that is not used by a dynamic domain manager.

Master domain manager configured as backup
Provide the name of the master domain manager database.

Dynamic domain manager
Provide the name of a database that is not used by a master domain manager.

Dynamic domain manager configured as backup
Provide the name of the dynamic domain manager database.

For information about DB2 database names, see the DB2 documentation.

Test connection
Click to check that the configuration was successful. The test connection result is shown in the upper left corner of the Install package panel.

Tablespace used to store scheduling objects and event rules
Provide the following advanced parameters for the tablespace:

Tablespace name
The name of the DB2 instance tablespace. This tablespace is used to store scheduling objects and event rules. For information about DB2 table spaces, see the DB2 documentation. The default name is **TWS_DATA**.

Tablespace path
The relative path of the DB2 table space. The default path is **TWS_DATA**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path, the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information see Appendix E, “DB2 tablespace relative paths,” on page 439. For UNIX and Linux operating systems, make sure that the DB2 Administrator has write access to the tablespace directory.

Tablespace used to store the plan
Specify the name and path of the DB2 table space where IBM Workload Scheduler event logs are to be stored. These logs include data about event rule instances, triggered actions, and operator messages displayed by the Dynamic Workload Console. Data from the logs can be used to create reports. You can view report data using the Dynamic Workload Console.

Plan tablespace name
The name of the table space for storing planning data. The default name is **TWS_PLAN**.

Plan tablespace path
The path of the table space for storing planning data. The default path is **TWS_PLAN**. The path can be a relative or a fully qualified

path. When the table space path is a fully qualified path the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, "DB2 tablespace relative paths," on page 439. Note that the report tablespace path cannot be the same as the tablespace path.

Tablespace used to store event logs
Specify the name and path of the DB2 table space where IBM Workload Scheduler event logs are to be stored. These logs include data about event rule instances, triggered actions, and operator messages displayed by the Dynamic Workload Console. Data from the logs can be used to create reports. You can view report data using the Dynamic Workload Console.

Report tablespace name
The name of the table space for storing report data. The default name is **TWS_LOG**.

Report tablespace path
The path of the table space for storing report data. The default path is **TWS_LOG**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, "DB2 tablespace relative paths," on page 439. Note that the report tablespace path cannot be the same as the tablespace path.

Installing and upgrading for a DB2 database client:
About this task

The following list describes the fields that you might need to complete during the installation. Many of these fields are in common with the upgrade installation.

During the installation of the **master domain manager configured as backup**, you install a DB2 client to connect to the DB2 server that contains the IBM Workload Scheduler database. This database was created by the master domain manager installation. If it is a DB2 database server, the database is on the workstation of the master domain manager. If it is a DB2 database client, the database is on another workstation.

During the installation of the **dynamic domain manager configured as backup**, you install a DB2 client to connect to the DB2 server that contains the IBM Workload Scheduler database. This database was created by the dynamic domain manager installation. If it is a DB2 database server, the database is on the workstation of the dynamic domain manager. If it is a DB2 database client, the database is on another workstation.

The following list describes the fields that you might need to complete during the installation.

Database path
Type, or **Browse** for the directory on which the existing DB2 instance is installed.

On Windows operating systems:
This path must be an absolute path up to the `sqllib` directory. If you have more than one DB2 instance installed, make sure that

you provide the fully qualified path to the DB2 instance you want. The default is `%ProgramFiles%\IBM\sqllib`.

On UNIX and Linux operating systems:

This path must be an absolute path up to the `sqllib` directory. If you have more than one DB2 instance installed, make sure that you provide the fully qualified path to the DB2 instance you want.

The default is `/home/<db2_instance_admin>/sqllib` where *<db2_instance_admin>* is the administrator of the DB2 instance. For example, if the *db2inst1* user is the DB2 instance administrator, the path is `/home/db2inst1/sqllib`.

Remote database server
The IP address or host name of the workstation where the DB2 server is installed.

Remote database port
The TCP/IP port number that the remote DB2 server instance uses to communicate.

Identify the user on the remote DB2 server to be used by the installation for DB2 administration tasks
Provide the following data:

DB2 server administrator user
The user name of the administrator of the DB2 server instance. This user can also be any user having SYSADM or SYSCTRL authority on the DB2 server. On UNIX systems, verify that you can switch to this user and that it can load the DB2 environment.

If the DB2 administrator already created the database tables using the procedure "Creating or upgrading the database schema if you are using DB2" on page 48, the user name is the one that the DB2 administrator specified in the **DB_USER** property in the `customizeDB2SQL.properties` file.

On Windows operating systems
The default value is **db2admin**.

On UNIX and Linux operating systems
The default value is **db2inst1**.

DB2 server administrator password
The password of the DB2 server administrator user or of the user with SYSADM or SYSCTRL authority.

Identify the user on the DB2 client to be used by the installation for DB2 administration tasks
Specify the user on the DB2 client to be used by the installation for DB2 administration tasks. Provide the following data:

DB2 local administrator user
The user name of the DB2 administrator of the DB2 client instance. The user ID must contain the following login properties:

```
-login='true'
-rlogin='true'
```

Identify the user on the DB2 server to be used by IBM Workload Scheduler to access the database, if different from the DB2

Server Administration User
Select this option when the DB2 server user used to access IBM Workload Scheduler is different from the DB2 Server Administration User. Provide the following data:

IBM Workload Scheduler DB2 user
The user name of the IBM Workload Scheduler DB2 user.

IBM Workload Scheduler DB2 password
The password of the IBM Workload Scheduler DB2 user.

Database name
The name of the DB2 database. The maximum length is five characters. This happens because IBM Workload Scheduler adds the **_DB** suffix to the database name, thereby reaching the maximum supported length for DB2, that is eight characters. You can use an existing DB2 database instance if its name does not exceed five characters. When you are installing a:

Master domain manager
Provide the name of a database that is not used by a dynamic domain manager.

Master domain manager configured as backup
Provide the name of the master domain manager database.

Dynamic domain manager
Provide the name of a database that is not used by a master domain manager.

Dynamic domain manager configured as backup
Provide the name of the dynamic domain manager database.

For information about DB2 database names, see the DB2 documentation.

Test connection
Click to check that the configuration was successful.

Tablespace used to store scheduling objects and event rules
Provide the following advanced parameters:

Tablespace name
The name of the DB2 instance table space. For information about DB2 table spaces, see the DB2 documentation.

Tablespace path
The relative path of the DB2 table space. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path, the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, “DB2 tablespace relative paths,” on page 439.

The default table space path name is **TWS_DATA**. The default table space temporary directory is **TWS_TEMP**. For UNIX and Linux operating systems, make sure that the DB2 Administrator has write access to the directory above the table space directory.

Tablespace used to store the plan

Specify the name and path of the DB2 table space where IBM Workload Scheduler event logs are to be stored. These logs include data about event rule instances, triggered actions, and operator messages displayed by the Dynamic Workload Console. Data from the logs can be used to create reports. You can view report data using the Dynamic Workload Console.

Plan tablespace name

The name of the table space for storing planning data. The default name is **TWS_PLAN**.

Plan tablespace path

The path of the table space for storing planning data. The default path is **TWS_PLAN**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, "DB2 tablespace relative paths," on page 439. Note that the report tablespace path cannot be the same as the tablespace path.

Tablespace used to store event logs

Specify the name and path of the DB2 table space where IBM Workload Scheduler event logs are to be stored. These logs are used to create reports. You can view report data using the Dynamic Workload Console.

Report tablespace name

The name of the table space for storing report data. The default name is **TWS_LOG**.

Report tablespace path

The path of the table space for storing report data. The default path is **TWS_LOG**. The path can be a relative or a fully qualified path. When the table space path is a fully qualified path, the DB2 administrator user must have complete access rights to the directory where the table space is installed. For more information, see Appendix E, "DB2 tablespace relative paths," on page 439.

Installing for an Oracle database:

About this task

When you are installing for an Oracle database, both for server and client, follow the installation wizard prompts. The following list describes the fields that you might need to complete during the installation. Many of these fields are in common with the upgrade installation.

Database path

Specify the path of an Oracle installation that satisfies the IBM Workload Scheduler prerequisites. The fully qualified path must identify the Oracle path that includes the `BIN` folder containing the `sqlplus` executable file.

Net service name

The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection. A net service

name is mapped to a port number and protocol. It is also known as a connect string, database alias, host string, or service name.

If your Oracle database is:

- Installed on the same system on which you are installing your master domain manager or its backup, the net service name is the name of your Oracle database.
- Installed on the same system on which you are installing your dynamic domain manager or its backup, the net service name is the name of your Oracle database.
- Not installed on the system on which you are installing your master domain manager or its backup, the net service name is the alias configured for the connection to the remote database.
- Not installed on the system on which you are installing your dynamic domain manager or its backup, the net service name is the alias configured for the connection to the remote database.

Contact your database administrator to obtain the correct net service name.

Oracle administrator user
The database administrator user name (such as `SYSTEM`) required to authenticate to the Oracle database. This account must already exist.

If the ORACLE administrator already created the database tables using the procedure "Creating or upgrading the database tables if you are using Oracle" on page 59, the user name is the one that the ORACLE administrator specified in the **MDL_USER** property of the `customizeORACLESQL.properties` file.

Oracle administrator user password
The database administrator user password required to authenticate to the Oracle database.

IBM Workload Scheduler Oracle user
The owner of the IBM Workload Scheduler schema.

If the ORACLE administrator already created the database tables using the procedure "Creating or upgrading the database tables if you are using Oracle" on page 59, the user name is the one that the ORACLE administrator specified in the **MDL_USER** property of the `customizeORACLESQL.properties` file.The name must comply with the Oracle naming rules.

If you are installing a:

Master domain manager
If you leave this field blank, this name is defaulted to **<TWS_user>**.

Master domain manager configured as backup
Enter the same name that you used in the master domain manager.

Dynamic domain manager
If you leave this field blank, this name is defaulted to **<TWS_user>**. Provide a name different from the one that you used when installing the master domain manager.

Dynamic domain manager configured as backup
Enter the same name that you used in the dynamic domain manager.

On a fresh installation of a:

Master domain manager
This user does not exist in the database. If this is not the case, it means that there is already a master domain manager or its backup instance pointing to the same database with this user name.

If your existing IBM Workload Scheduler instance is version 8.3 or later, the installation process upgrades the current database schema to the new schema.

Dynamic domain manager
This user does not exist in the database. If this is not the case, it means that there is already a dynamic domain manager or its backup pointing to the same database with this user name.

If your existing instance is the current version, the installation process assumes that the schema is at the correct level and does not create the database objects (tables, views, clusters, procedures, indexes, and so on) for IBM Workload Scheduler.

Note:

If you identify an existing Oracle user as the IBM Workload Scheduler Oracle user, the installation process assumes that the configuration is complete and does not create the database objects for IBM Workload Scheduler. In this case, the installation completes successfully but you cannot use the database.

IBM Workload Scheduler Oracle user password
The password for the IBM Workload Scheduler Oracle user. It must comply with the Oracle naming rules.

Confirm the IBM Workload Scheduler Oracle user password
Confirm the password for the IBM Workload Scheduler Oracle user that you insert in the IBM Workload Scheduler Oracle user password field.

Create the IBM Workload Scheduler schema using the Oracle Partitioning option
Only for master domain manager and dynamic domain manager. If you are installing on Oracle Enterprise Edition, you can choose to implement the Oracle Partitioning option to improve the performance of event-driven workload automation. For more information about event-driven workload automation, see *Overview*.

Tablespace name
Only for master domain manager and dynamic domain manager. The name that identifies the table space where scheduling objects data, event rules data, job history runs data, and job statistics data is stored. This table space must have been previously created by the database administrator. The default for this field is **USERS**.

Plan tablespace name
Only for master domain manager and dynamic domain manager. The name that identifies the table space where planning data is stored. This table space must have been previously created by the database administrator. The default for this field is **USERS**.

Reports tablespace name
Only for master domain manager and dynamic domain manager. The name that identifies the table space where report data is to be stored. You can view the report data using the Dynamic Workload Console.

This table space must have been previously created by the database administrator. The default value for this field is **USERS**.

Temporary tablespace
Only for master domain manager and dynamic domain manager. The name that identifies the temporary table space. This table space must have been previously created by the database administrator. The default value for this field is **TEMP**.

Remote database host name or IP address :
(Only for an upgrade). The host name or IP address of the Oracle server.

Database port:
(Only for an upgrade). The port number of the Oracle server. The default value is 1521.

IBM Workload Scheduler database user password:
(Only for an upgrade) The password of the database user that accesses the IBM Workload Scheduler tables on the Oracle server.

Oracle net service name:
(Only for an upgrade). The Oracle net service name of the IBM Workload Scheduler database. The default is: `ORCL`.

Installing for an Informix Dynamic Server:
About this task

Attention: This procedure is documented here for consistency with the other RDBMS configuration tasks, but you will have to complete the installation steps (namely WebSphere configuration and Disk space check) and finish the installation process, before you can run the Informix Dynamic Server configuration script described next.

Also, make sure you created or upgraded the IBM Workload Scheduler schema, as described in "Creating or upgrading the database schema if you are using Informix Dynamic Server" on page 74, before you run the configuration script.

With the following command, you are about to configure IBM Workload Scheduler to connect to the Informix Dynamic Server database. To start the configuration script, from the *<install_dir>*`/TWS/tws_tools` directory, run:

```
configureIDS.sh -twsUser twsUser -twsPassword twsPwd -dbServer dbServer
                -dbPort dbPort -dbName dbName -dbUser dbUser -dbPassword dbPwd
```

where:

twsuser
The IBM Workload Scheduler user name.

twsPassword
The password of the IBM Workload Scheduler user.

dbServer
The IP address or host name of the workstation where Informix Dynamic Server is installed.

dbPort
The TCP/IP port number that the Informix Dynamic Server instance uses to communicate.

dbName
The name of the database. The default is **TWS**.

dbUser
The user name that has access to the database.

dbPassword
The password of the user that has access to the database.

This information is available also if you run:

```
configureIDS.sh -usage
```

Installing for a Microsoft SQL Server database:
About this task

Attention: This procedure is documented here for consistency with the other RDBMS configuration tasks, but you will have to complete the installation steps (namely WebSphere configuration and Disk space check) and finish the installation process, before you can run the Microsoft SQL Server configuration script described next.

Also, make sure you created or upgraded the IBM Workload Scheduler schema, as described in "Creating or upgrading the database schema if you are using Microsoft SQL Server" on page 82, before you run the configuration script.

With the following command, you are about to configure IBM Workload Scheduler to connect to the Microsoft SQL Server database.

Note: If in the following command you have fields whose value contains the character '\', insert the escape character '\\' before the '\' character in the field value.

To start the configuration script, from the *installation_path*\TWS\tws_tools directory, run:

```
configureMSSQL.bat -twsUser twsUser -twsPassword twsPassword -dbJDBCPath dbJDBCPath
                   [-authType (WINDOWS|SQLSERVER) -dbUser dbUser -dbPassword dbPassword]
                   -dbName dbName -dbServer dbServer -dbPort dbPort
```

where:

twsuser
The IBM Workload Scheduler user name. This user is the owner of the IBM Workload Scheduler instance. If you are using Windows Authentication, this user is also the database user. You must specify the user name without the domain name.

twsPassword
The password of the IBM Workload Scheduler user.

dbJDBCPath
The name of the directory where the JDBC driver for Microsoft SQL Server is located.

Note: Be sure that the directory contains the following libraries and class library files :

- sqljdbc_auth.dll
- sqljdbc4.jar
- sqljdbc.jar

authType
The type of authentication you use to connect to the database. WINDOWS

is used by default. If you need to configure SQL Server Authentication, enter SQLSERVER as value and specify also the database user name and password using the `-dbUser` and `-dbPassword` options.

dbUser
The user name that has access to the database. Specify it only if you are using SQL Server Authentication.

dbPassword
The password of the user that has access to the database. Specify it only if you are using SQL Server Authentication.

dbName
The name of the database. The default is **TWS**.

dbServer
The IP address or host name of the workstation where Microsoft SQL Server is installed.

dbPort
The TCP/IP port number that the Microsoft SQL Server instance uses to communicate. The default is port 1433.

This information is available also if you run:

```
configureMSSQL.bat -usage
```

Examples

In this example IBM Workload Scheduler is configured to connect to the Microsoft SQL Server database authenticating as a Windows user.

```
configureMSSQL.bat -twsUser twsAdmin -twsPassword AdminTWS -dbJDBCPath c:\mssql
-dbName TWS -dbServer localhost -dbPort 1533
```

In this example IBM Workload Scheduler is configured to connect to the Microsoft SQL Server database authenticating as an SQL Server user.

```
configureMSSQL.bat -twsUser twsAdmin -twsPassword AdminTWS -dbJDBCPath c:\mssql
-authType SQLSERVER -dbUser sa -dbPassword sapwd -dbName TWS -dbServer localhost
-dbPort 1533
```

WebSphere Application Server profile configuration:
About this task

The following fields are provided for WebSphere Application Server profile configuration data.

WebSphere installation location
The field shows the path you specified in the Location panel. To change it go back to the Location panel.

Profile deployment type
Create a WebSphere Application Server profile.

Profile details
Enter the information that identify the WebSphere Application Server profile you created.

Profile location
Enter the name of the directory where the WebSphere Application Server profile is located. Click **Browse** to find the appropriate location. The default value is:

On Windows operating systems:

```
c:\Program Files\IBM\TWA\WAS\TWSProfile
```

On UNIX operating systems:

```
/opt/IBM/TWA/WAS/TWSProfile
```

Note: Do not use any of the following characters in the profile path field:

On Windows operating systems::

```
!"#$%&{}[]=?'<>,;*:
```

On UNIX operating systems:

```
!"#$%&{}[]=?'<>,;*
```

Profile name
Enter the name of the file on which the WebSphere Application Server profile is defined. The default is **TWSProfile**.

Node name
Enter the name of the node contained in the WebSphere Application Server profile. The default is **TWSNode**.

Server name
Enter the name of the server contained in the WebSphere Application Server profile. The default is **server1**.

Validate
Click to validate that the information you entered is correct.

WebSphere Application Server ports configuration:
About this task

This panel appears during installation or upgrade processes. If you are performing an upgrade, you are not required to insert or you cannot see some of the following fields.

The following fields are provided for WebSphere Application Server data. The installation procedure checks for the availability of the ports in the specified port range. If one or more ports are being used by other applications, you are prompted to enter a new port number.

Automatically generate WebSphere ports
Select if you changed the *JobManager* port and you want to automatically generate the ports listed starting from this port.

HTTP transport
The port for the HTTP transport. It is used by the **composer** command line and the Dynamic workload broker when this protocol is selected. The default value is **31115**. The valid range is from 1 to 65535.

HTTPS transport
The port for the secure HTTP transport. When this protocol is selected, it is used by the **composer** command line, the Dynamic workload broker, and, starting with Version 9.4, also the graphical user interfaces. The default value is **31116**. The valid range is from 1 to 65535.

Bootstrap
The port for the bootstrap or RMI. The default value is **31117**. The valid range is from 1 to 65535.

SOAP connector
The port for the application server protocol SOAP connector. The default value is **31118**. The valid range is from 1 to 65535.

SAS Server Authentication Listener
The port used by the Secure Association Services (SAS) to listen for inbound authentication requests. The default value is **31119**. The valid range is from 1 to 65535.

CSIv2 Server Authentication Listener
The port on which the Common Secure Interoperability Version 2 (CSIv2) service listens for inbound server authentication requests. The default value is **31120**. The valid range is from 1 to 65535.

CSIv2 Client Authentication Listener
The port on which the Common Secure Interoperability Version 2 (CSIv2) service listens for inbound client authentication requests. The default value is **31121**. The valid range is from 1 to 65535.

ORB Listener
The port used for RMI over IIOP communication. The default value is **31122**. The valid range is from 1 to 65535.

Administration HTTP transport
The administrative console port. The default value is **31123**. The valid range is from 1 to 65535

Administration HTTPS transport
The administrative console secure port. The default value is **31124**. The valid range is from 1 to 65535.

Disk space check:

The installation process checks if there is enough disk space.

About this task

The installation process checks if there is enough disk space available to install a master domain manager or its backup, a dynamic domain manager or its backup. The installation or upgrade process does not check the space required to install table spaces. Before you click install, verify there is enough space to install table spaces in the indicated path.

In the Disk space check panel, you can see the log for the disk space check operation. If the operation failed because of insufficient disk space, you must free the disk space that is shown in the log and then click **Retry**.

Performing a silent installation

Authorization requirements to check before you start to install, upgrade or uninstall.

Before you begin

1. Before starting to install, upgrade or uninstall, verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or **domain administrators** group with the rights **Act as Part of the Operating System**.

If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

UNIX and Linux operating systems
root access

2. Verify that your system meets the product system requirements by running a check: "Checking system prerequisites for the master domain manager" on page 115.
3. Ensure that you downloaded the IBM Workload Scheduler dynamic domain manager or master domain manager eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).

About this task

When you run a silent installation, the Installation Manager is already installed and you use an XML response file that contains parameters required to install the product package. The response file includes all the installation information required to run the installation without user intervention.

Select the appropriate response file, determine the eImages you need to download and extract, and then customize the properties in the response file including the settings for the repository location of the eImages before performing the silent installation.

Important: During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

To silently install the IBM Workload Scheduler product package you can have one the following scenarios:

Installing the IBM Workload Scheduler package:
The IBM Workload Scheduler prerequisites are already installed. For more information about performing a silent installation of IBM Workload Scheduler package, see "Performing a IBM Workload Scheduler silent installation" on page 116.

Installing the IBM Workload Scheduler and the Dynamic Workload Console packages and their prerequisites:
For more information about performing the silent installation of the IBM Workload Scheduler package, IBM Workload Scheduler prerequisites packages, the Dynamic Workload Console package and the Dynamic Workload Console prerequisites packages, see "Performing a silent installation of IBM Workload Scheduler and its prerequisites and a Dynamic Workload Console and its prerequisites" on page 118.

Note: You can decide to install only the IBM Workload Scheduler package and its prerequisites or only the Dynamic Workload Console package and its prerequisites or both.

Checking system prerequisites for the master domain manager:

Before installing or upgrading the master domain manager, run a script that checks the system against the product system requirements.

About this task

When you run a silent installation, you must create a response file to use as input to the IBM Installation Manager silent installation commands. The response file includes all the information required to run the installation without user intervention.

As a prerequisite step, specifically for the master domain manager silent installation, you can run a script that checks the system against the product system requirements to ensure a successful installation without delays or complications. The prerequisite check script checks requirements such as:

- Supported operating system.
- Sufficient RAM.
- Sufficient swap file space.
- Disk space for the creation of the installation, Jazz for Service Management, and temporary directories passed in input to the script.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler. It does not check the requirements for other components, such as DB2. To verify the requirements for Installation Manager use the procedure described in "Scanning system prerequisites for Installation Manager" on page 45.

For a detailed list of supported operating systems and product prerequisites, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

To run the prerequisite check script:

Procedure

1. Copy the script `iwsPrereqCheck.bat` or `iwsPrereqCheck.sh` and the `Prerequisites` folder from the eImage to a folder on the system where you plan to run the installation and ensure you have read, write, and execute permissions on the `Prerequisites` folder.
2. Submit the script to run as follows:

   On Windows operating systems:
   Run the following command:

   ```
   iwsPrereqCheck.bat -instdir <TWA_HOME> -tmpdir <tmp>
   ```

   On UNIX or Linux operating systems:
   Run the following command:

   ```
   iwsPrereqCheck.sh -instdir <TWA_HOME> -tmpdir <tmp>
   ```

   where,

   <TWA_HOME>
   Represents the product installation directory.

<*tmp*> Represents the temporary folder on the system where you are running the installation.

Results

The results of the prerequisite check are written to a text file named, `result.txt`, located in the `Prerequisites` folder.

What to do next

Proceed to customize the response file and run the silent installation.

Performing a IBM Workload Scheduler silent installation:
Before you begin

You must install Installation Manager before you perform a silent installation of the IBM Workload Scheduler package and its prerequisites. Run a check against your system to verify if it meets the product system requirements for a silent installation. See "Checking system prerequisites for the master domain manager" on page 115.

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the IBM Workload Scheduler package by using a response file that is provided with the installation eImages in the `\response_files\` directory. For a list of response files, see "IBM Workload Scheduler response file templates" on page 117.

Perform the following steps:

1. Copy the relevant response file to a local directory.
2. Edit the IBM Workload Scheduler section. For details about the response file properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse\tools
   ```

   On UNIX and Linux operating systems

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```
6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

On UNIX and Linux operating systems

```
 ./imcl input /<local_dir>/response_file.xml
-log /<local_dir>/log_file.xml
-acceptLicense
```

where

- The `response_file.xml` is the name of the response file to be used for the installation.
- The `log_file` is the name of the log file that records the result of the silent installation.

Note: For more information about the Installation Manager silent install command and the Installation Manager silent log file, see Installation Manager documentation.

After a successful installation, perform one of the following configuration tasks, depending on whether you installed a dynamic domain manager or its backup: or a master domain manager or its backup:

- "Configuring a master domain manager" on page 238.
- "Configuration steps for a master domain manager configured as backup" on page 239.
- "Configuring a dynamic domain manager" on page 241.
- "Configuration steps for a dynamic domain manager configured as backup" on page 242.

IBM Workload Scheduler response file templates:
About this task

Edit the response file templates provided with the installation eImages in the `\response_files\` directory. Instructions for customizing the files are included in the files as commented text.

Table 9 lists the response files and the types of installation each performs by operating systems:

Table 9. Installation response files

Type of installation	Response file to use
Installing on Windows operating systems	
Fresh dynamic domain manager configured as backup	`IWS94_FRESH_DDM_configured_as_backup_WIN.xml`
Fresh dynamic domain manager	`IWS94_FRESH_DDM_WIN.xml`
Fresh dynamic domain manager for z/OS controller	`IWS94_FRESH_DDM_for_zOS_WIN.xml`
Fresh master domain manager configured as backup	`IWS94_FRESH_MDMconfigured_as_backup_WIN.xml`
Fresh master domain manager	`IWS94_FRESH_MDM_WIN.xml`
Installing on UNIX operating systems	
Fresh dynamic domain manager configured as backup	`IWS94_FRESH_DDM_configured_as_backup_UNIX.xml`
Fresh dynamic domain manager	`IWS94_FRESH_DDM_UNIX.xml`
Fresh dynamic domain manager for z/OS controller	`IWS94_FRESH_DDM_for_zOS_UNIX.xml`

Table 9. Installation response files (continued)

Type of installation	Response file to use
Fresh master domain manager configured as backup	`IWS94_FRESH_MDMconfigured_as_backup_UNIX.xml`
Fresh master domain manager	`IWS94_FRESH_MDM_UNIX.xml`

For details about response file properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

Performing a silent installation of IBM Workload Scheduler and its prerequisites and a Dynamic Workload Console and its prerequisites:

Use the appropriate response file in XML format to prepare for a silent installation.

Before you begin

You must install Installation Manager before you perform a silent installation of the IBM Workload Scheduler package. Run a check against your system to verify if it meets the product system requirements for a silent installation. See "Checking system prerequisites for the master domain manager" on page 115 and "Checking system prerequisites for the Dynamic Workload Console" on page 361

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the IBM Workload Scheduler package and the Dynamic Workload Console package at the same time as their prerequisites packages, by using a global response file that is provided with the installation eImages in the `\response_files\` directory. For a list of response files, see Table 10 on page 120.

The silent installation process:

- Assigns the correct order to the package installation.
- Manages the prerequisites package installation.

The response file contains one section for each prerequisite package that you have to install, one section related to IBM Workload Scheduler, and one section related to the Dynamic Workload Console package installation.

Select the appropriate response file, determine the eImages you need to download and extract, and then customize the properties in the response file including the settings for the repository location of the eImages before performing the silent installation.

Important: During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

Perform the following steps:

1. Copy the response file to a local directory.
2. Edit the following sections:

   Dynamic Workload Console and IBM Workload Scheduler prerequisites packages sections:
   If you do not want to install the Dynamic Workload Console, comment the Dynamic Workload Console prerequisites section. For more information about how to type in this section, see the response file properties description provided as commented text or see the prerequisites product documentation.

   Dynamic Workload Console section:
   If you do not want to install the Dynamic Workload Console, comment this section. For more information about how to complete the Dynamic Workload Console section properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431.

   IBM Workload Scheduler section:
   For more information about how to complete the IBM Workload Scheduler section properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems
   `C:\Program Files\IBM\Installation Manager\eclipse\tools`

   On UNIX and Linux operating systems
   `/opt/IBM/InstallationManager/eclipse/tools`
6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for the installation.
   - The `log_file` is the name of the log file that records the result of the silent installation execution.

   Note: For more information about the Installation Manager silent installation command and Installation Manager silent log files, see the Installation Manager information center.

Table 10 lists the response files and the types of installation each file performs by operating systems:

Table 10. Global installation response files

Type of installation	Response file to use
Installing on Windows operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, IBM Workload Scheduler and Dynamic Workload Console.	`IWS94_FRESH_FULL_MDM_DWC_WIN.xml`
Installing on UNIX operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, IBM Workload Scheduler and Dynamic Workload Console.	`IWS94_FRESH_FULL_MDM_DWC_UNIX.xml`

After a successful installation, perform one of the following configuration tasks, depending on the type of agent you installed:

- "Configuring a master domain manager" on page 238.
- "Configuration steps for a master domain manager configured as backup" on page 239.
- "Configuring a dynamic domain manager" on page 241.
- "Configuration steps for a dynamic domain manager configured as backup" on page 242.

Encrypting user passwords for response files:

Steps that need to be taken to encrypt the user passwords for the response files.

About this task

You must encrypt each password string stored in the response files by using Installation Manager.

You can perform the password encryption by using one of the following procedures:

Installation Manager String encryption utility interface

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse
   ```

   UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

If you are installing as a non-root user
`/home/<non-root-user>/IBM/InstallationManager/eclipse/tools`

2. To open the **String encryption utility interface**, run the following command:

   Windows operating systems

   ```
   IBMIM.exe encryptString <stringToEncrypt>
   ```

   where `<stringToEncrypt>` is the value to be encrypted.

   UNIX and Linux operating systems

   ```
   ./IBMIM encryptString <stringToEncrypt>
   ```

   where `<stringToEncrypt>` is the value to be encrypted.

3. In the **String encryption utility** window, note the `Encrypted version of the String` field value related to the `String to be encrypt` field value.
4. Copy the `Encrypted version of the String` value in the password entry of the response file.

Installation Manager command line tool

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems
   `C:\Program Files\IBM\Installation Manager\eclipse`

   UNIX and Linux operating systems
   If you are installing as the root user

   `/opt/IBM/InstallationManager/eclipse/tools`

   If you are installing as a non-root user
   `/home/<non-root-user>/IBM/InstallationManager/eclipse/tools`

2. Run the following command:

   Windows operating systems

   ```
   IBMIM.exe -silent -noSplash encryptString <stringToEncrypt> >
   <Encryptedpwd>.txt
   ```

   where `<stringToEncrypt>` is the value to be encrypted and the `<Encryptedpwd>.txt` is the file where there is the encrypted value of the password.

   UNIX and Linux operating systems

   ```
   ./IBMIM -silent -noSplash encryptString <stringToEncrypt> >
   <Encryptedpwd>
   ```

   where `<stringToEncrypt>` is the value that is encrypted and the `<Encryptedpwd>` is the file where there is the encrypted value of the password.

3. Open the file `<Encryptedpwd>` and copy the value contained into the file in the data key of the response file.
4. Remove the file `<Encryptedpwd>`.

Example

This example shows you how to write the section USER INFORMATION of the IWS94_FRESH_MDM_WIN.xml response file, setting the IBM Workload Scheduler user value to *twsuser* and the user password value to *passw0rd* on Windows operating systems.

By using the Installation Manager command line tool, encrypt the password *passw0rd* saving the encrypted value to the file my_pwd.txt:

```
IBMIM.exe -silent -noSplash encryptString passw0rd > my_pwd.txt
```

The file *my_pwd.txt* contains the following value:

```
rbN1IaMAWYYtQxLf6KdNyA==
```

Complete the USER INFORMATION section of the IWS94_FRESH_MDM_WIN.xml response file as follows:

```
<!--USER INFORMATION
Supply the IBM Workload Scheduler credentials information -->
<data key='user.userName,com.ibm.tws' value='twsuser'/>
<data key='user.password,com.ibm.tws' value='rbN1IaMAWYYtQxLf6KdNyA=='/>
```

Note: For security reasons, remove the file *my_pwd.txt* after using it.

Installing a dynamic domain manager or its backup

Start the installation of a dynamic domain manager or its backup.

About this task

Install a dynamic domain manager if you want to schedule and control your static and dynamic workload both in distributed and end-to-end environments. For example, you might have different branch offices and want to run your dynamic schedule independently at each branch office to improve agent scalability. Moreover, installing a dynamic domain manager or its backup you run your dynamic schedule even if the master domain manager or the master domain manager configured as backup is unavailable.

By installing a dynamic domain manager you can:

- Improve fault-tolerant and dynamic agent scalability because the workload of the agents in the domain is directly controlled by the dynamic domain manager to which they are directly connected.
- Allow static and dynamic processing to continue even if the agent connection to its master domain manager is unavailable.

If you want to ensure that your workload runs even if the connection to the dynamic domain manager is unavailable, install a dynamic domain manager configured as backup.

A dynamic domain manager that is configured as backup is composed of a:

- Fault-tolerant agent
- Broker server
- Dynamic agent

When you install a dynamic domain manager, the following workstation types are created in the database:

Broker
For the broker server

Agent For the dynamic agent

Manager
For the fault-tolerant agent

Domain
For the domain. The domain is a child of the master domain manager domain.

These workstations belong to the newly created domain of the dynamic domain manager, and you cannot move them under another domain. Moreover, you cannot change the parent domain of the domain of the dynamic domain manager.

Installation procedure for a dynamic domain manager or its backup

Installation procedure for a dynamic domain manager or its backup

About this task

To install a IBM Workload Scheduler dynamic domain manager or its backup and all the prerequisites, perform the following steps:

1. Run the installation process, as follows:

   To start the installation program, perform the following steps:

   a. From the eImage that contains the IBM Workload Scheduler master domain manager, run:

      Windows operating systems:
      From the `root` directory of the eImage, run `setupTWS.bat`.

      UNIX operating systems:
      From the `root` directory of the eImage, run `setupTWS.sh`.

      The Installation Packages panel of Installation Manager opens.

   Note: If you want to install a dynamic domain manager and a Dynamic Workload Console at the same time in two different directories, run the command:

   Windows operating systems:
   From the `root` directory of the eImage, run `setupALL.bat`.

   UNIX operating systems:
   From the `root` directory of the eImage, run `setupALL.sh`.

   and follow the procedure described in this topic for the dynamic domain manager or its backup, and the procedure for the Dynamic Workload Console described in “Installation procedure for Dynamic Workload Console” on page 356.

2. In the Installation Packages panel of Installation Manager the installation process selected all the IBM Workload Scheduler prerequisites packages and the **"IBM Workload Scheduler"** > **"Version 9.4"** product package.

   Note: If you have already installed IBM Workload Scheduler or its prerequisites products a warning panel is displayed. Click **Continue** to install

the package in a new group or click **Cancel** to clear the package that is already installed.
Click **Next**.

3. On the Licenses page, read the license agreement for the selected package. If you selected to install the IBM Workload Scheduler package and the IBM Workload Scheduler prerequisites packages, you must accept the license agreement for each package. On the left side of the License page, click each package to see its license agreement. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**.
4. Click **Next**.
5. On the Location panel, the IBM Workload Scheduler and the IBM Workload Scheduler prerequisites packages are already selected:

   For each prerequisite package:
   Select the prerequisite package and type, or **Browse** the path to use as the installation directory on which to install the prerequisite instance, or accept the default path.

   For the IBM Workload Scheduler package:
   Type, or **Browse** the path to use as the installation directory on which to install the IBM Workload Scheduler instance for the specific user, or accept the default path:

   Installation directory

   The maximum field length is 46 characters. You cannot use national characters.

   On Windows operating systems:

   - The following characters are not valid:
     `! # $ % & { } [ ] = ? ' < > , ; ( )`
   - The name must be longer than three characters, the second character must be: and the third character must be \.
   - The default directory is `C:\Program Files\IBM\TWA`

   On UNIX and Linux operating systems:

   - The following characters are not valid:
     `! " # $ % & { } [ ] = ? ' < > , ; ( )` *blank_space*
   - The name must be longer than one character and the first character must be /.
   - The default directory is `/opt/IBM/TWA`
6. Click **Next**.
7. On the Features page, perform the following actions:

   For the prerequisites packages:

   To see a description of the feature, click the feature name. In the Details section you see a short description.

   Ensure that you leave the default prerequisites features selected by installation process.

   For the IBM Workload Scheduler package:
   Select the following feature:

   Dynamic domain manager

   Note:

Select directly the **Dynamic domain manager** option. If you first clear the **Master domain manager** option and then select the correct option, you have the following error message:

```
"Select at least one feature for the Workload Scheduler package."
```

8. Click **Next**.
9. Enter the information in the following panels:

   For each prerequisite package:
   On the prerequisites product panels, enter the information related to the product you are installing. For more information about the field values, see the prerequisite product documentation.

   For the IBM Workload Scheduler package:
   On the following panels, enter the following information:

   User information:
   See “IBM Workload Scheduler user information” on page 97.

   Dynamic domain manager Configuration:
   See “IBM Workload Scheduler dynamic domain manager configuration” on page 126.

   Database Configuration:
   See “Database Configuration” on page 129.

   WebSphere profile Configuration:
   See “WebSphere Application Server profile configuration” on page 111.

   WebSphere ports Configuration:
   See “WebSphere Application Server ports configuration” on page 112.

   Disk space check:
   See“Disk space check” on page 113.
10. On the Summary page, review your choices before installing the product package and its prerequisites. To change any choices that you made on previous pages, click **Back** and make the changes. Click **Install** to install the IBM Workload Scheduler package and its prerequisites.

After a successful installation, perform one of the following configuration tasks, depending on whether you installed a dynamic domain manager or its backup:

- “Configuring a dynamic domain manager” on page 241
- “Configuration steps for a dynamic domain manager configured as backup” on page 242.

IBM Workload Scheduler user information:
About this task

Complete the following IBM Workload Scheduler data fields.

User name
Specify the IBM Workload Scheduler user name. User name can contain alphanumeric, dash (-), and underscore (_) characters; it cannot contain national characters. The first character of the user name must be a letter. The default value is **twsuser**.

On Windows operating systems:

- If this user account does not already exist, it is automatically created by the installation wizard.
- If installing on a Windows server in a domain, do not define a domain and local ID with the same user name.
- If you specify a domain user, define the name as *domain_name\user_name*.
- If you specify a local user, define the name as *system_name\user_name*. Type and confirm the password.

On UNIX and Linux operating systems:
This user account must be created manually before running the installation. Create a user with a home directory and group. For more information, see "IBM Workload Scheduler user" on page 40.

Note: The IBM Workload Scheduler user name and password are also used as the WebSphere Application Server administrator user name and password.

Password
Specify the IBM Workload Scheduler password. The password must comply with the password policy in your Local Security Settings. Spaces are not permitted.

On Windows operating systems:
Passwords for users can include any alphanumeric characters and ()!?=^*/~[]$_+;:.,@`-#.

On UNIX and LINUX systems:
Passwords for users can include any alphanumeric characters and ()!?=*~_+.-.

Confirm password
Confirm the IBM Workload Scheduler password that you entered.

Validate user
Click to validate that the user was defined successfully and with the correct permissions.

IBM Workload Scheduler dynamic domain manager configuration:
About this task

Note: This panel appears for the installation and upgrade processes, if you are performing an upgrade, you are not required to insert or you cannot see some of the following fields.

Complete the following IBM Workload Scheduler data fields.

Enter the configuration information for the dynamic domain manager installation:

Configure this dynamic domain manager as backup
By default, this box is left clear. If you check this box, the installation process configures the dynamic domain manager installation as backup.

Do you want to connect the Dynamic Domain Manager only to the z/OS controller?
Only for dynamic domain manager.

Select this check box if you want to connect the dynamic domain manager only to the z/OS controller. Leave the check box clear to connect the dynamic domain manager to:

- A master domain manager
- Both a master domain manager and a z/OS controller

If you connect the dynamic domain manager only to a z/OS controller, you must create a lightweight end-to-end scheduling environment where the IBM Workload Scheduler for z/OS manages the scheduling workload on distributed systems. To complete this environment you must install a IBM Workload Scheduler for z/OS Agent. For a detailed explanation about how to install the IBM Workload Scheduler for z/OS Agent, see the *IBM Workload Scheduler for z/OS: Planning and Installation Guide*. If you select the check box the following fields are disabled:

- **Domain name**
- **This workstation name**
- **Master domain manager workstation name**
- **Dynamic domain manager port (used by Netman)**
- **Master domain manager host name**
- **Master domain manager HTTPS port**

Domain name
Only for a dynamic domain manager connected to a z/OS controller or to a master domain manager or both. Applies only to dynamic domain manager. Specify the IBM Workload Scheduler domain name managed by the dynamic domain manager. The default value is **DYNAMICDM**.

This workstation name
Only for connecting the Dynamic Domain Manager only to the z/OS controller. The name of the workstation on which you are installing the instance. The default is the hostname of the workstation. Spaces are not allowed and the maximum field length is 16 characters. If the host name is longer than 16 characters, an alternative name must be provided for a successful installation. It can contain alphanumeric, dash (-), and underscore (_) characters. The first character must be a letter. `This workstation name` and `master domain manager workstation name` values must not be the same.

dynamic domain manager
The name of the IBM Workload Scheduler workstation known in the database as **fta**. Configure it as **manager** by performing the procedure described in "Configuring a dynamic domain manager" on page 241.

dynamic domain manager configured as backup
The name of the IBM Workload Scheduler workstation known in the database as **fta**. Configure it as **fta** by performing the procedure described in "Configuration steps for a dynamic domain manager configured as backup" on page 242.

Master domain manager workstation name
Only for dynamic domain manager connected to a z/OS controller and a distributed environment or a distributed environment. The name of the

master domain manager workstation. Spaces are not allowed and the maximum field length is 16 characters. The first character cannot be numeric. `This workstation name` and `master domain manager workstation name` values must not be the same.

Dynamic domain manager port (used by Netman)
Only for dynamic domain manager connected to a z/OS controller and a distributed environment or a distributed environment The port used by the `Netman` process to manage distributed environment. `Netman` is the network process that controls the production environment. The default value is **31111**. The valid range is from 1 to 65535.

Note: If you change this value, all default port number values in the application server port information panel are changed to reflect the new range. For example, if you specify `42111` as TCP/IP port number, the default for HTTP transport becomes `42125`, the default for HTTPS becomes `42126`, and so on.

Master domain manager host name
Only for dynamic domain manager connected to a z/OS controller and a distributed environment or a distributed environment The fully qualified host name on which the dynamic domain manager contacts the master domain manager.

Master domain manager HTTPS port
Only for dynamic domain manager connected to a z/OS controller and a distributed environment or a distributed environment. The port for the secure HTTP transport. The dynamic agent component installed on the dynamic domain manager instance uses this port to connect to the dynamic workload broker installed on the master domain manager instance. The default value is **31116**. If you leave the field blank, it defaults to **0**. The valid range is from 1 to 65535.

Enter the configuration information for the dynamic scheduling

Host name or IP address
The host name or IP address of the dynamic agent component installed in the dynamic domain manager instance. The dynamic workload broker and the IBM Workload Scheduler for z/OS controller use this address to connect to the dynamic agent.

Dynamic agent workstation name
The name of the dynamic agent workstation definition.

Dynamic agent port
The dynamic agent secure port number (SECUREADDR). The IBM Workload Scheduler for z/OS controller and the Dynamic workload broker use this port to connect to the IBM Workload Scheduler dynamic agent. The default value is **31114**. The valid range is from 1 to 65535.

Enable the HTTPS communication for the JobManager port
This option enables HTTPS communication between the local Dynamic workload broker and the dynamic agent. For secure connections, it is recommended that you use HTTPS. To use HTTP communication, leave this box clear.

Enter the information to identify the Dynamic workload broker scheduling component. This is used by IBM Workload Scheduler to run jobs dynamically
Only for dynamic domain manager.

Dynamic workload broker workstation name
Only for dynamic domain manager. The definition of the Dynamic workload broker workstation created in the IBM Workload Scheduler database. Spaces are not allowed and the maximum field length is 16 characters. It can contain alphanumeric, dash (-), and underscore (_) characters. The first character must be a letter.

The Dynamic workload broker workstation acts as the communication bridge between the dynamic domain manager and the local Dynamic workload broker component. In your job or job stream definitions, it is the workstation on which the jobs run. In this way, you submit your workload through this workstation to the Dynamic workload broker component.

Dynamic workload broker Netman port
Only for dynamic domain manager. The port used by the IBM Workload Scheduler dynamic domain manager to communicate with the local Dynamic workload broker component. The default value is **41114**. The valid range is from 1 to 65535.

Database Configuration:
About this task

To complete the `Database configuration` panel, perform the following steps:

1. Select the database management system type. Select:

   DB2 Database Enterprise Edition
   If you will use this database.

   Oracle Database
   If you will use this database.

   Other Databases
   If you will use **Informix Dynamic Server** or **MicroSoft SQL Server**.

2. If you selected **DB2 Database Enterprise Edition** or **Oracle Database**:
   a. Specify the installation path of the database in the **Database path** field.
   b. Click **Retrieve database information** to load the information for the database system selected. For more information about how to configure the RDBMS you selected, see the following sections:
      - "Installing and upgrading for a DB2 database server" on page 101
      - "Installing and upgrading for a DB2 database client" on page 103
      - "Installing for an Oracle database" on page 106

   If you selected **Other Databases**, no **Informix Dynamic Server** or **MicroSoft SQL Server** configuration panels will display, as for the other two RDBMSs, but you will have to go on with the other installation steps (namely WebSphere configuration and Disk space check) and complete the installation process, before you manually run a command that starts a configuration script as described in:
   - "Installing for an Informix Dynamic Server" on page 109
   - "Installing for a Microsoft SQL Server database" on page 110

   Note: Before you run the configuration script, make sure you created or upgraded the IBM Workload Scheduler schema, as described in "Creating or upgrading the database schema if you are using Informix Dynamic Server" on page 74 or in "Creating or upgrading the database schema if you are using Microsoft SQL Server" on page 82.

Important: When providing the database name, ensure that you provide a database name that is not used by a master domain manager.

WebSphere Application Server profile configuration:
About this task

The following fields are provided for WebSphere Application Server profile configuration data.

WebSphere installation location
The field shows the path you specified in the Location panel. To change it go back to the Location panel.

Profile deployment type
Create a WebSphere Application Server profile.

Profile details
Enter the information that identify the WebSphere Application Server profile you created.

Profile location
Enter the name of the directory where the WebSphere Application Server profile is located. Click **Browse** to find the appropriate location. The default value is:

On Windows operating systems:
`c:\Program Files\IBM\TWA\WAS\TWSProfile`

On UNIX operating systems:
`/opt/IBM/TWA/WAS/TWSProfile`

Note: Do not use any of the following characters in the profile path field:

On Windows operating systems::
`!"#$%&{}[]=?'<>,;*:`

On UNIX operating systems:
`!"#$%&{}[]=?'<>,;*`

Profile name
Enter the name of the file on which the WebSphere Application Server profile is defined. The default is **TWSProfile**.

Node name
Enter the name of the node contained in the WebSphere Application Server profile. The default is **TWSNode**.

Server name
Enter the name of the server contained in the WebSphere Application Server profile. The default is **server1**.

Validate
Click to validate that the information you entered is correct.

WebSphere Application Server ports configuration:
About this task

This panel appears during installation or upgrade processes. If you are performing an upgrade, you are not required to insert or you cannot see some of the following fields.

The following fields are provided for WebSphere Application Server data. The installation procedure checks for the availability of the ports in the specified port range. If one or more ports are being used by other applications, you are prompted to enter a new port number.

Automatically generate WebSphere ports
Select if you changed the *JobManager* port and you want to automatically generate the ports listed starting from this port.

HTTP transport
The port for the HTTP transport. It is used by the **composer** command line and the Dynamic workload broker when this protocol is selected. The default value is **31115**. The valid range is from 1 to 65535.

HTTPS transport
The port for the secure HTTP transport. When this protocol is selected, it is used by the **composer** command line, the Dynamic workload broker, and, starting with Version 9.4, also the graphical user interfaces. The default value is **31116**. The valid range is from 1 to 65535.

Bootstrap
The port for the bootstrap or RMI. The default value is **31117**. The valid range is from 1 to 65535.

SOAP connector
The port for the application server protocol SOAP connector. The default value is **31118**. The valid range is from 1 to 65535.

SAS Server Authentication Listener
The port used by the Secure Association Services (SAS) to listen for inbound authentication requests. The default value is **31119**. The valid range is from 1 to 65535.

CSIv2 Server Authentication Listener
The port on which the Common Secure Interoperability Version 2 (CSIv2) service listens for inbound server authentication requests. The default value is **31120**. The valid range is from 1 to 65535.

CSIv2 Client Authentication Listener
The port on which the Common Secure Interoperability Version 2 (CSIv2) service listens for inbound client authentication requests. The default value is **31121**. The valid range is from 1 to 65535.

ORB Listener
The port used for RMI over IIOP communication. The default value is **31122**. The valid range is from 1 to 65535.

Administration HTTP transport
The administrative console port. The default value is **31123**. The valid range is from 1 to 65535

Administration HTTPS transport
The administrative console secure port. The default value is **31124**. The valid range is from 1 to 65535.

Disk space check:

The installation process checks if there is enough disk space.

About this task

The installation process checks if there is enough disk space available to install a master domain manager or its backup, a dynamic domain manager or its backup. The installation or upgrade process does not check the space required to install table spaces. Before you click install, verify there is enough space to install table spaces in the indicated path.

In the Disk space check panel, you can see the log for the disk space check operation. If the operation failed because of insufficient disk space, you must free the disk space that is shown in the log and then click **Retry**.

Performing a silent installation

Authorization requirements to check before you start to install, upgrade or uninstall.

Before you begin

1. Before starting to install, upgrade or uninstall, verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or **domain administrators** group with the rights **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

   UNIX and Linux operating systems
   root access
2. Verify that your system meets the product system requirements by running a check: "Checking system prerequisites for the master domain manager" on page 115.
3. Ensure that you downloaded the IBM Workload Scheduler dynamic domain manager or master domain manager eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).

About this task

When you run a silent installation, the Installation Manager is already installed and you use an XML response file that contains parameters required to install the product package. The response file includes all the installation information required to run the installation without user intervention.

Select the appropriate response file, determine the eImages you need to download and extract, and then customize the properties in the response file including the settings for the repository location of the eImages before performing the silent installation.

Important: During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.

3. Correct the repository location in the response file.
4. Rerun the silent installation.

To silently install the IBM Workload Scheduler product package you can have one the following scenarios:

Installing the IBM Workload Scheduler package:
The IBM Workload Scheduler prerequisites are already installed. For more information about performing a silent installation of IBM Workload Scheduler package, see "Performing a IBM Workload Scheduler silent installation" on page 116.

Installing the IBM Workload Scheduler and the Dynamic Workload Console packages and their prerequisites:
For more information about performing the silent installation of the IBM Workload Scheduler package, IBM Workload Scheduler prerequisites packages, the Dynamic Workload Console package and the Dynamic Workload Console prerequisites packages, see "Performing a silent installation of IBM Workload Scheduler and its prerequisites and a Dynamic Workload Console and its prerequisites" on page 118.

Note: You can decide to install only the IBM Workload Scheduler package and its prerequisites or only the Dynamic Workload Console package and its prerequisites or both.

Performing a IBM Workload Scheduler silent installation:
Before you begin

You must install Installation Manager before you perform a silent installation of the IBM Workload Scheduler package and its prerequisites. Run a check against your system to verify if it meets the product system requirements for a silent installation. See "Checking system prerequisites for the master domain manager" on page 115.

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the IBM Workload Scheduler package by using a response file that is provided with the installation eImages in the `\response_files\` directory. For a list of response files, see "IBM Workload Scheduler response file templates" on page 117.

Perform the following steps:
1. Copy the relevant response file to a local directory.
2. Edit the IBM Workload Scheduler section. For details about the response file properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

The default `tools` directory is:

On Windows operating systems

```
C:\Program Files\IBM\Installation Manager\eclipse\tools
```

On UNIX and Linux operating systems

```
/opt/IBM/InstallationManager/eclipse/tools
```

6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for the installation.
   - The `log_file` is the name of the log file that records the result of the silent installation.

   Note: For more information about the Installation Manager silent install command and the Installation Manager silent log file, see Installation Manager documentation.

After a successful installation, perform one of the following configuration tasks, depending on whether you installed a dynamic domain manager or its backup: or a master domain manager or its backup:

- "Configuring a master domain manager" on page 238.
- "Configuration steps for a master domain manager configured as backup" on page 239.
- "Configuring a dynamic domain manager" on page 241.
- "Configuration steps for a dynamic domain manager configured as backup" on page 242.

IBM Workload Scheduler response file templates:
About this task

Edit the response file templates provided with the installation eImages in the `\response_files\` directory. Instructions for customizing the files are included in the files as commented text.

Table 9 on page 117 lists the response files and the types of installation each performs by operating systems:

Table 11. Installation response files

Type of installation	Response file to use
Installing on Windows operating systems	
Fresh dynamic domain manager configured as backup	`IWS94_FRESH_DDM_configured_as_backup_WIN.xml`
Fresh dynamic domain manager	`IWS94_FRESH_DDM_WIN.xml`

Table 11. Installation response files (continued)

Type of installation	Response file to use
Fresh dynamic domain manager for z/OS controller	IWS94_FRESH_DDM_for_zOS_WIN.xml
Fresh master domain manager configured as backup	IWS94_FRESH_MDMconfigured_as_backup_WIN.xml
Fresh master domain manager	IWS94_FRESH_MDM_WIN.xml
Installing on UNIX operating systems	
Fresh dynamic domain manager configured as backup	IWS94_FRESH_DDM_configured_as_backup_UNIX.xml
Fresh dynamic domain manager	IWS94_FRESH_DDM_UNIX.xml
Fresh dynamic domain manager for z/OS controller	IWS94_FRESH_DDM_for_zOS_UNIX.xml
Fresh master domain manager configured as backup	IWS94_FRESH_MDMconfigured_as_backup_UNIX.xml
Fresh master domain manager	IWS94_FRESH_MDM_UNIX.xml

For details about response file properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

Performing a silent installation of IBM Workload Scheduler and its prerequisites and a Dynamic Workload Console and its prerequisites:

Use the appropriate response file in XML format to prepare for a silent installation.

Before you begin

You must install Installation Manager before you perform a silent installation of the IBM Workload Scheduler package. Run a check against your system to verify if it meets the product system requirements for a silent installation. See "Checking system prerequisites for the master domain manager" on page 115 and "Checking system prerequisites for the Dynamic Workload Console" on page 361

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the IBM Workload Scheduler package and the Dynamic Workload Console package at the same time as their prerequisites packages, by using a global response file that is provided with the installation eImages in the \response_files\ directory. For a list of response files, see Table 10 on page 120.

The silent installation process:

- Assigns the correct order to the package installation.
- Manages the prerequisites package installation.

The response file contains one section for each prerequisite package that you have to install, one section related to IBM Workload Scheduler, and one section related to the Dynamic Workload Console package installation.

Select the appropriate response file, determine the eImages you need to download and extract, and then customize the properties in the response file including the settings for the repository location of the eImages before performing the silent installation.

Important: During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

Perform the following steps:

1. Copy the response file to a local directory.
2. Edit the following sections:

   Dynamic Workload Console and IBM Workload Scheduler prerequisites packages sections:
   If you do not want to install the Dynamic Workload Console, comment the Dynamic Workload Console prerequisites section. For more information about how to type in this section, see the response file properties description provided as commented text or see the prerequisites product documentation.

   Dynamic Workload Console section:
   If you do not want to install the Dynamic Workload Console, comment this section. For more information about how to complete the Dynamic Workload Console section properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431.

   IBM Workload Scheduler section:
   For more information about how to complete the IBM Workload Scheduler section properties, see Appendix B, "The IBM Workload Scheduler response file properties," on page 415.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems
   `C:\Program Files\IBM\Installation Manager\eclipse\tools`

   On UNIX and Linux operating systems
   `/opt/IBM/InstallationManager/eclipse/tools`
6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

```
./imcl input /<local_dir>/response_file.xml
-log /<local_dir>/log_file.xml
-acceptLicense
```

where

- The `response_file.xml` is the name of the response file to be used for the installation.
- The `log_file` is the name of the log file that records the result of the silent installation execution.

Note: For more information about the Installation Manager silent installation command and Installation Manager silent log files, see the Installation Manager information center.

Table 10 on page 120 lists the response files and the types of installation each file performs by operating systems:

Table 12. Global installation response files

Type of installation	Response file to use
Installing on Windows operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, IBM Workload Scheduler and Dynamic Workload Console.	`IWS94_FRESH_FULL_MDM_DWC_WIN.xml`
Installing on UNIX operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, IBM Workload Scheduler and Dynamic Workload Console.	`IWS94_FRESH_FULL_MDM_DWC_UNIX.xml`

After a successful installation, perform one of the following configuration tasks, depending on the type of agent you installed:

- "Configuring a master domain manager" on page 238.
- "Configuration steps for a master domain manager configured as backup" on page 239.
- "Configuring a dynamic domain manager" on page 241.
- "Configuration steps for a dynamic domain manager configured as backup" on page 242.

Encrypting user passwords for response files:

Steps that need to be taken to encrypt the user passwords for the response files.

About this task

You must encrypt each password string stored in the response files by using Installation Manager.

You can perform the password encryption by using one of the following procedures:

Installation Manager String encryption utility interface

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse
   ```

   UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

   If you are installing as a non-root user

   ```
   /home/<non-root-user>/IBM/InstallationManager/eclipse/
   tools
   ```

2. To open the **String encryption utility interface**, run the following command:

   Windows operating systems

   ```
   IBMIM.exe encryptString <stringToEncrypt>
   ```

   where `<stringToEncrypt>` is the value to be encrypted.

   UNIX and Linux operating systems

   ```
   ./IBMIM encryptString <stringToEncrypt>
   ```

   where `<stringToEncrypt>` is the value to be encrypted.

3. In the **String encryption utility** window, note the `Encrypted version of the String` field value related to the `String to be encrypt` field value.
4. Copy the `Encrypted version of the String` value in the password entry of the response file.

Installation Manager command line tool

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse
   ```

   UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

   If you are installing as a non-root user

   ```
   /home/<non-root-user>/IBM/InstallationManager/eclipse/
   tools
   ```

2. Run the following command:

   Windows operating systems

   ```
   IBMIM.exe -silent -noSplash encryptString <stringToEncrypt> >
   <Encryptedpwd>.txt
   ```

   where `<stringToEncrypt>` is the value to be encrypted and the `<Encryptedpwd>.txt` is the file where there is the encrypted value of the password.

UNIX and Linux operating systems

```
./IBMIM -silent -noSplash encryptString <stringToEncrypt> >
<Encryptedpwd>
```

where <stringToEncrypt> is the value that is encrypted and the <Encryptedpwd> is the file where there is the encrypted value of the password.

3. Open the file <Encryptedpwd> and copy the value contained into the file in the data key of the response file.
4. Remove the file <Encryptedpwd>.

Example

This example shows you how to write the section USER INFORMATION of the IWS94_FRESH_MDM_WIN.xml response file, setting the IBM Workload Scheduler user value to *twsuser* and the user password value to *passw0rd* on Windows operating systems.

By using the Installation Manager command line tool, encrypt the password *passw0rd* saving the encrypted value to the file my_pwd.txt:

```
IBMIM.exe -silent -noSplash encryptString passw0rd > my_pwd.txt
```

The file *my_pwd.txt* contains the following value:

```
rbN1IaMAWYYtQxLf6KdNyA==
```

Complete the USER INFORMATION section of the IWS94_FRESH_MDM_WIN.xml response file as follows:

```
<!--USER INFORMATION
Supply the IBM Workload Scheduler credentials information -->
<data key='user.userName,com.ibm.tws' value='twsuser'/>
<data key='user.password,com.ibm.tws' value='rbN1IaMAWYYtQxLf6KdNyA=='/>
```

Note: For security reasons, remove the file *my_pwd.txt* after using it.

Installing agents

How to install an IBM Workload Scheduler fault-tolerant agent or dynamic agent in your distributed or end-to-end network by using the **twsinst** script.

About this task

When you install a fault-tolerant agent, also the remote command line client is installed.

Use only the **twsinst** script to install agents. If you are installing a dynamic agent, you can optionally add the Java run time which is needed to run job types with advanced options, and to configure a gateway to open communication with the dynamic workload broker.

When you install a dynamic or a fault-tolerant agent, also the following access methods, that extend the job scheduling capabilities of IBM Workload Scheduler to other software products, are installed:

PeopleSoft
To run and monitor PeopleSoft jobs from the IBM Workload Scheduler environment.

SAP R/3
To create, schedule, and control SAP jobs by using the job scheduling features of IBM Workload Scheduler.

z/OS To define and schedule jobs that run in a z/OS environment with JES2, JES3, or IBM Workload Scheduler for z/OS

See *IBM Workload Automation: Scheduling Applications with IBM Workload Automation* for details on configuring and using the access methods.

Important: The access methods are installed with IBM Workload Scheduler but, to be entitled to their use, you must purchase a separate chargeable component beside IBM Workload Scheduler or IBM Workload Scheduler for z/OS agents. Ask your IBM representative for details.

During each step of the installation process, the **twsinst** script creates files in the installation directory that you specified in the command. If you do not specify an installation directory in the `-inst_dir` option in the command, the script creates files in the following directories:

On Windows operating systems
`%ProgramFiles%\IBM\TWA_<TWS_USER>`

On UNIX operating systems
`/opt/IBM/TWA_<TWS_USER>`

Where *<TWS_USER>* is the user for which you are installing the IBM Workload Scheduler instance that you specify in the command.

The dynamic agent installation process automatically adds the workstation definition to the database and registers the workstation definition to the dynamic workload broker installed on the master domain manager or the dynamic domain manager that you specify during the installation process.

You can organize dynamic agents in pools to help organize your environment based on the availability of workstations and the requirements of the jobs to be run. Normally, when you create a pool, you add the dynamic agents to a workstation definition of type pool.

You can also register an agent with a pool by directly editing the `pools.properties` file located in `<TWS_home>/ITA/cpa/config`. See the topic about automatically registering agents to a pool in the *Planning and Installation Guide*.

Procedure

Before you begin

1. Before you start to install, upgrade, or uninstall, verify that the user that runs the installation process has the following authorization requirements:

   Windows operating system
   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the rights **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation, you must run the installation as **administrator**.

   UNIX and Linux operating systems

To install a fault-tolerant agent, the user must have **root** access.

To install a dynamic agent, the user is not required to have **root** access.

- If the installer has **root** privileges, the **uname** keyword can be omitted if the *username* value is meant to be root, or can be set to a username value other than root.
- If the installer is not the **root** user, this has some implications on the use of the uname keyword of the **twsinst** command, which becomes an optional parameter, and on its effect on the *username* of the dynamic agent. That is:
  - The **uname** keyword can be omitted, but *username* is automatically set to the login name of the installer. If the installer specifies a **uname** with a different *username* value, an error message is returned.
  - As a consequence, the agent can run jobs uniquely with the user name of that installer.
  - Future upgrades, modifications, and removal of the agent can be made exclusively with the same login used for installation. To keep track of the login name used by the installer, at installation time the read-only `InstallationLoginUser` parameter is recorded with the login name in the `JobManager.ini` configuration file in the agent.

  Also, if you install the agent as non-root on UNIX workstations, when running **conman** and **composer** commands it is mandatory to set the environment first, by using the **tws_env** script as described in "Setting the environment variables" on page 237.

2. Ensure that you downloaded the IBM Workload Scheduler agent eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).
3. Ensure that you have enough temporary space before you start the installation process. If you have not much space in the temporary directory and you cannot free the space, see "twsinst needs long time to run if the machine does not have enough temporary space" on page 273.

About this task

You can install a fault-tolerant or dynamic agent in a distributed or an end-to-end environment.

To install an IBM Workload Scheduler agent, perform the following steps:

On Windows operating systems:

1. Download the agent eImage. For more information, see "Installation media" on page 33 or the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843.
2. Log in as administrator on the workstation where you want to install the product.
3. From the *root*/TWS/*operating_system* directory, run `twsinst` by using the following syntax:

   ```
   cscript twsinst -new -uname username -password user_password -acceptlicense yes
   ```

   For a description of the syntax parameters and a complete list of them, see "Agent installation parameters - twsinst script" on page 143.

Note: twsinst for Windows is a Visual Basic Script (VBS) that you can run in CScript and WScript mode.

The IBM Workload Scheduler user is automatically created. The software is installed by default in the IBM Workload Scheduler installation directory. The default value is `%ProgramFiles%\IBM\TWA`.

If you enabled the Security Warning, a dialog box is displayed during the installation. In this case answer **Run** to continue.

On UNIX and Linux operating systems:

1. Download the agent eImage. For more information about eImages, see "Installation media" on page 33 or the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).
2. If you plan to login as **root** on the workstation where you will install the agent, create the IBM Workload Scheduler user. The software is installed by default in the user's home directory, referred to as */installation_dir/TWS*.

   User: *TWS_user*

   Home: */installation_dir/TWS* (for example: `/home/user1/TWS` where `user1` is the name of IBM Workload Scheduler user). Ensure this directory has **755** permission.

   If you plan to login as a non-root user (available only for dynamic agents), your login will become by default the only possible user of the agent. You do not need to create another IBM Workload Scheduler user, but make sure that you have a home directory (where the agent will be installed), and that it has **755** permission.

   Important: If you use the `-su` *non-root username* command in the shell where you are about to run `twsinst`, make sure that $HOME is set on your home directory as a non-root user (use `echo $HOME` to verify that the value returned corresponds to your home directory).
3. Log in on the workstation where you want to install the product.
4. From the *root*`/TWS/`*operating_system* directory, run **twsinst** by using the syntax described below. For a description of the syntax parameters, see "Agent installation parameters - twsinst script" on page 143.

If the installation fails, to understand the cause of the error see "Analyzing return codes for agent installation, upgrade, restore, and uninstallation" on page 267.

After a successful installation, perform one of the following configuration tasks, depending on the type of agent you installed:

- "Configuring a fault-tolerant agent" on page 242.
- "Configuring a dynamic agent" on page 243.

On Windows operating systems:

Show command usage and version

```
twsinst -u | -v
```

Install a new instance

```
twsinst -new -uname username
   -password user_password
   -acceptlicense yes|no
   [-addjruntime true|false]
   [-agent dynamic|fta|both]
```

```
[-company company_name]
[-displayname agentname]
[-domain user_domain]
[-gateway local|remote|none]
[-gweifport gateway_eif_port]
[-gwid gateway_id]
[-hostname host_name]
[-inst_dir install_dir]
[-jmport port_number]
[-jmportssl true|false]
[-lang lang_id]
[-master master_cpu_name]
[-password user_password]
[-port port_number]
[-skip_usercheck]
[-skipcheckprereq]
[-tdwbhostname host_name]
[-tdwbport tdwbport_number]
[-thiscpu workstation]
[-work_dir working_dir]
```

On UNIX and Linux operating systems

Show command usage and version

```
twsinst -u | -v
```

Install a new instance

```
twsinst -new -uname username
   -acceptlicense yes|no
   [-addjruntime true|false]
   [-agent dynamic|fta|both]
   [-company company_name]
   [-create_link]
   [-displayname agentname]
   [-gateway local|remote|none]
   [-gweifport gateway_eif_port]
   [-gwid gateway_id]
   [-hostname hostname]
   [-inst_dir install_dir]
   [-jmport port_number]
   [-jmportssl true|false]
   [-lang lang_id]
   [-master master_cpu_name]
   [-port port_number]
   [-reset_perm]
   [-skip_usercheck]
   [-skipcheckprereq]
   [-tdwbhostname host_name]
   [-tdwbport tdwbport_number]
   [-thiscpu workstation]
   [-work_dir working_dir]
```

Agent installation parameters - twsinst script

Agent installation parameters that can be passed to the **twsinst** script.

