

*Endpoint Manager for Server
Automation*



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Chapter 1. Overview

IBM® Endpoint Manager for Server Automation provides you with the capability to automate a sequence of Fixlets, Tasks, and Baselines across different endpoints, such as servers or computers. Server Automation exploits the agility and scalability of IBM Endpoint Manager to deliver powerful functionality in a lean and efficient manner, with minimal impact on your network. Server Automation helps you save time while maximizing the efficiency of your resources.

Server Automation enables you to run automation tasks in a simple sequence or in parallel across multiple endpoints. You do this by creating an Automation Plan that contains a separate step for each action that you want to run across the endpoints. Your Automation Plan can run in a simple straight sequence, where each step is processed one after the other, or you can include parallel processing in the plan. For example, you can create an Automation Plan to sequence actions that deploy an operating system on a set of virtual servers, then install a database on one of those virtual servers while concurrently installing middleware applications on the other virtual servers. You can create sequenced automation that is based on conditions, for example, you might want the Automation Plan to begin only if the virtual servers are powered on successfully.

To sequence your automation tasks, you create an Automation Plan. Each Automation Plan contains a number of steps. Each step is a Fixlet, Task, or Baseline and represents an action to be deployed across multiple endpoints, such as the deployment of a Fixlet to install patches on endpoints.

Some key Server Automation use cases are as follows:

Patch sequencing for endpoints

You can automate patching across multiple endpoints, for example, you can patch servers.

Patching Microsoft® Windows® clusters

You can also automate patching of applications running on Microsoft® Windows® clusters. For example, you can use Server Automation Fixlets in an Automation Plan to automate the patching of clusters on which Microsoft® SQL Server is installed.

Middleware application installations and deployments

You can install, remove, and upgrade middleware applications across multiple endpoints in a single Automation Plan. You can target different endpoints in different steps in the Automation Plan. Some examples are multi tier application deployments.

Virtual server management

You can manage your virtual servers and include virtual server management actions in your Automation Plans.

Example: sequencing automation across endpoints

This example shows typical automation sequencing over a number of servers in a data center. Instead of completing each step manually, you can automate the process with an Automation Plan. The Automation Plan contains a number of steps, with each step representing a single action, such as the installation of software or the restarting of a system.

Using Server Automation, you can create an Automation Plan to run actions in sequence and in parallel, without requiring manual intervention. To automate the scenario, you create an Automation Plan to run the actions in the following table in the sequence shown.

Table 1. Creating an Automation Plan

Requirement	Action
1. Deploy an operating system on two different computers.	Add a step to your Automation Plan to deploy the operating system. You can use the Deploy an operating system to one or more computers (133) Server Automation Task to do this.
2. Install DB2® on one of the operating systems that are deployed in step 1.	Add a second step to your Automation Plan to install DB2. There is a Server Automation Task available to install DB2. Make this step dependent on step 1.
3. Install WebSphere® Application Server on one of the other operating systems that are deployed in step 1.	Add a third step to install WebSphere Application Server. There is a Server Automation Task available to install WebSphere Application Server. Make this step dependent on step 1. This step runs in parallel with step 2.
4. Create a database on the computer on which you installed DB2.	Add a step to your Automation Plan to create the database for the DB2 installation in step 2. There is a Server Automation Task available to create the database. You make this step dependent on step 2.
5. Run a baseline on the computer on which WebSphere Application Server was installed in step 3.	Add a fifth step to your Automation Plan to include the baseline that you want to use to patch the computer. You then make this step dependent on step 3. This step runs in parallel with step 4.
6. Process the action.	Run the Automation Plan to perform the actions. The Automation Plan Engine processes the Automation Plan running some of the steps in parallel.

Supported content

This section lists the software and versions supported by Server Automation.

Table 2. Microsoft Windows Cluster patching support

Content	Version	Operating System
Patching Microsoft Windows clusters (Manage the cluster so the underlying operating system can be patched)	<ul style="list-style-type: none"> • Microsoft Windows 2003 • Microsoft Windows 2008 • Microsoft Windows 2008 Release 2 • Microsoft Windows 2012 • Microsoft Windows 2012 Release 2 	Same as versions.
Patching clusters running Microsoft Exchange 2007 (Manage the cluster so the underlying operating system can be patched)	Microsoft Windows Exchange 2007 Service Pack 1 - Service Pack 3	<ul style="list-style-type: none"> • Microsoft Windows 2003 • Microsoft Windows 2008 • Microsoft Windows 2008 Release 2 <p>For information about Exchange versions and operating system version support, see Exchange support matrix.</p>

Table 2. Microsoft Windows Cluster patching support (continued)

Content	Version	Operating System
Patching clusters running Microsoft Exchange 2010 (Manage the cluster so the underlying operating system can be patched)	Microsoft Exchange 2010	<ul style="list-style-type: none"> • Microsoft Windows 2008 Release 2 • Microsoft Windows 2012 <p>For information about Exchange versions and operating system version support, see Exchange support matrix.</p>
Patching clusters running Microsoft Exchange 2013 (Manage the cluster so the underlying operating system can be patched)	Microsoft Exchange 2013 Service Pack 1 and newer	<ul style="list-style-type: none"> • Microsoft Windows 2008 Release 2 • Microsoft Windows 2012 <p>For information about Exchange versions and operating system version support, see Exchange support matrix.</p>
Patching clusters running Microsoft SQL Server (Manage the cluster so the underlying operating system can be patched)	SQL Server 2008	<ul style="list-style-type: none"> • Windows 2003 • Windows 2008
Patching clusters running Microsoft SQL Server (Manage the cluster so the underlying operating system can be patched)	SQL Server 2012	<ul style="list-style-type: none"> • Windows 2012 • Windows 2012 Release 2
Patching Hyper-V clusters (Manage the cluster so the underlying operating system can be patched)	<ul style="list-style-type: none"> • Windows 2012 • Windows 2012 Release 2 • Windows 2008 Release 2 	Same as versions.

The following table describes the supported content for middleware automation.

Table 3. Middleware automation

Content	Version	Operating system
<ul style="list-style-type: none"> • Oracle 11g Enterprise Edition • Oracle 11g Client 	11.2.0.4	Red Hat Enterprise Linux versions later then V5.0

Table 3. Middleware automation (continued)

Content	Version	Operating system
DB2 Enterprise Server Edition and DB2 Client	9.7	<ul style="list-style-type: none"> • Windows 2003 • Windows 2008 • Windows 2008 Release 2 • Windows 2012 • Windows 2012 Release 2 • AIX 5.3 • AIX 6.1 • AIX 7.1 • Red Hat Enterprise Linux version later than V5.0 • SUSE Linux versions later than V10.0
MS SQL Server Enterprise	<ul style="list-style-type: none"> • 2008 • 2008 Release 2 • 2012 • 2014 	<ul style="list-style-type: none"> • Windows 2003 (except for SQL Server 2014) • Windows 2008 • Windows 2008 Release 2 • Windows 2012 • Windows 2012 Release 2
WebSphere Application Server and WebSphere Application Server Network Deployment	7.x	<ul style="list-style-type: none"> • Windows 2003 • Windows 2008 • Windows 2008 Release 2 • Windows 2012 • Windows 2012 Release 2 • AIX 5.3 • AIX 6.1 • AIX 7.1 • RHEL V4.6 or later than V5.0 • SUSE V9.4 and V10.0 or later

The following table lists the supported virtualization versions.

Table 4. Virtualization support

Content	Version	Operating system
ESXi Audit fixlets for VMWare Patches	<ul style="list-style-type: none"> • 4 • 4.1 • 5 • 5.1 • 5.5 	Not applicable.
VMWare Management	<ul style="list-style-type: none"> • 4 • 4.1 • 5 • 5.1 • 5.5 	Not applicable.

Table 4. Virtualization support (continued)

Content	Version	Operating system
PowerVM Logical partition provisioning	POWER7 Tested on Hardware Management Console V7.9.0.0, VIOS version 2.2.3.0, and NIM V7.1.	AIX®

The following table lists other supported content.

Table 5. Other supported content

Content	Version	Operating system
Chef-Solo	11.6	<ul style="list-style-type: none">• Windows 2003 Release 2• Windows 2008• Windows 2008 Release 2• Windows 2012• Windows 7

Architecture

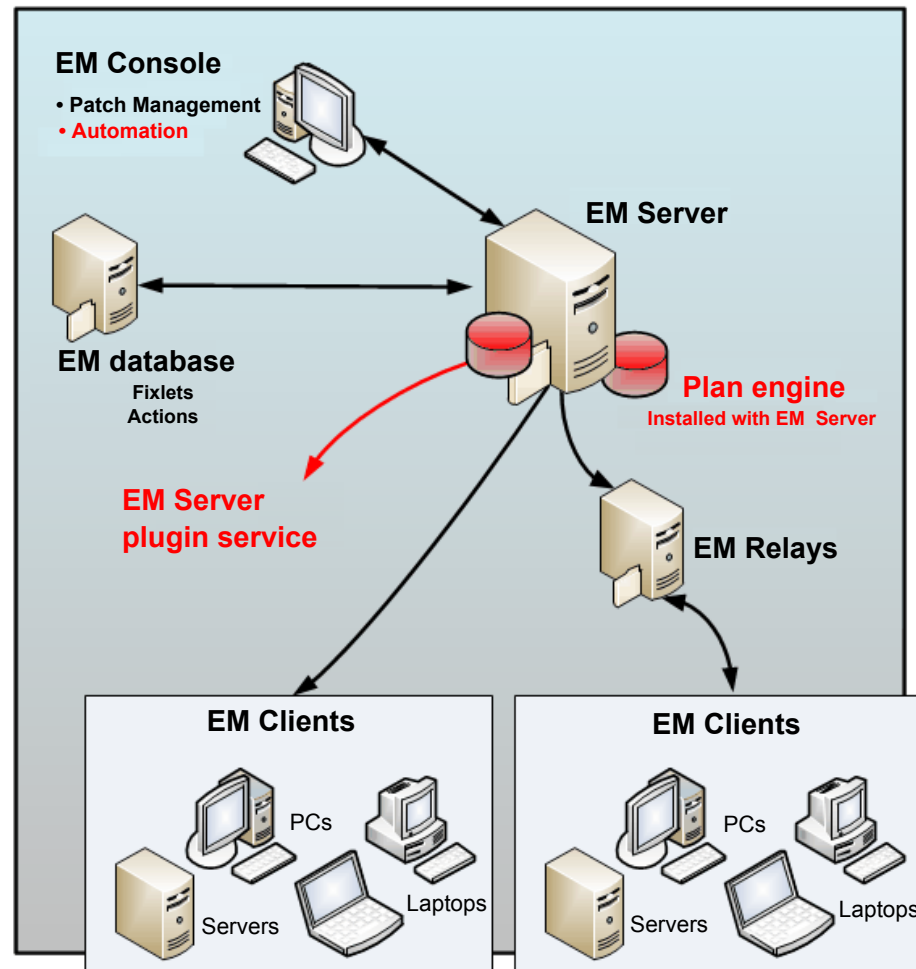
IBM Endpoint Manager for Server Automation is based on the IBM Endpoint Manager architecture. The only additional component required to use Server Automation is the Automation Plan Engine. The Automation Plan Engine processes your Automation Plans by running each step in the Automation Plan. You install the Automation Plan Engine using a Task. The Automation Plan Engine is located on the same system as the IBM Endpoint Manager server.

Server Automation integrated in IBM Endpoint Manager

The following diagram shows the IBM Endpoint Manager architecture with the Server Automation component displayed in red. Server Automation is an IBM Endpoint Manager application, similar to the IBM Endpoint Manager Patch Management or Lifecycle Management applications. You access and use Server Automation using the IBM Endpoint Manager console.

Architecture

New components in red



The Automation Plan Engine communicates with the IBM Endpoint Manager server via the REST API. The IBM Endpoint Manager server plug-in service is required on the IBM Endpoint Manager server. Server Automation requires no additional components. Server Automation can operate with or without relays.

For information about configuring the IBM Endpoint Manager server plug-in service, see [Server plugin service configuration information](#).

Key features

Server Automation provides key automation features that allow you to automate best practices for your data center.

Server Automation provides the following important features:

- Integration with the IBM Endpoint Manager platform.
- Automation technology that allows you to sequence a series of automation actions, such as Fixlets and Baselines, across multiple endpoints.
- Ability to manage VMware virtualization resources.

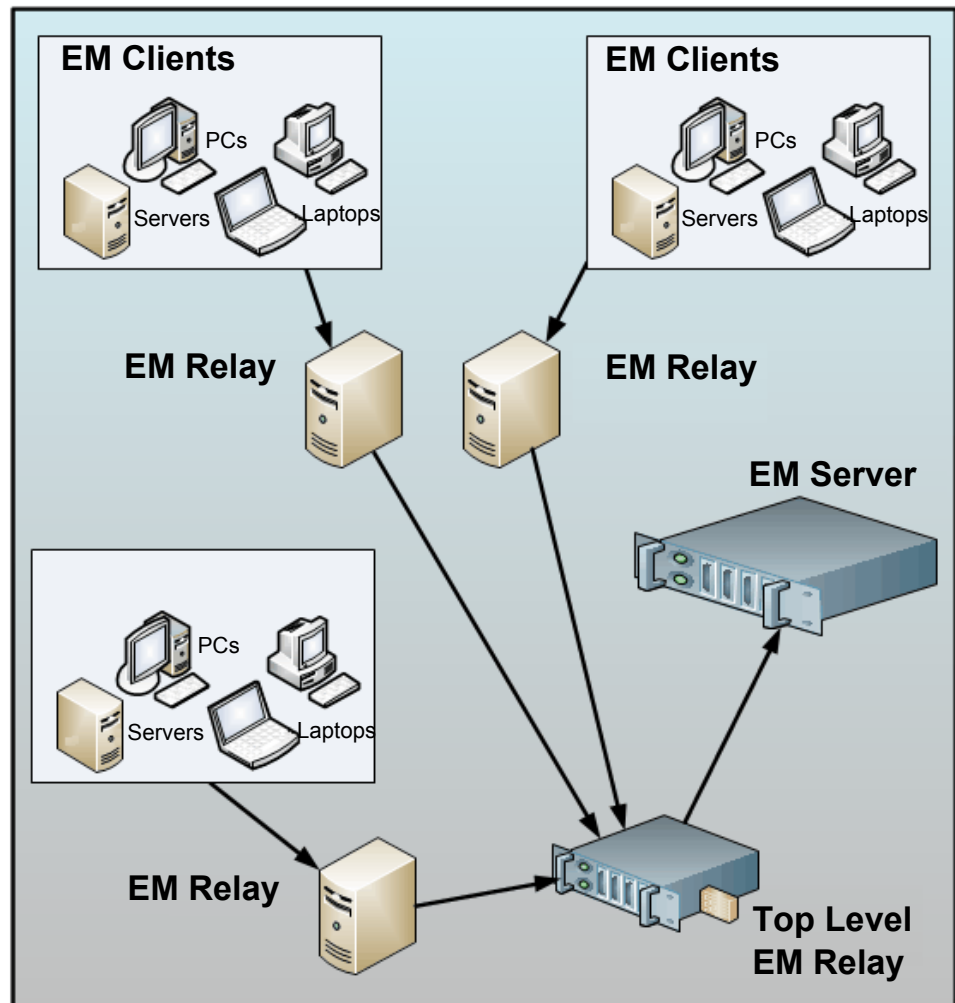
- Middleware content that you can use to automate deployment of middleware applications.
- Fixlet content for automating the patching process for Microsoft® Windows® clusters.
- Fixlet content for automating deployment of operating systems.
- Preconfigured Fixlets that allow you to deploy operating systems as part of your Automation Plans.

Server Automation and Data center configuration

Server Automation can help you to automate best practices in your data center. This section describes typical data center components and how they are configured in the IBM Endpoint Manager environment.

Data center

(1,000 to 10,000 clients)



This diagram displays the typical data center layout, where there are between 1,000 and 10,000 endpoints in the data center.

A typical data center is made up of between 1,000 and 10,000 endpoints, many of which are servers. In a topology such as this, you can use a top level IBM Endpoint Manager relay that communicates directly with the IBM Endpoint Manager server. Lower level relays communicate with the IBM Endpoint Manager server through the top level relay. For detailed information about configuration and best practice recommendations for using relays, see TEM Relays.

Acquiring the Server Automation site

After installing IBM Endpoint Manager, you can access the Server Automation site. You can only access the Server Automation site if you have purchased the license.

About this task

Ensure that you have signed off on the license agreement. The license agreement must be signed off before you can get the contents of the Server Automation site.

Complete the following steps to access the Server Automation site.

Procedure

1. From your IBM Endpoint Manager console, go to the BigFix Management domain and click **License Overview**.
2. Go to the Server Automation section of the **License Overview Dashboard** and accept the Endpoint Manager for Server Automation license.

Note: You might need to click the **Check for license update** button.

3. Click **Enable** beside the Server Automation site. The Server Automation site is made available on your console. It might take some time for the contents to become available on your system.

Chapter 2. Installation roadmap for Server Automation components

To use IBM Endpoint Manager for Server Automation, you must install the Automation Plan Engine. To use the virtualization technology, you must install management extenders. The installation roadmap for Server Automation describes each of the steps that you must perform to get Server Automation up and running.

The following steps show the installation roadmap for IBM Endpoint Manager for Server Automation:

- Install IBM Endpoint Manager version 9.1.
- Before you can install the Server Automation components, you must acquire the Server Automation license and site. For information about how to acquire the Server Automation site, see “Acquiring the Server Automation site” on page 8.
- Install the Automation Plan Engine, using the “Installing the Automation Plan Engine” documentation. The Automation Plan Engine processes your Automation Plans.
- Install the management extender for virtualization, using “Installing the management extender for VMware” on page 17. The management extender enables communication with the VMware vCenter.

For information about how to install IBM Endpoint Manager, see *Installing IBM Endpoint Manager on Windows* and *Installing IBM Endpoint Manager on Linux*.

For information about how to install the IBM Endpoint Manager client, see *Installing the client on Windows* and *Installing the client on Linux*.

Installing the Automation Plan Engine

To install the Automation Plan Engine, you must have IBM Endpoint Manager V9.1 or later with the Server Automation site installed. Make sure that your system meets all of the prerequisites before you begin installing the Automation Plan Engine. You can then install the Automation Plan Engine by executing a Task from your IBM Endpoint Manager console.

Install the Automation Plan Engine by completing the following steps:

1. Read the documentation for important information about the installation.
2. Complete the prerequisites. After you have completed the prerequisites, you are ready to install the Automation Plan Engine and the Task that installs the Automation Plan Engine becomes relevant.
3. Run the Task that installs the Automation Plan Engine on the IBM Endpoint Manager server. The installation takes a few minutes and when it has completed, the Task that installs the Automation Plan Engine is no longer relevant.
4. Verify that the Automation Plan Engine installed successfully and has started. The IBM Endpoint Manager server plugin service starts the Automation Plan Engine when it is installed on the IBM Endpoint Manager server.

The following sections describe each of these steps in detail.

Automation Plan Engine prerequisites

You can install the Automation Plan Engine on Linux and Windows platforms. Before installing the Automation Plan Engine, make sure that your system meets all of the prerequisites. This section describes all of the prerequisite tasks that you must complete before installing the Automation Plan Engine and the instructions are the same for both Windows and Linux.

About this task

Before you begin completing the prerequisite tasks, make sure that the external content site, BES Support, is accessible. This site publishes the Tasks to install the required component, the IBM Endpoint Manager server plugin service.

Note: The BES Server Plug-in Service, displayed on the user interface, is a synonym for the IBM Endpoint Manager server plugin service. The IBM Endpoint Manager server plugin service is the new term.

For each of the Fixlets or Tasks described here, there is normally a lag between the time you run one Fixlet or Task and when another becomes relevant and available.

Complete the following prerequisite steps in the order in which Tasks or Fixlets become relevant in the Server Automation domain. The Tasks or Fixlets only become relevant after you complete a dependant step.

Procedure

1. You must have IBM Endpoint Manager V9.1 installed to install the Automation Plan Engine. For a Linux installation, the IBM Endpoint Manager console must be installed on a Windows system.
2. You must have Web Reports installed with your IBM Endpoint Manager installation, and create a user with normal access rights in Web Reports. You must do this in Web Reports and this is a different user than the users that you create in the IBM Endpoint Manager console. For more information about creating a user in Web Reports, see Web Reports User's Guide.
3. Create a new IBM Endpoint Manager console user for the installation with master operator privileges. Do not use any unsupported characters in the user name or password for the Web Reports user. For information about the unsupported characters, see Unsupported user name and password characters.
4. Ensure that the site for the **Automation** domain, called Server Automation, is accessible. This site publishes the Task that installs the Automation Plan Engine.
5. Your computers must be subscribed to the Server Automation site. To subscribe the computers, select the Server Automation site from the **Sites > External Sites** section in the **All Content** domain. Click the **Computer Subscriptions** tab and subscribe the computers that you want to have access to the Server Automation site.
6. Install the IBM Endpoint Manager server plugin service on the IBM Endpoint Manager server. Install this plug-in using the Install BES Server Plugin Service Task from **Setup and Maintenance > Fixlets and Tasks** in the **Automation** node. When you click **Take Action**, target the IBM Endpoint Manager server.
7. Enable encryption of the credentials for the IBM Endpoint Manager REST API by running the Configure REST API credentials for BES Server Plugin Service Task from **Setup and Maintenance > Fixlets and Tasks** in the **Automation** node:

- a. Click the Configure REST API credentials for BES Server Plugin Service Task. The user interface from which you must start the encryption enablement Task is displayed.
- b. Enter the user name and password for the master operator user you created in step 3. This creates an encrypted password.
- c. Click **Take Action** and specify the server where you are installing the Automation Plan Engine, which is the IBM Endpoint Manager server.

Note: The Configure REST API credentials for BES Server Plugin Service Task remains relevant after you run it. You can check the action history to confirm that it has run.

Results

After completing all of the steps described in this topic, the Task to install the Automation Plan Engine becomes relevant. You can now proceed to install the Automation Plan Engine.

Installing the Automation Plan Engine

You can install the Automation Plan Engine on Windows and Linux systems. To install the Automation Plan Engine, you run a Task from your IBM Endpoint Manager console. The Task to install the Automation Plan Engine becomes relevant only if the IBM Endpoint Manager server plugin service is installed correctly. You must install the Automation Plan Engine on the system on which the IBM Endpoint Manager server is installed. The installation procedure is the same for both Windows and Linux.

About this task

Before you begin installing the Automation Plan Engine, make sure that your system meets the prerequisites as described in Automation Plan engine prerequisites. There is one Task for installing and upgrading the Automation Plan Engine and another Task for uninstalling the Automation Plan Engine. Each of these Tasks becomes relevant depending on whether you already installed the Automation Plan Engine. When you install the Automation Plan Engine, the Task that installs it becomes non-relevant and the Task that uninstalls it becomes relevant. After you install the Automation Plan Engine, it can take a few minutes for the Automation Plan Engine installation Task to become non-relevant.

Complete the following steps to install the Automation Plan Engine.

Procedure

1. Log on to the IBM Endpoint Manager console as the master operator and navigate to the Server Automation domain. Note for a Linux installation, the console must be installed on Windows.
2. From the **Automation** node, click **Setup and Maintenance > Fixlets and Tasks** and select one of the following Tasks, depending on your platform:
 - For Windows platforms, select the **Install Latest Automation Plan Engine**.
 - For Linux platforms, select the **Install Latest Automation Plan Engine (RHEL)**.
3. Click **Take Action**.
4. From the **Take Action** dialog box, target the system on which the IBM Endpoint Manager server is installed.

5. Click **OK**. The Task runs and installs the Automation Plan Engine. The default location for the Automation Plan Engine installation is in the following directory:
 - For Windows platforms, the C:\Program Files (x86)\BigFix Enterprise\BES Server\Applications\PlanEngine directory.
 - For Linux platforms, the /var/opt/BESServer/Applications/PlanEngine directory.

It can take a few minutes for the Automation Plan Engine installation Task to become non-relevant. The uninstallation Task now becomes relevant.

Results

After the Automation Plan Engine is installed, the IBM Endpoint Manager server plugin service starts it automatically. The Automation Plan Engine log file, `pe_console.log`, is available in the following location, depending on your platform:

- For Windows, the `pe_console.log` log file is available in the \BES Server\Applications\Logs subdirectory of the installation directory, for example, C:\Program Files (x86)\BigFix Enterprise\BES Server\Applications\Logs directory.
- For an installation with default values on Linux, the `pe_console.log` log file is available in the /var/opt/BESServer/Applications/Logs directory.

To verify that the Automation Plan Engine is installed correctly and has started, check for the following lines at the start of the log file:

```
2013-08-23 13:15:20,235 INFO [main] (cli.PlanEngineLauncher:255) :: IZNENG025I \
Plan Engine (build number 0.49) starting in JVM with PID (4508) ...
2013-08-23 13:15:20,235 INFO [main] (cli.PlanEngineLauncher:259) :: IZNENG026I \
Plan Engine CLI initializing ...
2013-08-23 13:15:20,235 INFO [main] (cli.PlanEngineLauncher:130) :: IZNENG001I \
Received command: "start"
```

Troubleshooting the Automation Plan Engine installation

If you have trouble completing the Automation Plan Engine installation, troubleshooting Tasks become relevant to help you to correct the problems. These Tasks only become relevant if you need to run them.

Troubleshooting Tasks become relevant in a **Warnings** folder if you experience problems installing the Automation Plan Engine. If you have problems installing the Automation Plan Engine, look for the **Warnings** folder. If this folder displays, check this folder to see which Tasks are relevant. To correct the problems with the installation, run any Tasks that are relevant.

If you do not see any relevant Tasks or the **Warnings** folder, your system is configured correctly for the installation.

Configuring the Automation Plan Engine

You can modify the configuration of the Automation Plan Engine. The `config.xml` configuration file contains properties that you can use to control the Automation Plan Engine behavior.

The `config.xml` file contains the following properties:

- The Polling interval for open Automation Plan actions is `pe.update.interval`. The Automation Plan Engine queries the IBM Endpoint Manager server to find open Automation Plan actions to process. When the most recently retrieved set

of open Automation Plan actions are processed, the Automation Plan Engine waits for the time that is specified in the polling interval before querying again.

- The Numeric argument conversion property is `numeric.argument.conversion.enabled`. This property is an internal Automation Plan Engine property. Do not change the value of this property.

Specifying the polling interval

To modify the polling interval, edit the `pe.update.interval` value in the `config.xml` file.

About this task

The default value for the polling interval, `pe.update.interval`, is 3,000 milliseconds. If the value of the property in `config.xml` is missing or invalid, the Automation Plan Engine uses the default value.

If you change the `pe.update.interval`, the change is applied without restarting the Automation Plan Engine.

Procedure

1. Open the `config.xml` file in a text editor. On Linux, the `config.xml` file is located in the `/var/opt/BESServer/Applications/PlanEngine/config` directory. On Windows, locate the `config.xml` file, as follows:
 - a. Open the Windows registry by running **regedit** from an MS DOS prompt.
 - b. Search for the `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\BigFix\Enterprise Server` key.
 - c. Find the `EnterpriseServerFolder` value in the appropriate key.
 - d. To change the contents of the `config.xml` file, open the Automation Plan Engine installation directory that is specified in the `EnterpriseServerFolder` value. Open the `Applications\PlanEngine\config` subdirectory of the installation directory. Open the `config.xml` file in a text editor.
2. Change the `pe.update.interval` value to the value of the polling interval.
3. Save and close the `config.xml` file.

Specifying the logging level

You can change the Automation Plan Engine logging level without stopping and restarting the Automation Plan Engine. For Windows, the Automation Plan Engine log file, `pe_console.log`, is located in the `\BES Server\Applications\Logs` subdirectory of the installation directory, for example, `C:\Program Files (x86)\BigFix Enterprise\BES Server\Applications\Logs`. For Linux, the `pe_console.log` file is located in the `/var/opt/BESServer/Applications/Logs` directory.

About this task

You can change the logging level of the Automation Plan Engine to different logging configurations. By default, Automation Plan Engine logs information messages, warnings, and errors. You can set the Automation Plan Engine logging level to `DEBUG` to log more detailed information about the internal operations of the Automation Plan Engine.

You can change the logging level by editing the `log4j.prop` file.

Note: Do not uncomment to enable any of the entries in the Local Settings section of the log4j.prop file. If you enable any of these settings by uncommenting them, you might encounter errors.

Procedure

1. Open the log4j.prop file. On Linux, the log4j.prop file is located in the /var/opt/BESServer/Applications/PlanEngine/config directory. On Windows, locate the log4j.prop file, as follows:
 - a. Open the Windows registry by running **regedit** from an MS DOS prompt.
 - b. Search for the HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\BigFix\Enterprise Server key.
 - c. Find the EnterpriseServerFolder value in the key.
 - d. To change the contents of the log4j.prop file, open the Automation Plan Engine installation directory that is specified in the EnterpriseServerFolder value. Open the BES Server\Applications\PlanEngine\config subdirectory of the installation directory. Open the log4j.prop file in a text editor.
2. To change the logging level, edit the log4j.prop file, specifying the logging level you want. For example, to change the logging level to debug, change log4j.appender.console.threshold=INFO to log4j.appender.console.threshold=DEBUG and log4j.appender.consolefile.threshold=INFO to log4j.appender.consolefile.threshold=DEBUG. Valid thresholds include TRACE, DEBUG, INFO, WARN, ERROR, and FATAL.
3. Save and close the log4j.prop file.