About this task

This section lists and describes the parameters that are used when running a **twsinst** script to install the fault-tolerant or dynamic agent.

To see some sample agent installation scenarios see "Example installations" on page 149 and "Dynamic agent gateway installation examples" on page 151.

-acceptlicense *yes | no*
Specify whether to accept the License Agreement.

-addjruntime *true|false*
Adds the Java run time to run job types with advanced options, both those types that are supplied with the product and the additional types that are implemented through the custom plug-ins. Valid values are **true** and **false**. The default for a fresh installation is **true**.

This option is applicable to both fault-tolerant agents and dynamic agents.

If you decided not to install Java run time at installation time, you can still add this feature later. For details about how to add a feature, see IBM Workload Scheduler Planning and Installation.

-agent *dynamic|fta|both*
The type of agent that you want to install. Valid values are:

dynamic
To install a IBM Workload Scheduler dynamic agent. Use this value with the **-tdwbhostname** *host_name* and the **-tdwbport** *tdwbport_number* parameters.

fta To install a IBM Workload Scheduler fault-tolerant agent.

both To install the dynamic agent that is used with the **-tdwbhostname** *host_name* and the **-tdwbport** *tdwbport_number* parameters, and a fault-tolerant agent.

The default is **dynamic**.

-agentid *agentid*
The unique identifier of the agent that you want to install. The parameter is optional. If not specified, the installation process assigns to the agent a string of alphanumeric characters, as in the following example:

```
893164748CCA4FC6820F12685AECBB07
```

It might be useful to specify an *agentid* when you want to reinstall an agent after it was uninstalled, and you want to use the same *agentid*. This prevents that two different *agentid* values are registered on the server for the same agent installation.

-company *company_name*
The name of the company. The company name cannot contain blank characters. The name is shown in program headers and reports. If not specified, the default name is COMPANY.

-create_link
UNIX systems only. Create the **symlink** between `/usr/bin/at` and `<install_dir>/TWS/bin/at`. For more information, see Table 3 on page 35.

-displayname
The name to assign to the agent. The name cannot start with a number. The default is the host name of this computer.

If the host name starts with a number, **-displayname** parameter must be specified.

-domain *user_domain*
Windows systems only. The domain name of the IBM Workload Scheduler user. The default is the name of the workstation on which you are installing the product.

-gateway ***local|remote|none***
Specifies whether to configure a gateway to communicate with the

dynamic workload broker or not, and how it is configured. Specify *local* if the gateway is local to the dynamic agent workstation. Specify *remote* if the dynamic agent communicates through a gateway that is installed on a different dynamic agent workstation from the dynamic agent being installed. The default value is *none*, no gateway is configured.

-gweifport *gateway_eif_port*
Specifies the Job Manager Event Integration Facility (EIF) port number. The default value is **31132**. The valid range is 1 to 65535.

-gwid *gateway_id*
The unique identifier for the gateway. This parameter is required when you specify **-gateway** *local*. The default gateway identifier that is assigned is **GW1**. The gateway identifier must start with either an alphabetic character or an underscore character (_), and it can contain only the following types of characters: alphabetic, numeric, underscores (_), hyphens (-), and periods (.).

Gateways can also work in parallel to mutually take over in routing communications to the agents connected to them. To enable gateways to work in parallel, all gateways must have the same *gateway_id* assigned. This information is stored in the `JobManagerGW.ini` file, by setting the JobManagerGWURIs property.

-hostname *host_name*
The fully qualified host name or IP address on which the agent is contacted by the dynamic workload broker. The default is the host name of this computer.

-inst_dir *installation_dir*
The directory of the IBM Workload Scheduler installation.

On Windows operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. Specify an absolute path. If you do not manually specify a path, the path is set to `%ProgramFiles%\IBM\TWA_<TWS_USER>`, where <*TWS_USER*> is the user for which you are installing the IBM Workload Scheduler that you specify in the `-uname` option.

On UNIX and Linux operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. Specify an absolute path. If you do not manually specify a path, the path is set to:

- `/opt/IBM/TWA_<TWS_USER>`, if you logged in as the **root** user to install the agent. <*TWS_USER*> is the user that you specify in the `-uname` option and for which you are installing the agent (can omit if <*TWS_USER*> is **root**).

  Note: The IBM Workload Scheduler user that you specify in the `-uname username` parameter must have read and run privileges for the `installation_dir` installation path; otherwise the installation fails.
- *home_dir*`/TWA`, if you logged in with a login other than **root**. Ensure that the directory permission is set to **755** for *home_dir*, the home directory for your login, and that you are the *home_dir* owner.

-jmport *port_number*

The JobManager port number used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. The default value is **31114**. The valid range is from 1 to 65535.

-jmportssl *true|false*
The JobManager port used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. The port value is the value of the ssl_port parameter in the `ita.ini` file if **`-jmportssl`** is set to `true`. If set to `false`, it corresponds to the value of the **`tcp_port`** parameter in the `ita.ini` file. The `ita.ini` file is located in `ITA\cpa\ita` on Windows systems and `ITA/cpa/ita` on UNIX, Linux, and IBM i systems.

Set the value to "true" if **`- gateway`** is set to `local`.

For communication using SSL or HTTPS
Set **jmportssl = true**. To communicate with the dynamic workload broker, it is recommended that you set the value to **true**. In this case, the port specified in **jmport** communicates in HTTPS.

For communication without using SSL or through HTTP
Set **jmportssl = false**. In this case the port specified in **jmport** communicates in HTTP.

-lang *lang_id*
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used. If neither **-lang** nor LANG are used, the default codepage is set to SBCS. For a list of valid values for these variables, see the following table:

Table 13. Valid values for -lang and LANG parameter

Language	Value
Brazilian portuguese	pt_BR
Chinese (traditional and simplified)	zh_CN, zh_TW
English	en
French	fr
German	de
Italian	it
Japanese	ja
Korean	ko
Russian	ru
Spanish	es

Note: This is the language in which the installation log is recorded and not the language of the installed engine instance. **`twsinst`** installs all languages as default.

-master *workstation*
The workstation name of the master domain manager. This name cannot exceed 16 characters, cannot contain spaces, and cannot be the same as the workstation name that you entered in the **thiscpu** parameter. If not specified, the default value is **MASTER**.

-new A fresh installation of the agent. Installs an agent and all supported language packs.

-password *user_password*
Windows systems only. The password of the user for which you are installing IBM Workload Scheduler. The password can include alphanumeric, dash (-), and underscore (_) characters, and the following symbols: ()!?=^*/^ [] $`+;:.,@.

-port *port_number*
The TCP/IP port number used by the Netman process to listen for communication from the master. The default value is **31111**. The valid range is from 1 to 65535. This port number is registered in the `localopts` file. For each installation you must specify a different number.

-reset_perm
UNIX and IBM i systems only. Reset the permission of the libraries in the `/usr/ibm` directory.

-restore
Run this command from the folder to where you copied the eImage (a folder other than the home directory of *<TWS_USER>*, where *<TWS_USER>* is the user that installed the IBM Workload Scheduler instance), and not from the installation path, to restore the version in the eImage.

-skip_usercheck
Enable this option if the authentication process within your organization is not standard, thereby disabling the default authentication option.

On Windows systems if you specify this parameter, the program does not create the user you specified in the -uname *username* parameter. If you specify this parameter you must create the user manually before running the script.

On UNIX and Linux systems if you specify this parameter, the program skips the check of the user in the `/etc/passwd` file or the check you perform using the **su** command.

-skipcheckprereq
If you specify this parameter, IBM Workload Scheduler does not scan system prerequisites before installing the agent. For more information on the prerequisite check, see "Scanning system prerequisites for IBM Workload Scheduler" on page 44.

-tdwbhostname *host_name*
The fully qualified host name of the dynamic workload broker. It is used together with the **-agent** parameter set to either **dynamic** or **both** and the **-tdwbport** *tdwbport_number* parameter. It is necessary to install the dynamic agent. If not specified, you cannot run your workload dynamically and this parameter assumes the **localhost** default value. This value is registered in the **ResourceAdvisorUrl** property in the `JobManager.ini` file.

If **-gateway** *local* or *remote* is specified, then this is the host name of the dynamic agent workstation where the gateway resides and to which the agent connects. This information is stored in the `JobManager.ini` file.

-tdwbport *tdwbport_number*
The HTTP or HTTPS transport port number of the dynamic workload broker. It is used together with the **-agent** parameter set to either **dynamic** or **both** and the **-tdwbhostname** *host_name* parameter. It is required if you install the dynamic agent so that the agent can connect to the dynamic workload broker. This number is registered in the **ResourceAdvisorUrl** property in the `JobManager.ini` file. The default value is **31116**. For each installation you must specify a different port number. The valid range is

from 0 to 65535. If you specify **0** or do not specify this parameter, you cannot run workload dynamically. Do not specify **0** if the *-agent* value is **dynamic** or **both**. The default is "0" for an upgrade, which means that this connection is not configured, otherwise, specify `31116` for a fresh installation.

If **-gateway***remote* is specified, then this is the HTTP or HTTPS port number of the dynamic agent workstation where the gateway resides and to which the agent connects. If you are performing a fresh installation, then the value to use is `31114`. This information is stored in the `JobManager.ini` file.

-thiscpu *workstation*
The name of the IBM Workload Scheduler workstation of this installation. The name cannot exceed 16 characters, cannot start with a number, cannot contain spaces, and cannot be the same as the workstation name of the master domain manager. This name is registered in the `localopts` file. If not specified, the default value is the host name of the workstation.

If the host name starts with a number, **-thiscpu** parameter must be specified.

-u Displays command usage information and exits.

-uname *username*
The name of the user for which the IBM Workload Scheduler agent is being installed. This user name is not to be confused with the user performing the installation. The user name cannot contain periods (.).

On UNIX and Linux systems, for a new installation, this user account must be created manually before running the installation. Create a user with a home directory. IBM Workload Scheduler is installed by default under the home directory of the specified user.

Dynamic agents can be installed on UNIX and Linux systems also by installers without **root** privileges. When this is the case:

- *username* takes by default the login name of the installer and **uname** can be omitted. If **uname** is specified with a different value than the login of the installer, an error message is returned.
- As a consequence, the agent can run jobs uniquely with the user name of the installer.
- Event Management triggers on files work only if the selected files are accessible to the user that was used for the installation.

-work_dir *working_dir*
The temporary directory used by the program to deploy the installation process files.

On Windows operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. If you do not manually specify a path, the path is set to `%temp%\TWA\tws<version_number>`, where `%temp%` is the temporary directory of the operating system.

On UNIX and Linux operating systems:
The path cannot contain blanks. If you do not manually specify a path, the path is set to `/tmp/TWA/tws<version_number>`.

-v Displays the command version and exits.

Example installations

About this task

The following example shows the syntax used when using the **twsinst** script to install a new instance of a fault-tolerant agent.

On Windows operating systems:

```
cscript twsinst -new
  -uname TWSuser1
  -password user_password
  -acceptlicense yes
  -agent fta
  -company IBM
  -displayname thishostcomputername
  -hostname thishostname.mycompany.com
  -inst_dir "c:\Program Files\IBM\TWA_TWSuser1"
  -master TWSmdm
  -port 37124
  -thiscpu fta92
```

On UNIX and Linux operating systems:

```
./twsinst -new
-uname TWSuser1
-acceptlicense yes
-agent fta
-company IBM
-create_link
-hostname thishostname.mycompany.com
-inst_dir "/opt/IBM/TWA_TWSuser1"
-master TWSmdm
-port 37124
-reset_perm
-skipcheckprereq
-thiscpu fta92
-work_dir "/home/TWSuser1/tmp"
```

The following example shows the syntax used when using the **twsinst** script to install a new instance of a dynamic agent and adding the Java run time for running job types with advanced options.

On Windows operating systems:

```
cscript twsinst -new
-uname TWSuser1
-password user_password
-acceptlicense yes
-addjruntime true
-agent dynamic
-displayname thishostcomputername
-hostname thishostname.mycompany.com
-inst_dir "c:\Program Files\IBM\TWA_TWSuser1"
-jmport 31114
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
```

On UNIX and Linux operating systems:

```
./twsinst -new
-uname TWSuser1
-acceptlicense yes
-addjruntime true
-agent dynamic
-displayname thishostcomputername
-hostname thishostname.mycompany.com
```

```
-inst_dir "/opt/IBM/TWA_TWSuser1"
-jmport 31114
-reset_perm
-skipcheckprereq
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
```

The following example shows the syntax used when running the **twsinst** script to install a new instance of both a fault-tolerant and a dynamic agent, and adding the Java run time for running job types with advanced options.

On Windows operating systems:

```
cscript twsinst -new
-uname TWSuser1
-password user_password
-acceptlicense yes
-addjruntime true
-agent both
-displayname thishostcomputername
-hostname thishostname.mycompany.com
-inst_dir "c:\Program Files\IBM\TWA_TWSuser1"
-jmport 31114
-master TWSmdm
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
-thiscpu mainworkstation
```

On UNIX and Linux operating systems:

```
./twsinst -new
-uname TWSuser1
-acceptlicense yes
-addjruntime true
-agent both
-displayname thishostcomputername
-create_link
-displayname thishostcomputername
-hostname thishostname.mycompany.com
-inst_dir "/opt/IBM/TWA_TWSuser1"
-jmport 31114
-master TWSmdm
-reset_perm
-skipcheckprereq
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
-thiscpu fta92
```

The following example shows the syntax used when using the **twsinst** script to install a new instance of a dynamic agent, adding the Java run time for running job types with advanced options, and to install a gateway on the same workstation as the agent to enable communication with the master domain manager.

On Windows operating systems:

```
cscript twsinst -new
-uname TWSuser1
-password user_password
-acceptlicense yes
-addjruntime true
-agent dynamic
-displayname thishostcomputername
-gateway local
-gwid gateway_id
-hostname thishostname.mycompany.com
-inst_dir "c:\Program Files\IBM\TWA_TWSuser1"
```

```
-jmport 31114
-jimportssl true
-master TWSmdm
-skipcheckprereq
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
-thiscpu mainworkstation
```

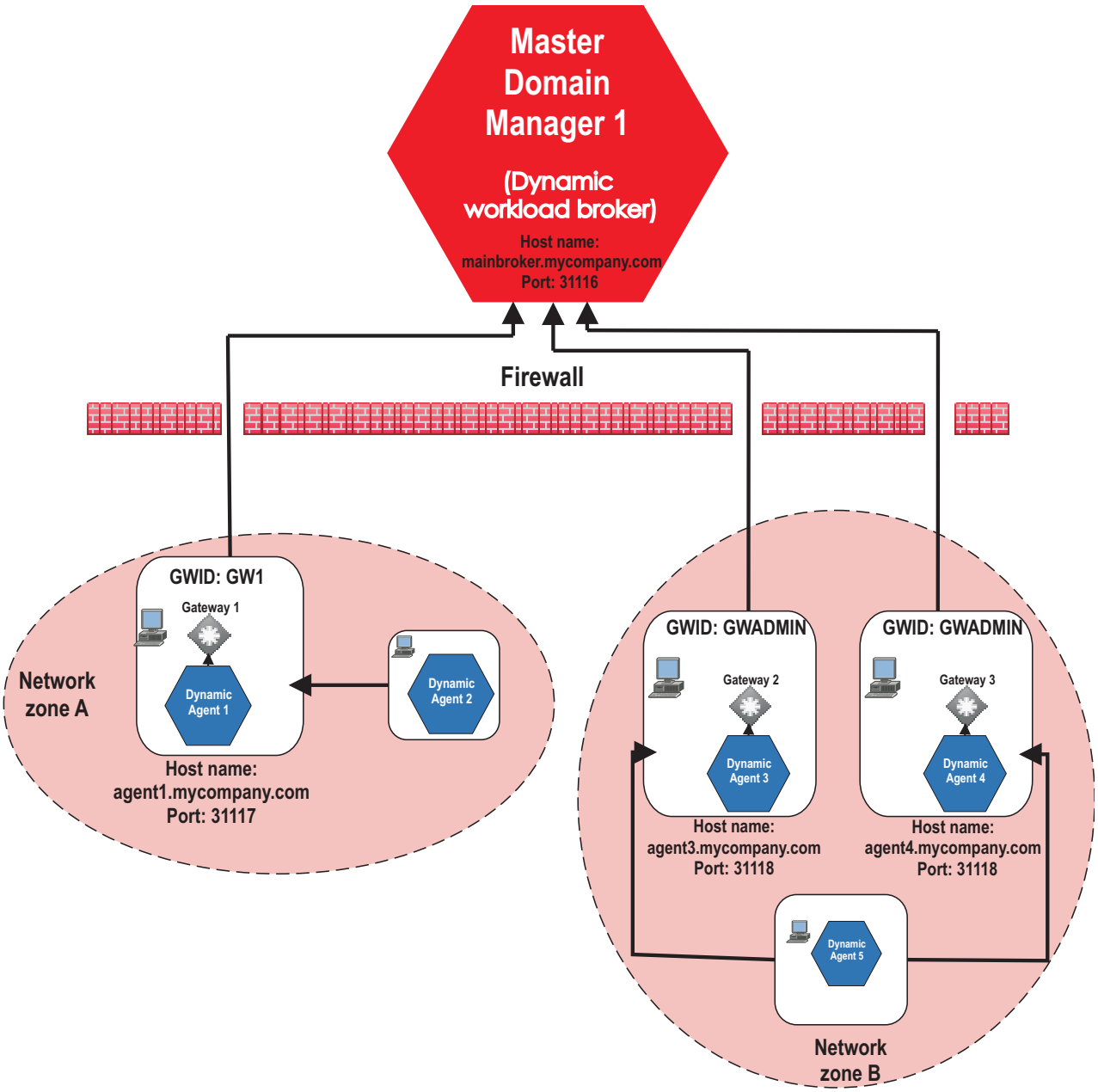
On UNIX and Linux operating systems:

```
./twsinst -new
-uname TWSuser1
-acceptlicense yes
-addjruntime true
-agent both
-displayname thishostcomputername
-create_link
-displayname thishostcomputername
-gateway local
-gwid gateway_id
-hostname thishostname.mycompany.com
-inst_dir "/opt/IBM/TWA_TWSuser1"
-jmport 31114
-jimportssl true
-master TWSmdm
-reset_perm
-skipcheckprereq
-tdwbport 31116
-tdwbhostname mainbroker.mycompany.com
-thiscpu fta92
```

Dynamic agent gateway installation examples

Example installations for configuring a local or remote gateway with dynamic agent workstations in the same or different network zones.

The following examples address two installation scenarios and indicate the parameters to use with the **twsinst** script to install the dynamic agents to support the scenarios. The following figure depicts the two scenario environments:



Scenario 1: Same network zone

The workstations where you install the agents can communicate with each other (Dynamic Agent 1 and Dynamic Agent 2) and are located in the same network zone, but only one agent workstation (Dynamic agent 1) can connect to the dynamic workload broker.

Table 14. Installation syntax for agent installation with agents in the same network zone

Dynamic Agent workstation	Installation syntax

Dynamic Agent 1	`twsinst -new -uname <user_name>`
	`  -password <user_password>`
	`  -acceptlicense yes`
	`  -agent dynamic`
	`  -gateway local`
	`  -gwid GW1`
	`  -jmport 31117`
	`  -tdwbport 31116`
	`  -tdwbhostname mainbroker.mycompany.com`

Dynamic Agent 2	`twsinst -new -uname <user_name>`
	`  -password <user_password>`
	`  -acceptlicense yes`
	`  -agent dynamic`
	`  -gateway remote`
	`  -tdwbport 31117`
	`  -tdwbhostname agent1.mycompany.com`

where,

Dynamic Agent 1

-gateway local
Dynamic Agent 1 communicates with the dynamic workload broker through its local gateway.

-gwid GW1
The gateway ID is the name that identifies the gateway site on Dynamic Agent 1. The default name is GW1.

-tdwbport 31116
The port number of the dynamic workload broker.

-tdwbhostname mainbroker.mycompany.com
The fully qualified host name of the dynamic workload broker.

Dynamic Agent 2

-gateway remote
Indicates that Dynamic Agent 2 can connect to the internet through a gateway installed on a different agent, Dynamic Agent 1.

-tdwbport 31117
The port number of the dynamic agent workstation where the gateway resides. In this example, the port number of Dynamic Agent 1 is 31117.

-tdwbhostname agent1.mycompany.com
The fully qualified host name of the dynamic agent workstation where the gateway resides and to which the agent connects.

Scenario 2: Different network zones

The workstations where you install the agents cannot communicate with each other and are in different network zones (Network zone A and Network zone B), however, one agent workstation in each network zone can successfully connect to the dynamic workload broker. In Network zone B, two parallel gateways are configured.

Table 15. Installation syntax for agent installation with agents in different network zones

Dynamic Agent workstation	Installation syntax

Dynamic Agent 3	`twsinst -new -uname <user_name>`
	`  -password <user_password>`
	`  -acceptlicense yes`
	`  -agent dynamic`
	`  -gateway local`
	`  -gwid GWADMIN`
	`  -jmport 31118`
	`  -tdwbport 31116`
	`  -tdwbhostname mainbroker.mycompany.com`

Dynamic Agent 4	`twsinst -new -uname <user_name>`
	`  -password <user_password>`
	`  -acceptlicense yes`
	`  -agent dynamic`
	`  -gateway local`
	`  -gwid GWADMIN`
	`  -jmport 31118`
	`  -tdwbport 31116`
	`  -tdwbhostname mainbroker.mycompany.com`

Dynamic Agent 5	`twsinst -new -uname <user_name>`
	`  -password <user_password>`
	`  -acceptlicense yes`
	`  -agent dynamic`
	`  -gateway remote`
	`  -tdwbport 31118`
	`  -tdwbhostname agent4.mycompany.com`

where,

Dynamic agent 3

-gateway local
Indicates that Dynamic Agent 3 can communicate with the dynamic workload broker directly, and a gateway is installed on Dynamic Agent 3 to route communications from dynamic agent workstations that cannot directly communicate with the dynamic workload broker.

-gwid GWADMIN
The gateway ID, GWADMIN, is the name that identifies the gateway on Dynamic Agent 3. Gateways with the same <gateway_id> can mutually take over in routing communications to the agents connected to them. Specify a different <gateway_id> if the gateways do not communicate with each other.

In addition, configure the two gateways in parallel to take over routing communications from the agents connected to them, should one of the gateways become unavailable. Edit the JobManagerGW.ini file on Dynamic agent 3 and set the JobManagerGWURIs property as follows:

```
JobManagerGWURIs = https://agent3.mycompany.com:31118/ita/JobManagerGW/
 JobManagerRESTWeb/JobScheduler/resource,https://agent4.mycompany.com:
 31118/ita/JobManagerGW/JobManagerRESTWeb/JobScheduler/resource
```

-tdwbport 31116
The port number of the dynamic workload broker.

-tdwbhostname mainbroker.mycompany.com
The fully qualified host name of the dynamic workload broker.

Dynamic agent 4

-gateway local
Indicates that Dynamic Agent 4 can communicate with the dynamic workload broker directly, and a gateway is installed on Dynamic Agent 4 to route communications from dynamic agent workstations (Dynamic agent 5) that cannot directly communicate with the dynamic workload broker.

-gwid GWADMIN
The gateway ID, GWADMIN, is the name that identifies the gateway site on Dynamic Agent 4. Gateways with the same <gateway_id> can mutually take over in routing communications to the agents connected to them. Specify a different <gateway_id> if the gateways do not communicate with each other.

In addition, you can configure the two gateways in parallel to take over routing communications from the agents connected to them, should one of the gateways become unavailable. Edit the JobManagerGW.ini file on Dynamic agent 4 and set the JobManagerGWURIs property as follows:

```
JobManagerGWURIs = https://agent3.mycompany.com:31118/ita/JobManagerGW/
 JobManagerRESTWeb/JobScheduler/resource,https://agent4.mycompany.com:
 31118/ita/JobManagerGW/JobManagerRESTWeb/JobScheduler/resource
```

-tdwbport 31116
The port number of the dynamic workload broker.

-tdwbhostname mainbroker.mycompany.com
The fully qualified host name of the dynamic workload broker.

Dynamic agent 5

-gateway remote
Indicates that Dynamic Agent 5 can connect to the internet through a gateway installed on a different agent, Dynamic Agent 4.

-tdwbport 31118
The port number of the dynamic agent workstation where the gateway resides. In this example, the port number of Dynamic Agent 4 is 31118.

-tdwbhostname agent4.mycompany.com
The fully qualified host name of the dynamic agent workstation where the gateway resides and to which the agent connects.

For information about configuring dynamic agent communications through a gateway, see the *Administration Guide* in the sections Network administration > Network communications.

The `twsinst` log files

About this task

The **twsinst** log file name is:

On Windows operating systems:
<*TWS_INST_DIR*>\logs\
twsinst_<*operating_system*>_<*TWS_user*>^<*version_number*>.log

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is C:\Program Files\IBM\TWA_<TWS_user>.

<operating_system>
The operating system.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

On UNIX and Linux operating systems:
`<TWS-INST-DIR>/logs/`
`twsinst_<operating_system>_<TWS_user>^<version_number>.log`

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is `/opt/IBM/TWA_<TWS_user>`.

<operating_system>
The operating system.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

Creating a Docker image to run dynamic agents

Quickly create a Docker image to run dynamic agents.

You can run dynamic agents in a Docker container that you use to run jobs remotely, for example to call REST APIs or database stored procedures, or to run jobs within the container itself.

To create a Docker container, you are provided with step-by-step instructions and the latest versions of the required samples on GitHub here. Follow the instructions to create a Docker container to run jobs remotely, or use it as base image to add the applications to be run with the agent to other images, or customize the samples to best meet your requirements.

Discovering installed components

To know which IBM Workload Scheduler components you have installed on the workstation

About this task

If you want to know which IBM Workload Scheduler components you have installed on the workstation, check the `TWSRegistry.dat` file.

Note: For more information about the `TWSRegistry.dat` file, see "Registry file".

Installing additional components

Installing the Job Brokering definition Console, and the Integration Workbench.

About this task

You can install the following additional components:

- The Job Brokering definition Console. See “Installing the Job Brokering Definition Console” on page 157.

- The Integration Workbench. See "Installing IBM Workload Scheduler Integration Workbench" on page 158.

Installing the Job Brokering Definition Console

About this task

This section describes how to install the Job Brokering Definition Console. It is divided into the following sections:

- "Installing the Job Brokering Definition Console using the installation wizard"
- "Performing a silent installation of the Job Brokering Definition Console"

The Job Brokering Definition Console is a structured editing tool that you use to create and modify Job Submission Description Language (JSDL) files. These files are saved in the Job Repository as job definitions and become available for submission. The JSDL files adhere to the XML syntax and semantics as defined in the JSDL schema. For more information about the Job Brokering Definition Console, see the *IBM Workload Scheduler: User's Guide and Reference*.

The Job Brokering Definition Console is supported only on Windows 32-bit and Linux 32-bit systems. You can install one instance of the Job Brokering Definition Console for a single user on each workstation. This is because two instances installed by the same user share the same workspace. If you need to install two instances of the Job Brokering Definition Console on the same workstation, install each instance using a different user and ensure that each instance accesses its own workspace.

Installing the Job Brokering Definition Console using the installation wizard

About this task

For a graphical installation, perform the following steps:

1. Download the appropriate eImages. See the product Download Document.
2. Run the setup for the operating system on which you are installing. From the root directory of the installation media, run the following:
   - On Windows operating systems: JBDC\WORKBENCH**setupwin32.exe**
   - On Linux operating systems: JBDC/WORKBENCH/**setuplinux.bin**

Follow the installation wizard, providing the installation directory name, to complete the installation.

Performing a silent installation of the Job Brokering Definition Console

About this task

For a silent installation:

1. Download the appropriate eImages. See the product Download Document.
2. Copy the following file to a local directory:

   <*images_path*>/JBDC/WORKBENCH/ResponseFiles/**TDWB_Workbench_installation.rsp**
3. In this file, edit the following parameters:

   ```
   -V licenseAccepted=true
   -P installLocation="<installation_path>"
   ```

To perform a silent installation using a response file template, enter the following command:

```
-options "<path-to-ResponseFile>/TDWB_Workbench_installation.rsp" -silent
```

For information about response files and silent installation, see "Performing a silent installation" on page 113.

Installing IBM Workload Scheduler Integration Workbench

About this task

Use IBM Workload Scheduler Integration Workbench to develop event and action plug-ins that extend the capabilities of IBM Workload Scheduler event-driven workload automation. You can create also Java applications that use the IBM Workload Scheduler Java API.

You can install IBM Workload Scheduler Integration Workbench using one of the methods that are described in this section:

Installation wizard
To start installation by using this method, see "Installation wizard."

Silent installation
To start installation by using this method, see "Performing the Integration Workbench silent installation" on page 160.

Installation wizard

Before you begin

1. Before starting to install, upgrade, or uninstall, verify that the user running the installation process has the following authorization requirements:

   UNIX and Linux operating systems
   root access

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the rights **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation, you must run the installation as **administrator**.
2. Ensure that you downloaded the IBM Workload Scheduler dynamic domain manager or its backup eImage. For details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).

About this task

Perform the following steps to install by using Installation Manager:

1. From the eImage that contains the component you want to install, run:

   UNIX operating systems
   From the `root` directory of the eImage, run `setupIntegrationWorkbench.sh`.

   Windows operating systems
   From the `root` directory of the eImage, run `setupIntegrationWorkbench.bat`.

The installation wizard opens and shows you the IBM Workload Scheduler component and its prerequisites already selected.

2. In the Product Package Installation Manager panel, the installation process selected the following product package and its prerequisites:

   "IBM Workload Scheduler Integration Workbench" > "Version 9.4"

   If you have the prerequisites already installed, you can clear the prerequisites to continue or reinstall them in a new package group as described in the next step.

   Click **Next** to continue.

3. On the Licenses page, read the license agreement for the selected package. If you selected more than one package to install, there might be a license agreement for each package. On the left side of the License page, click each package version to display its license agreement. The package versions that you selected (for example, the base package and an update) are listed under the package name. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**.

4. Click **Next**.

5. On this page, you can create a package group for the product package. A package group represents a directory in which packages share resources with other packages in the same group.

   To create a new package group:

   a. Click **Create a new package group**

   b. Type the path for the installation directory for the package group or use the default path. The name for the package group is created automatically.

6. Type or **Browse** the path for the installation directory where the IBM Workload Scheduler Integration Workbench instance is installed for the specific user or accept the default path:

   Installation directory

   The maximum field length is 46 characters. You cannot use national characters.

   On Windows operating systems

   - The following characters are not valid:

     ! # $ % & { } [ ] = ? \ < > , ; ( )

   - The name must be longer than three characters, the second character must be ':', the third character must be '\'.
   - The default directory is C:\Program Files\IBM\TWAIW

   On UNIX and Linux operating systems

   - The following characters are not valid:

     ! \ # $ % & { } [ ] = ? \ < > , ; ( )

   - The name must be longer than one character and the first character must be '/'.
   - The default directory is /opt/IBM/TWAIW

7. Click **Next**.

8. On the Features page, select the features you want to install. To display a description of a feature in the Details section, click the feature name.

9. On the Summary page, review your choices before installing the product package. To change the choices that you made on previous pages, click **Back** and make the changes. When you are satisfied with your installation choices, click **Install** to install the package.

Performing the Integration Workbench silent installation

Before you begin

You must install Installation Manager before you perform a silent installation of the Integration Workbench package.

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the Integration Workbench package by using a global response file that is provided on the installation eImages in the `\response_files\` directory. For a list of response files, see Table 16 on page 161.

Perform the following steps:

1. Copy the response file to a local directory.
2. Edit the following sections:

   Integration Workbench section:
   For more information about how to complete the section properties, see the properties description in the Integration Workbench response file

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems
   `C:\Program Files\IBM\Installation Manager\eclipse\tools`

   On UNIX and Linux operating systems
   `/opt/IBM/InstallationManager/eclipse/tools`
6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   Where:

   - The `response_file.xml` is the name of the response file to be used for installation.

- The `log_file` is the name of the log file that records the result of the silent installation.

Note: For more information about Installation Manager silent installation command and Installation Manager silent log files, see the Installation Manager information center.

Table 16 lists the response files and the types of installation that each one performs by platform:

Table 16. Global installation response files

Packages that you are installing:	**Response file to use**
Installing on Windows operating systems	
Integration Workbench	`IWS94_FRESH_IntegrationWorkbench_WIN.xml`
Installing on UNIX operating systems	
Integration Workbench	`IWS94_FRESH_IntegrationWorkbench_UNIX.xml`

Chapter 7. Upgrading

How to upgrade IBM Workload Scheduler to the current version.

Overview

To upgrade master domain manager and the dynamic domain manager or their backups, use the Installation Manager infrastructure that uses an external and exclusive WebSphere Application Server profile. To upgrade agents, use the **twsinst** command.

You can upgrade a single instance of V9.1 or later, and related fix packs by following the procedure outlined in "Upgrading single components" on page 168. A `single` instance contains one IBM Workload Scheduler component installed in the directory `<TWS_INST_DIR>`. IBM Workload Scheduler v9.1 or later does not support multiple component instances.

| If you are upgrading from V9.1, V9.2, or V9.3 to V9.4.0, you can upgrade directly
| to the latest fix pack level, if available, with just one single step (without the need
| to upgrade to V9.4.0 first). For more information, see the fix pack readme file.

= If you are upgrading from V9.1, V9.2, or V9.3, Fix Pack 2, to V9.4.0, CONDSUCC is
= a reserved keyword and is for internal use only.

= **Important:** For IBM Workload Scheduler V8.6 instances, the upgrade is supported
= for the master domain manager only using the parallel upgrade method. The direct
= upgrade is not supported for IBM Workload Scheduler V8.6 instances.

= The only supported scenario for the upgrade of a V8.6 master domain manager, is
= to install a new master domain manager configured as a backup.

Choosing how to upgrade your network

Because IBM Workload Scheduler supports compatibility with earlier versions, you can decide to upgrade in either of the following ways, depending on the type of your network:

Top-down
Upgrade the master domain manager and its backup, and then progressively upgrade the agents. Many of the new functions that are introduced in the current version become available for each agent as it is upgraded. The disadvantage is that the same functions are not available to all agents at the same time.

Bottom-up
Upgrade the agents first, and then upgrade the master domain manager and its backup. The new functions that are introduced in the current version are not available until the whole network is upgraded.

Note: IBM Workload Scheduler V9.4 installs new default certificates during the upgrade process. In the network upgrade phase, if you are using dynamic scheduling or you have the SSL enabled by using the default certificates on the

fault-tolerant agents, to manage the default certificates, see the *Release Notes*, *Interoperability Tables*, at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048863.

Before upgrading

Before starting to upgrade the product, verify that your network has the minimum required supported versions of the operating system, product, and database.

Supported operating systems

To produce a dynamic report that lists the supported operating systems, click Supported operating systems

For a complete list of system requirements (disk spaces, temporary spaces and RAM usage), see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Supported databases

IBM Workload Scheduler upgrade requires the use of one of the following relational databases:

- DB2
- Oracle
- Informix Dynamic Server
- Microsoft SQL Server

For supported versions, see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Product level prerequisites for master domain manager and its backup, dynamic domain manager and its backup, and agents

Before you start the upgrade, verify that your environment has the required product level prerequisites. For a complete list of product level, see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

If you are updating the master domain manager and you use an Oracle database, then ensure that you run IBM Installation Manager from a shell with the *ORACLE_HOME* environment variable set correctly. Also, ensure that you add the Oracle native client libraries located in *%ORACLE_HOME*`/lib` to the appropriate environment variable:

- Linux and Solaris: LD_LIBRARY_PATH. For example:

  ```
  export ORACLE_HOME=/oracle/app/oracle/product/12.1.0/dbhome_1
  export LD_LIBRARY_PATH=/oracle/app/oracle/product/12.1.0/dbhome_1/lib
  ```

- AIX: LIBPATH
- HP-UX: SHLIBPATH
- Windows: PATH

Specifically for a silent installation of the master domain manager and the Dynamic Workload Console, you can verify that your system meets the product system requirements by running a check: “Checking system prerequisites for the master domain manager” on page 115 and “Checking system prerequisites for the

Dynamic Workload Console" on page 361.

User authorization requirements

Before starting to upgrade, verify that the user running the installation process has the following authorization requirements:

UNIX and Linux operating systems
root access

Windows operating system

If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or **domain administrators** group with the right **Act as Part of the Operating System**.

You must run the installation as **administrator**.

Scanning system prerequisites for IBM Workload Scheduler

Having an environment that meets the product system requirements ensures that an installation or upgrade succeeds without any delays or complications.

The scan verifies that:

- The operating system is supported for the product.
- On UNIX operating systems, the necessary product libraries are installed.
- There is enough permanent and temporary disk space to install both the product and its prerequisites.
- There is enough memory and virtual memory.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler. It does not check the requirements for other components, such as DB2. To verify the requirements for Installation Manager use the procedure described in "Scanning system prerequisites for Installation Manager" on page 45.

If any of these checks fails, IBM Workload Scheduler performs the following action:

For all the components installed by using Installation Manager:
Displays a notification of the requirement that was not met. In this case, stop the installation or the upgrade, analyze the log files, solve the error, and rerun the installation or upgrade. If you are performing an interactive installation, the errors are displayed on the screen. If you are performing a silent installation, the errors are written in the Installation Manager log files. For more information about log files, see "Installation Manager wizard, silent installation and uninstallation log files" on page 263.

For agents
An error message is returned. In this case, analyze the log file, solve the error, and rerun the installation or upgrade. The log files are located:

On Windows operating systems:
TWA_home\TWA\logs

On UNIX and Linux operating systems:
TWA_home/TWA/logs

You can decide to rerun the installation or upgrade without executing the prerequisite scan. If you specify the **-skipcheckprereq** parameter, the **twsinst** installation script does not execute the prerequisite scan. If a

problem occurs, an error is displayed, the agent is installed or upgraded, but might not work. For more information about the `-skipcheckprereq` option, see "Agent installation parameters - twsinst script" on page 143.

For a detailed list of supported operating systems and product prerequisites, see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Scanning system prerequisites for Installation Manager

Scanning system prerequisites for Installation Manager before you install or upgrade the IBM Workload Scheduler.

About this task

Before you install or upgrade the IBM Workload Scheduler, if you have not installed Installation Manager, run a scan on your system to verify that your workstation has all the system requirements needed for a successful installation. Having an environment that meets the product system requirements ensures that an installation succeeds without any delays or complications.

You can run a prerequisite scan for Installation Manager by using **checkPrereq** command:

On Windows operating systems:

Run the following command:

```
checkPrereq.bat
```

On UNIX or Linux operating systems:

Run the following command:

```
checkPrereq.sh
```

Specify the **-silent** option if you are not interested in installing Installation Manager by using the wizard. If you use the **-silent** option, the program does not check that the graphical libraries exist. If the scan fails, the program displays a notification of the requirement that was not met. In this case, stop the installation, solve the error, and rerun the installation.

Files and folders changed during the upgrade

The upgrade process changes the following folders and files:

On Windows operating systems:

```
%windir%\TWA
%windir%\TWSRegistry.dat
%windir%\teb
tws_home
```

On UNIX and Linux operating systems:

```
/etc/TWS
/etc/TWA
/usr/Tivoli/TWS
/etc/teb
tws_home
```

Files not changed during upgrade

The following files are not modified during the master domain manager upgrade process:

On Windows operating systems:

- *<TWS_INST_DIR>*\TWS\jobmanrc.cmd
- *<TWS_INST_DIR>*\TWS\TWSCCLog.properties
- *<TWS_INST_DIR>*\TWS\Startup.cmd
- *<TWS_INST_DIR>*\TWS\JnextPlan.cmd
- *<TWS_INST_DIR>*\TWS\MakePlan.cmd
- *<TWS_INST_DIR>*\TWS\SwitchPlan.cmd
- *<TWS_INST_DIR>*\TWS\CreatePostReports.cmd
- *<TWS_INST_DIR>*\TWS\UpdateStats.cmd
- *<TWS_INST_DIR>*\TWS\ResetPlan.cmd
- *<TWS_INST_DIR>*\TWS\Sfinal
- *<TWS_INST_DIR>*\TDWB\config\audit.properties
- *<TWS_INST_DIR>*\TDWB\config\BrokerWorkstation.properties
- *<TWS_INST_DIR>*\TDWB\config\CCMDBConfig.properties
- *<TWS_INST_DIR>*\TDWB\config\CLIConfig.properties
- *<TWS_INST_DIR>*\TDWB\config\DAOCommon.properties
- *<TWS_INST_DIR>*\TDWB\config\EWLMBvcConfig.properties
- *<TWS_INST_DIR>*\TDWB\config\JobDispatcherConfig.properties
- *<TWS_INST_DIR>*\TDWB\config\ResourceAdvisorConfig.properties
- *<TWS_INST_DIR>*\TDWB\config\TEPListener.properties
- *<TWS_INST_DIR>*\TDWB\config\TPMConfig.properties

where *<TWS_INST_DIR>* is the IBM Workload Scheduler installation directory.

On UNIX operating systems:

- *<TWS_INST_DIR>*/TWS/jobmanrc
- *<TWS_INST_DIR>*/TWS/TWSCCLog.properties
- *<TWS_INST_DIR>*/TWS/Startup
- *<TWS_INST_DIR>*/TWS/JnextPlan
- *<TWS_INST_DIR>*/TWS/MakePlan
- *<TWS_INST_DIR>*/TWS/SwitchPlan
- *<TWS_INST_DIR>*/TWS/CreatePostReports
- *<TWS_INST_DIR>*/TWS/UpdateStats
- *<TWS_INST_DIR>*/TWS/ResetPlan
- *<TWS_INST_DIR>*/TWS/Sfinal
- *<TWS_INST_DIR>*/TDWB/config/audit.properties
- *<TWS_INST_DIR>*/TDWB/config/BrokerWorkstation.properties
- *<TWS_INST_DIR>*/TDWB/config/CCMDBConfig.properties
- *<TWS_INST_DIR>*/TDWB/config/CLIConfig.properties
- *<TWS_INST_DIR>*/TDWB/config/DAOCommon.properties
- *<TWS_INST_DIR>*/TDWB/config/EWLMBvcConfig.properties
- *<TWS_INST_DIR>*/TDWB/config/JobDispatcherConfig.properties

- <*TWS_INST_DIR*>/TDWB/config/ResourceAdvisorConfig.properties
- <*TWS_INST_DIR*>/TDWB/config/TEPListener.properties
- <*TWS_INST_DIR*>/TDWB/config/TPMConfig.properties

where <*TWS_INST_DIR*> is the IBM Workload Scheduler installation directory.

Note: The new version of these files are saved in the `config` directory.

The `localopts` file is not modified during the agent upgrade process. The file generated by the upgrade process is saved to the `/config` directory, to maintain your custom values, if any. You can then merge the two files with your customized values and save the resulting file in the `TWA_home/TWS` folder.

Upgrading single components

About this task

To upgrade an IBM Workload Scheduler single component instance of V9.1 or later, installed in the directory `<TWS-INST-DIR>`, you must follow the procedure listed in Table 17.

Table 17. Upgrade deployment model for IBM Workload Scheduler single component instance

IBM Workload Scheduler component	Procedure to run
Fault-tolerant agent V9.*x* and related fix packs	"Upgrading agents and domain managers" on page 204.
Dynamic agent V9.*x* and related fix packs	"Upgrading agents and domain managers" on page 204.
Dynamic domain manager V9.*x* and related fix packs	"Upgrading a dynamic domain manager instance or its backup" on page 192.
Backup dynamic domain manager V9.*x* and related fix packs	"Upgrading a dynamic domain manager instance or its backup" on page 192.
Master domain manager V9.*x* and related fix packs V8.6.*x* and related fix packs	"Upgrading a master domain manager instance or its backup" on page 169.
Backup master domain manager V9.*x* and related fix packs	"Upgrading a master domain manager instance or its backup" on page 169.

Note: Due to new support of the UPN Windows user, if you have Windows domain users that are defined in thelogon fields as `domain\username`, after performing an upgrade to this version, update the `Security` file before starting the { IDEP206A: File not found. } instance. Insert the escape character '\' before the '\' character in the `domain\username` value. For example, if you use the `MYDOMAIN\user1` value in the logon field, after the upgrade, in the `Security` file you must update the line in following way:

```
.............
logon=MYDOMAIN\\user1
.............
```

For details, see the section about configuring security file in *Administration Guide*.

Performing a safe upgrade

About this task

If you are upgrading in parallel mode you do not interrupt any running processes. However, if you are upgrading in direct mode you interrupt the running processes while you perform the upgrade.

If you are upgrading agents, the upgrade can be performed with minimal impact to scheduling activities. For more details see "Upgrading agents and domain managers" on page 204.

To ensure that this interruption does not risk the integrity of these running processes, the upgrade is performed in *safe mode*. Safe mode performs following actions before starting the upgrade:

- Checks if there are command lines currently running.
- Prevents other jobs from starting by setting the job fence on the workstation to the go (101) value.
- Checks if there are jobs running. If there are, it waits **60** minutes and checks again. If the jobs do not all complete during this interval, the upgrade does not proceed and an error message is displayed. If you want to change this value, specify the number of minutes to wait when you run the setup or perform a silent installation.
- Check if there are processes running. It stops any running processes and waits for the completion of the stop action.

If all these checks are passed, IBM Workload Scheduler starts the upgrade:

- If the upgrade completes successfully after the Batchman process restarts, the job fence is set to the original value, because there is a synchronization between the Batchman message queues and the Symphony file for the job fence value. The installation process does not start the Batchman process and the original job fence is not restored on your workstation. To set the original job fence, start Batchman process by running the following command:

  ```
  conman "start"
  ```

- If the upgrade does not complete successfully either because the checks are not passed or an error occurs, the job fence is not set to the original value. You must:
  - Set the job fence manually to its original value.
  - Perform the steps to complete the actions or correct the errors and resume the upgrade.

Upgrading a master domain manager instance or its backup

About this task

Depending on your environment configuration, you can perform the following types of upgrade:

Parallel upgrade (suggested upgrade procedure)

If you already use, or plan to use, a backup master domain manager in your environment configuration.

Direct upgrade (basic upgrade procedure)

A direct upgrade is not supported for IBM Workload Scheduler V8.6 instances.

If you do not use a backup master domain manager in your environment configuration, you are strongly recommended to install and use one to ensure the high availability of your scheduling environment.

With V9.3.0 fix pack 1 or later, the master domain manager direct upgrade is supported and if there are fix packs available for the latest version of the product then you can upgrade directly to the latest product version and fix pack level with just one single step. See the readme file for the related fix pack.

Note: You can roll back a master domain manager to the previous fix pack level or release if the master domain manager was installed using IBM Installation Manager. The first step of the procedure is to create a backup copy of some directories before you install a new fix pack or upgrade to a new release.

During the master domain manager upgrade process, the license model to be applied to the environment is defined. The license model determines the criteria by which your license compliance is calculated. The following pricing models are supported: **byWorkstation**, **perServer**, **perJob**. The default value is **perServer**. To determine the current value of this global option, enter the following command: **optman show ln** or **optman show licenseType**. To modify the pricing model, use the **optman chg ln**or **optman chg licenseType** command. For more information about licensing, see the section about license management in IBM License Metric Tool in *Administration Guide*.

Performing a parallel upgrade

About this task

The flow of the upgrade procedure depends on the version of the product you want to upgrade. See the following flowcharts for a high-level view of the steps to perform. To upgrade the master domain manager with the parallel upgrade procedure, complete the following steps:

1. Upgrading your existing backup master domain manager, or installing a new master domain manager configured as backup.
   a. Upgrading your current backup master domain manager.
   b. Installing a new master domain manager configured as backup.
2. Switching the master domain manager to the new or upgraded backup master.
3. Making the switch manager permanent.
4. Customizing and submitting the optional final job stream.
5. Upgrading your old master domain manager.
6. Switching back to the old master domain manager (optional).
7. Completing the security configuration for the new environment.

The following flowcharts outline the procedure for upgrading from a V8.6 master domain manager or its backup and from a V9.*x* master domain manager or its backup.

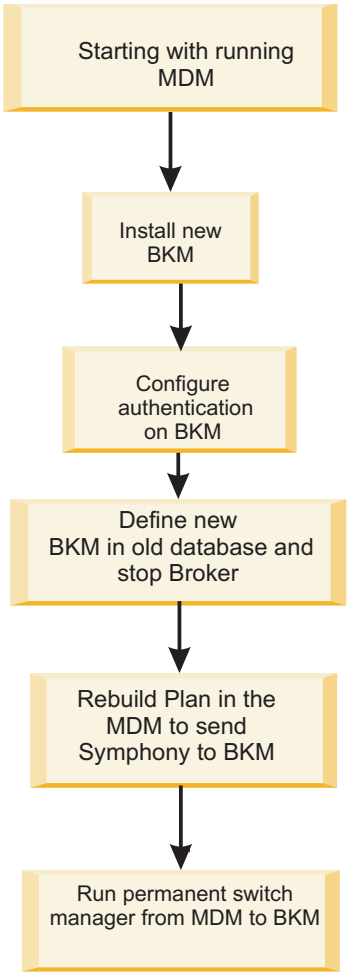


Figure 11. Parallel upgrade procedure flowchart from a V8.6

=

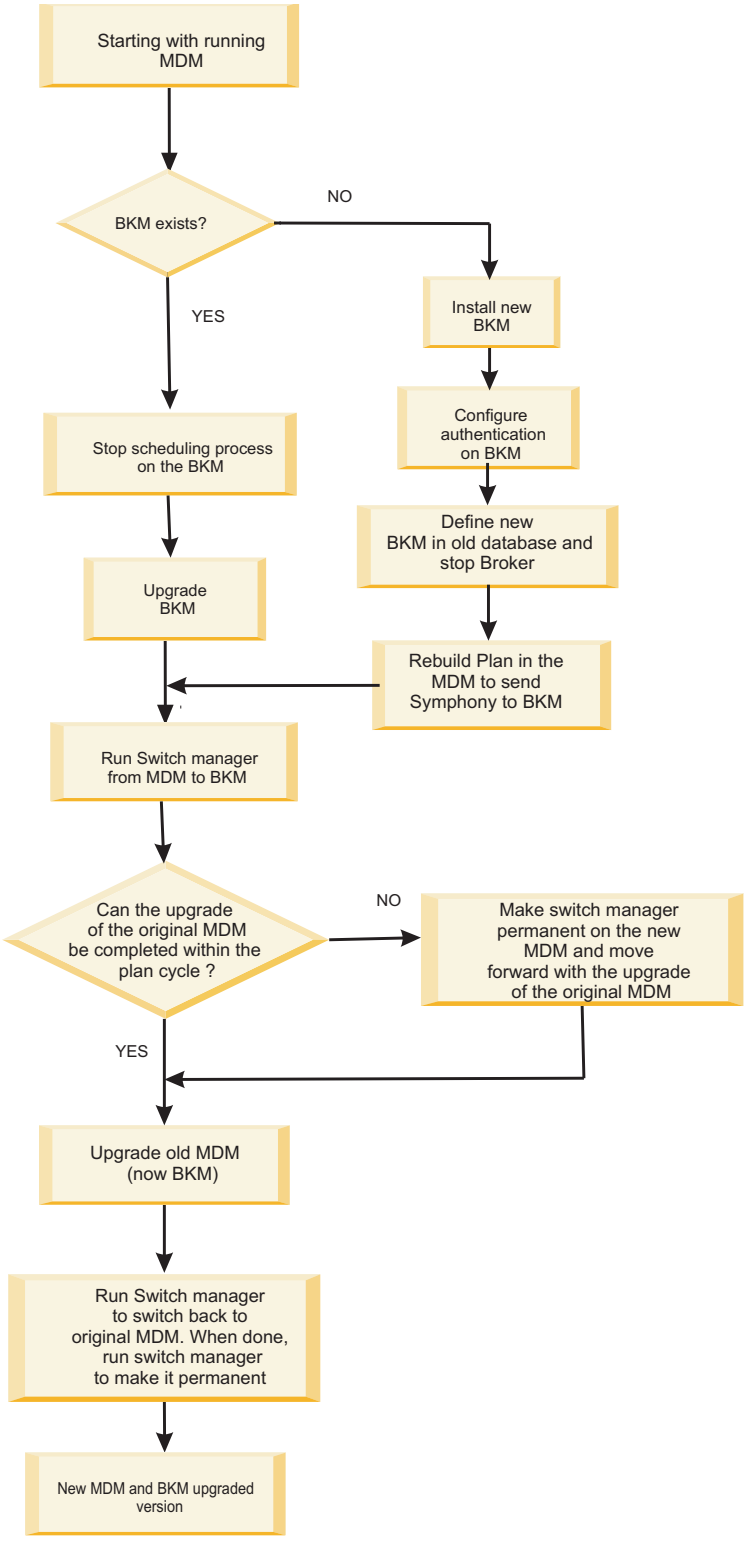


Figure 12. Parallel upgrade procedure flowchart from V9.x

Upgrading your existing backup master domain manager, or installing a new master domain manager configured as backup:

About this task

For an IBM Workload Scheduler V8.6 master domain manager, the only supported upgrade procedure is installing a new master domain manager configured as a backup. For an existing V9.*x* backup master domain manager, you can either upgrade it or, install a new master domain manager configured as backup. For IBM Workload Scheduler V8.6 instances, you must install a new master domain manager configured as a backup. The procedure is divided into two alternative steps, depending on if you already have a backup master domain manager in your environment.

In both cases, the upgraded backup master domain manager points to your current database instance. To ensure compatibility with earlier versions, the upgraded backup master domain manager and the old master domain manager work with the current database upgraded schemas and tables.

Upgrading your current backup master domain manager*:*
About this task

To upgrade your current backup master domain manager complete the following procedure:

1. **Stop the scheduling processes** by following the instructions provided in: Stopping scheduling processes.
2. **Upgrade your backup master domain manager** by following the instructions provided in: Upgrading the master domain manager.
3. **Complete the security configuration of your upgraded backup master domain manager** by following the instructions provided in: Completing the security configuration for the new environment.
4. **Restart the backup master domain manager processes** by following the instructions provided in: Restarting scheduling processes.

Installing a new master domain manager configured as backup*:*
About this task

Complete this procedure to install a fresh master domain manager configured as backup and link it to your current network.

The master domain manager configured as backup points to your existing IBM Workload Scheduler database and becomes your new master domain manager.

Perform the following steps:

1. **Install a master domain manager configured as backup:** for more information about how to install a new master domain manager configured as backup, see "Installing a master domain manager or its backup" on page 94 and subsequent sections depending on whether you are using a DB2 or an Oracle database. Ensure that your new master domain manager configured as backup points to your current IBM Workload Scheduler database instance.
2. **Configure your authentication configuration:** if you do not use default authentication mechanism, complete the following steps to configure your new backup master domain manager to use the same authentication mechanism used by your master domain manager:
   a. On your existing master domain manager, use the `showSecurityProperties` tool to export your authentication configuration to a text file.
   b. Copy this file to your new master domain manager configured as backup.

c. During the export all the passwords in the file have been replaced with asterisks. Locate them and remove the asterisks by entering passwords again.

d. Run the `changeSecurityProperties` tool on the new master domain manager configured as backup to import the configuration. The tool recognizes that the input file is in the old format and attempts to migrate the configuration to the new format.

   If your authentication mechanism is customized in ways that the migration cannot handle, an error or errors are issued and you must configure the authentication mechanism manually.

e. Test that the migrated authentication mechanism allows you to log on and use **composer** with more than one user ID.

3. **Define a new master domain manager configured as backup in the database:** define your new master domain manager configured as backup as a full status agent in the domain of your master domain manager, using the **composer** command interface.

4. **Stop the dynamic workload broker:** the install process installs a dynamic workload broker server on the master domain manager configured as backup. You must stop the dynamic workload broker server to avoid that two concurrently active servers are active.

   On Windows operating systems:
   Use wastool `stopBrokerApplication.bat`

   On UNIX and Linux operating systems:
   Use wastool `stopBrokerApplication.sh`

5. **Prepare the old security file for switching the manager:** to switch correctly, you must add the new *TWS_user* into the old security file. The new *TWS_user* is the one that you used when you installed the new master domain manager configured as backup manager. Perform the following steps:

   a. On the master domain manager, log in as the master *TWS_user* and set the IBM Workload Scheduler environment. Add the master configured as backup *TWS_user* to the old security file.

   b. If you have centralized security, distribute the security file to all agents. If you do not have centralized security, copy the compiled security file `Security` to the installed master domain manager configured as backup, overwriting the version that is there.

   c. Distribute the `Symphony` file to the new master domain manager configured as backup:

      1) Ensure that the **optman cf** option is set to *all*.

      2) To distribute the `Symphony` file to the new master domain manager configured as backup, run **JnextPlan -for 0000** or wait until the end of the production plan.

      3) Restore the previous setting of the **optman cf** option, if you previously modified the value.

Switching the master domain manager to the new backup master:
About this task

To switch the master domain manager to the new backup master domain manager, complete the following procedure:

1. Before you switch your master domain manager to the new backup master domain manager, you must stop the dynamic workload broker server on the current master domain manager:

On Windows operating systems
Use wastool `stopBrokerApplication.bat`

On UNIX and Linux operating systems
Use wastool `stopBrokerApplication.sh`

2. Switch to your new backup master domain manager, which now becomes your master domain manager, by issuing the following command from either the Dynamic Workload Console or the **command line** of your old master domain manager:

   From the Dynamic Workload Console
   In the navigation tree, click **System Status and Health** > **Monitor Workload** > select the engine and the object type Workstation, click run and, in the table of results, select backup master domain manager workstation name, click **More Actions**, and select **Become Master Domain Manager**.

   From the command line of the old master domain manager
   Issue the following command:

   ```
   conman "switchmgr masterdm;new_mgr_cpu"
   ```

   where *new_mgr_cpu* is the backup master domain manager workstation name.

3. Switch the event processor from the old master domain manager to the backup master domain manager, by running the following command from either the Dynamic Workload Console or the **command line** of your old master domain manager:

   From the Dynamic Workload Console
   In the navigation tree, click **System Status and Health** > **Monitor Workload** > select the engine and the object type Workstation, click run and, in the table of results, select backup master domain manager workstation name, click **More Actions**, and select **Become Event Processor**.

   From the command line of the old master domain manager
   Issue the following command:

   ```
   conman "switcheventprocessor new_mgr_cpu"
   ```

   where *new_mgr_cpu* is the backup master domain manager workstation name.

4. Start the dynamic workload broker server on the new master domain manager:

   On Windows operating systems
   Use wastool `startBrokerApplication.bat`

   On UNIX and Linux operating systems
   Use wastool `startBrokerApplication.sh`

5. Link the dynamic workload broker server with the new master domain manager:

   From the command line of the new master domain manager
   Issue the following command:

   ```
   conman "link broker_workstation_name"
   ```

   where *broker_workstation_name* is the broker workstation name.

Once you have switched the master domain manager to the new backup master, you can make this switch permanent. For details, see "Making the switch manager permanent."

Making the switch manager permanent:
About this task

In the procedure "Switching the master domain manager to the new backup master" on page 174, you switched your master domain manager promoting your new version backup master domain manager to the role of master domain manager.

To make this configuration fully operational and persistent through **JnextPlan**, you must complete the following procedure:

On the new master domain manager, referred to as *new_mgr_cpu*:

1. Edit the *localopts* file and modify the following entry as shown:
   ```
   DEFAULTWS=new_mgr_cpu
   ```
   where *new_mgr_cpu* is the workstation name of the new master domain manager. For more information about `localopts` file, see the *IBM Workload Scheduler: Administration Guide*.
2. Change the workstation definition of the old master by running:
   ```
   composer modify cpu=old_mgr_cpu
   ```
   and in the definition substitute *type=manager* with *type=fta*
3. Change the workstation definition of the new master by running:
   ```
   composer modify cpu=new_mgr_cpu
   ```
   and in the definition substitute *type=fta* with *type=manager*.
4. Ensure that the **optman** `cf` option is set to *all*.
5. Rebuild the plan to activate the changes to the database:
   ```
   JnextPlan -for 0000
   ```
6. Restore the previous setting of the **optman** `cf` option, if necessary.
7. Edit the *\TWS\mozart\globalopts* file and modify the **master=*old_mgr_cpu*** entry as shown:
   ```
   master=new_mgr_cpu
   ```
   where *new_mgr_cpu* is the workstation name of the new master. See the *IBM Workload Scheduler: Administration Guide*.
   In this way the reports **reptr-pre** and **reptr-post** can run when you run **JnextPlan**.

Once you have made the switch manager permanent, you must run the FINAL job stream on the new master domain manager. For details, see "Customizing and submitting the optional final job stream."

Customizing and submitting the optional final job stream:
About this task

The upgrade process writes the latest FINAL and FINALPOSTREPORTS definitions for the current release in the following file: `<TWA_HOME>/TWS/config/Sfinal`, where `<TWA_HOME>` is the IBM Workload Scheduler installation directory. To use these latest

definitions, you must merge the functions of your current FINAL and FINALPOSTREPORTS job streams with the syntax of your new FINAL and FINALPOSTREPORTS job streams. Complete the following procedure:

1. Depending on your situation, edit your current final job streams and customize the new final job streams as follows:

   If you had customized job streams called FINAL and FINALPOSTREPORTS in your database:

   a. Extract the definitions from the current FINAL and FINALPOSTREPORTS job streams file by using **composer**.
   b. Use a text editor to edit your customized FINAL and FINALPOSTREPORTS job streams.
   c. Merge the job streams with file *<TWA_HOME>*/TWS/config/Sfinal so that the new FINAL and FINALPOSTREPORTS job streams have the same customization as your customized final job streams plus the new required attributes provided by the new FINAL and FINALPOSTREPORTS job streams.
   d. Save your new FINAL and FINALPOSTREPORTS job streams by using **composer**.

   If you had customized final job streams called something other than FINAL and FINALPOSTREPORTS in your database:

   a. Extract the definitions from your customized final job stream files by using **composer**.
   b. Use a text editor to edit your customized final job stream files.
   c. Merge the job streams with file *<TWA_HOME>*/TWS/config/Sfinal so that the new FINAL and FINALPOSTREPORTS job streams have the same customization as your customized final job streams plus the new required attributes provided by the new FINAL and FINALPOSTREPORTS job streams.
   d. Save these new final job streams so that they have the same names as your current customized final job streams by running the command **composer -replace**.

   If you had final job streams called something other than FINAL and FINALPOSTREPORTS in your database, but they are not customized:

   a. Make a copy of file *<TWA_HOME>*/TWS/config/Sfinal.
   b. Edit this copy and rename the FINAL and FINALPOSTREPORTS parameters with the actual names.
   c. Run the command **composer -replace**.

   If you had final job streams called FINAL and FINALPOSTREPORTS in your database, but they are not customized:

   Run the command **composer -replace <TWA_HOME>/TWS/config/Sfinal**.

   If you had final job streams called FINAL and FINALPOSTREPORTS but they are in DRAFT in your database:

   Run the command **composer -replace** and, after the upgrade, change these job streams into the DRAFT status again.

2. After you customized the new final job streams, you must delete your current final job stream instances (**conman cancel sched** command) and submit the new final job stream instances (**conman sbs sched** command).

During the upgrade, **JnextPlan** is overwritten even if you customized it. The existing **JnextPlan** is backed up and renamed to:

On Windows operating systems:

JnextPlan.cmd.bk

On UNIX and Linux operating systems:

JnextPlan.bk

Upgrading your old master domain manager:

About this task

= Upgrading your old master domain manager, which is now your backup master
= domain manager, is only supported from V9.x.

Complete the following procedure:

1. **Stop the scheduling processes** by following the instructions provided in: Stopping scheduling processes.
2. **Upgrade your backup master domain manager** by following the instructions provided in: Upgrading the master domain manager.
3. **Complete the security configuration of your upgraded backup master domain manager** by following the instructions provided in: Completing the security configuration for the new environment.
4. **Restart the backup master domain manager processes** by following the instructions provided in: Restarting scheduling processes.

Switching back to the old master domain manager (optional):

About this task

This step is optional. This step can be performed if t you have not added nor modified objects in the new IBM Workload Scheduler schema. You can switch back to your old master domain manager that has now been upgraded.

Complete, with exchanged roles, the same procedure that you completed when switched your old master domain manager to the new upgraded backup master domain manager:

1. Stop the dynamic workload broker server on the current master domain manager.
2. Switch the master domain manager and the event processor, by issuing the following commands from the command line of the upgraded master domain manager:

   ```
   conman "switchmgr masterdm;old_mgr_cpu"

   and

   conman "switcheventprocessor old_mgr_cpu"
   ```

   where *old_mgr_cpu* is your upgraded master domain manager workstation name.
3. Start the dynamic workload broker server on the upgraded master domain manager.
4. Link the dynamic workload broker server with the upgraded master domain manager.

For details, see Switching the master domain manager to the new backup master.

To restore your upgraded master domain manager to its role permanently, perform the steps in "Making the switch manager permanent" on page 176, for the master workstation.

Completing the security configuration for the new environment:
About this task

If you have specific security settings in your current environment, these settings must be manually merged with the new settings before you build the final security file to be used in your new environment. The statements you might have to add manually vary depending on your specific security settings.

To manually merge the new settings, complete the following procedure:

1. Log in as *<TWS_user>* on your upgraded master domain manager and set the IBM Workload Scheduler environment.
2. If you have centralized security enabled, extract the new security file on the new master using the command:

   ```
   dumpsec > sec_file
   ```

   where *sec_file* is the text file created by the **dumpsec** command.
3. Edit the *sec_file*, and insert the following statements:

   Workload application

   ```
   WKLDAPPL NAME=@ ACCESS=ADD,DELETE,DISPLAY,MODIFY,LIST,UNLOCK
   ```

   Run cycle group

   ```
   RUNCYGRP NAME=@ ACCESS=ADD,DELETE,DISPLAY,MODIFY,USE,LIST,UNLOCK
   ```

   Centralized agent update

   Replace the statement:

   ```
   CPU CPU=@
   ACCESS=ADD,CONSOLE,DELETE,DISPLAY,FENCE,LIMIT,LINK,MODIFY,SHUTDOWN,
   START,STOP,UNLINK,LIST,UNLOCK,RUN,RESETFTA
   ```

   with the following statement:

   ```
   CPU CPU=@
   ACCESS=ADD,CONSOLE,DELETE,DISPLAY,FENCE,LIMIT,LINK,MODIFY,SHUTDOWN,
   START,STOP,UNLINK,LIST,UNLOCK,RUN,RESETFTA,MANAGE
   ```
4. Check that the user permissions of the new statements are correct and, if necessary, add the user of your old master domain manager to the security file of the just upgraded master.
5. Due to new support of the UPN Windows user, if you have Windows domain users that are defined in the logon fields as `domain\username`, insert the escape character '\' before the '\' character in the `domain\username` value.For example, if you use the `MYDOMAIN\user1` value in the logon field, after the upgrade, in the `Security` file you must update the line in following way:

   ```
   ..............
   logon=MYDOMAIN\\user1
   ..............
   ```
6. Save your changes to the `sec_file`.
7. Build your final security file for your new master domain manager using the **makesec** command:

   ```
   makesec sec_file
   ```
8. If you are using FIPS, you must manually enable it again in the WebSphere Application Server `java.security` file. For the FIPS compliance information, see the *IBM Workload Scheduler: Administration Guide* .
9. If you have centralized security enabled, distribute the security file.