Results

The Automation Plan Engine automatically includes the logging level change without requiring you to restart the system.

Upgrading the Automation Plan Engine

To upgrade the Automation Plan Engine, you run a Task from your IBM Endpoint Manager console. There are two upgrade scenarios described here. Use the first procedure if you upgraded your version of IBM Endpoint Manager from V8.2 to V9.1 and want to upgrade the Automation Plan Engine. Use the second scenario if you upgraded IBM Endpoint Manager V9.0 to V9.1 and want to upgrade the Automation Plan Engine. The procedure is the same for Microsoft Windows and Linux upgrades, except where identified as platform specific.

Upgrading from IBM Endpoint Manager V8.2

If you previously had Server Automation running on IBM Endpoint Manager V8.2 and upgraded your IBM Endpoint Manager system to V9.1, complete the following steps to upgrade the Automation Plan Engine.

Procedure

1. After upgrading IBM Endpoint Manager to V9.1, check that your version of the BES Server Plugin Service is V2.0.0.0 or later. If necessary, update the BES Server Plugin Service. To check your version of the BES Server Plugin Service:
 - On Microsoft Windows systems, the BES Server Plugin Service executable is the MFS.exe file in the C:\Program Files (x86)\BigFix Enterprise\BES Server\Applications directory. Right click the MFS.exe file and select **Properties** and then the **Details** tab to check the version number.

- On Linux systems, the BES Server Plugin Service executable is the MFS executable file in the /var/opt/BESServer/Applications directory. The MFS-Linux.ver file contains the MFS version. Use the cat MFS-Linux.ver command to display the version.
2. After upgrading IBM Endpoint Manager to V9.1, the Configure REST API credentials for BES Server Plugin Service Task becomes relevant. Run this Task, targeting the IBM Endpoint Manager server:
 - a. Log on to the IBM Endpoint Manager console as the master operator and go to the Server Automation domain.
 - b. From the **Automation** node, click **Setup and Maintenance** and select the Configure REST API credentials for BES Server Plugin Service Task.
 - c. Enter the master operator credentials on the **Description** section and click **Take Action**.
 - d. From the **Take Action** dialog box, target the system on which the IBM Endpoint Manager server is installed.

A short time later, the Install Latest Automation Plan Engine Task becomes relevant.

3. Run the Install Latest Automation Plan Engine Task targeting the IBM Endpoint Manager server. The latest version of the Automation Plan Engine is installed in the BES Server\Applications\PlanEngine subdirectory of the installation directory.

Upgrading from IBM Endpoint Manager V9.0

If you upgraded IBM Endpoint Manager from V9.0 to V9.1, use the Install Latest Automation Plan Engine Task to upgrade the Automation Plan Engine. You use the same Task to install the Automation Plan Engine. When the Automation Plan Engine is installed, the **Install Latest Automation Plan Engine** Task is relevant if the version of the Automation Plan Engine that is installed is earlier than the version in the Task.

About this task

Before an upgrade, the Install Latest Automation Plan Engine Task shuts down the Automation Plan Engine and removes it.

Note: The Install Latest Automation Plan Engine Task cannot fully remove an existing Automation Plan Engine instance if the files in the BES Server\Applications\PlanEngine subdirectory of the installation directory are being accessed by another user or application. To ensure that the Install Latest Automation Plan Engine Task runs successfully, you must close all other applications that access this directory before you run the Task.

Complete the following steps to upgrade the Automation Plan Engine.

Procedure

1. Log on to the IBM Endpoint Manager console as the master operator and go to the Server Automation domain.
2. From the **Automation** node, click **Setup and Maintenance** and select the **Install Latest Automation Plan Engine** Task.
3. Click **Take Action**.
4. From the **Take Action** dialog box, target the system on which the IBM Endpoint Manager server is installed.

5. Click **OK**. The latest version of the Automation Plan Engine is installed in the BES Server\Applications\PlanEngine subdirectory of the installation directory.

Results

The latest version of the Automation Plan Engine is installed. The IBM Endpoint Manager server plugin service restarts the Automation Plan Engine automatically. The Automation Plan Engine resumes processing any Automation Plan actions and step actions that were running before the upgrade. All the configuration data in the config.xml file and the log4j.prop file is unchanged by the upgrade. The version of the Automation Plan Engine installed by the Install Latest Automation Plan Engine Task is logged in the pe_console.log file in the \BES Server\Applications\Logs subdirectory of the installation directory.

Note: Do not uncomment to enable any of the entries in the Local Settings section of the log4j.prop file in the BES Server\Applications\PlanEngine\config folder. If you enable any of these settings by uncommenting them, you might encounter errors.

Uninstalling the Automation Plan Engine

To uninstall the Automation Plan Engine, you run a Task from your IBM Endpoint Manager console. The Task to uninstall the Automation Plan Engine becomes relevant when you install the Automation Plan Engine.

About this task

There is one Task to install the Automation Plan Engine and another Task to uninstall the Automation Plan Engine. When you install the Automation Plan Engine, the Task to install becomes non-relevant and the Task to uninstall becomes relevant.

Complete the following steps to uninstall the Automation Plan Engine.

Procedure

1. Log on to the IBM Endpoint Manager console as the master operator and go to the Server Automation domain.
2. From the **Automation** node, click **Setup and Maintenance > Fixlets and Tasks** and select one of the following Tasks, depending on your platform:
 - For Windows, select the Uninstall Automation Plan Engine Task.
 - For Linux, select the Uninstall Automation Plan Engine (RHEL) Task.
3. Click **Take Action**.
4. From the **Take Action** dialog box, target the system on which the IBM Endpoint Manager server is installed.
5. Click **OK**. After uninstallation, the Automation Plan Engine installation Task becomes relevant. The uninstallation Task becomes non-relevant.

Results

The **Uninstall Automation Plan Engine** Task runs and uninstalls the Automation Plan Engine.

Troubleshooting the uninstallation

You can use the information about troubleshooting errors in uninstalling the Automation Plan Engine if your uninstallation is unsuccessful.

There are several ways an Automation Plan Engine uninstallation might fail. For each type of failure, there are one or more potential causes and one or more solutions.

The Uninstall Automation Plan Engine Task fails

The uninstallation Task might fail to complete successfully if it cannot remove files from the file system because they are in use.

If this happens, shut down any applications that are using the files that cannot be removed and run the **Uninstall Automation Plan Engine** Task again. The **Uninstall Automation Plan Engine** Task remains relevant until it has been completed successfully.

The Install Latest Automation Plan Engine Task does not become relevant as soon as the Uninstall Automation Plan Engine Task is complete

This is normal. There is a time lag because of the frequency of the Task relevance evaluation.

Installing the management extender for VMware

Before you work with IBM Endpoint Manager for Server Automation virtualization features, you must install a management extender to communicate with the VMware vCenter or ESX host. Before you install the management extender, you must enable the license for Virtual Endpoint Manager.

Before you begin

You must have a relay server or a root server Version 9.0 or later. A VMware management extender must not be already installed on the server. Because of the workload that is imposed on the system by the management extender, it is recommended that you install the management extender on a relay server and not a root server.

Important: You must ensure that the license for Virtual Endpoint Manager is enabled. To enable the Virtual Endpoint Manager license, go to the **Bigfix Management** domain, navigate to **License Overview > Lifecycle Management**. From the list of **Available Sites**, enable **Virtual Endpoint Manager**. When **Virtual Endpoint Manager** is enabled, it disappears from the **Available Sites** list and is displayed in the **Enabled Sites** list.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Deploy VMware Components**.
3. In the **Deploy VMware Components** window, select the **Deploy Management Extender for VMware vCenter** Task.
4. In the **Task: Deploy Management Extender for VMware vCenter** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. In the **Computer Name** list, select a relay server or a root server and click **OK**.

Results

In the **Action: Deploy Management Extender for VMware vCenter** window, you can check the status of the installation. When the status changes to **Completed**, the management extender for VMware is installed.

What to do next

After you install the management extender for VMware, you must configure the management extender with your VMware system details. For more information about configuring the management extender, see “Configuring management extenders” on page 52.

Server Automation domain upgrades

The Server Automation domain is upgraded automatically when the contents of the Server Automation site is updated.

When you acquire the Server Automation site, the Server Automation domain is also added to your IBM Endpoint Manager console. The procedure to acquire the Server Automation site is described in *Acquiring the IBM Endpoint Manager for Server Automation site*.

After you acquire the Server Automation site, all updated site content is gathered automatically. When Server Automation domain updates are available, they are automatically updated in your IBM Endpoint Manager console.

Chapter 3. Sequencing actions across multiple endpoints with Automation Plans

IBM Endpoint Manager for Server Automation provides you with technology to sequence actions, such as the deployment of Fixlets, across multiple endpoints. To sequence automation, you create an Automation Plan. Your Automation Plan contains all of the actions for your end-to-end automation sequence.

Automation Plans can run a sequence of Fixlets, Tasks, and Baselines across multiple endpoints, with steps running in parallel. You can target different endpoints for each step in your Automation Plan.

Introducing Automation Plans and how they work

You can create Automation Plans that run multiple Fixlets, Tasks, or Baselines on a set of endpoints that you specify. Each Fixlet, Task, or Baseline can run on a different set of endpoints. You can use the Automation Plan Editor to create, edit, copy, and delete Automation Plans. You must run Automation Plans in the **Automation Plans** dashboard in the Server Automation domain. When you create your Automation Plans, you can set and save a set of default endpoints, default parameters, and filters for each step in the Automation Plan. This increases the ease-of-use and facilitates faster reuse of Automation Plans.

An Automation Plan is a grouping of Tasks, Fixlets, and Baselines called steps, performed on a set of endpoints in a sequence that you specify. Each step in an Automation Plan represents a single Fixlet, Task, or Baseline and each step can be targeted at different endpoints. A single command deploys or schedules the sequence of steps across a set of endpoints that you specify, in the order in which they are displayed in the Automation Plan Editor. When a step completes successfully, the step action state is set to stopped and the next step in the Automation Plan is run. When the final step in the Automation Plan completes, the Automation Plan action state is set to stopped.

You can schedule an Automation Plan to run at a specified date or time. When you schedule an Automation Plan to run at a future date or time, the Automation Plan action is created, and remains in an open state until the Automation Plan Engine starts to run the action at the time and date that you specified.

If you are scheduling your Automation Plan, you can opt to prefetch the content that needs to be downloaded. This option allows you to download the content required as part of the Automation Plan in advance of the execution of the Automation Plan. This speeds up the execution of the Automation Plan so that when the Automation Plan runs, the content has been downloaded in advance and runs much faster than if you do not choose this option. To use this option, you select the **Prefetch downloads** check box when you are scheduling your Automation Plan. If you select this option, an open action is created for each step in your Automation Plan. You can view these actions from the **Automation Plan Action Status** dashboard.

For each step in your Automation Plan, you can target computer groups as well as individual computers. You can do this by saving default targets when creating your Automation Plan, or at runtime, when you are running your Automation Plan.

All Automation Plans that are created in the Server Automation domain are displayed as Fixlets in the **Fixlets and Tasks** list in the **All Content** domain. If you run or schedule an Automation Plan in the **Fixlets and Tasks** panel, it will fail. If you add an Automation Plan as a Component in a Baseline, it will fail. You must run or schedule an Automation Plan in only the **Automation Plans** dashboard in the Server Automation domain.

When you add a step to an Automation Plan, you are adding a Fixlet, Task, or Baseline to the Automation Plan. A copy of the Fixlet, Task, or Baseline is stored in the Automation Plan. If this source content changes after it is added to the Automation Plan, the changes are not reflected in the copy in the Automation Plan. If the source Fixlet, Task, or Baseline changes, the Automation Plan displays an icon indicating that the copy in your Automation Plan no longer matches the source. You can then update the copy in the Automation Plan with the latest version of the source if you have access to the source. For legacy Automation Plans, this notification is displayed only if you edit and save the plan. Automation Plans created before Server Automation application update 3.0 do not automatically display that source content is out of date.

Each step in an Automation Plan has one action. A Fixlet or Task that you add to the step can have multiple actions. When you use the Automation Plan Editor to add a Fixlet or Task with multiple actions to a step, you must choose one action from the list of available actions. If you add a Fixlet or Task with a default action, the Automation Plan Editor automatically adds this action to the step. If you add a Fixlet or Task with an action that has a script type of URL, you cannot add this action to the step.

When you create an Automation Plan, you must select a site and a domain to host the Automation Plan. You must also specify the Automation Plan source release date. You can specify the Automation Plan category, source, and source severity. When you create an Automation Plan, you can assign any value to the category, source, and source severity. The category defines the type of Automation Plan, such as Support, Uninstall, BES Performance. The source specifies the creator of the plan. The source severity is a measure of the severity of the Automation Plan. Typical values are Critical, Important, Moderate, or Low.

Creating an Automation Plan

An Automation Plan contains all of the data required to run a sequence of Fixlets, Tasks, and Baselines across multiple endpoints. You create your Automation Plans in the Server Automation domain. You can select a site and a domain to host your Automation Plan and define a sequential or parallel processing path for the steps in the plan. Each step can have an optional failure step that runs if the step fails. You can also save a set of default targets for both computers and computer groups, default parameters, and filters for each step in the Automation Plan.

Automation Plans contain the following data:

- The Automation Plan name and description.
- The site and domain that host the plan.
- The Automation Plan category.
- The Automation Plan source, source release date, and source severity.
- The Automation Plan steps.

- The plan type, sequential or parallel and the sequence of the steps in the Automation Plan. The sequence can be a simple sequence or can include parallel processing of steps.
- An action for each step in the plan.
- Optional pending restart settings that enable you to pause or continue the plan if the target endpoints require a restart.
- Optional failure behavior for each step, including step failure mode, advanced failure behaviour to fail incomplete targets after a specified time, and an optional failure step for each step in the Automation Plan.
- If the plan is a parallel path plan, the plan also contains the dependencies that you set between steps in the plan. The dependencies determine the execution order of the steps in the plan. Sequential type plans do not contain dependencies because each step runs after the previous step has executed.
- Every step in an automation plan, whether it is sequential or parallel, has a unique identifier (UID).

Creating your Automation Plan

Use the Automation Plan Editor in the Server Automation domain to create an Automation Plan. When you are creating your Automation Plan you can create and save a set of default targets, default parameters, and filters for the plan. These default settings are then selected when you run the plan.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or a console operator. You must have Custom Content permissions to create an Automation Plan.

About this task

Each Automation Plan step is a Fixlet, Task, or Baseline. The steps are run in the order that they are displayed in the **Flow** tab in the **Automation Plans** dashboard. You can view the IBM Endpoint Manager console **Task**, **Fixlet** or **Baseline** panel for a step by clicking the **Go to source** icon for the step in the **Steps** tab. You can view the IBM Endpoint Manager console **Task** or **Fixlet** panel for a Component in a Baseline by clicking the Component name in the **Steps** tab. To return to the **Steps** tab, click **Back** in the menu bar.

Each step in the Automation Plan can contain a maximum of one action. When the Fixlet or Task that you add to a step contains one or more actions and no default action, you must select an action for the step. If the Fixlet or Task has a default action, this action is automatically added to the step. An action with Script Type of URL cannot be added to a step. An Automation Plan that contains Baseline steps will not necessarily fail when the Baselines contain Components for which no action is selected.

To control how the Automation Plan is processed when a step fails on one or more endpoints, you can define step failure behavior for each step in the Automation Plan. If a step in the Automation Plan fails, you can stop the Automation Plan. Alternatively, you can continue the Automation Plan on only the endpoints on which the step was successful or on all endpoints. For more information about the step failure behavior, see “Defining step failure behavior settings” on page 26.

When you create an Automation Plan, you can optionally add a single corresponding failure step for each Automation Plan step. A failure step is a Fixlet or a Task. A Baseline cannot be a failure step. If a step action fails and the Automation Plan contains a failure step for the failed step, the Automation Plan Engine identifies and runs the failure step action. You can target a failure step to run on either all the endpoints for the corresponding step action or only on the endpoints that returned a failed status for the step action. When a failure step action processing is complete, the Automation Plan Engine stops the failure step action and then the Automation Plan action, regardless of the overall final status of the failure step action.

Note: When you create an Automation Plan, the list of available Automation Plans in the **Automation Plans** dashboard is automatically refreshed. To manually refresh the list of available Automation Plans, click the **Refresh** icon in the upper-right corner of the dashboard.

Complete the following steps to create an Automation Plan.

Procedure

1. Open the **Server Automation domain** and from the navigation tree in the **Domain Panel**, click **Automation Plans**.
2. From the **Automation Plans** dashboard, click **Create** to open the plan editor on the lower part of the screen. By default, the plan type is a sequential plan. This means that the steps in the plan will be executed in sequence, in the order in which you add them to the plan. You can change a sequential plan type to a parallel plan type (where steps are executed concurrently). This is described below. However, you cannot change a parallel plan type to a sequential plan without manually changing the dependencies so that no steps are run in parallel.
3. In the **Details** tab, enter the Automation Plan name and description. The **Name** is a required value. Enter a site and a domain to host the Automation Plan. The **Site** and **Domain** fields are required values. Enter values in the **Category**, **Source**, **Source Release Date**, and **Category Source Severity** fields. The **Source Release Date** is a required field.
4. To add one or more steps to an Automation Plan, click the **Steps** tab. You must add a minimum of one step to an Automation Plan. Complete the following procedure to add one or more steps to an Automation Plan:
 - a. Click **Add Step**. By default, the Add Step dialog box does not display any Fixlets, Tasks or Baselines. To search for Fixlets, Tasks, or Baselines to add to the plan, from **Add Step** panel, select **Fixlets**, **Tasks**, or **Baselines** from the **Include** list to view Fixlets, Tasks or Baselines. The default value, **All**, displays Fixlets, Tasks and Baselines. Only Fixlets and Tasks which contain actions are displayed.
 - b. To filter the list of Fixlets, Tasks and Baselines, use the lists and the input box. To add or remove filters, use **+** - .
 - c. After you add the relevant search criteria, click the search icon or press Enter to search for Fixlets, Tasks and Baselines.
 - d. From the list of Fixlets, Tasks and Baselines, select one or more to add to the Automation Plan.
 - e. When you finish selecting Fixlets, Tasks and Baselines, click **Add**. The name and execution order of each step in the Automation Plan is shown in the **Flow** tab. Each step in the plan, whether sequential or parallel, is automatically assigned a unique identifier (UID) to help you to identify the step in the **Automation Plan Action Status** dashboard and **Take**

Action screen. The UID is read-only and you cannot change it. The UID does not represent the execution order of steps in the plan and does not change if you change the order of steps in the **Steps** tab.

- f. If the Fixlet, Task, or Baseline contains action script that requires the endpoints to be restarted, you see an alert warning on the **Settings** tab, indicating that the step contains an action that requires the target endpoints to be restarted. Go to the **Settings** tab and configure the Pending Restart settings. For more information, see Managing pending restart states.

Note: If the source Fixlet, Task, or Baseline is subsequently updated, you are notified of the change by a message displayed in the user interface. You can then update the copy of the Fixlet, Task, or Baseline in the Automation Plan.

5. For each step that is a Fixlet or a Task, select an action from the **Action** list. If the Fixlet or Task contains a default action, this action is automatically selected. If the Fixlet or Task contains one or more actions with no default, **No Action Selected** is displayed in the **Action** list. An action with a Script Type of URL is not displayed in the **Action** list.
6. Optional: To save a set of default targets, default parameters, and filters for the step, complete the procedures described in the following table, depending on what you want to set.

Table 6. Saving default options

Default setting	Description
Default targets	<ol style="list-style-type: none"> 1. Click the Default Settings icon beside the Action dropdown menu for the step. 2. From the Targets tab, search for and select the computers that you want to save as default targets for the step and add them to the Selected Targets list. You can also save default targets using the The same computers targeted by step or The computers specified in the list of names options. However, you cannot save a computer group by entering the computer group name using the The computers specified in the list of names option. To save default groups, you must select the computer group and move it to the Selected Targets list. When you do this, the computer group name is added to the list of Selected Targets. If you are saving a computer group as a default target, the group membership is not determined until the step is being executed. Therefore if computers belong to the group when you are creating the Automation Plan but not when the step is being executed, they are not targeted. Additionally, if the computer group that you save as a default target does not exist when the step is being executed, the computer group is no longer included in the Selected Targets list because it is no longer a valid target. For more information, see “Targeting by computer group” on page 28. Similarly, if computers that you save as default targets do not exist when you are running the Automation Plan, the Selected Targets list in the Take Automation Plan Action dialog box is updated to reflect this. Depending on security settings, users running the Automation Plan might not be able to see all of the default targets that you set if they do not have sufficient permissions. If you filter the search settings to view Computer Groups, the Use Applicability check box is disabled.

Table 6. Saving default options (continued)

Default setting	Description
Default parameters	<ol style="list-style-type: none"> 1. Click the Default Settings icon beside the Action dropdown menu for the step. 2. If there are parameters associated with the action for the step, you can set and save default parameters. From the Parameters tab, enter the parameters that you want to save as default parameters. You can enter some or all of the parameters associated with the action for the step. Note that the parameters that you set as defaults are not validated when you create the Automation Plan, they are validated when you run the Automation Plan. The Parameters tab is displayed only if there are parameters associated with the action for the step. When you move your mouse over the Default Settings icon after you have saved default parameters, a tooltip is displayed providing information that default parameters have been set. This tooltip provides this information for any Fixlet that has default parameters, not just for default parameters that you have saved. If a default parameter was set for the Fixlet when the Fixlet was created, the tooltip will display information that default parameters are set.
Filters	<ol style="list-style-type: none"> 1. Click the Default Settings icon beside the Action dropdown menu for the step. 2. You can set and save filter criteria, including custom properties, for targets for the step. To save filters, select the filters that you want displayed in the Take Automation Plan Action dialog box when you are running the Automation Plan. Note: If you are saving custom properties as filters, these properties must not be reserved or default properties, and they cannot come from an analysis. The custom properties must have been reported by at least one computer. If you export an Automation Plan containing custom properties and then import it on another server, and the custom properties are not specified on the server to which you import the Automation Plan, the custom properties are automatically deleted. If you delete the custom properties, they are also deleted from the Automation Plan.

Click **OK** and then **Save** to save the defaults that you have set and repeat this process for each step in the Automation Plan for which you want to save default options. If you delete the Automation Plan, default options are also deleted.

7. Optional: To define step failure behavior for a step, expand **Failure Behavior**:
 - a. From the **Failure Step Mode** list, select either **Stop Automation Plan** or **Continue Automation Plan**, depending on whether or not you want to stop the Automation Plan if this step fails on some or all endpoints. If you select **Stop Automation Plan**, the system runs any associated failure step and then stops the Automation Plan. If you select **Continue Automation Plan**, the system runs any associated failure step and then moves on to the next step in the Automation Plan. You must then choose to continue the Automation Plan on all endpoints, or only on the endpoints on which this step was successful.
 - b. If you selected **Continue Automation Plan**, from the **Failed Targets** list, select either **Include in Future Steps** or **Exclude from Future Steps**, depending on whether or not you want to continue the subsequent steps in the Automation Plan on the endpoints on which this step failed.

For more information about the step failure behavior feature, see “Defining step failure behavior settings” on page 26.

8. To add a failure step to a step, click the **Add Failure Step** icon for the step. A failure step is optional and can be a Fixlet or Task. A Baseline cannot be a failure step. Complete the following to add a failure step to a step:
 - a. In the **Add Step** panel, select **Fixlets** or **Tasks** from the **Include** list to view Fixlets or Tasks. The default value, **Fixlets and Tasks**, displays both.
 - b. To filter the list of Fixlets and Tasks, use the lists and the input box. To add or remove filters, use **+** **-**.
 - c. After you add the relevant search criteria, click the search icon or press Enter to search for Fixlets and Tasks.
 - d. From the list of Fixlets and Tasks, select one to add to the step.
 - e. When you select a Fixlet or a Task, click **Add**. The failure step is shown in the **Steps** tab.
 - f. To change the targeting for the failure step, expand **Failure Step:** for the step. To target all endpoints that are targeted by the step action, select **All** from the **Targeting** list. The default option is **Failed Only**. This option targets only the endpoints that return a failure status in the corresponding step action.
 - g. To choose an action in the failure step, expand **Failure Step:** for the step. Select an action from the **Action** list.
 - h. To remove a failure step from a step, click the **Remove Failure Step** icon for the step.
9. If you want your Automation Plan to be a parallel plan, from the **Steps** tab, click the **Parallel** radio button for the **Plan type**. You must then set the step dependencies to control the flow of the plan. For a step that you want to make dependent on another step, expand **Depends on** for that step. Enable the check box for the step that you want this step to be dependent on. For example, if you want step 5 to be dependent on step 2, enable the check box beside step 2. Refer to the **Flow** tab to see how the processing flow of the plan changes as you makes updates and set dependencies. For more information about setting dependencies, see Parallel processing and step dependencies. If you delete a step and other steps use the same targets as that step, a message displays to inform you that other steps are targeting those endpoints. You can confirm that you want to remove the step but you then need to re-select target endpoints for the steps that use the same endpoints. If you delete a step and other steps are dependent on that step, a message displays on the user interface to notify you that other steps have a dependency on the step that you are deleting. Where possible the system will maintain the dependencies but in some cases this is not possible and you must set the dependencies between steps.

Attention: After you have selected a parallel plan type and set dependencies, you cannot revert the plan to a sequential plan type by selecting the **Sequential** radio button for the **Plan type**. For complete information about setting dependencies, see Parallel processing and step dependencies.
10. Click **Save** to save the Automation Plan.

Results

You created an Automation Plan. The list of available Automation Plans in the **Automation Plans** dashboard is refreshed to display the new Automation Plan. You can run, edit, copy, or delete this plan.

Defining step failure behavior settings

When creating an Automation Plan, for each step in the plan you can define the behavior that occurs if a step in the plan fails. This is known as step failure behavior and is distinct from adding a failure step to a step. You can also set advance failure behaviour. Advanced failure behaviour enables you to specify a period of time after which to fail the step on targets that have not returned a status.

How it works

Use the step failure behavior feature when designing your Automation Plan. The step failure behavior feature provides you with the ability to control the flow of the Automation Plan on endpoints. It gives you the ability to define the behavior that occurs when steps in your Automation Plan fail on some or all endpoints.

The overall step failure behavior is defined by two separate settings. The first setting, step failure mode, defines if the Automation Plan should stop at that point. The second setting, the failed targets behavior, defines if failed targets are included or excluded from subsequent steps. Separately, and regardless of the values that you define for step failure behavior, if a failure step is defined, the failure step is always run before the step failure behavior is processed. After the failure step is run, the system then processes the remaining steps in the plan, based on what you defined in the step failure behavior settings in the step that failed.

To define step failure behavior, first choose whether to continue or stop the Automation Plan. To do this, select an option from the **Step Failure Mode** list. If you select the option to stop the Automation Plan on step failure, you do not make any further selection. The Automation Plan action is stopped at this point. If you want to continue the Automation Plan, you must decide if you want to continue on all endpoints or only on those endpoints on which the step was successful.

When adding a step to your Automation Plan, you can define the failure behavior as described in the following tables.

Table 7. Defining the step failure mode

Option	Description
Stop Automation Plan	Select this option to run any associated failure step and then stop the Automation Plan.
Continue Automation Plan	Select this option to run any associated failure step and then move on to the next step in the Automation Plan.

If you decide to continue the Automation Plan, choose from the options described in the following table to define the targeting. If you stop the Automation Plan, the Automation Plan is stopped.

Table 8. Defining targeting

Option	Description
Include in Future Steps	The endpoints on which the step failed are included in future steps in the Automation Plan.
Exclude from Future Steps	The Automation Plan continues on the endpoints on which the step was successful. The endpoints on which the step failed are removed from the future steps.

For Automation Plans created previously, default values are implemented. The default values are Stop Automation Plan. When you open a legacy Automation Plan and save it, the new attributes are added to the saved Automation Plan.

Step failure behavior and failure step targeting

Step failure behavior targeting is different from failure step targeting. When you add a failure step to an Automation Plan, you can apply that failure step to all endpoints targeted in the step, or to only the endpoints on which the step failed. If you add a failure step to a step and set the targeting for that failure step to apply to all endpoints, this targeting might be superseded if you have defined step failure behavior settings. If you have step failure mode defined as Continue Automation Plan and Exclude from Future Steps, any associated failure step targeting is set automatically to Failed Only. The reason for this is that you do not want to run the failure step against endpoints on which you want to run future steps, as this is defined in the step failure behavior settings. Instead, you want to run the failure step only on the endpoints that will be omitted from future steps.

Tracking Automation Plan actions and step failure behavior

You can view Automation Plan actions and step actions on the **Automation Plan Action Status** dashboard. If a step in your Automation Plan fails, the failure is indicated in the **Status** column. For steps that fail and do not have step failure behavior defined, a status of Failed is displayed in the **Status** column. For steps that fail and have step failure behavior defined, a status of Failed on some targets is displayed, identifying that the step has step failure behavior defined and has failed on some targets. Therefore, steps that have a status of Failed are steps that have failed. In this case, the Automation Plan runs any associated failure step and then stops. Steps that have a status of Failed on some targets are steps that have failed on some targets but the Automation Plan continues to run, according to the settings defined by the step failure behavior. The Automation Plan continues to run on all endpoints or only on the endpoints on which the step was successful.

To view the endpoints on which the step failed, click the Detail icon for the particular step.

Advanced failure behaviour

Advanced failure behaviour enables you to design your Automation Plan to run within scheduled maintenance windows by allowing you to specify a time limit for steps to complete on target endpoints. This enables you to control how steps complete and to fail steps on endpoints on which the step has not completed after a period of time that you specify. For example, if you have a maintenance window of 60 minutes and need to include three steps in your plan, you can enable advanced failure behaviour and enter a time period of say 20 minutes for each step. When a step runs and if 20 minutes elapse and the step has not completed on some endpoints, the step is then failed on those endpoints. The advanced failure behaviour settings are disabled by default.

To configure advanced failure behaviour:

- If you are creating your plan, click the **Default Settings** icon for the step and go to the **Execution** tab. Enable the check box for **Fail incomplete targets** and enter a period of time, in minutes after which you want to fail the step on any endpoints on which the step has not completed.

- If you are running your plan, from the **Take Automation Plan Action** screen, click the **Execution** tab and enable the check box for **Fail incomplete targets** and enter a period of time, in minutes, after which you want to fail the step on any endpoints on which the step has not completed.

Note: If you open a legacy Automation Plan that had timeout settings configured, the timeout targets are treated as failures. A message appears to indicate this. When you save the plan, the timeout behaviour

Setting step failure threshold

Setting a step failure threshold allows you to specify the percentage of failing targets that defines the success or failure of the step. When you specify a step failure threshold, you are specifying the maximum percentage of failing targets for the step to be considered successful. The step failure threshold manages the success or failure of the step. For example, if you set the **Step Failure Threshold** at 5%, and more than 5% of targeted endpoints, the step is treated as a failed step and if you have set a failure step, the failure step will be executed. If you set the **Step Failure Threshold** at 5% and the step fails on 5% or fewer of targeted endpoints, the step will be treated as successful and a failure step, if set, will not be run.

To set the step failure threshold:

1. Open the Automation Plan that contains the step for which you want to configure the step failure threshold and click **Edit**.
2. Select the step for which you want to configure the step failure threshold.
3. Click the **Default Settings** icon for the step and go to the **Execution** tab.
4. In the **Step Failure Threshold** section, enter a percentage value for the threshold at which to fail the step. For example, if you enter 5%, the step will be failed if the step is unsuccessful on more than 5% of endpoints targeted. The default value is *any* which means that if any endpoint fails the step, the step is treated as a failure and if you have defined a failure step for the step, the failure step will be executed.
5. Click OK and then repeat this process for each step for which you want to configure a step failure threshold.

Targeting by computer group

For each step in your Automation Plan, you can target computer groups as well as individual computers. You can do this by saving computer groups as default targets using the **Default Settings** feature when creating the Automation Plan, or when running or scheduling your Automation Plan from the **Take Automation Plan Action** screen. When you target a computer group for a step, the list of computers that belong to the computer group is determined at the time that the step is executed. Therefore, if group membership changes between the time you define the step in the Automation Plan and when the Automation Plan is executed, the system determines which computers belong to the computer group that you have targeted at the time that the step action is executed.

To specify a target computer group for a step, you must select an existing computer group and add it to the **Selected Targets** list. You cannot manually enter the name of a computer group using **The computers specified in the list of names below**. You can target by computer group either when creating your Automation Plan using the **Default Settings** feature, or when running the Automation Plan from the **Take Automation Plan Action** screen.

If you save a computer group as a default target when creating your Automation Plan and if that computer group does not exist when the Automation Plan is being executed, the computer group is no longer included in the **Selected Targets** list in the **Take Automation Plan Action** screen. Because the computer group does not exist, it is not a valid target. Only valid targets are included in the **Selected Targets** list.

It is possible that a computer group that you targeted might have been removed from the system by the time the step is executed. This is particularly likely if you have scheduled Automation Plans. In this case, the step is executed only against computers that can be resolved. If no computers can be resolved, for example, if there is only one computer group targeted for the step and the computer group is either removed or has no members at step execution time, then the step action is not executed and the Automation Plan action is stopped.

For the list of targets for each step, there is a single reference for any one target computer. If a computer is a member of more than one computer group and if more than one of those computer groups are targeted, the system includes the computer once in the step action target list.

Managing pending restart states and automated restart of endpoints

When you add a Fixlet, Task, or Baseline to an Automation Plan and if the Fixlet, Task, or Baseline contains an action script that requires the targeted endpoints to restart, this results in your plan remaining in a Pending restart state, until the endpoints are restarted. If the endpoints are not restarted, the step remains in this wait state and the Automation Plan is effectively stalled. Pending restart is a wait state in IBM Endpoint Manager, and if the endpoints are not restarted, the Automation Plan cannot progress. To prevent this from happening, add a specific Server Automation Fixlet to your plan to automate the restart of the endpoints and configure the **Pending Restart** settings to continue the plan.

Some Fixlets, Tasks, and Baselines contain action script that results in the targeted endpoints going into a Pending restart state. The following graphic shows an example of action script that requires a restart.

```

Action1 (default)
Script Type BigFix Action Script

prefetch Windows8-RT-KB2769165-x86.msu sha1:59965ce8134057c28081bbb6ae138feaaebe60dd size:83545622 http://download.microsoft.com/KB2769165-x86.msu sha256:34f3ca0b741389d6062078dc3569ebcd62d61efd4acd6c0fbd398314672f8fa

// Is Windows Update service running?
continue if (exists running service "wuauerv" OR NOT exists service "wuauerv" whose (start type of it = "disabled"))

waithidden "(pathname of system folder & "\wusa.exe")" "(pathname of client folder of current site & "\_Download\Windows8-RT-KB2769165-x86.msu)"

action requires restart "59965ce8134057c28081bbb6ae138feaaebe60dd"
```

Some Fixlets and Tasks contain a similar piece of action script, action may require restart. This action script can also result in the targeted endpoints entering a Pending restart state. If your Automation Plan contains steps or failure steps with Fixlets, Tasks, or Baselines that contain this action script, a warning icon is displayed on the **Settings** tab, indicating that one or more of the steps in the plan contain this action script. You can then move to the **Settings** tab to configure how you want to manage the Pending restart states. For example, you can choose to continue the plan and add a Fixlet to the plan to restart the endpoints.

Table 9. Pending restart settings. Use Fixlet 126 Restart Endpoint and Wait for Restart to Complete to restart the endpoints.

Option	Description
Pause Plan until restart completes	This option pauses the Automation Plan until the targeted endpoints are restarted and report success or failure. You must manually restart the endpoints before the plan progresses.
Continue Plan	<p>When you select this option the step is regarded as successful upon entering the Pending restart state and the plan moves on to the next step, ignoring the actual step status after the endpoints are restarted. Any associated failure step will not run if the step fails after entering the Pending restart state because the step is regarded as successful. You must add a Fixlet to the plan after the step or steps that require a restart. The following list describes how the plan is executed, depending on which Fixlet you use to restart the endpoints when you have selected the Continue Plan option:</p> <p>Fixlet 126 Restart Endpoint and Wait for Restart to Complete The system waits for the restart to complete before moving on to the next step in the plan.</p> <p>Fixlet 94 Restart Endpoint The system continues to the next step when this step enters a Pending restart state as the endpoints are being restarted. It attempts to execute the next step while the endpoints might still be restarting. Do not use this Fixlet to manage the Pending restart state and automate the restart of endpoints.</p> <p>No Fixlet The next step in the plan will be executed, while the pending restart endpoints from the previous step will remain in a Pending restart state until they are restarted.</p> <p>Important: To safely restart the endpoints before moving on to the next step in the plan, the Fixlet that you must include in the plan to restart the endpoints is 126 Restart Endpoint and Wait for Restart to Complete.</p>

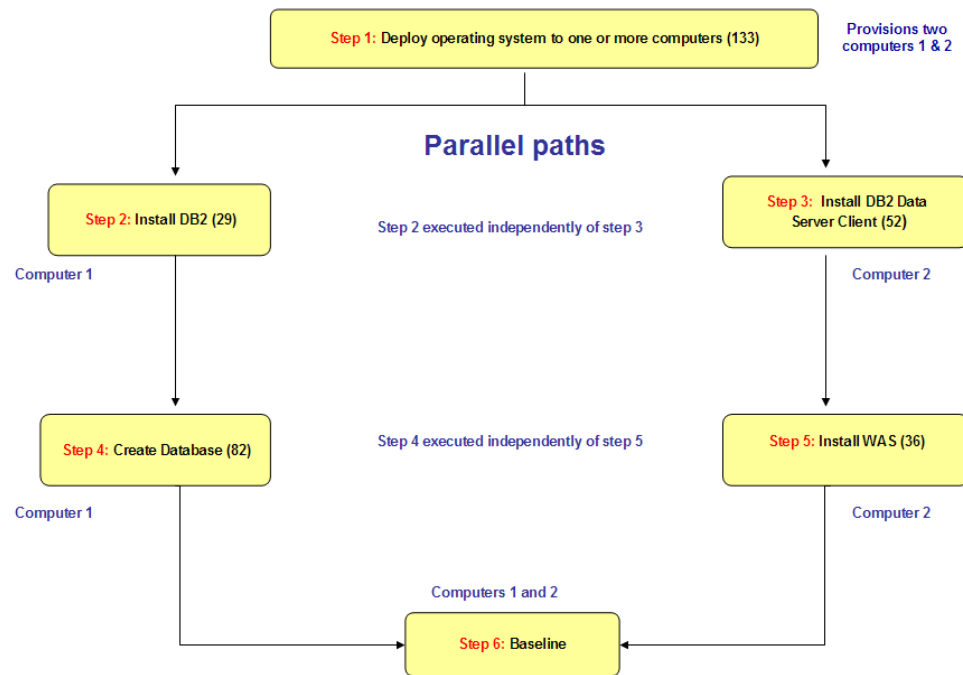
Parallel step processing and controlling the flow of your plan

You can design your Automation Plan so that steps are executed concurrently. This is known as parallel processing. Rather than the plan running in a simple straight sequence where each step is executed one at a time, one after another, with parallel processing you can run steps that do not have a dependency on each other concurrently. To create a parallel type plan, you must select the parallel plan type and manually set the dependencies between the various steps in the plan. Parallel processing is generally more suitable for advanced automation scenarios.

Parallel processing allows you to speed up the execution of your plan by running steps that are not dependent on each at the same time. For example, suppose the first step in your plan deploys an operating system to two computers. You then want to configure each of these computers separately by installing software on them. You want to install DB2 on one as step 2, and you want to install WAS on the other computer as step 3. Rather than step 3 wait for step 2 to complete, you can execute these steps concurrently because they do not depend on each other. They do, however, both depend on step 1 to complete.

The following graphic shows an example of a plan with two steps running in parallel. After step 1 runs, steps 2 and 3 can start concurrently on the different

endpoints. When step 2 has completed, step 4 will begin and after step 3 has completed, step 5 will begin. These parallel paths are distinct configurations and are processed separately by the Automation Plan Engine.



Running steps in parallel and setting dependencies between steps

A step is dependent on another step if it cannot start until that step has completed. In a simple sequence plan, where steps run one by one, one after the other, each step is dependent on the previous step. For steps to run in parallel, there cannot be a dependency between the steps that are running in parallel. They must be independent of each other, even if they each have a dependency on the same prior step. When designing your plan to run steps in parallel and set dependencies between steps, use the **Flow** tab for a visual display of the relationship between the various steps and sequence of the plan. The **Flow** tab gives you a visual read-only representation of the processing flow of the plan. This graphical view is essential for reviewing the dependencies that you have set between steps in the plan, and ultimately, the processing flow.

About this task

When setting dependencies between steps in your parallel plan, do not set circular dependencies. A circular dependency is a processing flow where a step depends on another step, which in turn has a dependency on a step that is itself dependent on the original step. For example, do not make step 6 dependent on step 4 if step 4 is dependent on 5, when step 5 is dependent on step 6. Review the **Flow** tab to see any circular dependencies. The following table lists some examples of circular dependencies.

Table 10. Circular dependencies

Illegal dependency type	Example
A step depends on itself. This is not possible to create in the application but illustrates the concept of a circular dependency.	Step 1 depends on step 1
Direct circular dependency.	Step 2 depends on Step 1 and Step 1 depends on Step 2
Indirect circular dependency.	<ul style="list-style-type: none"> • Step 2 depends on Step 1 • and Step 3 depends on Step 2 • and Step 1 depends on Step 3

Note: After you change dependencies in a plan, review the **Flow** tab to verify the changes before you save and run the plan.

Some additional points about dependencies:

- At least one step in a plan must have no dependency set. Otherwise the system has no starting point to begin processing the plan.
- A step in a plan is only available for execution when all of its dependencies have been completed.
- A step is not considered to be complete if a failure step must be run for that step, for example, if a failure step is running (or has yet to be run) for step 1, then step 1 is not considered complete until that failure step completes.

Note: If you remove a step on which other steps were dependent, the system maintains dependencies where possible. When it is not possible to maintain the dependencies, you are notified with a message in the user interface that identifies which steps were dependent on the step that you deleted. After you delete any step in a parallel plan, review the **Flow** tab to see how the dependencies have changed and make any adjustments as required by settings dependencies.

Complete the following steps to set dependencies.

Procedure

1. Add steps to your Automation Plan.
2. For the **Plan type**, select the **Parallel** radio button. When you select a parallel plan type, the dependencies setting becomes available. You expand the twisty beside each step to access the **Summary**, **Depends on**, and **Failure Behaviour** settings.
3. For a step that you want to make dependent on another step, expand **Depends on** for that step. For example, if you want step 5 to be dependent on step 2, expand **Depends on** beside step 5.
4. Enable the check box for the step that you want this step to be dependent on. If you want step 5 to be dependent on step 2, enable the check box beside step 2.
5. Repeat this process for each step in the plan for which you want to set dependencies, referring to the **Flow** tab to verify that you have designed the plan correctly.

Example

In this example we have a scenario of an Automation Plan that contains parallel steps.

- Step 1 in the plan is Deploy operating system to one or more computers (133), and you will use this step to deploy a Windows operating system on two computers, Computer1 and Computer2.
- The next two steps will depend on Step 1 but will run in parallel because they will be processed on the two separate computers, as follows:
 - Step 2: Install IBM DB2 UDB Enterprise Server Edition 9.x on Windows (29) on Computer1.
 - Step 3: Install IBM DB2 Data Server Client 9.x on Windows (52) on Computer2.
- Steps 4 and 5 will continue along a parallel path, step 4 dependent on step 2 for further configuration on Computer1, and step 5 dependent on step 3 for Computer2:
 - Step 4: Create Database for IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES, and IBM AIX (82) to create the database for the DB2 installation in step 2.
 - Step 5: Install IBM WebSphere Application Server Base (Distributed operating systems) 7.x on Windows (36) to install WebSphere Application Server on Computer2.
- Step 6 will be common to both steps 4 and steps 5 and will run a baseline to patch the operating system on both Computer1 and Computer2.

The following table lists the dependencies for this plan.

Table 11. Plan dependencies in this example

Step	Depends on	Targets
1	Nothing.	Computer1, Computer2
2	1	Computer1
3	1	Computer2
4	2	Computer1
5	3	Computer2
6	4 and 5	Computer1, Computer2

Converting a parallel plan to a sequential plan

You cannot convert a parallel plan type to a sequential plan type by selecting the **Sequential** radio button on the **Steps** tab. You can only convert a parallel plan type to a sequential plan type by manually changing the step dependencies so that the execution order of the plan is sequential. After manually changing the dependencies so that there are no steps running in parallel, you can then change the plan type to sequential and save the plan.

Procedure

1. Open the parallel plan that you want to convert to a sequential plan and click **Edit**.
2. Change the dependencies so that the processing flow of the plan is sequential.
3. Review the **Flow** tab and ensure that there are no steps running in parallel.
4. Click the **Sequential** radio button.
5. Click **Save**.

Note: Saving reloads the plan so that the display order of the plan in the sequential view matches the actual processing flow. To enable you to

successfully edit the plan and move steps in the sequential plan, the steps order on the **Steps** tab must match the actual processing flow as displayed on the **Flow** tab.

6. Edit the sequential plan as required.

Automation Plan processing

Your Automation Plan consists of a number of steps. When you run it in the **Automation Plans** dashboard in the Server Automation domain, your Automation Plan is processed by the Automation Plan Engine, one step at a time, in the order that is specified in the Automation Plan. If you run an Automation Plan from any other dashboard or panel, the Automation Plan will fail.

When you run an Automation Plan from the **Automation Plans** dashboard in the Server Automation domain, the Automation Plan is processed in the following stages:

1. The Automation Plan Engine begins processing the Automation Plan action.
2. The Automation Plan Engine opens a step action.
3. The Automation Plan Engine processes the step action on the endpoints that you specify.
4. If the step action is successful, the Automation Plan Engine stops the step action and proceeds to the next step action.
5. If the status for a step action is **Failure** and the step has no failure step, the Automation Plan action is stopped.
6. If the Automation Plan contains a failure step for the failed step action, the Automation Plan Engine runs the failure step before the Automation Plan action is stopped.
7. If the prior step action is successful, the Automation Plan Engine opens the next step action and begins processing it.

To calculate the overall state of an Automation Plan step action, the Automation Plan Engine gets the individual results that are retrieved from each of the endpoints. The Automation Plan Engine uses these results to calculate the overall state of the step action. This state mapping information shows how that overall state of the step action is used by the Automation Plan Engine to control the running of the Automation Plan action. The Automation Plan Engine runs each step action in the Automation Plan based on a wait, success, or failure status. For information about the states that map to the wait, success, or failure status, see “Running an Automation Plan” on page 41.

Important: Your Automation Plan actions are not visible to any other users, except users with master operator privileges, even if the **Show Other Operator's Actions** is set to **Yes** in the IBM Endpoint Manager console.

Stopping an Automation Plan action

When you stop an Automation Plan action, the step action that is in process continues to run and its status does not change to stopped. This step action remains open.

You can stop the step action that is currently running by identifying it and stopping it. For information about how to stop Automation Plans and step actions, see “Stopping an Automation Plan” on page 47.

Using failure steps in an Automation Plan

When you create an Automation Plan, you can optionally add a single corresponding failure step for each Automation Plan step. A failure step is a Fixlet or a Task. A Baseline cannot be a failure step. If a step action fails and the Automation Plan contains a failure step for the failed step, the Automation Plan Engine identifies and runs the failure step action. You can target a failure step to run on either all the endpoints for the corresponding step action or only on the endpoints that returned a failed status for the step action. When a failure step action processing is complete, the Automation Plan Engine stops the failure step action and then the Automation Plan action, regardless of the overall final status of the failure step action.

Automation Plan Engine shutdown and recovery

The Automation Plan Engine detects particular conditions under which it can no longer function correctly. For example, if credentials become invalid, the Automation Plan Engine cannot function as normal. In these situations, the Automation Plan Engine automatically shuts itself down. The IBM Endpoint Manager server plugin service is responsible for restarting the Automation Plan Engine after the period of time pre-configured in the PlanEngine.xml file in the \BigFix Enterprise\BES Server\Applications\Config directory for Windows or /var/opt/BESServer/Applications/Config/PlanEngine.xml for Linux. The default is 30 seconds, but you can change this by modifying the PlanEngine.xml file. On restart, the Automation Plan Engine resumes from the processing point at which it shut down. The Automation Plan Engine automatically recognizes any Automation Plans that have already started, the stage of processing at which the shutdown occurred, and then continues running these Automation Plans.

The Automation Plan Engine shutdown and recovery occurs in the following situations.

Table 12. Error conditions and recovery

Error condition	Recovery
The Automation Plan Engine fails to communicate with Web Reports.	Verify that the IBM Endpoint Manager Web Reports service is running. Verify also that the URL to the Web Reports Service is valid by opening a browser and pasting the URL and checking that you can log in using a valid user name and password combination.
The Web Reports Service might be disabled.	An error is displayed if the Disable relevance evaluation option has been set on the datasource in Web Reports. To correct this, re-enable the Web Reports service by navigating to Administration -> Datasources -> DataSource Options and clear the Disable relevance evaluation check box.
Web Reports user credentials fail or become invalid.	An attempt is made to contact the Web Reports server using the Reports Username and Password set at the time the Automation Plan Engine was started. If these credentials have since changed, an error is displayed to indicate that the credentials for Web Reports are invalid. To change the credentials for the Web Reports Service, log on to Web Reports, go to Administration and select User Management . You can change the credentials from this panel.

Table 12. Error conditions and recovery (continued)

Error condition	Recovery
IBM Endpoint Manager console user credentials fail or become invalid.	The Automation Plan Engine attempts to run a simple function to contact the IBM Endpoint Manager API Fixlet Message function using the Platform user name and password that were set at the time when the Automation Plan Engine was started. An error is displayed if the wrong credentials are used. To correct this, ensure that the user name and password credentials are correct.

Editing an Automation Plan

You can change an Automation Plan by editing it in the **Automation Plans** dashboard. Typically, you might want to copy an existing plan or sample plan and then customize or update it for a different automation scenario by changing steps or by assigning different targets.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or a console operator. You must have Custom Content permissions to create an Automation Plan.

About this task

When you edit an Automation Plan, the list of available Automation Plans in the **Automation Plans** dashboard is automatically refreshed. To manually refresh the list of available Automation Plans, you must click the **Refresh** icon in the upper-right corner of the dashboard.

Each Automation Plan step is a Fixlet, Task, or Baseline. The steps are run in the order that they are displayed in the **Flow** tab in the **Automation Plans** dashboard. You can view the IBM Endpoint Manager console **Task**, **Fixlet** or **Baseline** panel for a step by clicking the **Go to source** icon for the step in the **Steps** tab. You can view the IBM Endpoint Manager console **Task** or **Fixlet** panel for a Component in a Baseline by clicking the Component name in the **Steps** tab. To return to the **Steps** tab, click **Back** in the menu bar.

Important: When you add a step to an Automation Plan, you are adding a copy of a Fixlet, Task, or Baseline to the plan. If the Fixlet, Task, or Baseline changes after it is added to the Automation Plan, the changes are not reflected in the copy in the Automation Plan. When the source content has changed, an icon is displayed to indicate that the source content has changed. You must then update your Automation Plan to include the latest changes. If you have access to the source content, you can update the Automation Plan by clicking the update content icon that is displayed when source content has changed. You must be in edit mode to update the Automation Plan and you must click **Save** to save the updates.

Complete the following steps to edit an Automation Plan.

Procedure

1. Open the **Server Automation domain** and from the navigation tree in the **Domain Panel**, click **Automation Plans**. The **Automation Plans** dashboard is

opened. A list of available Automation Plans is displayed in the dashboard. To sort the list, click any column title. To filter all columns in the list, use the **filter** field.

2. Select an Automation Plan from the list. The lower pane displays the selected Automation Plan data as read-only with the **Steps** tab selected by default.
3. Click **Edit** to edit the selected Automation Plan. The lower pane displays the selected Automation Plan data as editable fields.
4. To change the Automation Plan name and description, click the **Details** tab and update the **Name** and **Description** fields. From the **Details** tab you can also change the **Domain**, **Category**, **Source**, **Source Release Date**, and **Category Source Severity** fields.
5. Click the **Steps** tab. If the plan type is a sequential plan, you can change the plan to a parallel plan by selecting the **Parallel** radio button beside **Plan type**. You then need to set the dependencies between the steps to control the processing flow of the plan. For information about how to set the dependencies, see “Parallel step processing and controlling the flow of your plan” on page 30. If the plan type is a parallel plan, you cannot automatically change it to a sequential plan type by changing the **Plan type** radio button. If you want to change a parallel plan type to a sequential plan, you must manually change the dependencies so that there are no parallel steps in the plan. Complete the following procedure to edit the steps in the Automation Plan:
 - a. If the plan is a parallel plan, to change the dependencies for a step, expand **Depends on** for the step. Then check the box beside each step on which you want this step to depend. Review the **Flow** tab to verify that the plan processing flow.
 - b. To remove a step from an Automation Plan, click the **Remove Step** icon for the step. If the plan is a parallel plan and if you remove a step on which other steps were dependent, you are notified with a message in the user interface. Review the **Flow** tab and check if you need to make changes to dependencies before running the plan.
 - c. To remove a failure step from a step, click the **Remove Failure Step** icon for the step.
 - d. To change the action for a step that is a Fixlet or a Task, select one action from the **Action** list. An action with a Script Type of URL is not displayed in the **Action** list.
6. Click **Add Step** to add steps to the Automation Plan. Complete the following procedure to add steps:
 - a. In the **Add Step** panel, select **Fixlets**, **Tasks**, or **Baselines** from the **Include** list to view Fixlets, Tasks or Baselines. The default value, **All**, displays Fixlets, Tasks and Baselines.
 - b. To filter the list of Fixlets, Tasks and Baselines, use the lists and the input box. To add or remove filters, use + - .
 - c. After you add the relevant search criteria, press Enter to search for Fixlets, Tasks and Baselines.
 - d. From the list of Fixlets, Tasks and Baselines, select one or more to add to the Automation Plan.
 - e. When you finish selecting Fixlets, Tasks and Baselines, click **Add**. The name and summary of each step in the Automation Plan is shown in the **Steps** tab. For sequential plans, the sequence is shown.
7. Optional: To save a set of default targets, default parameters, and filters for the step:

- a. Click the **Default Settings** icon beside the **Action** dropdown menu for the step.
- b. From the **Targets** tab, search for and select the computers that you want to save as default targets for the step and add them to the **Selected Targets** list. You can also save default targets using the **The same computers targeted by step** or **The computers specified in the list of names** options. If computers that you save as default targets do not exist when you are running the Automation Plan, the **Selected Targets** list in the **Take Automation Plan Action** dialog box is updated to reflect this. Depending on security settings, users running the Automation Plan might not be able to see all of the default targets that you set if they do not have sufficient permissions.
- c. If there are parameters that are associated with the action for the step, you can set and save default parameters. However, you cannot save parameters from virtualization or middleware Fixlets. From the **Parameters** tab, enter the parameters that you want to save as default parameters. You can enter some or all of the parameters associated with the action for the step. Note the parameters that you set as defaults are not validated when you create the Automation Plan, they are validated when you run the Automation Plan. The **Parameters** tab is displayed only if there are parameters associated with the action for the step. When you move your mouse over the **Default Settings** icon after you have saved default parameters, a tooltip is displayed providing information that default parameters have been set. This tooltip provides this information for any Fixlet that has default parameters, not just for default parameters that you have saved. If a default parameter was set for the Fixlet when the Fixlet was created, the tooltip displays information that default parameters are set.
- d. You can set and save filter criteria, including custom properties, for targets for the step. To save filters, select the filters that you want displayed in the **Take Automation Plan Action** dialog box when you are running the Automation Plan.

Note: If you are saving custom properties as filters, these properties must not be reserved or default properties, and they cannot come from an analysis. The custom properties must have been reported by at least one computer. If you export an Automation Plan containing custom properties and then import it on another server, and the custom properties are not specified on the server to which you import the Automation Plan, the custom properties are automatically deleted. If you delete the custom properties, they are also deleted from the Automation Plan.

- e. Click **OK** and then **Save** to save the default targets, default parameters, and filters.
 - f. Repeat this process for each step in the Automation Plan for which you want to save default targets or default parameters. If you delete the Automation Plan, default targets, default parameters, and filters are also deleted.
8. To add a failure step to a step, click the **Add Failure Step** icon for the step. A failure step is optional and can be a Fixlet or Task. A Baseline cannot be a failure step. A step can have only one failure step. Complete the following to add a failure step to a step:
 - a. In the **Add Step** panel, select **Fixlets** or **Tasks** from the **Include** list to view Fixlets or Tasks. The default value, **Fixlets and Tasks**, displays both.
 - b. To filter the list of Fixlets and Tasks, use the lists and the input box. To add or remove filters, use **+** **-** **.**

- c. After you add the relevant search criteria, press Enter to search for Fixlets and Tasks.
 - d. From the list of Fixlets and Tasks, select one to add to the step.
 - e. When you select a Fixlet or a Task, click **Add**. The failure step is shown in the step in the **Steps** tab.
 - f. To change the targeting for the failure step, expand **Failure Step:** for the step. To target all endpoints that are targeted by the step action, select **All** from the **Targeting** list. The default option is **Failed Only**. This option targets only the endpoints that return a failure status in the corresponding step action.
 - g. To choose one action in the failure step, expand **Failure Step:** for the step. Select an action from the **Action** list. An action with a Script Type of URL is not displayed in the **Action** list.
9. If your plan is a sequential plan type, you can change the order and sequence of steps by moving steps up or down in the **Steps** list. To move a step, select the step and click the **Move Step** icon. The **Move Step After** dialog box is displayed. Select the step after which you want the step that you are moving to be positioned. For parallel type Automation Plans, you use the dependencies to determine the processing flow of the plan. For complete information about setting dependencies, see “Parallel step processing and controlling the flow of your plan” on page 30.
 10. Click **Save** to save all the changes to the Automation Plan.