   Run **JnextPlan -for 0000** to distribute the Symphony file to the agents.

Note: Ensure that the **optman** `cf` option is set to **`all`** or only the unfinished jobstreams are carried forward.

10. Restore the previous setting of the **optman** `cf` option, if necessary.

Performing a direct upgrade

About this task

A direct upgrade is only supported from V9.*x*. To upgrade the master domain manager from version 9.*x* to version 9.4 using the direct upgrade procedure, complete the following steps:

1. Stopping scheduling processes.
2. Upgrading the master domain manager.
3. Customizing and submitting the optional final job stream.
4. Completing the security configuration for the new environment.
5. Restarting scheduling processes.

With V9.3.0 fix pack 1 and later, the direct upgrade is supported and you can upgrade to the latest product version including the latest fix pack level, with just one single step.

Stopping scheduling processes:

About this task

Before upgrading, you must stop the scheduling processes. You can complete the following procedure when upgrading either a master domain manager, or a backup master domain manager.

Complete these steps, by using either the Dynamic Workload Console or the command line:

1. Unlink all workstations in the domain (when upgrading a backup master domain manager you unlink only the backup master domain manager):

   From the Dynamic Workload Console

   Run the **Monitor Workstations** task and, in the table of results, select all the workstations of the master domain manager and click **Unlink**.

   From the command line of the master domain manager

   a. Log in as the *<TWS_user>*.
   b. Issue the following command:

      ```
      conman "unlink @;noask"
      ```

2. Stop the master domain manager processes:

   From the Dynamic Workload Console

   Run the **Monitor Workstations** task and, in the table of results, select all the workstations of the master domain manager and click **Stop**.

   From the command line of the master domain manager

   Issue the following command:

   ```
   conman "stop @;wait;noask"
   ```

3. Stop the `SSM Agent`:

   From the Dynamic Workload Console

   Run the **Monitor Workstations** task and, in the table of results, select all the workstations of the master domain manager and click **Stop Event Monitoring**.

From the command line of the master domain manager

Issue the following command:

```
conman "stopmon"
```

4. From the command line of the master domain manager, stop the **netman** process as follows:

   On Windows operating systems:

   Run the `shutdown.cmd` command from the IBM Workload Scheduler home directory.

   On UNIX and Linux operating systems:

   Run:

   ```
   conman "shut ; wait"
   ```

5. Only when upgrading from V9.1 or later, from the command line of the master domain manager, stop the dynamic agent processes as follows:

   On Windows operating systems:

   Run:

   ```
   ShutDownLwa.cmd
   ```

   On UNIX and Linux operating systems:

   Run:

   ```
   ShutDownLwa
   ```

6. Exit any directory or subdirectory in the master domain manager installation path.

   Also, close any **conman** or **composer** active session.

7. Verify that all services and processes are not running, as follows:

   Windows operating systems

   From Task Manager, verify that the following processes are not running: netman, mailman, batchman, writer, JOBMON, tokensrv, batchup, appserverman, agent, jobmanager.

   UNIX and Linux operating systems

   Run

   ```
   ps -u <TWS_user>
   ```

   Verify that the following processes are not running: netman, mailman, batchman, writer, jobman, JOBMAN, appserverman, agent, jobmanager.

Upgrading the master domain manager:

Before you begin

= A direct upgrade of the master domain manager is supported only from V9.*x*.

Verify that the user running the installation process has the following authorization requirements:

UNIX and Linux operating systems

root access

Windows operating system

If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or **domain administrators** group with the right **Act as Part of the Operating System**.

You must run the installation as **administrator**.

If you are updating the master domain manager and you use an Oracle database, then ensure that you run IBM Installation Manager from a shell with the *ORACLE_HOME* environment variable set correctly. Also, ensure that you add the Oracle native client libraries located in *%ORACLE_HOME*/lib to the appropriate environment variable:

- Linux and Solaris: LD_LIBRARY_PATH. For example:

```
export ORACLE_HOME=/oracle/app/oracle/product/12.1.0/dbhome_1
export LD_LIBRARY_PATH=/oracle/app/oracle/product/12.1.0/dbhome_1/lib
```

- AIX: LIBPATH
- HP-UX: SHLIBPATH
- Windows: PATH

About this task

You can upgrade a master domain manager by using the wizard or silent methods. You can use the same procedure when upgrading a backup master domain manager.

Upgrade procedure using the wizard*:*
Before you begin

Ensure that you downloaded the IBM Workload Scheduler master domain manager eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).

About this task

Perform the following steps to upgrade the master domain manager:

Step 1.
Start the upgrade process.

- If you are upgrading to V9.4.0 General Availability (GA), from the directory that contains the IBM Workload Scheduler eImage, run:

  Windows operating systems:
  `update.bat`.

  UNIX operating systems:
  `update.sh`.

  The Installation Manager main panel opens.
- If fix packs are available for V9.4.0, you can upgrade directly to the latest fix pack available, with just one single step. From the directory that contains the IBM Workload Scheduler fix pack eImage, run:

  Windows operating systems:
  `update.bat`.

  UNIX operating systems:
  `update.sh`.

  The Installation Manager main panel opens. Under **File > Preferences>Repositories**, add the V9.4.0 GA repository.

From the Installation Manager main panel select Update Packages.

Step 2.
On the Update Packages page, select the IBM Workload Scheduler package

and all the package groups for which you want to install updates. If you want to update all package groups, select the **Update all** check box.

Click **Next** to continue.

Step 3.
On the Updates page, select the **"Version 9.4.0.0"** IBM Workload Scheduler update packages and all the updates for the other package groups that you selected.

Click **Next**.

Step 4.
On the Licenses page, read the license agreement for the selected package. If you selected to install the IBM Workload Scheduler package and the IBM Workload Scheduler prerequisite packages, you must accept the license agreement for each package. On the left side of the License page, click each package to see its license agreement. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**.

Click **Next**.

Step 5.
In the Features page, complete the following actions:

For the prerequisites packages:

To see a description of the feature, click the feature name. In the Details section you see a short description.

Ensure that you leave the default prerequisite features selected by installation process.

For the IBM Workload Scheduler package:
Select the following feature:

Master domain manager

Click **Next** to continue.

Step 6.
The Retrieve Data Information panel is displayed with successful operation message or with an error message.

Note: If the upgrade process is unable to retrieve one or more IBM Workload Scheduler configuration properties values in the directory you specified, the Retrieve Data Information panel is shown. To perform the problem determination, see "Retrieving IBM Workload Scheduler instance information data fails with error AWSJIM018E" on page 293.

Step 7.
For the IBM Workload Scheduler package, complete the information required in the following panels.

The panels other than **Upgrade Configuration**, are common to the installation and the upgrade processes. For the meaning of the fields that you must fill in during the upgrade, see the installation references.

Upgrade Configuration:
For the information required in this panel, see Upgrade configuration.

User information:
For the meaning of the fields that you must fill in during the upgrade, see "IBM Workload Scheduler user information" on page 97.

Master Configuration:
For the meaning of the fields you must fill in during the upgrade, see "IBM Workload Scheduler master configuration" on page 98.

Database Configuration:
The upgrade process retrieves automatically the RDBMS you used in the previous version of the IBM Workload Scheduler.

To complete the `Database configuration` panel, perform the following steps:

1. Specify the database installation path.
   a. If you are using an Oracle RDBMS, specify the installation path in the **Database path** field.
   b. If you are using DB2, the installation path is discovered automatically by the upgrade process.
2. Press the **Retrieve database information** to load the information for the database systems selected.
3. For the meaning of the fields that you must fill in during the upgrade, see "Database configuration" on page 100.

WebSphere profile Configuration:
The upgrade process creates a profile in the external WebSphere Application Server instance. The WebSphere Application Server profile is created by using the data of the profile that is installed in the WebSphere Application Server embedded in the IBM Workload Scheduler instance old version.

For the meaning of the fields that you must fill in during the upgrade, see "WebSphere Application Server profile configuration" on page 111.

WebSphere ports Configuration:
For the meaning of the fields that you must fill in during the upgrade, see "WebSphere Application Server ports configuration" on page 112.

Disk space check:
See "Disk space check" on page 113.

Step 8.
On the Summary page, review your choices before upgrading the product package. To change any choices that you made on previous pages, click **Back** and make the changes. When you are satisfied with your installation choices, click **Install** to install the update packages.

Upgrade configuration:
About this task

Type or **`Browse`** the path for the backup directory where the IBM Workload Scheduler upgrade process saves a backup of your current configuration.

Backup directory
Type the directory:

On Windows operating systems

- The following characters are not valid:
  '!','#','$','%','&','{','}','[',']',
  '=','?','\',',','<','>',',',';','(',')',
  '*','/'
- The default is the Administrator temporary directory.

On UNIX and Linux operating systems

- The following characters are not valid:
  '!','#','$','%','&','{','}','[',']',
  '=','?','\',',','<','>',',',';','(',')',
  '*','/'
- The default is $TEMP.

Browse

Click to select an existing directory in which the IBM Workload Scheduler upgrade process saves a backup of your current configuration.

Upgrade procedure using the silent installation*:*
About this task

Use the response files for the master domain manager upgrade listed in Table 18 and follow the procedure described in "Performing a silent installation" on page 113.

Note:

With V9.3.0 fix pack 1 and later, the direct upgrade is supported and you can upgrade to the latest product version including the latest fix pack level, if available, with just one single step. The response files to upgrade become available when a fix pack on the latest version is released.

Table 18 lists the response files for the upgrade process:

Table 18. Upgrade response files

Type of installation	Response file to use
Upgrading on Windows	
Upgrade master domain manager	**IBM Workload Scheduler V9.1 or later** IWS94_UPGRADE_MDM_from9x_WIN.xml
Upgrade backup master domain manager	
Upgrading on UNIX	
Upgrade master domain manager	**IBM Workload Scheduler V9.1 or later** IWS94_UPGRADE_MDM_from9x_UNIX.xml
Upgrade backup master domain manager	

Customizing and submitting the optional final job stream:
About this task

The upgrade process writes the latest FINAL and FINALPOSTREPORTS definitions for the current release in the following file: <*TWA_HOME*>/TWS/config/Sfinal, where <*TWA_HOME*> is the IBM Workload Scheduler installation directory. To use these latest definitions, you must merge the functions of your current FINAL and

FINALPOSTREPORTS job streams with the syntax of your new FINAL and FINALPOSTREPORTS job streams. Complete the following procedure:

1. Depending on your situation, edit your current final job streams and customize the new final job streams as follows:

   If you had customized job streams called FINAL and FINALPOSTREPORTS in your database:

   a. Extract the definitions from the current FINAL and FINALPOSTREPORTS job streams file by using **composer**.
   b. Use a text editor to edit your customized FINAL and FINALPOSTREPORTS job streams.
   c. Merge the job streams with file *<TWA_HOME>*/TWS/config/Sfinal so that the new FINAL and FINALPOSTREPORTS job streams have the same customization as your customized final job streams plus the new required attributes provided by the new FINAL and FINALPOSTREPORTS job streams.
   d. Save your new FINAL and FINALPOSTREPORTS job streams by using **composer**.

   If you had customized final job streams called something other than FINAL and FINALPOSTREPORTS in your database:

   a. Extract the definitions from your customized final job stream files by using **composer**.
   b. Use a text editor to edit your customized final job stream files.
   c. Merge the job streams with file *<TWA_HOME>*/TWS/config/Sfinal so that the new FINAL and FINALPOSTREPORTS job streams have the same customization as your customized final job streams plus the new required attributes provided by the new FINAL and FINALPOSTREPORTS job streams.
   d. Save these new final job streams so that they have the same names as your current customized final job streams by running the command **composer -replace**.

   If you had final job streams called something other than FINAL and FINALPOSTREPORTS in your database, but they are not customized:

   a. Make a copy of file *<TWA_HOME>*/TWS/config/Sfinal.
   b. Edit this copy and rename the FINAL and FINALPOSTREPORTS parameters with the actual names.
   c. Run the command **composer -replace**.

   If you had final job streams called FINAL and FINALPOSTREPORTS in your database, but they are not customized:

   Run the command **composer -replace <TWA_HOME>/TWS/config/Sfinal**.

   If you had final job streams called FINAL and FINALPOSTREPORTS but they are in DRAFT in your database:

   Run the command **composer -replace** and, after the upgrade, change these job streams into the DRAFT status again.

2. After you customized the new final job streams, you must delete your current final job stream instances (**conman cancel sched** command) and submit the new final job stream instances (**conman sbs sched** command).

During the upgrade, **JnextPlan** is overwritten even if you customized it. The existing **JnextPlan** is backed up and renamed to:

On Windows operating systems:
JnextPlan.cmd.bk

On UNIX and Linux operating systems:
JnextPlan.bk

Completing the security configuration for the new environment:
About this task

If you have specific security settings in your current environment, these settings must be manually merged with the new settings before you build the final security file to be used in your new environment. The statements you might have to add manually vary depending on your specific security settings.

To manually merge the new settings, complete the following procedure:

1. Log in as <*TWS_user*> on your upgraded master domain manager and set the IBM Workload Scheduler environment.
2. If you have centralized security enabled, extract the new security file on the new master using the command:

   ```
   dumpsec > sec_file
   ```

   where *sec_file* is the text file created by the **dumpsec** command.
3. Edit the *sec_file*, and insert the following statements:

   Workload application

   ```
   WKLDAPPL NAME=@ ACCESS=ADD,DELETE,DISPLAY,MODIFY,LIST,UNLOCK
   ```

   Run cycle group

   ```
   RUNCYGRP NAME=@ ACCESS=ADD,DELETE,DISPLAY,MODIFY,USE,LIST,UNLOCK
   ```

   Centralized agent update

   Replace the statement:

   ```
   CPU CPU=@
   ACCESS=ADD,CONSOLE,DELETE,DISPLAY,FENCE,LIMIT,LINK,MODIFY,SHUTDOWN,
   START,STOP,UNLINK,LIST,UNLOCK,RUN,RESETFTA
   ```

   with the following statement:

   ```
   CPU CPU=@
   ACCESS=ADD,CONSOLE,DELETE,DISPLAY,FENCE,LIMIT,LINK,MODIFY,SHUTDOWN,
   START,STOP,UNLINK,LIST,UNLOCK,RUN,RESETFTA,MANAGE
   ```
4. Check that the user permissions of the new statements are correct and, if necessary, add the user of your old master domain manager to the security file of the just upgraded master.
5. Due to new support of the UPN Windows user, if you have Windows domain users that are defined in the logon fields as `domain\username`, insert the escape character '\' before the '\' character in the `domain\username` value.For example, if you use the `MYDOMAIN\user1` value in the logon field, after the upgrade, in the `Security` file you must update the line in following way:

   ```
   ..............
   logon=MYDOMAIN\\user1
   ..............
   ```
6. Save your changes to the `sec_file`.
7. Build your final security file for your new master domain manager using the **makesec** command:

   ```
   makesec sec_file
   ```

8. If you are using FIPS, you must manually enable it again in the WebSphere Application Server `java.security` file. For the FIPS compliance information, see the *IBM Workload Scheduler: Administration Guide* .
9. If you have centralized security enabled, distribute the security file.

   Run **JnextPlan -for 0000** to distribute the Symphony file to the agents.

   Note: Ensure that the **optman** `cf` option is set to **all** or only the unfinished jobstreams are carried forward.
10. Restore the previous setting of the **optman** `cf` option, if necessary.

Restarting scheduling processes:
About this task

After the upgrade is complete, restart the scheduling processes. You can execute the following procedure after upgrading either a master domain manager, or a backup master domain manager.

Follow these steps, by using either the Dynamic Workload Console or the **command line**:

1. Log in as the <*TWS_user*>. From the command line of the master domain manager, start the **netman** process as follows:

   Windows operating systems
   Run:
   ```
   StartUp
   ```

   UNIX and Linux operating systems
   Run:
   ```
   StartUp.sh
   ```
2. Start the master domain manager processes:

   From the Dynamic Workload Console
   In the navigation tree, click **System Status and Health** > **Monitor Workload** > , select the engine and the object type Workstation, click run and, in the table of results, select all the workstations of the master domain manager and click **Start**.

   From the command line of the master domain manager
   Issue the following commands:
   ```
   conman "start"
   ```
3. Link all workstations in the domain:

   From the Dynamic Workload Console
   In the navigation tree, click **System Status and Health** > **Monitor Workload** > **Select the engine and the object type Workstation**, run a task and, in the table of results, select all the workstations of the master domain manager and click **Link**.

   From the command line of the master domain manager
   Issue the following commands:
   ```
   conman "link @;noask"
   ```
4. Start the event monitoring engine:

   From the Dynamic Workload Console
   a. Click **System Status and Health** > **Monitor Workload** > **Select the engine and the object type Workstation**

b. Select the engine workstation and click **More Actions>Start Event Monitoring**.

From the command line of the master domain manager

Windows operating systems
Start the Windows service: IBM Workload Scheduler SSM Agent (for <*TWS_user*>).

UNIX and Linux operating systems
Run

```
conman startmon
```

5. From the command line of the master domain manager, start the dynamic agent processes as follows:

   On Windows operating systems:
   Run:

   ```
   StartUpLwa.bat
   ```

   On UNIX and Linux operating systems:
   Run:

   ```
   StartUpLwa
   ```

6. Verify that all services and processes are running, as follows:

   Windows operating systems
   From Task Manager, verify that the following processes are running: netman, mailman, batchman, writer, JOBMON, tokensrv, batchup, appserverman, agent, jobmanager.

   UNIX and Linux operating systems
   Run

   ```
   ps -u <TWS_user>
   ```

   Verify that the following processes are running: netman, mailman, batchman, writer, jobman, JOBMAN, appserverman, agent, jobmanager.

Note: Even if the autotrace mechanism is no longer supported, the upgrade process does not remove the *TWA_home*\TWS\trace directory after the upgrade because you might use it with other Tivoli® products. If you are sure that you do not use it, you can remove the *TWA_home*\TWS\trace directory.

Rolling back a master domain manager installation

This topic describes how to roll back a master domain manager to a previous fix pack level or release.

Before you begin

Important: The first step of the procedure is to create a backup copy of some directories before you install the new fix pack or upgrade to a new release. The backup is required for the subsequent restore operation which returns the master domain manager to the previous version.

About this task

The rollback procedure is supported for a master domain manager that was installed using IBM Installation Manager. When upgrading the master domain manager, the installation also upgrades the database. After the rollback procedure,

the database remains at the newer fix pack level or release and is not rolled back. It is still compatible with the master domain manager at the previous level.

You can revert back to an earlier version of an installed fix pack or release on the master domain manager by performing the following rollback procedure.

Procedure

1. Stop the IBM Workload Scheduler instance by running the following commands:
   - `conman "stopappserver;wait"`
   - `conman "stopmon;wait"`
   - `conman "stop;wait"`
   - `conman "shut;wait"`
   - `ShutDownLwa`
2. The backup phase. On the IBM Workload Scheduler instance, run the following commands to create a backup copy of the directories needed for a subsequent restore operation:

   Linux and UNIX

   a. Create a backup of the `/var/ibm/InstallationManager` directory, maintaining the file and directory permissions:
      1) `cd /var/ibm`
      2) `cp -fRp InstallationManager <REPOSITORY>`

      where <*REPOSITORY*> represents the directory where the backup files are stored, for example, `/repo`.

   b. Back up the IBM Workload Scheduler instance:
      1) `mkdir <REPOSITORY>/instance`
      2) `cd <TWA_HOME>/TWS/_uninstall/ACTIONTOOLS`
      3) `./backupInstance.sh -backupDir <REPOSITORY>/instance -installDir <TWA_HOME> -user <TWS_USER>`

      Verify that a sub-directory named with a timestamp has been created in the `<REPOSITORY>/instance` directory.

   c. Back up the IBM Workload Scheduler registries:
      1) `mkdir <REPOSITORY>/registries`
      2) `cd <REPOSITORY>/registries`
      3) `cp -pR /etc/TWA .`
      4) `cp -pR /etc/TWS .`

   Windows

   a. Create a backup of the `C:\ProgramData\ibm\Installation Manager\` directory and store it in a directory, for example, `C:\REPO\`. In this procedure, the backup directory is represented by <*REPOSITORY*>.

   b. Back up the IBM Workload Scheduler instance by running the following commands:
      1) `create <REPOSITORY>\instance`
      2) `cd <TWA_HOME>\TWS\_uninstall\ACTIONTOOLS`
      3) `backupInstance.cmd -backupDir <REPOSITORY>\instance -installDir <TWA_HOME> -user <TWS_USER>`

      Verify that a sub-directory named with a timestamp has been created in the `<REPOSITORY>\instance` directory.

   c. Back up the IBM Workload Scheduler registries by running the following commands:
      1) `create <REPOSITORY>\registries`
      2) `create <REPOSITORY>\registries\TWS`

3) Copy the C:\Windows\TWSRegistry.dat file into the <*REPOSITORY*>\registries\TWS directory.
4) Copy the C:\Windows\TWA directory into the <*REPOSITORY*>\registries directory.
5) cp -pR \etc\TWS .

3. The restore phase. After installing the fix pack or upgrading to the new release, you perform the restore phase when you want to revert back to the previous fix pack level or release. Complete the following steps:
   a. Stop the IBM Workload Scheduler instance by running the following commands:
      - conman "stopappserver;wait"
      - conman "stopmon;wait"
      - conman "stop;wait"
      - conman "shut;wait"
      - ShutDownLwa
   a. From the instance with the new fix pack level or release installed, create a backup copy of the IBM Workload Scheduler core files and folders, maintaining file permissions.

      Linux and UNIX

      Copy the files and folders as follows:

      ```
      mkdir <REPOSITORY>/core
      ```

      ```
      cp -fRp Symphony Sinfonia Symnew *.msg pobox Jobtable jmJobTableDir
      nxtjobno mozart stdlist schedlog <REPOSITORY>/core
      ```

      Windows

      Copy the following files from the <*TWA_HOME*>\TWS directory to the <*REPOSITORY*>\core directory:

      ```
      create <REPOSITORY>\core
      ```

      ```
      Symphony, Sinfonia, Symnew, *.msg, pobox\*.msg, Jobtable,
      jmJobTableDir, nxtjobno, mozart, schedlog, stdlist
      ```

4. Restore the IBM Workload Scheduler files.

   Linux and UNIX

   a. Restore IBM Installation Manager registries by running the following commands. In this example, 94fp2 refers to the newer installation.
      1) cd /var/ibm
      2) mv InstallationManager InstallationManager.94fp2
      3) cp -fRp <*REPOSITORY*>/InstallationManager
   b. Restore the IBM Workload Scheduler instance by running the following commands:
      1) cd <*TWA_HOME*>/TWS/_uninstall/ACTIONTOOLS
      2) ./restoreInstance.sh -backupDir <*REPOSITORY*>/instance -installDir <*TWA_HOME*>-user <*TWS_USER*>
      3) chown <*TWS_USER*>:<*TWS_USER_GROUP*> <*TWA_HOME*>/TWS
   c. Restore the IBM Workload Scheduler registries by running the following commands:
      1) cd <*REPOSITORY*>/registries
      2) cp -pR TWA /etc/
      3) cp -pR TWS /etc/
   d. Restore the IBM Workload Scheduler core files by running the following command:

      ```
      cp -fRp <REPOSITORY>/core/* <TWA_HOME>/TWS
      ```

Windows

a. Restore IBM Installation Manager registries by performing the following steps. In this example, 94fp2 refers to the newer installation.
   1) Rename "C:\ProgramData\ibm\Installation Manager\" to "C:\ProgramData\ibm\Installation Manager.94fp2\"
   2) Copy "<*REPOSITORY*>\Installation Manager" to "C:\ProgramData\ibm\"

b. Restore the IBM Workload Scheduler instance by running the following commands:
   1) cd <*TWA_HOME*>\TWS_uninstall\ACTIONTOOLS
   2) restoreInstance.cmd -backupDir <*REPOSITORY*>\instance -installDir <*TWA_HOME*> -user <*TWS_USER*>

c. Restore the IBM Workload Scheduler registries by running the following commands:
   1) Copy cd <*REPOSITORY*>\registries\TWS\TWSReigstry.dat to "C:\Windows\"
   2) Copy <*REPOSITORY*>\registries\TWA to "C:\Windows\" overwriting both files and folders.

d. Restore the IBM Workload Scheduler core files by copying the files and folders in the <*REPOSITORY*>\core directory to the <*TWA_HOME*>\TWS directory.

   cp -fRp <*REPOSITORY*>\core* <*TWA_HOME*>\TWS

Results

The IBM Workload Scheduler has now been restored to the previous fix pack level or release.

Upgrading a dynamic domain manager instance or its backup

About this task

This section describes how to upgrade a dynamic domain manager or its backup, from V9.1 or later.

Depending on your environment configuration, you can perform the following types of upgrade:

Parallel upgrade (suggested upgrade procedure)

If you already use, or plan to use, a backup dynamic domain manager in your environment configuration.

Direct upgrade (basic upgrade procedure)

If you do not use a backup dynamic domain manager in your environment configuration.

If you do not use a backup dynamic domain manager, you are strongly recommended to install and use one to ensure the high availability of your scheduling environment.

Performing a parallel upgrade

About this task

Complete the following procedure to upgrade a dynamic domain manager in parallel mode:

1. Upgrading your existing backup dynamic domain manager or installing a new dynamic domain manager configured as backup.
2. "Switching the dynamic domain manager to the new or upgraded dynamic domain manager configured as backup" on page 194.
3. "Upgrading your old dynamic domain manager" on page 195.
4. "Switching back to the old dynamic domain manager (optional)" on page 195.

Upgrading your current backup dynamic domain manager or installing a new dynamic domain manager configured as backup:

About this task

Upgrade your current backup dynamic domain manager

To upgrade your current backup dynamic domain manager, perform the following steps:

1. From the dynamic domain manager, unlink the current backup dynamic domain manager workstation

   ```
   conman "unlink current_bddm_wks"
   ```

   where *current_bddm_wks* is the backup dynamic domain manager workstation name.
2. Upgrade your current backup dynamic domain manager using the procedure described in "Upgrading a dynamic domain manager instance or its backup" on page 192.
3. Link the upgraded dynamic domain manager configured as backup to the network:

   ```
   conman "link current_bddm_wks"
   ```

Install a new dynamic domain manager configured as backup

To install a new dynamic domain manager configured as backup, see "Installing a dynamic domain manager or its backup" on page 122.

After the installation, performs the following steps:

1. **Define the new dynamic domain manager configured as backup in the database:** Define your new dynamic domain manager configured as backup as a full status agent in the domain of your dynamic domain manager, using the **composer** command line interface.
2. **Stop the dynamic workload broker:** the install process installs a dynamic workload broker server on the dynamic domain manager configured as backup. You must stop the dynamic workload broker server to avoid that two concurrently active servers are active.

   On Windows operating systems:

   ```
   stopBrokerApplication.bat
    -user <username> -password <password>
   [-port <portnumber>]
   ```

   On UNIX and Linux operating systems:

   ```
   stopBrokerApplication.sh
    -user <username> -password <password>
   [-port <portnumber>]
   ```

where <*username*> and <*password*> are the values specified during the dynamic domain manager installation. The parameter <*portnumber*> is optional, if it is not specified, the default is used.

3. **Distribute the Symphony file to the new dynamic domain manager configured as backup:**
   a. Ensure that the **optman cf** option is set to *all*.
   b. To distribute the Symphony file to the new dynamic domain manager configured as backup, run **JnextPlan -for 0000** or wait until the end of the production plan.
   c. Restore the previous setting of the **optman cf** option, if you previously modified the value.

Switching the dynamic domain manager to the new or upgraded dynamic domain manager configured as backup:
About this task

Switch to your new dynamic domain manager configured as backup, which now becomes your dynamic domain manager, by completing the following steps:

1. Stop the workload broker server on the dynamic domain manager, by running the following command:

   On Windows operating systems
   ```
   stopBrokerApplication.bat
    -user <username> -password <password>
   [-port <portnumber>]
   ```

   On UNIX and Linux operating systems
   ```
   stopBrokerApplication.sh
    -user <username> -password <password>
   [-port <portnumber>]
   ```

   where <*username*> and <*password*> are the values specified during the dynamic domain manager installation. The parameter <*portnumber*> is optional, if it is not specified, the default is used.

2. Switch the dynamic domain manager to its backup workstation. Use either the Dynamic Workload Console or run the command:

   ```
   conman
   switchmgr <dyn_dom>;new_mgr_cpu
   ```

   where <*dyn_dom*> is the domain where you installed the backup dynamic domain manager and the *new_mgr_cpu* is the backup dynamic domain manager workstation name.

3. Start the workload broker server on the backup dynamic domain manager which now is your new dynamic domain manager. Run the wastool:

   On Windows operating systems
   ```
   startBrokerApplication.bat
    -user <username> -password <password>
   [-port <portnumber>]
   ```

   On UNIX and Linux operating systems
   ```
   startBrokerApplication.sh
    -user <username> -password <password>
   [-port <portnumber>]
   ```

   where <*username*> and <*password*> are the values specified during the backup dynamic domain manager installation. The parameter <*portnumber*> is optional, if is not specified, the default is used.

4. Link the workload broker server in the backup dynamic domain manager which now is your new dynamic domain manager, by running the following command:

   ```
   conman "link broker_workstation_name"
   ```

   where *broker_workstation_name* is the broker workstation defined in the new dynamic domain manager. The default value for the *broker_workstation_name* is `dynamic_domain_manager_configured_as_backup_workstation_DWB`.

Upgrading your old dynamic domain manager:
About this task

To upgrade your old dynamic domain manager that now has the backup role, perform the following steps:

1. From the dynamic domain manager configured as backup which now is your new dynamic domain manager, unlink the old dynamic domain manager workstation:

   ```
   conman "unlink old_ddm_wks"
   ```

   where *old_ddm_wks* is the old dynamic domain manager workstation name that now has the backup role.
2. Upgrade your old dynamic domain manager to the current version using the procedure described in "Upgrading a dynamic domain manager instance or its backup" on page 192.
3. Link the upgraded dynamic domain manager to the network

   ```
   conman "link old_ddm_wks"
   ```

   where *old_ddm_wks* is the old dynamic domain manager workstation name that now has the backup role.

Switching back to the old dynamic domain manager (optional):
About this task

This step is optional. You can switch back to your old dynamic domain manager that has now been upgraded.

To do this, perform the following steps:

1. Stop the workload broker server on the new dynamic domain manager by running the following command:

   On Windows operating systems

   ```
   stopBrokerApplication.bat
    [-user <username> -password <password>]
   [-port <portnumber>]
   ```

   On UNIX and Linux operating systems

   ```
   stopBrokerApplication.sh
    [-user <username> -password <password>]
   [-port <portnumber>]
   ```

   where,

   username **and** *password*
   The values specified during the backup dynamic domain manager installation. The user and password are optional. By default, the script looks for the credentials in the `soap.client.props` file located in the properties directory of the WebSphere Application Server profile.

portnumber
The parameter is optional. If it is not specified, the default is used.

2. From the old upgraded dynamic domain manager run the command:

```
conman
switchmgr <dyn_dom>;old_mgr_cpu
```

where <dyn_dom> is the domain where the dynamic domain manager configured as backup is installed and the *old_mgr_cpu* is the old dynamic domain manager workstation name

3. Start the workload broker server on the upgraded dynamic domain manager, by running the following command:

On Windows operating systems

```
startBrokerApplication.bat
 [-user <username> -password <password>]
[-port <portnumber>]
```

On UNIX and Linux operating systems

```
startBrokerApplication.sh
 -user <username> -password <password>
[-port <portnumber>]
```

where,

username **and** *password*
The values specified during the dynamic domain manager installation. The user and password are optional. By default, the script looks for the credentials in the `soap.client.props` file located in the properties directory of the WebSphere Application Server profile.

portnumber
The parameter is optional. If it is not specified, the default is used.

4. Link the workload broker server in the dynamic domain manager by running the following command:

```
conman "link broker_workstation_name"
```

where the *broker_workstation_name* is the broker workstation defined in the dynamic domain manager. The default *broker_workstation_name* value is `dynamic domain manager_workstation_DWB`.

Performing a direct upgrade

About this task

Complete the following procedure to upgrade a V9.*x* dynamic domain manager in direct mode:

1. "Unlinking the dynamic domain manager from the network and stopping it."
2. "Upgrading the dynamic domain manager" on page 198.
3. Restarting the scheduling processes.

Unlinking the dynamic domain manager from the network and stopping it: About this task

Before upgrading, you must stop the scheduling processes. You can complete the following procedure when upgrading either a dynamic domain manager, or a backup dynamic domain manager.

Complete these steps, by using either the Dynamic Workload Console or the command line:

Procedure

1. Unlink the dynamic domain manager and all workstations in the dynamic domain manager domain (when upgrading a backup dynamic domain manager you unlink only the backup dynamic domain manager).

   From the Dynamic Workload Console

   In the navigation tree, click **System Status and Health** > **Monitor Workload** > select the engine and the object type Workstation, click run and in the table of results, select the dynamic domain manager and all the workstations of the dynamic domain manager domain and click **Unlink**.

   From the command line of the master domain manager

   a. Log in as the *<TWS_user>*.

   b. Issue the following command:

      ```
      conman "unlink @;noask"
      ```

2. Stop the dynamic domain manager processes:

   From the Dynamic Workload Console

   In the navigation tree, click **System Status and Health** > **Monitor Workload** > **Select the engine and the object type Workstation**, run a task and in the table of results, select all the workstations of the dynamic domain manager and click **Stop**.

   From the command line of the dynamic domain manager

   Issue the following command:

   ```
   conman "stop @;wait;noask"
   ```

3. Stop the `SSM Agent`:

   From the Dynamic Workload Console

   Run the **Monitor Workstations** task and in the table of results, select all the workstations of the dynamic domain manager and click **Stop Event Monitoring**.

   From the command line of the dynamic domain manager

   Issue the following command:

   ```
   conman "stopmon"
   ```

4. From the command line of the dynamic domain manager, stop the **netman** process as follows:

   On Windows operating systems:

   Run the `shutdown.cmd` command from the IBM Workload Scheduler home directory.

   On UNIX and Linux operating systems:

   Run:

   ```
   conman "shut ; wait"
   ```

5. From the command line of the dynamic domain manager, stop the dynamic agent processes as follows:

   On Windows operating systems:

   Run:

   ```
   ShutDownLwa.cmd
   ```

On UNIX and Linux operating systems:

Run:

```
ShutDownLwa
```

6. Ensure that no system programs are accessing the *<TWA_HOME>* directory or its subdirectories.

   Also, close any **conman** or **composer** active session.

7. Verify that all services and processes are not running, as follows:

   Windows operating systems

   From Task Manager, verify that the following processes are not running:

   ```
   netman, mailman, batchman, writer, jobman,stageman,
   JOBMON, tokensrv, batchup, monman, JobManager
   ```

   UNIX and Linux operating systems

   Run

   ```
   ps -u <TWS_user>
   ```

   Verify that the following processes are not running:

   ```
   netman, mailman, batchman, writer, jobman, JOBMAN,
   stageman, monman, JobManager
   ```

Upgrading the dynamic domain manager:

Before you begin

If you have an Installation Manager earlier version, upgrade Installation Manager to V1.8.5 before proceeding with the IBM Workload Scheduler upgrade.

Verify that the user running the installation process has the following authorization requirements:

UNIX and Linux operating systems

root access

Windows operating system

If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or **domain administrators** group with the rights **Act as Part of the Operating System**.

You must run the installation as **administrator**.

If you are updating the master domain manager and you use an Oracle database, then ensure that you run IBM Installation Manager from a shell with the *ORACLE_HOME* environment variable set correctly. Also, ensure that you add the Oracle native client libraries located in *%ORACLE_HOME*/lib to the appropriate environment variable:

- Linux and Solaris: LD_LIBRARY_PATH. For example:

  ```
  export ORACLE_HOME=/oracle/app/oracle/product/12.1.0/dbhome_1
  export LD_LIBRARY_PATH=/oracle/app/oracle/product/12.1.0/dbhome_1/lib
  ```

- AIX: LIBPATH
- HP-UX: SHLIBPATH
- Windows: PATH

About this task

You can upgrade a dynamic domain manager by using the wizard or silent methods.

You can use the same procedure when upgrading a backup dynamic domain manager.

Upgrade procedure using the wizard*:*
Before you begin

Ensure that you downloaded the IBM Workload Scheduler dynamic domain manager eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).

About this task

When upgrading from V9.1 or later, complete the following steps:

Step 1.

Start the upgrade process.

- If you are upgrading to the latest General Availability (GA) version, from the directory that contains the IBM Workload Scheduler dynamic domain manager eImage, run:

  Windows operating systems:
  `update.bat`.

  UNIX operating systems:
  `update.sh`.

  The Installation Manager main panel opens.
- If fix packs are available for the latest version, you can upgrade directly to the latest fix pack available, with just one single step. From the directory that contains the IBM Workload Scheduler dynamic domain manager fix pack eImage, run:

  Windows operating systems:
  `update.bat`.

  UNIX operating systems:
  `update.sh`.

  The Installation Manager main panel opens. Under **File > Preferences>Repositories**, add the latest version GA repository.

From the Installation Manager main panel select Update Packages.

Step 2.

On the Update Packages page, select the IBM Workload Scheduler package and all the package groups for which you want to install updates. If you want to update all package groups, select the **Update all** check box.

Click **Next**.

Step 3.

On the Updates page, select the **"Version 9.4.0.0"** IBM Workload Scheduler update packages and all the updates for the other package groups that you selected.

Click **Next**.

Step 4.

On the Licenses page, read the license agreement for the selected package. If you selected to install the IBM Workload Scheduler package and the IBM Workload Scheduler prerequisite packages, you must accept the license agreement for each package. On the left side of the License page, click each package to see its license agreement. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**.

Click **Next**.

Step 5.

In the Features page, complete the following actions:

For the prerequisites packages:

To see a description of the feature, click the feature name. In the Details section you see a short description.

Ensure that you leave the default prerequisite features selected by installation process.

For the IBM Workload Scheduler package:

Select the following feature:

Dynamic domain manager

Click **Next**.

Step 6.

The Retrieve Data Information panel is displayed with successful operation message or with an error message.

Note: If the upgrade process is unable to retrieve one or more IBM Workload Scheduler configuration properties values in the directory you specified, the Retrieve Data Information panel is shown. To perform the problem determination, see "Retrieving IBM Workload Scheduler instance information data fails with error AWSJIM018E" on page 293.

Step 7.

For the IBM Workload Scheduler package, complete the information required in the following panels.

The panels other than **Upgrade Configuration** , are common to the installation and the upgrade processes. For the meaning of the fields that you must fill in during the upgrade, see the installation references.

Upgrade Configuration:

For the information required in this panel, see Upgrade configuration.

User information:

For the meaning of the fields that you must fill in during the upgrade, see "IBM Workload Scheduler user information" on page 97.

Dynamic domain manager Configuration:

For the meaning of the fields you must fill in during the upgrade, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.

Database Configuration:

The upgrade process retrieves automatically the RDBMS you used in the previous version of the IBM Workload Scheduler.

To complete the `Database configuration` panel, perform the following steps:

1. Specify the database installation path.
   a. If you are using Oracle RDBMS, specify the installation path in the **Database path** field.
   b. If you are using DB2, the installation path is discovered automatically by the upgrade process.
2. Press the **Retrieve database information** to load the information for the database systems selected.
3. For the meaning of the fields that you must fill in during the upgrade, see "Database configuration" on page 100.

WebSphere profile Configuration:
The upgrade process creates a profile in the external WebSphere Application Server instance. The WebSphere Application Server profile is created by using the data of the profile that is installed in the WebSphere Application Server embedded in the IBM Workload Scheduler instance old version.

For the meaning of the fields that you must fill in during the upgrade, see "WebSphere Application Server profile configuration" on page 111.

WebSphere ports Configuration:
For the meaning of the fields that you must fill in during the upgrade, see "WebSphere Application Server ports configuration" on page 112.

Disk space check:
See "Disk space check" on page 113.

Step 8.
On the Summary page, review your choices before upgrading the product package. To change any choices that you made on previous pages, click **Back** and make the changes. When you are satisfied with your installation choices, click **Install** to install the update packages.

Upgrade configuration:
About this task

Type or **`Browse`** the path for the backup directory where the IBM Workload Scheduler upgrade process saves a backup of your current configuration.

Backup directory
Type the directory:

On Windows operating systems

- The following characters are not valid:

```
'!','#','$','%','&','{','}','[',']',
'=','?','\',',','<','>',',',';','(',')',
'*','/'
```

- The default is the Administrator temporary directory.

On UNIX and Linux operating systems

- The following characters are not valid:

```
'!','#','$','%','&','{','}','[',']',
'=','?','\',',','<','>',',',';','(',')',
'*','/'
```

- The default is `$TEMP`.

Browse
Click to select an existing directory in which the IBM Workload Scheduler upgrade process saves a backup of your current configuration.

Upgrading by using the silent installation:
About this task

To upgrade your IBM Workload Scheduler dynamic domain manager or its backup instance and follow the procedure described in "Performing a silent installation" on page 113.

Table 19 lists the response files for the upgrade process:

Table 19. Upgrade response files

Type of installation	Response file to use
Upgrading on UNIX	
Upgrade dynamic domain manager configured as backup	**IBM Workload Scheduler V9.x** `IWS94_UPGRADE_DDM_from9x_UNIX.xml`
Upgrade dynamic domain manager	**IBM Workload Scheduler V9.x** `IWS94_UPGRADE_DDM_from9x_UNIX.xml`
Upgrading on Windows	
Upgrade dynamic domain manager configured as backup	**IBM Workload Scheduler V9.x** `IWS94_UPGRADE_DDM_from9x_WIN.xml`
Upgrade dynamic domain manager	**IBM Workload Scheduler V9.x** `IWS94_UPGRADE_DDM_from9x_WIN.xml`

Restarting scheduling processes:
About this task

When the upgrade of the dynamic domain manager is complete, restart the scheduling processes. You can execute the following procedure after upgrading either a dynamic domain manager, or a backup dynamic domain manager.

Follow these steps, by using either the Dynamic Workload Console or the command line:

1. Log in as the *<TWS_user>*. From the command line of the dynamic domain manager, start the **netman** process as follows:

   Windows operating systems
   Run:
   `StartUp`

UNIX and Linux operating systems

Run:

```
StartUp.sh
```

2. Start the dynamic domain manager processes:

From the Dynamic Workload Console

In the navigation tree, click **System Status and Health** > **Monitor Workload** > , select the engine and the object type Workstation, click run and, in the table of results, select all the workstations of the dynamic domain manager and click **Start**.

From the command line of the dynamic domain manager

Issue the following commands:

```
conman "start"
```

3. Link all workstations in the domain:

From the Dynamic Workload Console

In the navigation tree, click **System Status and Health** > **Monitor Workload** > **Select the engine and the object type Workstation**, run a task and, in the table of results, select all the workstations of the dynamic domain manager and click **Link**.

From the command line of the dynamic domain manager

Issue the following commands:

```
conman "link @;noask"
```

4. Start the event monitoring engine:

From the Dynamic Workload Console

a. Click **System Status and Health** > **Monitor Workload** > **Select the engine and the object type Workstation**
b. Select the engine workstation and click **More Actions>Start Event Monitoring**.

From the command line of the dynamic domain manager

Windows operating systems

Start the Windows service: IBM Workload Scheduler SSM Agent (for <*TWS_user*>).

UNIX and Linux operating systems

Run

```
conman startmon
```

5. From the command line of the dynamic domain manager, start the dynamic agent processes as follows:

On Windows operating systems:

Run:

```
StartUpLwa.bat
```

On UNIX and Linux operating systems:

Run:

```
StartUpLwa
```

6. Verify that all services and processes are running, as follows:

Windows operating systems

From Task Manager, verify that the following processes are running:

```
 netman, mailman, batchman, writer, jobman,stageman,
JOBMON, tokensrv, batchup, monman, JobManager
```

UNIX and Linux operating systems

Run

```
ps -u <TWS_user>
```

Verify that the following processes are running:

```
 netman, mailman, batchman, writer, jobman, JOBMAN,
stageman, monman, JobManager
```

Note: Even if the autotrace mechanism is no longer supported, the upgrade process does not remove the *TWA_home*\TWS\trace directory after the upgrade because you might use it with other Tivoli products. If you are sure that you do not use it, you can remove the *TWA_home*\TWS\trace directory.

Upgrading agents and domain managers

How to upgrade IBM Workload Scheduler agents and domain managers in your distributed, z/OS, or end-to-end network.

The upgrade of agents and domain managers is supported starting from V9.*x*. The agent upgrade process meets the following objectives:

Performs the upgrade in a safe way
It checks for any processes or command lines that are running before starting. It stops them only for the short time necessary to perform the upgrade. If the upgrade fails, a backup and restore feature is in place.

Saves time, disk space, and RAM when upgrading the product
It performs the agent upgrade in less time than traditional methods. It saves disk space and RAM because it is not Java-based.

Uses a very simple command
It consists of a single line command.

Manages both Windows and UNIX operating system workstations
It runs on both Windows and UNIX agents.

The agent upgrade can be performed with minimal impact to scheduling activities. The agents are stopped for the shortest time necessary to perform the maintenance. Any active agent command-line interfaces and processes, such as conman, composer, netman, mailman, and batchman, to name a few, continue running. Any jobs already running when the upgrade process begins, continue to run as planned, however, no new jobs begin execution during this time. Once the upgrade is complete, the agent is restarted and quickly reconnects with its jobs. Any jobs that were actively running before the upgrade that have not yet completed, continue to run, and any jobs that successfully finished running during the upgrade procedure report a successful job status. An automatic backup and restore feature is in place in case of failure.

Use the **twsinst** script to upgrade the IBM Workload Scheduler agent in your distributed or end-to-end network.

For information about agents installed using the **twsinst** script, see "Installing agents" on page 139. See "Agent installation parameters - twsinst script" on page 143 for a full description of the agent installation parameters used by the script.

For a list of supported operating systems and requirements, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

The upgrade process changes some files and folders. For the complete list, see "Files and folders changed during the upgrade" on page 166.

When the upgrade procedure has completed successfully, the backup instance is deleted.

Procedure

Before you begin

1. Verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the rights **Act as Part of the Operating System**.

   You must run the installation as **administrator**.

   UNIX and Linux operating systems
   You must have **root** access.
2. Ensure that you downloaded the IBM Workload Scheduler agent eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).
3. Ensure that you have enough temporary space before starting the installation process. If you have not much space in the temporary directory and you cannot free the space, see "twsinst needs long time to run if the machine does not have enough temporary space" on page 273.

About this task

To upgrade agents, from the directory that contains the IBM Workload Scheduler agent eImage, run the **twsinst** script using the synopsis described below.

Note: twsinst for Windows is a Visual Basic Script (VBS) that you can run in CScript and WScript mode, for example:

```
cscript twsinst.vbs -update -uname username -password password -acceptlicense yes
```

A successful upgrade using the **twsinst** script issues the return code RC = 0. If the upgrade fails, to understand the cause of the error see Synopsis.

Synopsis:

On Windows operating systems

Show command usage and version

```
twsinst -u | -v
```

Upgrade an instance

```
twsinst -update -uname user_name
[-password user_password]
 -acceptlicense yes|no
 [-addjruntime true]
 [-displayname agentname]
 [-hostname host_name]
 [-inst_dir install_dir [-recovInstReg true]]
 [-jmport  port_number]
 [-jmportssl boolean]
 [-lang lang_id]
```

```
* [-patch]
| [-skipbackup]
| [-skipcheckprereq]
| [-skip_usercheck]
| [-tdwbhostname host_name]
| [-tdwbport port_number]
| [-wait minutes]
| [-work_dir working_dir]
```

On UNIX and Linux operating systems

Show command usage and version

```
./twsinst -u | -v
```

Upgrade an instance

```
./twsinst -update [-uname user_name]
 -acceptlicense yes|no
 [-addjruntime true]
 [-create_link]
 [-displayname agentname]
 [-hostname host_name]
 [-inst_dir install_dir [-recovInstReg true]]
 [-jmport port_number]
 [-jmportssl boolean]
 [-lang lang-id]
 [-reset_perm]
* [-patch]
 [-skipbackup]
 [-skipcheckprereq]
 [-skip_usercheck]
 [-tdwbhostname host_name]
 [-tdwbport port_number]
 [-wait minutes]
 [-work_dir working_dir]
```

-acceptlicense *yes|no*
Specify whether or not to accept the License Agreement.

-addjruntime *true*
Adds the Java run time to run job types with advanced options to the agent. The run time environment is used to run application job plug-ins on the agent and to enable the capability to run remotely, from the agent, the dynamic workload broker resource command on the server.

This option is applicable to both fault-tolerant agents and dynamic agents.

By default, if the Java run time was already installed on the agent, it is upgraded.

If the Java run time was not installed on the agent, it is not installed during the upgrade, unless you specify `-addjruntime true`.

If you decided not to install the Java run time when you upgrade, you can add this feature later, as described in *"Part 2. IBM Workload Scheduler -> Chapter 7. Configuring -> Adding a feature"* in *Planning and Installation Guide*.

-create_link
UNIX operating systems only. Create the **symlink** between `/usr/bin/at` and `<install_dir>/TWS/bin/at`. For more information, see Table 3 on page 35.

-displayname
The name to assign to the dynamic agent. The default is the host name of this computer.

-hostname
The fully qualified hostname on which the agent is contacted by the dynamic workload broker.

-inst_dir *install_dir*
The directory where you installed IBM Workload Scheduler. When upgrading, the directory **inst_dir** is used whether:

- The upgrade process cannot retrieve the product install location from the registries.
- You need to create the IBM Workload Scheduler registries again before upgrading. See "Re-creating registry files using twsinst" on page 226 for details.

If you do not provide the **inst_dir** directory and IBM Workload Scheduler cannot retrieve it from the installation registries, the product is installed in the user home directory.

On Windows operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. If not specified, the path is set to `%ProgramFiles%\IBM\TWA`.

On UNIX and Linux operating systems:
The path cannot contain blanks. If not specified, the path is set to the *user_name* home directory.

-jmport

The port used by the IBM Workload Scheduler for z/OS server or the dynamic workload broker to connect to the IBM Workload Scheduler agent. The default value is **31114**. The valid range is from 1 to 65535.

-jmportssl
The port used by the IBM Workload Scheduler for z/OS controller or by the dynamic workload broker to connect to the IBM Workload Scheduler agent. This number is registered in the `ita.ini` file located in the directory *ITA\cpa\ita* on Windows systems and the directory *ITA/cpa/ita* on UNIX systems. For communication using SSL, set *jmportssl* to *true*. To communicate with the dynamic workload broker, it is recommended that you set the value to **true**. In this case, the port specified in **jmport** communicates in HTTPS. If you specify **true**, ensure that you also configure the HTTPS communication on the z/OS controller. Specify **false** for HTTP communication. In this case the port specified in **jmport** communicates in HTTP. The default value is **true**. For communication without using SSL, set *jmportssl* to *false*. To increase the performance of the IBM Workload Scheduler for z/OS server, it is recommended that you set this value to false.

-lang
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used.

Note: The **-lang** option does not relate to the supported language packs. By default, all supported language packs are installed when you install using the **twsinst** script.

-password
Windows system only. The password of the user for which you are installing IBM Workload Scheduler.

-recovInstReg *true*
To re-create the registry files. Specify if you tried to upgrade a stand-alone, fault-tolerant agent (an agent that is not shared with other components or does not have the connector feature) and you received an error message that states that an instance of IBM Workload Scheduler cannot be found. This error can be caused by a corrupt registry file. See "Upgrading when there are corrupt registry files" on page 226. If you specify this parameter you must set **-inst_dir** option.

-reset_perm
UNIX systems only. Reset the permissions of the **libatrc** library.

-skipcheckprereq
If you specify this parameter, IBM Workload Scheduler does not scan system prerequisites before installing the agent. For more information on the prerequisite check, see "Scanning system prerequisites for IBM Workload Scheduler" on page 44.

- patch
Specifies that a patch must be installed. When you specify this option, only the files present in the patch package are replaced in the installed product and all other product files remain unchanged.

-skipbackup
If you specify this parameter the upgrade process does not create a backup of the instance you are upgrading. If the agent upgrade fails, the agent cannot be restored. If you do not specify this parameter, the upgrade process creates a backup of the agent instance in the path *<work_dir>*/backup. The *<work_dir>* is a temporary directory used by the upgrade process. It can be defined by passing the parameter -work_dir to the twsinst script. If you do not define the work_dir then by default it is set to /tmp/TWA_${*INST_USER*}/tws94, where tmp is the temporary directory of the operating system and ${*INST_USER*} is the user performing the upgrade. For example, /tmp/TWA_jsmith/tws94/backup.

-skip_usercheck
Enable this option if the authentication process within your organization is not standard, thereby disabling the default authentication option. On UNIX and Linux operating systems if you specify this parameter, the program skips the check of the user in the /etc/passwd file or the check you perform using the **su** command. On Windows operating systems if you specify this parameter, the program does not create the user you specified in the -uname *username* parameter. If you specify this parameter you must create the user manually before running the script.

-tdwbhostname
The dynamic workload broker fully qualified host name. It is used together with the **-tdwbport** *tdwbport_number* parameter. It adds and starts the capabilities to run workload dynamically to IBM Workload Scheduler. If not specified you cannot run your workload dynamically and this parameter assumes the **localhost** default value. This value is registered in the **ResourceAdvisorUrl** property in the JobManager.ini file.

-tdwbport
The dynamic workload broker HTTP or HTTPS port number used to add dynamic scheduling capabilities to your distributed or end-to-end environment. It is used together with the **-tdwbhostname** *host_name* parameter. This number is registered in the ResourceAdvisorUrl property in the JobManager.ini file. The default value is **0**, however, if you leave the value as

0, you cannot run your workload dynamically. Specify a nonzero value to add dynamic capability. The valid range is from 0 to 65535.

-uname *username*
The name of the user for which IBM Workload Scheduler is being updated. The software is updated in this user's home directory. This user name is not to be confused with the user performing the upgrade.

-update
Upgrades an existing agent that was installed using the **twsinst** script.

-wait *minutes*
The number of minutes that the product waits for jobs that are running to complete before starting the upgrade. If the jobs do not complete during this interval the upgrade does not proceed and an error message is displayed. Valid values are integers or **-1** for the product to wait indefinitely. The default is **60**.

-work_dir *working_dir*
The temporary directory used for the IBM Workload Scheduler upgrade process files deployment.

On Windows operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. If you do not manually specify a path, the path is set to `%temp%\TWA\tws<version_number>`, where `%temp%` is the temporary directory of the operating system.

On UNIX and Linux operating systems:
The path cannot contain blanks. If you do not manually specify a path, the path is set to `/tmp/TWA/tws<version_number>`.

What to do next

When the agent upgrade completes, the agent is restarted and quickly reconnects with its jobs. Any jobs that were actively running before the upgrade that have not yet completed, continue to run, and any jobs that successfully finished running during the upgrade procedure report a successful job status. An automatic backup and restore feature is in place in case of failure.

Examples

About this task

This section contains examples of **twsinst** scripts that you can use to upgrade an agent.

To upgrade an agent installed in the user home directory that does not have the dynamic scheduling capabilities and the Java run time to run job types with advanced options:

```
./twsinst -update -uname twsuser -acceptlicense yes
```

To upgrade an agent installed in the path `/opt/IBM/TWA` on UNIX operating systems and in the path `C:\Program Files\IBM\TWA` on Windows operating systems, and give it dynamic scheduling capabilities, but not the Java run time to run job types with advanced options:

On Windows operating systems:

```
cscript twsinst -update -uname TWS_user -password password
-acceptlicense yes
-tdwbhostname mybroker.mycompany.com -tdwbport 31116
-inst_dir "c:\Program Files\IBM\TWA"
```

On UNIX and Linux operating systems:

```
./twsinst -update -uname twsuser
-acceptlicense yes
-tdwbhostname mybroker.mycompany.com
          -tdwbport 31116 -inst_dir /opt/IBM/TWA
```

To upgrade an agent and give it both dynamic scheduling capabilities and the Java run time to run job types with advanced options. The run time environment is used to run application job plug-ins on the agent and to enable the capability to remotely run, from the agent, the dynamic workload broker resource command on the server:

On Windows operating systems:

```
cscript twsinst -update -uname TWS_user -password password
-acceptlicense yes
-tdwbhostname mybroker.mycompany.com -tdwbport 31116 -addjruntime true
-inst_dir "c:\Program Files\IBM\TWA"
```

On UNIX and Linux operating systems:

```
./twsinst -update -uname twsuser -acceptlicense yes
-tdwbhostname mybroker.mycompany.com
          -tdwbport 31116 -addjruntime true
```

Upgrading agents from V9.1 or later, using IBM Endpoint Manager

Use the IBM Endpoint Manager analyses and Fixlets for IBM Workload Scheduler agents upgrade management to take advantage of:

- The IBM Endpoint Manager functions to view and analyze IBM Workload Scheduler information about all the agents installed on IBM Endpoint Manager endpoints.
- The Fixlets to automatically find all the IBM Workload Scheduler agents on which to install IBM Workload Scheduler upgrades. When the Fixlets become relevant, you can choose to schedule or run immediately a IBM Workload Scheduler upgrade installation.

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

Software requirements:

You can use IBM Endpoint Manager analyses and Fixlets for IBM Workload Scheduler agents upgrade management in a distributed environment, by installing:

- IBM Workload Scheduler V9.1 or later fault-tolerant agents, dynamic agents, IBM Workload Scheduler for z/OS Agents.
- IBM Endpoint Manager for Lifecycle Management.

For supported product versions of IBM Endpoint Manager for Lifecycle Management, 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.

Upgrading remarks:

Before you begin to upgrade agents using IBM Endpoint Manager, consider the following items:

- Make sure that you have at least 2 GB of free space under the root directory or filesystem (depending on your operating system).
- If on an agent there is more than one IBM Workload Scheduler instance, more than one baseline or Fixlet might be relevant for that agent. Make sure that you apply the baseline or Fixlet in the correct order and that you wait for an action to complete before starting a new one, because only one single action can be taken on the same agent at the same time.
- If there is more than one IBM Workload Scheduler instance installed on an agent; when you run a Fixlet to upgrade to a later level, this upgrade is made on one instance at a time, starting with the first one listed in the IBM Workload Scheduler registry. You cannot select a specific agent.

Customizing IBM Endpoint Manager to manage IBM Workload Scheduler agent upgrades:

To customize IBM Endpoint Manager to manage a IBM Workload Scheduler agent upgrade, perform the following steps:

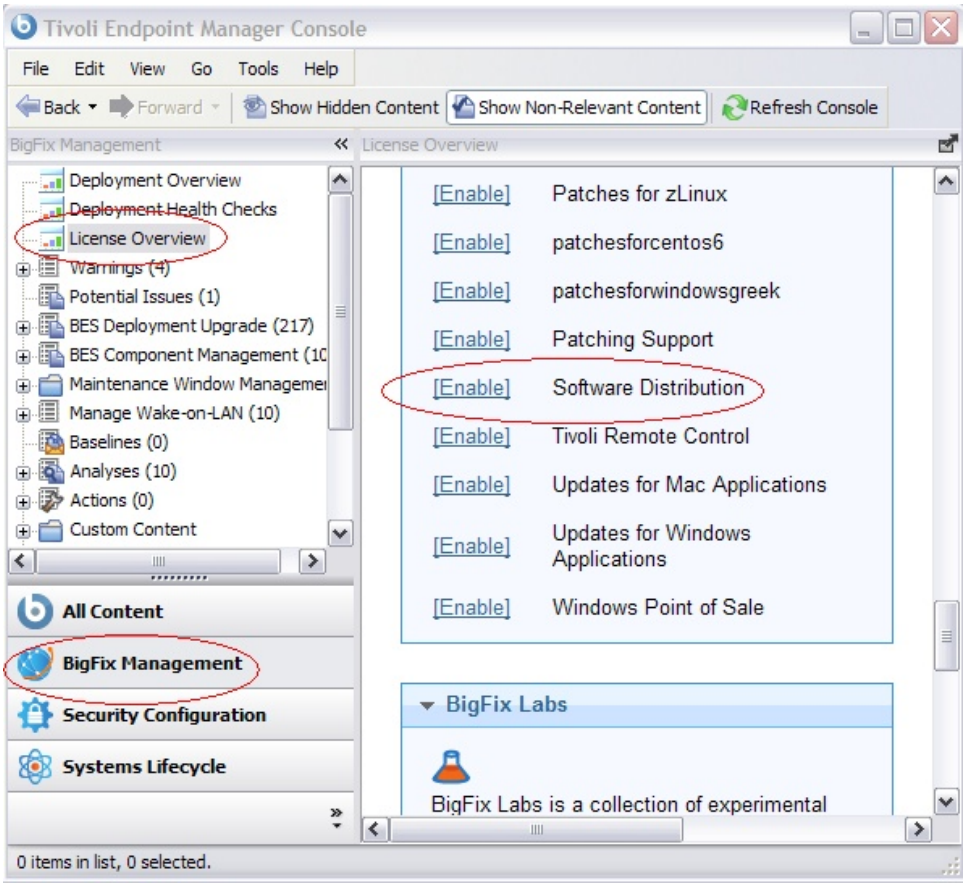
1. Open the IBM Endpoint Manager Console.
2. Log in to the IBM Endpoint Manager server by using the administrative credentials and perform the steps listed in the next sections to configure and customize the IBM Endpoint Manager environment to automate the IBM Workload Scheduler upgrade installation.

Note: The screen shots used are to be intended as a reference only, and do not reflect the current version of the product.

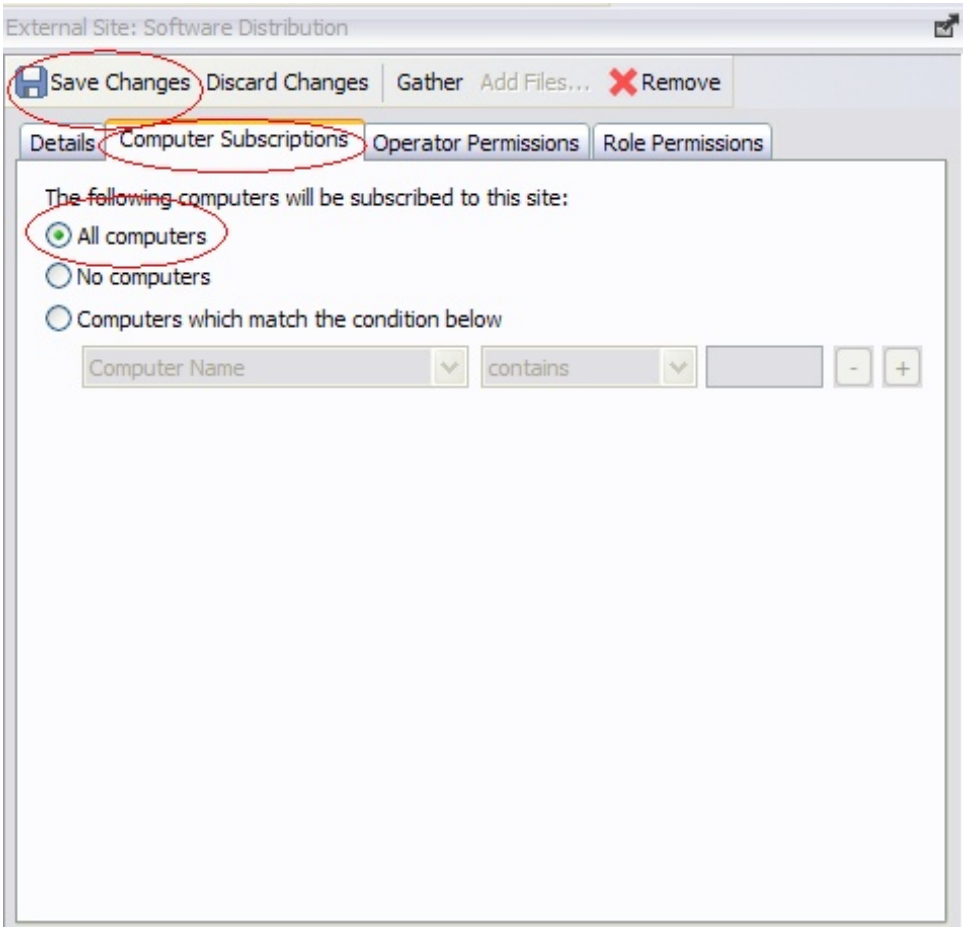
Enabling and subscribing to the Software Distribution external site:

To enable and subscribe all the computers to the Software Distribution site using the IBM Endpoint Manager Console, perform the following steps:

1. Open the BigFix Management domain and scroll to the top to view the associated dashboards.
2. From the **License Overview** Dashboard, expand the **Lifecycle Management**, click **Software Distribution** hyperlink in the table of enabled sites.



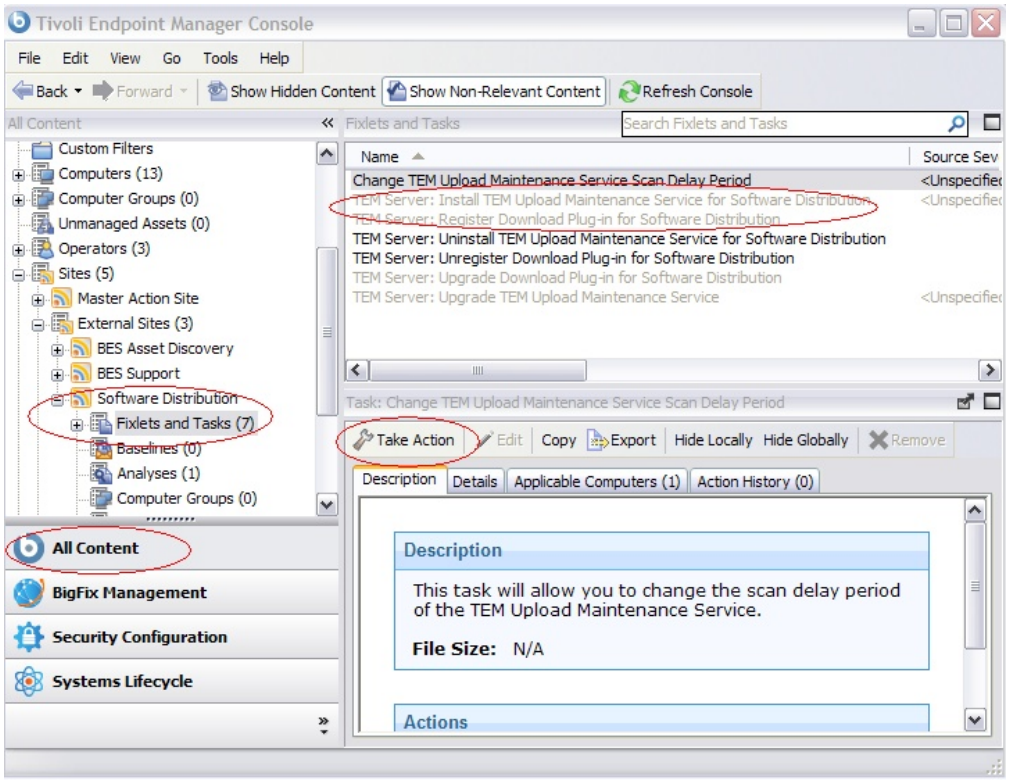
3. Select the **Computer Subscriptions** tab.
4. Select **All computers** to subscribe all the computers in the IBM Endpoint Manager environment to the Software Distribution site.
5. Click **Save Changes** to save the subscription settings.