Results

The changes that you made are added to the Automation Plan. The list of available Automation Plans in the **Automation Plans** dashboard is refreshed to display the changes to the Automation Plan. You can run, edit, copy, or delete this Automation Plan.

Copying an Automation Plan

You can create an Automation Plan by copying an existing Automation Plan. You can then edit the data in the Automation Plan that you copied.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or a console operator. You must have Custom Content permissions to copy an Automation Plan.

About this task

When you create an Automation Plan by copying an existing Automation Plan, all of the data in the original Automation Plan is copied into the new Automation Plan. You can change the data in the new Automation Plan by using the Automation Plan Editor in the **Automation Plans** dashboard. The new Automation Plan can have the same name as the original Automation Plan. A unique ID is assigned to the new Automation Plan.

Important: You need Custom Content permissions to copy an Automation Plan. If you do not have Custom Content permissions, **Copy** is disabled.

Note: When you copy an Automation Plan, the list of available Automation Plans in the **Automation Plans** dashboard is automatically refreshed. To manually refresh the list of available Automation Plans, you must click the **Refresh** icon in the upper-right corner of the dashboard.

Complete the following steps to copy an Automation Plan. For information about editing an Automation Plan, see [Editing an Automation Plan](#).

Procedure

1. Open the **Server Automation domain**.
2. From the navigation tree in the **Domain Panel**, click **Automation Plans**. The **Automation Plans** dashboard is opened. A list of available Automation Plans is displayed in the dashboard. To sort the list, click any column title. To filter all columns in the list, use the **filter** field.
3. Select an Automation Plan from the list. The lower pane displays the selected Automation Plan data as read-only.
4. Click **Copy** to copy the selected Automation Plan. A copy of the selected Automation Plan data is displayed in the lower pane as editable fields.
5. Click **Save** to save the changes to the new Automation Plan.

Results

You created an Automation Plan. The list of available Automation Plans in the **Automation Plans** dashboard is refreshed to display the new Automation Plan. You can run, edit, copy, or delete this Automation Plan.

Deleting an Automation Plan

You can delete Automation Plans in the **Automation Plans** dashboard. If you want to delete several Automation Plans, you must delete each Automation Plan individually. When an Automation Plan is deleted, the Automation Plan actions and step actions are not deleted.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or a console operator. You must have Custom Content permissions to delete an Automation Plan.

About this task

When you delete an Automation Plan, the list of available Automation Plans in the **Automation Plans** dashboard is automatically refreshed. To manually refresh the list of available Automation Plans, click the **Refresh** icon in the upper-right corner of the dashboard.

Important: Deleting an Automation Plan does not delete or stop any Automation Plan actions or step actions for the deleted Automation Plan.

Procedure

To delete an Automation Plan, complete the following steps:

1. Open the **Server Automation domain**.

2. From the navigation tree in the **Domain Panel**, click **Automation Plans**. The **Automation Plans** dashboard is opened. A list of available Automation Plans is displayed in the dashboard. Click any column title to sort the list. Use the **filter** field to filter all columns in the list.
3. Select an Automation Plan.
4. To delete the selected Automation Plan, click **Remove**.

Results

You deleted an Automation Plan. The list of available Automation Plans in the **Automation Plans** dashboard is refreshed to remove the deleted Automation Plan.

Running an Automation Plan

You run or schedule your Automation Plan from the **Automation Plans** dashboard in the Server Automation domain. If you run or schedule an Automation Plan from any other dashboard or panel, it will fail. The Automation Plan Engine runs the Automation Plan, one step at a time, by opening, processing, and then stopping each step in the order that you specify when you create the Automation Plan. The Automation Plan Engine calculates the state of each step and uses these states to control the execution of the Automation Plan. In the **Automation Plans** dashboard, you must specify one or more endpoints for each step in an Automation Plan. You must specify the correct value for each parameter in a step or a failure step to ensure that the step or failure step can run successfully. Only steps that are Fixlets or Tasks can have parameters.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or console operator. If you log on as a console operator, you must have permission to target each endpoint that you select. You must have Custom Content permissions to run an Automation Plan. You must run the Automation Plan in the **Automation Plans** dashboard in the Server Automation domain. If you run an Automation Plan in any other dashboard or panel, it will fail.

To schedule an Automation Plan, ensure that the latest version of the Automation Plan Engine is installed on your IBM Endpoint Manager console. If the latest version is not installed, the Install Latest Automation Plan Engine Task is relevant. To upgrade to the latest version of the Automation Plan Engine, see “Upgrading the Automation Plan Engine” on page 14.

About this task

The Automation Plan Engine opens a step as it begins to process it. When the step processing is complete, the Automation Plan Engine stops the step. If the step is successful, the Automation Plan Engine then opens and processes the next step. If the step fails, the Automation Plan Engine then opens the associated failure step, if one exists, and processes it. To understand how the Automation Plan Engine calculates if a step is complete or not, review the state mapping information that is described here. To calculate the overall state of an Automation Plan step, the Automation Plan Engine gets the individual results that are retrieved from each of the endpoints. The Automation Plan Engine uses these results to calculate the overall state of the step. This state mapping information shows how that overall state of the step is used by the Automation Plan Engine to control the running of the Automation Plan. The Automation Plan Engine runs each step in the

Automation Plan based on a wait, success, or failure status. The following table outlines the states that map to the wait, success, or failure status.

Table 13. Automation Plan state mapping

Status of action	Outcome of action status	Description
<ul style="list-style-type: none"> • Running • Evaluating • Waiting • Pending Downloads • Postponed • Pending Restart • Pending Message • Pending Login • Not Reported 	Wait	The action is still in progress or waiting for user input. The Automation Plan Engine waits for this status to change.
<ul style="list-style-type: none"> • <Error> • Failed • Canceled • Download Failed • Invalid Signature • Expired • Completed • Locked • Constrained 	Failure	The action cannot proceed. There might be an error or problem with the targeted endpoint. The Automation Plan Engine stops the Automation Plan.
<ul style="list-style-type: none"> • Fixed • Not Relevant 	Success	The action completed successfully. The Automation Plan Engine proceeds to the next step.

A final state for the Automation Plan step is not calculated until all of the targeted endpoints report a state that maps to either a success or failure decision. Until that happens, the overall state of the Automation Plan step is wait. This includes the scenario where one or more targeted endpoints do not exist or are unavailable for some other reason, for example, if the endpoint is powered off, or if you do not have permission to target the endpoint. Unless all of the targeted endpoints report a status that maps to either a success or failure decision, the Automation Plan stays in a wait state. In the case of non-existent or unavailable endpoints, this results in an infinite wait state, and causes the Automation Plan to wait indefinitely.

When you run an Automation Plan, you must specify one or more endpoints for each step. You can assign endpoints to a step by using one of the following approaches:

- Select one or more computers from the list of computers that are managed by the IBM Endpoint Manager server.
- Select one or more computer groups from the list of computers groups that are managed by the IBM Endpoint Manager server.
- Type the names of one or more computers.
- Specify the same endpoints as another step in the Automation Plan.

Important: You must not add a Baseline as a step if it contains any Component that prompts for parameter values when run. You cannot specify the values of the parameters in a step that is a Baseline. If you run an Automation Plan containing a Baseline that has a Component with an unspecified parameter, the Automation Plan might fail or result in some other unexpected behavior. Only steps that are Fixlets or Tasks can have parameters that prompt for values when run.

Scheduling an Automation Plan and Prefetch downloads

You can schedule an Automation Plan to run at a specified date and time. The date and time that you specify in the **Take Automation Plan Action** panel is the IBM Endpoint Manager console local time. The IBM Endpoint Manager console converts the specified time to Coordinated Universal Time (UTC) and the Automation Plan Engine runs the Automation Plan at the specified UTC time. If the scheduled UTC time and date are less than or equal to the current UTC time and date, the Automation Plan Engine runs the Automation Plan immediately.

If you are scheduling your Automation Plan, you can choose to prefetch the content that needs to be downloaded. This option allows you to download the content required as part of the Automation Plan in advance of the execution of the Automation Plan. This speeds up the execution of the Automation Plan so that when the Automation Plan runs, the content has been downloaded in advance and runs much faster than if you do not choose this option. To use this option, you select the **Prefetch downloads** check box when you are scheduling your Automation Plan. If you select this option, an open action is created for each step in your Automation Plan that has a prefetch or download statement. You can view these actions from the **Automation Plan Action Status** dashboard.

Important: If prefetch download actions run in parallel with Automation Plan steps to the same endpoints, the step waits until all prefetch download steps are completed. Because the step action and the step download action share the same download, the IBM Endpoint Manager client detects this and waits for it to complete.

Important: There is a potential performance impact associated with using the **Prefetch downloads** option because an additional action is created for each step that requires software downloads. The recommended maximum number of open actions on the system is 2,500. For any given Automation Plan, an action is open for the Automation Plan and also for each individual step in the Automation Plan. If you use the **Prefetch downloads** option, additional actions are created and opened for each step that requires software downloads. So instead of having two open actions per Automation Plan at any one point (one action for the Automation Plan and one for the current step) there are additional actions opened for each step that requires software downloads.

Note: If an endpoint does not yet exist, the Automation Plan Engine waits until the endpoint is created before executing the step.

Complete the following steps to run or schedule an Automation Plan.

Procedure

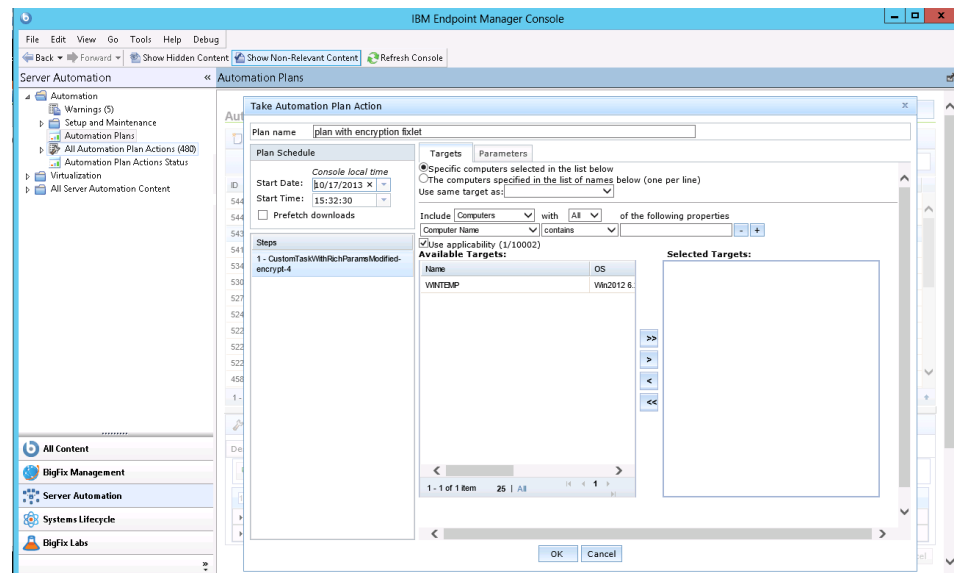
1. Open the Server Automation domain.
2. From the navigation tree in the **Domain Panel**, click **Automation Plans**. The **Automation Plans** dashboard is opened. A list of available Automation Plans

is displayed in the dashboard. To sort the list, click any column title. To filter all columns in the list, use the **filter** field.

3. Select an Automation Plan from the list.
4. Click **Take Action**. The **Take Automation Plan Action** panel is opened.
5. To schedule the Automation Plan, specify the start time and date for the Automation Plan by selecting a date from the **Start Date** list and a time from the **Start Time** list in the **Plan Schedule** pane. You can also type values for the date and time in the **Start Time** field and the **Start Date** field. The time and date that you specify is the IBM Endpoint Manager console local time. The default values of the **Start Date** list and the **Start Time** list are the current IBM Endpoint Manager console local time and date. You can select the Prefetch downloads option to download the content required for each step in the Automation Plan in advance of the execution of the Automation Plan. If you select this option, an open action is created for each step in your Automation Plan.
6. Select a step from the list. To view only the applicable endpoints for the selected step, select the **Use applicability** check box. To view all the endpoints that are managed by the Tivoli® Endpoint Manager server, clear the **Use applicability** check box. If there are no applicable endpoints for the selected step, the **Use applicability** check box is disabled.
7. To filter computers or computer groups that you want to target based on their properties, use the lists and the input box. To add or remove filters, click + or -. After you enter the relevant criteria to search, press Enter.
8. To assign one or more endpoints as targets for the step, use one of the following methods:
 - Click **Specific computers selected in the list below** to select one or more computer names as endpoints for the step:
 - a. From the **Include** list, select **Computers**.
 - b. To add all the computers in the **Available Targets** list to the **Selected Targets** list, click **Add All Displayed Targets**.
 - c. To add selected computers to the **Selected Targets** list, select one or more computers in the **Available Targets** list and click **Add Highlighted Targets**.
 - Click **Specific computers selected in the list below** to select one or more computer groups as endpoints for a step:
 - a. From the **Include** list, select **Computer Group**.
 - b. To add all the computer groups in the **Available Targets** list to the **Selected Targets** list, click **Add All Displayed Targets**.
 - c. To add selected computer groups to the **Selected Targets** list, select one or more computer groups in the **Available Targets** list and click **Add Highlighted Targets**.
 - Click **The computers specified in the list below (one per line)** to specify one or more computers as endpoints for a step:
 - a. Type or copy and paste the names of the computers that you want to target.
 - b. Enter one computer name per line.
 - Select a step name from the **Use same targets as** list to specify the same endpoints as another step in the Automation Plan.

Note: If the step has a set of default targets saved when the Automation Plan is created, these targets are displayed in the **Selected Targets** list.

9. Repeat steps 5, 6, 7, and 8 for each step in the Automation Plan.
10. To specify parameters for a step, select the step from the list and click the **Parameters** tab. For each parameter required by the step, a description and an entry field are displayed. If the parameter has a default value, the entry field contains the default. If the step has a saved default set of parameters, an icon is displayed to indicate this. To ensure the step runs successfully, each parameter displayed on the tab must have a valid value.
11. To specify parameters for a failure step, select the step from the list and click the **Failure Step Parameters** tab. If the selected step has a failure step that requires parameters, a description and entry field is displayed for each parameter. If a parameter has a default value, the entry field contains the default. To ensure the failure step runs successfully, each parameter displayed on the tab must have a valid value. The failure step parameters are independent of the step parameters.
12. To run or schedule the Automation Plan, ensure that all steps have one or more endpoints selected as targets and that all step parameters have values, then click **OK**. The following graphic shows an example of the **Take Automation Plan Action** screen.



Results

The Automation Plan runs and the **Automation Plan Action Status** dashboard is opened. In this panel, you can view the Automation Plan action and the corresponding step actions for the Automation Plan.

Viewing Automation Plan actions

You can view a list of all the Automation Plan actions and the corresponding step actions in the **Automation Plan Action Status** panel. This list includes all schedules Automation Plan actions.

Before you begin

You must log on to the IBM Endpoint Manager console as a master operator or a console operator. You must have Custom Content permissions to view Automation Plan actions.

About this task

To refresh the Automation Plan action and step action information, you must click the **Refresh** icon in the upper-right corner of the panel.

To view pending Automation Plan actions only, select the **Show only pending Automation Plan Actions** check box. Pending Automation Plan actions do not have step actions.

Tip: You can also view pending Automation Plans actions in **All Automation Plan Actions > Pending Automation Plan Actions** in the Server Automation domain.

Important: All Automation Plan action and step action information in this panel is read-only. You cannot delete, stop, or restart an action in the **Automation Plan Action Status** panel.

Complete the following steps to view an Automation Plan action.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the **Domain Panel**, click **Automation Plan Action Status**. The **Automation Plan Action Status** panel is opened. A list of all Automation Plan actions, with the most recent Automation Plan action first, is displayed in the upper pane. To sort the list, click any column title. To filter all columns in the list, use the **filter** field.
3. To view the IBM Endpoint Manager console **Action** panel for an Automation Plan action, click the **Details** value of the Automation Plan action in the list. To return to the **Automation Plan Action Status** panel, click **Back** in the menu bar.
4. To display the step actions in an Automation Plan action, select the Automation Plan action in the list. The lower pane displays the step actions for the selected Automation Plan action.
5. To view the IBM Endpoint Manager console **Action** panel for a step action, click the **Details** value of the step action in the list. To return to the **Automation Plan Action Status** panel, click **Back** in the menu bar. The following graphic shows an example of the **Automation Plan Action Status** dashboard.

Automation Plan Actions Status							
Automation Plan Action Status							
Automation Plan Actions							
Show only pending Automation Plan Actions							
Filter							
ID	Name	State	Time Issued	Start Time	Details	Issued By	Site
698	Patch Web Server Cluster using baseline	Stopped	30 May 2013 16:12:43	30 May 2013 16:05:48		besadmin	ActionSite
680	Provision RHEL Apache Web Server	Expired	10 April 2013 11:13:52			besadmin	ActionSite
677	Reimage a Server	Expired	09 April 2013 16:28:57			besadmin	ActionSite
660	Provision RHEL Apache Web Server	Expired	09 April 2013 12:45:12			besadmin	ActionSite
655	Reimage a Server	Expired	05 April 2013 17:48:35			besadmin	ActionSite
651	Reimage a Server	Expired	05 April 2013 16:44:40			besadmin	ActionSite
646	Reimage a Server	Expired	05 April 2013 13:34:01			besadmin	ActionSite
636	Provision RHEL Apache Web Server	Expired	05 April 2013 13:05:06			besadmin	ActionSite
1 - 11 of 11 items							
5 10 25 50 100 All							
Step Actions							
ID	Name	Status	% Complete	State	Time Issued	Details	
699	#(EMPlan 698,1,0) RHEL Apache Patch Baseline	Fixed	100%	Stopped	30 May 2013 16:13:16		
706	#(EMPlan 698,2,0) RHEL Apache Patch Baseline	Fixed	100%	Stopped	30 May 2013 16:17:45		

Stopping an Automation Plan

When you run an Automation Plan, an Automation Plan action is generated to process the Automation Plan. The Automation Plan action then generates step actions, when required, when the preceding step is complete. If you want to stop an Automation Plan that is running, you must stop the Automation Plan action before you stop the step action. To stop a pending Automation Plan action, you must stop the Automation Plan action only.

About this task

To stop an Automation Plan that is running, you must first stop the Automation Plan action, and then stop the open step action. Only one step action is open at any one time.

If you stop an Automation Plan step action without first stopping the Automation Plan action, the Automation Plan Engine continues to process the Automation Plan action, generating new step actions as it does so.

The **All Automation Plan Actions** dashboard displays all Automation Plan actions, including all scheduled and pending Automation Plan actions, and all Automation Plan step actions. The **Automation Plan Actions** dashboard displays all Automation Plan actions including all scheduled and pending Automation Plan actions. The **Pending Automation Plan Actions** dashboard displays pending Automation Plan actions only. The **All Automation Plan Step Actions** dashboard displays Automation Plan step actions only. From each dashboard, you can stop the displayed actions.

If you stop a pending Automation Plan action, the state of the Automation Plan action is set to stopped and the Automation Plan action will not run at the scheduled time. The stopped Automation Plan action is not displayed on the **Pending Automation Plan Actions** dashboard. A pending Automation Plan action has no step actions.

Complete the following steps to stop an Automation Plan.

Procedure

1. To find the Automation Plan action, expand **All Automation Plan Actions** in the Server Automation domain. Search for and select an Automation Plan action in the **All Automation Plan Actions** or the **Automation Plan Actions** dashboards. If you want to stop a pending Automation Plan action, you can search for and select the Automation Plan action in the **Pending Automation Plan Actions** dashboard.
2. Right-click the Automation Plan action and click **stop**. The step action that is in process continues to run and its status does not change to stop. This step action remains open.
3. To identify an open Automation Plan step action in the stopped Automation Plan:
 - a. Open the **Automation Plan Actions Status** dashboard. Search for the Automation Plan action that you stopped. Make a note of the Automation Plan action ID value, in the first column.
 - b. From the Server Automation domain, expand the **All Automation Plan Actions** node and click **All Automation Plan Step Actions**.

- c. In the search field on the **All Automation Plan Step Actions** dashboard, enter the **ID** value that you noted for the stopped Automation Plan action. The list of steps in the Automation Plan is displayed.
4. Identify the step action that is open, right-click the action, and click **Stop Action**.

Results

The Automation Plan and all of the Automation Plan steps are stopped.

Exporting an Automation Plan

You can export an Automation Plan from the **All Content** domain in the IBM Endpoint Manager console. You can edit an exported Automation Plan in an external editor and then import the Automation Plan into a different console or deployment. Other console operators can edit and import Automation Plans that you export.

Before you begin

You must log on to the IBM Endpoint Manager console.

About this task

When you export an Automation Plan, references or links to any custom Fixlets, Tasks, or Baselines in the Automation Plan are not exported. The Fixlets, Tasks, or Baselines in the exported Automation Plan execute correctly, but the link to their source from the exported Automation Plan does not display the action script. When you click the Task, Fixlet, or Baselines source, you are returned to the Automation Plan action.

For information about how to import content such as Automation Plans, see [Importing content](#).

Complete the following steps to export an Automation Plan.

Procedure

1. Open the **All Content** domain.
2. From the navigation tree in the **Domain Panel**, click **Fixlets and Tasks**. A list of Fixlets, Tasks, and Automation Plans is displayed in the upper pane.
3. To display all the Fixlets, Tasks, and Automation Plans, click **Show Non-Relevant Content** in the menu bar. To sort the list, click any column title. To filter all columns in the list, use the **Search Fixlets and Tasks** field.
4. Select an Automation Plan from the list. The lower pane displays the selected Automation Plan data.
5. Click **Export** to export the selected Automation Plan.
6. In the **Save As** window, specify **File name** and click **Save**.

Results

The Automation Plan is exported to a .BES file. You can edit the Automation Plan in an external editor or copy it to another console or deployment.

Setting or changing the default values of parameters

You can set or change default values of parameters that are not displayed when you are editing an Automation Plan from the Automation Plans dashboard. When you are editing an Automation Plan, you might not be able to change parameter values using the user interface. However, you can change the default values of parameters by changing the action script for the Automation Plan in the **All Content** domain.

About this task

Complete the following steps to change the default values of parameters.

Procedure

1. Open the **All Content** domain.
2. In the **Fixlets and Tasks** tree, search for and select the Automation Plan for which you want to change the default parameters.
3. Click the **Edit** button.
4. Click the **Actions** tab to view the action script.
5. In the action script section, search for the action parameter query string and locate the parameter for which you want to change the default value.
6. To set the default value, change the **With default** value for the parameter to the value that you want to specify as the default.
7. Save the action script.

Chapter 4. Virtualization

Virtualization is a software technology that allows multiple operating systems to run on the same host computer at the same time. Additional uses of virtualization include the quick creation of new systems for testing, training, and demonstration. Using virtualized computers saves the cost of hardware, management, and administration of the server infrastructure.

A virtual server is composed of software and acts like a complete hardware system from processor to network card in a self-contained, isolated software environment, enabling the simultaneous operation of otherwise incompatible systems. A virtual server has no hardware components. Virtual servers are based on host platforms. A host platform is a physical computer that has hosting capabilities and can host many virtual servers.

In Server Automation, you manage your virtualization infrastructure using Tasks.

VMware

You can deploy and configure a management extender plug-in for VMware. You can then manage VMware virtual machines from within the IBM Endpoint Management console.

Setup and maintenance

This section provides documentation about setup and maintenance tasks that you can complete for VMware virtualization.

Use the information in this section for instructions and important information about how to set up the virtualization environment for VMware.

Installing the management extender for VMware

Before you work with IBM Endpoint Manager for Server Automation virtualization features, you must install a management extender to communicate with the VMware vCenter or ESX host. Before you install the management extender, you must enable the license for Virtual Endpoint Manager.

Before you begin

You must have a relay server or a root server Version 9.0 or later. A VMware management extender must not be already installed on the server. Because of the workload that is imposed on the system by the management extender, it is recommended that you install the management extender on a relay server and not a root server.

Important: You must ensure that the license for Virtual Endpoint Manager is enabled. To enable the Virtual Endpoint Manager license, go to the **Bigfix Management** domain, navigate to **License Overview > Lifecycle Management**. From the list of **Available Sites**, enable **Virtual Endpoint Manager**. When **Virtual Endpoint Manager** is enabled, it disappears from the **Available Sites** list and is displayed in the **Enabled Sites** list.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Deploy VMware Components**.
3. In the **Deploy VMware Components** window, select the **Deploy Management Extender for VMware vCenter** Task.
4. In the **Task: Deploy Management Extender for VMware vCenter** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. In the **Computer Name** list, select a relay server or a root server and click **OK**.

Results

In the **Action: Deploy Management Extender for VMware vCenter** window, you can check the status of the installation. When the status changes to **Completed**, the management extender for VMware is installed.

What to do next

After you install the management extender for VMware, you must configure the management extender with your VMware system details. For more information about configuring the management extender, see “Configuring management extenders.”

Configuring management extenders

Before you can begin working with the different Virtualization features, you must configure a relay server or a root server to communicate with a specific VMware vCenter or ESX host. You can use ESX version 5.1 or lower.

Before you begin

Before you can configure the management extender, you must install the management extender for VMware. The VMware credentials that are used to log in must be part of the Administrator group in VMware. If you have Read Only permissions, you cannot correctly configure the management extender and cannot use any of the Virtualization capabilities.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Configuration Wizard** to open the **Configure Management Extenders** list.
3. In the **Configure Management Extenders** pane, select a relay server or a root server from the **Deployed Extenders** list and click **Configure**.
4. In the **Configure Extender** area, enter the **Server name**. You can enter either a complete URL or the server address. If you enter the server name, a URL `https://<servername>:<port>/sdk/webservice/` is generated. This URL can cause problems if you want to manage a single ESX host virtual environment because a single ESX host requires a URL with an ending: `https://<servername>:<port>/sdk/vimService`. If you want to manage a single ESX host virtual environment, ensure that you tick the **Enter vCenter's web service URL** box in the **Configure Extender** window and enter the correct version of the URL.

5. In the **Configure Extender** area, enter the **Admin user** and **Password** of the specific VMware system that you want to configure with a relay server or a root server and click **Configure VMware vCenter Management Extender...**
6. In the **Take Action** dialog box, select a relay server or a root server that you want to target from the **Computer Name** list and click **OK**.

Results

When the management extender is completed, the **Status** changes to **Completed** in the **Action: Configure VMware vCenter Management Extender** window.

Upgrading the management extender plug-in

Using the **VMware Upgrade vCenter Plugin** Task, you can upgrade the VMware vCenter plug-in component of the management extender for VMware vCenter.

Before you begin

The **VMware Upgrade vCenter Plugin** Task checks if the process vCenter plugin.exe is running and waits for this process to finish before it takes action.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Upgrade VMware Components**.
3. From the **Upgrade VMware Components** list, select **VMware Upgrade vCenter Plugin**.
4. In the **VMware Upgrade vCenter Plugin** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the computer name which is configured with the management extender and click **OK**.

Results

When the management extender plug-in is upgraded, the **Status** changes to **Completed** in the **Action: VMware Upgrade vCenter Plugin** window.

Configuring your Windows administrator password

To create Windows virtual machines from a template, you must set your Windows administrator password in VMware. The **Configuring VMware Management Extender for Windows Templates** Task configures the Windows administrator password as the initial password. Using this wizard, you can set your Windows administrator password on a VMware management extender. First, the wizard encrypts the password, then sends the encrypted password to the management extender. You can then proceed to create a Windows virtual machine from a template.

Before you begin

You must ensure that the **SSL Encryption Analysis for Management Extender** analysis is active. If this analysis is not activated, a warning message is displayed in the **Configuring VMware Management Extender for Windows Templates** Task. You cannot proceed to configure your Windows administrator password without activating the analysis. After you activate the analysis, it can take a few minutes to gather. To check the status of the analysis, from the navigation tree in the Server Automation domain click **Virtualization > Setup and Maintenance > Activate**

Analyses. In the **Activate Analysis** list, select **SSL Encryption Analysis for Management Extender**. In the **Analysis: SSL Encryption Analysis for Management Extender** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Configuring VMware Management Extender for Windows Templates**.
3. To filter the list of management extenders that are not configured with a Windows administrator password, enable the **Show Extenders with passwords not set** check box.
4. From the **VMware Management Extender** list, select the management extender that you want to use to configure your Windows administrator password.
5. In the **Administrator Password** field, enter your Windows administrator password. The password must contain only alphanumeric characters.
6. In the **Confirm Administrator Password** field, enter your Windows administrator password details again to confirm that the details are correct and click **Take Action**.
7. In the **Take Action** dialog box, select the computer that you want to use to configure your Windows administrator password.

Results

When the Windows administrator password is set in VMware, the **Status** changes to **Completed** in the **Action: VMware Management Extender for VMware Windows Templates** window.