Installing and registering the Download Plug-in for Software Distribution:

To install and register the Download Plug-in for Software Distribution using the IBM Endpoint Manager Console, perform the following steps:

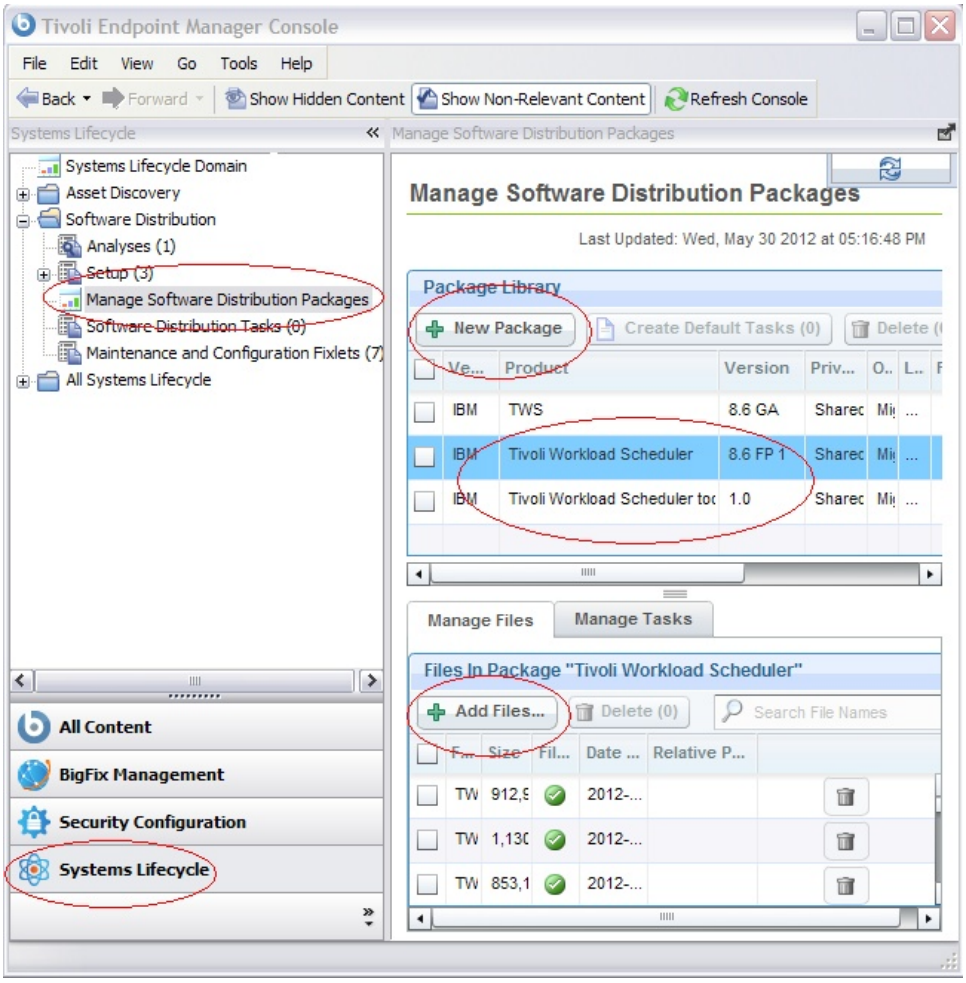
1. From the navigation tree in the All Content domain, click **Sites->External Sites->Software Distribution->Fixlets and Tasks**.
2. From the resulting list panel on the right, click the **IBM BigFix Server: Install IBM BigFix Upload Maintenance Service for Software Distribution** Fixlet to open it. Ensure that the **Description** tab is selected.
3. From the **Description** tab, click the link or button corresponding to the Fixlet action. The **Take Action** dialog box is displayed.
4. If needed, you can refine the action settings using the appropriate tabs.
5. Click **OK** at the bottom of the **Take Action** dialog box to propagate the action to all the computers listed in this dialog box.
6. Repeat the procedure for the Fixlet: **IBM BigFix Server: Register Download Plug-in for Software Distribution**.



Uploading the IBM Workload Scheduler eImages and tools on the IBM Endpoint Manager server:

To upload the IBM Workload Scheduler product eImages and the tools to unpack and deploy the product on the IBM Endpoint Manager server using the IBM Endpoint Manager Console, perform the following steps:

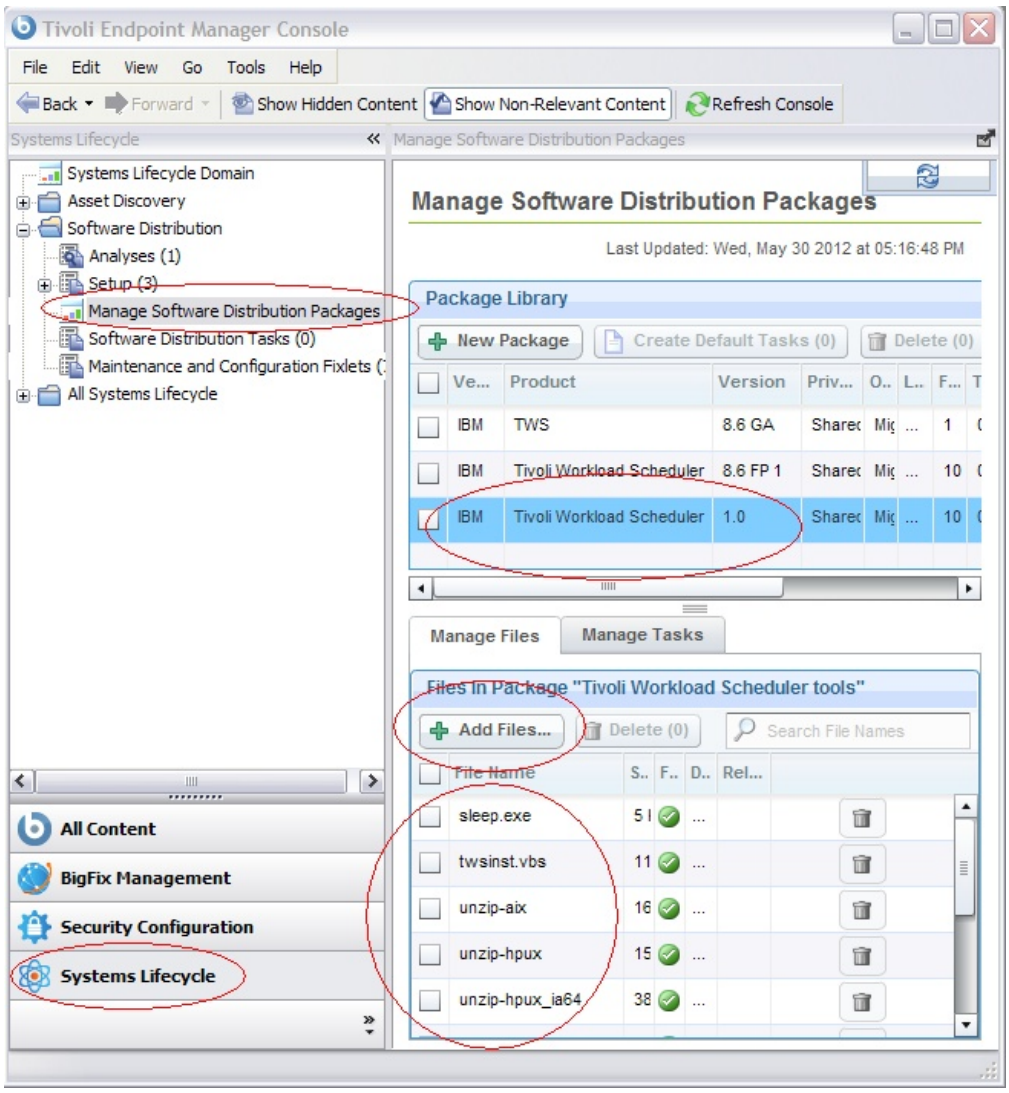
1. Download the IBM Workload Scheduler product eImages from Passport Advantage, depending on your platform and agent.
2. In the navigation tree of the Systems Lifecycle domain panel, click **Software Distribution ->Manage Software Distribution Packages**.
3. From the resulting **Package Library** list panel on the right, click **New Package** to create the package for the IBM Workload Scheduler eImages and the package for the tools. Using the same panel, you must customize all the properties for these packages.
4. In the **Manage Files** tab at the bottom, click **Add Files** to upload the IBM Workload Scheduler eImages on the IBM Endpoint Manager server, one file at a time.



5. From the **Package Library** list panel, add the IBM Workload Scheduler tools package.
6. In the **Manage Files** tab at the bottom, click **Add Files** to upload the IBM Workload Scheduler tools on the IBM Endpoint Manager server, one file at a time.

Note: You must add the extract tools for every platform that you need. The extract tools are located in the IBM Workload Scheduler utility tools Multiplatform eImage that you downloaded from Passport Advantage. The following naming convention, specific for each operating system, was used:

- unzip-aix
- unzip-hpux_ia64
- unzip-linux_s390
- unzip-linux_x86
- unzip-solaris
- unzip-solaris_i386
- unzip-windows.exe



Enabling and subscribing to the IBM Workload Scheduler external site:

Enable and subscribe all the computers to the site using the IBM BigFix Console

IBM Workload Scheduler fixlets, actions, baselines, and analyses that are pertinent to your network are hosted on the IBM Workload Scheduler site.

Before you can perform this procedure you must ensure you have requested to add the "IBM Software" product to your license certificate for IBM BigFix.

To enable and subscribe all the computers to the site using the IBM BigFix Console, perform the following steps:

1. Open the BigFix Management domain and scroll to the top to view the associated dashboards.
2. Click the **License Overview** dashboard, to display the **IBM Software** collapsible section in the right-pane.
3. Click **IBM Workload Scheduler** in the list of sites to enable the site, if not already enabled.

4. Click IBM Workload Scheduler hyperlink in the table of enabled sites and select the **Computer Subscriptions** tab.
5. Select **All computers** to subscribe all the computers in the IBM BigFix environment to the IBM Workload Scheduler site.
6. Click **Save Changes** to save the site subscription settings.

Using IBM BigFix analyses to receive information about the IBM Workload Scheduler agents installed:

An analysis is a collection of property expressions that allow operators to view and summarize various properties of IBM BigFix client computers in a network. These properties are grouped together to be labeled, edited, and activated against groups of computers whose results must be displayed together. For example, suppose you have a custom application deployed in your network, and you want to create an analysis to have important information about the state of the workstations related to that custom application, you might build an analysis with several properties, such as:

- If the custom application is installed.
- The version of the custom application.
- If the application is running.

IBM Workload Scheduler analyses are grouped by supported platforms. From the IBM BigFix Console, you can access the IBM Workload Scheduler site and browse and analyze the information related to the IBM Workload Scheduler instance installed on each computer connected to the IBM BigFix server.

To display a IBM Workload Scheduler analysis using the IBM BigFix Console, perform the following steps:

1. In the Domain panel, click **Sites** > **External Sites** > **IBM Workload Scheduler** > **Analyses**.
2. Click any **IWS agent (*platform*)** entry in the resulting **Analyses** list panel. The body of the analysis is displayed in the area below the list. Click the **Description** tab if it is not already selected.
3. The Analysis: IWS agent (*platform*) area has the following tabs:

   Description
   This is an HTML page providing a description of the analysis.

   Details
   This panel provides a property listing for the chosen analysis, as well as the relevance statement used to target the chosen computers. A text box is provided to enter comments relevant to this analysis.

   Results
   This panel lists the actual results of the analysis, which can be filtered and sorted by the preassigned properties. This tab is available only if the analysis is active. For each IBM Workload Scheduler agent analysis, the following information is provided for every instance installed:
   - Computer name
   - IBM Workload Scheduler version (Major, Minor, Maintenance, Fix Pack)
   - IBM Workload Scheduler agent type
   - IBM Workload Scheduler user owner
   - IBM Workload Scheduler installation path

4. **Applicable Computers**: This is a list of all the computers on which the selected analysis is applicable. You can filter the list by selecting items from the folders on the left, and sort the list by clicking the column headers.

Using IBM Endpoint Manager relevant Fixlets to upgrade IBM Workload Scheduler agents:

Fixlets and tasks are central to IBM Endpoint Manager. Using Relevance statements, they target specific computers, remediating only those IBM Endpoint Manager clients affected by an issue. They are both packaged with an action script that can resolve the issue with a simple mouse-click.

For example, IBM Workload Scheduler Fixlets find, if relevant, only the IBM Workload Scheduler agents that have installed a version earlier than 9.4. The related actions then prepare the instance to install the upgrade and then upgrade the agent.

Fixlets and tasks differ mainly on how they get resolved.

A Fixlet is triggered by a Relevance clause that detects a vulnerability, for example a version earlier than 9.4 applied to agents. When an action is invoked to solve the vulnerability, this Fixlet automatically loses relevance and is no longer applicable on that specific IBM Endpoint Manager client. When a Fixlet action propagates through your network, you can track its progress using the Console, Web Reports, and the Visualization Tool. When you remedy every IBM Endpoint Manager client in your network, the Fixlet is no longer relevant and is removed from the list. If the vulnerability returns, the Fixlet is shown again in the list to address the vulnerability again.

A task comes with one or more action scripts that help you to adjust settings or to run maintenance tasks.

At any time, you can open a Fixlet to inspect the underlying Relevance expressions that are used to target clients, as well as the action scripts that are designed to address the issue. The language used is close to the human language to give you a high degree of confidence in both applicability and efficacy of the remedial action. You can also see precisely which computers in your network are affected by each Fixlet. When propagated, you can view the progress and ultimate history of each action taken on a client basis.

IBM Workload Scheduler provides the following Fixlets for each operating system to upgrade agents to the new version:

1. **Prepare the upgrade of the IBM Workload Scheduler *type_of_agent* agent to version 9.4 for *platform***
2. **Upgrade the IBM Workload Scheduler *type_of_agent* agent to version 9.4 for *platform***

Where *type_of_agent* can be fault-tolerant, dynamic, for z/OS and *platform* is one of the supported operating systems.

If the first Fixlet is relevant and you click **Take Action**, IBM Endpoint Manager prepares the IBM Workload Scheduler agent for the upgrade by performing the following steps:

- Downloads the images from the IBM Endpoint Manager server or relay.
- Extracts the images.

- Checks if the IBM Workload Scheduler command line tools are running (**conman**, **composer**, **fileaid**). If they are running, the action fails.
- Sets the fence of the workstation to GO.
- Waits for jobs to complete. If there are still jobs running after `WaitForJobCompletion` seconds, the action fails.
- Stops the agent. If the agent cannot be stopped, the action fails.
- Checks if all IBM Workload Scheduler binaries and files are unlocked.

If one of the actions fails, the Fixlet fails and remains relevant. You can check the failed action by using the **Status** tab of the action. Perform the necessary steps to solve the problems on the agents and rerun the action.

Note: If the extract step fails, check if the extract tool is present on the agent. If it is not present, install the extract tool and rerun the action.

Note: If the procedure to prepare the agent upgrade fails with the following error:

```
Completed // Delete $TMP/run.sh
Completed delete "{parameter "TMP"}/run.sh"
Completed // Move __createfile to $TMP/run.sh
Completed move __createfile "{parameter "TMP"}/run.sh"
Completed // Execute run.sh
Completed wait sh "{parameter "TMP"}/run.sh"
Completed // Continue if the return code of the previous command was 0
Failed continue if {exit code of action = 0}
```

the problem is caused by an IBM Workload Scheduler process that did not stop. To solve the problem, run the following actions:

1. On UNIX operating systems, check the file:

   `/tmp/TWA/tws94/tws94_process_<agent_user>.txt`

   to find information about the process that is still running.
2. Kill the process.
3. Rerun the action.

To find information about the log file location for IBM Endpoint Manager on various operating systems, see: IBM Endpoint Manager Common File Locations .

If all the actions succeed, the Fixlet is no longer relevant and the next Fixlet becomes relevant. If you click **Take Action** for the new one, it upgrades the previously prepared agent instance to 9.4, performing the following steps:

- Upgrades the instance.
- Resets the fence to the original value.
- Links back to the domain manager.

Also in this case you can check the status of the action through the relative tab and, in case of errors, solve the problems and rerun the action until it succeeds.

Displaying relevant IBM Workload Scheduler Fixlets:

To display a IBM Workload Scheduler Fixlet using the IBM Endpoint Manager Console, perform the following procedure:

1. From the navigation tree in the **Domain** Panel, click the icon labeled **Fixlets and Tasks**. The list panel is displayed on the right.

2. From the list panel, click any IBM Workload Scheduler Fixlet to open it. The body of the Fixlet message is displayed in the work area.
3. Each Fixlet contains a work area with the following four tabs:

   Description
   This page provides a descriptive explanation of the problem and one or more actions to fix it. The actions are represented by links at the bottom of the description page. Click an action to open the **Take Action** dialog, to choose other targets, or to schedule the action. If you click by mistake an action hyperlink before the actual deployment, you always have the chance to modify or cancel the action.

   Details
   This dialog contains the Fixlet and task properties such as category, security ID, download size, source, severity, and date. It also lists the code behind the Relevance expressions and the actions. In a text box at the bottom of this dialog, you can type a comment that remains attached to this item.

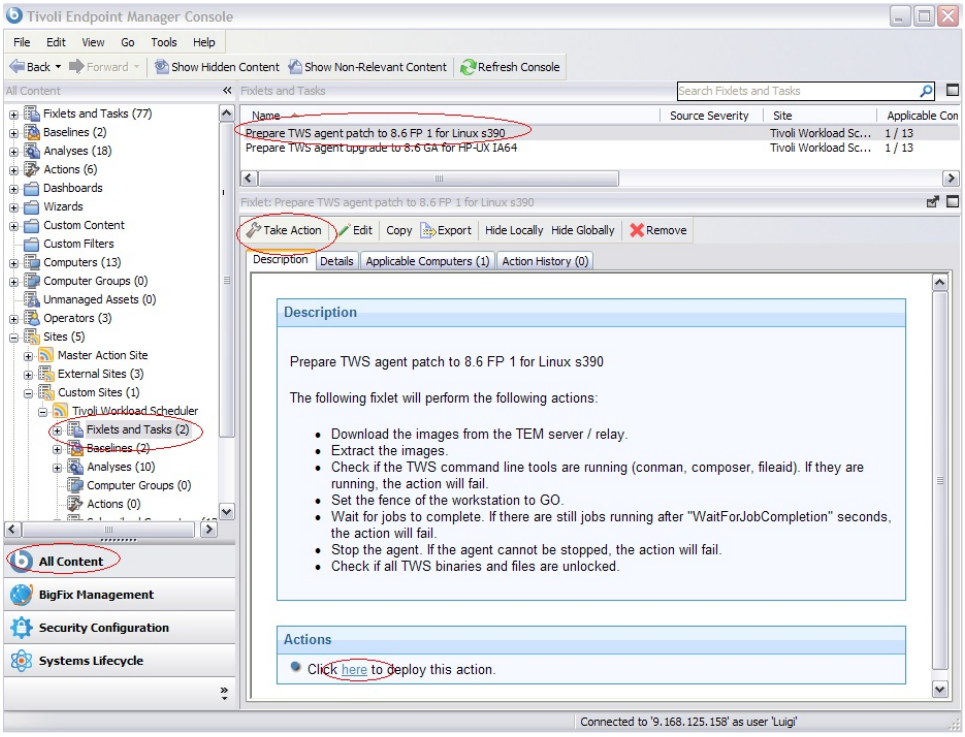
   Applicable Computers
   This is a list of all the computers targeted by the selected Fixlet or task. You can filter the list by selecting items from the folders on the left, and sort the list by clicking the column headers.

   Action History
   This is a list of actions that have been deployed by this Fixlet or task. If this item is new, the list is empty. You can filter the actions using the left panel, and sort them by clicking the column headers above the right-hand list.

Deploying IBM Workload Scheduler actions:

To deploy a IBM Workload Scheduler action using the IBM Endpoint Manager Console, perform the following procedure:

1. Click the list panel to open a relevant Fixlet or task. Make sure the **Description** tab is selected.
2. Read the description carefully. Scroll down to see the suggested actions.
3. Click the **Details** tab and search the action. Examine the Relevance section and the action script itself.



4. In the **Description** tab, click the link corresponding to the Fixlet action or click the **Take Action** button.
5. The **Action Parameter** pop-up window is displayed. Provide the required information. Click **OK**.
6. The **Take Action** dialog box is displayed. In the **Preset** pull-down menu, you can accept the default settings or select **Policy** to set an action with no expiration date. For more information about presets, see the section about **Custom Actions**.
   a. You can refine the list of targeted computers using the **Target** tab. Use the computer tree in the left panel to filter the list of workstations in the right panel.
   b. In the **Execution** tab, you can set various scheduling constraints and behaviors.
   c. In the **Messages** tab, you can create an optional message to be shown on the IBM Endpoint Manager client computers.
   d. In the **Action Script** tab, operators with Custom Authoring permissions can modify the action script.
   e. Use the other interface tabs to further modify the Action settings.
7. Click **OK**

Note: If you are taking an action that applies to different computers, when you are prompted to insert values for the action parameters, you must leave the default values; you must not specify other values.

The action is propagated to all the computers targeted in the **Take Action** dialog. After the action ends successfully and the targeted computers are fixed, those computers no longer report this Fixlet as relevant.

Monitoring IBM Workload Scheduler actions:

When you decide to take a proposed action, you have several deployment options. For example, you might schedule the action to run unattended after midnight or to run with user involvement during the day.

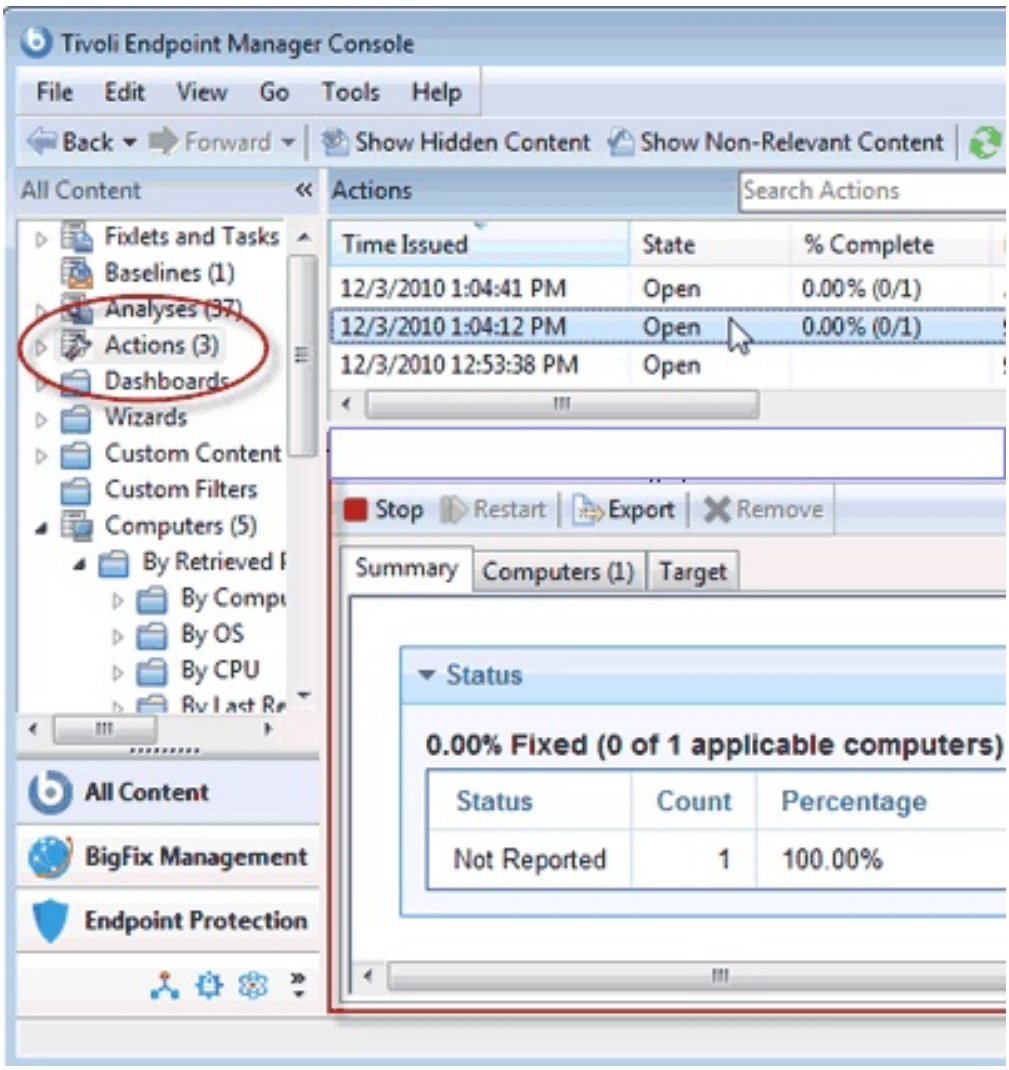
After you schedule the actions, the IBM Endpoint Manager server attempts to identify the computers suitable for those actions. Ideally, the IBM Endpoint Manager client gathers the action information from the action site and performs it immediately. However, some computers might be powered off and others might be mobile devices undocked when the action is deployed. As soon as these computers become available, the remedial action is applied.

To monitor a deployed action, using the IBM Endpoint Manager Console, click the **Actions** icon in the Domain panel navigation tree.

If you have not yet deployed an action or all the actions completed, this list is empty. Otherwise, click any action to view its status, whether it is evaluating, waiting, running, fixed, or failed. You can also add comments to the action.

Actions might go through several states as they are collected, evaluated, and run by clients.

Note: If an action failed for any reason and its state is Open, before running it again, make sure to stop it and that it is not listed in the actions list.



Using IBM Endpoint Manager relevant baselines to upgrade IBM Workload Scheduler agents:

Baselines are collections of Fixlet messages and tasks. They provide a powerful way to deploy a group of actions across an entire network with a single command.

Baselines provide a way to maintain a common operating environment, making sure that all users in any given domain have the same software, patches, and drivers. Baselines are easy to set up, by selecting the Fixlet messages, tasks, and other baselines that you want to be a part of the group. To limit the scope of a baseline, a Relevance expression can be used to target any subset of your network, using IP addresses, computer names, operating systems, and many other qualifiers.

For example, you might make a baseline named "All critical hot fixes," and populate it with all the current critical hot fixes available in the Fixlet list. Alternatively, you might create one baseline named "Finance department baseline," to keep that particular group of computers updated with the latest financial programs, financial tables, updates, and patches.

IBM Workload Scheduler provides a baseline for every platform supported. The provided baselines group together the IBM Workload Scheduler Fixlets described

in "Using IBM Endpoint Manager relevant Fixlets to upgrade IBM Workload Scheduler agents" on page 218 that prepare the agent instance for the upgrade and then upgrade the agent. In this way you can manage the agent upgrade with a single click.

The IBM Workload Scheduler baselines provided are named: **Upgrade IWS *type_of_agent* agent to version 9.4 for *platform***, where *type_of_agent* can be fault-tolerant, dynamic, for z/OS and *platform* is the operating system of the agent to upgrade.

Viewing IBM Workload Scheduler baselines:

With baselines you can group Fixlet messages and tasks for simple, one-click deployment. To display an existing baseline, perform the following steps:

1. Click the **Baselines** icon in the Domain panel navigation tree.
2. Click an item in the list panel. The body of the baseline is shown in the work area below.

The baseline display region contains the following tabs:

Description
This page provides a descriptive explanation of the problem and an action to fix it.

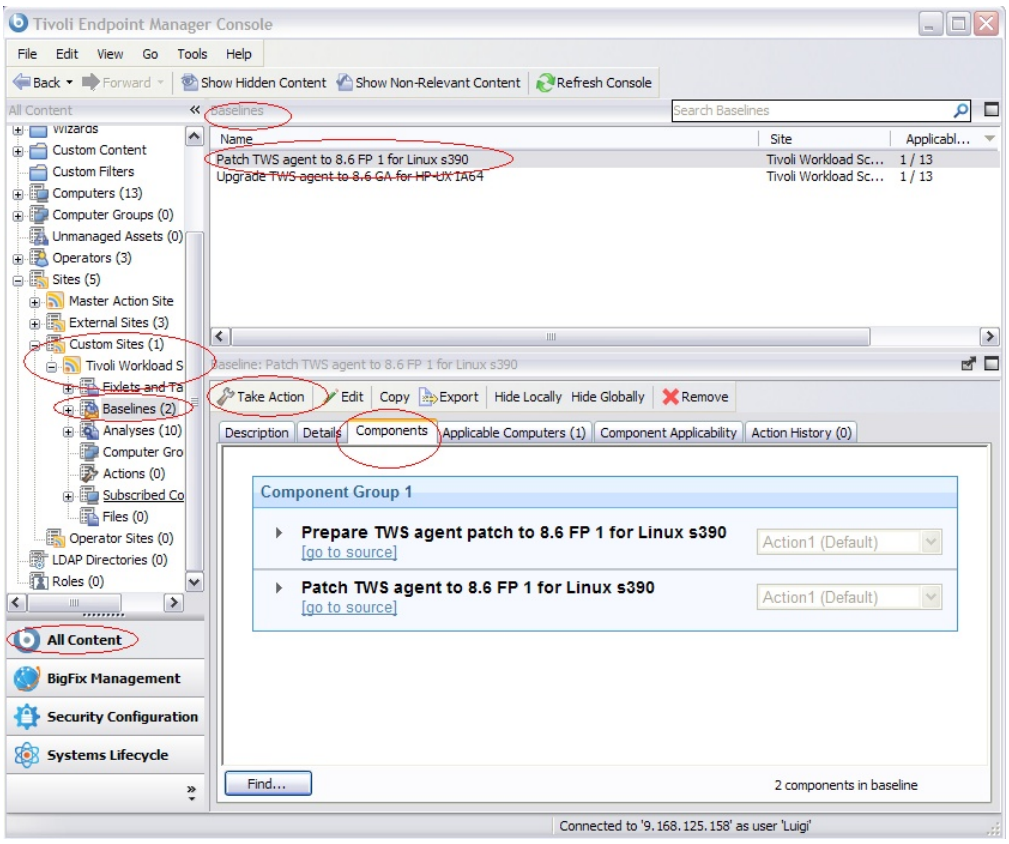
Details
This dialog lists the baseline properties, a section detailing the code behind the Relevance expressions, and the baseline actions. You can enter a comment in a text box at the bottom of this dialog.

Components
This dialog lists the baseline components, such as Fixlet messages, tasks, and other baselines that are grouped into this baseline. Baselines make a copy of their components, so it is possible for one of these copies to get out of synchronization with the underlying Fixlet or task that propagated it. In this case, a message is displayed alerting you that the source differs from the copy and you can synchronize it with the current source.

Applicable Computers
This is a list of all the computers targeted by the selected baseline. You can filter the list by selecting items from the folders on the left, and sort the list by clicking the column headers.

Component Applicability
This is a list of the various components of the baseline. It displays two numbers separated by a slash. The first one is the number of computers where the baseline is currently applicable; the second one is the number of computers where it is not. Double-click an item in the list to display its details.

Action History
This is a list of actions that have been deployed by this baseline. If the baseline is new, there are no actions in the list. As for other lists in the Console, you can filter the actions using the left panel, and sort them by clicking the column headers.



Monitoring relevant IBM Workload Scheduler baselines:

When baselines become relevant in your network, the IBM Endpoint Manager Console adds them to the list of baselines to be displayed under the baselines icon in the domain panel navigation tree. You can filter this list by opening the icon and selecting one of the subsets. In the resulting list panel on the right, you can sort the baselines by clicking one of the column headings, which can include the following fields:

Name The name assigned to the baseline by the author.

ID A numerical identification assigned to the baseline by the author.

Site The name of the site that is generating the relevant baseline.

Applicable Computer Count
The number of IBM Endpoint Manager clients in the network currently targeted by the baseline.

Open Action Count
The number of actions open for the given baseline.

If you do not see one of the columns listed above, right-click the baseline header and select the column from the menu.

Deploying and Monitoring IBM Workload Scheduler actions related to baselines:

See the "Deploying IBM Workload Scheduler actions" on page 220 and "Monitoring IBM Workload Scheduler actions" on page 222 sections for further information.

Upgrading when there are corrupt registry files

If you have tried to upgrade a stand-alone, fault-tolerant agent (an agent that is not shared with other components or does not have the connector feature) and received an error message that states that an instance of IBM Workload Scheduler cannot be found, this can be caused by a corrupt registry file. It is possible to upgrade a stand-alone, fault-tolerant agent that has corrupt registry files without having to reinstall the product. IBM Workload Scheduler has a recovery option you can run to re-create the necessary files. You can also use this option when upgrading nodes in clusters, where the node on which you want to perform the upgrade is not available or is in an inconsistent state. The recovery option re-creates the registry files and the Software Distribution information without having to reinstall the complete product.

You can run the recovery option using the **twsinst** script.

Re-creating registry files using twsinst

To re-create the registry files while upgrading an agent by using the **twsinst** script, from the directory that contains the IBM Workload Scheduler agent eImage, run **twsinst** using the synopsis described below.

Synopsis:

On Windows operating systems:

Show command usage and version

```
twsinst -u | -v
```

Upgrade an instance

```
twsinst -update -uname user_name -password password
..-acceptlicense yes|no
  [-domain user_domain]
  [-recovInstReg true]
  [-inst_dir install_dir]
```

Example

```
cscript twsinst -update -uname twsuser -password twspassword
-acceptlicense yes -inst_dir "C:\Program Files\IBM\TWA"
-recovInstReg true
```

On UNIX and Linux operating systems

Show command usage and version

```
./twsinst -u | -v
```

Upgrade an instance

```
./twsinst -update -uname user_name
..-acceptlicense yes|no
..[-inst_dir install_dir
..[-recovInstReg true]]
```

Example

```
./twsinst -update -uname twsuser -inst_dir /opt/IBM/TWA
-acceptlicense yes -recovInstReg true
```

For information about the **twsinst** parameters, see "Procedure" on page 205.

Chapter 8. Centralized agent update

You can install fix packs or upgrade releases for multiple fault-tolerant agent and dynamic agent instances, by downloading a package on the master domain manager workstation and updating the multiple agent instances by running an action from the Dynamic Workload Console.

You can also schedule the centralized update of multiple agent instances, by using the Dynamic Workload Console or the command line.

The centralized agent update process does not apply to z-centric agents. Also, a distributed master domain manager is required.

During the upgrade or update, the agents are stopped for the shortest time necessary to perform the maintenance. Any active agent command-line interfaces and processes, such as conman, composer, netman, mailman, and batchman, to name a few, continue running. Any jobs already running when the upgrade process begins, continue to run as planned, however, no new jobs begin execution during this time. Once the upgrade is complete, the agent is restarted and quickly reconnects with its jobs. Any jobs that were actively running before the upgrade that have not yet completed, continue to run, and any jobs that successfully finished running during the upgrade procedure report a successful job status.

Centralized agent update by using Dynamic Workload Console

You can centrally update multiple fault-tolerant agent and dynamic agent instances with just one single action by using Dynamic Workload Console.

Before you begin

In the master domain manager `Security` file, you must have `manage` authorization for all the agent workstations for `TWS_master_user`, root, or Administrator users. If your master domain manager is a version 9.3.0 or later fresh installation, the authorization role is automatically added to the `Security` file. If your master domain manager is an upgraded version 9.3.0 or later instance, you must manually add the authorization.

For more information about the `manage` keyword usage, see the section about object type - cpu in *Administration Guide*. For an example of a master domain manager `Security` file, see the section about the security file on the master domain manager to install fix packs or upgrade fault-tolerant agents and dynamic agents in *Administration Guide*.

Note: From an IBM Workload Scheduler master domain manager version 9.3.0 or later, you can centrally update only instances of fault-tolerant agent version 9.3.0 or later and dynamic agent version 9.3.0 or later.

About this task

Complete the following steps:

1. From IBM Fix Central, download on the master domain manager workstation the fix pack installation package, or the upgrade eImage that you want to install on fault-tolerant agent or dynamic agent instances in the following default directory:

   On Windows operating systems:
   `<TWA_home>\TWS\depot\agent`

   On UNIX operating systems:
   `<TWA_home>/TWS/depot/agent`

   where *<TWA_home>* is the master domain manager installation directory.

   You can change the default directory value executing the following steps:
   - Stop the WebSphere Application Server on the master domain manager
   - Modify the `com.ibm.tws.conn.engine.depot` key value in the following property file:

     On Windows operating systems:
     `<TWA_home>\WAS\TWSProfile\properties\TWSConfig.properties`

     On UNIX operating systems:
     `<TWA_home>/WAS/TWSProfile/properties/TWSConfig.properties`
   - Start the WebSphere Application Server
2. Log on to Dynamic Workload Console.
3. Create a `Monitor Workstations` task, as described in the section about creating a task to Monitor Workstations in *Dynamic Workload Console User's Guide*.
4. Run a `Monitor Workstations` task and select one or more dynamic agent or fault-tolerant agent instances that you want to update.
5. Click **More Actions** > **Update agent**. The **`Update agent`** action checks whether the selected agent is a supported workstation type.

   The **`Update agent`** action is applicable to the following workstation types only:
   - Dynamic Agent
   - Fault-tolerant agent

   The **`Update agent`** action is not applicable to the following workstation types:
   - Master domain manager
   - Backup master domain manager
   - Dynamic domain manager
   - Backup dynamic domain manager
   - Extended agent
   - Standard agent
   - Remote engine
   - Broker
   - Pool
   - Dynamic pool
   - Limited fault-tolerant agent

   The process updates the agent only if the workstation type is supported. Otherwise, either an error message is displayed on the Dynamic Workload Console, or is written in the operator log messages console, depending on the workstation type.

You can schedule the centralized update of multiple agent instances, by using the Dynamic Workload Console or the command line. For a description of the scheduling option, see: "Scheduling the centralized agent update."

For a description of the **Update agent** action on fault-tolerant agents and dynamic agents, see: "Updating fault-tolerant agent and dynamic agent instances" on page 231.

Results

Verify the update agent results by completing one of the following actions in the Dynamic Workload Console:

Check the operator log messages console:
Click **System Status and Health** > **Event Monitoring** > **Monitor Triggered Actions** and check the messages related to the agent workstation update.

The following event rules are triggered:

UPDATESUCCESS
When the workstation is successfully updated

UPDATEFAILURE
When an error occurs

UPDATERUNNING
With the information about the update process status

Check the workstation version changes:
After the next plan update, in the `Monitor Workstations` view of the Dynamic Workload Console, you can check the updated version in the `Version` column of the selected agent. Otherwise, if you do not want to wait for the next plan update to see the updated version, run the command **JnextPlan -for 0000** with the **-noremove** option.

You can also perform a **manual check of the update agent results** by looking at the following log files on the agent system:

On Windows operating systems:
`<TWA_home>\TWS\logs\centralized_update.log`

On UNIX operating systems:
`<TWA_home>/TWS/logs/centralized_update.log`

Scheduling the centralized agent update

About this task

You can schedule the centralized update of multiple agent instances by creating a centralized agent update job, either by using the Dynamic Workload Console or the **composer** command line.

Creating a centralized agent update job by using the Dynamic Workload Console:

1. Log on to the Dynamic Workload Console.
2. Create a `Centralized agent update` job type definition, as described in "Creating job definitions" in *Dynamic Workload Console User's Guide*.
3. In the properties panel, specify the attributes for the job definition that you are creating. For all the details about available fields and options, see the online help by clicking the "?" in the upper-right corner.

4. In the `Connection` tab, specify the master domain manager workstation where you loaded the fix pack installation package, or the upgrade eImage, that you want to install on fault-tolerant agent or dynamic agent instances.
5. In the `Action` tab, define the list of fault-tolerant agent or dynamic agent instances that you want to update. You can select up to 20 agent instances.
6. Save the job definition in the database.

Creating a centralized agent update job by using the composer command line:

This section describes the required and optional attributes that you need to specify to create a centralized agent update job by using the **composer** command line. For more information, see "Job definition" in *User's Guide and Reference*:

Table 20. Required and optional attributes for the definition of a centralized agent update job

Attribute	Description and value	Required
hostname	The host name of the master domain manager workstation where you loaded the fix pack installation package, or the upgrade eImage, that you want to install on fault-tolerant agent or dynamic agent instances.	✓
port	The port number of the master domain manager workstation.	✓
protocol	The protocol for connecting to the master domain manager workstation. Supported values are **http** and **https**.	✓
userName	The user to be used for accessing the master domain manager workstation. This attribute is optional, depending on your settings.	
password	The password to be used for accessing the master domain manager workstation. This attribute is optional, depending on the settings on your server.	
NumberOfRetries	The number of times the program tries to connect to the master domain manager workstation. Default value is 0.	
RetryIntervalSeconds	The number of seconds the program waits before retrying the operation. Default value is 30 seconds.	

workstationListValues	The list of agent instances that you want to update.
	
	Example:
	`<jsdlcentralizedagentupdate:workstationsListValue>`
	`NY053015_AGT (type: Agent, version: 9.3.0.00)`
	`</jsdlcentralizedagentupdate:workstationsListValue>`
	`<jsdlcentralizedagentupdate:workstationsListValue>`
	`NY053009_AGT (type: Agent, version: 9.3.0.00)<`
	`/jsdlcentralizedagentupdate:workstationsListValue>`
	`<jsdlcentralizedagentupdate:workstationsListValue>`
	`NY053016_FTA (type: FTA, version: 9.3.0.00)`
	`</jsdlcentralizedagentupdate:workstationsListValue>`
	
	You can specify up to 20 agent instances.
		✓

Scheduling a centralized agent update job

You can schedule a centralized agent update job by adding the necessary scheduling arguments to your job, and submitting it. You can submit jobs by using the Dynamic Workload Console or the **conman** command line.

When the job runs, the job forwards to the master domain manager the **`Update agent`** request for all the fault-tolerant agent or dynamic agent instances that you selected, and then completes.

Note: The job does not wait for the **`Update agent`** request to complete. The completion status of the centralized agent update job refers only to the submission of the **`Update agent`** request; the completion status does not refer to the agent update results. To verify the agent update results, see the *Results* section in "Centralized agent update by using Dynamic Workload Console" on page 227.

Job properties

When the job completes, you can see the job properties by running:

```
conman sj <job_name>;jobprop
```

where<*job_name*> is the centralized agent update job name.

The following example shows the `Extra Information` section of the output command:

```
EXTRA INFORMATION
The update request has been successfully submitted for the following workstations:
NY053015_AGT|NY053009_AGT|NY053016_FTA
```

Updating fault-tolerant agent and dynamic agent instances

A description of the **Update agent** action on fault-tolerant agents and dynamic agents.

About this task

Note: There is no update support for V8.6 fault-tolerant agents and dynamic agents.

When you run the `update agent` action in the `Monitor Workstations` task from Dynamic Workload Console, or when you schedule a centralized agent update job, IBM Workload Scheduler completes the following steps:

1. From the master domain manager workstation, the fix pack installation package or upgrade eImage is copied and its content is extracted in the following default directory:

   For fault-tolerant agent workstations:

   On Windows operating systems:
   <*TWA_home*>\TWS\stdlist\download

   On UNIX operating systems:
   <*TWA_home*>/TWS/stdlist/download

   For dynamic agent workstations:

   On Windows operating systems:
   <*TWA_home*>\TWS\stdlist\JM\download

   On UNIX operating systems:
   <*TWA_home*>/TWS/stdlist/JM/download

   Where <*TWA_home*> is the fault-tolerant agent or dynamic agent installation directory. You can change this default directory by modifying the `DownloadDir` value in the following configuration file:

   For fault-tolerant agent workstations:

   On Windows operating systems:
   <*TWA_home*>\TWS\localopts

   On UNIX operating systems:
   <*TWA_home*>/TWS/localopts

   For dynamic agent workstations:

On Windows operating systems:

<*TWA_home*>\TWS\ITA\cpa\config\JobManager.ini

On UNIX operating systems:

<*TWA_home*>/TWS/ITA/cpa/config/JobManager.ini

Note:

If the path specified in DownloadDir does not exist, a warning message is issued and the default download directory is used.

If you are updating both fault-tolerant agent and dynamic agent instances on the same workstation, be sure that you specify different download directories.

2. On the agent workstation, the following script runs automatically:

For fault-tolerant agent workstations:

On Windows operating systems:

<*TWA_home*>\TWS\stdlist\download\.self\selfupdate.wsf

On UNIX operating systems:

<*TWA_home*>/TWS/stdlist/download/.self/selfupdate.sh

For dynamic agent workstations:

On Windows operating systems:

<*TWA_home*>\TWS\stdlist\JM\download\.self\selfupdate.wsf

On UNIX operating systems:

<*TWA_home*>/TWS/stdlist/JM/download/.self/selfupdate.sh

The centralized agent update script, named **selfupdate**, performs a backup of the agent workstation, runs the **twsinst** installation command, and creates the following log file:

On Windows operating systems:

<*TWA_home*>\TWS\logs\centralized_update.log

On UNIX operating systems:

<*TWA_home*>/TWS/logs/centralized_update.log

Note:

If for any reason the agent update fails, the **selfupdate** script restores the agent to its initial status. The backup files are removed after the agent update completes successfully. The backup files are not removed when the agent restore fails or is successful. For more information about restoring agent instances, see the troubleshooting scenario "Manually restore agent instances when the automatic restore fails" on page 234. To modify the backup directory, specify the new directory in the BACKUP_DIR variable in the **selfupdate.wsf** script.

Troubleshooting scenarios

You can troubleshoot the centralized agent update.

You can troubleshoot the centralized agent update by reading the **centralized_update** log file.

Prerequisite scan detects missing prerequisites and the centralized agent update fails

You are centrally updating dynamic agents or fault-tolerant agents but the prerequisite scan detects missing prerequisites and the agent installation fails.

Cause and solution

The centralized agent update fails because the prerequisite scan detects missing prerequisites. In this case, analyze the prerequisite scan log file and solve the error, if any. You can then decide to rerun the installation or upgrade without executing the prerequisite scan. To do this, perform the following steps:

1. On the master domain manager workstation, go to the directory where you download the fix pack installation package, or the eImage that you want to install on the agent. The default directory value is:

   On Windows operating systems:
   <*TWA_home*>\TWS\depot\agent

   On UNIX operating systems:
   <*TWA_home*>/TWS/depot/agent

   where <*TWA_home*> is the master domain manager installation directory.
2. Edit the following script:

   On Windows operating systems:
   <*TWA_home*>\TWS\depot\agent\TWS94_agent_platform_AGENT.zip\self\selfupdate.wsf

   On UNIX operating systems:
   <*TWA_home*>/TWS/depot/agent/TWS94_agent_platform_AGENT.zip/self/selfupdate.sh
3. In the **selfupdate** script, locate the **twsinst** installation command and add the **-skipcheckprereq** option. If you specify the **-skipcheckprereq** parameter, the **twsinst** script does not execute the prerequisite scan. For more information about the **-skipcheckprereq** option, see "Agent installation parameters - twsinst script" on page 143.

Centralized agent update fails because the temporary backup directory is too small

You are centrally updating dynamic agents or fault-tolerant agents but the backup directory used is too small, and the agent installation fails.

Cause and solution

The centralized agent update fails because the backup directory, by default */tmp*, does not have enough space. You can set a different directory by performing the following steps:

1. On the master domain manager workstation, go to the directory where you downloaded the fix pack installation package, or the eImage that you want to install on the agent. The default directory value is:

   On Windows operating systems:
   <*TWA_home*>\TWS\depot\agent

   On UNIX operating systems:
   <*TWA_home*>/TWS/depot/agent

where <*TWA_home*> is the master domain manager installation directory.

2. Edit the following script:

   On Windows operating systems:
   <*TWA_home*>\TWS\depot\agent\TWS94_agent_platform_AGENT.zip\self\selfupdate.wsf

   On UNIX operating systems:
   <*TWA_home*>/TWS/depot/agent/TWS94_agent_platform_AGENT.zip/self/selfupdate.sh

3. In the **selfupdate** script, locate the **BACKUP_DIR** variable and replace the value to the directory you want to use as backup.

Manually restore agent instances when the automatic restore fails

You are upgrading dynamic agents or fault-tolerant agents using either the centralized agent update method or the **twsinst** script, but the update process fails and starts the automatic restore process. If the automatic restore process fails, you need to manually restore the old agent instances.

Cause and solution

The automatic restore process might fail for several causes, for example, the automatic process does not have the necessary space to perform the operation. If you want to manually restore the old agent instance, complete the following steps:

1. On the workstation where the agent is installed, go to the temporary directory, where the **selfupdate** script backs up the agent installation directory. The default temporary directory value is:

   Centralized agent update method

   On Windows operating systems:
   %TEMP%\backupTWS\<date>

   On UNIX operating systems:
   /tmp/backupTWS/<date>

   Where <*date*> is the date of the **selfupdate** running for your agent instance.

   twsinst script upgrade method

   On Windows operating systems:
   <*working_dir*>\backupTWS\<date>

   On UNIX operating systems:
   <*working_dir*>/backupTWS/<date>

   where <*working_dir*> is a temporary directory used by the upgrade process. You define the <*working_dir*> passing the **-work_dir** parameter to the **twsinst** script. If you do not define the <*working_dir*> then by default it is set to /tmp/TWA_${*INST_USER*}/tws94, where tmp is the temporary directory of the operating system and ${*INST_USER*} is the user performing the upgrade. For example, on a UNIX operating system: /tmp/TWA_jsmith/tws94/backup.

   Where <*date*> is the date of the **selfupdate** running for your agent instance.

2. Locate the *agent_instance_backup_dir* backup directory for your agent instance.
3. Copy the content of the following directory to the `TWS_agent_inst_dir` agent installation directory:

   Centralized agent update method

   On Windows operating systems:
   `%TEMP%\backupTWS\<date>\agent_instance_backup_dir`

   On UNIX operating systems:
   `/tmp/backupTWS/<date>/agent_instance_backup_dir`

   twsinst script upgrade method

   On Windows operating systems:
   `<working_dir>\backupTWS\<date>\agent_instance_backup_dir`

   On UNIX operating systems:
   `<working_dir>/backupTWS/<date>/agent_instance_backup_dir`
4. In the `TWS_agent_inst_dir` directory, re-create the `stdlist` directory.
5. Manually delete the following lock file:

   Centralized agent update method

   On Windows operating systems:
   `%TEMP%\`**`twsselfupdate.lock`**

   On UNIX operating systems:
   `/tmp/`**`twsselfupdate.lock`**

   twsinst script upgrade method

   On Windows operating systems:
   `<working_dir>\`**`twsselfupdate.lock`**

   On UNIX operating systems:
   `<working_dir>/`**`twsselfupdate.lock`**
6. Restart the agent instance.

Centralized agent update does not complete and no operator message is displayed

You are centrally updating dynamic agents and fault-tolerant agents from Dynamic Workload Console. An agent is in running status in the Dynamic Workload Console, but the update process does not complete and no operator message is displayed.

Cause and solution

The agent has been stopped but the Dynamic Workload Console has not been refreshed yet and reports an incorrect agent status. When the update agent action is selected on this agent, the process cannot start and no operator message is displayed.

To solve this problem, you have to check the agent status locally and restart the agent instance if needed. Then, you have to re-issue the update agent command.

Centralized update fails on agents in parallel due to WebSphere Application Server wrong memory management

You are centrally updating 20 dynamic agents and fault-tolerant agents in parallel from the Dynamic Workload Console. On some of the agents, the update fails during the download of the agent package.

Cause and solution

The problem is due to WebSphere Application Server wrong memory management during the download of the agent package.

The problem and its workaround are documented in the following WebSphere Application Server technote: http://www-01.ibm.com/support/docview.wss?uid=swg21317658.

Chapter 9. Configuring

Configuring IBM Workload Scheduler components after installation.

About this task

You must configure IBM Workload Scheduler components after installation.

Setting the environment variables

About this task

Before you configure your IBM Workload Scheduler components, you must set the environment variables using the `tws_env` script.

Starting with Version 9.4, the upgrade installation process for a master domain manager and for agents installs a new version of the `tws_env` script in the directory *<TWA_HOME>*`/TWS`, where *<TWA_HOME>* is the IBM Workload Scheduler installation directory. A backup copy of your original version is created in a backup directory. After the upgrade process, merge the content of the new version with the content of the original version to carry your customized content into the new version.

The script is copied into the backup instance as follows:

Master domain manager upgrade
If you performed the upgrade installation using the wizard installation panels, then you specified the backup directory during the procedure.

If you performed the upgrade using the silent installation, then the backup directory is specified using the key: `user.backupDir`

Agent upgrade
The backup directory used when upgrading the agent is:
/<working_dir>`/TWA_`*<user_name_of_installation_user>*

On Windows operating systems, run the **`tws_env.cmd`** shell script to set up both the *PATH* and *TWS_TISDIR* variables. For example, if IBM Workload Scheduler is installed in the `%ProgramFiles%\IBM\TWA\TWS` directory, the *PATH* variable is set as follows:

```
c:\Program Files\IBM\TWA\TWS;c:\Program Files\IBM\TWA\TWS\bin
```

Note: If you have more than one version of IBM Workload Scheduler installed on your computer, make sure *TWS_TISDIR* points to the latest one. This ensures that the most recent character set conversion tables are used.

On UNIX and Linux operating systems, source the **`tws_env`** shell script to set up both the *PATH* and TWS_TISDIR variables. For example, if IBM Workload Scheduler is installed in the default directory `/opt/IBM/TWA/TWS` directory, **`tws_env.sh`** sets the variables as follows:

```
PATH=/opt/IBM/TWA/TWS:/opt/IBM/TWA/TWS/bin:$PATH
      export PATH

TWS_TISDIR=/opt//opt/IBM/TWA/TWS
     export TWS_TISDIR
```

The **tws_env** script has two versions:

- **tws_env.sh** for Bourne and Korn shell environments
- **tws_env.csh** for C Shell environments

Configuring a master domain manager

About this task

After you installed a master domain manager, if you did not select to automatically add the final job stream during installation, follow the steps in this section to add the *FINAL* and *FINALPOSTREPORTS* job streams to the database.

The *FINAL* job stream is placed in production every day and runs **JnextPlan** before the start of a new day.

The *FINALPOSTREPORTS* job stream, responsible for printing post production reports, follows the *FINAL* job stream and starts only when the last job listed in the *FINAL* job stream (*SWITCHPLAN*) is completed successfully.

The installation creates the `<TWS_INST_DIR>\TWS\Sfinal` file that contains the *FINAL* and *FINALPOSTREPORTS* job stream definitions.

You can use the `<TWS_INST_DIR>\TWS\Sfinal` or create a customized new file for the *FINAL* job stream. For details about customizing the final job stream, see *IBM Workload Scheduler: User's Guide and Reference*.

The following steps gives an example of how to configure a master domain manager after the installation:

1. Log in as <*TWS_user*> or as administrator.
2. Set the environment variables. See "Setting the environment variables" on page 237.
3. Add the *FINAL* and *FINALPOSTREPORTS* job stream definitions to the database by running the following command from the `/opt/IBM/TWA/TWS` directory:

   ```
   composer add Sfinal
   ```

   where *Sfinal* is the name of the file that contains the *FINAL* and *FINALPOSTREPORTS* job stream definitions.
4. Add the *FINAL* and the *FINALPOSTREPORTS* job streams to the plan by running:

   ```
   JnextPlan
   ```

   You can automate this step after installation. See *IBM Workload Scheduler: User's Guide and Reference*.
5. When **JnextPlan** completes, check the status of IBM Workload Scheduler:

   ```
   conman status
   ```

   If IBM Workload Scheduler started correctly, the status that is returned by the command is `Batchman LIVES`.
6. Change the workstation limit value to run jobs. The default job limit after installation is 0, so no jobs run at any time. Raise the job limit to allow jobs to run, for example, to run 10 jobs at the same time:

   ```
   conman "limit ;10"
   ```

If no workstation name is specified for the limit command, the default value is the current login workstation.

Note: If the priority of jobs is HI (100) or GO (101), the limit is ignored and the jobs run even if the limit is 0, unless the workstation fence is greater than or equal to the priority.

Additionally, the following configuration procedures might be necessary. For information about these procedures, see *IBM Workload Scheduler: Administration Guide*.

- Customizing and configuring global, local, and user options.
- Customizing and configuring user authentication to allow users authorization on actions and objects, and to configure LDAP.
- Setting connection security to enable SSL or GSKit for inter-component communications.

Configuration steps for a master domain manager configured as backup

About this task

After you install a master domain manager configured as backup, perform the following additional configuration steps:

1. Log in as <*TWS_user*> on your master domain manager
2. Add the username and password for the master domain manager configured as backup to the `useropts` file. For details, see

   the *Administration Guide* section about setting user options.
3. Set the environment variables by running **tws_env** as described in "Setting the environment variables" on page 237.
4. Define the master domain manager configured as backup as a full status autolink fault-tolerant agent in the IBM Workload Scheduler database, using the **composer** command interface or the Dynamic Workload Console. In this example, using **composer**:

   ```
   composer
   new
   ```
5. Type the workstation definition in the text editor, for example:

   ```
   CPUNAME BDM1
    DESCRIPTION "Backup master domain mananger"
    OS UNIX
    NODE lab777
    TCPADDR 31111
    FOR MAESTRO
      TYPE FTA
      AUTOLINK ON
      BEHINDFIREWALL OFF
      FULLSTATUS ON
   end
   ```

   For more information about workstation definitions, see the *IBM Workload Scheduler: User's Guide and Reference*.
6. Run **JnextPlan -for 0000** to include the master domain manager configured as backup workstation in the plan and to send the Symphony® file to it.

Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.

7. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:

```
conman "limit DM1;10"
```

Note: If you are logged into the master domain manager configured as backup, DM1 is not required.

Additionally, the following configuration procedures might be necessary. For information about these procedures, see *IBM Workload Scheduler: Administration Guide*.

- Customizing and configuring global, local, and user options.
- Customizing and configuring user authentication to allow users authorization on actions and objects, and to configure LDAP.
- Setting connection security to enable SSL or GSKit for inter-component communications.

Configuring a domain manager

About this task

After you install a domain manager, perform the following configuration steps:

1. Log in as *<TWS_user>* on your master domain manager.
2. Set the environment variables by running **tws_env** as described in "Setting the environment variables" on page 237.
3. Define the domain manager as a full status autolink fault-tolerant agent in the IBM Workload Scheduler database, using the **composer** command interface or the Dynamic Workload Console. In this example, using **composer**, type:

```
composer
new
```

4. Type the workstation definition in the text editor, for example:

```
CPUNAME DDM1
  DESCRIPTION "domain mananger"
  OS UNIX
  NODE lab0777
  TCPADDR 31111
  DOMAIN MDM
  FOR MAESTRO
     TYPE MANAGER
     AUTOLINK ON
     BEHINDFIREWALL OFF
     FULLSTATUS ON
END
```

For more information about workstation definitions, see the *IBM Workload Scheduler: User's Guide and Reference*.

5. Run **JnextPlan -for 0000** to include the domain manager workstation in the plan and to send the Symphony file to it.

Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.

6. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:

```
conman "limit;10"
```

Configuring a backup domain manager

About this task

After you install a backup domain manager, perform the following configuration steps:

1. Log in as <*TWS_user*> on your master domain manager.
2. Set the environment variables by running **tws_env** as described in "Setting the environment variables" on page 237.
3. Define the backup domain manager as a full status autolink fault-tolerant agent in the IBM Workload Scheduler database, using the **composer** command interface or the Dynamic Workload Console. In this example, using **composer**, type:

   ```
   composer
   new
   ```

4. Type the workstation definition in the text editor, for example:

   ```
   CPUNAME DDM1
     DESCRIPTION "backup domain mananger"
     OS UNIX
     NODE lab0777
     TCPADDR 31111
     DOMAIN MDM
     FOR MAESTRO
        TYPE FTA
        AUTOLINK ON
        BEHINDFIREWALL OFF
        FULLSTATUS ON
   END
   ```

   For more information about workstation definitions, see the *IBM Workload Scheduler: User's Guide and Reference*.

5. Run **JnextPlan -for 0000** to include the backup domain manager workstation in the plan and to send the Symphony file to it.

   Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.

6. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:

   ```
   conman "limit;10"
   ```

Configuring a dynamic domain manager

About this task

After you install a dynamic domain manager, perform the following configuration steps:

1. Log in as <*TWS_user*> on your master domain manager.
2. Set the environment variables by running **tws_env** as described in "Setting the environment variables" on page 237.
3. Run **JnextPlan -for 0000** to include the dynamic domain manager workstation in the plan and to send the Symphony file to it.

   Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.

4. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:
   ```
   conman "limit;10"
   ```

Configuration steps for a dynamic domain manager configured as backup

About this task

After you install a dynamic domain manager as backup, perform the following configuration steps:

1. Log in as <*TWS_user*> on your master domain manager
2. Set the environment variables by running **tws_env** as described indynamic domain manager.
3. Define the dynamic domain manager as backup as a full status autolink fault-tolerant agent in the IBM Workload Scheduler database, using the **composer** command interface or the Dynamic Workload Console. In this example using **composer**, type:
   ```
   composer
   new
   ```
4. Type the workstation definition in the text editor, for example:
   ```
   CPUNAME BDDM1
     DESCRIPTION "backup dynamic domain mananger"
     OS UNIX
     NODE lab00777
     TCPADDR 31111
     DOMAIN DYNAMICDM
     FOR MAESTRO
        TYPE FTA
        AUTOLINK ON
        BEHINDFIREWALL OFF
        FULLSTATUS ON
   END
   ```

   For more information about workstation definitions, see the *IBM Workload Scheduler: User's Guide and Reference*.
5. Run **JnextPlan -for 0000** to include the dynamic domain manager as backup workstation in the plan and to send the Symphony file to it.

   Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.
6. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:
   ```
   conman "limit;10"
   ```

Configuring a fault-tolerant agent

About this task

After installing a fault-tolerant agent, define the workstation in the database and link the workstation from the master. You can perform this task by using the Dynamic Workload Console or the command line interface. For information, see the *IBM Workload Scheduler: User's Guide and Reference*. The following is an example of how to configure a fault-tolerant agent after installation using the command line interface:

1. Log in to the master domain manager as <*TWS_user*>.
2. Set the environment variables by running **tws_env.sh**.
3. Create the workstation definition in the IBM Workload Scheduler database. Open a command line window and enter the following commands:

   ```
   composer
   new
   ```

4. Type the workstation definition in the text editor. For example:

   ```
   CPUNAME F235007_00
      DESCRIPTION "fault-tolerant agent"
      OS UNIX
      NODE lab235007
      TCPADDR 31111
      DOMAIN MASTERDM
      FOR MAESTRO
        TYPE FTA
        AUTOLINK ON
        BEHINDFIREWALL OFF
        FULLSTATUS OFF
   END
   ```

   Run **JnextPlan** with the option **-for 0000** to add the agent workstation definition to the plan and to send the Symphony file to it. For more information about workstation definitions, see the *IBM Workload Scheduler: User's Guide and Reference*.

   Note: Ensure that the global option **carryforward** is set to **all** or only the not completed job streams are carried forward.
5. If you set the autolink parameter to OFF, issue the link command from the master domain manager to link the agent and to download the Symphony file to it:

   ```
   conman "link workstation"
   ```

6. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs to run concurrently on the workstation to 10:

   ```
   conman "limit F235007_00;10"
   ```

Additionally, the following configuration procedures might be necessary. For information about these procedures, see *IBM Workload Scheduler: Administration Guide*.

- Customizing and configuring global, local, and user options.
- Customizing and configuring user authentication to allow users authorization on actions and objects, and to configure LDAP.
- Setting connection security to enable SSL or GSKit for inter-component communications.

Configuring a dynamic agent

How to configure a dynamic agent.

About this task

The dynamic agent installation process automatically adds the workstation definition to the database and registers the workstation definition to the dynamic workload broker installed on the master domain manager or dynamic domain manager that you chose during the installation process.

Dynamic agents can be organized in pools to help organize your environment based on the availability of workstations and on the requirements of the jobs that need to be run. You can create a pool, adding dynamic agents to a workstation definition of type pool, or, you can automatically register agents to pools through a different process. See the topic about automatically registering agents to a pool in the *Planning and Installation Guide*.

After installing a dynamic agent, depending on the `enAddWorkstation` global option settings in the master domain manager, perform the following steps:

If `enAddWorkstation` is set to `no`:

1. Run **`JnextPlan`** with the **`-for 0000`** option to add the dynamic agent workstation definition to the plan and to send the Symphony file to it. For more information about workstation definitions, see *User's Guide and Reference*.

   Note: To carry forward completed and not completed job stream instances, ensure that the `carryforward` global option is set to `all` or run **`JnextPlan -for 0000`** also with the **`-noremove`** option.
2. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs that can run concurrently on the workstation to 10:

   ```
   conman "limit DA235007_00;10"
   ```

If `enAddWorkstation` is set to `yes`:

The workstation definition is automatically added to the plan after it is defined in the database by the installation process. The `workstationLimit` global option specifies the dynamic agent workstation limit value that the dynamic agent workstation assumes after the workstation is added to the plan.

For more information about how to modify the `enAddWorkstation` and `workstationLimit` global option settings, see the section about global options settings in *Administration Guide*.

For more information about troubleshooting, see the section about troubleshooting when automatically adding dynamic agent workstations to the plan in *Troubleshooting Guide*.

You might also need to run the following configuration procedures. For information about these procedures, see *Administration Guide*.

- Customizing and configuring `jobmanager.ini` and user options.
- Customizing and configuring `JobManagerGW.ini` for opening communication between the gateway and the dynamic workload broker.
- Customizing and configuring user authentication to allow user authorization for actions and objects, and to configure LDAP.
- Setting connection security to enable GSKit for inter-component communications.

Automatically register agents to pools

The dynamic agent installation process automatically adds the workstation definition to the database and registers the workstation definition to the dynamic workload broker installed on the master domain manager or the dynamic domain manager that you specify during the installation process.

You can add dynamic agents in pools to help organize your environment based on the availability of workstations and the requirements of the jobs to be run. Normally, when you create a pool, you add the dynamic agents to a workstation definition of type pool.

Starting from IBM Workload Scheduler version 9.4 Fix Pack 4, you can automatically register dynamic agents in pools by editing the `pools.properties` file located in `<TWS_home>/ITA/cpa/config`.

This alternative way of registering dynamic agents to a pool can be useful when you need to quickly add more than one agent to a pool, or when you want to associate multiple pools to a dynamic agent.

The file is composed by a series of lines with a list of pools to which the agent will be automatically registered. To make the changes in this file effective on the agent, you must stop and start the agent. See StartUpLwa - Start the agent and ShutDownLwa - Stop the agent.

For example, if you want to register a dynamic agent with three different pools, then edit the `pools.properties` file as follows:

```
POOL1
POOL2
POOL3
```

By default, master domain manager and backup domain manager dynamic agents register with the pool named, `MASTERAGENTS`. In this case, the `pools.properties` file on these agents contains the following default entry:

```
$MASTERAGENTS
```

Note: The default name for this pool workstation, MASTERAGENTS, can be modified using the **optman** global option `resubmitJobName`. See the detailed description of the global options in the *Administration Guide* for details about this option.

The following options are supported for each entry in the `pool.properties` file:

;skip

Use this option to exclude pools from even being considered. You might want to ignore specific pools for a period of time, but still maintain them in the list so that they can be considered in the future.

;optional

Use this option to specify that a pool is not obligatory, but optional, so that if the agent is unable to register to a pool, for example, a pool no longer exists) then the pool is ignored.

If an agent has obligatory pools in the `pools.properties` file that are not defined in the system, then the agent will not be able to automatically register and go online. To ensure agent connectivity, these options can be used to manage situations where the agent needs to online even if some pools are not defined.

If the agent does not receive any errors, then the agent goes online and is added to all of the pools in the list, except for those with the `;skip` option specified.

If, instead, the agent encounters an error, the agent is able to determine which of the pools in the list has a problem. If the problematic pool is mandatory (without

the ;optional option specified), then the agent goes offline and is not added to any of the pools. If the problematic pool is optional (with the ;optional option specified), the pool is discarded.

To demonstrate how you can use these options in the pool.properties file, consider the following example:

```
$MASTERAGENT;optional
POOL1
POOL2;skip
POOL3;optional;skip
POOL4;optional
```

Case 1: POOL1 and POOL4 exist, MASTERAGENT does not exist

- POOL2;skip is not considered at all.
- POOL3;optional;skip is not considered at all because the ;skip option overrides the ;optional option.
- MASTERAGENT;optional is the problematic pool and is optional and therefore not considered by the agent.
- POOL1 is not a problematic pool.
- POOL4 is not a problematic pool.

Outcome: The agent goes online and is inserted in POOL1 and POOL4.

Case 2: POOL1 does not exist, MASTERAGENT and POOL4 exist

- POOL2;skip is not considered at all.
- POOL3;optional;skip is not considered at all because the ;skip option overrides the ;optional option.
- MASTERAGENT;optional is not a problematic pool.
- POOL1 is the problematic pool and is mandatory and cannot be discarded.
- POOL4 is not a problematic pool.

Outcome: The agent goes offline and is not inserted in any of the pools.

Configuring a remote command-line client

About this task

To configure a remote command-line client that is automatically installed in a fault-tolerant agent instance, perform the following steps:

1. Log on as Administrator on Windows operating systems, or as root on UNIX and Linux operating systems, on the machine where the remote command-line client is installed with a fault-tolerant agent.
2. Open the localopts configuration file in the fault-tolerant agent instance.
3. Complete the # Attributes for CLI connections configuration section to connect the remote command-line client to the command-line server in the master domain manager:

   HOST The IP address or host name of the workstation where the master domain manager is installed.

   PROTOCOL
   The protocol that is used by the command-line client to connect to the workstation where the master domain manager is installed. The

possible values are *http* and *https*. The default protocol that is used by the command-line client to establish a connection with the master is *https*.

PORT The HTTP or HTTPS port number that is used to connect to the workstation where the master domain manager is installed. This port number must match the values that are defined for the master domain manager instance.

TIMEOUT
The timeout in seconds to wait for a master domain manager response.

CLISSLSERVERAUTH
Specify whether or not the connection to the master domain manager is SSL or not. If you set this value to `true`, perform the steps described in "Configuring SSL connection between remote command-line client and master domain manager."

CLISSLSERVERCERTIFICATE
Specify only if *CLISSLSERVERAUTH* is set to `true`. The absolute path of the .arm file of the server public certificate. For more information about this value, see "Configuring SSL connection between remote command-line client and master domain manager."

CLISSLTRUSTEDDIR
Specify only if *CLISSLSERVERAUTH* is set to `true`. The path of all the .arm files that the remote CLI must trust. For more information about this value, see "Configuring SSL connection between remote command-line client and master domain manager."

DEFAULTWS
The master domain manager workstation name.

USEROPTS
The file that contains the user name and password to use to connect to the master domain manager workstation. This user must be a valid user that is listed in the `Security` file on the master domain manager.

4. Save the `localopts`.
5. Restart the fault-tolerant agent processes to accept the `localopts` changes.

Configuring SSL connection between remote command-line client and master domain manager

Before you begin

Before starting with the procedure to configure the SSL connection between the remote command-line client and the master domain manager, ensure that you set the *CLISSLSERVERAUTH* property to `true` in the *localopts* file of the fault-tolerant agent instance.

About this task

To configure a remote command-line client to connect to a master domain manager in SSL mode, perform the following steps:

1. Extract the certificate on the master domain manager instance by running the following procedure:
   a. Log on as Administrator on Windows operating systems, or as root on UNIX and Linux operating systems, on the machine where the master domain manager is installed.

b. Extract the server.crt base 64 certificate by running:

```
keytool -export
-alias server
-rfc
-file server.crt
-keystore <TWS_INST_DIR>/WAS/profile/TWSServerKeyFile.jks
-storepass default
```

2. Log on as Administrator on Windows operating systems, or as root on UNIX and Linux operating systems, on the machine where the remote command-line client is installed with a fault-tolerant agent.
3. Perform a binary FTP of the server.crt certificate from the machine where you installed the master domain manager instance to the machine where you installed the remote command-line client in the directory <FTA_INST_DIR>\ssl.
4. Rename the <FTA_INST_DIR>\ssl\server.crt file to <FTA_INST_DIR>\ssl\server.arm.
5. Open the localopts configuration file in the fault-tolerant agent instance.
6. Complete one of the following attributes in the # Attributes for CLI connections configuration section and perform the actions:

   CLISSLSERVERCERTIFICATE
   Specify the absolute path of the server.arm file on the fault-tolerant agent machine. In this example, <FTA_INST_DIR>\ssl\server.arm.

   CLISSLTRUSTEDDIR
   Specify the path of the directory that contains all the <certificates>.arm files also the <FTA_INST_DIR>\ssl\server.arm that the remote command-line client can trust.

   Note: Do not set simultaneously the *CLISSLSERVERAUTH* and *CLISSLTRUSTEDDIR* values. For more information about the SSL configuration, see *Administration Guide*.
7. Save the localopts file.
8. Restart the fault-tolerant agent processes to accept the localopts changes.

Configuring a z-centric agent on Windows operating systems

About this task

After you install a z-centric agent on a Windows operating system with a local or domain account, perform the following configuration steps:

1. Stop the dynamic agent.
2. From the **Start** menu, click **Administrative Tools > Services**.
3. Edit the properties of the following service by double-clicking on its name: IBM Common Platform Agent: tws_cpa_agent_<*TWS_user*>, where <*TWS_user*> is the name of the user for which IBM Workload Scheduler was installed (the name you supplied during installation).
4. Click label **Log On**.
5. Click **Log on as: Local System account**.
6. If you plan to run interactive jobs, check mark **Allow service to interact with desktop**.
7. Click **OK**.
8. From the **Start** menu, click **Administrative Tools > Local Security Policy**.
9. Remove the following permissions from the user created when you installed the z-centric agent:

- Act as part of the operating system.
- Log on locally.
- Log on as batch.

10. Restart the dynamic agent.

Adding a feature

Use the **twsinst** script to add the following feature to the IBM Workload Scheduler agent in your distributed or end-to-end network:

Add the Java run time to an agent

During the installation or the upgrade of the agent you might have chosen not to add the Java run time that supports the running of job types advanced options. This option provides your agent with the following capabilities:

- Run job types with advanced options, both those types supplied with the product and the additional types implemented through the custom plug-ins.
- Enable the capability to run remotely, from the agent, the dynamic workload broker resource command on the server.

If you later decide that you require this function, you can add the Java run time separately, as described in "Procedure."

If you already installed your environment and you want to enable dynamic scheduling capabilities, see "Enabling dynamic scheduling after installation" on page 251.

Procedure

About this task

To modify agents by using the **twsinst** script, perform the following steps:

On Windows operating systems

1. Download the eImage for your operating system. See "Installation media" on page 33.
2. Log in as administrator on the workstation where you want to upgrade the product.
3. From the *root*/TWS/*operating_system* directory of the eImage, run **twsinst** by using the synopsis described below.

   Note: twsinst for Windows is a Visual Basic Script (VBS) that you can run in CScript and WScript mode, for example:

   ```
   cscript twsinst -modify -uname username
   -password user_password -acceptlicense yes
   -addjruntime true
   ```

On UNIX and Linux operating systems

1. Download the eImage according to the operating system. See "Installation media" on page 33.
2. From the *root*/TWS/*operating_system* directory, run the **twsinst** script by using the synopsis described below.

A successful modify by using the **twsinst** script issues the return code RC = 0. If the operation fails, to understand the cause of the error, see "Analyzing return codes for agent installation, upgrade, restore, and uninstallation" on page 267.

Synopsis:

On Windows operating systems:

Show command usage and version

```
twsinst -u | -v
```

Modify an instance

```
twsinst -modify -uname user_name
 -password user_password
 -acceptlicense yes|no
 -addjruntime true
 [-inst_dir install_directory]
 [-recovInstReg boolean]
```

On UNIX and Linux operating systems

Show command usage and version

```
./twsinst -u | -v
```

Modify an instance

```
./twsinst -modify -uname user_name
 -acceptlicense yes|no
 -addjruntime true
 [-inst_dir install_directory]
 [-recovInstReg boolean]
```

-acceptlicense *yes|no*
Specify whether or not to accept the License Agreement.

-addjruntime *true*
Adds the Java run time to run job types with advanced options to the agent. The run time environment is used to run application job plug-ins on the agent and to enable the capability to run remotely, from the agent, the dynamic workload broker resource command on the server. With the `-modify` option, the only valid value for this parameter is **true**.

This option is applicable to both fault-tolerant agents and dynamic agents.

-inst_dir *install_directory*
The installation directory for IBM Workload Scheduler. The default is the home directory of the user for which IBM Workload Scheduler is being installed.

-modify
Modifies an existing agent that was installed by using **twsinst**.

-password *user_password*
Windows operating systems only. The password of the user for which you are upgrading IBM Workload Scheduler.

-recovInstReg *boolean*
Select this option to recover workstations that have corrupt registry files without reinstalling the product. If you specify this option, IBM Workload Scheduler re-creates the installation registries. Valid values are **true** and **false**. The default value is **false**.

You can use this option also to recover registry files in a cluster environment; in this case you can run the command on any node of the cluster and not

necessarily on the node where you installed IBM Workload Scheduler. This is useful when the cluster node where the product is installed is unavailable or in an inconsistent state.

-uname *username*
The name of the user for which IBM Workload Scheduler is being updated. The software is updated in this user's home directory. This user name is not to be confused with the user that performs the upgrade.

Configuring WebSphere Application Server

About this task

If, after installing, you have more than one instance of WebSphere Application Server managing any IBM Workload Automation products, you must ensure that they have the same LTPA token_keys. See the *IBM Workload Scheduler: Administration Guide*.

Enabling dynamic scheduling after installation

This section describes the procedure that you must follow to enable dynamic scheduling if you upgrade the product, both the master and the agent, without enabling the dynamic scheduling capabilities. For example, you upgraded the product in the following ways:

Using the installation wizard
You did not select one or both of the following options:

- **Enable the dynamic scheduling capabilities**, when upgrading the master
- **Dynamic agent**, when upgrading the agent.

Using twsinst, when upgrading the agent
You did not specify the **-tdwbport** *tdwbport_number* and **-tdwbhostname** *host_name*.

To enable dynamic scheduling, perform the following steps:

1. In the *tws_home*/TDWB/config/BrokerWorkstation.properties file, modify the values of the following properties according to the values that you specified at upgrade time:

   ```
   Broker.Workstation.Name= workstation_name_DWB
   Broker.Workstation.Port= port_number
   MasterDomainManager.HostName= host_name
   MasterDomainManager.Name= workstation_name
   Broker.AuthorizedCNs=server1; ... ;servern
   ```

   where:

   Broker.Workstation.Name=*workstation_name*_**DWB**
   It is the master domain manager workstation name followed by _DWB. You can modify this value including the _DWB suffix.

   Broker.Workstation.Port=*port_number*
   It is the port on the workload broker workstation used by the IBM Workload Scheduler master domain manager to communicate with dynamic workload broker. You can specify any value. The default value is **41114** if the Netman port number is **31111**. The valid range is from 1 to 65535. If you changed the Netman port number, the Broker.Workstation.Port *port_number* is calculated as:

netman_*port_number*+10003

MasterDomainManager.HostName=*host_name*
It is the fully qualified host name on which the master domain manager will be contacted by the agents.

MasterDomainManager.Name=*workstation_name*
It is the master domain manager workstation name.

Broker.AuthorizedCNs=*server1; ... ;servern*
It is the list of prefixes of common names included in the master domain manager certificates authorized to communicate with the broker server. For more information about authorizing the connection to the server, see sections Customizing the SSL connection to the master domain manager and dynamic domain manager section in the *IBM Workload Scheduler: Administration Guide*.

2. On the master domain manager, verify the current value of the **httpsPort** by running the **showHostProperties** wastool. The default value is **31116**. The following is an example output:

```
############################################################
# Ports Configuration Panel
############################################################
bootPort=31117
bootHost=nynewhost.romelab.myorg.it.com
soapPort=31118
soapHost=mynewhost.romelab.it.myorg.com
httpPort=31115
httpHost=*
httpsPort=31116
............
```

3. On the master domain manager and on every agent that is connected to the workload broker server, update the **JobManager.ini** configuration file located under:
   - On Windows operating systems:
     tws_home\TWS\ITA\cpa\config\JobManager.ini
   - On UNIX and Linux operating systems:
     tws_home/TWS/ITA/cpa/config/JobManager.ini

   by assigning to the *tdwb_hostname* and *tdwb_httpsport* variables contained in the **ResourceAdvisorUrl** property, the following values:

   tdwb_hostname
   Specify the fully qualified host name of the workload broker server

   tdwb_httpsport
   Specify the value that the **httpsPort** has on the master domain manager as shown by the **showHostPorperties** wastool. The default is **31116**, which is the dynamic workload broker port number. The port is currently set to zero because at installation time you specified that you would not use the dynamic workload broker.

   The **ResourceAdvisorUrl** property has the following syntax:

```
ResourceAdvisorUrl = https://<tdwb_hostname>:<tdwb_httpsport>
/JobManagerRESTWeb/JobScheduler/resource
```

4. Start the dynamic workload broker component by running the **startBrokerApplication.sh** wastool as follows:

```
/<TWS_home>/wastools/startBrokerApplication.sh -user user_name
-password password
```

   where:

user_name
Specifies the name of the WebSphere Application Server.

password
Specifies the password of the WebSphere Application Server.

5. On the master domain manager and on every agent of your network that you want to connect to the workload broker server, start the IBM Workload Scheduler agent by running the following command from the *TWS_home* directory:
   - On Windows operating systems:

     ```
     StartUpLwa.cmd
     ```
   - On UNIX and Linux operating systems:

     ```
     StartUpLwa
     ```

This is an example of `BrokerWorkstation.properties` file.

```
# --------------------------------
# Broker Workstation Configuration
# --------------------------------

# This file can be used to configure the local Dynamic Workload Broker Workstation.
# Jobs submitted or scheduled on this workstation are routed to TWS agents
# according to available resources.
#---------------------------------

# Use this switch to enable or disable the Dynamic Workload Broker Workstation
Broker.Workstation.Enable=true

# Name of the Dynamic Workload Broker Workstation in the TWS production plan
Broker.Workstation.Name=NC926121_DWB

# Port on which the Dynamic Workload Broker Workstation listens (equivalent to
# Netman port)
Broker.Workstation.Port=41114

# Seconds between following attempts to link the Dynamic Workload Broker
# Workstation
Broker.Workstation.RetryLink=600

# Name of the Master Domain Manager Workstation
MasterDomainManager.Name=NC926121

# Name of the Master Domain Manager Host Name
MasterDomainManager.HostName=localhost

# HTTPS Port on which the Master Domain Manager listens
MasterDomainManager.HttpsPort=31116

# Cpu Type of the Dynamic Workload Broker Workstation
Broker.Workstation.CpuType=MDM

Broker.AuthorizedCNs=Server;ServerNew

# Domain of the Domain Manager Workstation
DomainManager.Workstation.Domain=MASTERDM

# Name of the Domain Manager Workstation in the TWS production plan
DomainManager.Workstation.Name=NC926121

# Port on which the Domain Manager Workstation listens (equivalent to Netman
# port)
DomainManager.Workstation.Port=31111

# Name of the Dynamic Master Domain Manager Host Name
```

```
DomainManager.Workstation.Address=nc926121.romelab.it.myorg.com

# Name of the Dynamic Master Domain Manager OS Type
DomainManager.Workstation.OS=UNIX
```

Chapter 10. Uninstalling

An overview on how to uninstall the product.

Uninstalling the product does not remove files created after IBM Workload Scheduler was installed, nor files that are open at the time of uninstallation. If you do not need these files, you must remove them manually. If you intend to reinstall and therefore need to use the files, make a backup before starting the installation process. The uninstallation does not remove your DB2 or Oracle database.

Note: To manually uninstall IBM Workload Scheduler, see "Uninstalling IBM Workload Scheduler manually" on page 309

Uninstalling the main components

About this task

How to uninstall the following components:

- master domain manager or its backup
- dynamic domain manager or its backup
- agents

Selecting uninstallation methods

Methods to use when you uninstall IBM Workload Scheduler.

About this task

You can uninstall IBM Workload Scheduler using one of the methods described in this section:

Uninstallation wizard

Uninstall IBM Workload Scheduler components by using the Installation Manager interactive wizard for each supported platform. To start uninstallation by using this method, see "Uninstallation wizard."

Silent installation

In silent mode, a response file provides the relevant information to the uninstallation process, which is run in background. To start uninstallation by using this method, see "Performing a silent uninstallation" on page 258.

Uninstallation wizard

Before you begin

1. Before starting to uninstall, verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the right, **Act as Part of the Operating System**.

If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

UNIX and Linux operating systems
root access

2. Ensure that all IBM Workload Scheduler processes, services and the WebSphere Application Server process are stopped, and that there are no active or pending jobs. For information about stopping the processes and services see *Administration Guide*.

About this task

By using the Installation Manager wizard, you can uninstall the installed packages from a single package group, or you can uninstall all installed packages from every package group.

The uninstallation program removes the product files, the registry keys, and on Windows operating systems also the services. It also removes the binaries related to the installed IBM Workload Scheduler agent.

The uninstallation program does not remove the IBM Workload Scheduler configuration files.

To start the uninstallation program, perform the following steps:

1. Start the Installation Manager program.
2. On the Installation Manager Start page wizard, click **Uninstall**.

Uninstalling a master domain manager or its backup

Before you begin

1. Before starting to install, to upgrade or to uninstall, verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the right, **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

   UNIX and Linux operating systems
   root access

2. Ensure that all IBM Workload Scheduler processes, services and the WebSphere Application Server process are stopped, and that there are no active or pending jobs. For information about stopping the processes and services see *Administration Guide*.

About this task

To uninstall a master domain manager or its backup, perform the following steps:

1. Run the uninstallation process as described in “Uninstallation wizard” on page 255.
2. In the Product package Installation Manager panel, select the packages that you want to uninstall.

3. Click **Next**.
4. Specify the name of the user for which you want to uninstall the product and click **Validate user**. You do not need to specify the user password.
5. On the Summary page, review the packages that you selected to uninstall. Click **Back** if you want to make some changes. If you are satisfied with your choices, click **Uninstall**. A progress indicator bar shows the percentage of the uninstallation completed.
6. When the uninstallation process completes, the Complete page opens and confirms success of the uninstallation process.

Uninstalling a dynamic domain manager or its backup

Authorization requirements to verify before uninstalling.

Before you begin

1. Before starting to uninstall, verify that the user running the installation process has the following authorization requirements:

   Windows operating system

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators group with the rights, **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

   UNIX and Linux operating systems
   root access
2. Ensure that all IBM Workload Scheduler processes, services and the WebSphere Application Server process are stopped, and that there are no active or pending jobs. For information about stopping the processes and services see *Administration Guide*.

About this task

Before uninstalling a dynamic domain manager, to maintain a correct hierarchy of the IBM Workload Scheduler network, see "Uninstalling a dynamic domain manager maintaining a correct hierarchy in the network" on page 258.

To uninstall a dynamic domain manager or its backup, perform the following steps:

1. Run the uninstallation process as described in "Uninstallation wizard" on page 255.
2. In the Product package Installation Manager panel, select the packages that you want to uninstall.
3. Click **Next**.
4. Specify the name of the user for which you want to uninstall the product and click **Validate user**. You do not need to specify the user password.
5. On the Summary page, review the packages that you selected to uninstall. Click **Back** if you want to make some changes. If you are satisfied with your choices, click **Uninstall**. A progress indicator bar shows the percentage of the uninstallation completed.
6. When the uninstallation process completes, the Complete page opens and confirms success of the uninstallation process.

Uninstalling a dynamic domain manager maintaining a correct hierarchy in the network

To correctly uninstall a dynamic domain manager, perform the following steps:

1. Uninstall the dynamic agents connected to the dynamic domain manager you want to uninstall by using one of the procedures described in this section.
2. In the database, delete the definitions of the workstations of type AGENT that are connected to the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer or run the following command:

   `composer del ws` *`agent_workstation_name`*
3. Delete the definitions of the workstations of type REM-ENG connected to the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer or run the following command:

   `composer del ws` *`rem_eng_workstation_name`*
4. Delete the definitions of the workstations of type POOL connected to the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer or run the following command:

   `composer del ws` *`pool_workstation_name`*
5. Delete the definitions of the workstations of type D-POOL connected to the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer or run the following command:

   `composer del ws` *`dpool_workstation_name`*
6. Uninstall the dynamic domain manager by using the "Uninstalling a dynamic domain manager or its backup" on page 257 or the "Performing a silent uninstallation" procedure.
7. Delete the definition of the workstations of type X-AGENT hosted by the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer, or run the following command:

   `composer del ws` *`x-agent_workstation_name`*
8. Delete the definitions of the workstations of type BROKER of the dynamic domain manager that you are uninstalling. You can use either the Dynamic Workload Console workload designer or run the following command:

   `composer del ws` *`broker_workstation_name`*

Performing a silent uninstallation

For a silent uninstallation of a master domain manager, a backup master domain manager, a dynamic domain manager, or a backup dynamic domain manager, customize a response file provided in the installation eImage to satisfy your uninstallation requirements.

To perform a silent uninstallation by using a response file template listed in Table 21 on page 259, perform the following steps:

1. Ensure that all IBM Workload Scheduler processes and services are stopped, and that there are no active or pending jobs. For information about stopping the processes and services, see *Administration Guide*.
2. Copy the relevant response file to a local directory <*local_dir*> and edit the file to meet the needs of your environment.
3. Save the file with your changes.
4. Open a command-line utility.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

On Windows operating systems

```
C:\Program Files\IBM\Installation Manager\eclipse\tools
```

On UNIX and Linux operating systems

```
/opt/IBM/InstallationManager/eclipse/tools
```

6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for uninstallation.
   - The `log_file` is the name of the log file that records the result of the silent uninstall action.

   Note: For more information about the Installation Manager silent uninstall command, see the Installation Manager Knowledge Center.

Table 21 lists the response files to be used for the uninstallation process by platform:

Table 21. Uninstallation response files

Type of installation	Response file to use
Uninstalling on Windows operating systems	
Backup master domain manager	`IWS94_UNINST_MDM.xml`
Master domain manager	`IWS94_UNINST_MDM.xml`
dynamic domain manager	`IWS94_UNINST_DDM.xml`
Backup dynamic domain manager	`IWS94_UNINST_DDM.xml`
Uninstalling on UNIX operating systems	
Backup master domain manager	`IWS94_UNINST_MDM.xml`
Master domain manager	`IWS94_UNINST_MDM.xml`
dynamic domain manager	`IWS94_UNINST_DDM.xml`
Backup dynamic domain manager	`IWS94_UNINST_DDM.xml`

Uninstalling agents using the twsinst script

Before you begin

1. Before starting to uninstall, verify that the user running the uninstallation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators with the right, **Act as Part of the Operating System**.

If you set the Windows User Account Control (UAC) on the workstation, you must run the installation as **administrator**.

UNIX and Linux operating systems

To uninstall a fault-tolerant agent, the user must have **root** access.

To uninstall a dynamic agent that was installed by the **root** user, the user must have **root** access.

To uninstall a dynamic agent that was installed by a non-root user, the uninstaller must use the same login used to install the agent. To find the login value used at installation, see the read-only `InstallationLoginUser` parameter in the `JobManager.ini` configuration file in the agent.

2. Ensure that you have enough temporary space before starting the uninstallation process. If you have not much space in the temporary directory and you cannot free the space, see "twsinst needs long time to run if the machine does not have enough temporary space" on page 273.
3. Ensure that all IBM Workload Scheduler processes and services are stopped, and that there are no active or pending jobs. For information about stopping the processes and services, see *Administration Guide*.

Follow these steps to uninstall IBM Workload Scheduler agents using the **twsinst** script. Depending on the operating system, proceed as follows:

On Windows operating systems:

1. Ensure that all IBM Workload Scheduler processes and services are stopped, and that there are no active or pending jobs. For information about stopping the processes and services see *Administration Guide*.
2. Log on as administrator on the workstation where you want to uninstall the product.
3. **twsinst** for Windows is a Visual Basic Script (VBS) that you can run in CScript and WScript mode, from the *installation_dir*\TWS, run the **twsinst** script as follows:

   ```
   cscript twsinst -uninst -uname username [-wait minutes]
   [-lang lang_id]
   [-work_dir working_dir]
   ```

   The uninstallation is performed in the language of the locale and not the language set during the installation phase. If you want to uninstall agents in a language other than the locale of the computer, run the **twsinst** script from the *installation_dir*\TWS as follows:

   ```
   cscript twsinst -uninst -uname user_name -lang language
   ```

   where *language* is the language set during the uninstallation.

On UNIX and Linux operating systems:

1. Log on as root and change your directory to */installation_dir*/TWS
2. From the `TWS` directory, run the **twsinst** script as follows:

   ```
   twsinst -uninst -uname username [-wait minutes]
   [-lang lang_id] [-work_dir working_dir]
   ```

   The uninstallation is performed in the language of the locale and not the language set during the installation phase. If you want to uninstall agents in a language other than the locale of the computer, run the **twsinst** script from the */installation_dir*/TWS as follows:

   ```
   ./twsinst -uninst -uname user_name -lang language
   ```

where *language* is the language set during the uninstallation.

-uninst
Uninstalls the IBM Workload Scheduler agent.

-uname *username*
The name of the user for which the IBM Workload Scheduler agent is uninstalled. This user name is not to be confused with the user performing the uninstallation logged on as **administrator** on Windows operating systems and as **root** on UNIX and Linux operating systems.

-wait *minutes*
The number of minutes that the product waits for jobs that are running to complete before starting the uninstallation. If the jobs do not complete during this interval, the uninstallation stops and an error message is displayed. Valid values are integers or **-1** for the product to wait indefinitely. The default is **60** minutes.

-lang *lang_id*
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used.

Note: The **-lang** option is not to be confused with the IBM Workload Scheduler supported language packs.

-work_dir *working_dir*
The temporary directory used for the IBM Workload Scheduler installation process files deployment.

On Windows operating systems:
If you specify a path that contains blanks, enclose it in double quotation marks. If you do not manually specify a path, the path is set to `%temp%\TWA\tws<version_number>`, where `%temp%` is the temporary directory of the operating system.

On UNIX and Linux operating systems:
The path cannot contain blanks. If you do not manually specify a path, the path is set to `/tmp/TWA/tws<version_number>`.

The following is an example of a **twsinst** script that uninstalls the IBM Workload Scheduler agent, originally installed for user named **twsuser**:

On Windows operating systems:

```
cscript twsinst -uninst -uname TWS_user
```

On UNIX and Linux operating systems:

```
./twsinst -uninst -uname TWS_user
```

Chapter 11. Troubleshooting installation, migration, and uninstallation

An overview on troubleshooting installation, migration, and uninstallation of the IBM Workload Scheduler.

Issues dealing with the installation, removal, and configuration of IBM Workload Scheduler and its prerequisites.

For information about issues on the DB2 installation, see the DB2 product documentation.

Installation log files

The type of log files you find on your system depends on the type of installation you performed.

About this task

Logs associated with the different installations.

If a problem occurs during the installation process, read the following logs files:

master domain manager or dynamic domain manager and its backup

- All files created by Installation Manager process, as described in "Installation Manager wizard, silent installation and uninstallation log files."
- All files and subdirectories in the *<tempDir>*/TWA/tws92 directory.
- All WebSphere Application Server files creates by installation process, see "WebSphere Application Server profile log files" on page 265.
- If you are installing for DB2 RDBMS, for more information about the DB2 logs, see "DB2 installation log files" on page 266.

Dynamic agents and fault-tolerant agents
All files created by **twsinst** script, see "The **twsinst** log files" on page 155.

Integration Workbench
For Software Developers Kit, all files and subdirectories in the /tmp/TWA/sdk92 directory.

Job Brokering Definition Console
For the Job Brokering Definition Console, all files and subdirectories in the */tmp/TWA/jbdc92* directory.

For more information about log files, see the *Administration Guide*.

Installation Manager wizard, silent installation and uninstallation log files

About this task

Installation Manager creates the following installation and uninstallation log files common to any package installation, regardless of which components you choose to install:

On Windows operating system

<INSTALLATION_MANAGER_LOGS_DIR>\<YYYYMMDD_HHMM>.xml

On UNIX and Linux operating systems

<INSTALLATION_MANAGER_LOGS_DIR>/<YYYYMMDD_HHMM>.xml

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files, YYYYMMDD is the date and HHMM is the time when the log file is created.

IBM Workload Scheduler installation process creates the following Installation Manager native logs files:

On Windows operating system

<INSTALLATION_MANAGER_LOGS_DIR>\native\<YYYYMMDD_HHMM>.log

On UNIX and Linux operating systems

<INSTALLATION_MANAGER_LOGS_DIR>/native/<YYYYMMDD_HHMM>.log

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files, and YYYYMMDD is the date and HHMM is the time when the log file is created.

The <INSTALLATION_MANAGER_LOGS_DIR> default value is:

On Windows operating system

C:\ProgramData\IBM\InstallationManager\logs

On UNIX and Linux operating systems

/var/ibm/InstallationManager/logs

If more than one native log have the same timestamp, Installation Manager creates the log files with the following name:

On Windows operating system

<INSTALLATION_MANAGER_LOGS_DIR>\native\<YYYYMMDD_HHMMLETTER>.log

On UNIX and Linux operating systems

<INSTALLATION_MANAGER_LOGS_DIR>/native/<YYYYMMDD_HHMMLETTER>.log

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files, YYYYMMDD is the date, HHMM is the time when the log file is created, and LETTER is a letter of the alphabet.

For more information about accessing the log files by using the Installation Manager wizard, see "Accessing Installation Manager log files via wizard."

For more information about creating a *.zip* file of the native log directory, see "Packaging Installation Manager log files via wizard" on page 265

Accessing Installation Manager log files via wizard

About this task

By using the Installation Manager wizard, you can access the Installation Manager log files in the following log directory:

<INSTALLATION_MANAGER_LOGS_DIR>

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the logs files. The <INSTALLATION_MANAGER_LOGS_DIR> default value is:

On Windows operating systems

```
C:\ProgramData\IBM\InstallationManager\logs
```

On UNIX and Linux operating systems

```
/var/ibm/InstallationManager/logs
```

To access the log files by using the wizard, perform the following steps:

1. Open the Installation Manager Start page.
2. Select **File**>**View Log**.
3. The Installation Log panel shows you all the log files saved on your machine. Select the log file whose name is the correct timestamp for your installation process.
4. Depending on the action that you want to perform, click the **Export log file** icon or **Open log file** icon on the upper right side.

Packaging Installation Manager log files via wizard

About this task

By using the Installation Manager wizard, you can create a *.zip* file that contains the following log files:

- Native log files in the <INSTALLATION_MANAGER_LOGS_DIR>\native directory.
- xml log files in the <INSTALLATION_MANAGER_LOGS_DIR> directory.

Where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files.

The <INSTALLATION_MANAGER_LOGS_DIR> default value is:

On Windows operating systems

```
C:\ProgramData\IBM\InstallationManager\logs
```

On UNIX and Linux operating systems

```
/var/ibm/InstallationManager/logs
```

To create a *.zip* file of the *native* log directory, perform the following steps:

1. Open the Installation Manager Start page.
2. Select **Help**>**Export Data for Problem Analysis**.
3. Enter the name of the directory where you want to create the .zip file and the .zip file name.
4. Press **Ok**. A *.zip* file that contains all log files is created in the directory you specified.

WebSphere Application Server profile log files

About this task

The IBM Workload Scheduler installation process creates its own profile in the WebSphere Application Server instance.

The WebSphere Application Server log files is located in the following path:

/<WAS_profile_creation_path>/logs/<SERVER_NAME>

where <WAS_profile_creation_path> is the IBM Workload Scheduler installation directory and <SERVER_NAME> is the server name specified during the installation process.

The default value is:
/<TWS_INST_DIR>/WAS/TWSProfile/logs/<SERVER_NAME>

where <TWS_INST_DIR> is the IBM Workload Scheduler installation directory and <SERVER_NAME> is the server name specified during installation process.

The log for the WebSphere Application Server start can be found at:
/<TWS_INST_DIR>/WAS/TWSProfile/logs/<SERVER_NAME>/startServer.log

where <TWS_INST_DIR> is the IBM Workload Scheduler installation directory and <SERVER_NAME> is the server name specified during installation process.

DB2 installation log files

About this task

For information about DB2 installation log files, see the DB2 documentation.

The `twsinst` log files

About this task

The **twsinst** log file name is:

On Windows operating systems:

<*TWS_INST_DIR*>\logs\
twsinst_<*operating_system*>_<*TWS_user*>^<*version_number*>.log

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is C:\Program Files\IBM\TWA_<TWS_user>.

<operating_system>
The operating system.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

On UNIX and Linux operating systems:

<TWS-INST-DIR>/logs/
twsinst_<*operating_system*>_<*TWS_user*>^<*version_number*>.log

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is /opt/IBM/TWA_<TWS_user>.

<operating_system>
The operating system.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

Packaging log files for support

If a problem occurs with an installation that you cannot resolve, the product support team might ask you to send them all of the installation log files.

For more information about log files, see "Installation log files" on page 263.

Note: Do not remove, add, or modify files in the `<tempDir>/TWA/tws<version_number>` directory because this might cause an installation to fail, or prevent the recovery of a failed installation.

Analyzing return codes for agent installation, upgrade, restore, and uninstallation

Check how your operation completed by analyzing the return codes that are issued by twsinst.

Return codes that you can receive when you are installing, upgrading, restoring, or uninstalling agents. To analyze them and take corrective actions, run the following steps:

On Windows operating systems

1. Display the operation completion return code, by using the following command:

   ```
   echo %ERRORLEVEL%
   ```

2. Analyze the following table to verify how the operation completed:

Table 22. Windows operating system agent return codes

Error Code	Description	User action
0	Success: The operation completed successfully without any warnings or errors.	None.
1	Generic failure	Check the messages that are displayed on the screen by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation cannot create the IBM Workload Scheduler user or assign the correct permission to it.	Verify the operating system policies and configuration. Verify the input values. If necessary, create the user manually before you run the installation.
3	The password is not correct or the installation cannot verify it.	Verify the operating system policies and configuration. Verify the input values.
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.

Table 22. Windows operating system agent return codes (continued)

Error Code	Description	User action
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

On UNIX and Linux operating systems:

1. Display the installation completion return code, by using the following command:

   ```
   echo $?
   ```

2. Analyze the following table to verify how the installation completed:

Table 23. UNIX or Linux operating system agent return codes

Error Code	Description	User action
0	Success: The installation completed successfully without any warnings or errors.	None.
1	Generic failure.	Check the messages that are displayed on the video by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation did not find the IBM Workload Scheduler user or its home directory. The IBM Workload Scheduler user that you specified either does not exist or does not have an associated home directory.	Verify the operating system definition of the IBM Workload Scheduler user.

Table 23. UNIX or Linux operating system agent return codes (continued)

Error Code	Description	User action
3	Not applicable	
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

Problem scenarios: install, reinstall, upgrade, migrate, and uninstall

Known problem scenarios that could occur with the install, reinstall, upgrade, migrate, and uninstall of IBM Workload Scheduler components.

Problems installing on Windows operating systems

The following sections describe problems that could occur when installing on Windows, and their workaround:

Error AWSJIM963E while creating the IBM Workload Scheduler user or while assigning the user policies

While you are installing a master domain manager or a dynamic domain manager, you receive the error AWSJIM963E.

During the installation of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM963E
An error occurred while creating the IBM Workload Scheduler user user_name
or while assigning the user policies.
Verify the operating system policies and configuration. Verify the input values.
If necessary, create the user manually before running the installation.
```

On Windows operating systems, the installation automatically creates the IBM Workload Scheduler user with the appropriate rights, if the user does not already

exist. However, if the installation encountered problems with the creation of the user, you can perform the following steps.

1. Back out of the installation.
2. Create a local user account with a name of your choice on the workstation where you want to install IBM Workload Scheduler.

   Note: You can also use an existing user account. Ensure, however, that this user is a member of the Windows **Administrators** group.
3. Grant to this <*TWS_user*> the following advanced user rights:

   Act as part of the operating system
   Adjust memory quotas
   Log on as batch job
   Log on as a service
   Log on locally
   Replace a process level token
4. Rerun the installation, citing the name of the account you created when requested.

On Windows systems a dialog box is displayed when you install or upgrade

You are installing or upgrading on Windows systems and a dialog box is displayed.

If you enabled the Security Warning, a dialog box is displayed during the installation or upgrade. In this case answer **Run** to continue.

Installing or upgrading on Windows a dialog box is displayed.

Cause and solution

This problem occurs if you enabled the Security Warning for the operating system.

Answer **Run** to continue the upgrade.

On Windows operating systems the prerequisite scan fails with error AWSJIM1001W

You are installing or upgrading on a Windows operating systems and the prerequisite scan fails with the error AWSJIM1001W.

You are installing or upgrading on a Windows operating system. The prerequisite scan fails with the following error even if you have more than 5 MB in the temporary directory:

```
AWSJIM1001W: Error while running the Prerequisite Scan.
The Prerequisite Scan does not run.
Before proceeding with the installation,
check that you have at least 5 MB on your temporary directory
and analyze the Installation Manager log files.
61INFO00:32.93com.ibm.tws.validator.CreateNewWasProfileValidator
- Execute location check for silent
```

Cause and solution

This problem occurs because the Windows command line is not correctly configured. To solve the problem, run the following steps:

1. Configure the command line properly, by running the following command:

```
%systemroot%\system32\regsvr32 %systemroot%\system32\scrrun.dll
```

2. Rerun the installation.

Installing a Master Domain Manager on Windows 64-bit might fail

Installing a Master Domain Manager on Windows 64-bit might fail.

You are installing a Master Domain Manager, or a Backup Master Domain Manager, or a Dynamic Master Domain Manager, or Backup Dynamic Master Domain Manager on a Windows 64- bit operating system using Installation Manager V1.6.1. The installation might fail because of a corrupted Windows script and the following error is displayed.

```
twsinst.vbs(557, 2) (null): Library not registered.
```

Cause and solution

This problem occurs because Installation Manager V1.6.1 makes only 32-bit installations, and if you run a vbs script that uses the element `Scripting.FileSystemObject` in a 64-bit command shell you might have this issue because of a corrupted Windows registry. For more information, see the following link: http://support.microsoft.com/kb/949140. To solve the problem, perform the following steps:

1. Start `c:\windows\syswow64\cmd.exe`.
2. From this shell launch the following commands:

```
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\vbscript.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\jscript.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\dispex.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\scrobj.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\scrrun.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\wshext.dll
%systemroot%\syswow64\regsvr32 %systemroot%\syswow64\wshom.ocx
```

3. Rerun the installation.

To check that the problem is fixed, you can create and run the following script `check.vbs`:

```
Option Explicit

Dim objFSO

Set objFSO = CreateObject("Scripting.FileSystemObject")

Wscript.Echo "FullName: " & Wscript.FullName _
    & vbCrLf & "Name: " & Wscript.Name _
    & vbCrLf & "Path: " & Wscript.Path _
    & vbCrLf & "ScriptFullName: " & Wscript.ScriptFullName _
    & vbCrLf & "ScriptName: " & Wscript.ScriptName _
    & vbCrLf & "Version: " & Wscript.Version _
    & vbCrLf & "GetAbsolutePathName: " & objFSO.GetAbsolutePathName(".")

cscript check.vbs
```

Twsuser cannot access default HOMEPATH folder

Installing a Master Domain Manager on Windows, twsuser cannot access default HOMEPATH folder.

You are installing a Master Domain Manager on a Windows operating system. Connect to the Master Domain Manager as administrator, open a DOS shell and run **runas** command personifying the twsuser:

```
runas /user:twsuser
```

Initialize the command line by launching the **tws_env.cmd** script.

If you try to launch any of the following command line commands:

- dumpsec
- composer
- optman
- wappman

you receive an internal error.

Cause and solution

This problem occurs because the HOMEPATH folder is set by default to:

```
HOMEPATH=\WINDOWS\system32
```

but twsuser doesn't have the required read and write permissions on this folder. To solve the problem, the HOMEPATH folder must be manually changed to the twsuser home path:

```
HOMEPATH=\Users\ITAuser
```

The problem doesn't occur if you connect to the Master Domain Manager with the twsuser credentials by using a remote desktop client.

Other installation problems

Some miscellaneous problems might occur.

Fence is erroneously set to GO.

After an install and then uninstall of a previous version and a reinstall of the latest version of IBM Workload Scheduler, the fence on the master is set to GO.

If you perform an installation of a previous version and then uninstall it and then reinstall the latest version of IBM Workload Scheduler on a master domain manager, the fence setting after the installation is set to GO.

Cause and solution

This problem can occur because versions earlier than V9.4 used to set the fence to GO when they were uninstalled. This setting remains even after an installation of V9.4 or later.

To solve this problem, change the setting using the conman **fence** command.

See the conman **fence** command in the *User's Guide and Reference*.

Generating the customization SQL files when using MicroSoft SQL Server fails with exit code 103 for master domain manager or dynamic domain manager V9.3.0.0

Generating the customization SQL files when using MicroSoft SQL Server fails for master domain manager or dynamic domain manager V9.3.0.0

Before installing V9.3.0.0 of the product, while you are creating the database schema for the master domain manager or the dynamic domain manager, the generation of the SQL files on MicroSoft SQL Server fails when running the script:

```
<images_dir>\dbtools\customizeSQL.bat
```

with the following error message:

```
The JRE location, ("%\iim\jre_7.0.0.sr6_20131213_1238\jre), does not exist or is
invalid. Please specify a correct path for the java runtime home directory.

The script exit code is 103
```

Cause and solution

This error occurs because the script uses a wrong jre home directory name:

```
%\iim\jre_7.0.0.sr6_20131213_1238\jre
```

To circumvent the problem in V9.3.0.0, manually replace the wrong directory name with the correct one, as follows:

```
%\iim\jre_7.0.8000.20141126_1221\jre
```

Note: The problem is fixed in V9.3.0.1

twsinst needs long time to run if the machine does not have enough temporary space

About this task

Problem:

If the machine does not have enough temporary space, the agent installation performed by using the **twsinst** script needs a long time to run, due to concomitant use of the temporary directory by the **twsinst** script and by the check prerequisites script started by the**twsinst** script.

Cause and solution:

You can solve the long time execution problem by manually running the **prereq_checker.sh** script on UNIX and Linux operating systems and **prereq_checker.bat** script on Windows operating systems, that performs the check prerequisites process before running the **twsinst**.

You can manually run the check prerequisites script, by performing the following steps:

On Windows operating systems:

1. Log on as Administrator on the machine where you want to install the agent.
2. Go to the <CD-ROM>\Prerequisites directory where <*CD-ROM*> is the directory where you mounted the CD-ROM.
3. Run:

   Dynamic agent or IBM Workload Scheduler for z/OS Agent

   ```
   prereq_checker.bat "DA1 09010000"
   -p "DA1.inst_dir=<TWS_INST_DIR>,DA1.work_dir=<TEMP_DIR>"
   ```

   where <*TWS_INST_DIR*> is the IBM Workload Scheduler installation directory and <*TEMP_DIR*> is the temporary directory.

   Fault tolerant-agent

   ```
   prereq_checker.bat "FTA 09010000"
   -p "FTA.inst_dir=<TWS_INST_DIR>,,FTA.work_dir=<TEMP_DIR>"
   ```

where <*TWS_INST_DIR*> is the IBM Workload Scheduler installation directory and <*TEMP_DIR*> is the temporary directory.

On UNIX and Linux operating systems:

1. Log on as root on the machine where you want to install the agent.
2. Go to the `<CD-ROM>\Prerequisites` directory where <*CD-ROM*> is the directory where you mounted the CD-ROM.
3. Run:

   Dynamic agent or IBM Workload Scheduler for z/OS Agent

   ```
   ./prereq_checker.sh "DA1 09010000,TWA 09010000"
   -p "DA1.inst_dir=<TWS_INST_DIR>,DA1.work_dir=<TEMP_DIR>"
   ```

   where <*TWS_INST_DIR*> is the IBM Workload Scheduler installation directory and <*TEMP_DIR*> is the temporary directory.

   Fault tolerant-agent

   ```
   ./prereq_checker.sh "FTA 09010000,TWA 09010000"
   -p "FTA.inst_dir=<TWS_INST_DIR>,FTA.work_dir=<TEMP_DIR>"
   ```

   where <*TWS_INST_DIR*> is the IBM Workload Scheduler installation directory and <*TEMP_DIR*> is the temporary directory.

On LINUX operating systems Japanese characters might be corrupted

The Japanese characters are showed corrupted on Linux operating systems

On Linux operating systems, it might happen that the Japanese language is showed with corrupted characters when the codepage setting is `ja_JP.UTF-8`.

Cause and solution

This error might occur because of wrong codepage settings in variables for local language.

To solve the problem, perform the following actions:

1. Stop the fault-tolerant agent and check that no process is running (including **netman**).
2. Export the following variables either in the shell where you restart the fault-tolerant agent or in the `StartUp` script. Moreover, export the same variables in the fault-tolerant agent file `jobmanrc`:

   ```
   LANG=ja_JP.eucJP
   LC_CTYPE=ja_JP.eucJP
   LC_NUMERIC=ja_JP.eucJP
   LC_TIME=ja_JP.eucJP
   LC_COLLATE=ja_JP.eucJP
   LC_MONETARY=ja_JP.eucJP
   LC_MESSAGES=ja_JP.eucJP
   LC_PAPER=ja_JP.eucJP
   LC_NAME=ja_JP.eucJP
   LC_ADDRESS=ja_JP.eucJP
   LC_TELEPHONE=ja_JP.eucJP
   LC_MEASUREMENT=ja_JP.eucJP
   LC_IDENTIFICATION=ja_JP.eucJP
   ```

3. Start again the fault-tolerant agent.

On UNIX operating systems twsinst fails with exit value 2 while running the "Start IBM Workload Scheduler" step

About this task

Problem:

On UNIX operating systems, **twsinst** fails with the following error:

```
twsinst -uname TWS_user -inst_dir TWS_user_inst_path .........
.....................................................................
.....................................................................
.....................................................................

ACTION STEP: AWSFAB067I Start up Tivoli Workload Scheduler
     EXIT VALUE: 2

FAILED:
*****************************
\ntebctl-tws_cpa_agent_TWS_user agent not installed properly
*****************************
```

Cause and solution:

If the `TWS_user` for which you are installing the IBM Workload Scheduler instance does not have read and run privileges in the `TWS_user_inst_path` installation path, the agent installation fails.

You can solve the problem by manually giving read and run privileges to the `TWS_user` in the `TWS_user_inst_path` installation path and then rerunning the installation.

Miscellaneous failures

The installation fails and the cause is not immediately obvious from the log messages.

Cause and solution

The cause of the failure could be any of the following:

The FTP transfer of the files to the node was not done in binary mode

You copied the install directory from the eImage to the local hard disk using FTP, but did not specify the binary option. Make sure the entire directory is transferred by FTP in binary mode.

Note: The directory on the local hard disk can have any name, but it is important to have a parent directory available for the twsinst installation, because some temporary files need to be located there.

For example:

```
/temp/HP-UX
```

or

```
/temp/TWS84/HP-UX
```

There is not enough disk space available for the installation

Check that there is enough disk space for the installation on your chosen fileset.

For more information about the amount of space required for installation, see the IBM Workload Scheduler System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

File names did not retain their original case

On UNIX, check that file names retain their case. For example, the file "TWS_size.txt" cannot be "tws_size.txt".

One or more required files were not copied from the root of the installation eImage

Check that the number of files copied from the eImage is the same as that on the eImage. If not, copy the files again.

The repository location specified in response file is not found

Problem description:

During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

Cause and solution

Perform the following steps:

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

Prerequisite check fails with AWSJIM1001W during master domain manager installation.

While you are installing a master domain manager with DB2 Server, the prerequisite check fails with error AWSJIM1001W.

During the installation of a master domain manager with a DB2 Server, a lack of swap space can prevent the prerequisite check from running, and your receive the following error:

```
AWSJIM1001W
Error while running the Prerequisite Scan. The Prerequisite Scan cannot proceed.
User response
Before proceeding with the installation, check that you have at least 5 MB
in your temporary directory and analyze the Installation Manager log files.
```

This error stops the prerequisite check, therefore any further space lack cannot be detected at this time.

Cause and solution

The prerequisite check needs at least 5 MB of free space in the temporary directory.

To solve this problem, free some space in the temporary directory and rerun the installation.

Dynamic Domain Manager installation fails due to missing license plug-in

While you are installing a dynamic domain manager, you receive the error CRIMC1017E.

During the installation of a dynamic domain manager, you receive the following error:

```
CRIMC1017E: Failed to locate plug-in com.ibm.tws.enginepanels_9.3.0.201310100746.
  Cannot find the table of contents file for an artifact in the repository.
Table of contents files are located under the atoc directory in the repository.
  If the repository files were transferred from a different location,
verify that the files were not altered during the transfer operation.
Copy the repository files to a different location and install from that location.
CRIMC1086E: Failed to read artifact table of contents
 at '/mnt/swrep/TWS_9.3/IM/20131010'.
 Cannot read the table of contents file from the repository.
You might have an issue with your network connection.
 A table of contents file located under the atoc directory
 in the source repository might be corrupted. If you retrieve
the file from a machine or a network in your environment,
the file system might be mounted incorrectly.
Verify your network connection.
If the source repository files were transfered
from a different location before the installation,
verify that the files were not altered during the transfer operation.
Copy the source files to a different file system and install from that file system.
    java.io.IOException: No locks available
```

Cause and solution

This problem can happen if the `cic.repo.locking` option is set to **true** or it does not exist in the IBM Installation Manager `config.ini` file.

To solve the problem, add the option `cic.repo.locking=false` in the IBM Installation Manager `config.ini` file. The file is located:

On Windows operating systems:

```
C:\Program Files\IBM\Installation Manager\eclipse\configuration\
config.ini
```

On UNIX and Linux operating systems:

```
/opt/IBM/InstallationManager/eclipse/config.ini or
/opt/IBM/InstallationManager/eclipse/configuration
```

This option stops IBM Installation Manager from trying to lock the repository. Usually during the installation IBM Installation Manager locks the repository so that no one can modify it. This action is not run if you set the option `cic.repo.locking=false`.

Installation by using Installation Manager on AIX operating systems fails with an unhandled exception error

Installing a master domain manager, a dynamic domain manager or a Dynamic Workload Console by using Installation Manager, you receive an unhandled exception error.

Cause and solution

This error occurs because you do not have the prerequisite libraries that are required by Installation Manager on AIX operating systems. For more information about these libraries, see the technote about **Required gtk libraries for IBM Installation Manager on AIX**.

To solve the problem, install the required libraries and restart the installation process.

Master domain manager or dynamic domain manager DB2 installation fails with error AWSJIM923E

While you are installing a master domain manager or a dynamic domain manager, you receive the error AWSJIM923E.

During the installation of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM923E
An error occurred while installing the database database_name.
The database exists, but it is not in the catalog.
```

Cause and solution

This error occurs because the database was not cataloged.

To solve the problem, run the following steps:

1. Verify whether the node is in the cataloged and is pointing to the correct database server workstation. If you used the TWS default value as database name, the node name is TWS_ND. Do the following actions:
   a. If the node is incorrectly cataloged, uncatalog it by using the following command:

      ```
      db2 uncatalog node
      ```

   b. If the node is not cataloged or you uncataloged it, catalog it again by using the following command:
      - If the database is remote, that is you are using a DB2 client, run the following command:

        ```
        db2 catalog tcpip node node_name remote db2_hostname server db2_port
        ```

        In case you did not change the default TWS value as database name, use the following command:

        ```
        db2 catalog tcpip node TWS_ND remote db2_hostname server db2_port
        ```

      - If the database is local, that is you are using a DB2 server, run the following command:

        ```
        db2 catalog local node node_name instance db2_instance
        db2 catalog tcpip node LBNODE remote 127.0.0.1 server db2_port
        ```

2. Catalog the database by using the following command:
   - If the database is remote, that is you are using a DB2 client, run the following command:

     ```
     db2 catalog db db_name as db_name_DB at node node_name
     db2 catalog db db_name at node node_name
     ```

   - If the database is local, that is you are using a DB2 server, run the following command:

     ```
     db2 catalog db db_name as db_name_DB at node LBNODE
     db2 catalog db db_name
     ```

Master domain manager or dynamic domain manager installation fails with error AWSJIM924E

While you are installing a master domain manager or a dynamic domain manager, you receive the error AWSJIM924E.

During the installation of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM924E
An error occurred while installing the database database_name.
You are installing either a master domain manager
or a dynamic domain manager as a backup,
but the database already exists in the catalog.
```

Cause and solution

This error occurs because the database exists in the catalog.

To solve the problem, run the following steps:

1. Verify that the database specified in the message, for example TWS if you did not change the default at installation time, is present in the catalog by running the following command:

   ```
   db2 list db directory
   ```

2. If it is present in the catalog, run the following command to uncatalog it:

   ```
   db2 uncatalog db DB_NAME
   ```

3. Uncatalog the node by running the following command:

   ```
   db2 uncatalog node NODE_NAME
   ```

Master domain manager or dynamic domain manager installation fails with error AWSJIM928E

While you are installing a master domain manager or a dynamic domain manager, you receive the error AWSJIM928E.

During the installation of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM928E
An error occurred while creating the Windows service
for the IBM Workload Scheduler WebSphere Application Server profile.
Check the status of the Windows Service Manager.
```

Cause and solution

This error occurs because the installation cannot create the WebSphere Application Server Windows service.

To solve the problem, run the following steps:

1. Check the status of the Windows Service Manager and Windows Events.
2. Solve the errors and restart the installation. If you did not find any errors, reboot the workstation.

Master domain manager or dynamic domain manager installation completes with warning AWSJIM970W

While you are installing a master domain manager or a dynamic domain manager, you receive the warning AWSJIM970W.

During the installation of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM970W
The installation completed, but errors occurred
while adding the FINAL job stream to the database;
add it manually.
```

Cause and solution

You can find the cause of the problem in the WebSphere Application Server log files.

To complete the installation, run the following procedure:

1. Analyze the WebSphere Application Server log files. Find the error that caused the problem and resolve it.
2. Go to the TWS directory, by using the following command:

   ```
   -cd installation_dir/TWS
   ```
3. Set the IBM Workload Scheduler environment, by using the following command:

   Windows operating systems:

   ```
   tws_env.cmd
   ```

   UNIX and Linux operating systems:

   ```
   . ./tws_env.sh
   ```
4. Add the FINAL and FINALPOSTREPORTS job streams definition to the database, by using the following command:

   ```
   composer add SFinal
   ```

   where Sfinal is the name of the file that contains the FINAL and FINALPOSTREPORTS job stream definitions.

Master domain manager or dynamic domain manager warning AWSJIM971W starting the WebSphere Application Server

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM971W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM971W
The installation completed, but errors occurred while starting
the WebSphere Application Server.
Verify the WebSphere Application Server log files.
```

Cause and solution

This problem typically occurs for a timeout problem.

To complete the installation or the upgrade, start the WebSphere Application Server using the following command:

Windows operating systems:

```
startWas.bat
```

UNIX and Linux operating systems:

```
./startWas.sh
```

Master domain manager or dynamic domain manager installation completes with warning AWSJIM976W

You receive a AWSJIM976W commit action failure when you are installing a master domain manager or a dynamic domain manager.

The following warning is displayed (commit action failure) when you are installing a master domain manager or a dynamic domain manager specifying Oracle as database:

```
AWSJIM976W
The installation completed, but an error occurred while
adding the master domain manager workstation definition to the database.
Analyze the WebSphere Application Server logs for further details
```

Cause and solution

To understand the cause of the problem, analyze the WebSphere Application Server log files located in the */<WAS_profile_creation_path>*/logs/<SERVER_NAME> path and run:

- The procedure described in **"Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError"**, if in the log file you find the following error:

  ```
  Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError:
  <ORACLE_HOME>/lib/<ORACLE_LIB> (<ORACLE_HOME>/lib/<ORACLE_LIB>:
  wrong ELF class: ELFCLASS32)
  ```

  where:

  WAS_profile_creation_path
  Specify the path where you created the WebSphere Application Server profile.

  server_name
  Specify the name of the server you used during the installation process.

  The default WebSphere Application Server path is /<TWS_INST_DIR>/WAS/TWSProfile/logs/<SERVER_NAME>.

- The procedure described in "**Any other error in the WebSphere Application Server log file**", if you find any other error in the WebSphere Application Server log.

Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError

This problem occurs because IBM Workload Scheduler uses 64-bit libraries and the Oracle database you specified during the installation uses 32-bit libraries.

To solve the problem, perform the following procedure:

1. Change the Oracle JBDC from **Type2** to **Type4** using the **changeDataSourceProperties** WebSphere Application Server tool. Do the following:

   On Windows operating systems:

   a. Log on as administrator.
   b. Go to the <TWA_home>\wastools directory.
   c. Run **showDataSourceProperties.bat**
   d. Save the output to a file using the following command:

      ```
      showDataSourceProperties.bat > DataSourceProperties.txt
      ```

   e. Edit the DataSourceProperties.txt file.
   f. Change the line:

      ```
      OracleType2JndiName=jdbc/twsdb
       to
      OracleType2JndiName=jdbc/twsdb_old
      ```

   g. Change the line:

      ```
      OracleType4JndiName=
       to
      OracleType4JndiName=jdbc/twsdb
      ```

h. Set:

```
OracleType4URL=jdbc:oracle:thin:@//host_name:
oracle_listener_port/database_instance_name
```

where:

host_name
Specify the host name or TCP/IP address of the ORACLE server.

oracle_listener_port
Specify port number of the ORACLE listener on the ORACLE server.

database_instance_name
Specify the database instance name (SID) that is connected to IBM Workload Scheduler

You can find this information in the <ORACLE_HOME>\NETWORK\ADMIN\tnsnames.ora file located on the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:

```
 <hostname> =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
(PORT = oracle_listener_port))
)
CONNECT_DATA =
(SERVICE_NAME = database_instance_name)
)
)
```

i. Save the DataSourceProperties.txt file.

j. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.

k. Run the following command to apply the change:

```
changeDataSourceProperties.bat DataSourceProperties.txt
```

l. Start the WebSphere Application Server using the **conman startappserver** command.

m. Verify that the change has been implemented by running the **showDataSourceProperties.bat** command and verifying the output.

n. Perform the steps that the product could not run:

1) Add the workstation definition using the following command:

```
composer add cpudef_wnt
```

2) Manually create the Windows user, by using the following command:

```
composer new user
```

The text editor opens. Write the following information:

```
USERNAME<master>#<domain>\<user>
PASSWORD "<password>"
END

USERNAME <master>#<user>
PASSWORD "<password>"
END
```

```
USERNAME <user>
PASSWORD "<password>"
END
```

Where:

master
Specify the master domain manager workstation name.

user Specify the IBM Workload Scheduler user.

password
Specify the password of the IBM Workload Scheduler user.

domain
Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.

o. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

```
planman resync
```

p. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

```
copy <TWSUSER_HOME>\.TWS\useropts_<TWS_USER>
%userprofile%\.TWS\useropts_<TWS_USER>
```

where:

TWSUSER_HOME
Specify the IBM Workload Scheduler user home directory.

TWS_USER
Specify IBM Workload Scheduler user.

%userprofile%
Specify the environment variable of the user that is installing the IBM Workload Scheduler product.

On UNIX and Linux operating systems:

a. Log on as root.

b. Go to the TWA_home/wastools directory.

c. Run **showDataSourceProperties.sh**

d. Save the output to a file using the following command:

```
./showDataSourceProperties.sh > DataSourceProperties.txt
```

e. Edit the DataSourceProperties.txt file.

f. Change the line:

```
OracleType2JndiName=jdbc/twsdb
 to
OracleType2JndiName=jdbc/twsdb_old
```

g. Change the line:

```
OracleType4JndiName=
 to
OracleType4JndiName=jdbc/twsdb
```

h. Set:

```
OracleType4URL=jdbc:oracle:thin:@//host_name:
oracle_listener_port/database_instance_name
```

where:

host_name
Specify the host name or TCP/IP address of the ORACLE server.

oracle_listener_port
Specify port number of the ORACLE listener on the ORACLE server.

database_instance_name
Specify the database instance name (SID) that is connected to IBM Workload Scheduler

You can find this information in the <ORACLE_HOME>/NETWORK/ADMIN/tnsnames.ora file located on the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:

```
 <hostname> =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
(PORT = oracle_listener_port))
)
CONNECT_DATA =
(SERVICE_NAME = database_instance_name)
)
)
```

i. Save the DataSourceProperties.txt file.

j. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command

k. Run the following command to apply the change:

```
changeDataSourceProperties.sh DataSourceProperties.txt
```

l. Start the WebSphere Application Server using the **conman startappserver** command.

m. Verify that the change has been implemented by running the command and verifying the output.

```
./showDataSourceProperties.sh
```

n. Add the workstation definition using the following command:

```
composer add cpudef_unix
```

o. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

```
planman resync
```

p. Assign the files ownership to the IBM Workload Scheduler user by using the following command:

```
<INSTALL_DIR>/TWS/_uninstall/ACTIONTOOLS/twsServerRightsAction.sh
 <INSTALL_DIR> <TWS_USER> <TWS_GROUP> <ROOT_GROUP>
```

where:

INSTALL_DIR
Specify the IBM Workload Scheduler installation directory.

TWS_USER
Specify IBM Workload Scheduler user.

TWS_GROUP
Specify the IBM Workload Scheduler group.

ROOT_GROUP
Specify the group of the root user.

q. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

```
cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
 $HOME/.TWS/useropts_<TWS_USER>
```

where:

TWSUSER_HOME
Specify the IBM Workload Scheduler user home directory.

TWS_USER
Specify IBM Workload Scheduler user.

$HOME
Specify the $HOME environment variable of the root user.

Any other error in the WebSphere Application Server log file

To understand the cause of the problem, analyze the WebSphere Application Server log files located in the */<WAS_profile_creation_path>*/logs/<SERVER_NAME> path. This problem can occur if you have database connection problems. Correct the error and run the following procedure:

On Windows operating systems:

1. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.
2. Start the WebSphere Application Server using the **conman startappserver** command.
3. Perform the steps that the product could not run:
   a. Add the workstation definition using the following command:

   ```
   composer add cpudef_wnt
   ```

   b. Manually create the Windows user, by using the following command:

   ```
   composer new user
   ```

   The text editor opens. Write the following information:

   ```
   USERNAME<master>#<domain>\<user>
   PASSWORD "<password>"
   END

   USERNAME <master>#<user>
   PASSWORD "<password>"
   END

   USERNAME <user>
   PASSWORD "<password>"
   END
   ```

   Where:

   master
   Specify the master domain manager workstation name.

   user Specify the IBM Workload Scheduler user.

   password
   Specify the password of the IBM Workload Scheduler user.

domain
Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.

4. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

   ```
   planman resync
   ```

5. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

   ```
   copy <TWSUSER_HOME>\.TWS\useropts_<TWS_USER>
   %userprofile%\.TWS\useropts_<TWS_USER>
   ```

   where:

   TWSUSER_HOME
   Specify the IBM Workload Scheduler user home directory.

   TWS_USER
   Specify IBM Workload Scheduler user.

   %userprofile%
   Specify the environment variable of the user that is installing the IBM Workload Scheduler product.

On UNIX and Linux operating systems:

1. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command
2. Start the WebSphere Application Server using the **conman startappserver** command.
3. Add the workstation definition using the following command:

   ```
   composer add cpudef_unix
   ```

4. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

   ```
   planman resync
   ```

5. Assign the files ownership to the IBM Workload Scheduler user by using the following command:

   ```
   <INSTALL_DIR>/TWS/_uninstall/ACTIONTOOLS/twsServerRightsAction.sh
   <INSTALL_DIR> <TWS_USER> <TWS_GROUP> <ROOT_GROUP>
   ```

   where:

   INSTALL_DIR
   Specify the IBM Workload Scheduler installation directory.

   TWS_USER
   Specify IBM Workload Scheduler user.

   TWS_GROUP
   Specify the IBM Workload Scheduler group.

   ROOT_GROUP
   Specify the group of the root user.

6. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

   ```
   cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
   $HOME/.TWS/useropts_<TWS_USER>
   ```

where:

TWSUSER_HOME
Specify the IBM Workload Scheduler user home directory.

TWS_USER
Specify IBM Workload Scheduler user.

$HOME
Specify the $HOME environment variable of the root user.

Warning AWSJIM974W while starting the IBM Workload Scheduler instance

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM974W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM974W
An error occurred while starting the IBM Workload Scheduler instance.
Analyze the files in the stdlist folder for further details.
```

Cause and solution

To understand the cause of the problem, analyze the log files that are located in the following directory:

Windows operating systems:
TWA_installation_dir\TWS\stdlist\logs

A possible case of the problem is that both the **Tivoli Token service** and the **IBM Workload Scheduler for <*TWS_user*>** service (backup) fail to start for the first time (after a successful installation).

UNIX and Linux operating systems:
TWA_installation_dir/TWS/stdlist/logs

To complete the installation or the upgrade, start the IBM Workload Scheduler instance, by running the following command from the *TWA_installation_dir*/TWS directory:

Windows operating systems:
Startup

UNIX and Linux operating systems:
StartUp

Warning AWSJIM975W while starting the dynamic agent embedded in the IBM Workload Scheduler instance

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM975W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM975W
An error occurred while starting
the dynamic agent embedded in the instance.
Analyze the files in the stdlist/JM folder for further details.
```

Cause and solution

To understand the cause of the problem, analyze the fog files that are located in the following directory:

Windows operating systems:
TWA_installation_dir\TWS\stdlist\JM

UNIX and Linux operating systems:
TWA_installation_dir/TWS/stdlist/JM

To complete the installation or the upgrade, start the IBM Workload Scheduler dynamic agent, by running the following command from the *TWA_installation_dir*/TWS directory:

Windows operating systems:
StartupLwa

UNIX and Linux operating systems:
StartUpLwa

Warning AWSJIM977W while adding the Windows user definition to the database

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM977W.