Removing the management extender for VMware

Using the **Remove Management Extender for VMware vCenter** Task, you can remove the management extender for VMware.

About this task

The **Remove Management Extender for VMware vCenter** Task removes the management extender but does not remove the list of computers that are associated with a relay server or a root server. If you reconfigure the management extender at a later stage, the reconfiguration might cause computers with duplicate names to be displayed within the IBM Endpoint Manager console. To remove unwanted computers from the database of the IBM Endpoint Manager console, navigate to the **All Content** domain, select **Computers** and from the **Computers** list, select the computers that you want to remove, right-click, and select **Remove from Database**.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Remove VMware Components**.
3. In the **Remove VMware Components** window, select the **Remove Management Extender for VMware vCenter** Task.

4. In the **Task: Remove Management Extender for VMware vCenter** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. In the **Computer Name** list, select the computer from which you want to remove the management extender and click **OK**.

Results

In the **Action: Remove Management Extender for VMware vCenter** window, you can check the status of the uninstall. When the status changes to **Completed**, the management extender for VMware is uninstalled from the root server or the relay server.

Virtual server overview

The **Virtual Server Overview** dashboard lists the hosts and virtual machines reported by the management extender through the VMware API. You can use the **Virtual Server Overview** to view the attributes of each host and virtual machine. You can also filter the lists of hosts and virtual machines by their attributes. To view the Virtual Server Overview, in the Server Automation domain, select **Virtualization > Virtual Server Overview**.

To view the **Virtual Server Overview**, you must ensure that the analyses **VMware Host Overview** and **VMware VM Overview** are active. If these analyses are not activated, a warning message is displayed in the **Virtual Server Overview** list. You cannot proceed to view the overview without activating the analyses. After you activate the analyses, it can take a few minutes to gather. To check the status of the analyses, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analysis** list, ensure that the **Status** changes from **Not Activated** to **Activated Globally**. In the **Activate Analyses** list, click both **VMware Host Overview** and **VMware VM Overview** individually. In the **Analysis: VMware Host Overview** and the **VMware VM Overview** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered.

To view hosts, click the **Hosts** tab in the **Virtual Server Overview**. In the **Hosts** tab, you can view the following host attributes.

Table 14. Virtual Server Overview - Hosts

Requirement	Description
Link to Host	Contains a link to a page with full specifications of the host.
Name	Displays the host name.
Operating System	Displays the operating system of the host.
CPU count	Displays the logical processor count of the host.
Datacenter	Displays the datacenter that contains the host.
Status	Displays the status of the host.
Memory size	Displays the memory size of the host.
NIC Count	Displays the number of network interface cards.
VM and Template Count	Displays the number of virtual machines and templates that are on the host.

Table 14. Virtual Server Overview - Hosts (continued)

Requirement	Description
Last Refresh Time	Displays the last time the management extender provided updated information from VMware.

In the **Virtual Machines** tab in the **Virtual Server Overview**, you can also view the following attributes of the virtual machines.

Table 15. Virtual Server Overview - Virtual Machines

Requirement	Description
Link to VM	Contains a link to a page with full specifications of the virtual machine.
Name	Displays the virtual machine name.
Status	Displays the status of the virtual machine.
State	Displays the power state of the virtual machine.
Link to Host	Contains a link that leads to a page with full specifications of the host of the virtual machine.
Host	Displays the name of the host on which the virtual machine is running.
CPU Count	Displays the logical processor number allocated to the virtual machine.
Memory Size (MB)	Displays the memory size that is allocated to the virtual machine.
Provisioned Storage	Displays the amount of storage that is allocated to the virtual machine.
Used Storage	Displays the amount of provisioned storage which is being used by the virtual machine.
Last Refresh Time	Displays the last time the management extender provided updated information from VMware.

Filtering the virtual server overview

You can filter the Virtual Server Overview to list the hosts and virtual machines according to their attributes. Click the title of each column to order the list by that attribute. For example, in the **State** column, click the **State** heading to order the virtual machines and hosts by their power state. Repeat this action for the other attributes.

Host management tasks

Using these tasks, you can create, modify, and delete virtual machines that are on a VMware host that is configured with a management extender. You can also refresh a datastore to update the IBM Endpoint Manager console with a list of ISO image files.

Creating a VMware virtual machine from ISO

Using the **VMware Create Virtual Machine from ISO Task**, you can create VMware virtual machines from within the IBM Endpoint Manager console.

Before you begin

Before you can create a virtual machine, you must install and configure the management extender. You must ensure that the analysis **Host Overview** is active. If this analysis is not active, a warning message is displayed in the **VMware Create Virtual Machine from ISO** Task. You cannot proceed to create the virtual machine without activating the analysis **Host Overview**. After you activate the analysis, it can take a few minutes to gather. To check the status of the analysis, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analysis** list, click the **Host Overview** analysis, in the **Analysis: Host Overview** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values into the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see "Turning off validation in a Task" on page 69.

Complete the following steps to create a virtual machine from ISO.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration** to open the list of **Host Configuration** Tasks.
3. From the **Host Configuration** list, select **VMware Create Virtual Machine from ISO**. In the **Task: VMware Create Virtual Machine from ISO** window, you must complete the form to take action.

Table 16. Parameter list for creating a virtual machine

Requirement	Description
Virtual Machine Name	Enter the name of the new virtual machine to be created. Ensure that you give your virtual machine a unique name to avoid any future confusion with duplicate names.
Host	Select the host on which you want the virtual machine to run.
Datacenter Name	Select the datacenter on which you want your virtual machine to be stored.
Guest OS Name	Select the operating system that you want to run on your virtual machine.
Datastore Name	Select the datastore in which you want the virtual machine configuration to be stored.
SCSI Controller Type	Select the disk controller type that you want to allocate to your disk.

Table 16. Parameter list for creating a virtual machine (continued)

Requirement	Description
Provisioned Disk size	Enter the disk size that you want to allocate to your virtual machine. The disk size cannot exceed the free space available on the datastore. The disk size cannot be greater than the file size that is configured for the datastore. If you want to enter a value that is greater than the disk size that is available, select OFF on the validation button for Provisioned Disk Size in the Validation column. For example, if you know that virtual machines on the datastore are scheduled to be deleted and free disk capacity will become available, you can enter a greater disk size than the capacity that is available. You can then schedule the task to run at a time when the greater disk size is available. You must ensure that this data is correct.
Memory size	Select the memory size that you want to allocate to your virtual machine.
Number of Virtual Processors	Select the number of processors that you want to allocate to your virtual machine. You must enter a number of processors greater than zero.
Associated Network	Select the network that you want assigned to your virtual machine.
Connect NIC at power on	Select whether you want your network interface card that is powered on or off when the virtual machine is created.
ISO Image Name	Select the name of the ISO image that you want to use to create your virtual machine. If you want to work with an ISO image that is not in the ISO Image Name list, select OFF on the validation button for ISO Image Name in the Validation column. You must ensure that this data is correct.

- When you complete the form, click **Take Action**.
- In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host computer on which you want to run the virtual machine. Click **OK**.

Results

When your virtual machine is created, the status changes to **Completed** in the **Action: VMware Create Virtual Machine from ISO** window. The new virtual machine is also displayed in the **Device List** of the **Virtualization Device Inventory**.

Modifying a VMware virtual machine

Using the **VMware Modify Virtual Machine** Task, you can modify the disk size, memory size, and number of processors of existing virtual machines from the IBM Endpoint Manager console.

Before you begin

You cannot modify templates using this procedure. Ensure that the analysis **VMware Host Overview** is active. If you need to activate this analysis, a warning message is displayed in the **VMware Modify Virtual Machine** Task. You cannot proceed without activating the analysis. After you activate the analysis, it can take a few minutes for the results to gather.

To check the status of the analyses, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. Ensure that the **Status** changes from **Not Activated** to **Activated Globally**. In the **Activate Analyses** list, click **Host Overview**. In the **Analysis: VMware Host Overview** window, click the **Results** tab. When the **Results** window

is populated with one or more computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

About this task

This Task is automatically populated with data from VMware. To work with other data, you need to turn off validation and enter your own values into the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see "Turning off validation in a Task" on page 69.

Complete the following steps to modify a virtual machine.

Procedure

1. Open the Server Automation domain
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration**. This opens the list of **Host Configuration** Tasks.
3. From the **Host Configuration** list, select **VMware Modify Virtual Machine**.
4. In the **Task: VMware Modify Virtual Machine** window, from the **Host** list, select the host on which the virtual machine that you want to modify is running.
5. From the **Virtual Machine Name** list, select the name of the virtual machine that you want to modify. If the virtual machine name that you want to modify is displayed more than once in the **Virtual Machine Name** list, you can verify that the virtual machine that you select is correct by viewing the **Virtual Machine UUID** and the **IP Address** field. If you want to modify a virtual machine that does not display in the **Virtual Machine Name** list, select **OFF** on the validation button for **Virtual Machine Name** in the **Validation** column. For example, if you want to modify a virtual machine that does not exist, but is scheduled to be created, you can turn off validation and enter the name of the virtual machine to be modified. You can then schedule the Task to take action when the virtual machine exists. If you disable validation for **Virtual Machine Name**, the validation for the **Power State** and **Disk Size** is also disabled. The validation for **Power State** and **Disk Size** is disabled because the IBM Endpoint Manager console cannot validate that the power state or disk size of a virtual machine name that has been entered while validation is disabled. You must ensure that the virtual machine name that you enter is correct or the Task fails in VMware.
6. You can use the **Power State** field to view whether the virtual machine that you want to work with is powered on or off. VMware only allows you to modify virtual machines that are powered off. However, if you want to modify a virtual machine that is currently powered on, but is scheduled to be powered off at a later stage, select **OFF** on the validation button for **Power State** in the **Validation** column. You can then schedule the Task to take action when the virtual machine is powered off.

7. From the **Disk Name** list, select the disk that you want to modify. You can use the **Maximum Size** field to view the maximum size that you can configure a virtual machine.
8. In the **Maximum file Size** field, you can view the maximum file size that can be allocated to a virtual machine that is created on the datastore. You cannot modify the disk size of the virtual machine to be greater than the maximum file size allowed for the datastore.
9. In the **Datastore free space** field, you can view the free space available on the datastore. You can add the value that is displayed in the **Datastore free space** field to the value that is displayed in the **Disk Size** field.
10. In the **Disk Size** field, enter the disk size that you want to allocate to your virtual machine. In VMware, you can only increase the disk size, you cannot decrease it. You cannot exceed the maximum file size configured for the datastore. You cannot exceed the free space available on the datastore. If you want to enter a value for the disk size that is greater than the size that is currently available on the datastore, select **OFF** on the validation button for the **Disk Size** in the **Validation** list. For example, if you know that virtual machines on the datastore are scheduled to be deleted and free disk capacity will become available, you can enter a greater disk size than that which is currently available. You can schedule the Task to take action when more disk space becomes available. You must ensure that this information is correct. You cannot modify a virtual machine with a provisioned disk size greater than the **Maximum file size** for the datastore even if you disable validation.
11. From the **Memory Size** list, select the memory size that you want to allocate to your virtual machine.
12. In the **Number of Virtual Processors** list, select the number of processors that you want to allocate to your virtual machine. You must enter a number greater than zero.
13. In the **Take Action** dialog box, ensure that **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host of the virtual machine that you want to modify and click **OK**.

Results

When your virtual machine is modified, the **Status** changes to **Completed** in the **Action: VMware Modify Virtual Machine** window.

Deleting a virtual machine

Using the **VMware Delete Virtual Machine** Task, you can delete VMware virtual machines from within the IBM Endpoint Manager console.

Before you begin

Ensure that the analysis **VMware Host Overview** is active. If this analysis must be activated, a warning message is displayed in the **VMware Delete Virtual Machine** Task. You cannot proceed without activating the analysis. Activating the analysis can take a few minutes.

To check the status of the analysis, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analyses** list, ensure that the **VMware Host Overview** analysis changes from **Not Activated** to **Activated Globally** and click the **VMware Host Overview** analysis. In the **Analysis: VMware Host Overview** window, click the **Results** tab. When the **Results** window is populated with one or more

computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values into the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see "Turning off validation in a Task" on page 69.

Complete the following steps to delete a virtual machine.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration**.
3. From the **Host Configuration** list, select the **VMware Delete Virtual Machine** Task.
4. In the **Task: VMware Delete Virtual Machine** window, from the **Host** menu, select the host on which the virtual machine is running.
5. From the **Virtual Machine Name** list, select the name of the virtual machine that you want to delete. If the virtual machine name that you want to delete is displayed more than once in the **Virtual Machine Name** list, you can verify that the virtual machine that you select is correct by viewing the **Virtual Machine UUID** and the **IP Address** fields. If you want to delete a virtual machine whose name does not display in the **Virtual Machine Name** list, select **OFF** on the validation button for **Virtual Machine Name** in the **Validation** column. If you disable validation for the **Virtual Machine Name** list, the validation for the **Power State** is also disabled and the **Virtual Machine UUID** is cleared. You must ensure that the virtual machine name that you enter is correct or the Task fails in VMware.
6. You can use the **Power State** field to view whether the virtual machine that you want to work with is powered on or off. You can delete virtual machines that are powered off. However, if you want to delete a virtual machine that is powered on, but is scheduled to be powered off at a later stage, select **OFF** on the validation button for **Power State** in the **Validation** column. You can then schedule the Task to take action when the virtual machine is powered off.
7. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host on which the virtual machine that you want to delete is running and click **OK**.

Results

When your virtual machine is deleted, the **Status** changes to **Completed** in the **Action: VMware Delete Virtual Machine Fixlet** window. In the **Device List** of the **Virtualization Device Inventory** and in the IBM Endpoint Manager console the virtual machine is still visible but is grayed-out.

Creating a Windows virtual machine from a template

Using the **VMware Create Windows Virtual Machine from Template** Task, you can create VMware virtual machines from a VMware template from within the IBM Endpoint Manager console.

Before you begin

You must activate the following analyses

- VMware Host Overview
- SSL Encryption Analysis for Windows Administrator Password

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German, and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

If you configured the VMware Management Extender with an ESX host, you cannot use this Task.

To create a virtual machine from a template, you must install VMware tools on the template that you want to use.

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values in the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see “Turning off validation in a Task” on page 69.

Complete the following steps to create a virtual machine from template.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration** to open the list of **Host Configuration** Tasks.
3. From the **Host Configuration** list, select **VMware Create Windows Virtual Machine from Template**. To create a virtual machine from a template, you must complete the following parameters. in the **Task: VMware Create Windows Virtual Machine from Template** window.
4. In the **Specification** section, enter values for the following parameters.

Host containing the Template

Select the host that contains the template that you want to use to create a virtual machine.

Template

Select the name of the template to be cloned. If the template that you want to work with is not listed, select **OFF** on the button in the **Validation** column. You must ensure that the template name that you enter is correct.

VMware Tools Installed

You can view whether VMware tools is installed. You can create virtual machines only from templates that have installed.

Virtual Machine Name

Enter the name of the new virtual machine to be created. Ensure that you use a unique name to avoid any confusion with duplicate names in the future.

Virtual Machine Host

Enter the name of the host on which you want the virtual machine to be located.

Datastore Name

Enter the name of the datastore in which you want to store the virtual machine configuration files.

Maximum file size (GB)

You can view the maximum file size, in gigabytes, that can be allocated to a virtual machine that is created on the datastore. You cannot create a virtual machine with a disk size that is larger than the maximum file size allowed for the datastore. If you select a template that has more than one hard disk, you must ensure that each hard disk has a provisioned disk size that does not exceed the maximum file size for the datastore.

Datastore free space (GB)

You can view the free space, in gigabytes, that is available on the datastore. The virtual machine provisioned disk size cannot exceed the free space size that is available on the datastore.

Provisioned Disk size (GB)

You can view the disk size, in gigabytes, that is provisioned for the template that you selected. If you want to use a template that has a greater disk size than the free space on the datastore, select **OFF** on the validation button in the **Validation** column for **Provisioned Disk size (GB)**. For example, if you know that virtual machines on the datastore are scheduled to be deleted and free disk capacity becomes available, you can disable validation and use the template with a greater disk size than that that is available. You can schedule the Task to take action when more disk space becomes available. You must ensure that the data that you provide is correct. You cannot create a virtual machine with a provisioned disk size greater than the **Maximum file size** for the datastore even if you disable validation. You cannot create a virtual machine with a provisioned disk size greater than the Maximum file size for the datastore even if you disable validation.

Memory Size (MB)

You can view the memory size, in megabytes, that are available for your virtual machine.

Number of Virtual Processors

You can view the number of processors that are allocated to your virtual machine.

Power On VM

Select whether you want the new virtual machine to be powered on or off on creation. The default power setting for the new virtual machine is off.

5. In the **Registration Information** section, enter values for the following parameters.

Owner Name

Enter the name of the owner of the new virtual machine.

Organization Name

Enter the organization name of the new virtual machine.

6. In the **Computer Name** section, enter values for the following parameter.

NetBIOS Name

Enter the computer name for the new virtual machine when it is shown on the network. Ensure that you give the computer a slightly different name than the virtual machine name to distinguish them in a list.

7. In the **Windows License**, enter values for the following parameter.

Product Key

Enter the product license key for the Windows operating system for the new virtual machine. You are not required to enter the license key before you create the virtual machine from template. You can also enter the product key after the virtual machine is created.

8. In the **Administrator Password** section, enter values for the following parameters.

Windows administrator Password

Enter a Windows administrator password. The password can contain only alphanumeric characters.

Confirm Windows administrator Password

Reenter the administrator password to confirm.

Auto Login Attempts

Enter the number of times that you want to allow the computer to restart without entering the password. The default value is 1.

9. In the **Time Zone** section, select a timezone with the following parameter.

TimeZone

Select the time zone that you want to set for the new virtual machine.

10. From the **Network Configuration** list, select whether you want a typical or custom configuration.

- a. Select **Typical** for DHCP configuration.
- b. If you select **Custom**, you must enter information into the following parameters.

Network Adaptor

Select the network adapter that you want to configure with your custom configurations. The other network adapters are configured with typical settings.

Network Adaptor Configuration

Select whether you want DHCP or static IP configuration. If you select static IP configuration, the parameters below the Network Adaptor Configuration list become editable and you must complete the following parameters.

IP Address

Enter the fixed IP address for your new virtual machine. Only IPv4 is supported.

Subnet Mask

Enter the subnet mask of the network that you want to use for your new virtual machine.

Default Gateway

Enter the default gateway for your new virtual machine.

Alternative Gateway

Enter an alternative gateway for your new virtual machine.

Preferred DNS

Enter the preferred DNS for your new virtual machine.

Alternative DNS

Enter an alternative DNS for your new virtual machine.

11. In the **Workgroup or Domain** section, enter values for the following parameters.

Join Domain or Workgroup

Select whether you want to assign the new virtual machine to a Windows workgroup or a domain. If you select Workgroup, enter a value in the **Workgroup** parameter. If you select Domain, enter values in the **Domain Domain user name** and **Domain Password** parameters.

WorkGroup

Enter the Windows workgroup to which you want to assign the new virtual machine.

Domain

Enter the domain name to which you want to assign the new virtual machine.

Domain user name

Enter the user name with to associate with the new virtual machine in the domain.

Domain Password

Enter the password that corresponds with the domain user name.

12. Click **Take Action**. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host computer on which you want to create the virtual machine. Click **OK**.

Results

In the **Action: VMware Create Windows Virtual Machine from Template** window, when the **Status** changes to **Complete** the virtual machine is created. The new virtual machine is also visible in the **Device List** of the **Virtualization Device Inventory**.

For information about how to create a template with a preinstalled Endpoint Manager Client, see <http://www-01.ibm.com/support/docview.wss?uid=swg21505996>.

Creating a Linux virtual machine from template

Using the **VMware Create Linux Virtual Machine from Template** Task, you can create a new Linux virtual machine using a VMware template within the IBM Endpoint Manager console.

Before you begin

You must ensure that the analysis **Host Overview** is active. If this analysis is not activated, a warning message is displayed in the **VMware Create Linux Virtual Machine from Template** Task. You cannot create the virtual machine from template without activating this analysis. After you activate the analysis, it can take a few minutes to gather. To check the status of the analysis, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analysis** list, check that the **Status** of the analysis changes from **Not Activated** to **Activated Globally**. In the **Activate**

Analysis list, you must select **Host Overview** and click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is gathered. If any of the computer names displays the message "not reported", the analysis is not gathered.

To create a virtual machine from a template, you must install VMware tools on the template that you want to use.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

If you configured the VMware Management Extender with an ESX host, you cannot use this Task.

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values in the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see "Turning off validation in a Task" on page 69.

Complete the following steps to create a Linux virtual machine from template.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization** > **Host Management** > **Host Configuration** to open the list of **Host Configuration** Tasks.
3. From the **Host Configuration** list, select the **VMware Create Linux Virtual Machine from Template** Task. To create a virtual machine from a template, you must complete the following parameters in the **Task: VMware Create Linux Virtual Machine from Template** window. If you are working with a copied Task, click Take Action and enter the required information when you are prompted by the alert boxes.

Table 17. Create Linux Virtual Machine from Template parameters

Parameter name	Description
Host containing the Template	Select the host that contains the template that you want to use to create a virtual machine.
Template	Select the name of the template that you want to use to create a virtual machine. If the template that you want to work with is not listed, select OFF on the button in the Validation column and enter the name of the template that you want to use. You must ensure that the template name that you enter is correct.
VMware Tools Installed	You can view whether or not VMware tools is installed. You can only create virtual machines from templates which have VMware tools installed.

Table 17. Create Linux Virtual Machine from Template parameters (continued)

Parameter name	Description
Virtual Machine Name	Enter the name of the new virtual machine to be created. Ensure that you use a unique name to avoid any confusion with duplicate names in the future.
Virtual Machine Host	Enter the name of the host on which you want the virtual machine to run.
Datastore Name	Enter the name of the datastore in which you want to store the virtual machine configuration files.
Maximum file size	You can view the maximum file size, in gigabytes, that can be allocated to a virtual machine that is created on the datastore. You cannot create a virtual machine with a disk size that is larger than the maximum file size allowed for the datastore. If you select a template which has more than one hard disk, you must ensure that each hard disk has a provisioned disk size that does not exceed the maximum file size for the datastore.
Datastore free space	You can view the free space, in gigabytes, that is available on the datastore. The virtual machine provisioned disk size cannot exceed the free space size that is available on the datastore.
Power On VM	Select whether you want the new virtual machine to be powered on or off on creation. The default power setting for the new virtual machine is off.
Provisioned Disk size (GB)	You can view the disk size, in gigabytes, that is provisioned for the template that you selected. If you want to use a template that has a greater disk size than the free space on the datastore, select OFF on the validation button in the Validation column for Provisioned Disk size (GB) . For example, if you know that virtual machines on the datastore are scheduled to be deleted and free disk capacity will become available, you can disable validation and use the template with a greater disk size than that which is available. You can schedule the Task to take action when more disk space becomes available. You must ensure that the data that you provide is correct. You cannot create a virtual machine with a provisioned disk size greater than the Maximum file size for the datastore even if you disable validation.
Memory Size (MB)	You can view the memory size, in megabytes, that is allocated for your virtual machine.
Number of Virtual Processors	You can view the number of processors that are allocated to your virtual machine.
Computer Name	Enter the computer name for the new virtual machine as it would appear on the network.
Domain Name	Enter the domain name for the new virtual machine.
Timezone Area	Select a region which contains the time zone that you want to use for the virtual machine. For more information on time zones, see the following VMware documentation: http://www.vmware.com/support/developer/vc-sdk/visdk400pubs/ReferenceGuide/timezone.html
Timezone location	Enter the location of the time zone that you want to use for the virtual machine.
Hardware Clock Setting	Select whether the Hardware clock should be set to UTC or local time.

4. From the **Network Configuration** list, select whether you want a typical or custom configuration. Whether you choose typical or custom configuration, you must enter the DNS search path for your new virtual machine in the **DNSSearchPath** field.
 - a. Select **Typical** if you want all network adaptors to be configured with DHCP configuration.
 - b. Select **Custom** to manually configure one network adaptor. If you select **Custom**, you must enter information into the following parameters.

Table 18. Custom Network Configuration requirements

Parameter name	Description
Network Adaptor	Select the network adaptor that you want to configure with your custom configurations. The other network adaptors are configured with DHCP configuration.
Network Adaptor Configuration	Select whether you want DHCP or static IP configuration. If you select static IP configuration, the parameters below the Network Adaptor Configuration list become editable and you must complete the following parameters.
IP address (Static IP configuration only)	Enter the fixed IP address for your new virtual machine. Only IPv4 is supported.
Subnet Mask (Static IP configuration only)	Enter the subnet mask of the network that you want to use for your new virtual machine. Only IPv4 is supported.
Default Gateway (Static IP configuration only)	Enter the preferred gateway for your new virtual machine. This field is optional.
Alternative Gateway (Static IP configuration only)	Enter an alternative gateway for your new virtual machine. This field is optional.

5. For both static and custom network configuration, you can enter a **Primary DNS**, **Secondary DNS** and **Tertiary DNS** for your new virtual machine. These fields are optional.
6. When you complete the form, click **Take Action**.
7. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host computer on which you want to create the virtual machine. To schedule a task to run at a specific time, select the **Execution** tab in the **Take Action** dialog box and enter the scheduling information in the **Constraints** menu. Click **OK**.

Results

When the new virtual machine is created, the **Status** changes to **Completed** in the **Action: VMware Create Linux Virtual Machine from Template** window. The new virtual machine is also visible in the **Device List** of the **Virtualization Device Inventory**

Refreshing the ISO images

Using the **VMware ISO Image Refresh** Task, you can refresh the list of ISO images in the VMware datastore and update the list in the IBM Endpoint Manager

console. You can work with your ISO images in IBM Endpoint Manager console faster than having to wait for an automatic refresh which occurs every 24 hours.

Before you begin

You must ensure that the analysis **Host Overview** is active. If this analysis is not activated, a warning message is displayed in the **VMware ISO Image Refresh** Task. You cannot proceed without activating the analysis **Host Overview**. After you activate the analysis, it can take a few minutes to gather. To check the status of the analysis, from the navigation tree in the Domain Panel, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analysis** list, ensure that the **Status** changes from **Not Activated** to **Activated Globally**. From the **Activate Analysis** list, select the **Host Overview** analysis. In the **Analysis: VMware Host Overview** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is activated. If any of the computer names displays the message "not reported", the analysis is not gathered.

This Task refreshes the ISO images list from a single datastore. You must run this Task on every datastore that has ISO images that you want to view.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

About this task

Complete the following steps to refresh ISO images in a datastore.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration**.
3. From the **Host Configuration** list, select the **VMware ISO Image Refresh** Task.
4. In the **Task: VMware ISO Images Refresh** window, select the **Host** and **Datastore** name that contains the list of ISO files that you want to refresh is stored and click **Take Action**.
5. In the **Take Action** dialog box, target the host on which your ISO images are stored and click **OK**.

Results

When the list of ISO images is refreshed and the updated list of ISO images is available in the IBM Endpoint Manager console, the **Status** changes to **Complete** in the **Action: VMware ISO Images Refresh** window.

Turning off validation in a Task

Some of the Host management Tasks within the Server Automation domain contain a Validation button which you can use to disable validation and enter your own data for some of the parameters.

The Host management Tasks in the Server Automation domain contain forms which are automatically populated with data from VMware which you must complete to take action. However, on occasion, the data can either be out of date,

or you might need to work with data that does not currently exist but is scheduled to exist at a specific time in the future. If you must work with data that is not populated within the Task, you can disable validation.

You can check whether you can disable validation in the **Validation** column in the Task. If there is an **ON/OFF** button in the **Validation** column for the parameter that you want to work with, you can select **OFF** to disable validation. For example, if you want to modify a virtual machine that is powered on but is scheduled to be powered off, you can select **OFF** on the button in the **Validation** column for **Power State** and schedule the Task to take action when the virtual machine is powered off.

For some parameters, you can both disable validation and enter your own values. For example, if you want to modify a virtual machine that is not in the **Virtual Machine Name** list because it does not exist, but is scheduled to be created, you can select **OFF** on the button in the **Validation** column and enter the name of the virtual machine that you want to modify.

Disable validation only if you can ensure that your data is correct. When you disable validation on a parameter and take action, the IBM Endpoint Manager console does not verify whether the parameter contains valid data. If invalid data is used, the Task fails in VMware.

If you disable validation for a parameter, other parameters which are dependent on that parameter might be affected. For example, in the **VMware Modify Virtual Machine** Task, if you disable the **Virtual Machine Name** parameter, the **Power State** and the **Disk size** parameters are also disabled. The validation on these parameters is disabled because the IBM Endpoint Manager console cannot validate the power state or the disk size of a virtual machine that is not listed.

Converting a virtual machine to a template

Using the **VMware Convert Virtual Machine to Template** Task, you can convert a VMware virtual machine to a template from the IBM Endpoint Manager console.

Before you begin

Ensure that the analysis **VMware Host Overview** is active. If this analysis must be activated, a warning message is displayed in the **VMware Convert Virtual Machine to Template** Task. You cannot proceed without activating the analysis. Activating the analysis can take a few minutes.