During the installation of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM977W
The installation completed, but an error occurred while adding
the Windows User definition to the database.
Analyze the WebSphere Application Server logs for further details.
```

Cause and solution

To understand the cause of the problem, analyze the WebSphere Application Server log files located in the */<WAS_profile_creation_path>*/logs/<SERVER_NAME> path and run:

- The procedure described in **"Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError"**, if in the log file you find the following error:

  ```
  Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError:
  <ORACLE_HOME>/lib/<ORACLE_LIB> (<ORACLE_HOME>/lib/<ORACLE_LIB>:
  wrong ELF class: ELFCLASS32)
  ```

  where:

  WAS_profile_creation_path
  Specify the path where you created the WebSphere Application Server profile.

  server_name
  Specify the name of the server you used during the installation process.

  The default WebSphere Application Server path is /<TWS_INST_DIR>/WAS/TWSProfile/logs/<SERVER_NAME>.
- The procedure described in "**Any other error in the WebSphere Application Server log file**", if you find any other error in the WebSphere Application Server log.

Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError

This problem occurs because IBM Workload Scheduler uses 64-bit libraries and the Oracle database you specified during the installation uses 32-bit libraries.

To solve the problem, perform the following procedure:

1. Change the Oracle JBDC from **Type2** to **Type4** using the **changeDataSourceProperties** WebSphere Application Server tool.
2. Log on as administrator.
3. Go to the <TWA_home>\wastools directory
4. Run **showDataSourceProperties.bat**
5. Save the output to a file using the following command:

   showDataSourceProperties.bat > DataSourceProperties.txt
6. Edit the DataSourceProperties.txt file.
7. Change the line:

   ```
   OracleType2JndiName=jdbc/twsdb
    to
   OracleType2JndiName=jdbc/twsdb_old
   ```
8. Change the line:

   ```
   OracleType4JndiName=
    to
   OracleType4JndiName=jdbc/twsdb
   ```
9. Set:

   OracleType4URL=jdbc:oracle:thin:@//*host_name*:
   oracle_listener_port/database_instance_name

   where:

   host_name
   Specify the host name or TCP/IP address of the ORACLE server.

   oracle_listener_port
   Specify port number of the ORACLE listener on the ORACLE server.

   database_instance_name
   Specify the database instance name (SID) that is connected to IBM Workload Scheduler

   You can find this information in the <ORACLE_HOME>\NETWORK\ADMIN\ tnsnames.ora file located on the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:

   ```
    <hostname> =
   (DESCRIPTION =
   (ADDRESS_LIST =
   (ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
   (PORT = oracle_listener_port))
   )
   CONNECT_DATA =
   (SERVICE_NAME = database_instance_name)
   )
   )
   ```
10. Save the DataSourceProperties.txt file.
11. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.
12. Run the following command to apply the change:

    changeDataSourceProperties.bat DataSourceProperties.txt

13. Start the WebSphere Application Server using the **conman startappserver** command.
14. Verify that the change has been implemented by running the **showDataSourceProperties.bat** command and verifying the output.
15. Manually create the Windows user, by using the following command:

    ```
    composer new user
    ```

    The text editor opens. Write the following information:

    ```
    USERNAME<master>#<domain>\<user>
    PASSWORD "<password>"
    END

    USERNAME <master>#<user>
    PASSWORD "<password>"
    END

    USERNAME <user>
    PASSWORD "<password>"
    END
    ```

    Where:

    master
    Specify the master domain manager workstation name.

    user Specify the IBM Workload Scheduler user.

    password
    Specify the password of the IBM Workload Scheduler user.

    domain
    Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.
16. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

    ```
    planman resync
    ```
17. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

    ```
    cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
     $HOME/.TWS/useropts_<TWS_USER>
    ```

    where:

    TWSUSER_HOME
    Specify the IBM Workload Scheduler user home directory.

    TWS_USER
    Specify IBM Workload Scheduler user.

    $HOME
    Specify the $HOME environment variable of the root user.

Any other error in the WebSphere Application Server log file

To understand the cause of the problem analyze the WebSphere Application Server log files located in the /<*WAS_profile_creation_path*>/logs/<SERVER_NAME> path. This problem can occur if you have database connection problems. Correct the error and run the following procedure:

1. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.
2. Start the WebSphere Application Server using the **conman startappserver** command.
3. Manually create the Windows user, by using the following command:

   ```
   composer new user
   ```

   The text editor opens. Write the following information:

   ```
   USERNAME<master>#<domain>\<user>
   PASSWORD "<password>"
   END

   USERNAME <master>#<user>
   PASSWORD "<password>"
   END

   USERNAME <user>
   PASSWORD "<password>"
   END
   ```

   Where:

   master
   Specify the master domain manager workstation name.

   user Specify the IBM Workload Scheduler user.

   password
   Specify the password of the IBM Workload Scheduler user.

   domain
   Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.
4. Perform a replication between the `Symphony` file and the plan data stored in the database, by running the following command:

   ```
   planman resync
   ```
5. Copy the `useropts` file for the IBM Workload Scheduler user, by running the following command:

   ```
   cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
   $HOME/.TWS/useropts_<TWS_USER>
   ```

   where:

   TWSUSER_HOME
   Specify the IBM Workload Scheduler user home directory.

   TWS_USER
   Specify IBM Workload Scheduler user.

   $HOME
   Specify the $HOME environment variable of the root user.

Warning AWSJIM979W while setting the ownership for the IBM Workload Scheduler server files

After you install a master domain manager or a dynamic domain manager, you receive the warning AWSJIM979W.

During the installation of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM979W
The installation completed, but an error occurred while setting
the ownership for the IBM Workload Scheduler Server files.
The instance is working, but some files still belong
to the root owner instead of belonging to TWS_user.
Analyze the log files for details.
```

Cause and solution

To complete the installation or the upgrade, run the following procedure as root:

1. Assign the files ownership to the IBM Workload Scheduler user by running the following command :

   ```
   <INSTALL_DIR>/TWS/_uninstall/ACTIONTOOLS/twsServerRightsAction.sh
    <INSTALL_DIR> <TWS_USER> <TWS_GROUP> <ROOT_GROUP>
   ```

   where:

   INSTALL_DIR
   Specify the IBM Workload Scheduler installation directory. The default is /opt/IBM/TWA/TWS.

   TWS_USER
   Specify IBM Workload Scheduler user.

   TWS_GROUP
   Specify the IBM Workload Scheduler group.

   ROOT_GROUP
   Specify the group of the root user.

2. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

   ```
   cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
    $HOME/.TWS/useropts_<TWS_USER>
   ```

   where:

   TWSUSER_HOME
   Specify the IBM Workload Scheduler user home directory.

   TWS_USER
   Specify IBM Workload Scheduler user.

   $HOME
   Specify the $HOME environment variable of the root user.

Reinstallation problems

The following problems might be encountered during the upgrade process.

Reinstalling a master domain manager or dynamic domain manager pointing to a remote IBM Workload Scheduler database fails

You are reinstalling a master domain manager or dynamic domain manager on a workstation that points to a remote IBM Workload Scheduler database, and your local DB2 client was not configured.

Cause and solution

The installation fails because your DB2 client must be manually configured. To configure it, perform the following steps as DB2 administrator:

1. Create a node:

   ```
   db2 catalog tcpip node <TWS_db_name>_ND remotte <hostname_db_server>
   server <port_db_server>
   ```

2. Attach the node:

   ```
   db2 attach to <TWS_db_name>_ND user <TWS_admin_user> using <TWS_admin_pwd>
   ```

3. Catalog the TWS database:

   ```
   db2 catalog db <TWS_db_name> at node <TWS_db_name>_ND
   ```

4. Catalog the TWS_DB database:

   ```
   db2 catalog db <TWS_db_name> as <TWS_db_name>_DB at node <TWS_db_name>_ND
   ```

Upgrade problems

The following problems might be encountered during the upgrade process.

Master upgrade fails during database upgrade

Upgrade of the master domain manager fails during the upgrade of the Oracle database due to JVM issues.

During the upgrade of the master domain manager where an Oracle database is used, the installation must be performed using a connection that is not in SSL between the machine where the upgrade is being performed and the machine where the Oracle database is installed.

Cause and solution

Ensure that the connection between the machine where the upgrade is being performed and the machine where the Oracle database is installed is not in SSL.

Retrieving IBM Workload Scheduler instance information data fails with error AWSJIM018E

You are performing a wizard master domain manager or dynamic domain manager upgrade.

In the Installation Manager Install Package panel, after you entered the *Installation Directory* field and click **Next** and in the Feature panel after you check the correct feature selection and click **Next**, you have the following error message:

```
AWSJIM018E The product cannot retrieve the <TWS_PROPERTIES> parameter from the
Tivoli Workload Scheduler instance you want to upgrade.
Check the Installation Manager log for details on the error.
Check the BrokerWorkstation.properties,  JobManager.ini,  TWSConfig.properties,
ita.ini, localopts, globalopts files,
and the registry to verify if the parameter was correctly defined.
```

Where *<TWS_PROPERTIES>* is the IBM Workload Scheduler properties for which the installation properties is unable to retrieve the correct value. The *<TWS_PROPERTIES>* is contained in one of the following IBM Workload Scheduler properties files:

- `BrokerWorkstation.properties`.
- `JobManager.ini`.
- `TWSConfig.properties`.
- `ita.ini`.
- `localopts`.
- `globalopts`.

- Installation Registry file.

Cause and solution

This problem has occurred because the installation process is unable to retrieve the information data in the installation directory that you specified, in one of the following IBM Workload Scheduler properties files:

- `BrokerWorkstation.properties`.
- `JobManager.ini`.
- `TWSConfig.properties`.
- `ita.ini`.
- `localopts`.
- `globalopts`.
- Registry file.

If you entered the correct installation directory value, check whether the IBM Workload Scheduler properties files are corrupted or incomplete.

Registry file information not found during upgrade

You have tried to upgrade a stand-alone, fault-tolerant agent (an agent that is not shared with other components and does not have the connector feature) but the upgrade fails. If you were upgrading using the **twsinst** script, you may have seen the following error message:

```
AWSFAB025E You are performing an update or uninstall operation, but the
installation script has failed to find a previous instance of Tivoli
Workload Scheduler in the Tivoli Workload Scheduler registry file. The
script expected to find an entry belonging to the following user:user_name.
and in the following registry file: registry_file_name.
```

If you were performing a silent installation, you may have seen the following error message:

```
AWSJIS165E No valid instance of Tivoli Workload Automation has been specified.
Specify a valid instance or install the component in a new instance.
```

Cause and solution

This problem has occurred because of the following possible reasons:

- You have defined specified an incorrect installation path and the registry file cannot be found.
- You have used a user name that is not associated with the specific instance of IBM Workload Scheduler agent that you are upgrading.
- You are upgrading a stand-alone, fault-tolerant agent that has a corrupt registry file.

If you are sure you are using the correct installation path and user name, you can upgrade this agent without having to reinstall the product by using the IBM Workload Scheduler registry file recovery option, which re-creates the necessary files. See “Upgrading when there are corrupt registry files” on page 226 for the procedures on how to use the recovery option according to your upgrade method.

Insufficient memory message when you upgrade the product on Windows systems

Upgrading on Windows systems an `insufficient memory` message is present in the Installation Manager log file.

Upgrading on Windows you receive an error similar to the following in the Installation Manager log files:

```
-installDir "C:\Program Files\IBM\TWA92GA"
-backupDir C:\Users\ADMINI~1\AppData\Local\Temp\tws93UpgradeBackup
INSTALLDIR="C:\Program Files\IBM\TWA92GA"
BACKUPDIR=C:\Users\ADMINI~1\AppData\Local\Temp\tws93UpgradeBackup
Insufficient memory
1855 File(s) copied
Possible error, errorlevel=4, Backupping C:\Program Files\IBM\TWA92GA files,
check system stderr/stdout.
```

Cause and solution

This problem occurs if the workstation where you are upgrading does not have enough RAM to complete the operation.

To solve the problem, verify whether there are processes that are consuming the RAM. In this case, stop them, and rerun the upgrade.

AWSJIM267E Unable to query the database to retrieve some table information

You are upgrading and receive the "Unable to query the database to retrieve some table information" error.

Upgrading you receive the following error on the window:

```
AWSJIM267E:
Unable to query the database to retrieve some table information.
Check the logs for details.
```

and find the following error in the Installation Manager log files:

```
SQL0443N  Routine "SYSPROC.SNAPSHOT_CONTAINER"
(specific name  "SNAPSHOT_CONTAINER")
has returned an error SQLSTATE with diagnostic text "".
SQLSTATE=38553
```

Cause and solution

This problem occurs during an upgrade for the following reasons:

- The mode setting for the DB2 `/home/db2inst1/sqllib/.ftok` file is not correct.
- There is a connection problem with DB2.
- Upgrading you specified in the following fields an incorrect name:
  - DB2 server administrator user
  - DB2 client administrator user

To solve the problem, run one of the following procedures:

To change the mode setting for the DB2 `/home/db2inst1/sqllib/.ftok`, perform the following steps:

1. Open the `db2diag.log` file and search for entries similar to the following entry:

```
"<DATE TIME STAMP&gt; E538283E857 LEVEL: Error (OS)
PID : 21077 TID : 140205009344256PROC : db2fmp
INSTANCE: db2inst1 NODE : 000
FUNCTION: DB2 UDB, oper system services, sqloopenp, probe:80
MESSAGE : ZRC=0x840F0001=-2079391743=SQLO_ACCD "Access Denied"
DIA8701C Access denied for resource "",
operating system return code was "".
CALLED : OS, -, open OSERR: EACCES (13)
DATA #1 : Codepath, 8 bytes
4:12:18:25:37
DATA #2 : File name, 27 bytes
/home/db2inst1/sqllib/.ftok
```

2. Change the file mode of the /home/db2inst1/sqllib/.ftok file to 644, running the following command:

   ```
   $ chmod 644 /home/db2inst1/sqllib/.ftok
   ```

3. Rerun the upgrade

To solve the connection problem with DB2, perform the following steps:

- Resolve the issue by stopping and restarting DB2 by using the **db2stop** and the **db2start** commands.
- If the DB2 does not stop, run the following command:

  ```
  "db2stop force
  ```

- When DB2 starts, ensure that you can establish a connection by using the following command:

  ```
  $ db2 connect to database_name user
   DB2_instance_owner using DB2_instance_owner_password
  ```

- After you established the connection, upgrade.

On Windows systems a dialog box is displayed when you install or upgrade

You are installing or upgrading on Windows systems and a dialog box is displayed.

If you enabled the Security Warning, a dialog box is displayed during the installation or upgrade. In this case answer **Run** to continue.

Installing or upgrading on Windows a dialog box is displayed.

Cause and solution

This problem occurs if you enabled the Security Warning for the operating system.

Answer **Run** to continue the upgrade.

After upgrading a master domain manager or a dynamic domain manager you cannot perform any operation

You cannot perform any operation after upgrading a master domain manager or a dynamic domain manager

After you upgraded a master domain manager or a dynamic domain manager, you cannot use the product. Moreover the WebSphere Application Server log files located in the */<WAS_profile_creation_path>*/logs/<SERVER_NAME> path, contains the following error:

```
Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError:
<ORACLE_HOME>/lib/<ORACLE_LIB> (<ORACLE_HOME>/lib/<ORACLE_LIB>:
wrong ELF class: ELFCLASS32)
```

Cause and solution

This problem occurs because the version of IBM Workload Scheduler to which you are upgrading, uses 64-bit libraries and the Oracle database uses 32-bit libraries.

To solve the problem, perform the following procedure:

1. Change the Oracle JBDC from **Type2** to **Type4** using the **changeDataSourceProperties** WebSphere Application Server tool. Do the following:

   On Windows operating systems:

   a. Log on as administrator.
   b. Go to the <TWA_home>\wastools directory
   c. Run **showDataSourceProperties.bat**
   d. Save the output to a file using the following command:
      ```
      showDataSourceProperties.bat > DataSourceProperties.txt
      ```
   e. Edit the DataSourceProperties.txt file.
   f. Change the line:
      ```
      OracleType2JndiName=jdbc/twsdb
       to
      OracleType2JndiName=jdbc/twsdb_old
      ```
   g. Change the line:
      ```
      OracleType4JndiName=
       to
      OracleType4JndiName=jdbc/twsdb
      ```
   h. Set:
      ```
      OracleType4URL=jdbc:oracle:thin:@//host_name:
      oracle_listener_port/database_instance_name
      ```

      where:

      host_name
      Specify the host name or TCP/IP address of the ORACLE server.

      oracle_listener_port
      Specify port number of the ORACLE listener on the ORACLE server.

      database_instance_name
      Specify the database instance name (SID) that is connected to IBM Workload Scheduler

      You can find this information in the <ORACLE_HOME>\NETWORK\ADMIN\tnsnames.ora file located in the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:
      ```
       <hostname> =
      (DESCRIPTION =
      (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
      (PORT = oracle_listener_port))
      )
      CONNECT_DATA =
      (SERVICE_NAME = database_instance_name)
      )
      )
      ```
   i. Save the DataSourceProperties.txt file.

j. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.

k. Run the following command to apply the change:

```
changeDataSourceProperties.bat DataSourceProperties.txt
```

l. Start the WebSphere Application Server using the **conman startappserver** command.

m. Verify that the change has been implemented by running the command and verifying output.

```
showDataSourceProperties.bat
```

On UNIX and Linux operating systems:

a. Log on as root.

b. Go to the `TWA_home/wastools` directory

c. Run **showDataSourceProperties.sh**

d. Save the output to a file using the following command:

```
./showDataSourceProperties.sh > DataSourceProperties.txt
```

e. Edit the `DataSourceProperties.txt` file.

f. Change the line:

```
OracleType2JndiName=jdbc/twsdb
 to
OracleType2JndiName=jdbc/twsdb_old
```

g. Change the line:

```
OracleType4JndiName=
 to
OracleType4JndiName=jdbc/twsdb
```

h. Set:

```
OracleType4URL=jdbc:oracle:thin:@//host_name:
oracle_listener_port/database_instance_name
```

where:

host_name
Specify the host name or TCP/IP address of the ORACLE server.

oracle_listener_port
Specify port number of the ORACLE listener on the ORACLE server.

database_instance_name
Specify the database instance name (SID) that is connected to IBM Workload Scheduler

You can find this information in the `<ORACLE_HOME>/NETWORK/ADMIN/tnsnames.ora` file located in the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:

```
 <hostname> =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
(PORT = oracle_listener_port))
)
CONNECT_DATA =
(SERVICE_NAME = database_instance_name)
)
)
```

i. Save the DataSourceProperties.txt file.

j. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command

k. Run the following command to apply the change:

```
changeDataSourceProperties.sh DataSourceProperties.txt
```

l. Start the WebSphere Application Server using the **conman startappserver** command.

m. Verify that the change has been implemented by running the command and verifying output.

```
./showDataSourceProperties.sh
```

On AIX and Linux PPC the user and password validation hangs when you upgrade

You are trying to upgrade the master domain manager, dynamic domain manager, backup master domain manager, or backup dynamic domain manager on AIX and Linux PPC operating systems, but the user and password validation hangs.

Perform the following steps:

1. Identify the process ID (pid) of the twsStopAction.sh and twsCheckInstance.sh processes by running the following command:

   ```
   ps -ef | grep tws
   ```

2. Stop twsStopAction.sh and twsCheckInstance.sh by running the following command for each process:

   ```
   kill -9 <pid>
   ```

3. Edit twsStopAction.sh and twsCheckInstance.sh located in TWS/_uninstall/ACTIONTOOLS by inserting the following command as the first line:

   ```
   exit 0
   ```

4. Stop IBM Workload Scheduler.

You can now proceed with the user and password validation required to upgrade your system.

When upgrading IBM Workload Scheduler, the dynamic agent workstation name is not correct

You are upgrading the master domain manager, backup master domain manager, dynamic domain manager, or backup dynamic domain manager, and the dynamic agent workstation name is not correct.

Cause and solution

This problem has occurred because the ComputerSystemDisplayName property in the <TWA_Home>/TWS/ITA/cpa/config/JobManager.ini file is not the same as the value set in the IBM Workload Scheduler database.

Manually set the correct value for ComputerSystemDisplayName and run the upgrade process again.

When upgrading a backup dynamic domain manager the connection to the database does not work

You are trying to upgrade a backup dynamic domain manager, but the connection to the remote dynamic domain manager database does not work.

Cause and solution

This problem has occurred because the database of the remote dynamic domain manager is not cataloged on the backup dynamic domain manager. To resolve the problem, before upgrading the backup dynamic domain manager, catalog the database by issuing the following command:

```
db2 catalog db <dynamic_dom_mgr_dbname> at node <dynamic_dom_mgr_dbname>_ND
```

where <dynamic_dom_mgr_dbname> is the name of the database of the remote dynamic domain manager.

When upgrading a domain manager or dynamic domain manager a WebSphere Application Server exception is returned

You are trying to upgrade a domain manager or dynamic domain manager or the corresponding backup workstations, a WebSphere Application Server exception is returned.

Cause and solution

The retrieval of the WebSphere Application Server parameter fails on a random basis while upgrading a master domain manager, backup master domain manager, dynamic domain manager, or backup dynamic domain manager. A message is returned stating that some parameters have not been retrieved.

This problem is caused by an exception of the **wsadmin** command.

To solve this problem, perform a cleanup of the WebSphere Application Server class cash, as described in http://www-01.ibm.com/support/docview.wss?uid=swg21607887

Master domain manager upgrade fails with error AWSJIM950E while creating the backup of the previous version.

While you are upgrading a master domain manager you receive the error AWSJIM950E.

During the upgrade of a master domain manager you receive the following error:

```
AWSJIM950E
An error occurred while creating the backup of the instance in the folder
/var/tmp/backupTWSDir.
Check the directory permissions, the disk space, and if any processes
are locking files located in the Tivoli Workload Scheduler installation path.
The installation cannot start.
Explanation
The installation cannot create the backup of the previous version.
User response
See message text.
```

In particular, the error is:

```
An error occurred when running step Backing up files of current
Tivoli Workload Scheduler instance.
Command backupInstance.sh,
parameters [-installDir, /export/home/IBM/MDM92, -backupDir, /var/tmp/backupTWSDir],
return code 37
```

Cause and solution

Before the upgrade, a backup of the previous version is created. All processes must be stopped and files present in <*installation_dir*>/TWS/ITA/cpa/temp/ipc folder must be cleaned up. If some files are still present in ipc folder, the backup step fails.

To solve this problem, manually remove all files in ipc folder by running the following command:

```
rm -rf <installation_dir>/TWS/ITA/cpa/temp/ipc/*
```

Master domain manager or dynamic domain manager upgrade fails with error AWSJIM931E

While you are upgrading a master domain manager or a dynamic domain manager, you receive the error AWSJIM931E.

During the installation of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM931E
An error occurred while creating the Windows service
for the IBM Workload Scheduler WebSphere Application Server profile.
Check the status of the Windows Service Manager.
If no more errors occur the instance is rolled back to the previous veraion.
```

Cause and solution

This error occurs because the installation cannot create the WebSphere Application ServerWindows service.

To solve the problem, run the following steps:

1. Check the status of the Windows Service Manager and Windows Events.
2. Solve the errors and restart the installation. If you did not find any errors, reboot the workstation.

Master domain manager or dynamic domain manager upgrade fails with error AWSJIM967E

While you are upgrading a master domain manager or a dynamic domain manager, you receive the error AWSJIM967E.

During the upgrade of a master domain manager or a dynamic domain manager, you receive the following error:

```
AWSJIM967E
An error occurred while validating the instance against
the IBM Workload Scheduler installation registry.
Re-create it using the twsClusInstEnabler command.
```

Cause and solution

This error occurs because the installation registry for the selected instance is corrupted and the operation cannot proceed. Use the **twsClusInstEnabler** command to fix the registry and then try the operation again.

To re-create the installation registry, run the following steps:

1. Run the following command:

   Windows operating systems:

   ```
   <Image>\utilities\twsClusInstEnabler.cmd -twsPath installation_dir
   ```

   For example:

   ```
   <Image>\utilities\twsClusInstEnabler.cmd
   -twsPath "C:\Program Files\IBM\TWA"
   ```

   UNIX and Linux operating systems:

   ```
   <Image>/utilities/twsClusInstEnabler.sh -twsPath installation_dir
   ```

For example:

```
<Image>/utilities/twsClusInstEnabler.sh -twsPath /opt/IBM/TWA
```

Master domain manager or dynamic domain manager warning AWSJIM971W starting the WebSphere Application Server

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM971W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM971W
The installation completed, but errors occurred while starting
the WebSphere Application Server.
Verify the WebSphere Application Server log files.
```

Cause and solution

This problem typically occurs for a timeout problem.

To complete the installation or the upgrade, start the WebSphere Application Server using the following command:

Windows operating systems:

```
startWas.bat
```

UNIX and Linux operating systems:

```
./startWas.sh
```

Master domain manager or dynamic domain manager warning AWSJIM972W removing the Windows service

After you upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM972W.

During the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM972W
The upgrade completed, but errors occurred while removing
the Windows service for the old installation.
Remove it manually.
```

Cause and solution

This problem occurs because the upgrade program cannot not remove the Windows service of the previous IBM Workload Scheduler version.

To complete the upgrade, run the following steps:

1. Open the Windows Service Manager by using the following command:

   ```
   services.msc
   ```

   The Services windows is displayed.
2. Identify the Windows service that is related to the WebSphere Application Server of the previous installation.
3. Right click it and select **Properties**.
4. In the General tab, read the value that is contained in the **Service name** field.
5. Delete the *service_name* by using the following command:

   ```
   sc delete "service_name"
   ```

Upgrading a fault-tolerant agent installed on a shared instance fails

After installing a shared instance that contains a fault-tolerant agent and other components, you uninstalled the other components then tried to upgrade the fault-tolerant agent but the upgrade fails.

Cause and solution

This problem has occurred because the eWAS/profiles/<profile_name>/installedApps/<cell_name>/<ear_file> directory was not deleted. Delete the directory, then upgrade the fault-tolerant agent.

Warning AWSJIM974W while starting the IBM Workload Scheduler instance

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM974W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM974W
An error occurred while starting the IBM Workload Scheduler instance.
Analyze the files in the stdlist folder for further details.
```

Cause and solution

To understand the cause of the problem, analyze the log files that are located in the following directory:

Windows operating systems:

TWA_installation_dir\TWS\stdlist\logs

A possible case of the problem is that both the **Tivoli Token service** and the **IBM Workload Scheduler for <*TWS_user*>** service (backup) fail to start for the first time (after a successful installation).

UNIX and Linux operating systems:

TWA_installation_dir/TWS/stdlist/logs

To complete the installation or the upgrade, start the IBM Workload Scheduler instance, by running the following command from the *TWA_installation_dir*/TWS directory:

Windows operating systems:

Startup

UNIX and Linux operating systems:

StartUp

Warning AWSJIM975W while starting the dynamic agent embedded in the IBM Workload Scheduler instance

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM975W.

During the installation or the upgrade of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM975W
An error occurred while starting
the dynamic agent embedded in the instance.
Analyze the files in the stdlist/JM folder for further details.
```

Cause and solution

To understand the cause of the problem, analyze the fog files that are located in the following directory:

Windows operating systems:
TWA_installation_dir\TWS\stdlist\JM

UNIX and Linux operating systems:
TWA_installation_dir/TWS/stdlist/JM

To complete the installation or the upgrade, start the IBM Workload Scheduler dynamic agent, by running the following command from the *TWA_installation_dir*/TWS directory:

Windows operating systems:
StartupLwa

UNIX and Linux operating systems:
StartUpLwa

Warning AWSJIM977W while adding the Windows user definition to the database

After you install or upgrade a master domain manager or a dynamic domain manager, you receive the warning AWSJIM977W.

During the installation of a master domain manager or a dynamic domain manager, you receive the following warning:

```
AWSJIM977W
The installation completed, but an error occurred while adding
the Windows User definition to the database.
Analyze the WebSphere Application Server logs for further details.
```

Cause and solution

To understand the cause of the problem, analyze the WebSphere Application Server log files located in the /<*WAS_profile_creation_path*>/logs/<SERVER_NAME> path and run:

- The procedure described in **"Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError"**, if in the log file you find the following error:

  ```
  Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError:
  <ORACLE_HOME>/lib/<ORACLE_LIB> (<ORACLE_HOME>/lib/<ORACLE_LIB>:
  wrong ELF class: ELFCLASS32)
  ```

  where:

  WAS_profile_creation_path
  Specify the path where you created the WebSphere Application Server profile.

  server_name
  Specify the name of the server you used during the installation process.

  The default WebSphere Application Server path is /<TWS_INST_DIR>/WAS/TWSProfile/logs/<SERVER_NAME>.
- The procedure described "**Any other error in the WebSphere Application Server log file**", if you find any other error in the WebSphere Application Server log.

Caused by: java.lang.RuntimeException: java.lang.UnsatisfiedLinkError

This problem occurs because IBM Workload Scheduler uses 64-bit libraries and the Oracle database you specified during the installation uses 32-bit libraries.

To solve the problem, perform the following procedure:

1. Change the Oracle JBDC from **Type2** to **Type4** using the **changeDataSourceProperties** WebSphere Application Server tool.
2. Log on as administrator.
3. Go to the <TWA_home>\wastools directory
4. Run **showDataSourceProperties.bat**
5. Save the output to a file using the following command:

   showDataSourceProperties.bat > DataSourceProperties.txt
6. Edit the DataSourceProperties.txt file.
7. Change the line:

   ```
   OracleType2JndiName=jdbc/twsdb
    to
   OracleType2JndiName=jdbc/twsdb_old
   ```
8. Change the line:

   ```
   OracleType4JndiName=
    to
   OracleType4JndiName=jdbc/twsdb
   ```
9. Set:

   OracleType4URL=jdbc:oracle:thin:@//*host_name*:
   oracle_listener_port/database_instance_name

   where:

   host_name
   Specify the host name or TCP/IP address of the ORACLE server.

   oracle_listener_port
   Specify port number of the ORACLE listener on the ORACLE server.

   database_instance_name
   Specify the database instance name (SID) that is connected to IBM Workload Scheduler

   You can find this information in the <ORACLE_HOME>\NETWORK\ADMIN\ tnsnames.ora file located on the workstation where you installed IBM Workload Scheduler. The information corresponds to the information in the following section:

   ```
    <hostname> =
   (DESCRIPTION =
   (ADDRESS_LIST =
   (ADDRESS = (PROTOCOL = TCP)(HOST = host_name)
   (PORT = oracle_listener_port))
   )
   CONNECT_DATA =
   (SERVICE_NAME = database_instance_name)
   )
   )
   ```
10. Save the DataSourceProperties.txt file.
11. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.
12. Run the following command to apply the change:

    changeDataSourceProperties.bat DataSourceProperties.txt

13. Start the WebSphere Application Server using the **conman startappserver** command.
14. Verify that the change has been implemented by running the **showDataSourceProperties.bat** command and verifying the output.
15. Manually create the Windows user, by using the following command:

    ```
    composer new user
    ```

    The text editor opens. Write the following information:

    ```
    USERNAME<master>#<domain>\<user>
    PASSWORD "<password>"
    END

    USERNAME <master>#<user>
    PASSWORD "<password>"
    END

    USERNAME <user>
    PASSWORD "<password>"
    END
    ```

    Where:

    master
    Specify the master domain manager workstation name.

    user Specify the IBM Workload Scheduler user.

    password
    Specify the password of the IBM Workload Scheduler user.

    domain
    Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.
16. Perform a replication between the Symphony file and the plan data stored in the database, by running the following command:

    ```
    planman resync
    ```
17. Copy the useropts file for the IBM Workload Scheduler user, by running the following command:

    ```
    cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
     $HOME/.TWS/useropts_<TWS_USER>
    ```

    where:

    TWSUSER_HOME
    Specify the IBM Workload Scheduler user home directory.

    TWS_USER
    Specify IBM Workload Scheduler user.

    $HOME
    Specify the $HOME environment variable of the root user.

Any other error in the WebSphere Application Server log file

To understand the cause of the problem analyze the WebSphere Application Server log files located in the /<*WAS_profile_creation_path*>/logs/<SERVER_NAME> path. This problem can occur if you have database connection problems. Correct the error and run the following procedure:

1. Stop the WebSphere Application Server using the **"conman stopappserver;wait"** command.
2. Start the WebSphere Application Server using the **conman startappserver** command.
3. Manually create the Windows user, by using the following command:

   ```
   composer new user
   ```

   The text editor opens. Write the following information:

   ```
   USERNAME<master>#<domain>\<user>
   PASSWORD "<password>"
   END

   USERNAME <master>#<user>
   PASSWORD "<password>"
   END

   USERNAME <user>
   PASSWORD "<password>"
   END
   ```

   Where:

   master
   Specify the master domain manager workstation name.

   user Specify the IBM Workload Scheduler user.

   password
   Specify the password of the IBM Workload Scheduler user.

   domain
   Specify the Windows domain if the IBM Workload Scheduler user is a domain account. Otherwise specify the hostname of the workstation you are installing.
4. Perform a replication between the `Symphony` file and the plan data stored in the database, by running the following command:

   ```
   planman resync
   ```
5. Copy the `useropts` file for the IBM Workload Scheduler user, by running the following command:

   ```
   cp <TWSUSER_HOME>/.TWS/useropts_<TWS_USER>
   $HOME/.TWS/useropts_<TWS_USER>
   ```

   where:

   TWSUSER_HOME
   Specify the IBM Workload Scheduler user home directory.

   TWS_USER
   Specify IBM Workload Scheduler user.

   $HOME
   Specify the $HOME environment variable of the root user.

When upgrading IBM Workload Scheduler the Sfinal file is updated

When you upgrade IBM Workload Scheduler, your FINAL job stream, if any, is not modified. However, the upgrade process changes the FINAL job stream definition that is contained in the `<TWA_home>/TWS/Sfinal` file.

Cause and solution

After upgrading IBM Workload Scheduler, the Sfinal file is updated and need to be imported in your database. If you customized your old Sfinal and want to merge the two versions, perform the following steps:

1. From the composer, extract your old Sfinal file to a new <Sfinal definition file> by issuing the command:

   ```
   composer extract <Sfinal_definition_file> from js=final
   ```

2. Merge the content of the old Sfinal file to the new Sfinal file.
3. Import the new Sfinal file by issuing the command:

   ```
   composer replace Sfinal
   ```

Uninstallation problems

This section lists the problems you can find when uninstalling.

On Linux uninstalling the master domain manager does not delete some directories

After uninstalling the master domain manager on Linux, the log files store some warning messages about directories that were not deleted.

Cause and solution

You uninstalled the master domain manager on Linux, and the log files show some warning messages about the /opt/IBM/TWA/ and /opt/IBM/TWA/TWS directories that were not deleted.

This behaviour is correct, because some files in the /opt/IBM/TWA/ and /opt/IBM/TWA/TWS directories are not to be deleted. You can ignore the warning messages.

Uninstallation fails at any stage of the process

You are uninstalling a master domain manager or backup master domain manager, a dynamic domain manager or backup dynamic domain manager, or the Dynamic Workload Console, and the uninstallation process fails at some stage.

Cause and solution

If the uninstallation fails at any stage of the process, you must complete it by performing a manual uninstallation.

For details about how to manually uninstall the master domain manager or dynamic master domain manager, see "Uninstalling IBM Workload Scheduler manually" on page 309.

For details about how to manually uninstall the Dynamic Workload Console, see "Manually uninstall the Dynamic Workload Console and the zConnector on Windows systems" on page 393 and "Manually uninstall the Dynamic Workload Console and the zConnector on UNIX systems" on page 394.

Fix pack installation problems

This section describes problems and solutions for problems that might occur during the installation of a fix pack.

The following problem could be encountered:

Uninstalling IBM Workload Scheduler manually

Steps to take when manually uninstalling the IBM Workload Scheduler master domain manager.

How to manually remove the IBM Workload Scheduler master domain manager.

Run the steps listed in the following topics to properly uninstall manually a IBM Workload Scheduler instance:

- "Uninstalling manually on Windows operating systems"
- "Uninstalling manually on UNIX operating systems" on page 311

Read the following topic to learn about known workaround for problems that might affect the IBM Workload Scheduler uninstall:

- "Problems during manual uninstall" on page 313

Uninstalling manually on Windows operating systems

Steps to take when manually uninstalling the IBM Workload Scheduler master domain manager on a Windows operating systems.

Run the following steps to manually remove a IBM Workload Scheduler master domain manager.

Note: If your RDBMS is based on Oracle, run the `showDataSource wastools` command before uninstalling the master domain manager and take note of the net service name used for your database.

1. Shut down all IBM Workload Scheduler operations and processes

1. On a system prompt, go to the IBM Workload Scheduler installation path.
2. Set the environment by running the `twa_env.cmd` command.
3. Stop the dynamic agent by running the `ShutDownLwa` command.
4. Stop **netman**, **conman** and their child processes by running the `conman "shut;wait"` command.
5. Stop the event process by running the `conman stopmon` command.
6. Stop the application server process by running the `conman stopappservman` command.
7. In the task manager, verify that the following processes are inactive:

   ```
   netman
   appserrvman
   java
   mailman
   monman
   ```

   As an alternative, you can also stop all processes by shutting down the related IBM Workload Scheduler and IBM WebSphere Application Server services from the services panel.

2. Delete the IBM Workload Scheduler profile on WebSphere Application Server

1. Go to the `bin` subdirectory under the installation path, for example `C:\Program Files\IBM\WebSphere\AppServer\bin`, and run the command:

   ```
   manageprofiles.bat –delete –profileName your_profile_name
   ```

2. Check the name of the profile used by your IBM Workload Scheduler instance by running these steps:
   a. Go to the `C:\WINDOWS\TWA` directory. This directory contains several files, one for each IBM Workload Scheduler instance that is installed.
   b. Look for the file whose properties include the path of the profile to delete. The *profile_name* property contains the name of the profile to delete.
3. Verify in the log file that the profile was deleted successfully.
4. Delete manually the **TWSProfile** from the WebSphere Application Server directory under the installation path.

3. Delete the IBM Workload Scheduler services

If you are uninstalling the master domain manager, you must delete the following services:

`tws_tokensrv_`*`TWS_user`*
`tws_maestro_`*`TWS_user`*
`tws_ssm_agent_`*`TWS_user`*
`tws_netman_`*`TWS_user`*
`tws_cpa_agent_`*`TWS_user`*
`IBMWASService - `*`TWS_user`*

The command to delete a service is:

`sc delete `*`service_name`*

When you finished, check that the following services are no longer listed in the active services for the *TWS_user*:

Workload Scheduler
Netman
Token service
Common Platform agent
Websphere Application Server

If any of these services is still in the list, reboot the system and check again.

4. Delete the registry in the Installation Manager (IM)

1. Launch Installation Manager.
2. Select the IBM Workload Scheduler package that you want to uninstall.

5. Delete the IBM Workload Automation and the IBM Workload Scheduler registries

1. Edit the `C:\Windows\TWSRegistry.dat` file.
2. Delete the lines tagged with *TWS_user*.
3. Go to the `C:\Windows\TWA` directory, which contains two files for each IBM Workload Scheduler instance installed.
4. Look for the properties file that applies to the IBM Workload Scheduler instance to remove.
5. Delete that properties file and the file with the same filename and extension *.ext*.
6. Delete the `C:\Windows\teb` directory.

6. Delete the IBM Workload Scheduler files

Delete all the files under the `TWA_install_dir` directory.

7. Drop the IBM Workload Scheduler tables to the RDBMS

On DB2:

Run the following steps:

1. From the program menu, open the DB2 command line processor (CLP).
2. Look for the database name by running the command:

   `list db directory`
3. If you see an entry named *your_db_name* associated to the IBM Workload Scheduler instance, run the command:

   `drop db your_db_name`
4. If you see an entry named *your_db_name*_DB associated to the IBM Workload Scheduler instance, run the command:

   `uncatalog db your_db_name_DB`
5. To see which node is attached to the master domain manager system run the command:

   `list node directory`
6. Run the command:

   `uncatalog node your_node`

If the master domain manager was installed on the DB2 client, run steps 1 and 5 also on the system where the master domain manager is installed.

On ORACLE:

Run the following steps:

1. Access the ORACLE command line.
2. Run the command:

   `sqlplus system/password@net_service_name`
3. Delete all the tables related to the IBM Workload Scheduler instance by running the command:

   `drop user ORACLE_TWS_user cascade;`

Uninstalling manually on UNIX operating systems

Steps to take when uninstalling IBM Workload Scheduler master domain manager manually on a UNIX operating systems.

To manually remove a IBM Workload Scheduler master domain manager complete the following steps.

Note: If your RDBMS is based on Oracle, run the `showDataSource wastools` command before uninstalling the master domain manager and take note of the net service name used for your database.

1. Shut down all IBM Workload Scheduler operations and processes

1. On a system prompt, go to the IBM Workload Scheduler installation path.
2. Set the environment by running the `twa_env.sh` command.
3. Stop the dynamic agent by running the `ShutDownLwa` command.
4. Stop **netman**, **conman**, and their child processes by running the `conman "shut;wait"` command.
5. Stop the event process by running the `conman stopmon` command.

6. Stop the application server process by running the `conman stopappservman` command.
7. To verify that the following processes are inactive run the command `ps -ef | grep process_name`.

   ```
   netman
   appservman
   java
   mailman
   monman
   ```

2. Delete the IBM Workload Scheduler profile on WebSphere Application Server

1. Go to the `bin` subdirectory under the IBM Workload Scheduler installation path, and run the command:

   ```
   manageprofiles.sh –delete –profileName your_profile_name
   ```

2. Check the name of the profile used by your IBM Workload Scheduler instance by running these steps:
   a. Go to the `/etc/TWA` directory. This directory contains several files, one for each IBM Workload Scheduler instance that is installed.
   b. Look for the file whose properties include the path of the profile to delete. The *profile_name* property contains the name of the profile to delete.
3. Check in the log file that the profile was deleted successfully.
4. Delete manually the **TWSProfile** from the WebSphere Application Server directory under the installation path.

3. Delete the registry in the Installation Manager (IM)

1. Launch Installation Manager.
2. Select the IBM Workload Scheduler package that you want to uninstall.

4. Delete the IBM Workload Automation and the IBM Workload Scheduler registries

1. Edit the `/etc/TWS/TWSRegistry.dat` file.
2. Delete the lines tagged with *TWS_user*.
3. Go to the `/etc/TWA` directory which contains two files for each IBM Workload Scheduler instance installed.
4. Look for the properties file that applies to the IBM Workload Scheduler instance to remove.
5. Delete the properties file and the file with the same filename and extension *.ext*.
6. Delete the `/etc/init.d/tebetl-tws_cpa_agent_TWS_user` directory.

5. Delete the IBM Workload Scheduler files

Delete all the files under the `TWA_install_dir` directory.

6. Drop the IBM Workload Scheduler tables into the RDBMS

On DB2:

Complete the following steps:

1. Connect as DB2 administrator.
2. Look for the database name by running the command:

   ```
   list db directory
   ```

3. If you see an entry named *your_db_name* associated to the IBM Workload Scheduler instance, run the command:

drop db *your_db_name*

4. If you see an entry named *your_db_name*_DB associated to the IBM Workload Scheduler instance, run the command:

   uncatalog db *your_db_name*_DB

5. See which is the node attached to the master domain manager system by running the command:

   list node directory

6. Run the command:

   uncatalog node *your_node*

If the master domain manager was installed on the DB2 client, run the steps 1 and 5 also on the system where the master domain manager is installed.

On ORACLE:

Complete the following steps:

1. Login as oracle user by running the command su - oracle.
2. Run the command:

   sqlplus system/*password@net_service_name*

3. Delete all the tables related to the IBM Workload Scheduler instance by running the command:

   Drop user *ORACLE_TWS_user* cascade;

7. Remove the Common Platforms Agent configuration file

Remove the file named /etc/teb/teb_tws_cpa_agent_*TWS_user*.ini.

Problems during manual uninstall

The following problem might occur during a manual uninstall:

- "File deletion on Windows too slow"

File deletion on Windows too slow

When manually deleting files during a manual uninstallation, the deletion of the files in the path $TWA_DIR\TWS\stdlist\yyyy.mm.dd\Onnnn.hhmm is unacceptably slow.

Cause and solution:

This problem is caused by a known Microsoft issue on Windows operating systems. It occurs when you try to delete the indicated files on the Windows system after having uninstalled the master domain manager. To prevent the problem from occurring use **Shift-Canc** to remove these files instead of using the **Delete** menu option, moving them to the recycle bin, or using the **Canc** key on the keyboard.

Part 3. IBM Workload Scheduler on IBM i systems

How to plan, install, configure, and uninstall IBM Workload Scheduler on IBM i systems.

Chapter 12. Prerequisites

Describes the prerequisites for running the IBM i agent.

About this task

To install and use the IBM i agent you must have a supported version of the IBM i operating system. For a detailed list of supported operating systems, see the Detailed System Requirements document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Scanning system prerequisites on IBM i systems

Scanning system prerequisites on IBM i systems

About this task

Before you install or upgrade the agent, IBM Workload Scheduler automatically runs a scan on your system. Having an environment that meets the product system requirements ensures that the installation or upgrade succeeds without any delays or complications.

The scan verifies that:

- The operating system is supported for the product.
- There is enough permanent and temporary disk space to install both the product and its prerequisites.
- There is enough memory and virtual memory swap space.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler.

If any of these checks fails, IBM Workload Scheduler performs the following action:

- An error message is returned. Analyze the log file, solve the error, and rerun the installation or upgrade. The log file is in `%TEMP%\TWA\tws94\result.txt`
- You can decide to rerun the installation or upgrade without executing the prerequisite scan. If you specify the **-skipcheckprereq** parameter, the **twsinst** installation script does not execute the prerequisite scan. For more information about the `-skipcheckprereq` option, see "Agent installation parameters - twsinst script" on page 143.

For a detailed list of supported operating systems and product prerequisites, see http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Chapter 13. Installing agents on IBM i systems

Learn how to install agents on IBM i systems.

About this task

You install the IBM Workload Scheduler for z/OS agent and dynamic agent on IBM i systems by using the `twsinst` installation script.

To install an agent, complete the following steps:

1. Sign on as **QSECOFR** user.
2. Create an IBM i user profile for which the IBM Workload Scheduler agent is installed.

   Note: The user profile is not the same as for the user that is performing the installation logged on as **QSECOFR**. Instead the user profile is for the user that you specify in the **-uname** *username* parameter when running the **twsinst** script. For descriptions of the syntax parameters, see "Agent installation parameters on IBM i systems" on page 321. You cannot use an existing IBM i system user profile, an application supplied user profile, or any of the following reserved IBM i user profiles:
   - QDBSHR
   - QDFTOWN
   - QDOC
   - QLPAUTO
   - QLPINSTALL
   - QRJE
   - QSECOFR
   - QSPL
   - QSYS
   - QTSTRQS

   Attention: Be aware of the following considerations:
   - If the user profile is a member of a group, the installation fails. Set the group profile that is associated with the user profile to **NONE*.
   - If the *username* is longer than 8 characters, after the installation the agent (and the JobManager component) runs under the **QSECOFR** user instead of under the authority of the installation user. To prevent this problem, set the `PASE_USRGRP_LIMITED` environment variable to N.
3. On the IBM i system, verify that no library exists with the same name as the user profile supplied for the agent user.
4. Download the IBM i agent eImage from IBM Passport Advantage. For more information about the installation media, see "Installation media" on page 33 in *IBM Workload Scheduler: Planning and Installation* or the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843.
5. To untar or unzip the agent eImage, you can use the *PASE* shell or the *AIXterm* command.

   Using *PASE* shell:

a. Open the *PASE* shell.
b. Run the command **"CALL QP2TERM"**.
c. Locate the folder where you downloaded the agent eImage and run the command:

IBM Workload Scheduler for z/OS agent

```
"tar xvf TWS<version_number>_IBM_I.tar"
```

Dynamic Agent

```
"unzip TWS<version_number>_IBM_I.zip"
```

d. Exit from the *PASE* shell.

Using *AIXterm* **command:**

a. Start the *Xserver* on your desktop.
b. On the iSeries machine, open a *QSH shell* and export the display.
c. In *QSH shell*, go to the directory */QopenSys* and run the command **"aixterm -sb"**.
d. A pop-up window is displayed on your desktop. By Using this pop-up window, unzip the *TWS<version_number>_IBM_I.zip* file, or untar the *TWS<version_number>_IBM_I.tar* file.

6. Open a *QSH shell* and run the **twsinst** script. During the installation process, the product creates an IBM i library and a job description with the same name as the user profile created in Step 2 on page 319.

   The installation procedure adds this library to the user profile library list of the dynamic agent user profile and sets this job description as the job description of the dynamic agent user profile. By default, the software is installed in the user's home directory.

   Note: If you do not run the **twsinst** script from a *QSH shell* the installation fails.

If the installation fails to understand the cause of the error, see "Analyzing return codes for agent installation, upgrade, restore, and uninstallation" on page 267.

After a successful installation, perform the following configuration task:

- "Configuring a dynamic agent" on page 243, as described in *IBM Workload Scheduler: Planning and Installation*.

Command usage and version

Show command usage and version

```
twsinst -u | -v
```

Install a new instance

```
twsinst -new -uname username
   -acceptlicense yes|no
   [-addjruntime true|false]
   [-agent dynamic]
   [-company company_name]
   [-displayname agentname]
   [-gateway local|remote|none]
   [-gweifport gateway_eif_port]
   [-gwid gateway_id]
   [-hostname hostname]
   [-inst_dir install_dir]
   [-jmport port_number]
   [-jmportssl true|false]
```

```
[-lang lang_id]
[-tdwbport tdwbport_number]
[-tdwbhostname host_name]
[-work_dir working_dir]
```

For a description of the installation parameters and options that are related to agent on this operating system, see "Agent installation parameters on IBM i systems" in *IBM Workload Scheduler: Planning and Installation*.

Agent installation parameters on IBM i systems

About this task

The parameters set when using the **twsinst** script to install the dynamic agent on IBM i systems.

-acceptlicense *yes | no*
Specify whether to accept the License Agreement.

-addjruntime *true | false*
Adds the Java run time to run job types with advanced options, both those types that are supplied with the product and the additional types that are implemented through the custom plug-ins. Valid values are **true** and **false**. The default for a fresh installation is **true**.

This option is applicable to both fault-tolerant agents and dynamic agents.

If you decided not to install Java run time at installation time, you can still add this feature later. For details about how to add a feature, see IBM Workload Scheduler Planning and Installation.

-company *company_name*
The name of the company. The company name cannot contain blank characters. The name is shown in program headers and reports. If not specified, the default name is COMPANY.

-displayname
The name to assign to the agent. The name cannot start with a number. The default is the host name of this computer.

If the host name starts with a number, **-displayname** parameter must be specified.

-gateway *local | remote | none*
Specifies whether to configure a gateway to communicate with the dynamic workload broker or not, and how it is configured. Specify *local* if the gateway is local to the dynamic agent workstation. Specify *remote* if the dynamic agent communicates through a gateway that is installed on a different dynamic agent workstation from the dynamic agent being installed. The default value is *none*, no gateway is configured.

-gweifport *gateway_eif_port*
Specifies the Job Manager Event Integration Facility (EIF) port number. The default value is **31132**. The valid range is 1 to 65535.

-gwid *gateway_id*
The unique identifier for the gateway. This parameter is required when you specify **-gateway** *local*. The default gateway identifier that is assigned is **GW1**. The gateway identifier must start with either an alphabetic

character or an underscore character (_), and it can contain only the following types of characters: alphabetic, numeric, underscores (_), hyphens (-), and periods (.).

Gateways can also work in parallel to mutually take over in routing communications to the agents connected to them. To enable gateways to work in parallel, all gateways must have the same *gateway_id* assigned. This information is stored in the `JobManagerGW.ini` file, by setting the JobManagerGWURIs property.

-hostname *host_name*
The fully qualified host name or IP address on which the agent is contacted by the dynamic workload broker. The default is the host name of this computer.

-inst_dir *installation_dir*
The directory of the IBM Workload Scheduler installation. Specify an absolute path. The path cannot contain blanks. If you do not manually specify a path, the path is set to the default home directory, that is, the *home/username* directory, where *username* is the value specified in the `-uname` option.

-jmport *port_number*

The JobManager port number used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. The default value is **31114**. The valid range is from 1 to 65535.

-jmportssl *true|false*
The JobManager port used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. The port value is the value of the ssl_port parameter in the `ita.ini` file if **`-jmportssl`** is set to `true`. If set to `false`, it corresponds to the value of the **`tcp_port`** parameter in the `ita.ini` file. The `ita.ini` file is located in `ITA\cpa\ita` on Windows systems and `ITA/cpa/ita` on UNIX, Linux, and IBM i systems.

Set the value to "true" if **`- gateway`** is set to `local`.

For communication using SSL or HTTPS
Set **jmportssl = true**. To communicate with the dynamic workload broker, it is recommended that you set the value to **true**. In this case, the port specified in **jmport** communicates in HTTPS.

For communication without using SSL or through HTTP
Set **jmportssl = false**. In this case the port specified in **jmport** communicates in HTTP.

-lang *lang_id*
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used. If neither **-lang** nor LANG are used, the default codepage is set to SBCS. For a list of valid values for these variables, see the following table:

Table 24. Valid values for -lang and LANG parameter

Language	Value
Brazilian portuguese	pt_BR
Chinese (traditional and simplified)	zh_CN, zh_TW
English	en

Table 24. Valid values for -lang and LANG parameter (continued)

Language	Value
French	fr
German	de
Italian	it
Japanese	ja
Korean	ko
Russian	ru
Spanish	es

Note: This is the language in which the installation log is recorded and not the language of the installed engine instance. **twsinst** installs all languages as default.

-new A fresh installation of the agent. Installs an agent and all supported language packs.

-skip_usercheck
Enable this option if the authentication process within your organization is not standard, thereby disabling the default authentication option. If you specify this parameter, you must create the user manually before running the script.

-skipcheckprereq
If you specify this parameter, IBM Workload Scheduler does not scan system prerequisites before installing the agent.

For a detailed list of supported operating systems and product prerequisites, see http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

-tdwbhostname *host_name*
The fully qualified host name of the dynamic workload broker. It is used together with the **-agent** *dynamic* and the **-tdwbport** *tdwbport_number* parameters. If not specified, you cannot run your workload dynamically and this parameter uses the **localhost** default value. This value is registered in the **ResourceAdvisorUrl** property in the `JobManager.ini` file.

If **-gateway** *local* or *remote* is specified, then this is the host name of the dynamic agent workstation where the gateway resides and to which the agent connects. This information is stored in the `JobManager.ini` file.

-tdwbport *tdwbport_number*
The dynamic workload broker HTTP or HTTPS transport port number. It is used together with the **-agent** dynamic and the **-tdwbhostname** *host_name* parameters. The valid range is from 0 to 65535. If you specify **0** or do not specify this parameter, you cannot run workload dynamically. Do not specify **0** if the *-agent* value is **dynamic**. This number is registered in the **ResourceAdvisorUrl** property in the `JobManager.ini` file. The default value is **41114**.

If **-gateway***remote* is specified, then this is the HTTP or HTTPS port number of the dynamic agent workstation where the gateway resides and to which the agent connects. If you are performing a fresh installation, then the value to use is 31114. This information is stored in the `JobManager.ini` file.

-thiscpu *workstation*
The name of the IBM Workload Scheduler workstation of this installation. The name cannot exceed 16 characters, cannot start with a number, cannot contain spaces, and cannot be the same as the workstation name of the master domain manager. This name is registered in the `localopts` file. If not specified, the default value is the host name of the workstation.

If the host name starts with a number, **-thiscpu** parameter must be specified.

-u Displays command usage information and exits.

-uname *username*
The name of the user for which IBM Workload Scheduler is installed.

Note: This user name is not the same as the user performing the installation logged on as **QSECOFR**.

If *username* is longer than 8 characters, after installation the agent (and the JobManager component) erroneously run under the **QSECOFR** user, instead of under the authority of the installation user. To prevent this, set the `PASE_USRGRP_LIMITED` environment variable to N.

-work_dir *working_dir*
The temporary directory used for the IBM Workload Scheduler installation process files deployment. The path cannot contain blanks. If you do not manually specify a path, the path is set to `/tmp/TWA/tws<version_number>`.

-v Displays the command version and exits.

Example installation of an agent on IBM i systems

About this task

The following example shows the syntax used when using the **twsinst** script to install a new instance of the agent on an IBM i system.

```
./twsinst -new
-uname TWS_user
-acceptlicense yes
-hostname thishostname.mycompany.com
-jmport 31114
-tdwbport 41114
-tdwbhostname mainbroker.mycompany.com
-work_dir "/tmp/TWA/tws93"
```

The `twsinst` script log files on IBM i systems

About this task

The **twsinst** log file name is:

`<TWS_INST_DIR>/twsinst_IBM_i_<TWS_user>^<product_version>.log`

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is `/home/<TWS_user>`.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

<product_version>
Represents the product version. For example, for version 9.4 of the product, the value is 9.4.0.00

Analyzing return codes for agent installation, upgrade, restore, and uninstallation

Check how your operation completed by analyzing the return codes that are issued by twsinst.

Return codes that you can receive when you are installing, upgrading, restoring, or uninstalling agents. To analyze them and take corrective actions, run the following steps:

On Windows operating systems

1. Display the operation completion return code, by using the following command:
   ```
   echo %ERRORLEVEL%
   ```
2. Analyze the following table to verify how the operation completed:

Table 25. Windows operating system agent return codes

Error Code	Description	User action
0	Success: The operation completed successfully without any warnings or errors.	None.
1	Generic failure	Check the messages that are displayed on the screen by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation cannot create the IBM Workload Scheduler user or assign the correct permission to it.	Verify the operating system policies and configuration. Verify the input values. If necessary, create the user manually before you run the installation.
3	The password is not correct or the installation cannot verify it.	Verify the operating system policies and configuration. Verify the input values.
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Table 25. Windows operating system agent return codes (continued)

Error Code	Description	User action
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

On UNIX and Linux operating systems:

1. Display the installation completion return code, by using the following command:

   ```
   echo $?
   ```

2. Analyze the following table to verify how the installation completed:

Table 26. UNIX or Linux operating system agent return codes

Error Code	Description	User action
0	Success: The installation completed successfully without any warnings or errors.	None.
1	Generic failure.	Check the messages that are displayed on the video by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation did not find the IBM Workload Scheduler user or its home directory. The IBM Workload Scheduler user that you specified either does not exist or does not have an associated home directory.	Verify the operating system definition of the IBM Workload Scheduler user.
3	Not applicable	
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.

Table 26. UNIX or Linux operating system agent return codes (continued)

Error Code	Description	User action
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

Chapter 14. Configuring a dynamic agent

How to configure a dynamic agent.

About this task

The dynamic agent installation process automatically adds the workstation definition to the database and registers the workstation definition to the dynamic workload broker installed on the master domain manager or dynamic domain manager that you chose during the installation process.

Dynamic agents can be organized in pools to help organize your environment based on the availability of workstations and on the requirements of the jobs that need to be run. You can create a pool, adding dynamic agents to a workstation definition of type pool, or, you can automatically register agents to pools through a different process. See the topic about automatically registering agents to a pool in the *Planning and Installation Guide*.

After installing a dynamic agent, depending on the `enAddWorkstation` global option settings in the master domain manager, perform the following steps:

If `enAddWorkstation` is set to `no`:

1. Run **`JnextPlan`** with the **`-for 0000`** option to add the dynamic agent workstation definition to the plan and to send the Symphony file to it. For more information about workstation definitions, see *User's Guide and Reference*.

   Note: To carry forward completed and not completed job stream instances, ensure that the `carryforward` global option is set to `all` or run **`JnextPlan -for 0000`** also with the **`-noremove`** option.
2. Change the workstation limit to allow jobs to run on the workstation. For example, set the number of jobs that can run concurrently on the workstation to 10:

   ```
   conman "limit DA235007_00;10"
   ```

If `enAddWorkstation` is set to `yes`:

The workstation definition is automatically added to the plan after it is defined in the database by the installation process. The `workstationLimit` global option specifies the dynamic agent workstation limit value that the dynamic agent workstation assumes after the workstation is added to the plan.

For more information about how to modify the `enAddWorkstation` and `workstationLimit` global option settings, see the section about global options settings in *Administration Guide*.

For more information about troubleshooting, see the section about troubleshooting when automatically adding dynamic agent workstations to the plan in *Troubleshooting Guide*.

You might also need to run the following configuration procedures. For information about these procedures, see *Administration Guide*.

- Customizing and configuring `jobmanager.ini` and user options.

- Customizing and configuring `JobManagerGW.ini` for opening communication between the gateway and the dynamic workload broker.
- Customizing and configuring user authentication to allow user authorization for actions and objects, and to configure LDAP.
- Setting connection security to enable GSKit for inter-component communications.

Chapter 15. Upgrading agents on IBM i systems

How to upgrade agents on IBM i systems.

About this task

You can upgrade the agent on an IBM i system by using the `twsinst` installation script.

To upgrade an IBM Workload Scheduler agent, perform the following steps:

1. Sign on as **QSECOFR** user.
2. Download the agent eImage from the Passport Advantage® Online website. For more information about the installation media, see "Installation media" on page 33 or the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843.
3. If you downloaded the eImages, to extract the package, use the *PASE* shell or the *AIXterm* command.

   Using *PASE* shell:

   a. Open the *PASE* shell.
   b. Run the command **"CALL QP2TERM"**.
   c. Locate the folder where you downloaded the eImages and run the command:

      "tar xvf *TWS94_IBM_I.tar*"

   d. Exit from the *PASE* shell.

   Using *AIXterm* command:

   a. Start the *Xserver* on your desktop.
   b. On the iSeries machine, open a *QSH shell* and export the display.
   c. In *QSH shell*, go to the directory */QopenSys* and run the command **"aixterm -sb"**.
   d. A pop-up window is displayed on your desktop. By Using this pop-up window, extract the file *TWS94_IBM_I.tar*.
4. Open a *QSH shell* and run the **twsinst** script.

   The installation procedure replaces the library to the user profile library list of the dynamic agent user profile and sets this job description as the job description of the dynamic agent user profile. The upgrade process replaces the new version of the agent in the directory where the old agent is installed.

   Note: If you do not run the **twsinst** script from a *QSH shell* the installation fails.

If the operation fails to understand the cause of the error, see "Analyzing return codes for agent installation, upgrade, restore, and uninstallation" on page 267.

Command usage and version

Show command usage and version

```
twsinst -u | -v
```

Upgrade an instance

```
./twsinst -update -uname user_name
 -acceptlicense yes|no
 [-addjruntime true]
 [-create_link]
 [-hostname host_name]
 [-inst_dir install_dir]
 [-jmport port_number]
 [-jmportssl boolean]
 [-lang lang-id]
 [-reset_perm]
 [-recovInstReg true]
 [-skip_usercheck]
 [-tdwbhostname host_name]
 [-tdwbport port_number]
 [-wait minutes]
 [-work_dir working_dir]
```

For a description of the installation parameters and options that are related to agent on this operating system, see "Agent upgrade parameters on IBM i systems."

Agent upgrade parameters on IBM i systems

About this task

The parameters set when using the **twsinst** script to upgrade a dynamic agent on IBM i systems.

-acceptlicense *yes | no*
Specify whether to accept the License Agreement.

-addjruntime *true*
Adds the Java run time to run job types with advanced options to the agent. The run time environment is used to run application job plug-ins on the agent and to enable the capability to run remotely, from the agent, the dynamic workload broker resource command on the server.

By default, if the Java run time was already installed on the agent, it will be upgraded to the new version.

If the Java run time was not installed on the agent, it will not be installed during the upgrade, unless you specify `-addjruntime true`.

If you decided not to install Java run time when you upgrade, you can still add this feature later. For details about how to add a feature, see *IBM Workload Scheduler for z/OS: Planning and installation*.

-create_link
Create the **symlink** between `/usr/bin/at` and `<install_dir>/TWS/bin/at`. See Table 3 on page 35 for more information.

-displayname
The name to assign to the agent. The default is the host name of this computer.

-inst_dir *installation_dir*
The directory of the IBM Workload Scheduler installation.

Note: The path cannot contain blanks. If you do not manually specify a path, the path is set to the default home directory, that is, the *user_home**user_name* directory.

-jmport *port_number*

The JobManager port number used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. The default value is **31114**. The valid range is from 1 to 65535.

-jmportssl *true|false*
The JobManager port used by the dynamic workload broker to connect to the IBM Workload Scheduler dynamic agent. This number is registered in the `ita.ini` file located in the `ITA/cpa/ita` directory.

For communication using SSL or HTTPS
Set **jmportssl = true**. To communicate with the dynamic workload broker, it is recommended that you set the value to **true**. If the value is set to *true*, the port specified in **jmport** communicates in HTTPS.

For communication without using SSL, or through HTTP
Set **jmportssl = false**. If the value is set to *false*, the port specified in **jmport** communicates in HTTP.

-lang *lang_id*
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used.

Note: This is the language in which the installation log is recorded, and not the language of the installed engine instance. The **`twsinst`** script installs all languages by default.

-recovInstReg *true*
To re-create the registry files. Specify it if you have tried to upgrade a stand-alone, fault-tolerant agent (an agent that is not shared with other components or does not have the connector feature) and you received an error message that states that an instance of IBM Workload Scheduler cannot be found, this can be caused by a corrupt registry file. See "Upgrading when there are corrupt registry files" on page 226.

-skip_usercheck
Enable this option if the authentication process within your organization is not standard, thereby disabling the default authentication option. If you specify this parameter, you must create the user manually before running the script.

-skipcheckprereq
If you specify this parameter, IBM Workload Scheduler does not scan system prerequisites before upgrading the agent.

For a detailed list of supported operating systems and product prerequisites, see http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

-tdwbhostname *host_name*
The dynamic workload broker fully qualified host name. It is used together with the **-tdwbport** *tdwbport_number* parameter. It adds and starts the capabilities to run workload dynamically to IBM Workload Scheduler. If not specified you cannot run your workload dynamically and this parameter assumes the **localhost** default value. This value is registered in the **ResourceAdvisorUrl** property in the `JobManager.ini` file.

-tdwbport *tdwbport_number*
The dynamic workload broker HTTP or HTTPS port number used to add dynamic scheduling capabilities to your distributed or end-to-end

environment. It is used together with the **-tdwbhostname** *host_name* parameter. This number is registered in the ResourceAdvisorUrl property in the `JobManager.ini` file. The default value is **0**, however, if you leave the value as **0**, you cannot run your workload dynamically. Specify a nonzero value to add dynamic capability. The valid range is 0 to 65535.

-uname *user_name*
The name of the user for which IBM Workload Scheduler is being updated. The software is updated in this user's home directory. This user name is not to be confused with the user performing the upgrade.

Note: This user name is not the same as the user performing the installation logged on as **QSECOFR**.

-update
Upgrades an existing agent that was installed using **twsinst**.

-wait *minutes*
The number of minutes that the product waits for jobs that are running to complete before starting the upgrade. If the jobs do not complete during this interval the upgrade does not proceed and an error message is displayed. Valid values are integers or **-1** for the product to wait indefinitely. The default is **60** minutes.

-work_dir *working_dir*
The temporary directory used for the IBM Workload Scheduler installation process files deployment. The path cannot contain blanks. If you do not manually specify a path, the path is set to `/tmp/TWA/tws94`.

Example upgrade of an agent on IBM i systems

About this task

The following example shows the syntax used when using the **twsinst** script to upgrade an instance of the agent on IBM i system.

```
./twsinst -update
-uname TWS_user
-acceptlicense yes
-nobackup
-work_dir "/tmp/TWA/tws94"
```

The `twsinst` script log files on IBM i systems

About this task

The **twsinst** log file name is:

<TWS_INST_DIR>/twsinst_IBM_i_*<TWS_user>*^*<product_version>*.log

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is `/home/<TWS_user>`.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

<product_version>
Represents the product version. For example, for version 9.4 of the product, the value is 9.4.0.00

Analyzing return codes for agent installation, upgrade, restore, and uninstallation

Check how your operation completed by analyzing the return codes that are issued by twsinst.

Return codes that you can receive when you are installing, upgrading, restoring, or uninstalling agents. To analyze them and take corrective actions, run the following steps:

On Windows operating systems

1. Display the operation completion return code, by using the following command:

   ```
   echo %ERRORLEVEL%
   ```

2. Analyze the following table to verify how the operation completed:

Table 27. Windows operating system agent return codes

Error Code	Description	User action
0	Success: The operation completed successfully without any warnings or errors.	None.
1	Generic failure	Check the messages that are displayed on the screen by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation cannot create the IBM Workload Scheduler user or assign the correct permission to it.	Verify the operating system policies and configuration. Verify the input values. If necessary, create the user manually before you run the installation.
3	The password is not correct or the installation cannot verify it.	Verify the operating system policies and configuration. Verify the input values.
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.

Table 27. Windows operating system agent return codes (continued)

Error Code	Description	User action
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

On UNIX and Linux operating systems:

1. Display the installation completion return code, by using the following command:

   ```
   echo $?
   ```

2. Analyze the following table to verify how the installation completed:

Table 28. UNIX or Linux operating system agent return codes

Error Code	Description	User action
0	Success: The installation completed successfully without any warnings or errors.	None.
1	Generic failure.	Check the messages that are displayed on the video by the script. Correct the error and rerun the operation. If the error persists, search the http://www.ibm.com/software/sysmgmt/products/support database for a solution.
2	The installation did not find the IBM Workload Scheduler user or its home directory. The IBM Workload Scheduler user that you specified either does not exist or does not have an associated home directory.	Verify the operating system definition of the IBM Workload Scheduler user.
3	Not applicable	
4	The IBM Workload Scheduler installation directory is not empty. You specified as installation folder a directory that exists.	Empty it or specify a different directory.
5	An error occurred checking the IBM Workload Scheduler prerequisites on the workstation.	See the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Table 28. UNIX or Linux operating system agent return codes (continued)

Error Code	Description	User action
6	The IBM Workload Scheduler registry is corrupted.	Use the `recovInstReg` option to recover the registry. Then, rerun the operation.
7	The upgrade or restore operation cannot retrieve the information from the configuration files.	Check that the previous installation and the `localopts`, the `globalopts`, the `ita.ini`, and the `JobManager.ini` files are not corrupted. Correct the errors and try again the operation.
8	The upgrade, restore, or uninstallation cannot proceed because there are jobs that are running.	Stop the jobs that are running or wait for these jobs to complete. Restart the operation.
9	The upgrade, restore, or uninstallation cannot proceed because there are files that are locked.	Stop all the processes that are running and close all the activities that can block the installation path. Restart the operation.
10	The upgrade, restore, or uninstallation cannot proceed because there are command lines opened.	Close the command lines. Restart the operation.

Chapter 16. Uninstalling agents on IBM i systems

Learn how to uninstall agents on IBM i systems.

To uninstall IBM Workload Scheduler agents on an IBM i system using the **twsinst** script, follow these steps:

1. Ensure that all IBM Workload Scheduler processes and services are stopped, and that there are no active or pending jobs. For information about stopping the processes and services, see *Administration Guide*.
2. Log on as QSECOFR and change your directory to */installation_dir*/TWS. For example: /home/user1/TWS where user1 is the name of IBM Workload Scheduler user.
3. From the `Installation directory\TWS` directory, run the **twsinst** script as follows:

   twsinst -uninst -uname *username* [**-wait** *minutes*]
   [**-lang** *lang_id*] [**-work_dir** *working_dir*]

-uninst
Uninstalls IBM Workload Scheduler.

-uname *username*
The name of the user for which IBM Workload Scheduler is uninstalled. This user name is not the same as the user performing the installation logged on as **QSECOFR**.

-wait *minutes*
The number of minutes that the product waits for jobs that are running to complete before starting the uninstallation. If the jobs do not complete during this intervals the uninstallation stops and an error message is displayed. Valid values are integers or **-1** for the product to wait indefinitely. The default is **60** minutes.

-lang *lang_id*
The language in which the `twsinst` messages are displayed. If not specified, the system LANG is used. If the related catalog is missing, the default C language catalog is used.

-work_dir *working_dir*
The temporary directory used for the IBM Workload Scheduler installation process files deployment. If you do not manually specify a path, the path is set to `/tmp/TWA/tws<version_number>`.

The following example shows a **twsinst** script that uninstalls the IBM Workload Scheduler agent, originally installed for **twsuser** user:

On IBM i systems:

```
./twsinst -uninst -uname TWS_user
```

The `twsinst` script log files on IBM i systems

About this task

The **twsinst** log file name is:

`<TWS_INST_DIR>/twsinst_IBM_i_<TWS_user>^<product_version>.log`

Where:

<TWS_INST_DIR>
The IBM Workload Scheduler installation directory. The default installation directory is `/home/<TWS_user>`.

<TWS_user>
The name of the user for which IBM Workload Scheduler was installed, that you supplied during the installation process.

<product_version>
Represents the product version. For example, for version 9.4 of the product, the value is 9.4.0.00

Part 4. Dynamic Workload Console

How to install, upgrade, configure, uninstall and troubleshoot the Dynamic Workload Console.

Chapter 17. Overview of the Dynamic Workload Console

An overview of the Dynamic Workload Console.

The Dynamic Workload Console is a web-based user interface that is used with the following products:

- IBM Workload Scheduler
- IBM Workload Scheduler for z/OS
- IBM Workload Scheduler for Applications
- dynamic workload broker

When you install the Dynamic Workload Console, also the following products are installed:

- Self-Service Catalog
- Self-Service Dashboards
- Application Lab

For more information, see Mobile Applications User's Guide and IBM Workload Automation Application Lab User's Guide.

You can access IBM Workload Scheduler and dynamic workload broker environments from any location in your network using one of the supported browsers connected to the Dynamic Workload Console. The Dynamic Workload Console must be installed on a system that can reach either the IBM Workload Scheduler or the dynamic workload broker nodes using network connections.

Chapter 18. Preparing

An overview on how to install and use the Dynamic Workload Console.

To install and use the Dynamic Workload Console :

1. Check the installation prerequisites in the Detailed System Requirements at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048859 to verify that your system is compliant.
2. Choose the installation method that best suits your needs as described in the section about selecting your installation method in *Planning and Installation*.
3. Collect the information necessary to type in the required fields during the installation. See Chapter 20, “Installing,” on page 355.
4. Install the Dynamic Workload Console by following the instructions provided in "Installing components using Installation Manager."
5. Log in to the Dynamic Workload Console as described in “Accessing the Dynamic Workload Console” on page 368.
6. In the navigation tree click one of the following:

   IBM Workload Scheduler
   To access the IBM Workload Scheduler available functions

   dynamic workload broker
   To access the dynamic workload broker available functions
7. To effectively manage the functions available in the Dynamic Workload Console, create *engine connections* to the IBM Workload Scheduler and dynamic workload broker environments that you want to manage. Without defining engine connections, you can use only a limited set of Dynamic Workload Console functions. For more information, see “Quick steps to define an IBM Workload Scheduler engine connection” on page 369 and “Quick steps to define an dynamic workload broker connection” on page 370.

Directories created outside of *TWA_home* at installation time

The following list shows the directories that are created outside of *TWA_home* when you install the Dynamic Workload Console and IBM Workload Scheduler for z/OS connector.

On Windows operating systems:

Dynamic Workload Console:

```
%WINDIR%\TWA
```

z/OS connector:

```
%WINDIR%\TWA
%WINDIR%\system32\TWSRegistry.dat (32 bits)
%WINDIR%\sysWOW64\TWSRegistry.dat (32 bits on 64 bits)
%WINDIR%\TWSRegistry.dat (64 bits on 64 bits)
```

On UNIX operating systems:

Dynamic Workload Console:

```
/etc/TWA
```

z/OS connector:

```
/etc/TWA
/etc/TWS
```

Downloading installation images on your workstation

Steps to take when downloading images on your workstation.

About this task

You can download installation images by performing the following steps:

1. Ensure that your workstation has sufficient space to store both the files you download from IBM Passport Advantage and the extracted installation image. For more information about Systems requirements, see IBM Workload Scheduler System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.
2. From IBM Passport Advantage, download all the required parts for the product image listed in Table 2 on page 31 to a temporary directory.

Table 29. Required eImages

IBM Workload Scheduler components to install	**eImages to download**
• A dynamic agent • A fault-tolerant agent with remote command line	Agent eImage.
• A master domain manager or its backup • A dynamic domain manager or its backup	• IBM Workload Scheduler eImage. • WebSphere Application Server eImage. • DB2 eImage if you want to install and use the DB2 relational database.
Dynamic Workload Console	• IBM Workload Scheduler eImage. • WebSphere Application Server eImage.
Integration Workbench	Integration Workbench eImages.
Batch reports	IBM Workload Scheduler eImage.
Job Brokering Definition Console	IBM Workload Scheduler eImage.

3. Extract the installation image from the downloaded file and verify that the installation image is complete.

For more information about eImages, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843.

Creating a network repository

About this task

This scenario is valid only for master domain manager or dynamic domain manager and their backups, or Dynamic Workload Console that are installed by using the Installation Manager infrastructure.

Use the Installation Manager **Package Utility** to create the IBM Workload Scheduler eImages in network repository format. For more information about the **Package Utility** wizard, see *Installation Manager > Installing> Managing packages*

with Packaging Utility in the Installation Manager Information center https://www.ibm.com/support/knowledgecenter/SSDV2W/im_family_welcome.html.

After you use the **Packaging Utility** to create a repository from the ESD images, you can use the Installation Manager to define this location as a repository. You can save the repository on a UNC drive on Windows operating systems or on a web server to make the directories and files available over HTTP.

To create an IBM Workload Scheduler network repository, perform the following procedure:

1. Download the eImages as described in "Downloading installation images on your workstation" on page 31.
2. Install Installation Manager on your workstation.
3. Install the **Package Utility** using Installation Manager on your workstation.
4. To create the ESD images in network format, run the following steps:
   a. Start the **Package Utility**.
   b. Click **Point to the ESD image**.
   c. Run the wizard. For more information about the **Package Utility** wizard, see *Installation Manager > Installing> Managing packages with Packaging Utility*.

After you created a repository in network format, define this location as anInstallation Manager repository. To add a repository, run the following steps:

1. Open the Installation Manager wizard.
2. Select **File** > **Preferences**. The Repositories page is displayed and shows available repositories, repository locations, and the connection status for the repositories.
3. Select **Add Repository**. The Add Repository page is displayed.
4. Enter the repository location or select **Browse**.
5. Go to the repository location where you saved the eImages content in network format and select the URL related to the product that you want to install.
6. Click **OK**. If you provided an HTTPS or restricted FTP repository location, you are prompted to enter a user ID and password. The new repository location is added to the list. If the repository is not connected, a red box is shown in the Connection column.
7. Click **OK**.

After you defined an Installation Manager repository, install the product:

IBM Workload Scheduler
See "Installing main components" on page 93 in *IBM Workload Scheduler: Planning and Installation*.

Dynamic Workload Console
See Chapter 20, "Installing," on page 355.

Accessing the installation media

Accessing the installation media

Access the installation media to download the installation files

Installation media

Content of the installation media.

About this task

The content of the installation media depends on the image that you downloaded.

Agents image

Depending on the operating system, the installation image contains some or all of the following directories:

TWS Contains the files required to install a IBM Workload Scheduler dynamic agent or a fault-tolerant agent with remote command line.

JavaExtension
Contains the files to install Java extension or to add Java extension to an installed IBM Workload Scheduler instance.

IBM Workload Scheduler Server image

Depending on the operating system, the installation image contains some or all of the following directories:

dbtools
Contains the files required to create or update the IBM Workload Scheduler database before installing or upgrading the product. For more information about managing IBM Workload Scheduler database before the installation process, see Chapter 5, "Creating or upgrading the IBM Workload Scheduler database tables before installing or upgrading," on page 47.

FULL Contains the repository required to install the product by using Installation Manager.

iim Contains the files required to install Installation Manager manually.

response_files
Contains the response files that install the IBM Workload Scheduler master domain manager, the backup master domain manager, the dynamic domain manager, the backup dynamic domain manager, or the Dynamic Workload Console.

DWC Contains the files required to install the Dynamic Workload Console.

TWS Contains the files required to install the IBM Workload Scheduler master domain manager or its backup, the dynamic domain manager or its backup.

Prerequisites
Contains the files needed to scan your system to verify that your environment has all the product system requirements necessary to perform a successful installation.

Integration Workbench
Contains the files required to install IBM Workload Scheduler Integration Workbench.

DB2 images
Contains the files required to install DB2.

WebSphere Application Server images
Contains the files required to install WebSphere Application Server.

Jazz for Service Management extension for WebSphere images
Contains the files required to install Jazz for Service Management extension for WebSphere.

Chapter 19. Dynamic Workload Console prerequisites

Prerequisite information for installing a Dynamic Workload Console

Dynamic Workload Console installation has the following prerequisites:

WebSphere Application Server
If you do not have this product installed, the installation process automatically installs it.

Jazz for Service Management
If you do not have this product installed, you can decide to install it at installation time. If you plan to use Tivoli Common Reporting for administering, running, customizing, and creating reports, select the **Reporting Services** package when installing Jazz for Service Management.

Before you install the **Reporting Services** package, ensure you run IBM Prerequisite Scanner. IBM Prerequisite Scanner is a stand-alone prerequisite checking tool that analyzes system environments before the installation or upgrade of an IBM product. For more information, see the section about running the Prerequisite Scanner manually in the Jazz for Service Management documentation.

For more information about installing and configuring Jazz for Service Management and the **Reporting Services** package, see the Jazz for Service Management documentation.

For more information about Tivoli Common Reporting, see the section about Tivoli Common Reporting in the *Dynamic Workload Console User's Guide*.

You can optionally create a Windows service for Jazz for Service Management. For more information, see the section about creating a windows service for Jazz for Service Management.

Dashboard Application Services Hub
If you do not have this product installed, the installation process automatically installs it.

WebSphere SDK Java Technology Edition
If you do not have this product installed, the installation process automatically installs it.

To install the prerequisites, choose one of the following options:

- Manually launch the Jazz for Service Management extension for WebSphere installation on the product image.
- Download the appropriate eImages. See the product Download Document.

For a complete list of the correct versions to install, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Supported operating systems

How to obtain information about the supported operating systems.

About this task

To produce a dynamic report that lists the supported operating systems, click Supported operating systems.

For a complete list of system requirements (disk spaces, temporary spaces and RAM usage), see System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Scanning system prerequisites for IBM Workload Scheduler

Before installing or upgrading the product, IBM Workload Scheduler automatically runs a scan on your system.

About this task

Having an environment that meets the product system requirements ensures that an installation or upgrade succeeds without any delays or complications.

The scan verifies that:

- The operating system is supported for the product.
- On UNIX operating systems, the necessary product libraries are installed.
- There is enough permanent and temporary disk space to install both the product and its prerequisites.
- There is enough memory and virtual memory.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler. It does not check the requirements for other components, such as DB2. To verify the requirements for Installation Manager use the procedure described in "Scanning system prerequisites for Installation Manager" on page 45.

If any of these checks fails, IBM Workload Scheduler performs the following action:

For all the components installed by using Installation Manager:
Displays a notification of the requirement that was not met. In this case, stop the installation or the upgrade, analyze the log files, solve the error, and rerun the installation or upgrade. If you are performing an interactive installation, the errors are displayed on the screen. If you are performing a silent installation, the errors are written in the Installation Manager log files. For more information about log files, see "Installation Manager wizard, silent installation and uninstallation log files" on page 263 in *IBM Workload Scheduler: Planning and Installation*.

For agents
An error message is returned. In this case, analyze the log file, solve the error, and rerun the installation or upgrade. The log files are located:

On Windows operating systems:
%TEMP%\TWA\tws<*version_number*>\result.txt

On UNIX and Linux operating systems:
$tmp/TWA/tws<*version_number*>/result.txt

You can decide to rerun the installation or upgrade without executing the prerequisite scan. If you specify the **-skipcheckprereq** parameter, the **twsinst** installation script does not execute the prerequisite scan. If a problem occurs, an error is displayed, the agent is installed or upgraded,

but might not work. For more information about the `-skipcheckprereq` option, see "Agent installation parameters - twsinst script" on page 143 in *IBM Workload Scheduler: Planning and Installation*.

For a detailed list of supported operating systems and product prerequisites, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

Scanning system prerequisites for Installation Manager

Scanning system prerequisites for Installation Manager before you install or upgrade the IBM Workload Scheduler.

About this task

Before you install or upgrade the IBM Workload Scheduler, if you have not installed Installation Manager, run a scan on your system to verify that your workstation has all the system requirements needed for a successful installation. Having an environment that meets the product system requirements ensures that an installation succeeds without any delays or complications.

You can run a prerequisite scan for Installation Manager by using **checkPrereq** command:

On Windows operating systems:

Run the following command:

```
checkPrereq.bat
```

On UNIX or Linux operating systems:

Run the following command:

```
checkPrereq.sh
```

Specify the **-silent** option if you are not interested in installing Installation Manager by using the wizard. If you use the **-silent** option, the program does not check that the graphical libraries exist. If the scan fails, the program displays a notification of the requirement that was not met. In this case, stop the installation, solve the error, and rerun the installation.

Chapter 20. Installing

Installing the Dynamic Workload Console.

Install this component if you want to manage your static and dynamic workload both in distributed and end-to-end environments using a web interface.

By default the Dynamic Workload Console installation process installs the z/OS connector component. During installation process, you might also configure the z/OS connector instance to connect to the z/OS system.

Selecting your installation method

Installing the Dynamic Workload Console by selecting your installation method.

You can install the Dynamic Workload Console using one of the following methods:

Installation wizard
Install the Dynamic Workload Console and the z/OS connector by using the wizard for each supported platform. The wizard guides you through the installation steps. For more information, see "Installation procedure for Dynamic Workload Console" on page 356.

Silent mode
Using this method, you run the installation unattended and in the background. A response file provides the relevant information to the installation process. Customize the *response file* by adding all the configuration settings to be used during the installation, Then, from the command line, run the Installation Manager command. As a prerequisite step, you can run a script that checks the system against the product system requirements to ensure a successful installation. For more information, see "Silent installation" on page 360.

Changing temporary directory when installing using Installation Manager

When you install the Dynamic Workload Console using Installation Manager, you can change the default path of the temporary directory.

To change the location of the default directory where temporary files are stored during the installation of the Dynamic Workload Console using the IBM Installation Manager, perform the following actions:

1. Go to the Installation Manager installation path, edit the `IBMIM.ini` file and add after line:

   ```
   -vmargs
   ```

   the following line:

   ```
   -Djava.io.tmpdir=<new_temp_folder>
   ```

   where *<new_temp_folder>* is the full path to the new temporary directory.
2. Restart the Installation Manager and install the Dynamic Workload Console.

Examples:

On Windows operating systems:

```
-vmargs
-Djava.io.tmpdir=C:\NewDir
```

On UNIX operating systems:

```
-vmargs
-Djava.io.tmpdir=/tmp/NewDir
```

Installation procedure for Dynamic Workload Console

About this task

To install a Dynamic Workload Console and its prerequisites, perform the following steps:

1. Run the installation process. as follows:
   a. From the eImage that contains the IBM Workload Scheduler master domain manager, run:

      Windows operating systems:
      From the root directory of the eImage, run `setupDWC.bat`.

      UNIX operating systems:
      With IBM Workload Scheduler Version 9.4 you are no longer required to have root privileges to install the Dynamic Workload Console.

      If you decided to silently install the Dynamic Workload Console as non-root user, also the Installation Manager must be installed by the same non-root user.

      If you are installing as the root user
      From the root directory of the eImage, run `setupDWC.sh`.

      If you are installing as a non-root user
      Complete the following steps:

      1) Create the `/etc/TWA` folder and grant write access to the non-root user that is installing the Dynamic Workload Console.
      2) Assign to the *<DWC_INSTALL_MEDIA>* directory the non-root user ownership, by running the following command:

         `chown -R non-root-user /<DWC_INSTALL_MEDIA>`
      3) Run `setupDWC.sh -noroot`

      Note: If you are installing the Dynamic Workload Console as a non-root user, consider the following limitations:

      - All the prerequisite products, as listed in Chapter 19, "Dynamic Workload Console prerequisites," on page 351, must be installed by the non-root user.
      - After the installation, fix packs can be installed only by the non-root user.
      - Only fix packs and releases certified for the non-root user can be applied on that Dynamic Workload Console instance.

- Any WebSphere Application Server command must be run only by the non-root user.
- The *wastools* installed for the Dynamic Workload Console must be run only by the non-root user.
- You can install the Dynamic Workload Console only by using File or LDAP, and you cannot configure it with LocalOS or Custom security repositories

The Installation Packages Installation Manager panel opens.

2. In the Installation Packages Installation Manager panel, the installation process selected all the Dynamic Workload Console prerequisites packages and the Dynamic Workload Console Version 9.4 product package.

   Note: If you have already installed the Dynamic Workload Console or its prerequisites products, a warning window is displayed. Click **Continue** to install the package in a new group or click **Cancel** to clear the package that is already installed.
   Click **Next**.
3. On the Licenses page, read the license agreement for the selected package. If you selected to install the Dynamic Workload Console package and the Dynamic Workload Console prerequisites packages, you must accept the license agreement for each package. On the left side of the License page, click each package to see its license agreement. If you agree to the terms of all the license agreements, click **I accept the terms in the license agreements**. Click **Next**
4. On the Location panel, the Dynamic Workload Console and the Dynamic Workload Console prerequisites packages are listed:

   For each prerequisite package:
   Accept the default path, or type, or **Browse** for the path to use as the installation directory in which to install the prerequisite instance.

   For Dynamic Workload Console package:
   Accept the default path, or type, or **Browse** for the path to use as the installation directory in which you install the Dynamic Workload Console:

   Installation directory

   The maximum field length is 46 characters. You cannot use national characters.

   On Windows operating systems:

   - The following characters are not valid:
     ```
     '!','#','$','%','&','{','}','[',']','=',
     '?','\'','<','>',',',';','(',')'
     ```
   - The name must be longer than three characters, the second character must be ':', the third character must be '\'.
   - The default directory is `C:\Program Files\IBM\TWAUI`

   On UNIX and Linux operating systems:

   - The following characters are not valid:
     ```
     '!','\"','#','$','%','&','{','}','[',']','=',
     '?','\'','<','>',',',';','(',')',' '
     ```
   - The name must be longer than one character and the first character must be '/'.
   - The default directory is `/opt/IBM/TWAUI`

Note: If you are installing on a Windows server 2008 follow the instructions in the message about virtualized directories.

5. Click **Next**. On the Features page, select the languages for which the corresponding WebSphere Application Server packages will be installed. The language translations for the user interface and documentation are installed. You have the option to select languages only the first time that you install a package to a package group. You can install other language translations for all the packages in a package group with the Modify wizard. Click **Next**.
6. On the Features page, perform the following actions:

   For the prerequisite packages:

   To see a description of a feature, click the feature name. In the Details section you see a short description.

   Ensure that you leave the default prerequisites features selected by installation process.

   For the Dynamic Workload Console package:
   Leave the **Dynamic Workload Console** option selected.

   Click **Next**.
7. In the following panels, enter the following information:

   For each prerequisite package:
   On the prerequisites product panels, enter the information related to the product you are installing. For more information about the field values, see the prerequisite product documentation.

   For the Dynamic Workload Console package:
   On the following panels, enter the following information:

   WebSphere Application Server profile configuration:
   "WebSphere Application Server profile configuration"

   z/OS connector configuration:
   "z/OS connector configuration" on page 359.

   Click **Next**.
8. On the Summary page, review your choices before installing the product package and its prerequisites. To change any choices that you made on previous pages, click **Back** and make the changes. Click **Install** to install the Dynamic Workload Console package and its prerequisites.

Note: If you installed the WebSphere Application Server prerequisite, after the installation do not create a profile because the installation process already created its own profile.

After a successful installation, to configure the Dynamic Workload Console, see "Accessing the Dynamic Workload Console" on page 368.

WebSphere Application Server profile configuration

About this task

The following fields are provided for WebSphere Application Server profile configuration data. The fields you complete depend upon whether you are using an existing profile for Dashboard Application Services Hub or another profile.

WebSphere installation location
Type or **Browse** for the directory where the WebSphere Application Server instance is installed. Click **Browse** to find the appropriate location.

Use an existing WebSphere Application Server profile
You use a WebSphere Application Server profile that you have already created.

Profile details
Profile location
Enter the name of the directory where the WebSphere Application Server profile is located. Click **Browse**, to find the appropriate location. The default is:

On Windows operating systems:
`C:\Program Files\IBM\JazzSM\profile`

On UNIX operating systems:
`/opt/IBM/JazzSM/profile`

Note: Do not use any of the following characters in the profile path field:

On Windows operating systems:
!"#$%&{}[]=?'<>,;*:

On UNIX operating systems:
!"#$%&{}[]=?'<>,;*

Profile name
Enter the name of the file where the WebSphere Application Server profile is defined. The default is **JazzSMProfile**.

Node name
Enter the name of the node contained in the WebSphere Application Server profile. The default is **JazzSMNode01**.

Server name
Enter the name of the server contained in the WebSphere Application Server profile. The default is **server1**.

User name
Provide the user that can access the WebSphere Application Server profile. The default is **wasdmin**.

Password
Provide the WebSphere Application Server password for the user you specified. The password must comply with the password policy in your Local Security settings.

Validate
Click validate the information you entered are correct.

z/OS connector configuration

About this task

Specify the information to connect to an IBM Workload Scheduler for z/OS system.

Configure a connection to an IBM Workload Scheduler for z/OS host
Select it if you want to create a connection to an IBM Workload Scheduler for z/OS controller.

IBM Workload Scheduler for z/OS engine name
Specify the name of the IBM Workload Scheduler for z/OS engine which you are connecting to.

IBM Workload Scheduler for z/OS remote host
Specify the host name or TCP/IP address of the remote z/OS system where the IBM Workload Scheduler for z/OS controller is installed.

IBM Workload Scheduler for z/OS remote TCP/IP port
Specify the number of the TCP/IP port of the z/OS system used to communicate with the IBM Workload Scheduler for z/OS controller.

Enable SSL
Select to enable the SSL communication between the z/OS connector and the remote z/OS system. By default, this box is not selected and the communication is not SSL.

Silent installation

Before you begin

1. Ensure that you downloaded the Dynamic Workload Console eImage (for details, see the Download Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg24042843).
2. Verify that your system meets the product system requirements by running a check: "Checking system prerequisites for the Dynamic Workload Console" on page 361.
3. Before starting to install, verify that the user running the installation process has the following authorization requirements:

   Windows operating systems

   If you set the Windows User Account Control (UAC), your login account must be a member of the Windows **Administrators** group or domain administrators group with the rights **Act as Part of the Operating System**.

   If you set the Windows User Account Control (UAC) on the workstation you must run the installation as **administrator**.

   UNIX and Linux operating systems
   You can silently install the Dynamic Workload Console both as **root** and **non-root** user.

   See "Installation procedure for Dynamic Workload Console" on page 356 for non-root installation limitations.

About this task

When you run a silent installation, you have the Installation Manager already installed and you use an XML response file that contains parameters required to install the product package.

Select the appropriate response file, determine the eImages you need to download and extract, and then customize the properties in the response file including the settings for the repository location of the eImages before performing the silent installation.

Important: During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

To silently install Dynamic Workload Console product package you can have one of the following scenarios:

Installing the Dynamic Workload Console package:
The Dynamic Workload Console prerequisites are already installed. For more information, see "Performing a Dynamic Workload Console silent installation" on page 362.

Installing the Dynamic Workload Console package and its prerequisites:
You need to install the Dynamic Workload Console package and its prerequisites. For more information, , see "Performing a Dynamic Workload Console and its prerequisites silent installation" on page 364.

Installing the Dynamic Workload Console and master domain manager packages and their prerequisites:
You need to install the Dynamic Workload Console package, Dynamic Workload Console prerequisites packages, master domain manager package, master domain manager prerequisites packages. For more information, see "Performing a silent installation of IBM Workload Scheduler and its prerequisites and a Dynamic Workload Console and its prerequisites" on page 118.

Checking system prerequisites for the Dynamic Workload Console

Before installing or upgrading the Dynamic Workload Console, run a script that checks the system against the product system requirements.

About this task

When you run a silent installation, you must create a response file to use as input to the IBM Installation Manager silent installation commands. The response file includes all the information required to run the installation without user intervention.

As a prerequisite step, specifically for the Dynamic Workload Console silent installation, you can run a script that checks the system against the product system requirements to ensure a successful installation without delays or complications. The prerequisite check script checks requirements such as:

- Supported operating system.
- Sufficient RAM.
- Sufficient swap file space.
- Disk space for the creation of the installation, Jazz for Service Management, and temporary directories passed in input to the script.

Note: The scan verifies only that the environment meets the requirements of IBM Workload Scheduler. It does not check the requirements for other components,

such as DB2. To verify the requirements for Installation Manager use the procedure described in "Scanning system prerequisites for Installation Manager" on page 45.

For a detailed list of supported operating systems and product prerequisites, see the System Requirements Document at http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048858.

To run the prerequisite check script:

Procedure

1. Copy the script `dwcPrereqcheck.bat` or `dwcPrereqCheck.sh` and the `Prerequisites` folder from the eImage to a folder on the system where you plan to run the installation and ensure you have read, write, and execute permissions on the `Prerequisites` folder.
2. Submit the script to run as follows:

   On Windows operating systems:
   Run the following command:

   ```
   dwcPrereqCheck.bat -instdir <DWC_HOME> -jazzdir <JAZZDIR> -tmpdir <tmp>
   ```

   On UNIX or Linux operating systems:
   Run the following command:

   ```
   dwcPrereqCheck.sh -instdir <DWC_HOME> -jazzdir <JAZZDIR> -tmpdir <tmp>
   ```

   where,

   <DWC_HOME>
   Represents the Dynamic Workload Console installation path, for example, on Windows, this path is `C:\Program Files\IBM\TWAUI`.

   <JAZZDIR>
   Represents the directory where the Jazz™ for Service Management extension for WebSphere is installed.

   <tmp> Represents the temporary folder on the system where you are running the installation.

Results

The results of the prerequisite check are written to a text file named, `result.txt`, located in the `Prerequisites` folder.

What to do next

Proceed to customize the response file and run the silent installation.

Performing a Dynamic Workload Console silent installation

Before you begin

You must install Installation Manager before you perform a silent installation of the Dynamic Workload Console package.

Verify that your system meets the product system requirements by running a check: "Checking system prerequisites for the Dynamic Workload Console" on page 361.

If you decided to silently install the Dynamic Workload Console as non-root user, also the Installation Manager must be installed by the same non-root user.

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

To perform a silent installation of the Dynamic Workload Console package, by using one of the response files listed in "Dynamic Workload Console response file templates" on page 364, perform the following steps:

1. Copy the relevant response file to a local directory.
2. Edit the Dynamic Workload Console section. For details about the response file properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse\tools
   ```

   On UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

   If you are installing as a non-root user

   ```
   /home/<non-root-user>/IBM/InstallationManager/eclipse/tools
   ```
6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for installation.
   - The `log_file` is the name of the log file that records the result of the silent installation execution.

   Note: For more information about Installation Manager, see Installation Manager documentation.

After a successful installation, perform the configuration tasks as described in the *Dynamic Workload Console User's Guide*.

Dynamic Workload Console response file templates

About this task

Edit the response file templates provided in the installation media in the `\response_files\` directory. Instructions for customizing the files are included in the files as commented text.

Table 30 lists the response files and the types of installation each performs by platform:

Table 30. Installation response files

Type of installation	Response file to use
Installing on Windows operating systems	
Fresh Dynamic Workload Console	`IWS94_FRESH_DWC_WIN.xml`
Installing on UNIX operating systems	
Fresh Dynamic Workload Console	`IWS94_FRESH_DWC_UNIX.xml`

Table 31 lists the response files and the types of upgrade each performs by platform:

Table 31. Upgrade response files

Type of upgrade	Response file to use
Upgrading on Windows operating systems	
Dynamic Workload Console	`IWS94_UPGRADE_DWC_WIN.xml`
Upgrading on UNIX operating systems	
Dynamic Workload Console	`IWS94_UPGRADE_DWC_UNIX.xml`

For details about response file properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431.

Performing a Dynamic Workload Console and its prerequisites silent installation

Before you begin

You must install Installation Manager before you perform a silent installation of the Dynamic Workload Console package and its prerequisites. Verify that your system meets the product system requirements by running a check: "Checking system prerequisites for the Dynamic Workload Console" on page 361.

If you decided to silently install the Dynamic Workload Console as non-root user, also the Installation Manager must be installed by the same non-root user.

For detailed information about how to install Installation Manager, see the Installation Manager documentation.

About this task

You can silently install the Dynamic Workload Console package at the same time as its prerequisites packages, by using a global response file located in the `\response_files\` directory of the installation media. For a list of response files, see Table 32 on page 366.

The silent installation process:

- Assigns the correct order to the package installation.
- Manages the prerequisites package installation.

The response file contains one section for each prerequisite package that you have to install and one section related to the Dynamic Workload Console package installation.

Perform the following steps:

1. Copy the response file to a local directory.
2. Edit the following sections:

   Dynamic Workload Console prerequisites packages sections:
   For more information about how to type in this section see the response file properties description provided as commented text or see the prerequisites product documentation.

   Dynamic Workload Console section:
   For more information about how to complete the Dynamic Workload Console section properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431.

   Note: Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems
   `C:\Program Files\IBM\Installation Manager\eclipse\tools`

   On UNIX and Linux operating systems
   If you are installing as the root user

   `/opt/IBM/InstallationManager/eclipse/tools`

   If you are installing as a non-root user
   `/home/<non-root-user>/IBM/InstallationManager/eclipse/tools`
6. Run the following command:

   On Windows operating systems:

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems:

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   Where:

   - The `response_file.xml` is the name of the response file to be used for installation.
   - The `log_file` is the name of the log file that records the result of the silent installation.

Note: For more information about Installation Manager silent installation command and Installation Manager silent log files, see the Installation Manager information center.

Table 32 lists the response files and the types of installation that each one performs by platform:

Table 32. Global installation response files

Packages that you are installing:	Response file to use
Installing on Windows operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, and Dynamic Workload Console.	`IWS94_FRESH_FULL_DWC_WIN.xml`
Installing on UNIX operating systems	
WebSphere Application Server, Jazz for Service Management extension for WebSphere, and Dynamic Workload Console.	`IWS94_FRESH_FULL_DWC_UNIX.xml`

After a successful installation, perform the configuration tasks as described in the *Dynamic Workload Console User's Guide*.

Encrypting user passwords for response files

Steps that need to be taken to encrypt the user passwords for the response files.

About this task

You must encrypt each password string stored in the response files by using Installation Manager.

You can perform the password encryption by using one of the following procedures:

Installation Manager String encryption utility interface

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse
   ```

   UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

   If you are installing as a non-root user

   ```
   /home/<non-root-user>/IBM/InstallationManager/eclipse/
   tools
   ```

2. To open the **String encryption utility interface**, run the following command:

   Windows operating systems

   ```
   IBMIM.exe encryptString <stringToEncrypt>
   ```

where <stringToEncrypt> is the value to be encrypted.

UNIX and Linux operating systems

```
./IBMIM encryptString <stringToEncrypt>
```

where <stringToEncrypt> is the value to be encrypted.

3. In the **String encryption utility** window, note the Encrypted version of the String field value related to the String to be encrypt field value.
4. Copy the Encrypted version of the String value in the password entry of the response file.

Installation Manager command line tool

To encrypt the password string for the response files, perform the following steps:

1. Go to the eclipse directory of the Installation Manager installation directory. The default eclipse directory is:

   Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse
   ```

   UNIX and Linux operating systems

   If you are installing as the root user

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

   If you are installing as a non-root user

   ```
   /home/<non-root-user>/IBM/InstallationManager/eclipse/
   tools
   ```

2. Run the following command:

   Windows operating systems

   ```
   IBMIM.exe -silent -noSplash encryptString <stringToEncrypt> >
   <Encryptedpwd>.txt
   ```

   where <stringToEncrypt> is the value to be encrypted and the <Encryptedpwd>.txt is the file where there is the encrypted value of the password.

   UNIX and Linux operating systems

   ```
   ./IBMIM -silent -noSplash encryptString <stringToEncrypt> >
   <Encryptedpwd>
   ```

   where <stringToEncrypt> is the value that is encrypted and the <Encryptedpwd> is the file where there is the encrypted value of the password.

3. Open the file <Encryptedpwd> and copy the value contained into the file in the data key of the response file.
4. Remove the file <Encryptedpwd>.

Example

This example shows you how to write the section USER INFORMATION of the IWS94_FRESH_MDM_WIN.xml response file, setting the IBM Workload Scheduler user value to *twsuser* and the user password value to *passw0rd* on Windows operating systems.

By using the Installation Manager command line tool, encrypt the password *passw0rd* saving the encrypted value to the file `my_pwd.txt`:

```
IBMIM.exe -silent -noSplash encryptString passw0rd > my_pwd.txt
```

The file *my_pwd.txt* contains the following value:

```
rbN1IaMAWYYtQxLf6KdNyA==
```

Complete the `USER INFORMATION` section of the `IWS94_FRESH_MDM_WIN.xml` response file as follows:

```
<!--USER INFORMATION
Supply the IBM Workload Scheduler credentials information -->
<data key='user.userName,com.ibm.tws' value='twsuser'/>
<data key='user.password,com.ibm.tws' value='rbN1IaMAWYYtQxLf6KdNyA=='/>
```

Note: For security reasons, remove the file *my_pwd.txt* after using it.

Accessing the Dynamic Workload Console

From a supported browser, access one of the following links provided by the installation program:

http://*dynamic_workload_console_system*:*http_port*/*DASH_context_root*

https://*dynamic_workload_console_system*:*https_port*/*DASH_context_root*

where:

dynamic_workload_console_system
: The hostname or IP address of the system where you installed the Dynamic Workload Console.

http_port
: The port number used to access the Dynamic Workload Console using an unsecure connection over HTTP. The default value for this port number is **16310**.

https_port
: The port number used to access the Dynamic Workload Console using a secure connection over HTTPS. The default value for this port number is **16311**.

  When connecting to the Dashboard Application Services Hub using an HTTPS connection, if you receive a security alert, proceed with the Dynamic Workload Console working session. If you receive security information windows while navigating through the Dashboard Application Services Hub, choose to display nonsecure items to proceed. If you are using Internet Explorer, you can prevent these windows from opening by setting **Display mixed content** to **Enable** in the Security settings.

DASH_context_root
: It is the Dashboard Application Services Hub context root defined at installation time. The context root determines the URL of a deployed application and by default is identical with the application directory or archive structure. In this case, the default is `ibm/console`.

In the Dashboard Application Services Hub login portlet, enter the user ID and password you specified during the installation, and click **Log in**.

Access Single Entry Pointpage and click Go from the Dynamic Workload Console launching point.

For a quick and rapid overview of the portal and of its use, after logging in to the Dashboard Application Services Hub, click one of the hyperlinks displayed on the welcome page to launch videos and a tutorial that help you find the information you need.

Several products might be integrated in this portal and their related entries are listed together with those belonging to the Dynamic Workload Console in the toolbar. Use these icons to perform your tasks.

Use the toolbar to work with the Dynamic Workload Console to perform the IBM Workload Scheduler tasks.

To effectively use the functions of the IBM Workload Scheduler and the dynamic workload broker, you must define connections to the IBM Workload Scheduler engines and the dynamic workload broker servers.

If you do not define engine connections, you can perform only this limited set of operations:

On IBM Workload Scheduler:

- Create monitor tasks
- Create report tasks
- Create event management tasks
- Define user preferences

On dynamic workload broker

Define user preferences

If the user ID you used to connect to the Dynamic Workload Console has been assigned a role different from **TWSWEBUIAdministrator** and **TDWBAdministrator**, you will see a subset of the available panels. This subset depends on the authorizations assigned to the role associated to your user ID. For more information about roles, see the information about configuring the Dynamic Workload Console in the *IBM Workload Scheduler: Administration Guide*.

If the user ID you used to connect to the Dynamic Workload Console has no role assigned, you do not see the entries for IBM Workload Scheduler and dynamic workload broker in the Dashboard Application Services Hub navigation tree.

Quick steps to define an IBM Workload Scheduler engine connection

Steps to create an engine connection to one of your supported IBM Workload Scheduler engines.

After logging in to the Dynamic Workload Console using the administrator user ID or another user ID with assigned **TWSWEBUIAdministrator** or **TWSWEBUIConfigurator** roles, use the following steps to create an engine connection to one of your supported IBM Workload Scheduler engines.

1. From the navigation toolbar, click **System Configuration** > **Manage Engines**.
2. From the displayed panel you can create, edit, delete, or share an engine connection, and test the connection to the remote server where IBM Workload

Scheduler is installed. You can order the list of engine connections displayed in this panel by using sorting criteria that you select with the buttons at the upper left corner of the table.

3. Click **New Engine**.
4. In the Engine Connection Properties window, assign a name to the engine connection and specify the required information. For more details about fields and options, see the online help by clicking the "**?**" in the top right corner. If you want to test the connection to the IBM Workload Scheduler database (mandatory for managing reporting and event management functions), you must select **Enable reporting** and specify the user credentials.
5. Click **Test Connection** to check that the configuration was successful and that the Dynamic Workload Console is communicating with the selected engine. If the test connection fails, see *Troubleshooting Guide*.

Quick steps to define an dynamic workload broker connection

Steps to take to create a connection to a supported dynamic workload broker engine.

The Dynamic Workload Console supports a single connection to one dynamic workload broker engine at any given time for each authorized user. A different connection is supported for each authorized user.

After logging in to the Dynamic Workload Console using the administrator user ID, or another user ID with assigned **TDWBAdministrator** or **TDWBConfigurator** roles, follow these steps to create an engine connection to a supported dynamic workload broker engine:

1. In the Dynamic Workload Console, click **dynamic workload broker** to expand the tree.
2. Select **Configuration**.
3. Click **Server connection**.
4. In the Server Connection specify:

   Hostname
   The host name of the dynamic workload broker you want to connect to.

   Non secure port
   The non-secure port to be used for connection.

   Secure port
   The secure port to be used for connection.

   Use Secure Connection
   Specify whether a secure connection must be used. For more information about security, see the *Administration Guide*.

   Username
   Optionally specify a different user for the server connection. The connection to the new server is enabled using the credentials of the user you specified. Each user has access to only one server connection.

   Password
   Specify the password for the authenticated user the connection applies to.
5. Click **OK** to save your changes. The server connection you specified is enabled and is immediately effective.

Starting and stopping the Dynamic Workload Console

Options on starting and stopping the Dynamic Workload Console.

To start and stop the Dynamic Workload Console, related to a Jazz for Service Management extension for WebSphere profile, you must start and stop the WebSphere Application Server instance by using one of the following options:

wastools **installed for the Dynamic Workload Console:**

To Start the Dynamic Workload Console:

On Windows operating systems:

```
<DWC_INST_DIR>\wastools\startWas.bat
```

On UNIX and Linux operating systems

```
<DWC_INST_DIR>/wastools/startWas.sh
```

To Stop the Dynamic Workload Console:

On Windows operating systems

```
<DWC_INST_DIR>\wastools\stopWas.bat
```

On UNIX and Linux operating systems:

```
<DWC_INST_DIR>/wastools/stopWas.sh
```

where `<DWC_INST_DIR>` is the Dynamic Workload Console installation directory.

For more information about the utilities usage, see Administration Guide*: Application server tasks*.

Note: When you start or stop the Dynamic Workload Console, related to a Jazz for Service Management extension for WebSphere profile, you are prompt to insert the credentials for the profile. To avoid this behaviour, run the command with `-direct` option.

WebSphere Application Server native commands:

To Start the Dynamic Workload Console:

On Windows operating systems:

```
<JAZZSM_INSTALL_DIR>\profile\bin\startServer.bat
<app_server>
```

On UNIX and Linux operating systems:

```
<JAZZSM_INSTALL_DIR>/profile/bin/startServer.sh
<app_server>
```

To Stop the Dynamic Workload Console:

On Windows operating systems:

```
<JAZZSM_INSTALL_DIR>\profile\bin\stopServer.bat
<app_server>
-user <user_id> -password <user_id_pw>
```

On UNIX and Linux operating systems:

```
<JAZZSM_INSTALL_DIR>/profile/bin/stopServer.sh
<app_server>
-user <user_id> -password <user_id_pw>
```

where:

<JAZZSM_INSTALL_DIR>
Is the directory where the Jazz for Service Management extension for WebSphere is installed.

<app_server>
Is the server name specified in the Jazz for Service Management extension for WebSphere profile related to the Dynamic Workload Console. The default is **server1**.

<user_id>
Is the administrator user ID specified when installing the Dynamic Workload Console.

<user_id_pw>
Is the administrator user ID password specified when installing the Dynamic Workload Console.

Chapter 21. Configuring

Some links and pointers on configuration tasks that are needed for the Dynamic Workload Console.

The following is a list of links or pointers to places that document the configuration tasks needed for the Dynamic Workload Console. You can perform the following optional configuration steps at any time after the installation.

- Configuring new users to access the Dynamic Workload Console: see the section about configuring access to the Dynamic Workload Console in the *IBM Workload Scheduler: Administration Guide*.
- Configuring the Dynamic Workload Console to use a user registry:
  - For configuring the Dynamic Workload Console with LDAP - RACF®, see the WebSphere documentation at: Configuring to secure Lightweight Directory Access Protocol user registry using Resource Access Control Facility based on z/OS.

    Also, see "Post-installation steps to configure the use of Lightweight Third-Party Authentication (LDAP)" on page 374.
  - For configuring access to the Dynamic Workload Console, see the corresponding section in the *IBM Workload Scheduler: Administration Guide*.
- Configuring roles to access the Dynamic Workload Console: see the corresponding section in the *IBM Workload Scheduler: Administration Guide*.
- Configuring the Dynamic Workload Console to use Single Sign-On: see the corresponding section in the *IBM Workload Scheduler: Administration Guide*.
- Securing your communication with the Secure Socket Layer protocol: see the section about customizing the SSL connection between the Dynamic Workload Console and components with a distributed connector in the *IBM Workload Scheduler: Administration Guide*.
- Creating a Windows service for Jazz for Service Management extension for WebSphere: see the section in the *IBM Workload Scheduler: Administration Guide*.
- Configuring the Dynamic Workload Console to launch in context: see the corresponding section in the *IBM Workload Scheduler: Administration Guide*.

Note: If, after installing, you have more than one instance of WebSphere Application Server managing any IBM Workload Automation products, you must ensure that they have the same LTPA token_keys.

For detailed information about how to configure the Dynamic Workload Console, see the *IBM Workload Scheduler: Administration Guide*.

For more information about configuring authentication using the Lightweight Directory Access Protocol (LDAP), see the *IBM Workload Scheduler: Administration Guide*.

Post-installation steps to configure the use of Lightweight Third-Party Authentication (LDAP)

If the Dynamic Workload Console and the IBM Workload Scheduler engine or the IBM Workload Scheduler z/OS Connector have been configured with the same LDAP user registry, or are installed on the same computer, you might receive a connection failure. If this happens, use the same Lightweight Third-Party Authentication (LTPA) keys on all servers: the Dynamic Workload Console, the IBM Workload Scheduler engine server, and the IBM Workload Scheduler z/OS Connector server.

To align the LTPA keys, see the topic about configuring the use of lightweight third-party authentication in the IBM Workload Scheduler Administration manual.

Chapter 22. Navigating the Dynamic Workload Console

An overview to the Dynamic Workload Console.

For an interactive overview of the product and its features, you can view several demo scenarios, available (in English only) on the IBM Workload Automation YouTube channel.

To have a quick and rapid overview of the portal and of its use, after logging in, the Welcome page for the Dynamic Workload Console is displayed in the Dashboard Application Services Hub console window. This window has a navigation menu across the top, organized in categories. Each category drops down to display a number of options that when clicked, display a portlet in the work area on the right. Each portlet displays with a title in its tabbed window in the work area. Just as the navigation menu items are customized according to the role of the logged in user, the welcome page is also customized for the user. The **Quick start** tasks available on the **Welcome** page allow you to access a related how-to video and launch the related portlet. Only the tasks corresponding to the logged in user's role are displayed. To get oriented with the navigation bar, take the tour and explore the available items. The tour brings into focus each of the navigation bar categories and corresponding descriptive text is displayed.

There are other helpful links on the page such a link to the embedded online help, the IBM Workload Automation YouTube channel, and a QR code to scan with your mobile device to launch the mobile applications.

Several products can be integrated in this portal and their related entries are listed together with those belonging to the Dynamic Workload Console in the navigation bar displayed at the top of the page.

The navigation bar at the top of the page is your entry point to the Dynamic Workload Console.

First actions

Some first actions that need to be performed when connecting to the Dynamic Workload Console.

The first and main actions you perform when you connect to the Dynamic Workload Console.

Creating a connection to an IBM Workload Scheduler engine

You type the details (such as IP address, user name, and password) to access an IBM Workload Scheduler engine, and, optionally, a database to operate with objects defined in plans or stored in the database. From the Dynamic Workload Console you can access the current plan, a trial plan, a forecast plan, or an archived plan for the distributed environment or the current plan for the z/OS® environment. You might want to access the database to perform actions against objects stored in it or generate reports showing historical or statistical data. In addition, working both on the database and on plans, you can create and run event rules to define and trigger actions that you want to run in response to events occurring on IBM Workload Scheduler nodes.

Defining a scheduling environment

You define your IBM Workload Scheduler network. You create workstation definitions on the database representing the physical machines or computer systems on which your workload is scheduled to run. The IBM Workload Scheduler network is made up of the workstations where job and job stream processing occurs. When you design your network, you assign roles to these workstations to suit your specific business requirements. You can design your network with multiple domains, to divide control of a large network into smaller manageable groups. A typical IBM Workload Scheduler network consists of a workstation acting as a master domain manager and at least one domain. See Dynamic Workload Console User's Guide, section about Creating and managing engine connections.

Defining scheduling objects in the database

You define your workload, which consists of jobs that are concatenated in job streams. Then, you specify the calendars and run cycles according to which job streams must run. Moreover, you define possible dependencies to condition the workload processing. All these definitions can be done within the Workload Designer. See Dynamic Workload Console User's Guide, section about Designing your Workload.

Creating tasks to manage IBM Workload Scheduler objects in the plan

You specify some filtering criteria to query a list of scheduling objects whose attributes satisfy the criteria you specified. Starting from this list, you can navigate and modify the content of the plan, switching between objects, opening more lists, and accessing other plans or other IBM Workload Scheduler environments. See Dynamic Workload Console User's Guide, section about Monitoring your Workload.

Creating a connection to a Dynamic Workload Broker scheduling environment

You type the details (such as IP address, user name, password, and port) to access a dynamic workload broker workstation. Specify if you want to work in a secure HTTPS or HTTP protocol. After creating the connection, by opening the tracking computer you can view status and details of broker workstations, and define resources and dynamic jobs. For more details about dynamic scheduling, see IBM Workload Scheduler Scheduling Workload Dynamically.

Chapter 23. Upgrading

Upgrading the Dynamic Workload Console.

This section describes how to upgrade the Dynamic Workload Console from version 8.6 and 9.1 or later, to the current version.

Upgrading overview

This section provides an overview of the upgrade process for:

- A single or multiple V8.6 Dynamic Workload Console
- A single V9.*x* Dynamic Workload Console

Upgrade deploy model for a single or multiple V8.6 component instance:

Single instance:
A *single instance* contains the Dynamic Workload Console component installed in the <DWC_INSTALL_DIR> directory. You can upgrade the single instance on the same workstation where the back-level Dynamic Workload Console is installed by installing it in a different path (DWC_NEW_INSTALL_DIR), or you can upgrade the Dynamic Workload Console installed in a directory on an old workstation to a directory on a new workstation.

Multiple instance:
A *multiple Instance* contains the Dynamic Workload Console component plus one or more additional IBM Workload Scheduler components installed in the same <TWS_INST_DIR> directory. A multiple instance upgrade of a V8.6 Dynamic Workload Console plus one or more components is not supported. Only the Dynamic Workload Console component can be upgraded to the latest version while the other components either remain at the V8.6 level, or can be upgraded to the V9.3 level.

You must know if the instance you are upgrading is *single* or *multiple* to understand which procedure you must use to upgrade the Dynamic Workload Console.

Upgrade deploy model for a single V9.*x* instance:
The upgrade model for a V9.*x* Dynamic Workload Console is a single component instance. Multiple instances of a V9.*x* Dynamic Workload Console are not supported.

If the existing version of the Dynamic Workload Console is configured to use the local operating system user registry, the same users and groups with the same passwords must be created in the local operating system of the workstation where you install the new version of the Dynamic Workload Console.

Note: You can upgrade a Dynamic Workload Console on a new workstation only if the new workstation has the same operating system type as the old workstation. Ensure that the new workstation is on a supported operating system. For more information about supported operating systems, see "Supported operating systems" on page 37.

Upgrading Dynamic Workload Console V8.6 single instance

You can upgrade a single instance of the Dynamic Workload Console V8.6 in one of the following ways:

Procedure to upgrade a Dynamic Workload Console on the same workstation where the back-level is installed:
"Upgrading Dynamic Workload Console V8.6 single instance on the same workstation."

Procedure to upgrade Dynamic Workload Console on a new workstation:
"Upgrading Dynamic Workload Console V8.6 single instance on a new workstation" on page 381

Upgrading Dynamic Workload Console V8.6 single instance on the same workstation

To upgrade a single instance of Dynamic Workload Console on the same workstation where the back level Dynamic Workload Console is installed, run the following steps:

1. Install a new Dynamic Workload Console in the <DWC_NEW_INSTALL_DIR> directory, on the system where the back-level Dynamic Workload Console is installed. The new path must be different from the old one.

   For information about Dynamic Workload Console installation, see "Installation procedure for Dynamic Workload Console" on page 356.

   Note: When installing the new Dynamic Workload Console instance, the default server name proposed by the installation is **server1**, defined in the Core Services in Jazz for Service Management - WebSphere Application Server profile configuration. This is also the default value proposed when you installed the Dynamic Workload Console, version 8.6 instance. If you maintained this value, then the values in the two instances (8.6 and current) are aligned and no changes are necessary. However, if you used a value different from the default value when you installed the Dynamic Workload Console, version 8.6 instance, then you must necessarily change the default value proposed during the Dynamic Workload Console, new installation to match the version 8.6 instance. You can verify the value of the server name by checking the name in the place of **server1** in the following path: <TWS_home_directory>/eWAS/profiles/twaprofile/config/cells/DefaultNode/ nodes/DefaultNode/servers/server1.
2. Ensure that no Dynamic Workload Console user interface is active and that the WebSphere Application Server is up and running.
3. Migrate the data from the back-level to the newly installed Dynamic Workload Console by running the following script:

   On Windows operating systems:

   ```
   <DWC_NEW_INSTALL_DIR>\TDWC\scripts\tdwcUpgrade.bat
       -oldwasuser old_user
       -oldwaspassword old_password
       -oldtwapath old_twa_path
       -newwasuser new_user
       -newwaspassword new_password
       -newtwapath new_twa_path
       [-backuppath backup_path]
       [-machinechange false]
   ```

   On UNIX and Linux operating systems:

```
<DWC_NEW_INSTALL_DIR>/TDWC/scripts/tdwcUpgrade.sh
    -oldwasuser old_user
    -oldwaspassword old_password
    -oldtwapath old_twa_path
    -newwasuser new_user
    -newwaspassword new_password
    -newtwapath new_twa_path
    [-backuppath backup_path]
    [-machinechange false]
```

where:

-oldwasuser *old_user*
The Tivoli Integrated Portal administrator user ID specified for the back-level Dynamic Workload Console.

-oldwaspassword *old_password*
The Tivoli Integrated Portal administrator user password specified for the back-level Dynamic Workload Console.

-oldtwapath *old_twa_path*
The installation directory where the back-level Dynamic Workload Console is installed.

-newwasuser *new_user*
The Dashboard Application Services Hub administrator user ID. The new user ID must be different from the old one.

-newwaspassword *new_password*
The password of the Dashboard Application Services Hub administrator.

-newtwapath *new_twa_path*
The installation directory where you want to install the Dynamic Workload Console. By default the installation directory is:

On Windows operating systems:
`C:\Program Files\IBM\TWAUI`

On UNIX and Linux operating systems:
`/opt/IBM/TWAUI`

-backuppath *backup_path*
The <BACKUP_DIR> backup directory for the upgrade. By default the backup directory is:

On Windows operating systems:
`<DWC_NEW_INSTALL_DIR>\TDWC\tmp\backup`

On UNIX and Linux operating systems:
`<DWC_NEW_INSTALL_DIR>/TDWC/tmp/backup`

This directory contains:

- The **tdwcUpgrade** script log file, `upgrade.log`.
- The files containing the following configuration data exported from the back-level Dynamic Workload Console:
  - The embedded WebSphere Application Server profile in the `UpgradeData.zip` file.
  - The embedded WebSphere Application Server profile registry.
  - The port settings in the `ports.txt` file.
  - The Tivoli Integrated Portal settings.
  - The Dynamic Workload Console settings.

This data is then imported into the newly installed Dynamic Workload Console.

- A compressed file named `backup.zip` containing a saved copy of the configuration data of the newly-installed Dynamic Workload Console. This file is used to roll back to the original configuration if the migration script fails while importing the configuration data from the back-level Dynamic Workload Console.

  Note: Because the `backup.zip` file is overwritten every time you run the migration script, it might be useful to save a copy of the first `backup.zip` file containing the original configuration.

-machinechange *false*
To upgrade on the same workstation you must specify the `false` value. The default value is `false`.

Note:

The script replaces any customized data in the new Dynamic Workload Console instance, with the data exported from the old Dynamic Workload Console instance.

A result of `Completed` indicates that the script ran successfully and that the data was correctly imported into the newly-installed Dynamic Workload Console.

If the script fails to import the configuration data into the newly-installed Dynamic Workload Console, a rollback is automatically performed, and the original configuration is restored. To double-check that the rollback ran correctly, ensure that you can access the newly-installed Dynamic Workload Console user interface with the user ID and password specified during the installation.

4. The port numbers used by the two instances of the Dynamic Workload Console are different and they are not automatically migrated by the **tdwcUpgrade** script. Run the following steps to migrate the port numbers of the back-level instance to the newly-installed instance:
   a. Check that the data was correctly migrated from the old Dynamic Workload Console to the newly-installed Dynamic Workload Console.
   b. Stop the back-level Dynamic Workload Console.
   c. Uninstall the back-level Dynamic Workload Console.
   d. Run the following command:

      On Windows operating systems:
      ```
      changeHostProperties <BACKUP_DIR>\ports.txt
      ```

      On UNIX and Linux operating systems:
      ```
      changeHostProperties <BACKUP_DIR>/ports.txt
      ```

      where `<BACKUP_DIR>` is the backup directory.

   For more information about this command, see the section about Application server - using the utilities that change the properties in *Administration Guide*.

Upgrading Dynamic Workload Console V8.6 single instance on a new workstation

To upgrade a Dynamic Workload Console installed in the directory <DWC_BACKLEV_INSTALL_DIR> of your old workstation in the directory <DWC_INSTALL_DIR> of the new workstation, run the following steps:

1. Log on as Administrator on Windows operating systems, or as root on UNIX and Linux operating systems, on the workstation where the back-level Dynamic Workload Console is installed.
2. To save the back-level Tivoli Integrated Portal profile data, run the **preupgrade** script:

   On Windows operating systems:
   From <DWC_BACKLEV_INSTALL_DIR>\eWAS\profiles\TIPProfile\upgrade\bin:

   ```
   preupgrade.sh
       --username old_DWCuser
       --password old_DWCpassword
   ```

   On UNIX and Linux operating systems:
   From <DWC_BACKLEV_INSTALL_DIR>/eWAS/profiles/TIPProfile/upgrade/bin:

   ```
   preupgrade.bat
       --username old_DWCuser
       --password old_DWCpassword
   ```

   where:

   old_DWCuser
   The Tivoli Integrated Portal administrator user ID specified for the back-level Dynamic Workload Console.

   old_DWCpassword
   The Tivoli Integrated Portal administrator user password specified for the back-level Dynamic Workload Console.

   Note: The **preupgrade** script creates the following .zip file that contains the back-level Tivoli Integrated Portal profile data:

   On Windows operating systems:
   <DWC_BACKLEV_INSTALL_DIR>\eWAS\profiles\TIPProfile\upgrade\data\upgradeData.zip:

   On UNIX and Linux operating systems:
   <DWC_BACKLEV_INSTALL_DIR>/eWAS/profiles/TIPProfile/upgrade/data/upgradeData.zip:
3. To save the Dynamic Workload Console ports data, redirect the **showHostProperties** script output to the HostProperties_file file:

   On Windows operating systems:
   From <DWC_BACKLEV_INSTALL_DIR>\wastools:

   ```
   showHostProperties.sh
       --username old_DWCuser
       --password old_DWCpassword

   > HostProperties_file
   ```

   On UNIX and Linux operating systems:
   From <DWC_BACKLEV_INSTALL_DIR>/wastools:

```
showHostProperties.bat
    --username old_DWCuser
    --password old_DWCpassword
 > HostProperties_file
```

where:

old_DWCuser
The Tivoli Integrated Portal administrator user ID specified for the back-level Dynamic Workload Console.

old_DWCpassword
The Tivoli Integrated Portal administrator user password specified for the back-level Dynamic Workload Console.

4. Log on as Administrator on Windows operating systems, or as root on UNIX and Linux operating systems, on the new workstation where you want to upgrade the Dynamic Workload Console.
5. Install a new Dynamic Workload Console in the <DWC_INSTALL_DIR> directory of the new workstation.

   For information about Dynamic Workload Console installation, see "Installation procedure for Dynamic Workload Console" on page 356.

   Note: When installing the new Dynamic Workload Console instance, the default server name proposed by the installation is **server1**, defined in the Core Services in Jazz for Service Management - WebSphere Application Server profile configuration. This is also the default value proposed when you installed the Dynamic Workload Console, version 8.6 instance. If you maintained this value, then the values in the two instances (8.6 and current) are aligned and no changes are necessary. However, if you used a value different from the default value when you installed the Dynamic Workload Console, version 8.6 instance, then you must necessarily change the default value proposed during the Dynamic Workload Console, new installation to match the version 8.6 instance. You can verify the value of the server name by checking the name in the place of **server1** in the following path: <TWS_home_directory>/eWAS/profiles/twaprofile/config/cells/DefaultNode/nodes/DefaultNode/servers/server1.
6. Copy the following files created on the old workstation to the new workstation in the <BACKUP_DIR> backup directory that you want to use for the upgrade process:
   - upgradeData.zip created in step 2 on page 381.
   - HostProperties_file created in step 3 on page 381.

   By default, the backup directory used in the upgrade process is:

   On Windows operating systems:
   <DWC_INSTALL_DIR>\TDWC\tmp\backup

   On UNIX and Linux operating systems:
   <DWC_INSTALL_DIR>/TDWC/tmp/backup
7. Ensure that no Dynamic Workload Console user interface is active and that the WebSphere Application Server is up and running on the workstation where the back-level Dynamic Workload Console is installed.
8. From the new workstation perform the following steps:

   On Windows operating systems:
   Map the network drive <DWC_BACKLEV_INSTALL_DIR> of the old workstation where the back-level Dynamic Workload Console is installed.

On UNIX and Linux operating systems:

Mount in read-write access mode the remote file system <DWC_BACKLEV_INSTALL_DIR> where the back-level Dynamic Workload Console is installed. If the mount point name on the new workstation is different from the remote file system name, create a symbolic link between the mount point on the new workstation and the remote file system <DWC_BACKLEV_INSTALL_DIR>;the link name value must be <DWC_BACKLEV_INSTALL_DIR>.

9. Migrate the data from the back-level to the newly-installed Dynamic Workload Console by running the following script from the new workstation:

   On Windows operating systems:

   <DWC_INSTALL_DIR>\TDWC\scripts\tdwcUpgrade.bat
   -oldwasuser *old_user*
   -oldwaspassword *old_password*
   -oldtwapath *old_twa_path*
   -newwasuser *new_user*
   -newwaspassword *new_password*
   -newtwapath *new_twa_path*
   [**-backuppath** *backup_path*]
   -machinechange *true*

   On UNIX and Linux operating systems:

   <DWC_INSTALL_DIR>/TDWC/scripts/tdwcUpgrade.sh
   -oldwasuser *old_user*
   -oldwaspassword *old_password*
   -oldtwapath *old_twa_path*
   -newwasuser *new_user*
   -newwaspassword *new_password*
   -newtwapath *new_twa_path*
   [**-backuppath** *backup_path*]
   -machinechange *true*

   where:

   -oldwasuser *old_user*
   The Tivoli Integrated Portal administrator user ID specified for the back-level Dynamic Workload Console.

   -oldwaspassword *old_password*
   The Tivoli Integrated Portal administrator user password specified for the back-level Dynamic Workload Console.

   -oldtwapath *old_twa_path*
   The installation directory where the back-level Dynamic Workload Console is installed.

   -newwasuser *new_user*
   The Dashboard Application Services Hub administrator user ID. The new user ID must be different from the old one.

   -newwaspassword *new_password*
   The password of the Dashboard Application Services Hub administrator.

   -newtwapath *new_twa_path*
   The installation directory where the Dynamic Workload Console must be installed. By default the installation directory is:

   On Windows operating systems:
   C:\Program Files\IBM\TWAUI

   On UNIX and Linux operating systems:
   /opt/IBM/TWAUI

-backuppath *backup_path*
The <BACKUP_DIR> backup directory for the upgrade where you already copied the upgradeData.zip and HostProperties_file in step 6 on page 382.

By default, the installation directory is:

On Windows operating systems:
<DWC_INSTALL_DIR>\TDWC\tmp\backup

On UNIX and Linux operating systems:
<DWC_INSTALL_DIR>/TDWC/tmp/backup

This directory contains the following files:

- The **tdwcUpgrade** script log file, upgrade.log.
- The files containing the following configuration data exported from the back-level Dynamic Workload Console:
  - The embedded WebSphere Application Server profile.
  - The embedded WebSphere Application Server profile registry.
  - The port settings in HostProperties_file file.
  - The Tivoli Integrated Portal settings.
  - The Dynamic Workload Console settings.

  This data is then imported into the newly-installed Dynamic Workload Console.
- A compressed file named backup.zip that contains a saved copy of the configuration data of the newly-installed Dynamic Workload Console. This file is used to roll back to the original configuration if the migration script fails while importing the configuration data from the back-level Dynamic Workload Console.

  Note: Because the backup.zip file is overwritten every time you run the migration script, it might be useful to save a copy of the first backup.zip file containing the original configuration.

-machinechange *true*
You must specify the true value to upgrade the Dynamic Workload Console on the new workstation.

Note: The script replaces any customized data in the new Dynamic Workload Console instance, with the data exported from the old Dynamic Workload Console instance. A result of Completed indicates that the script ran successfully and that the data was correctly imported into the newly-installed Dynamic Workload Console.

If the script fails to import the configuration data into the newly-installed Dynamic Workload Console, a rollback is automatically performed and the original configuration is restored. To double-check that the rollback ran correctly, ensure that you can access the newly-installed Dynamic Workload Console user interface with the user ID and password specified during the installation.

10. Check that the data was correctly migrated from the old Dynamic Workload Console to the newly-installed Dynamic Workload Console.
11. Perform this step only if the Dynamic Workload Console ports of the instance installed in the new workstation are different from these of the instance installed on the old workstation and you want to have the same values.