To check the status of the analysis, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analyses** list, ensure that the **VMware Host Overview** analysis changes from **Not Activated** to **Activated Globally** and click the **VMware Host Overview** analysis. In the **Analysis: VMware Host Overview** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is gathered. If any of the computer names display the message "not reported", the analysis is not gathered.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

If you configured the VMware Management Extender with an ESX host, you cannot use this Task.

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values into the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see “Turning off validation in a Task” on page 69.

Complete the following steps to convert a virtual machine to a template.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration**.
3. From the **Host Configuration** list, select the **VMware Convert Virtual Machine to Template** Task. If you are working with a copied Task, click **Take Action** and enter the required information when you are prompted by the alert boxes.
4. In the **Task: VMware Convert Virtual Machine to Template** window, from the **Host** list, select the host on which the virtual machine is running.
5. From the **Virtual Machine Name** list, select the name of the virtual machine that you want to convert. If the virtual machine name that you want to convert is displayed more than once in the **Virtual Machine Name** list, you can verify that the virtual machine that you select is correct by viewing the **Virtual Machine UUID** field and the **IP Address** field. If you want to convert a virtual machine whose name is not displayed in the **Virtual Machine Name** list, select **OFF** on the validation button for **Virtual Machine Name** in the **Validation** column. If you disable validation for the **Virtual Machine Name** list, the **Virtual Machine UUID** field is cleared. You must ensure that the virtual machine name that you enter is correct or the Task fails in VMware. For more information, see Turning off validation in a Task
6. You can use the **Power State** field to view whether the virtual machine that you want to convert is powered on or off. VMware allows you to convert only virtual machines that are powered off. However, if you want to convert a virtual machine that is powered on, but is scheduled to be powered off at a later stage, select **OFF** on the validation button for **Power State** in the **Validation** column. You can then schedule the Task to take action when the virtual machine is powered off.
7. When the form is completed, click **Take Action**.
8. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host on which the virtual machine is stored and click **OK**.

Results

When your virtual machine is converted, the **Status** changes to **Completed** in the **Action: VMware Convert Virtual Machine to Template** window. The new template is visible in the **Device List** window of the **Virtualization Device Inventory** and in the **Computers** window in the All Content domain.

Cloning a virtual machine to a template

Using the **VMware Clone Virtual Machine to Template** Task, you can clone a VMware virtual machine to a template from within the IBM Endpoint Manager console.

Before you begin

Ensure that the analysis **VMware Host Overview** is active. If this analysis must be activated, a warning message is displayed in the **VMware Clone Virtual Machine to Template** Task. You cannot proceed without activating the analysis. Activating the analysis can take a few minutes.

To check the status of the analysis, from the navigation tree in the Server Automation domain, click **Virtualization > Setup and Maintenance > Activate Analyses**. In the **Activate Analyses** list, ensure that the **VMware Host Overview** analysis changes from **Not Activated** to **Activated Globally** and click the **VMware Host Overview** analysis. In the **Analysis: VMware Host Overview** window, click the **Results** tab. When the **Results** window is populated with one or more computer names, the analysis is gathered. If any of the computer names display the message "not reported", the analysis is not gathered.

For non English users, VMware vCenter only supports, Simplified Chinese, Japanese, German and French. You can only use this Task if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

For non-English users: VMware vCenter supports only Simplified Chinese, Japanese, German and French. You can use this Task only if the console language that you selected in IBM Endpoint Manager console is identical to the console language selected in VMware.

If you configured the VMware Management Extender with an ESX host, you cannot use this Task.

About this task

This Task is automatically populated with data from VMware. To work with other data, you must turn off validation and enter your own values into the parameter field. To override the data that is provided in the form, check whether a button exists in the **Validation** column to the left of the parameter that you want to disable and select **OFF**. For more information, see "Turning off validation in a Task" on page 69.

Complete the following steps to clone a virtual machine to a template.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Host Management > Host Configuration**.
3. From the **Host Configuration** list, select the **VMware Clone Virtual Machine to Template** Task. If you are working with a copied Task, click **Take Action** and enter the required information when you are prompted by the alert boxes.
4. In the **Task: VMware Clone Virtual Machine to Template** window, from the **Virtual Machine Host** list, select the host on which the virtual machine that you want to clone is running.

5. From the **Virtual Machine Name** list, select the name of the virtual machine that you want to clone. If the virtual machine name that you want to clone is displayed more than once in the **Virtual Machine Name** list, you can verify that the virtual machine that you select is correct by viewing the **Virtual Machine UUID** field and the **IP Address** field. If you want to clone a virtual machine whose name is not displayed in the **Virtual Machine Name** list, select **OFF** on the validation button for **Virtual Machine Name** in the **Validation** column. If you disable validation for the **Virtual Machine Name** list, the validation for the **Provisioned Disk size** is also disabled and the **Virtual Machine UUID** field is cleared. You must ensure that the virtual machine name that you enter is correct or the Task fails in VMware. For more information, see Turning off validation in a Task
6. In the **Template Name** field, enter the name of the new template.
7. From the **Template Host** list, select a host for the new template.
8. From the **Datastore Name** list, select a datastore for the new template.
9. In the **Maximum file size** field, you can view the maximum file size that can be allocated to a virtual machine that is created on the datastore. You cannot clone a virtual machine that is larger than the maximum file size allowed for the datastore. If you select a template which has more than one hard disk, you must ensure that each hard disk has a provisioned disk size that does not exceed the maximum file size for the datastore.
10. In the **Datastore free space** field, you can view the free space available on the datastore. The virtual machine provisioned disk size cannot exceed the freespace size that is available on the datastore.
11. In the **Provisioned Disk size** field, you can view the disk space that is allocated to the new template. If you want to clone a virtual machine to template that has a greater provisioned disk size than the maximum size available in the **Datastore free space** field, select **OFF** on the validation button for **Provisioned Disk size** in the **Validation** column and enter a higher value. For example, if you know that virtual machines on the datastore are scheduled to be deleted and free disk capacity will become available, you can clone a new template that has a disk size greater than the maximum free space that is available. You can then schedule the task to run at a time when the greater disk size is available. You must ensure that this data is correct or the tasks fails in VMware. You cannot create a virtual machine with a provisioned disk size greater than the Maximum file size for the datastore even if you disable validation.
12. When you complete the form, click **Take Action**.
13. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected and from the list of **Computer Names**, select the host on which you want the new template to be created and click **OK**.

Results

When your virtual machine is cloned, the **Status** changes to **Completed** in the **Action: VMware Clone Virtual Machine to Template** window. The new template is visible in the **Device List** window of the **Virtualization Device Inventory** and in the **Computers** window in the All Content domain.

Snapshot management tasks

Using these tasks you can create and manage VMware snapshots from the IBM Endpoint Manager console.

Creating a snapshot

Using the **Create Snapshot** Task, you can create a snapshot of a virtual machine from within the IBM Endpoint Manager console. Creating a snapshot captures an image of a virtual machine at a certain time. This snapshot can contain the disk, memory, and device state of a virtual machine at the time of creation.

Before you begin

Ensure that each snapshot that you create has a unique name.

About this task

Complete the following steps to create a snapshot.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Create Snapshot**.
4. In the **Task: Create a Snapshot** window, click **Take Action**.
5. In the **Action Parameter** window, enter the name that you want to give your snapshot and click **OK**. Ensure that you give the snapshot a unique name.
6. From the **Computer Name** list, select the virtual machine of which you want to create a snapshot.

Results

When you successfully create a snapshot of a virtual machine, the **Status** changes to **Completed** in the **Action: Create Snapshot** window.

Renaming a snapshot

Using the **Rename Snapshot** Task, you can rename a snapshot of a virtual machine from the IBM Endpoint Manager console.

Before you begin

You must have at least one snapshot of a VMware virtual machine.

About this task

Complete the following steps to rename a snapshot.

Procedure

1. Open the **Automation** domain.
2. From the navigation tree in the **Automation** domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Rename Snapshot**.
4. In the **Task: Rename Snapshot** window, click **Take Action**.
5. In the **Action Parameter** window, enter the name of the snapshot that you want to rename and click **OK**.
6. In the **Action Parameter** window, enter the new snapshot name and click **OK**.
7. From the **Computer Name** list, target the virtual machine of which the snapshot was taken and click **OK**.

Results

When the snapshot is renamed, the **Status** changes to **Completed** in the **Action: Rename Snapshot** window.

Removing a snapshot

Using the **Remove Snapshot** Task, you can remove an individual snapshot of a virtual machine. This Task does not support the removal of hierarchical snapshots.

Before you begin

You must have at least one snapshot of a virtual machine.

About this task

Complete the following steps to remove a snapshot.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Remove Snapshot**.
4. In the **Task: Remove Snapshot** window, click **Take Action**.
5. In the **Action Parameter** window, enter the name of the snapshot that you want to remove and click **OK**.
6. From the **Computer Name** list, select the computer of which the snapshot is taken and click **OK**.

Results

When the snapshot is removed, the **Status** changes to **Completed** in the **Action: Remove Snapshot** window.

Removing all snapshots

Using the **Remove All Snapshots** Task, you can remove all the snapshots of a virtual machine from the IBM Endpoint Manager console.

Before you begin

You must have one or more existing snapshots of a virtual machine.

About this task

Complete the following steps to remove all snapshots of a virtual machine.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Remove All Snapshots**.
4. In the **Task: Remove All Snapshots** window, click **Take Action**.
5. In the **Take Action** dialog box, target the computer of which the snapshots were created and click **OK**.

Results

When the snapshots are removed, the **Status** changes to **Completed** in the **Action: Remove All Snapshots** window.

Go to Snapshot

Using the **Go To Snapshot** Task, you can go to a user-defined snapshot of a VMware virtual machine from within the IBM Endpoint Manager console.

Before you begin

You must have one or more existing snapshots for the VMware virtual machine to use this Task.

About this task

Complete the following steps to go to a snapshot.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Go To Snapshot**.
4. In the **Action Parameter** window, enter the name of the snapshot that you want to go to and click **OK**.
5. In the **Take Action** dialog box, target the computer of which the snapshot that you want to work with was created and click **OK**.

Results

When you successfully move to a different snapshot, the **Status** changes to **Completed** in the **Action: Go To Snapshot** window.

Reverting a Snapshot

Using the **Revert Snapshot** Task, you can revert to the current snapshot of the VMware virtual machine from the IBM Endpoint Manager console.

Before you begin

You must have at least one snapshot of the VMware virtual machine.

This Task does not create a snapshot before it reverts to the original snapshot of a VMware virtual machine.

About this task

Complete the following steps to revert a snapshot.

Procedure

1. Open the Server Automation domain
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Snapshot Configuration**.
3. From the **Snapshot Configuration** list, select **Revert Snapshot**.

4. In the **Take Action** dialog box, target the computer of which the snapshot is created and click **OK**.

Results

When the snapshot is reverted, the **Status** changes to **Completed** in the **Action: Revert Snapshot** window.

Power management tasks

Using these tasks you can manage the power state of your VMware virtual machines. Using VMware, you can power off, suspend, and restart your virtual machines in two different ways: soft and hard. When you perform a power operation on a virtual machine with VMware Tools that are installed on the virtual machine, it is referred to as soft. When you perform a power operation by immediately stopping the virtual machine, it is referred to as hard. You can perform both hard and soft power operations on VMware virtual machines from within the IBM Endpoint Manager console.

Powering on a VMware virtual machine

Using the **Power On VM** Task, you can power on VMware virtual machines from the IBM Endpoint Manager console.

About this task

Complete the following steps to power on a VMware virtual machine.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization** > **Virtual Machine Management** > **Power Configuration**.
3. From the **Power Configuration** list, select **Power On VM**.
4. In the **Task: Power On VM** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. From the **Computer Name** list, select the virtual machine that you want to power on and click **OK**.

Results

When you successfully power on the virtual machine, the status changes to **Completed** in the **Action: VMware Power On Virtual Machine** window.

Powering off a VMware virtual machine (hard)

Using VMware, you can power off your virtual machines in two different ways: power off (soft) and power off (hard). When a virtual machine is powered off using VMware tools that are installed on the virtual machine, it is referred to in VMware as power off (soft). When a virtual machine is powered off by immediately stopping it, it is referred to in VMware as a power off (hard). You can power off VMware virtual machines from within the IBM Endpoint Manager console.

About this task

Complete the following steps to power off a virtual machine (hard).

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Power Configuration** list, select **Power Off VM (hard)**.
4. In the **Task: Power Off VM (hard)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to power off, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is powered off, the **Status** changes to **Completed** in the **Action: Power Off VM (hard)** window.

Powering off a VMware virtual machine (soft)

Using VMware, you can power off your virtual machines in two different ways: power off (soft) and power off (hard). When you power off a virtual machine with VMware tools that are installed on the virtual machine, it is referred to as power off (soft). When a virtual machine is powered off by immediately stopping it, it is referred to as a power off (hard). You can perform both hard and soft power off operations on VMware virtual machines from within the IBM Endpoint Manager console.

Before you begin

To power off (soft) a virtual machine, you must have VMware tools installed on the guest operating system of the virtual machine.

About this task

Complete the following steps to power off a VMware virtual machine (soft).

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Power Configuration** list, select the **Power Off VM (soft)** Task.
4. In the **Task: Power Off VM (soft)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to power off, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is powered off, the **Status** changes to **Completed** in the **Action: Power Off VM (soft)** window.

Restarting a VMware virtual machine (hard)

Using VMware, you can restart your virtual machines in two different ways: restart (soft) and restart (hard). When you restart a virtual machine with VMware tools that are installed on the virtual machine, it is referred to in VMware as restart (soft). When you restart a virtual machine by immediately restarting it, it is referred to in VMware as a restart (hard). You can perform both hard and soft restart operations on VMware virtual machines from the IBM Endpoint Manager console.

About this task

Complete the following steps to restart a virtual machine (hard).

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Power Configuration** list, select **Restart VM (hard)**.
4. In the **Task: Restart VM (hard)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to restart, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is restarted the **Status** changes to **Completed** in the **Action: Restart VM (hard)** window.

Restarting a VMware virtual machine (soft)

Using VMware, you can restart your virtual machines in two different ways: restart (soft) and restart (hard). When you restart a virtual machine with VMware tools that are installed on the virtual machine, it is referred to as restart (soft). When you restart a virtual machine by immediately restarting it, it is referred to as a restart (hard). You can perform both hard and soft restart operations on VMware virtual machines from the IBM Endpoint Manager console.

Before you begin

To restart (soft) a virtual machine, you must have VMware tools installed on the guest operating system of the virtual machine.

About this task

Complete the following steps to restart a VMware virtual machine (soft)

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > Virtual Machine Management > Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Power Configuration** list, select **Restart VM (soft)**.

4. In the **Task: Restart VM (soft)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to restart, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is restarted, the **Status** changes to **Completed** in the **Action: Restart VM (soft)** window.

Suspending a VMware virtual machine (hard)

Using VMware, you can suspend your virtual machines in two different ways: suspend (soft) and suspend (hard). When you suspend a virtual machine with VMware tools that are installed on the virtual machine, it is referred to in VMware as suspend (soft). When you suspend a virtual machine by immediately suspending it, it is referred to in VMware as a suspend (hard). You can perform both hard and soft suspend operations on VMware virtual machines from the IBM Endpoint Manager console.

About this task

Complete the following steps to suspend a VMware virtual machine (hard).

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization** > **Virtual Machine Management** > **Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Tasks** list, select **Suspend VM (hard)**.
4. In the **Task: Suspend VM (hard)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to suspend, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is suspended, the **Status** changes to **Completed** in the **Action: Suspend VM (hard)** window.

Suspending a VMware virtual machine (soft)

Using VMware, you can suspend your virtual machines in two different ways: suspend (soft) and suspend (hard). When you suspend a virtual machine with VMware tools that are installed on the VMware virtual machine, it is referred to in VMware as suspend (soft). When you suspend a virtual machine by immediately suspending it, it is referred to in VMware as a suspend (hard). You can perform both hard and soft suspend operations on VMware virtual machines from the IBM Endpoint Manager console.

Before you begin

To suspend (soft) a virtual machine, you must have VMware tools installed on the guest operating system of the virtual machine.

About this task

Complete the following steps to suspend a VMware virtual machine (soft)

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization** > **Virtual Machine Management** > **Power Configuration** to open the list of **Power Configuration** Tasks.
3. From the **Power Configuration** list, select **Suspend VM (soft)**.
4. In the **Task: Suspend VM (soft)** window, click **Take Action**.
5. In the **Take Action** dialog box, ensure **Specific computers selected in the list below** is selected.
6. To target a virtual machine to suspend, select a virtual machine from the **Computer Name** list and click **OK**.

Results

When the virtual machine is suspended, the status changes to **Completed** in the **Action: Suspend VM (soft)** window.

AIX NIM

You can setup and configure management extender plug-in for AIX NIM. You can then create and remove NIM Clients and Mksysb images on a NIM master server from within the IBM Endpoint Management console.

Setup and Maintenance

Use the information in this section for instructions and important information about how to set up the virtualization environment for AIX NIM.

Before you begin the setup, you must activate the **Management Extender Status** analysis. To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization** > **Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

To use the AIX NIM tasks, you must activate the **AIX NIM Overview** analysis. To activate the analysis, in the Domain Panel of the Server Automation domain, select > **Virtualization** > **AIX NIM** > **Setup and Configuration** > **Activate Analyses**. Select **AIX NIM Overview** and click **Activate**. It is good practise to activate the analysis before you begin to work with the AIX NIM tasks.

Deploying an AIX NIM management extender

Using the **Deploy Management Extender for AIX NIM** task, you can deploy the management extender plug-in for AIX NIM.

Before you begin

Important: Before you install the management extender plug-in, you must install the latest version of the proxy agent with a separate Fixlet®. In the BES Support site, run the latest version of the **Install Proxy Agent** Fixlet to install the proxy agent.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

About this task

If you want to create or remove NIM Clients, netboot logical partitions (LPARs), or create a Mksysb image, you must deploy and configure the management extender plug-in for AIX NIM.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel of the Server Automation domain, select **Virtualization > AIX NIM > Setup and Maintenance > Deploy AIX NIM Components** and select the **Deploy Management Extender for AIX NIM** task.
3. From the **Management Extender Host** list, select the host on which you want to deploy the management extender.
4. In the **Management Extender Plug-in Name** field, enter a name for the AIX NIM management extender that is 32 characters or less. You cannot create a name with the following characters `*?<>\/:|` or enter spaces. You must enter a unique name for every plug-in that you deploy to the IBM Endpoint Manager server.
5. Click **Take action**. In the **Take Action** dialog box, select the management extender host on which you want to deploy a management extender plug-in for AIX NIM and click **OK**.

Results

In the **Action: Management Extender for AIX NIM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender plug-in for AIX NIM is deployed.

Configuring an AIX NIM management extender

Using the **Configure Management Extender for AIX NIM** task, you can configure a management extender plug-in for AIX NIM.

Before you begin

To configure the management extender plug-in with an AIX NIM system, you must use the root credentials.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel of the Server Automation domain, select **Virtualization > Setup and Maintenance > AIX NIM > Configure Management Extender** and select the **Configure Management Extender for AIX NIM** task.
3. In the **Connection Details** section, enter values for the following parameters

Management Extender Host

Select the host that contains the management extender that you want to configure with an AIX NIM system.

Filter AIX NIM Plug-ins

Select whether you want to filter the list to display only unconfigured management extender plug-ins.

Management Extender Name

Select the management extender that you want to configure with an AIX NIM system.

Discovery refresh interval

Enter the frequency, in minutes, in which a full discovery is performed. You must enter a frequency of 45 minutes or longer.

NIM Server

Enter the IP address or DNS name of the NIM server with which you want to configure the management extender. The default SSH port is 22. To control which SSH port is used to contact the server, add a colon to the end of the IP address or DNS name and enter the port number. Valid port numbers are 1 - 65534. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

NIM User Name

Enter the user name with which you want to connect to the NIM server. You must use the root credentials to configure the management extender plug-in with a NIM server.

NIM Password

Enter the password that corresponds with the user name that you entered.

4. In the **Command Execution Options** section, if the NIM user name that you entered does not have the permissions to run scripts on the NIM server, enter your root credentials to the following parameters.

Enable SU

Select whether you want to enter a root password to run all scripts on the NIM server with SU. If the user name and password that you entered above cannot connect to the NIM with SSH, you must select True to enable SU. If you select True, you can enter a root password in the **Root Password** field.

Root Password

Enter the root password for the NIM server.

Confirm Root Password

Enter the root password again to confirm.

5. Click **Take Action**. In the **Take Action** dialog box, select the IBM Endpoint Manager server on which the management extender that you want to configure is located

Results

In the **Action: Configure Management Extender for AIX NIM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender plug-in is configured with the AIX NIM system.

Note: If this task fails to complete, check the log files. If the log file contains information about the corruption of the signed XML, or a mismatch between the stored checksum and the script checksum, you must remove and redeploy the management extender.

Upgrading an AIX NIM management extender

Using the **Upgrade Management Extender for AIX NIM Plugin** task, you can upgrade a management extender plug-in for AIX NIM.

Before you begin

Important: You cannot use this task to upgrade the proxy agent. You must upgrade the proxy agent with a separate Fixlet. In the BES Support site, run the latest version of the **Update Windows Proxy Agent** Fixlet to upgrade the proxy agent.

Before you can run the **Upgrade Management Extender for AIX NIM Plugin** task, you must configure the management extender that you want to upgrade.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel of the Server Automation domain, select **Virtualization > AIX NIM > Setup and Maintenance > Upgrade AIX NIM Components** and select the **Upgrade Management Extender for AIX NIM Plugin** task.
3. From the **Management Extender Host** list, select the IBM Endpoint Manager server on which the management extender plug-in that you want to upgrade is located.
4. From the **Management Extender Name** list, select the management extender that you want to upgrade.
5. Click **Take Action**. In the **Take Action** dialog box, select the IBM Endpoint Manager server on which the management extender that you want to upgrade is located.

Results

In the **Action: Upgrade Management Extender for AIX NIM Plugin** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender plug-in is upgraded.

Removing an AIX NIM management extender

Using the **Remove Management Extender for AIX NIM** task, you can remove the management extender plug-in for AIX NIM.

Before you begin

Important: This task removes the management extender plug-in. The proxy agent is not removed as part of this task. In the BES Support site, run the latest version of the **Uninstall Windows Proxy Agent** Fixlet to remove the proxy agent.

You must activate the following analysis

- **Management Extender Status**

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel of the Server Automation domain, select **Virtualization > AIX NIM > Setup and Maintenance > Remove AIX NIM Components** and select the **Remove Management Extender for AIX NIM** task.
3. From the **Management Extender Host** list, select the host from which you want to remove the management extender.
4. From the **Management Extender Plug-in Name** list, select the management extender that you want to remove.
5. Click **Take Action**. In the **Take Action** dialog box, select the IBM Endpoint Manager server from which you want to remove the management extender plug-in and click **OK**.

Results

In the **Action: Remove Management Extender for AIX NIM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender plug-in is removed from the IBM Endpoint Manager server.

AIX NIM Tasks

Use the following section to find information about how to create and remote NIM Clients on a NIM master server. You can also create a Mksysb image on a NIM server. These tasks are run on the AIX NIM server.

Creating a NIM client for an LPAR on a NIM server

Using the **AIX NIM Create a Client for a Logical Partition (LPAR) on a NIM Master Server** task, you can create a NIM client on a NIM server. The client that you create is associated to an operating system image on the NIM server. When a new client is created, the client copies the image and any required start information that is defined on the client. When you netboot the LPAR, the operating system image is deployed to the LPAR at this stage.

Before you begin

You must activate the following analysis:

- AIX NIM Overview

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > AIX NIM > Setup and Maintenance** and select **AIX NIM Overview**. In the **Analysis: AIX NIM Overview** pane, select **Activate**.

Procedure

1. Open the Server Automation domain
2. In the Domain Panel, click **Virtualization > AIX NIM > NIM Operations** and select the **AIX NIM Create a NIM client for a Logical Partition (LPAR) on a NIM Master Server** task.
3. From the **NIM Server** list, select the NIM server on which you want to create a client.
4. In the **NIM Client Name** field, enter a name by which you want the LPAR to be known on the NIM client server.
5. In the **LPAR Host/DNS Name** field, enter a name for the new client. You can enter either a fully qualified DNS host name or a short host name.
6. In the **LPAR IP** field, enter the IP address that corresponds to the DNS name, or the entry in the host file on the NIM master server.
7. From the **PowerVM OS Image Type** list, select whether you want to use an LPP Source or a Mksysb image.
8. If you selected **LPP Source** from the **PowerVM OS Image Type** list, select the LPP sources that you want to use from the **LPP Source** list.
9. If you selected **Mksysb**, from the **PowerVM OS Image Type** list, select the Mksysb image that you want to use from the **Mksysb** list.
10. Click **Take Action**, and in the **Take Action** dialog box, select the NIM server on which you want to create a NIM client, and click **OK**.

Results

In the **Action: AIX NIM Create a Client for an LPAR on a NIM server** window, you can view the progress of the action. When the **Status** changes to **Complete**, the NIM client is created.

Creating a Mksysb Image

Using the **AIX NIM Create a mksysb image** task, you can create a Mksysb image from a NIM master server. You can then use the Mksysb image to create a NIM client.

Before you begin

You must activate the following analysis:

- AIX NIM Overview

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > AIX NIM > Setup and Maintenance** and select **AIX NIM Overview**. In the **Analysis: AIX NIM Overview** pane, select **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > AIX NIM > NIM Operations** and select the **AIX NIM Create a mksysb image** task.
3. From the **NIM Server** list, select the NIM master server that contains the NIM client that you want to use.

4. From the **NIM Client** list, select the NIM client that you want to use to generate a Mksysb image file.
5. In the **NIM Client State**, you can view the state of the selected NIM client. To create a Mksysb image, ensure that the NIM client state is "Currently running". To override the data that is provided in the form, select **OFF** in the **Validation** column to the left of the parameter. For more information, see "Turning off validation in a Task" on page 69.
6. In the **Image Name** field, enter a name for the new Mksysb image. The name can contain alphanumeric characters and the following special characters: @%._~!#{ }-.
7. In the **Image Location** field, enter a location for the image on the NIM master server. The file path can contain alphanumeric characters and the following special characters: @%/.,_~!#{ }-^:+=(){}[]-.
8. Click **Take Action**, select the NIM client server that you want to use to generate the Mksysb image and click **OK**.

Results

In the **Action: AIX NIM Create a mksysb image** window, you can view the progress of the action. When the **Status** changes to **Complete**, the new Mksysb image is created.

Removing a NIM client

Using the **AIX NIM Remove NIM Client** task, you can remove a NIM client from a NIM master server.

Before you begin

You must activate the following analysis

- AIX NIM Overview

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > AIX NIM > Setup and Maintenance** and select **AIX NIM Overview**. In the **Analysis: AIX NIM Overview** pane, select **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > AIX NIM > NIM Operations** and select the **AIX NIM Remove NIM Client** task.
3. From the **NIM Server** list, select the NIM master server that contains the NIM client that you want to remove.
4. From the **NIM Client Name** list, select the NIM client that you want to remove and click **Take Action**.
5. In the **Take Action** dialog box, select the NIM master server from which you want to remove the NIM client and click **OK**.

Results

In the **Action: AIX NIM Remove NIM Client** window, you can view the progress of the action. When the **Status** changes to **Complete**, the NIM client is removed from the NIM master server.

PowerVM

You can deploy and configure a management extender plug-in for PowerVM®. You can then manage PowerVM logical partitions (LPARs) from within the IBM Endpoint Management console.

Setup and Maintenance

Before you begin the setup, you must activate the **Management Extender Status** analysis. To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

To use the PowerVM tasks, you must activate several analyses. To activate the analyses, in the Domain Panel of the Server Automation domain, select > **Virtualization > PowerVM > Setup and Configuration > Activate Analyses**. Select each analysis and click **Activate**. It is good practise to activate the analyses before you begin to work with the PowerVM tasks.

Deploying a PowerVM Management Extender

Using the **Deploy Management Extender for PowerVM** task, you can deploy a management extender to an IBM Endpoint Manager server. You can then configure the Management Extender to communicate with a PowerVM system.

Before you begin

Important: Before you install the management extender plug-in, you must install the latest version of the proxy agent with a separate Fixlet. In the BES Support site, run the latest version of the **Install Proxy Agent** Fixlet to install the proxy agent.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > PowerVM > Setup and Maintenance > Deploy PowerVM Components** and select the **Deploy Management Extender for PowerVM** task.
3. From the **Management Extender Host** list, select the host on which you want to deploy the management extender.
4. In the **Management Extender Plugin Name** field, enter a name that you want to associate to this PowerVM managed system plug-in instance. You cannot use the following characters: *?<>\\/:|. The name can be up to 32 characters in length and cannot include any spaces. You must enter a unique name for any plug-in deployed to a relay.
5. Click **Take Action**. In the **Take Action** dialog box, target the host on which you want to deploy the management extender and click **OK**.

Results

In the **Action: Deploy Management Extender for PowerVM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender for PowerVM is deployed.

What to do next

To work with the management extender plug-in for PowerVM, you must configure the plug-in with a PowerVM Hardware Management Console. For more information, see “Configuring a PowerVM management extender.”

Configuring a PowerVM management extender

Using the **Configure Management Extender for PowerVM** task, you can configure a selected management extender to connect to a Hardware Management Console (HMC). You can use this task also to modify existing management extender connections to a PowerVM environment.

Before you begin

Ensure that all managed systems, LPAR, and profile names contain only valid characters. The management extender cannot discover any resources with names that the following special characters: !@#\$%^&*()+\=[{}|,.<>\/?~` or spaces.

You must install a management extender for a PowerVM system before you can configure a management extender. To install a management extender for PowerVM, use the **Deploy Management Extender for PowerVM** task. For more information, see “Deploying a PowerVM Management Extender” on page 88

To configure the management extender plug-in with the PowerVM HMC, you must enter credentials that are part of the HMC Administrator's group.

Ensure that your HMC credentials are valid. You can validate your credentials by logging in to the HMC servers.

If you enter an HMC IP address, ensure that the address is IPv4. IPv6 is not supported.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate** in the panel.

Procedure

1. Open the Server Automation domain.
2. In the navigation tree of the **Domain Panel**, select **Virtualization > PowerVM > Setup and Maintenance > Configure Management Extender** and select the **Configure Management Extender for PowerVM** task.
3. In the **Connection Details** section, enter values for the following parameters.

Management Extender Host

Select the host that contains the management extender that you want to configure.

Filter PowerVM Plug-ins

Select whether you want to filter the list of management extenders to display only unconfigured PowerVM management extenders in the **Management Extender Name** list.

Management Extender Name

Select the management extender that you want to configure with a PowerVM system.

Discovery refresh interval

Select the frequency, in minutes, in which a full discovery is performed. You must enter a frequency of 45 minutes or longer.

HMC Server

Enter the IP address or DNS name of the HMC server with which you want to configure the management extender. The default SSH port is 22. To control which SSH port is used to contact the server, add a colon (:) to the end of the IP address or DNS name and enter the port number. Valid port numbers are 1 - 65534.

HMC User Name

Enter the user name with which you want to connect to the HMC server. The user name that you enter must be part of the HMC Administrator's group. Valid HMC user names begin with a letter and contain up to 32 characters. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter that you want to disable. For more information, see "Turning off validation in a Task" on page 69.

HMC password

Enter the password that corresponds to the HMC user name that you entered. Valid passwords contain at least 7 characters.

Confirm HMC password.

Enter the password again to confirm.

4. In the **Redundant Connection Details**, enter values for the following parameters. The redundancy model is an 'active standby' model rather than 'active active'. The management extender plug-in uses only one HMC server at a time to manage the PowerVM environment.

Enable HMC Connection Redundancy

Select whether you want to setup a redundant HMC connection to the management extender plug-in. If you select true, you must enter values for the **Redundant HMC Server**, **Redundant HMC User Name**, **Redundant HMC Password**, and **Confirm Redundant HMC Password** parameters.

Redundant HMC Server

Enter the IP address or DNS name of the redundant HMC server with which you want to configure the management extender. The default SSH port is 22. To control which SSH port is used to contact the server, add a colon (:) to the end of the IP address or DNS name and enter the port number. Valid port numbers are 1 - 65534.

Important: This HMC must be available at the time of configuring.

Redundant HMC User Name

Enter the user name with which you want to connect to the redundant HMC server. The user name that you enter must be part of the HMCAdministrator's group. Valid user names begin with a letter and contain up to 32 characters.

Redundant HMC Password

Enter the password that corresponds to the user name that you entered.
Valid passwords contain at least 7 characters.

Confirm Redundant HMC Password

Enter the password again to confirm.

5. Click **Take Action** and in the **Take Action** dialog box, target the host on which the management extender that you want to configure is located, and click **OK**.

Results

In the **Action: Configure Management Extender for PowerVM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the manager extender is configured.

Upgrading a PowerVM management extender

Using the **Upgrade Management Extender for PowerVM Plugin** task, you can upgrade the plug-in component of the management extender for PowerVM.

Before you begin

Important: You cannot use this task to upgrade the proxy agent. You must upgrade the proxy agent with a separate Fixlet. In the BES Support site, run the latest version of the **Update Windows Proxy Agent** Fixlet to upgrade the proxy agent.

Before you can run the **Upgrade Management Extender for PowerVM Plugin** task, you must configure the management extender that you want to upgrade. For more information, see “Configuring a PowerVM management extender” on page 89.

You must activate the following analysis:

- Management Extender Status

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

Procedure

1. Open the Server Automation domain.
2. In Domain Panel, select **Virtualization > PowerVM > Setup and Maintenance > Upgrade PowerVM Components**.
3. From the **Upgrade PowerVM Components** list, select **Upgrade Management Extender for PowerVM Plugin**.
4. From the **Management Extender Host** list, select the host on which the management extender that you want to upgrade is located.
5. From the **Management Extender Name** list, select the management extender that you want to upgrade and click **Take Action**.
6. In the **Take Action** dialog box, select the management extender host on which the management extender that you want to upgrade is located and click **OK**.

Results

In the **Action: Upgrade Management Extender for PowerVM Plugin** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender is upgraded.

Removing a PowerVM management extender

Using the **Remove Management Extender for PowerVM** task, you can remove a selected management extender plug-in from an IBM Endpoint Manager server.

Before you begin

Important: You must first remove the management extender plug-in, then uninstall the proxy agent with a separate Fixlet. In the BES Support site, run the latest version of the **Uninstall Windows Proxy Agent** Fixlet to remove the proxy agent.

You must activate the following analysis

- **Management Extender Status**

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > Management Extender Analyses**. In the **Management Extender Analyses** list, select **Management Extender Status** and click **Activate**.

About this task

The **Remove Management Extender for PowerVM** task removes the management extender plug-in for PowerVM from the IBM Endpoint Manager server that you target.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > PowerVM > Setup and Maintenance > Remove PowerVM Components**.
3. From the **Remove PowerVM Components** list, select **Remove Management Extender for PowerVM**.
4. From the **Management Extender Host** list, select the host on which the management extender plug-in that you want to remove is located.
5. From the **Management Extender Name** list, select the name of the management extender that you want to remove.
6. Click **Take Action**. In the **Take Action** dialog box, target the host from which you want to remove the management extender plug-in, and click **OK**.

Results

In the **Action: Remove Management Extender for PowerVM** window, you can view the progress of the action. When the **Status** changes to **Complete**, the management extender plug-in is removed.

Managed System Tasks

Use the information in this section to create and delete logical partitions on a PowerVM Managed System that is configured with a management extender for PowerVM

Creating a Logical Partition (LPAR)

Using the **PowerVM Create a logical partition (LPAR)** task, you can create a new logical partition (LPAR) on a PowerVM Managed System.

Before you begin

You must deploy and configure a management extender for PowerVM on an IBM Endpoint Manager server. For more information, see “Deploying a PowerVM Management Extender” on page 88 and “Configuring a PowerVM management extender” on page 89.

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM LPAR Overview
- PowerVM Managed System Overview
- PowerVM VIOS Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview, PowerVM LPAR Overview, and PowerVM VIOS Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, click **Virtualization > PowerVM > Managed System Operations > Configuration Management** and select **PowerVM Create a logical partition (LPAR)**.
3. In the **Partition** section, add the name, ID, and profile details of the new LPAR.

HMC

Select the hardware management console on which you want to create the LPAR.

Managed System

Select a PowerVM managed system on which you want to create the LPAR.

Partition Name

Enter a name for the new LPAR. Ensure that the name that you enter is unique on the Managed System that you select. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Partition ID

Enter an ID for the new LPAR. Ensure that the ID that you enter is unique on the Managed System that you select. To override the validation that is provided on the parameter, in the **Validation** column to the left of the parameter and select **OFF**. For more information, see “Turning off validation in a Task” on page 69.

Profile Name

Enter a profile name for the new LPAR. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

4. From the **Processing Mode** list, select whether you want to add shared or dedicated processors to the new LPAR. If you select shared, the managed system assigns partial processor units from the shared processor pool to the new LPAR. If you select dedicated, the managed system reserves entire physical processors that can be used only by the new LPAR.
5. In the **Processing Settings** section, you can configure the processing settings for the new LPAR. From the **Processing Mode** list, if you select shared, the task displays the following parameters: **Minimum Processing Units**, **Desired Processing Units**, and **Maximum Processing Units**. If you select dedicated, the task removes these parameters. Use the **Total Processors available** field to view how many processors are available on the managed system that you selected.

Minimum Processing Units

Enter the minimum number of processing units that you want to use to create virtual processors for the new LPAR. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Desired Processing Units

Enter the number of processing units that you want to use to create virtual processors for the new LPAR. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Maximum Processing Units

Enter the maximum number of physical processors that you want to use to create virtual processors for the new LPAR. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Minimum Processing Units required

View the minimum processing units to ensure that you enter valid values in the **Minimum Processors** field.

Minimum Processors

Enter the minimum number of processors that you want to assign to the new LPAR. Enter a value that is greater than the minimum processing units. If you select Shared, these processors are virtual. If you select Dedicated, these processors are physical.

Desired Processors

Enter the number of virtual processors that you want to assign to the new LPAR. If you select Shared, these processors are virtual. If you select Dedicated, these processors are physical.

Maximum Processors

Enter the maximum number of virtual processors that you want to assign to the new LPAR. If you select Shared, these processors are virtual. If you select Dedicated, these processors are physical.

6. In the **Memory Settings** section, enter the memory values for the new LPAR. Use the **Installed Memory** field and **Current Memory Available** field to determine how much memory is available to assign.

Minimum Memory

Select a minimum memory size that you want to set for the selected LPAR.

Desired Memory

Select a memory size that you want to set for the selected LPAR.

Maximum Memory

Select a maximum memory size that you want to set for the selected LPAR.

7. In the **General Virtual Adapter Settings** section, enter the maximum virtual adapter values for the new LPAR.

Maximum Virtual Adapters

Enter the maximum number of virtual adapters that you want to connect to the new LPAR.

8. In the **Virtual Ethernet Settings** section, enter values for the Ethernet parameters.

Virtual Ethernet Adapter ID

Enter the virtual Ethernet adapter ID.

VLAN

Enter the ID of the (Virtual Local Area Network) VLAN that you want to configure with the Ethernet adapter. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

9. In the **Storage Settings** section, enter the storage values for the new LPAR. From the **Storage Type** list, select whether you want Virtual Small Computer System Interface (vSCSI) or Node Port ID Virtualization (NPIV) storage type for the new LPAR.

- a. If you select vSCSI, enter the following parameters.

vSCSI Type

Select whether you want to add a Hard Disk or Logical Volume storage to be the root disk of the new LPAR. Depending on your selection, the task displays different parameters. If you select Hard Disk, you must enter values for the following parameters: **Configure Redundant IO**, **Hard Disk**, parameters. If you select Logical volume, you must enter the values for the following parameters: **Logical Volume Group**, **Logical Volume Size (GB)**, and **Logical Volume Name**.

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the root disk of the new LPAR.

VIO Server Partition

Select the name of the virtual input/output server (VIOS) to which you want to add the adapter to the disk of the new LPAR.

VIO Server Adapter ID

Enter the adapter ID of the VIOS that you want to use on the VIOS for the disk of the new LPAR. To override the validation that is provided

on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Configure Redundant IO

Select whether you want to configure an alternative path for multi path input output (MPIO) redundancy. If you select YES, you must enter the values for the following parameters: **Redundant Client Adapter ID**, **Redundant Server Partition**, and **Redundant Server Adapter ID**. The **Hard Disk** list is filtered and displays only hard disks that are configured for MPIO.

Redundant Client Adapter ID

Enter the ID of the redundant LPAR client adapter that you want to use for the root disk of the new LPAR.

Redundant Server Partition

Select the Redundant VIO Server that you want to configure to enable multi-path for the root disk of the new LPAR.

Redundant Server Adapter ID

Enter the redundant VIO server adapter ID that you want to use on the redundant VIO server for the root disk of the new LPAR.

Hard Disk

Select the physical disk to which you want to attach the vSCSI adapter. Hard disks that are associated to volume groups or LPARs are not listed. Hard disks without a valid physical volume ID (PVID) are not listed.

Disk Unique ID

View the unique ID of the hard disk that you selected.

Disk Description

View the description of the hard disk.

Logical Volume Group

Select the logical volume group from which you want to create storage for the new SCSI disk.

Logical Volume Size (GB)

Enter the size, in gigabytes, that you want to allocate to the new SCSI disk.

Logical Volume Name

Enter a name for the logical volume.

Device Name

Enter a virtual target name that the VIO server associates with the hard disk.

- b. If you select NPIV, enter the values for following parameters:

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the root disk of the new LPAR.

VIO Server Partition

Select the name of the (VIOS) to which you want to add the adapter for the root disk of the new LPAR.

VIO Server Adapter ID

Enter the adapter ID of the VIO server that you want to use on the VIOS for the root disk of the new LPAR.

Autogenerate WWPNs

Select whether you want to automatically generate worldwide port names (WWPN) for the client adapter. The default setting is Yes. If you select No, you must enter port name in the **WWPN 1** and **WWPN 2** fields. If you select No and are configuring MPIO, you must also enter the **Redundant WWPN 1** and **Redundant WWPN 2** fields.

WWPN 1

Enter the first WWPN for the client adapter.

WWPN 2

Enter the second WWPN for the client adapter.

Primary FC Port

Select the Fibre Channel port that you want to use as the primary port.

Configure Redundant IO

Select whether you want to configure an alternative path for multi-path input/output (MPIO) redundancy. If you select YES, the following parameters become visible: **Redundant Client Adapter ID**, **Redundant Server Partition**, **Redundant Server Adapter ID**, **Redundant WWPN 1**, **Redundant WWPN 2**, and **Secondary FC Port**, .

Redundant Client Adapter ID

Enter the unique ID of the redundant LPAR client adapter that you want to use.

Redundant Server Partition

Select the name of the redundant server to which you want to add the redundant client adapter ID.

Redundant Server Adapter ID

Enter the redundant adapter ID of the Virtual I/O Server that you want to use.

Redundant WWPN 1

Enter the first redundant WWPN for the client adapter.

Redundant WWPN 2

Enter the second redundant WWPN for the client adapter.

Secondary FC Port

Select a secondary Fibre Channel port.

10. When you enter all the mandatory parameters, click **Take Action**.

11. In the **Take Action** dialog box, select the PowerVM managed system on which you want to create the new LPAR, and click **OK**.

Results

In the **Action: PowerVM Create a logical partition (LPAR)** window, you can view the progress of the action. When the **Status** changes to **Complete**, the new LPAR is created. In the **Computers** list in the **All Content** domain, you can view the new LPAR. You can distinguish an LPAR from other computers by using the **Device Type** column in the **Computers** list. The **Device Type** of the new LPAR is **PowerVM LPAR**.

What to do next

To work with the new LPAR, you must create a client for the LPAR on a NIM server and then netboot the LPAR. For more information, see “Creating a NIM

client for an LPAR on a NIM server” on page 85 and “Netbooting a logical partition” on page 111.

Deleting an LPAR

Using the **PowerVM Delete a Logical Partition (LPAR)** task, you can delete an LPAR from a PowerVM managed system. The LPAR is deleted together with the hard disk, logical volume, physical volume, virtual host, virtual target, vSCSI adapter, Fibre Channel host, and Fibre Channel adapter ID.

Before you begin

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM LPAR Overview
- PowerVM Managed System Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview, and PowerVM LPAR Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Virtualization > PowerVM > Managed System Operations > Configuration Management**.
3. From the **Configuration Management** list, select **PowerVM Delete a Logical Partition (LPAR)**.
4. From the **HMC** list, select the Hardware Management Console on which the LPAR that you want to delete is located.
5. From the **Managed System** list, select the PowerVM managed system on which the LPAR that you want to delete is located.
6. From the **LPAR Name** list, select the LPAR that you want to delete. To override the validation that is provided on the parameter, in the **Validation** column to the left of the parameter, select **OFF**. For more information, see “Turning off validation in a Task” on page 69.
7. In the **LPAR State** field, you can view whether the LPAR that you select is running or not activated. You cannot delete an LPAR that is running. To override the validation that is provided on the parameter, in the **Validation** column to the left of the parameter, select **OFF**. For more information, see “Turning off validation in a Task” on page 69.
8. From the **Delete Disk** list, select **No** if you want to delete the LPAR but retain the Logical Volume. Select **Yes** if you want to delete LPAR and also the hard disk, logical volume, physical volume, virtual host, virtual target, vSCSI adapter, Fibre Channel host, and Fibre Channel adapter ID.
9. Click **Take Action**, and in the **Take Action** dialog box, select the PowerVM managed system from which you want to delete an LPAR, and click **OK**.

Results

In the **Action: PowerVM Delete a Logical Partition (LPAR)** window, you can view the progress of the action. When the **Status** changes to **Complete**, the LPAR is deleted.

LPAR Tasks

Using these tasks, you can modify, add disks, and create profiles for existing logical partitions (LPARs).

Creating an LPAR Profile

Using the **PowerVM Create a logical partition (LPAR) Profile** task, you can create an LPAR Profile for an existing LPAR from within the IBM Endpoint Manager console.

Before you begin

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM LPAR Overview
- PowerVM Managed System Overview
- PowerVM VIOS Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview, PowerVM LPAR Overview, and PowerVM VIOS Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > Configuration Management**, and select **PowerVM Create a logical partition (LPAR) Profile**.
3. In the **Partition** section, add the name, ID, and profile details of the new LPAR profile.

HMC

Select the Hardware Management Console on which the LPAR that you want to use is located.

Managed System

Select the PowerVM managed system on which the LPAR that you want to use is located.

Partition Name

Select the LPAR on which you want to create a profile. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Profile Name

Enter the name of the new profile. To override the validation that is

provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

4. From the **Processing Mode** list, select whether you want to add shared or dedicated processors to the new LPAR profile. If you select shared, the managed system assigns partial processor units from the shared processor pool to the new LPAR profile. If you select dedicated, the managed system reserves entire physical processors that can be used only by the new LPAR profile.
5. In the **Processing Settings** section, you can configure the processing settings for the new LPAR profile. If you select shared from the **Processing Mode** list, the task displays the following parameters: **Minimum Processing Units**, **Desired Processing Units**, and **Maximum Processing Units**. If you select dedicated, the task removes these parameters. Use the **Total Processors available** field to view how many processors are available on the managed system that you selected.

Minimum Processing Units

Enter the minimum number of physical processors that you want to use to create virtual processors for the new LPAR profile. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Desired Processing Units

Enter the number of physical processors that you want to use to create virtual processors for the new LPAR profile. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Maximum Processing Units

Enter the maximum number of physical processors that you want to use to create virtual processors for the new LPAR profile. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Minimum Processing Units required

View the minimum processing units to ensure that you enter valid values in the **Minimum Processors** field.

Minimum Processors

Enter the minimum number of processors that you want to assign to the new LPAR profile. Enter a value that is greater than the minimum processing unit.

Desired Processors

Enter the number of processors that you want to assign to the new LPAR profile.

Maximum Processors

Enter the maximum number of processors that you want to assign to the new LPAR profile.

6. In the **Memory Settings** section, enter the memory values for the new LPAR profile. Use the **Installed Memory** field and **Current Memory Available** field to determine how much memory is available to assign.

Minimum Memory

Select the minimum memory size that you want to set for the selected LPAR profile.

Desired Memory

Select the memory size that you want to set for the selected LPAR profile.

Maximum Memory

Select the maximum memory size that you want to set for the selected LPAR profile.

7. In the **General Virtual Adapter Settings** section, enter the maximum virtual adapter values for the new LPAR.

Maximum Virtual Adapters

Enter the maximum number of virtual adapters that you want to connect to the new LPAR.

8. In the **Virtual Ethernet Settings** section, enter values for the parameters in the Ethernet settings of the new profile.

Virtual Ethernet Adapter ID

Enter the virtual Ethernet adapter ID. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

VLAN

Enter the ID of the (Virtual Local Area Network) VLAN that you want to configure with the Ethernet adapter.

9. In the **Storage Settings** section, enter the storage values for the new LPAR. From the **Storage Type** list, select whether you want Virtual Small Computer System Interface (vSCSI) or Node Port ID Virtualization (NPIV) storage for the new LPAR profile.
 - a. If you select vSCSI, enter the following parameters.

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the AIX root disk of the new LPAR. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

VIO Server Partition

Select the name of the virtual input/output server (VIOS) to which you want to add the adapter ID.

Server Adapter ID

Enter the adapter ID that you want to use on the VIOS for the root disk of the new LPAR. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Configure Redundant IO

Select whether you want to configure an alternative path for multi-path input/output (MPIO) redundancy. If you select **YES**, you must enter the values for the following parameters: **Redundant Client Adapter ID**, **Redundant Server Partition**, and **Redundant Server Adapter ID**. The **Hard Disk** list is filtered and displays only hard disks that are configured for MPIO.

Redundant Client Adapter ID

Enter the ID of the redundant LPAR client adapter that you want to use for the root disk of the new LPAR.

Redundant Server Partition

Select the Redundant VIO Server that you want to configure to enable multi-path for the root disk of the new LPAR.

Redundant Server Adapter ID

Enter the redundant VIO server adapter ID that you want to use on the redundant VIO server for the root disk of the new LPAR.

- b. If you select NPIV, enter the values for following parameters:

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the root disk of the new LPAR.

VIO Server Partition

Select the name of the (VIOs) to which you want to add the adapter for the root disk of the new LPAR.

VIO Server Adapter ID

Enter the adapter ID that you want to use on the VIOS for the root disk of the new LPAR.

Autogenerate WWPNS

Select whether you want to automatically generate worldwide port names (WWPN) for the client adapter. The default setting is Yes. If you select No, you must enter port name in the **WWPN 1** and **WWPN 2** fields. If you select No and you are configuring MPIO, you must also enter the **Redundant WWPN 1** and **Redundant WWPN 2** fields.

WWPN 1

Enter the first WWPN for the client adapter.

WWPN 2

Enter the second WWPN for the client adapter.

Configure Redundant IO

Select whether you want to configure an alternative path for multi-path input/output (MPIO) redundancy. If you select YES, the following parameters become visible: **Redundant Client Adapter ID**, **Redundant Server Partition**, **Redundant Server Adapter ID**, **Redundant WWPN 1**, **Redundant WWPN 2**.

Redundant Client Adapter ID

Enter the unique ID of the redundant LPAR client adapter that you want to use.

Redundant Server Partition

Select the name of the redundant server to which you want to add the redundant client adapter ID.

Redundant Server Adapter ID

Enter the redundant adapter ID of the Virtual I/O Server that you want to use.

Redundant WWPN 1

Enter the first redundant WWPN for the client adapter.

Redundant WWPN 2

Enter the second redundant WWPN for the client adapter.

10. Click **Take Action**, and in the **Take Action** dialog box, target the LPAR on which you want to create a profile, and click **OK**.

Results

In the **Action: Power VM Create LPAR Profile** window, you can view the progress of the action. When the **Status** changes to **Complete**, the new LPAR profile is created.

Modifying an LPAR Profile

Using the **PowerVM Modify a Logical Partition (LPAR) Profile** task, you can modify the profile name, the processing settings, and the memory settings of a logical partition (LPAR) profile.

Before you begin

You must activate the following analysis:

- PowerVM HMC Overview
- PowerVM LPAR Overview
- PowerVM Managed System Overview

To activate the analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview and PowerVM LPAR Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > Configuration Management** and select **PowerVM Modify a Logical Partition (LPAR) Profile**.
3. In the **Partition** section, select the LPAR that you want to modify and enter any changes to the following parameters:

HMC

Select the Hardware Management Console on which the LPAR that you want to modify is located.

Managed System

Select the PowerVM managed system on which the LPAR that you want to modify is located.

Partition Name

Select the name of the LPAR that you want to modify. Use the **Partition ID** field to verify that the LPAR that you select is correct. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Profile Name

Select the LPAR Profile that you want to modify. To override the validation

that is provided on the parameter, in the **Validation** column to the left of the parameter and select **OFF**. For more information, see “Turning off validation in a Task” on page 69.

New Profile Name

Enter a new name for the profile that you selected from the **Profile Name** list. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

4. From the **Processing Mode** list, select whether you want to add shared or dedicated processors. If you select shared, the managed system assigns partial processor units from the shared processor pool. If you select dedicated, the managed system reserves entire physical processors that can be used only by the selected LPAR profile.
5. In the **Processing Settings** section, you can modify the processing settings of the selected LPAR. If you select shared, the task displays the following extra parameters: **Minimum Processing Units**, **Desired Processing Units**, and **Maximum Processing Units**. If you select dedicated, the task hides these three parameters. Use the **Total Processors available** field to view how many processors are available on the managed system that you selected.

Minimum Processing Units

Enter the minimum number of physical processors that you want to use to create virtual processors. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Desired Processing Units

Enter the number of physical processors that you want to use to create virtual processors. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Maximum Processing Units

Enter the maximum number of physical processors that you want to use to create virtual processors. Each processing unit is equivalent to the processing power of one processor. You can enter whole numbers or decimal numbers. For example, 2 or 2.5 processor units can be assigned to the partition.

Minimum Processing Units required

View the minimum processing units to ensure that you enter valid values in the **Minimum Processors** field.

Minimum Processors

Enter the minimum number of processors that you want to assign to the LPAR profile. Enter a value that is greater than the minimum processing units. If you selected Shared, these processors are virtual. If you selected Dedicated, these processors are physical.

Desired Processors

Enter the number of virtual processors that you want to assign to the LPAR profile. If you selected Shared, these processors are virtual. If you selected Dedicated, these processors are physical.

Maximum Processors

Enter the maximum number of virtual processors that you want to assign

to the LPAR profile. If you selected Shared, these processors are virtual. If you selected Dedicated, these processors are physical.

6. In the **Memory Settings** section, enter the changes that you want to make to the memory settings. Use the **Installed Memory** field **Current Memory Available** fields to determine how much memory is available to assign.

Minimum Memory

Select a minimum memory size for the selected LPAR.

Desired Memory

Select a memory size that you want to set for the selected LPAR.

Maximum Memory

Select a maximum memory size for the selected LPAR.

7. Click **Take Action**, and in the **Take Action** dialog box, select the LPAR that you want to modify, and click **OK**.

Results

In the **Action: PowerVM Modify a Logical Partition (LPAR) Profile** window, you can view the progress of the action. When the **Status** changes to **Complete**, the LPAR profile is modified.

Adding a disk to an LPAR

Using the **PowerVM Add disk to a Logical Partition (LPAR)** task, you can add a disk to an existing logical partition (LPAR).

Before you begin

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM LPAR Overview
- PowerVM Managed System Overview
- PowerVM VIOS Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview, PowerVM LPAR Overview, and PowerVM VIOS Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > Configuration Management** and select **PowerVM Add disk to a Logical Partition (LPAR)**.
3. In the **Partitions** section, enter the following parameters to select the LPAR to which you want to add a disk:

HMC

Select the Hardware Management Console on which the LPAR to which you want to add a disk is located.

Managed System

Select the managed system on which the LPAR to which you want to add a disk is located.

Partition Name

Select the name of the LPAR to which you want to add a disk. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

4. In the **Storage Settings** section, enter the storage values for the new LPAR. From the **Storage Type** list, select whether you want Virtual Small Computer System Interface (vSCSI) or Node Port ID Virtualization (NPIV) storage type for the new LPAR.
 - a. If you select vSCSI, enter values for the following parameters.

vSCSI Type

Select whether you want to add a Hard Disk or Logical Volume storage for the new disk of the LPAR. Depending on your selection, the task displays different parameters. If you select Hard Disk, you must enter values for the following parameters: **Configure Redundant IO, Hard Disk**, parameters. If you select Logical volume, you must enter the values for the following parameters: **Logical Volume Group, Logical Volume Size (GB)**, and **Logical Volume Name**.

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the new disk. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

VIO Server Partition

Select the name of the virtual input/output server (VIOS) to which you want to add the adapter ID.

VIO Server Adapter ID

Enter the adapter ID that you want to use on the VIOS for the new disk. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Configure Redundant IO

Select whether you want to configure an alternative path for multi-path input/output (MPIO) redundancy. If you select YES, you must enter the values for the following parameters: **Redundant Client Adapter ID, Redundant Server Partition**, and **Redundant Server Adapter ID**. The **Hard Disk** list is filtered and displays only hard disks that are configured for MPIO.

Redundant Client Adapter ID

Enter the ID of the redundant LPAR client adapter that you want to use.

Redundant Server Partition

Select the Redundant VIO Server that you want to configure to enable multi-path for the new disk.

Redundant Server Adapter ID

Enter the redundant VIO server adapter ID that you want to use on the redundant VIO server for the new disk.

Hard Disk

Select the physical disk to which you want to attach to the vSCSI adapter. Hard disks that are associated to volume groups or LPARs are not listed. Hard disks without a valid physical volume ID (PVID) are not listed.

Disk Unique ID

View the unique ID of the hard disk that you selected.

Disk Description

View the description of the hard disk. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

Logical Volume Group

Select the logical volume group from which you want to create storage for the new SCSI disk.