The port numbers used by the two instances of the Dynamic Workload Console might be different and they are not automatically migrated by the**tdwcUpgrade** script. If theDynamic Workload Console ports of the instance installed on the new workstation are different from the Dynamic Workload Console ports of the instance installed on the old machine and you want to have the same values, run the following steps to migrate the port numbers of the back level instance on the old machine to the newly-installed instance on a new machine:

On Windows operating systems:

```
changeHostProperties <BACKUP_DIR>\HostProperties_file
```

On UNIX and Linux operating systems:

```
changeHostProperties <BACKUP_DIR>/HostProperties_file
```

For more information about this command, see the section about Application server - using the utilities that change the properties in *Administration Guide*.

12. Optionally uninstall the back-level Dynamic Workload Console in the old machine.

Upgrading Dynamic Workload Console V8.6 installed with one or more components in the same directory

About this task

= Due to Dynamic Workload Console installation infrastructure changes, which are
= described in "Upgrading overview" on page 377, if you want to upgrade the
= Dynamic Workload Console V8.6 installed with one or more components in the
= same directory <TWS_INST_DIR>, you must upgrade the Dynamic Workload Console
= in a new directory and then uninstall the old version. The additional components
= either remain at the V8.6 level or they can be upgraded to V9.4.

Upgrading Dynamic Workload Console V9.1 and later

You can upgrade the Dynamic Workload Console V9.1 and later in one of the following ways:

Note: When installing the new Dynamic Workload Console instance, the default server name proposed by the installation is **server1**, defined in the Core Services in Jazz for Service Management - WebSphere Application Server profile configuration. This is also the default value proposed when you installed the Dynamic Workload Console, version 8.6 instance. If you maintained this value, then the values in the two instances (8.6 and current) are aligned and no changes are necessary. However, if you used a value different from the default value when you installed the Dynamic Workload Console, version 8.6 instance, then you must necessarily change the default value proposed during the Dynamic Workload Console, new installation to match the version 8.6 instance. You can verify the value of the server name by checking the name in the place of **server1** in the following path: <TWS_home_directory>/eWAS/profiles/twaprofile/config/cells/DefaultNode/nodes/DefaultNode/servers/server1.

Upgrade versions 9.1, 9.2, and 9.3 as a root user using Installation Manager
"Upgrading Dynamic Workload Console V9.1 or later" on page 386

Upgrade versions 9.1, 9.2, and 9.3 as a root user using silent upgrade
"Upgrading Dynamic Workload Console V9.1 or later with silent upgrade" on page 386

Upgrade version 9.3 as a non-root user using Installation Manager
"Upgrading Dynamic Workload Console as a non-root user" on page 387

Upgrade version 9.3 as a non-root user using silent upgrade
"Upgrading Dynamic Workload Console as a non-root user with silent upgrade" on page 388

Upgrading Dynamic Workload Console V9.1 or later

Before you begin

Ensure that you have upgraded the following software to the latest version, if they apply to your environment. For details about the supported versions, see the Detailed System Requirements for Dynamic Workload Console at the following link http://www-01.ibm.com/support/docview.wss?rs=672&uid=swg27048859.

- Jazz for Service Management extension for WebSphere
- Dashboard Application Services Hub

About this task

To upgrade Dynamic Workload Console V9.1 or later to the current version, complete the following procedure.

Procedure

1. Copy the new Dynamic Workload Console image in the <DWC_INSTALL_MEDIA> directory on the system where the back-level Dynamic Workload Console is installed.
2. Start Installation Manager.
3. Create a new Repository Connection pointing to the <DWC_INSTALL_MEDIA> directory:
   a. Open the Installation Manager wizard.
   b. Select File -> Preferences ->Repositories. The Repositories page is displayed.
   c. Select Add Repositories to display the Add Repository page.
   d. Click Browse and point to the <DWC_INSTALL_MEDIA> directory.
   e. Select repository.config and click OK to save the new repository.
4. On the Installation Manager main screen select Update.
5. Select Dynamic Workload Console and then Dynamic Workload Console 9.*x*.
6. Fill in the values (as for the installation process).

Upgrading Dynamic Workload Console V9.1 or later with silent upgrade

About this task

To perform a silent upgrade of the Dynamic Workload Console package, by using one of the response files listed in "Dynamic Workload Console response file templates" on page 364, perform the following steps:

Procedure

1. Copy the relevant response file to a local directory.
2. Edit the Dynamic Workload Console section. For details about the response file properties, see Appendix C, "The Dynamic Workload Console response file

properties," on page 431. Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.

3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory.

   The default `tools` directory is:

   On Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse\tools
   ```

   On UNIX and Linux operating systems

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

6. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for upgrade.
   - The `log_file` is the name of the log file that records the result of the silent upgrade execution.

   Note: For more information about Installation Manager, see Installation Manager documentation.

Upgrading Dynamic Workload Console as a non-root user

Before you begin

Ensure that you have upgraded the following software products to the latest version, if they apply to your environment. For details about the supported versions, see the Detailed System Requirements for Dynamic Workload Console at the following link http://www-01.ibm.com/support/docview.wss?rs=672 &uid=swg27048859.

- Jazz for Service Management extension for WebSphere
- Dashboard Application Services Hub

About this task

With IBM Workload Scheduler, version 9.3 and later, you are no longer required to have root privileges to install the Dynamic Workload Console.

To upgrade a Dynamic Workload Console installed as a non-root user, perform the following steps: .

Procedure

1. Copy the new Dynamic Workload Console image in the <DWC_INSTALL_MEDIA> directory on the system where the back-level Dynamic Workload Console is installed.
2. Start Installation Manager.
3. Assign to the <*DWC_INSTALL_MEDIA*> directory the non-root user ownership, by running the following command: `chown -R` *non-root-user /<DWC_INSTALL_MEDIA>*
4. Run `upgradeDWC.sh -noroot`.

   Note: If you are installing the Dynamic Workload Console as a non-root user, consider the following limitations:

   - All the prerequisite products, as listed in Chapter 19, "Dynamic Workload Console prerequisites," on page 351, must be installed by the non-root user.
   - After the installation, fix packs can be installed only by the non-root user.
   - Only fix packs and releases certified for the non-root user can be applied on that Dynamic Workload Console instance.
   - Any WebSphere Application Server command must be run only by the non-root user.
   - The *wastools* installed for the Dynamic Workload Console must be run only by the non-root user.
5. Fill in the values (as for the installation process).

Upgrading Dynamic Workload Console as a non-root user with silent upgrade

About this task

With IBM Workload Scheduler, version 9.3 and later you are no longer required to have root privileges to install the Dynamic Workload Console.

To perform a silent upgrade of the Dynamic Workload Console package, by using one of the response files listed in "Dynamic Workload Console response file templates" on page 364, perform the following steps:

Procedure

1. Copy the relevant response file to a local directory.
2. Edit the Dynamic Workload Console section. For details about the response file properties, see Appendix C, "The Dynamic Workload Console response file properties," on page 431. Ensure that all the passwords that you specify in the response file are encrypted as described in "Encrypting user passwords for response files" on page 120.
3. Save the file with your changes.
4. Open a command-line prompt.
5. Go to the Installation Manager `tools` directory. The default `tools` directory is `/home/<non-root-user>/IBM/InstallationManager/eclipse/tools`.
6. Run the following command:

   ```
    ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

- The `response_file.xml` is the name of the response file to be used for upgrade.
- The `log_file` is the name of the log file that records the result of the silent upgrade execution.

Note: For more information about Installation Manager, see Installation Manager documentation.

Chapter 24. Uninstalling

Uninstalling the Dynamic Workload Console.

How to uninstall the Dynamic Workload Console.

Uninstalling using the Installation Manager wizard

Steps to uninstall using the Installation Manager wizard.

By using the Installation Manager wizard, you can uninstall the installed packages from a single package group, or you can uninstall all installed packages from every package group.

To uninstall a Dynamic Workload Console, perform the following steps:

1. Start the Installation Manager.
2. On the Installation Manager Start page wizard, click **Uninstall**.
3. In the Uninstallation Packages wizard panel, select the Dynamic Workload Console package that you want to uninstall.

   Note: If you want to uninstall every package from every package group on your workstation, click **Select all**.
4. Click **Next** to continue.
5. Supply the required fields of the following panel:
   - "WebSphere Application Server profile configuration" on page 358.
6. On the Summary page, review the packages that you selected to uninstall. Click **Back** if you want to make some changes. If you are satisfied with your choices, click **Uninstall**. A progress indicator bar shows the percentage of the uninstallation completed.
7. When the uninstallation process is complete, the Complete page opens and confirms success of the uninstallation process.

Uninstalling in silent mode

Steps to carry out a silent uninstallation.

To perform a silent uninstallation by using a response file template listed in Table 33 on page 392, perform the following steps:

1. Copy the relevant response file to a local directory <*local_dir*> and edit the file to meet the needs of your environment.
2. Save the file with your changes.
3. Open a command-line utility.
4. Go to the Installation Manager`tools` directory.

   The default `tools` directory is:

   On Windows operating systems

   ```
   C:\Program Files\IBM\Installation Manager\eclipse\tools
   ```

   On UNIX and Linux operating systems

   ```
   /opt/IBM/InstallationManager/eclipse/tools
   ```

5. Run the following command:

   On Windows operating systems

   ```
   imcl.exe input <local_dir>\response_file.xml
   -log <local_dir>\log_file.xml
   -acceptLicense
   ```

   On UNIX and Linux operating systems

   ```
   ./imcl input /<local_dir>/response_file.xml
   -log /<local_dir>/log_file.xml
   -acceptLicense
   ```

   where

   - The `response_file.xml` is the name of the response file to be used for uninstallation.
   - The `log_file` is the name of the log file that records the result of the silent uninstall execution. For more information about Installation Manager silent log files, see "Installation Manager wizard, silent installation and uninstallation log files" on page 263.

Table 33 lists the response files to be used for the uninstallation process by platform:

Table 33. Uninstallation response files

Type of installation	Response file to use
Uninstalling on Windows operating systems	
Dynamic Workload Console	`IWS94_UNINST_DWC.xml`
Uninstalling on UNIX and Linux operating systems	
Dynamic Workload Console	`IWS94_UNINST_DWC.xml`

Chapter 25. Troubleshooting the installation, upgrade, and uninstallation

Troubleshooting the installation, upgrade, and uninstallation the Dynamic Workload Console.

How to troubleshoot the installation, upgrade, and uninstallation of the Dynamic Workload Console.

Note: To manually uninstall or recover from a failed installation, see the section "Manually uninstall the Dynamic Workload Console and the zConnector on Windows systems" or "Manually uninstall the Dynamic Workload Console and the zConnector on UNIX systems" on page 394

Installation and uninstallation log and trace files

For information about installation log files, see "Installation log files" on page 396.

Manually uninstall the Dynamic Workload Console and the zConnector on Windows systems

To uninstall the Dynamic Workload Console manually and the zConnector on Windows systems.

Run the following steps to manually remove an instance of the Dynamic Workload Console and the zConnector:

1. Start the JazzSM WebSphere Application Server profile on the system where the Dynamic Workload Console and the zConnector are installed.

You can skip this step if the **JazzSM** WebSphere Application Server profile is already started.

1. In a system prompt, go to the Dynamic Workload Console installation path, for example `C:\Program Files\IBM\TWAUI`.
2. Go to the `wastools` subdirectory.
3. Run the following command to start the **JazzSM** WebSphere Application Server profile:

   ```
   startWas.bat -direct
   ```

2. Uninstall the zConnector package.

1. In a system prompt, go to the Dynamic Workload Console installation path, for example `C:\Program Files\IBM\JazzSM\profile`.
2. Access the `bin` subdirectory.
3. Run the following command to uninstall the zConnector:

   ```
   wsadmin.bat -conntype NONE -c "$AdminApp uninstall ZConnector"
   ```

3. Uninstall the zConnector resource adapter.

1. Go to the `wastools` subdirectory under the Dynamic Workload Console installation path.
2. Run the following command to uninstall the zConnector resource adapter:

```
uninstallResourceAdapter.bat -user <your DWC username>
-password <your DWC password>
```

3. Go to the %JazzSM_profile_dir%\installedApps\%cell_name% directory, for example: C:\Program Files\IBM\JazzSM\profile\installedApps\JazzSMNode01Cell\, and ensure that the ZConnector.ear directory is deleted. If it still exists, delete it manually.

4. Uninstall the Dynamic Workload Console package

1. Go to the bin subdirectory under the **JazzSM** profile directory, for example, C:\Program Files\IBM\JazzSM\profile.
2. Run the following command to uninstall the Dynamic Workload Console package:

```
wsadmin.bat -connType NONE -lang jython -f
"%tdwc_install_dir%\TDWC\scripts\install_webui.py"
-war "TWSWebUI.war" -contenturi TWSWebUI.war
-contextroot \dwc -serverName %server_name%
-operation delete
```

3. Go to the C:\%JazzSM_profile_dir%\installedApps\%cell_name%\isc.ear directory and ensure that the TWSWebUI.war directory is deleted. If it still exists, delete it manually.

5. Uninstall the dynamic workload broker package

1. Run the following command to uninstall the Dynamic Workload Console package:

```
wsadmin.bat -connType NONE -lang jython -f
"%tdwc_install_dir\TDWC\scripts\install_webui.py"
-war "WebUI.war" -contenturi WebUI.war -contextroot
\ibm\TDWB -serverName %server_name%
-operation delete
```

2. Go to the C:\%JazzSM_profile_dir%\installedApps\%cell_name%\isc.ear directory and ensure that the WebUI.war directory is deleted. If it still exists, delete it manually.

6. Uninstall the dynamic workload broker package

Go to the C:\Windows\TWA directory and ensure that the files named twainstance.twa.properties and twainstance.twa.properties.ext apply to the Dynamic Workload Console instance being deleted. For example, you might check that the TDWC_basePath key is the same as the *%tdwc_install_dir%* directory. If they do, delete them manually.

7. Delete the Dynamic Workload Console installation directory

Remove manually the *%tdwc_install_dir%* directory, for example C:\Program Files\IBM\TWAUI.

Manually uninstall the Dynamic Workload Console and the zConnector on UNIX systems

Steps to manually uninstall the Dynamic Workload Console and the zConnector on UNIX systems.

Run the following steps to manually remove an instance of the Dynamic Workload Console and the zConnector:

1. Start the JazzSM WebSphere Application Server profile on the system where the Dynamic Workload Console and the zConnector are installed.

You can skip this step if the **JazzSM** WebSphere Application Server profile is already started.

1. In a system prompt, go to the Dynamic Workload Console installation path, for example `/opt/IBM/TWAUI`.
2. Go to the `wastools` subdirectory.
3. Run the following command to start the **JazzSM** WebSphere Application Server profile:

   ```
   startWas.sh -direct
   ```

2. Uninstall the zConnector package.

1. In a system prompt, go to the Dynamic Workload Console installation path, for example `/opt/IBM/JazzSM/profile`.
2. Access the `bin` subdirectory.
3. Run the following command to uninstall the zConnector:

   ```
   wsadmin.sh -conntype NONE -c "\$AdminApp uninstall ZConnector"
   ```

3. Uninstall the zConnector resource adapter.

1. Go to the `wastools` subdirectory under the Dynamic Workload Console installation path.
2. Run the following command to uninstall the zConnector resource adapter:

   ```
   uninstallResourceAdapter.sh -user <your DWC username>
   -password <your DWC password>
   ```

3. Go to the `$JazzSM_profile_dir/installedApps/$cell_name` directory, for example `/opt/IBM/JazzSM/profile/installedApps/JazzSMNode01Cell`.
4. Verify that the `ZConnector.ear` directory is deleted. If it still exists, delete it manually.

4. Uninstall the Dynamic Workload Console package.

1. Go to the `bin` subdirectory under the **JazzSM** profile directory, for example, `/opt/IBM/JazzSM/profile/bin`.
2. Run the following command to uninstall the Dynamic Workload Console package:

   ```
   wsadmin.sh -connType NONE -lang jython -f "$tdwc_
   install_dir/tdwc/scripts/install_webui.py" -war
   "$websphere_install_dir/AppServer/systemApps/WebUI.war"
   -contenturi TWSWebUI.war -contextroot /dwc
   -serverName $server_name -operation delete
   ```

   where:

   $tdwc_install_dir
   Is the directory on the filesystem where the Dynamic Workload Console is installed, for example, `/opt/IBM/TWAUI`.

   $server_name
   Is the name of the Dynamic Workload Console server, for example, **server1**.

3. Go to the `$JazzSM_profile_dir/installedApps/$cell_name/isc.ear` directory.
4. Verify that the `TWSWebUI.war` directory is deleted. If it still exists, delete it manually.

5. Uninstall the dynamic workload broker package

1. Run the following command to uninstall the Dynamic Workload Console package:

```
wsadmin.sh -connType NONE -lang jython -f
"$tdwc_install_dir/tdwc/scripts/install_webui.py"
-war "$websphere_install_dir/AppServer/systemApps/WebUI.war"
-contenturi WebUI.war -contextroot /ibm/TDWB
-serverName $server_name -operation delete
```

2. Go to the $JazzSM_profile_dir/installedApps/$cell_name/isc.ear directory and ensure that the WebUI.war directory is deleted. If it still exists, delete it manually.

6. Uninstall the dynamic workload broker package

Go to the /etc/TWA directory and ensure that the files named twainstance.twa.properties and twainstance.twa.properties.ext apply to the Dynamic Workload Console instance being deleted, for example you might check that the TDWC_basePath key is the same as the *$tdwc_install_dir* directory. If they do, delete them manually.

7. Delete the Dynamic Workload Console installation directory

Remove manually the *$tdwc_install_dir* directory, for example, /opt/IBM/TWAUI.

Troubleshooting scenarios

The troubleshooting scenarios to manage.

Installation log files

Log files created by the installation process.

For more information about log files, see the *Administration Guide*.

Interactive wizard installation and uninstallation log files

Installation Manager creates the following installation and uninstallation logs files common to any package installation, regardless of which components you choose to install:

On Windows operating systems

<INSTALLATION_MANAGER_LOGS_DIR>\<YYYYMMDD_HHMM>.xml

On UNIX and Linux operating systems

<INSTALLATION_MANAGER_LOGS_DIR>/<YYYYMMDD_HHMM>.xml

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files, YYYYMMDD is the date and HHMM is the time when the log file is created.

The Dynamic Workload Console installation process creates the following Installation Manager native logs files:

On Windows operating systems

<INSTALLATION_MANAGER_LOGS_DIR>\native\<YYYYMMDD_HHMM>.log

On UNIX and Linux operating systems

<INSTALLATION_MANAGER_LOGS_DIR>/native/<YYYYMMDD_HHMM>.log

where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the logs files, and YYYYMMDD is the date and HHMM is the time when the log file is created.

The <INSTALLATION_MANAGER_LOGS_DIR> default is:

On Windows operating systems

```
C:\ProgramData\IBM\InstallationManager\logs
```

On UNIX and Linux operating systems

```
/var/ibm/InstallationManager/logs
```

If more than one native log have the same timestamp, Installation Manager creates the log files with the following name:

On Windows operating systems

```
<INSTALLATION_MANAGER_LOGS_DIR>\native\<YYYYMMDD_HHMMLETTER>.log
```

On UNIX and Linux operating systems

```
<INSTALLATION_MANAGER_LOGS_DIR>/native/<YYYYMMDD_HHMMLETTER>.log
```

where `<INSTALLATION_MANAGER_LOGS_DIR>` is the directory where Installation Manager creates the logs files, `YYYYMMDD` is the date, `HHMM` is the time when the log file is created, and `LETTER` is a letter of the alphabet.

For more information about how to access the log files by using the Installation Manager wizard, see "Accessing Installation Manager log files via wizard" on page 264.

For more information about how to create a *.zip* file of the native log directory, see "Packaging Installation Manager log files via wizard" on page 265

Accessing Installation Manager log files via wizard:
About this task

By using the Installation Manager wizard, you can access the Installation Manager log files in the following log directory:

```
<INSTALLATION_MANAGER_LOGS_DIR>
```

where `<INSTALLATION_MANAGER_LOGS_DIR>` is the directory where Installation Manager creates the logs files. The `<INSTALLATION_MANAGER_LOGS_DIR>` default value is:

On Windows operating systems

```
C:\ProgramData\IBM\InstallationManager\logs
```

On UNIX and Linux operating systems

```
/var/ibm/InstallationManager/logs
```

To access the log files by using the wizard, perform the following steps:

1. Open the Installation Manager Start page.
2. Select **File**>**View Log**.
3. The Installation Log panel shows you all the log files saved on your machine. Select the log file whose name is the correct timestamp for your installation process.
4. Depending on the action that you want to perform, click the **Export log file** icon or **Open log file** icon on the upper right side.

Packaging Installation Manager log files via wizard:
About this task

By using the Installation Manager wizard, you can create a *.zip* file that contains the following log files:

- Native log files in the <INSTALLATION_MANAGER_LOGS_DIR>\native directory.
- xml log files in the <INSTALLATION_MANAGER_LOGS_DIR> directory.

Where <INSTALLATION_MANAGER_LOGS_DIR> is the directory where Installation Manager creates the log files.

The <INSTALLATION_MANAGER_LOGS_DIR> default value is:

On Windows operating systems

```
C:\ProgramData\IBM\InstallationManager\logs
```

On UNIX and Linux operating systems

```
/var/ibm/InstallationManager/logs
```

To create a *.zip* file of the *native* log directory, perform the following steps:

1. Open the Installation Manager Start page.
2. Select **Help**>**Export Data for Problem Analysis**.
3. Enter the name of the directory where you want to create the .zip file and the .zip file name.
4. Press **Ok**. A *.zip* file that contains all log files is created in the directory you specified.

Jazz for Service Management extension for WebSphere profile log files

The Dynamic Workload Console installation process manages its own profile in the Jazz for Service Management extension for WebSphere instance.

The log for the Jazz for Service Management extension for WebSphere profile management of the application server can be found at:

/<JAZZ_SM_HOME>/profile/logs/<SERVER_NAME>

where <JAZZ_SM_HOME> is the Jazz for Service Management extension for WebSphere installation directory and the <SERVER_NAME> is the server name related to the Jazz for Service Management extension for WebSphere that you use.

Problems with the interactive installation

Problems that you might encounter while installing the Dynamic Workload Console interactively.

The Dynamic Workload Console installation fails

Problem description:

The installation of the Dynamic Workload Console does not proceed. This occurs regardless of the method you used to install.

Cause and solution

Make sure an active personal firewall is not preventing the installation process from connecting to the network. If it is, allow the connection and then continue with the installation.

Installation by using Installation Manager on AIX operating systems fails with an unhandled exception error

Installing a master domain manager, a dynamic domain manager or a Dynamic Workload Console by using Installation Manager, you receive an unhandled exception error.

Cause and solution

This error occurs because you do not have the prerequisite libraries that are required by Installation Manager on AIX operating systems. For more information about these libraries, see the technote about **Required gtk libraries for IBM Installation Manager on AIX**.

To solve the problem, install the required libraries and restart the installation process.

Problems with the silent installation

Problems that you might encounter while running the Dynamic Workload Console silent installation.

The silent uninstallation does not work and an error code is returned

Problem description:

If you try to perform a silent uninstall with a response file that does not exist, either because the file name is incorrect or because you specified the wrong directory, an error code is returned and the uninstallation does not run. Nothing is logged in the temporary directory and no messages are issued.

Cause and solution

Ensure that you specify a valid response file name.

The repository location specified in response file is not found

Problem description:

During the silent installation, if the location specified for a repository is not found, then correct the location and before rerunning the installation, clear the repository locations from IBM Installation Manager.

Cause and solution

Perform the following steps:

1. Open the Preferences panel in Installation Manager.
2. From the Repositories page, select and remove the repository location in error.
3. Correct the repository location in the response file.
4. Rerun the silent installation.

Part 5. Tutorials

Installation tutorials

Chapter 26. Using the IBM Workload Scheduler tutorial utility

The IBM Workload Scheduler tutorial utility shows you how to populate and use a stand-alone test environment.

About this task

IBM Workload Scheduler tutorial utility guides you through a set of steps to populate and use a stand-alone test environment. The tutorial utility is intended for first-time users of IBM Workload Scheduler who want an overview of the features and capabilities of the product in a real environment. The tutorial utility includes a sample database with predefined scheduling objects and a set of scenarios that use these objects.

The **sampledbsetup.sh** or the **SAMPLEDBSETUP.CMD** script (depending on whether you are in a UNIX or Windows environment) populates your IBM Workload Scheduler with a set of scheduling objects. The scenario scripts use these objects in basic scheduling activities. Each scenario is self-contained and can be run in any order, with the exception of the first scenario which is a prerequisite to all others.

The IBM Workload Scheduler tutorial utility runs only on a master domain manager. It does not affect any other workstation defined in your IBM Workload Scheduler environment. Each scenario is launched as a separate script file which uses the **conman** and **composer** command interfaces. The syntax and usage of each command used in the scenarios is explained in detail in the *IBM Workload Scheduler: User's Guide and Reference*. Before you begin using the utility, read an overview of IBM Workload Scheduler concepts and tasks in *IBM Workload Automation: Overview*.

This chapter is divided into the following sections:

Populating your IBM Workload Scheduler database

About this task

How you use the utility to populate your IBM Workload Scheduler database.

After you have installed IBM Workload Scheduler on the master domain manager in your test environment you are ready to populate the database.

Follow these steps:

1. Go to the *TWS_home*/TWS/TWSTutorial directory, where *TWS_home* is the home directory of the user for which you installed IBM Workload Scheduler.
2. Launch the tutorial utility installation script:
   - In a Windows operating system:
     SAMPLEDBSETUP.CMD

- In a UNIX and Linux operating systems:
  `sampledbsetup.sh`

The script adds a set of scheduling objects with names starting with the string *SMPL*, followed by the object type and scenario number so that all objects used in each scenario are easily identifiable. Some objects are different depending on whether you are using a UNIX or a Windows environment.

The script performs a check on the database. If any objects with the same name are found, you are prompted to specify if these objects can be overwritten.

When processing of the script ends successfully, your IBM Workload Scheduler database contains the objects needed to run the scheduling scenarios.

Objects used by the IBM Workload Scheduler tutorial scenarios

About this task

After you have successfully installed the IBM Workload Scheduler tutorial utility in your test environment, your database is populated with the following scheduling objects:

Table 34. Objects downloaded by the tutorial utility

Object type	Object Names (Total objects)
Calendar	SMPCAL6 (1)
Variable	SMPLHOME, SMPLUSER, SMPLWIN1 to SMPLWIN4 or SMPLUNX1 to SMPLUNX4, SMPLSLEEP, SMPLTMP, SMPLPATH (6)
Resource	SMPLRES1, SMPLRES2 (2)
Prompt	SMPLPRM4, SMPLPRM5, SMPLPRM6, SMPLPRM7 (4)
Job	SMPL_JOB_3_0_1, SMPL_JOB_3_0_2, SMPL_JOB_3_0_3, SMPL_JOB_4_0_1, SMPL_JOB_4_0_2, SMPL_JOB_4_0_3, SMPL_JOB_5_0_1, SMPL_JOB_5_0_2, SMPL_JOB_7_0_1, SMPL_JOB_7_0_2, SMPL_JOB_7_0_3, SMPL_JOB_9_0_1, SMPL_JOB_9_1_1, SMPL_JOB_EVN, SMPL_JOB_ODD, SMPL_JOB_PAIR, SMPL_JOB_SBJ, SMPL_JOB_7_0_LAST, SMPL_JOB_7_0_RECV (19)
Job Stream	SMPL_SCHED_3_0_1, SMPL_SCHED_3_0_2, SMPL_SCHED_4_0_1, SMPL_SCHED_4_0_2, SMPL_SCHED_4_0_3, SMPL_SCHED_4_0_S, SMPL_SCHED_5_0_1, SMPL_SCHED_5_0_2, SMPL_SCHED_7_0_1 SMPL_SCHED_7_0_2, SMPL_SCHED_7_0_3, SMPL_SCHED_9_0_1, SMPL_SCHED_9_0_2, SMPL_SCHED_9_1_1, SMPL_SCHED_5–ODD, SMPL_SCHED_5_EVN, SMPL_SCHED_SBS (17)
Event Rule	SMPL_FILTER_RULE (1)
Variable table	SMPL_VAR_TABLE_9_0_1, SMPL_VAR_TABLE_9_0_2 (2)

You can display each object by running the **composer** command interface. For specific information about the syntax of the **composer** interface, see the *IBM Workload Scheduler: User's Guide and Reference*.

Overview of the scheduling scenarios

About this task

The following table describes the topics covered in each scenario. Each scenario is a separate script file.

You must run Scenario 1 first, but you can choose to run the other scenarios in any order.

Table 35. List of scheduling scenarios

Scenario name	Script name	Topics
Scenario 1	**scenario1.0.bat** (Windows)**scenario1.0.sh** (UNIX)	Creating the production plan and viewing its contents **Note:** This scenario is a prerequisite for all the other scenarios in your sequence.
Scenario 2	**scenario2.0.bat** (Windows)**scenario2.0.sh** (UNIX)	Administrative commands: starting and stopping IBM Workload Scheduler processes
Scenario 3	**scenario3.0.bat** (Windows)**scenario3.0.sh** (UNIX)	Scheduling basics: how jobs are scheduled, run order of jobs
Scenario 4	**scenario4.0.bat** (Windows)**scenario4.0.sh** (UNIX)	Advanced Scheduling: prompt, file, and resource dependencies
Scenario 5	**scenario5.0.bat** (Windows)**scenario5.0.sh** (UNIX)	Time dependencies and run cycles
Scenario 6	**scenario6.0.bat** (Windows)**scenario6.0.sh** (UNIX)	Job submission (jobs, job streams, ad-hoc jobs)
Scenario 7	**scenario7.0.bat** (Windows)**scenario7.0.sh** (UNIX)	Recovery options and recovery jobs
Scenario 8	**scenario8.0.bat** (Windows)**scenario8.0.sh** (UNIX)	Event-driven scheduling
Scenario 9	**scenario9.0.bat** (Windows)**scenario9.0.sh** (UNIX)	Using variable tables

Creating and working with the production plan

About this task

After you have successfully populated the database, you are ready to run the Scenario 1, which creates the production plan. The production plan contains the database objects (jobs and job streams) that are eligible for scheduling.

Scenario 1 is a prerequisite to all other scenarios so you must run it first. The other scenarios can then be run in any order.

Most commands in the scenarios are given in their short form. Where this is the case, the full name of the command is shown in parentheses in each scenario description.

Scenario 1: Creating the production plan and viewing its contents

The scenario shows you how to:
- Create and extend a production plan
- Understand if a plan was created successfully
- View the contents of a plan

The scenario performs the following actions:
- Creates a production plan with a duration of 24 hours
- Inserts into the plan all the jobs and job streams that the tutorial already added in the database with their dependencies
- Views the contents of the plan

Commands used in the scenario in their run sequence:
1. **JnextPlan**
2. **conman sc** (showcpus)
3. **planman showinfo**
4. **conman ss @#SMPL@** (showschedules)

Running the scheduling scenarios

After creating the plan in Scenario 1, the other scenarios use the tutorial objects in the database by scheduling them in the plan. Each scenario explains different scheduling concepts. For each command used in the scenarios, the output is displayed on the screen.

Note: You can run the scenarios in any order because each scenario uses different objects. However, if you want to run the same scenario more than once in your sequence, you must reset the plan and run Scenario 1 again before you rerun the individual scenario. Perform these steps:

1. Run the following command:
   ```
   ResetPlan -scratch
   ```
2. Run the **scenario1.0.bat** in Windows or the **scenario1.0.sh** script in UNIX.

Scenario 2: Starting and stopping IBM Workload Scheduler processes

This scenario performs some basic administrative tasks. After each stop or start command, the status is displayed on the screen.

Scenario tasks and concepts:
- Stopping and starting the IBM Workload Scheduler engine
- Stopping and starting the event processor
- Stopping and starting the monitoring agent
- Viewing process status

Commands used in the scenario in their run sequence:
1. **"conman stop"**

2. **"conman status"**
3. **"conman start"**
4. **"conman status"**
5. **"conman stopevtproc"** (stopeventprocessor)
6. **"conman startevtproc"** (starteventprocessor)
7. **"conman sc"** (showcpus)
8. **"conman stopmon;wait"**
9. **"conman startmon"**
10. **"conman sc"** (showcpus)

For a detailed description of IBM Workload Scheduler processes and related commands, see the *IBM Workload Scheduler: User's Guide and Reference*.

Scenario 3: Scheduling basics, how jobs are scheduled, and run order of jobs

This scenario performs basic scheduling tasks by showing how you schedule jobs and how you manage the scheduling sequence.

Scenario tasks and concepts:
- Running a job and a job stream on a workstation
- Viewing job status
- Viewing and changing the workstation limit
- Understanding the concept and purpose of dependent job streams and run order (FOLLOWS)
- Viewing dependency resolution during job runs

Commands used in the scenario in their run sequence:
1. **"conman ss @#SMPL_SCHED_3@"** (showschedules)
2. **"composer disp sched=@SMPL_SCHED_3_0_2"**
3. **"conman lc; 10;noask"** (limit)
4. **"conman sc"** (showcpus)
5. **"conman sj @#SMPL_SCHED_3_0_@.SMPL_JOB_3_0_@"** (showjobs)
6. **"conman sj @#SMPL_SCHED_3_0_@.SMPL_JOB_3_0_@"** (showjobs

Scenario 4: Advanced scheduling, dependencies from prompts, files, and resources

This scenario performs advanced scheduling tasks by showing different types of dependencies in action.

Scenario tasks and concepts:
- Viewing and managing prompt dependencies
- Viewing and managing resource dependencies
- Viewing and managing file dependencies
- Understanding resource contention between jobs

Commands used in the scenario in their run sequence:
1. **"composer disp sched= @#SMPL_SCHED_4@"**
2. **"conman ss @SMPL_SCHED_4@"** (showschedules)
3. **"conman sp @#SMPLPRM4"** (showprompts)
4. **"conman reply SMLPRM4;y"** (reply)
5. **"conman sp @#SMLPRM4"** (showprompts)
6. **"conman sj @SMPL_SCHED_4_0_@.@"** (showjobs)
7. **"conman sj @SMPL_SCHED_4_0_@.@"** (showjobs)

8. **"conman sj @SMPL_SCHED_4_0_S.@"** (showjobs)

Scenario 5: Time dependencies and run cycles

This scenario performs advanced scheduling using time dependencies and run cycles.

Scenario tasks and concepts:

- Managing time limits such as AT time and UNTIL time
- Releasing a time dependency
- Using run cycles to plan scheduling activities

Commands used in the scenario in their run sequence:

1. **"conman sj @#SMPL_SCHED_5_0_@.SMPL_JOB_5_0_@"** (showjobs)
2. **"conman ddj @#SMPL_SCHED_5_0_1.SMPL_JOB_5_0_1;at;noask"** (deldep)
3. **"conman sj @#SMPL_SCHED_5_0_1.SMPL_JOB_5_0_1"** (showjobs)
4. **"conman rj @#SMPL_SCHED_5_0_1.SMPL_JOB_5_0_2"** (release)
5. **"conman sj @#SMPL_SCHED_5_0_1.SMPL_JOB_5_0_2"** (showjobs)
6. **"conman ss @#SMPL_SCHED_5-@"** (showschedules)

Scenario 6: Manual submission of jobs, job streams, and commands

This scenario uses the submit command to insert jobs, job streams, and ad-hoc jobs in the plan.

Scenario tasks and concepts:

- Submitting a job in the current production plan
- Submitting a job stream in the current production plan
- Submitting a command in the current production plan
- Displaying the job, job stream, and command status in the plan

Commands used in the scenario in their run sequence:

1. **"conman sbj @#SMPL_JOB_SBJ;alias=SMPL_SBJ_ALIAS"** (submit)
2. **"conman sj @#JOBS.SMPL_ALIAS"** (showjobs)
3. **"conman sbs @#SMPL_SCHED_SBS;alias=SMPL_SBS_ALIAS"** (submit)
4. **"conman sj @#SMPL_SBS_ALIAS"** (showjobs)
5. **"conman sbd "ver"; logon=^SMPLUSER^;alias=SMPL_SBD_ALIAS"** (submit)
6. **"conman sj @#JOBS.SMPL_SBD_ALIAS"** (showjobs)

Note: The value of the logon attribute in step 5 is specified by using a parameter object. For more information about parameters see the *IBM Workload Scheduler: User's Guide and Reference*.

Scenario 7: Recovery options and recovery jobs

This scenario shows some examples of recovery options and recovery jobs.

Scenario tasks and concepts:

- Defining and using the STOP, CONTINUE, and RERUN recovery options
- Understanding the use of recovery jobs to solve scheduling malfunctions

Commands used in the scenario in their run sequence:

1. **"conman reply SMPLPRM7;y"** (reply)
2. **"conman sp SMPLPRM7"** (showprompts)
3. **"conman sj @#SMPL_SCHED_7_0_1.@"** (showjobs)
4. **"conman sj @#SMPL_SCHED_7_0_2.@"** (showjobs)
5. **"conman sj @#SMPL_SCHED_7_0_3.@"** (showjobs)

Scenario 8: Event-driven scheduling

This scenario shows some examples of event-driven scheduling.

Scenario tasks and concepts:

- Creating a rule and associating an action to the rule
- Understanding the different rule types: Filter, Sequence, and Collection rules
- Processing an action associated to a rule

Commands used in the scenario in their run sequence:

1. **"composer disp erule=SMPL_FILTER_RULE"** (display)
2. **"planman deploy -scratch"**
3. **"conman sj @#JOBS.SMPL_SBJ_ALIAS2"** (showjobs)

Scenario 9: Using variable tables

This scenario shows how you use variable tables to:

- Change the behavior of jobs and job streams based on why they are scheduled to run. For example, you can create a job that runs different commands for different operating systems.
- Change the behavior of jobs and job streams based on when they are scheduled to run, that is, on which days they run.

Commands used in the scenario in their run sequence:

1. **"composer disp vartable=SMPL_VAR_TABLE_9_0_?"** (display)
2. **"composer disp vartable=MAIN_TABLE"** (display)
3. **"composer disp job=SMPL_JOB_9_1_1"** (display)
4. **"composer disp sched=SMPL_SCHED_9_1_1"** (display)
5. **"conman sj SMPL_SCHED_9_1_1(1000).SMPL_JOB_9_1_1;info** (showjobs)
6. **"conman sj SMPL_SCHED_9_1_1(1200).SMPL_JOB_9_1_1;info** (showjobs)

Because the production plan has already been generated, you can see the following results:

- The job stream added for the run cycle associated to the SMPL_VAR_TABLE_9_0_2 variable table contains the SMPL_JOB_9_1_1 job that launches the default command.
- The job stream added for the run cycle associated to the SMPL_VAR_TABLE_9_0_1 variable table contains the SMPL_JOB_9_1_1 job that launches the command specified within the variable table.

Scenario 9 part 1: Using variable tables to run different commands using the same job definition

This part shows how you use variable tables to create two job streams containing the same job definition to launch two different commands. The scenario performs the following steps:

- Creates two variable tables and defines variables inside them.
- Uses variables inside jobs.
- Defines two job streams
- Associates a different variable table to each job stream.

Commands used in the scenario in their run sequences:

1. **"composer disp vartable=SMPL_VAR_TABLE_9_0_?"** (display)
2. **"composer disp job=SMPL_JOB_9_0_1"** (display)
3. **"composer disp sched=SMPL_SCHED_9_0_?"** (display)
4. **"conman sj SMPL_SCHED_9_0_1.SMPL_JOB_9_0_1;info"** (showjobs)
5. **"conman sj SMPL_SCHED_9_0_2.SMPL_JOB_9_0_1;info"** (showjobs)

Because the production plan has already been generated, you can see the following results:

- The job added with the SMPL_SCHED_9_0_1 job stream contains the command to list the content of the `TWSTutorial` directory.
- The job added with the SMPL_SCHED_9_0_2 job stream contains the command to list the content of the `TWS` directory.

Scenario 9 part 2: Using variable tables to run different commands on different days

This part shows how you use variable tables to have the same job stream containing two run cycles to launch two commands based on variable substitution. It create a job stream containing a job definition and two different run cycles that address two different variable tables. The scenario performs the following steps:

- Creates two variable tables and defines variables inside them.
- Uses variables inside jobs.
- Defines a job stream.
- Associates a different variable table to each run cycle.

Removing tutorial objects from the database

Steps to remove all tutorial objects from the database.

You can choose to keep the database objects in your environment to use them as templates for new objects. If, instead, you want to completely remove all tutorial objects from the database, perform the following steps:

1. Go to the *TWS_home*`/TWS/TWSTutorial` directory, where *TWS_home* is the home directory of the user for which you installed IBM Workload Scheduler.
2. Launch the tutorial utility installation script as follows:
   - In a Windows operating system:
     ```
     SAMPLEDBSETUP.CMD -uninstall
     ```
   - In a UNIX and Linux operating systems:
     ```
     sampledbsetup.sh -uninstall
     ```

Part 6. Appendixes

Appendix A. Registry file

On UNIX operating systems, when you install IBM Workload Scheduler using Installation Manager or the **twsinst** script, a check is performed to determine whether there are other IBM Workload Scheduler instances already installed. The `TWSRegistry.dat` file stores the history of all instances installed. On Windows operating systems, this file is stored under the system drive directory, for example, `c:\WINDOWS\system32`. On UNIX operating systems, this file is stored in the `/etc/TWS` path. The file contains the values of the following attributes that define a IBM Workload Scheduler installation:

Table 36. Registry file attributes

Attribute	Value
ProductID	TWS_ENGINE
PackageName	The name of the software package used to perform the installation.
InstallationPath	The absolute path of the IBM Workload Scheduler instance.
UserOwner	The owner of the installation.
MajorVersion	IBM Workload Scheduler version number.
MinorVersion	IBM Workload Scheduler release number.
MaintenanceVersion	IBM Workload Scheduler maintenance version number.
PatchVersion	The latest product patch number installed.
Agent	Any one of the following: standard agent, fault-tolerant agent, master domain manager.
FeatureList	The list of optional features installed.

Appendix B. The IBM Workload Scheduler response file properties

The following tables describe the properties that are used in the IBM Workload Scheduler response file:

- General information: Table 37
- User information: Table 38 on page 416
- Upgrade configuration: Table 39 on page 416
- Master configuration: Table 40 on page 416
- Dynamic domain manager configuration: Table 41 on page 418
- Database configuration: Table 42 on page 420
- WebSphere configuration: Table 43 on page 427
- Offering and features to install: Table 44 on page 428

Note:

1. All values must be written between single quotation marks ('), for example: `<data key='user.finalJob,com.ibm.tws' value='false'/>`
2. Properties are written in mixed case for ease of reading, but are not case-sensitive
3. Keywords (for example, "true") used in values, are not case-sensitive.

Table 37. General information

Name	Description	Permitted values
`id`	The IBM Workload Scheduler profile ID.	**Fresh installation** The value must be *IBM Workload Scheduler*. Do not modify this value. **Upgrade** The value depends on the original fresh installation of the product. If the original fresh installation of the product was version 9.2 Fix Pack 1 or later, then the value must be *IBM Workload Scheduler*. If the original fresh installation of the product was a version earlier than version 9.2 Fix Pack 1, then the value must be *Tivoli Workload Scheduler*. Do not modify this value.
`installLocation`	The IBM Workload Scheduler installation directory.	For more information about possible values for the installation directory , see “Installation procedure for master domain manager and its backup” on page 94 or “Installation procedure for a dynamic domain manager or its backup” on page 123.

Table 37. General information (continued)

Name	Description	Permitted values
`user.offeringId`	The offering ID.	The value must be *com.ibm.tws*. Do not modify this value.
`user.isSilentUpgrade`	The value that indicates if you are performing an upgrade or a fresh installation in silent mode.	**true** Upgrade silent process **false** Installation silent process

Table 38. User information

Name	Description	Permitted values
`user.userName`	Specify the IBM Workload Scheduler user name.	For more information about IBM Workload Scheduler user names, see "IBM Workload Scheduler user information" on page 97.
`user.password`	Specify the IBM Workload Scheduler encrypted password. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about IBM Workload Scheduler user passwords, see "IBM Workload Scheduler user information" on page 97.

Table 39. Upgrade configuration (only for upgrade)

Name	Description	Permitted values
`user.backupDir`	Specify the fully qualified path of the backup directory where you back up the IBM Workload Scheduler instance data.	The default value must be: **On Windows operating systems** The Administrator temporary directory. **On UNIX and Linux operating systems** `$TEMP`.

Table 40. Master configuration

Name	Description	Permitted values
`user.mdmIsBackup`	Specify if you want to install the instance as a master domain manager or a backup master domain manager.	**true** the installation process configure the IBM Workload Scheduler installed as backup master domain manager. **false** the installation process configure the IBM Workload Scheduler installed as master domain manager. By default, the value is set to *false*.
`user.mdmCompany`	Company name.	For information related to the master domain manager configuration, see "IBM Workload Scheduler master configuration" on page 98.
`user.mdmWorkstation`	The name of the workstation where you are installing the component.	For information related to the master domain manager configuration, see "IBM Workload Scheduler master configuration" on page 98.

Table 40. Master configuration (continued)

Name	Description	Permitted values
`user.mdmRemoteWorkstation`	The name of the master domain manager workstation.	For information related to the master domain manager, see "IBM Workload Scheduler master configuration" on page 98.
`user.mdmPort`	The port used by the **netman** process of this workstation.	For information related to the master domain manager configuration, see "IBM Workload Scheduler master configuration" on page 98.
`user.dynamicAgentHostname`	The fully qualified host name or IP address of the dynamic agent.	For information related to the configuration of the dynamic scheduling, see "IBM Workload Scheduler master configuration" on page 98.
`dynamicAgentWorkstation`	The name of the dynamic agent workstation.	For information related to the configuration of the dynamic scheduling, see "IBM Workload Scheduler master configuration" on page 98.
`dynamicAgentJobManagerPort`	The dynamic agent secure port number (SECUREADDR).	For information related to the configuration of the dynamic scheduling, see "IBM Workload Scheduler master configuration" on page 98.
`user.finalJob`	Add the final job stream to the database. This option allows you to perform automatic production plan extension at the end of each current production plan processing. This option is available only if you are installing a master domain manager.	**true** Add the final job stream **false** Do not add the final job stream By default, the value is set to false.
`user.eventProcessorPort`	The port used by the event management processor to receive events.	For information related to the configuration of the Event driven workload automation, see "IBM Workload Scheduler master configuration" on page 98.
`user.dwbWorkstation`	Use only if `user.mdmIsBackup` is set to *false*. The definition of the dynamic workload broker workstation created in the IBM Workload Scheduler database. The master domain manager name followed by _DWB.	For information related to dynamic workload broker scheduling component configuration, see "IBM Workload Scheduler master configuration" on page 98.
`user.dwbPort`	Use only if `user.mdmIsBackup` is set to *false*. The port of the dynamic workload broker workstation that you will create in the IBM Workload Scheduler database. The IBM Workload Scheduler engine and the dynamic workload broker component communicate using this port.	For information related to thedynamic workload broker scheduling component configuration, see "IBM Workload Scheduler master configuration" on page 98.

Table 40. Master configuration (continued)

Name	Description	Permitted values
`user.dwbHostname`	Use only if `user.mdmIsBackup` is set to *true*. The fully qualified host name or IP address of the remote workstation where isdynamic workload broker.	For information related to the dynamic workload broker scheduling component configuration, see "IBM Workload Scheduler master configuration" on page 98.
`user.dwbHttpsPort`	Use only if `user.mdmIsBackup` is set to *true*. The HTTPS port of the remote dynamic workload broker.	For information related to the dynamic workload broker scheduling component configuration, see "IBM Workload Scheduler master configuration" on page 98.
`user.symbolicLink`	*Only on UNIX operating systems*. Choose whether to create symbolic links to `/usr/bin` directory (see Table 3 on page 35 for more details).	**true** Symbolic links are created. **false** Symbolic links are not created.

Table 41. Dynamic domain manager configuration

Name	Description	Permitted values
`user.ddmIsBackup`	Specify if you want to install the instance as dynamic domain manager or backup dynamic domain manager.	**true** The installation process configure the IBM Workload Scheduler installed as backup dynamic domain manager. **false** The installation process configure the IBM Workload Scheduler installed as dynamic domain manager. By default, the value is set to *false*.
`user.ddm2ZosOnly`	*Only for dynamic domain manager.* Specify if you want to connect the dynamic domain manager only to the z/OS controller or to a master domain manager or to both a master domain manager and a z/OS controller.	**true** You connect the dynamic domain manager only to the z/OS controller. **false** You connect the dynamic domain manager to the z/OS controller and master domain manager. By default, the value is set to *false*.
`user.ddmDomainName`	*Only for both user.ddm2ZosOnly set to "false" and for user.ddmIsBackup set to "false"*. Specify the IBM Workload Scheduler domain name managed by the dynamic domain manager.	The default value is **DYNAMICDM**. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.ddmWorkstation`	*Only for user.ddm2ZosOnly set to "false"*. The name of the dynamic domain manager workstation. The `user.ddmWorkstation` and `user.ddmMasterWorkstation` values must not be the same.	The default is the hostname of the workstation. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.ddmMasterWorkstation`	*Only for user.ddm2ZosOnly set to "false"*. The name of the master domain manager. The `user.ddmWorkstation` and `user.ddmMasterWorkstation` values must not be the same.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.

Table 41. Dynamic domain manager configuration (continued)

Name	Description	Permitted values
`user.ddmPort`	*Only for user.ddm2ZosOnly set to "false"*. The port used by Netman on the system on which the component is installed.	The default value is **31111**. The valid range is from 1 to 65535. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dwbMasterHostname`	*Only for both user.ddm2ZosOnly set to "false" and for user.ddmIsBackup set to "false"*. The fully qualified host name on which the dynamic domain manager contacts the master domain manager.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dwbMasterHttpsPort`	*Only for both user.ddm2ZosOnly set to "false" and for user.ddmIsBackup set to "false"*. The dynamic agent component installed on the dynamic domain manager instance uses this port to connect to the dynamic workload broker installed on the master domain manager instance.	The default value is **31116**. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dynamicAgentHostname`	The fully qualified host name or IP address of the dynamic agent component installed on the dynamic domain manager instance. The agents contact the dynamic domain manager by using this address. The dynamic workload broker and the IBM Workload Scheduler for z/OS controller use this address to connect to the dynamic agent.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dynamicAgentWorkstation`	The name of the dynamic agent workstation definition component installed on the dynamic domain manager instance.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dynamicAgentJobManagerPort`	The JobManager secure port number. The IBM Workload Scheduler for z/OS controller and the Dynamic workload broker use this port to connect to the IBM Workload Scheduler dynamic agent.	The default value is **31114**. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.ddmEnableJobManagerHttps`	This option enables HTTPS communication between the local Dynamic workload broker and the dynamic agent.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.
`user.dwbWorkstation`	*Only for dynamic domain manager*. The definition of the Dynamic workload broker workstation created in the IBM Workload Scheduler database.	For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.

Table 41. Dynamic domain manager configuration (continued)

Name	Description	Permitted values
`user.dwbPort`	*Only for dynamic domain manager*. The port used by the IBM Workload Scheduler dynamic domain manager to communicate with the local Dynamic workload broker component.	The default value is **41114**. The valid range is from 1 to 65535. For information related to the configuration of the dynamic domain manager, see "IBM Workload Scheduler dynamic domain manager configuration" on page 126.

Table 42. Database configuration

Name	Description	Permitted values
`user.dbType`	Choose which type of RDBMS support you want to use, DB2®, Oracle, or Other (Informix® Dynamic Server or Microsoft SQL Server).	**db2** DB2 RDBMS **oracle** Oracle RDBMS **others** Informix® Dynamic Server or Microsoft SQL Server. See "Database configuration" on page 100 for more information about configuration scripts you must run to complete the installation for these RDBMSs.
`user.dbPath`	The installation directory of the DB2 or Oracle database.	For more information about RDBMS configuration, see **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103 **Oracle** "Installing for an Oracle database" on page 106
`user.db2IsClient`	Specify if the DB2 you use is a server edition or a client edition.	**true** DB2 client **false** DB2 server

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.db2UserName`	The user name of the administrator of the DB2 server instance. If the DB2 administrator already created the database tables using the procedure "Creating or upgrading the database schema if you are using DB2" on page 48, the user name is the one that the DB2 administrator specified in the **DB_USER** property in the `customizeDB2SQL.properties` file. The default value is: **On Windows operating systems** **db2admin**. **On UNIX and Linux operating systems** **db2inst1**. If the DB2 administrator already upgraded the database tables using the procedure "Creating or upgrading the database schema if you are using DB2" on page 48, the user name is the one that the DB2 administrator specified in the **DB_UPGRADE_USER** field. You must assign SYSMON authority to the user you specified in the **DB_UPGRADE_USER** field.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2Password`	The encrypted password of the DB2 server administrator user, or of the user with SYSADM or SYSCTRL authority. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.db2Name`	The name of the DB2 database. The default is TWS.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2LocalAdminUserName`	Only if `user.db2IsClient` is set to *true*. The DB2 local admin user.	For more information about DB2 configuration, see: **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2IsDifferentUser`	Only if `user.db2IsClient` is set to *true*. Specify if the IBM Workload Scheduler DB2 user is different from the DB2 Administrator user.	**true** DB2 user is different from the DB2 Administrator user **false** DB2 user is NOT different from the DB2 Administrator user
`user.db2TWSUserName`	Only if `user.db2IsDifferentUser` is set to *true*. The name of the IBM Workload Scheduler DB2 user different from the DB2 Administrator user.	For more information about DB2 configuration, see: **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2TWSPassword`	Only if `user.db2IsDifferentUser` is set to *true*. The encrypted password of the IBM Workload Scheduler DB2 user different from the DB2 Administrator user. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about DB2 configuration, see: **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.db2DataTableSpaceName`	The name of the DB2 instance tablespace for storing scheduling objects and event rules.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2DataTableSpacePath`	The relative path of the DB2 table space for storing scheduling objects and event rules.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2ReportTableSpaceName`	The name of the table space for storing report data.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2ReportTableSpacePath`	The path of the table space for storing report data.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.db2PlanTableSpaceName`	The name of the table space for storing planning data.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2PlanTableSpacePath`	The path of the table space for storing planning data.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2InstanceName`	The name of the DB2 server instance.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2InstancePort`	The TCP/IP port number used to communicate with the DB2 instance.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.db2Hostname`	Only if `user.db2IsClient` is set to *true*. The hostname of the workstation where the DB2 server is installed.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.db2Port`	Only if `user.db2IsClient` is set to *true*. The port of the remote workstation where the DB2 server is installed.	For more information about DB2 configuration, see: **DB2 Server** "Installing and upgrading for a DB2 database server" on page 101 **DB2 Client** "Installing and upgrading for a DB2 database client" on page 103
`user.oracleNetServiceName`	The name used by clients to identify an Oracle Net server and the specific system identifier or database for the Oracle Net connection.	For more information about Oracle configuration, see:"Installing for an Oracle database" on page 106.
`user.oracleUserName`	The database administrator user name (such as `SYSTEM`) required to authenticate to the Oracle database. If the ORACLE administrator already created the database tables using the procedure "Creating or upgrading the database tables if you are using Oracle" on page 59, the user name is the one that the ORACLE administrator specified in the **MDL_USER** property of the `customizeORACLESQL.properties` file.	For more information about Oracle configuration, see:"Installing for an Oracle database" on page 106.
`user.oraclePassword`	The database administrator user encrypted password required to authenticate to the Oracle database. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about Oracle configuration, see:"Installing for an Oracle database" on page 106.

Table 42. Database configuration (continued)

Name	Description	Permitted values
`user.oracleTWSUserName`	The owner of the IBM Workload Scheduler schema.	For more information about Oracle configuration, see:"Installing for an Oracle database" on page 106.
`user.oracleTWSPassword`	The database administrator user password required to authenticate to the Oracle database.	For more information about Oracle configuration, see:"Installing for an Oracle database" on page 106.
`user.oraclePartitioningOption`	Specify whether the event-driven workload automation database schema is to be created using the Oracle Partitioning feature.	**true** The Oracle Partitioning feature is used when creating the event-driven workload automation database schema. **false** The Oracle Partitioning feature is NOT used when creating the event-driven workload automation database schema.
`user.oracleDataTableSpace`	The name that identifies the IBM Workload Scheduler data table space.	For more information about Oracle configuration, see "Installing for an Oracle database" on page 106.
`user.oracleReportTableSpace`	The name that identifies the IBM Workload Scheduler table space where report data is to be stored.	For more information about Oracle configuration, see "Installing for an Oracle database" on page 106.
`user.oraclePlanTableSpace`	The name that identifies the IBM Workload Scheduler table space where planning data is to be stored.	For more information about Oracle configuration, see "Installing for an Oracle database" on page 106.
`user.oracleTempTableSpace`	The name that identifies the IBM Workload Scheduler temporary table space.	For more information about Oracle configuration, see "Installing for an Oracle database" on page 106.
`user.dbJDBCHost`	*Only for an upgrade.* The host name or IP address of the remote workstation where the Oracle server is installed.	For more information about Oracle configuration, see "Installing for an Oracle database" on page 106.
`user.dbJDBCPort`	*Only for an upgrade.* The port of the remote Oracle server.	The default port number is: 1521
`user.dbJDBCOracleNetServiceName`	*Only for an upgrade.* The Oracle Service Name of the IBM Workload Scheduler database.	The default value is `orcl`.

Table 43. WebSphere configuration

Name	Description	Permitted values
`user.wasInstallLocation`	The directory where you installed the WebSphere Application Server.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.createNewWasProfile`	Specify if you want to use an existent profile or you want create a new one.	**true** Installation process create a new profile in theWebSphere Application Server. **false** Installation process uses a profile already created and used in the WebSphere Application Server. The default is **true**.
`user.wasProfileLocation`	The location where the WebSphere Application Server profile is saved.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasProfileName`	The name of the WebSphere Application Server profile you are using.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasHostname`	The IP address or fully qualified hostname of the WebSphere Application Server server related to the profile you are using.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasServerName`	The name of the WebSphere Application Server server related to the profile you are using.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasNodeName`	The name of the WebSphere Application Server node related to the profile you are using.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasCellName`	Supply the WebSphere Application Server cell name for the WebSphere Application Server profile that you are using.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 111.
`user.wasAdminConsolePort`	Administration HTTP transport port.	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasAdminConsoleSecurePort`	Administration HTTPS transport port.	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.

Table 43. WebSphere configuration (continued)

Name	Description	Permitted values
`user.wasHTTPPort`	HTTP transport port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasHTTPSPort`	HTTPS transport port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasCSIV2ClientAuthListenerPort`	CSIv2 Client Authentication Listener port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasORBListenerPort`	ORB Listener port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasBootstrapPort`	Bootstrap port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasSASServerAuthPort`	SAS Server Authentication Listener port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasSOAPConnectorPort`	SOAP connector port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.
`user.wasCSIV2ServerAuthListenerPort`	CSIv2 Server Authentication Listener port	For more information about WebSphere configuration ports, see "WebSphere Application Server ports configuration" on page 112.

Table 44. Offering and features to install

Name	Description	Permitted values
`modify`	The following property is used by silent installation as-is, and must not be modified. This Boolean field specify if the installation process is modifying the product already installed.	Do not modify the value in the response file.
`offering id`	The following property is used by silent installation as is, and must not be modified. The offering ID.	Do not modify the value in the response file.

Table 44. Offering and features to install (continued)

Name	Description	Permitted values
`profile`	The following property is used by silent installation as is, and must not be modified. The profile name.	**Fresh installation** The value must be *IBM Workload Scheduler*. Do not modify this value. **Upgrade** The value depends on the original fresh installation of the product. If the original fresh installation of the product was version 9.2 Fix Pack 1 or later, then the value must be *IBM Workload Scheduler*. If the original fresh installation of the product was a version earlier than version 9.2 Fix Pack 1, then the value must be *Tivoli Workload Scheduler*.
`feature`	The following property is used by silent installation as is, and must not be modified. The feature name.	The value must be: **Master domain manager or backup master domain manager** tws.mdm **Dynamic domain manager or backup dynamic domain manager** tws.ddm Do not modify the value in the response file.
`installFixes`	The following property is used by silent installation as is, and must not be modified. This Boolean field specify if the installation process is installing fixes of the product.	Do not modify the value in the response file.

Appendix C. The Dynamic Workload Console response file properties

The following tables describe the properties used in the Dynamic Workload Console response file:

- General information: Table 45.
- WebSphere configuration: Table 46 on page 432.
- z/OS connector configuration: Table 47 on page 433.
- Offering and features to install: Table 48 on page 433.
- Upgrade settings: Table 49 on page 434.

Note:

1. All values must be written between single quotation marks ('), for example: `<data key='user.wasInstallLocation,com.ibm.tws' value='C:\Program Files\IBM\TWA\'/>`
2. Properties are written in mixed case for ease of reading, but are not case-sensitive.
3. Keywords (for example, "true") used in values, are not case-sensitive.
4. For UNIX and Linux operating systems, in case the installation is performed by a non-root user, customize the installation path properly.

Table 45. General information

Name	Description	Permitted values
`repository location`	The location where you stored the eImages.	For more information about downloading eImages on your workstation, see "Downloading installation images on your workstation" on page 31
`profile id`	The profile ID.	**Fresh installation** The value must be IBM Dynamic Workload Console. Do not modify this value. **Upgrade** The value depends on the original fresh installation of the product. If the original fresh installation of the product was version 9.2 Fix Pack 1 or later, then the value must be *IBM Dynamic Workload Console*. If the original fresh installation of the product was a version earlier than version 9.2 Fix Pack 1, then the value must be *Tivoli Dynamic Workload Console*.

Table 45. General information (continued)

Name	Description	Permitted values
`installLocation`	The Dynamic Workload Console installation directory.	For more information about the installation directory possible values, see "Installation procedure for Dynamic Workload Console" on page 356.
`user.offeringId`	The offering ID.	The value must be *com.ibm.tws.tdwc*. Do not modify this value.

Table 46. WebSphere configuration

Name	Description	Permitted values
`user.wasInstallLocation`	The directory where you installed the WebSphere Application Server.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.
`createNewWasProfile`	To create a new WebSphere Application Server profile after the installation.	**false** Do not modify the value in the response file.
`user.wasProfileLocation`	The location where the WebSphere Application Server profile is saved.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.
`user.wasUserName`	Enter the WebSphere Application Server user ID of the WebSphere Application Server profile that you use. This field is optional.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.
`user.wasPassword`	Enter the encrypted password of the WebSphere Application Server user ID of the WebSphere Application Server profile that you are using. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.

Table 47. z/OS connector configuration

Name	Description	Permitted values
`user.zosConnIsEnabled`	Specify if you want to create a connection to an IBM Workload Scheduler for z/OS host.	**true** Installation process configures a new connection to an IBM Workload Scheduler for z/OS controller. **false** Installation process does not configure a connection to an IBM Workload Scheduler for z/OS controller. **Note:** After the installation, you can create connections using *wastools* scripts. The default is **false**.
`user.zosConnEngineName`	Specify the name of the IBM Workload Scheduler for z/OS engine which you are connecting to.	It is a label that identifies the z/OS connector instance.
`user.zosConnHostname`	Specify the host name or TCP/IP address of the remote z/OS system where the IBM Workload Scheduler for z/OS controller is installed.	A valid host name or TCP/IP address.
`user.zosConnPort`	Specify the number of the TCP/IP port of the remote z/OS system used to communicate with the IBM Workload Schedulerz/OS controller.	This value must correspond to the value specified in the `SERVOPTS` member of the controller. The default value is **11111**.
`user.zosConnSslIsEnabled`	Specify if you want to create the connection to an IBM Workload Scheduler for z/OS controller in SSL mode.	**true** Installation process configures the connection to an IBM Workload Scheduler for z/OS controller in SSL mode. **false** Installation process does not configure a connection to an IBM Workload Scheduler for z/OS controller in SSL mode. **Note:** After the installation, you can create connections using *wastools* scripts. The default is **false**.

Table 48. Offering and features to install

Name	Description	Permitted values
`modify`	This property is used by silent installation as-is, and must not be modified. In this boolean field the installation process specifies if you are modifying the product already installed.	Do not modify the value in the response file.
`offering id`	This property is used by silent installation as-is, and must not be modified.	Do not modify the value in the response file.

Table 48. Offering and features to install (continued)

Name	Description	Permitted values
`profile`	This property is used by silent installation as-is, and must not be modified.	Do not modify the value in the response file.
`feature`	This property is used by silent installation as-is, and must not be modified.	Do not modify the value in the response file.
`installFixes`	This property is used by silent installation as-is, and must not be modified. In this boolean field the installation process specifies if you are installing fixes to the product.	Do not modify the value in the response file.

Table 49. Upgrade settings

Name	Description	Permitted values
`repository location`	The location where you stored the eImages.	For more information about downloading eImages on your workstation, see "Downloading installation images on your workstation" on page 31
`repository location`	The location where you stored the fix pack eImages.	For more information about downloading fix pack eImages on your workstation, see the fix pack readme files.
`profile id`	**Fresh installation** The value must be IBM Dynamic Workload Console. Do not modify this value. **Upgrade** The value depends on the original fresh installation of the product. If the original fresh installation of the product was version 9.2 Fix Pack 1 or later, then the value must be *IBM Dynamic Workload Console*. If the original fresh installation of the product was a version earlier than version 9.2 Fix Pack 1, then the value must be *Tivoli Dynamic Workload Console*.	The value must be IBM Dynamic Workload Console. Do not modify this value.
`user.offeringId`	The offering ID.	The value must be *com.ibm.tws.tdwc*. Do not modify this value.
`user.wasUserName`	Enter the WebSphere Application Server user ID of the WebSphere Application Server profile that you use. This field is optional.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.

Table 49. Upgrade settings (continued)

Name	Description	Permitted values
`user.wasPassword`	Enter the encrypted password of the WebSphere Application Server user ID of the WebSphere Application Server profile that you are using. For more information about password encryption, see "Encrypting user passwords for response files" on page 120.	For more information about the configuration of the WebSphere Application Server profile, see "WebSphere Application Server profile configuration" on page 358.

Appendix D. The Job Brokering Definition Console response file properties

This section describes the properties used in the Job Brokering Definition Console response files:

Note:

1. All values must be written between double quotation marks (").
2. Property names are written in mixed case for ease of reading, but are not case-sensitive
3. Keywords used in values are not case-sensitive.

Table 50. Job Brokering Definition Console response file properties

Name	Description	Permitted values
`licenseAccepted`	Accept license agreement To install the Job Brokering Definition Console using a response file, you must explicitly accept the license agreement, a copy of which is in the License directory of the product install media.The license must be accepted before installation. This value must equal **true** for the installation to be successful.	**true** To accept the license agreement. **false** To not accept the license agreement. In this event, the Job Brokering Definition Console is *not* installed.
`installLocation`	Installation path for the Job Brokering Definition Console.	Any fully qualified path.

Appendix E. DB2 tablespace relative paths

When you create a DB2 tablespace with a relative path, the path is constructed in the following way:

`DFTDBPATH\`*`DB2_instance`*`\NODE0000\SQLnnnnn\`*`TABLESPACE_REL_PATH`*

where:

DFTDBPATH
For Windows operating system, this is the drive where the DB2 instance is installed. For UNIX and Linux operating systems, this is the home instance of the DB2 installation.

DB2_instance
Is the name of the DB2 instance.

NODE0000
Is the directory where DB2 database instances are located.

SQLnnnn
Is an incremental directory path that depends on the number of database instances.

TABLESPACE_REL_PATH
Is the relative path you specified for the tablespace.

For more information about tablespace relative paths, seethe DB2 documentation set.

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Index

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

R

S

T

U

V

W

Z

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