Logical Volume Size (GB)

Enter the size, in gigabytes, that you want to allocate to the new SCSI disk.

Logical Volume Name

Enter a name for the logical volume.

Device Name

Enter a virtual target name that the VIO server associates with the hard disk.

- b. If you select NPIV, enter the values for following parameters:

Client Adapter ID

Enter the ID of the LPAR client adapter that you want to use for the new disk.

VIO Server Partition

Select the name of the VIOS to which you want to add the adapter for the new disk.

VIO Server Adapter ID

Enter the adapter ID that you want to use on the VIOS for the new disk.

Autogenerate WWPNS

Select whether you want to automatically generate worldwide port names (WWPN) for the client adapter. The default setting is Yes. If you select No, you must enter port name in the **WWPN 1** and **WWPN 2** fields. If you select No and are configuring MPIO, you must also enter the **Redundant WWPN 1** and **Redundant WWPN 2** fields.

WWPN 1

Enter the first WWPN for the client adapter.

WWPN 2

Enter the second WWPN for the client adapter.

Primary FC Port

Select the Fibre Channel port that you want to use as the primary port.

Configure Redundant IO

Select whether you want to configure an alternative path for multi-path input/output (MPIO) redundancy. If you select YES, the following parameters become visible: **Redundant Client Adapter ID**, **Redundant**

Server Partition, Redundant Server Adapter ID, Redundant WWPN 1, Redundant WWPN 2, and Secondary FC Port.

Redundant Client Adapter ID

Enter the unique ID of the redundant LPAR client adapter that you want to use.

Redundant VIO Server Partition

Select the name of the redundant server to which you want to add the redundant client adapter ID.

Redundant Server Adapter ID

Enter the redundant adapter ID of the Virtual I/O Server that you want to use.

Redundant WWPN 1

Enter the first redundant WWPN for the client adapter.

Redundant WWPN 2

Enter the second redundant WWPN for the client adapter.

Secondary FC Port

Select a secondary Fibre Channel port.

5. Click **Take Action**, and in the **Take Action** dialog box, select the LPAR to which you want to add a disk, and click **OK**.

Results

In the **Action: PowerVM Add disk to a Logical Partition (LPAR)** window, you can view the progress of the task. When the **Status** changes to **Complete**, the disk is added to the LPAR.

What to do next

You must activate and deactivate the LPAR for the new disk to be discovered by the operating system. You can also run the command **cfgmgr** on the AIX operating system on the LPAR

State Management Tasks

Use these tasks to activate and deactivate individual or groups of LPARs. You can also netboot an LPAR.

Activating a logical partition

Using the **PowerVM Activate a Logical Partition** task, you can activate a specific profile instance of a selected LPAR.

Before you begin

You must also activate the following analyses:

- PowerVM HMC Overview
- PowerVM Managed System Overview
- PowerVM LPAR Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview and PowerVM LPAR Overview analyses.

For information about how to disable validation on parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > State Management** and select **PowerVM Activate a Logical Partition**.
3. .
4. From the **HMC** list, select the Hardware Management Console on which the LPAR that you want to activate is located.
5. From the **Managed System** list, select the PowerVM managed system on which the LPAR that you want to activate is located.
6. From the **LPAR Name** list, select the LPAR that you want to activate. In the **LPAR State** field, you can view the Power® State of the LPAR that you select. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.
7. From the **LPAR Profile** list, select the profile of the LPAR that you want to activate. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.
8. Click **Take Action**. In the **Take Action** dialog box, select the LPAR that you want to activate, and click **OK**.

Results

In the **Action: PowerVM Activate a Logical Partition** window, you can view the progress of the action. When the **Status** changes to **Complete**, the LPAR is activated.

Activating multiple LPARs

Using the **PowerVM Activate Multiple Logical Partitions (LPARS)** task, you can power on multiple LPARs at one time from the IBM Endpoint Manager console.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > State Management** and select **PowerVM Activate Multiple Logical Partitions (LPARS)**.
3. From the **LPAR Configuration** list, select **Current Configuration** to activate each LPAR according to its current configuration, or select **Specific Profile** to enter a profile name that you want to activate on each LPAR.
4. In the **Profile Name** field, enter the name of the profile that you want to activate. Profile names are case-sensitive.
5. Click **Take Action**. In the **Take Action** dialog box, select the virtual machines that you want to activate. To select multiple virtual machines, hold the control key while you select more than one virtual machine. Click **OK**.

Results

In the **Action: PowerVM Activate Multiple Logical Partitions (LPARS)** window, you can view the progress of each of the LPARS that you selected to activate.

Deactivating a logical partition

Using the **PowerVM Deactivate a Logical Partition** task, you can deactivate a selected LPAR.

Before you begin

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM Managed System Overview
- PowerVM LPAR Overview

To activate the analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview and PowerVM LPAR Overview analyses.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.
2. From the navigation tree in the Server Automation domain, select **Virtualization > PowerVM > LPAR Operations > State Management** and select **PowerVM Deactivate a Logical Partition (LPAR)**.
3. .
4. From the **HMC** list, select the Hardware Management Console on which the LPAR that you want to deactivate is located.
5. From the **Managed System** list, select the PowerVM managed system on which the LPAR that you want to deactivate is located.
6. From the **LPAR Name** list, select the LPAR that you want to deactivate. In the **LPAR State** field, you can verify whether LPAR that you select is activated or deactivated. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.
7. From the **Shutdown Option** list, select whether you want to perform a hard or soft shutdown of the LPAR.
8. From the **Immediate** list, select whether you want the LPAR to deactivate immediately or with a delay of several minutes. When you complete the form, click **Take Action**.
9. In the **Take Action** dialog box, select the LPAR that you want to deactivate and click **OK**.

Results

In the **PowerVM Deactivate a Logical Partition** window, you can view the progress of the action. When the **Status** changes to **Complete**, the LPAR is deactivated.

Deactivating multiple LPARs

Using the **PowerVM Deactivate Multiple Logical Partitions (LPARS)** task, you can deactivate multiple LPARs from within the IBM Endpoint Manager console.

Procedure

1. Open the Server Automation domain.
2. In the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > State Management** and select **PowerVM Deactivate Multiple Logical Partitions (LPARS)**.
3. From the **Shutdown Option** list, select whether you want a hard or soft shutdown of the LPARS.
4. From the **Immediate** list, select whether you want to deactivate the LPAR immediately or later.
5. Click **Take Action**. In the **Take Action** dialog box, select the LPARS that you want to deactivate. To select more than one LPAR, hold the Ctrl key and select multiple LPARS, and click **OK**.

Results

In the **Action: PowerVM Deactivate Multiple Logical Partitions (LPARS)** window, you can view the progress of each of the LPARS that you selected to deactivate.

Netbooting a logical partition

When you create a logical partition (LPAR), you must create a NIM client for the LPAR and then netboot the LPAR. Using the **PowerVM Netboot a Logical Partition (LPAR)** task, you can netboot an existing LPAR.

Before you begin

If you do not have a NIM client for the LPAR that you want to netboot, create a NIM client with the **AIX NIM Create a Client for a Logical Partition (LPAR) on a NIM Master Server** task. For more information, see “Creating a NIM client for an LPAR on a NIM server” on page 85 task.

You must activate the following analyses:

- PowerVM HMC Overview
- PowerVM Managed System Overview
- PowerVM LPAR Overview
- AIX NIM Overview

To activate the PowerVM analyses, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > PowerVM > Setup and Maintenance** and select **PowerVM HMC Overview**. In the **Analysis: PowerVM HMC Overview** pane, select **Activate**. Repeat this action for the PowerVM Managed System Overview and PowerVM LPAR Overview analyses.

To activate the AIX NIM analysis, navigate to the Domain Panel of the Server Automation domain and select **Virtualization > AIX NIM > Setup and Maintenance** and select **AIX NIM Overview**. In the **Analysis: AIX NIM Overview** pane, select **Activate**.

For information about how to disable validation on certain parameters in the task, see “Turning off validation in a Task” on page 69.

Procedure

1. Open the Server Automation domain.

2. In the Domain Panel, select **Virtualization > PowerVM > LPAR Operations > State Management** and select the **PowerVM Netboot a Logical Partition (LPAR)** task.
3. In the **NIM Details** section, enter values for the following parameters.

NIM Server

Select the NIM server from which you want the LPAR to netboot.

NIM Network

Select a NIM network from which you want the LPAR to netboot. To override the validation that is provided on the parameter, in the **Validation** column to the left of the parameter and select **OFF**. For more information, see “Turning off validation in a Task” on page 69.

NIM IP

Enter the IP address of the LPAR that you want to netboot.

4. In the **LPAR Details** section, enter values for the following parameters.

HMC

Select the Hardware Management Console on which the LPAR that you want to netboot is located.

Managed System

Select the managed system that hosts the LPAR that you want to netboot.

LPAR Name

Select the LPAR that you want to netboot. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

LPAR Profile

Select the name of the LPAR profile that you want to netboot. To override the validation that is provided on the parameter, select **OFF** in the **Validation** column to the left of the parameter. For more information, see “Turning off validation in a Task” on page 69.

LPAR IP

Enter the IP that you want to assign to the selected LPAR.

LPAR Gateway

You can view the gateway IP address of the LPAR that you want to netboot. You can also enter a different NIM IP in this field.

LPAR Subnet

You can view the subnet mask for the LPAR that you want to netboot. You can also enter a different NIM IP in this field.

5. In the **Completion Test Details**, enter values for the following parameters.

Test SSH Connection

Select whether you want to test if SSH is functional when the LPAR netboots. If you select true, enter values for the **User Name** and **Password** parameters.

User Name

Enter the user name with which you want to connect with SSH to the LPAR server.

Password

Enter the password that corresponds to the user name with which you want to test the SSH connection to the LPAR server.

6. Click **Take Action**. In the **Take Action** dialog box, select the LPAR that you want to netboot, and click **OK**.

Results

In the **Action: PowerVM Netboot a Logical Partition (LPAR)** window, you can view the progress of the action. When the **Status** changes to **Complete**, the netboot of the LPAR is complete.

Sample Automation Plans

The IBM Endpoint Manager for Server Automation provides four sample content Automation Plans for PowerVM.

Ensure that the Automation Plan Engine is installed on the IBM Endpoint Manager console. For more information, see the IBM Endpoint Manager for Server Automation Knowledge Center https://pic.dhe.ibm.com/infocenter/tivihelp/v26r1/index.jsp?topic=%2Fcom.ibm.tem.doc_9.1%2FServerAutomation%2Fcom.ibm.tivoli.tpm.wkf.doc%2Fdev%2Fcdev_overview.html

You must deploy and configure a Management Extender for PowerVM and for AIX NIM on an IBM Endpoint Manager server. For more information, see PowerVM “Setup and Maintenance” on page 88 and AIX NIM “Setup and Maintenance” on page 81.

To deploy the IBM Endpoint Manager Agent to the new LPAR, you must install the IBM Endpoint Manager Agent application on an IBM Endpoint Manager server. For more information, see <https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Windows%20Agent%20Deployment%20Tasks%20%28Console%29>.

Sample Plan for Creating an LPAR

IBM Endpoint Manager for Server Automation provides a sample Automation Plan for building a functioning PowerVM logical partition. Using this Automation Plan, you can provision a logical partition (LPAR) on a PowerVM Managed System, install an operating system on the LPAR, netboot the LPAR, and deploy an IBM Endpoint Manager agent to the LPAR.

Procedure

1. Open the Server Automation domain.
2. From Domain Panel, select **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 145 in the filter text box and press the Enter key.
4. From the **Automation Plans** list select the **Build AIX LPAR Sample** Automation Plan.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows each step of the Plan and provides links to more information about each step.

Table 19. Steps in Sample Plan

Step	Task ID	Name	More Information
1	1018	PowerVM Create a Logical Partition (LPAR)	“Creating a Logical Partition (LPAR)” on page 93

Table 19. Steps in Sample Plan (continued)

Step	Task ID	Name	More Information
2	3020	PowerVM Create a NIM client for a Logical Partition (LPAR) on a NIM Master Server	"Creating a NIM client for an LPAR on a NIM server" on page 85
3	1019	PowerVM Netboot a Logical Partition (LPAR)	"Netbooting a logical partition" on page 111
4	1581	Deploy Endpoint Manager Agent	https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Windows%20Agent%20Deployment%20Tasks%20%28Console%29

- Click **OK** to run the Plan.

Results

The Automation Plan runs.

Sample Plan for LPAR with two disks

IBM Endpoint Manager for Server Automation provides a sample Automation Plan for building a functioning PowerVM logical partition (LPAR) and adding hard disks. Using this Automation Plan, you can provision an LPAR on a PowerVM Managed System, install an operating system image, netboot the LPAR, deploy an IBM Endpoint Manager agent, and add a second hard disk to the LPAR.

Procedure

- Open the Server Automation domain.
- From the Domain Panel, select **Automation Plans**.
- In the **Automation Plans** dashboard, enter 146 in the filter text box and press the Enter key.
- From the **Automation Plans** list, select the **Build AIX LPAR with 2 disks Sample** Automation Plan.
- Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
- To run the Automation Plan, click **Take Action**. The following table shows each step of the Plan and provides links to more information about each step.

Table 20. Steps in Sample Plan

Step	Task ID	Name	More Information
1	1018	PowerVM Create a Logical Partition (LPAR)	"Creating a Logical Partition (LPAR)" on page 93
2	3020	PowerVM Create a NIM client for a Logical Partition (LPAR) on a NIM Master Server	"Creating a NIM client for an LPAR on a NIM server" on page 85
3	1019	PowerVM Netboot a Logical Partition (LPAR)	"Netbooting a logical partition" on page 111

Table 20. Steps in Sample Plan (continued)

Step	Task ID	Name	More Information
4	1581	Deploy Endpoint Manager Agent	Visit the IBM Endpoint Manager Wiki https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Windows%20Agent%20Deployment%20Tasks%20%28Console%29
5	1026	PowerVM Add disk to a Logical Partition (LPAR)	"Adding a disk to an LPAR" on page 105

- Click **OK** to run the Plan.

Results

The Automation Plan runs.

Sample Plan for building an LPAR with DB2

IBM Endpoint Manager for Server Automation provides a sample Automation Plan for building a functioning logical partition (LPAR) and installing DB2. Using this Automation Plan, you can provision an LPAR on a PowerVM Managed System, install an operating system image, netboot the LPAR, deploy an IBM Endpoint Manager agent, and install Websphere Application Server on the LPAR.

Procedure

- Open the Server Automation domain.
- From the Domain Panel, select **Automation Plans**.
- In the **Automation Plans** dashboard, enter 147 in the filter text box and press the Enter key.
- From the **Automation Plans** list, select the **Build AIX LPAR DB2 Server Sample** Automation Plan.
- Click **Copy** to copy the Automation Plan and then save the copy that you created.
- To run the Automation Plan, click **Take Action**. The following table shows each step of the Plan and provides links to more information about each step.

Table 21. Steps in Sample Plan

Step	Task ID	Name	More Information
1	1018	PowerVM Create a Logical Partition (LPAR)	"Creating a Logical Partition (LPAR)" on page 93
2	3020	PowerVM Create a NIM client for a Logical Partition (LPAR) on a NIM Master Server	"Creating a NIM client for an LPAR on a NIM server" on page 85
3	1019	PowerVM Netboot a Logical Partition (LPAR)	"Netbooting a logical partition" on page 111

Table 21. Steps in Sample Plan (continued)

Step	Task ID	Name	More Information
4	1581	Deploy Endpoint Manager Agent	For more information, see the IBM Endpoint Manager wiki https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Windows%20Agent%20Deployment%20Tasks%20%28Console%29
5	23	Install IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	For more information, see Server Automation Middleware content http://www-01.ibm.com/support/knowledgecenter/SSPMR3_9.2.0/com.ibm.tem.sa.doc_9.2/ServerAutomation/com.ibm.tivoli.tpm.wkf.doc/Server%20Automation%20middleware%20tasks/sa_middlewareintro.html?lang=en

7. Click **OK** to run the Plan.

Results

The Automation Plan runs.

Sample Plan for AIX LPAR WebSphere Server

IBM Endpoint Manager for Server Automation provides a sample Automation Plan for building a functioning logical partition with Websphere Application Server installed. Using this Automation Plan, you can provision a logical partition (LPAR) on a PowerVM Managed System, install an operating system image, netboot the LPAR, deploy an IBM Endpoint Manager agent, and install Websphere Application Server on the LPAR.

Procedure

1. Open the Server Automation domain.
2. From the Domain Panel, select **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 148 in the filter text box and press the Enter key.
4. From the **Automation Plans** list select the **Build LPAR Websphere Server Sample** Automation Plan.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows each step of the Plan and provides links to more information about each step.

Table 22. List of Steps in Sample Plan

Step	Task ID	Name	More Information
1	1018	PowerVM Create a Logical Partition (LPAR)	"Creating a Logical Partition (LPAR)" on page 93
2	3020	PowerVM Create a NIM client for a Logical Partition (LPAR) on a NIM Master Server	"Creating a NIM client for an LPAR on a NIM server" on page 85

Table 22. List of Steps in Sample Plan (continued)

Step	Task ID	Name	More Information
3	1019	PowerVM Netboot a Logical Partition (LPAR)	"Netbooting a logical partition" on page 111
4	1581	Deploy Endpoint Manager Agent	For more information on deploying the IBM Endpoint Manager agent, visit the IBM Endpoint Manager wiki page https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Endpoint%20Manager/page/Windows%20Agent%20Deployment%20Tasks%20%28Console%29
5	43	Install IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX.	For more information, see Server Automation Middleware content http://www-01.ibm.com/support/knowledgecenter/SSPMR3_9.2.0/com.ibm.tem.sa.doc_9.2/ServerAutomation/com.ibm.tivoli.tpm.wkf.doc/Server%20Automation%20middleware%20tasks/sa_middlewareintro.html?lang=en

7. Click **OK** to run the Plan

Results

The Automation Plan runs.

Turning off validation in a Task

Some of the Host management Tasks within the Server Automation domain contain a Validation button which you can use to disable validation and enter your own data for some of the parameters.

The Host management Tasks in the Server Automation domain contain forms which are automatically populated with data from VMware which you must complete to take action. However, on occasion, the data can either be out of date, or you might need to work with data that does not currently exist but is scheduled to exist at a specific time in the future. If you must work with data that is not populated within the Task, you can disable validation.

You can check whether you can disable validation in the **Validation** column in the Task. If there is an **ON/OFF** button in the **Validation** column for the parameter that you want to work with, you can select **OFF** to disable validation. For example, if you want to modify a virtual machine that is powered on but is scheduled to be powered off, you can select **OFF** on the button in the **Validation** column for **Power State** and schedule the Task to take action when the virtual machine is powered off.

For some parameters, you can both disable validation and enter your own values. For example, if you want to modify a virtual machine that is not in the **Virtual Machine Name** list because it does not exist, but is scheduled to be created, you can select **OFF** on the button in the **Validation** column and enter the name of the virtual machine that you want to modify.

Disable validation only if you can ensure that your data is correct. When you disable validation on a parameter and take action, the IBM Endpoint Manager console does not verify whether the parameter contains valid data. If invalid data is used, the Task fails in VMware.

If you disable validation for a parameter, other parameters which are dependent on that parameter might be affected. For example, in the **VMware Modify Virtual Machine** Task, if you disable the **Virtual Machine Name** parameter, the **Power State** and the **Disk size** parameters are also disabled. The validation on these parameters is disabled because the IBM Endpoint Manager console cannot validate the power state or the disk size of a virtual machine that is not listed.

Chapter 5. Configuring your system and best practices

This section describes how the IBM Endpoint Manager architecture is relevant for Server Automation. It also describes how Server Automation can affect IBM Endpoint Manager performance.

When configured correctly, Server Automation does not adversely affect IBM Endpoint Manager performance. However, be aware of the potential impact that Server Automation action sequencing can have on system performance. You also need to know how the IBM Endpoint Manager architecture affects Server Automation functionality. For example, because of the refresh interval between Web Reports and the server, there is a delay of 15 seconds between when you create a Automation Plan and when that Automation Plan is available in the Automation Plan Engine.

The configuration information described here assumes that you have existing knowledge of the IBM Endpoint Manager platform and performance tuning. If you are not familiar with IBM Endpoint Manager performance and tuning, first read the IBM Endpoint Manager documentation on performance, deployments, and troubleshooting.

Overview

IBM Endpoint Manager for Server Automation is built on the IBM Endpoint Manager platform. Server Automation uses the key IBM Endpoint Manager strengths and advantages. It is also subject to the IBM Endpoint Manager architecture capacity considerations and latency. Read the configuration documentation included here to understand how IBM Endpoint Manager architecture is relevant to IBM Endpoint Manager for Server Automation and how you can configure your system for optimum performance. This documentation also describes how Server Automation functionality influences IBM Endpoint Manager system performance.

Server Automation provides the capability to sequence Fixlets, Tasks, and Baselines across multiple endpoints. You sequence Fixlets, Tasks, and Baselines across endpoints by creating and running an Automation Plan. Automation Plans are processed by the Automation Plan Engine. When you run an Automation Plan, new actions are created on the IBM Endpoint Manager system. An action is created for the Automation Plan and the Automation Plan Engine creates an action for each step in the Automation Plan. When the step has completed the Automation Plan Engine stops the action. In addition, if you schedule an Automation Plan and use the **Prefetch downloads** feature to download content in advance of the Automation Plan execution, an additional action is created for each step in the Automation Plan that contains a prefetch or download statement. You might need to monitor the number of open actions to ensure that system performance is not adversely affected. In a traditional IBM Endpoint Manager environment, open actions are created manually by the console operator. Because the Automation Plan Engine automatically creates open actions, you need to be aware of the potential impact on system performance if there are too many open actions on the system. Similarly, depending on the number of Automation Plans that you create, the Automation Plan Engine can potentially leave a large number of stopped and expired actions. Therefore, you might need to monitor the number of open, closed, and expired actions on the system and take action.

There are some latency and refresh considerations that influence Server Automation behaviour and you need to understand these factors to use Server Automation effectively. For example, when you create an Automation Plan, the Automation Plan is not immediately available in the Automation Plan Engine. Normally, there is a 15-seconds delay because of the refresh interval between Web Reports and the IBM Endpoint Manager server.

This documentation assumes that you are familiar with the IBM Endpoint Manager platform and architecture and that you are experienced in using IBM Endpoint Manager. If you are not familiar with IBM Endpoint Manager, read the following IBM Endpoint Manager documentation before you read this documentation on Server Automation:

- Tivoli Endpoint Manager Administrator's Guide - Overview
- Tivoli Endpoint Manager Administrator's Guide - Configuring the Components
- The Network Traffic Guide
- Performance Configurations Guide

Server Automation components

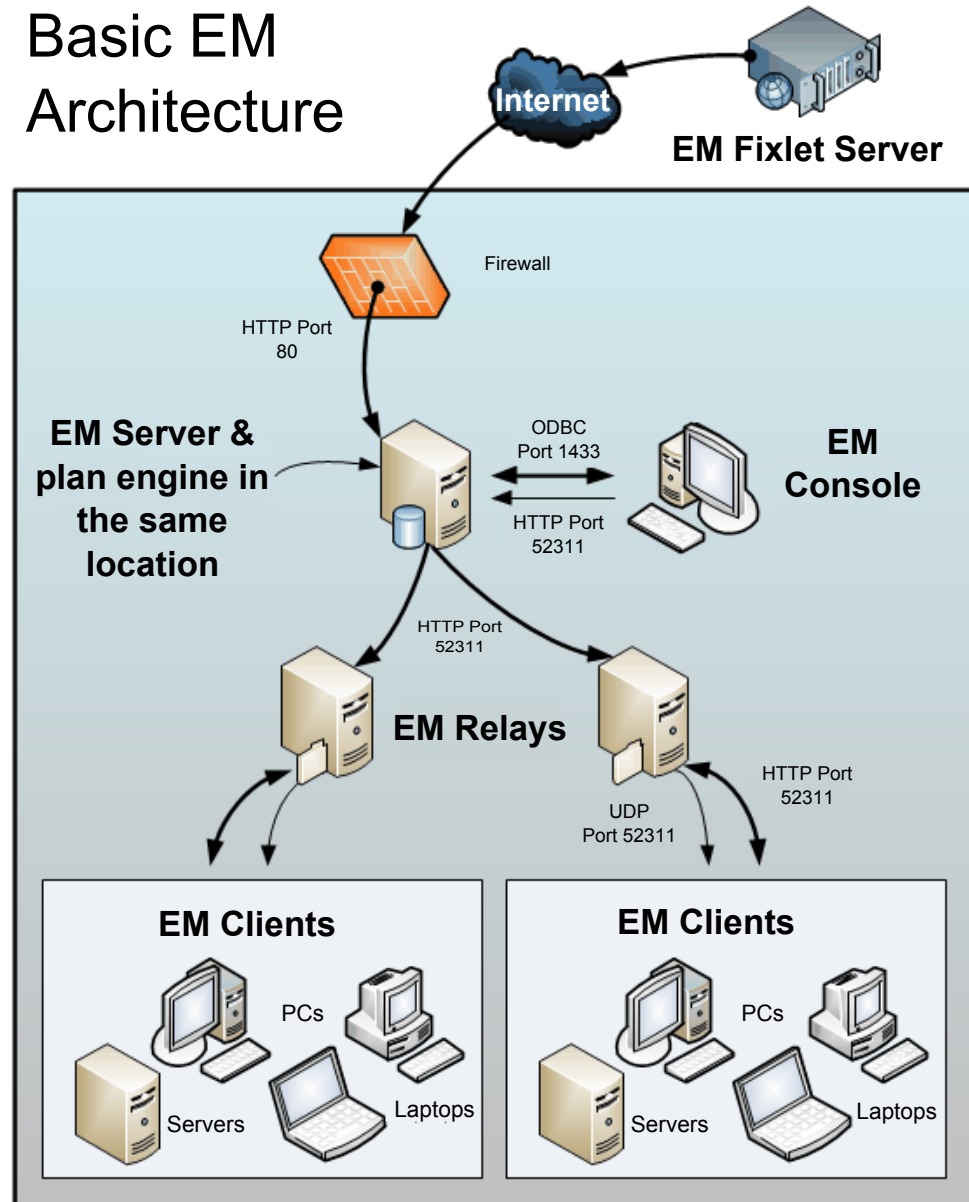
IBM Endpoint Manager for Server Automation uses IBM Endpoint Manager technology and is subject to the same latency considerations as IBM Endpoint Manager. Read the information in this section to learn about the inherent latency and how it affects Server Automation.

Review the following information to understand how latency can affect your Server Automation plans:

- When you create a plan, there is approximately 15 seconds delay from the time you create the plan to the time it is available in the Automation Plan Engine. This delay is caused by the refresh interval between Web Reports and the server, the recommended default and the minimum delay is 15 seconds.
- There is a delay between the time a result from an endpoint is stored in the IBM Endpoint Manager database to when it is available to the Automation Plan Engine. This can be up to 15 seconds (assuming the Web Reports refresh interval is 15 seconds). A similar delay occurs for results being displayed in the console.
- There is a three-seconds delay for each relay to communicate with the IBM Endpoint Manager server. This value cannot be tuned or improved. Relays transmit their responses every three seconds. The more relays that you have on your system, the longer it takes for results to be returned from the endpoints to the server and the Automation Plan Engine.
- IBM Endpoint Manager uses the http protocol for communication between the server and the relays.
- IBM Endpoint Manager uses the UDP protocol for communication between the relays and IBM Endpoint Manager client. Though not a strict requirement, if you do not use the UDP protocol, the alternative is http polling by the agent, which is infrequent.

The following diagram displays the main components in the IBM Endpoint Manager architecture. Server Automation uses the same communication protocols and components.

Basic EM Architecture



For more information about the Server Automation architecture, see Server Automation architecture.

Enhancing the performance of Server Automation

To ensure that you minimize the impact on performance, you need to understand the limits and capacity constraints of the IBM Endpoint Manager architecture. This section describes how the IBM Endpoint Manager capacity constraints are relevant to IBM Endpoint Manager for Server Automation. Use the information described here to ensure that your system is tuned for optimum performance.

Actions

To ensure that your system is configured for optimum performance, you need to complete maintenance tasks on existing actions in the system. A large number of

actions on the system affects system performance. The number of open actions on the system affects system resources. Closed actions also use system resources, as the system reports on all closed actions.

Try to ensure that the maximum number of open actions on the system does not exceed 2,500. As the number of open actions on the system exceeds 2,500, system performance is adversely affected. It is important to note that the Automation Plan Engine automatically generates actions as it processes the Automation Plans that you create. Therefore, you might need to check the number of open actions on the system more regularly than if you were creating actions manually.

Important: There is a potential performance impact associated with using the **Prefetch downloads** option because an additional action is created for each step that requires software downloads. The recommended maximum number of open actions on the system is 2,500. For any given Automation Plan, an action is open for the Automation Plan and also for each individual step in the Automation Plan. If you use the **Prefetch downloads** option, additional actions are created and opened for each step that requires software downloads. So instead of having two open actions per Automation Plan at any one point (one action for the Automation Plan and one for the current step) there are additional actions opened for each step that requires software downloads.

To check the number of open actions on the system, complete the following:

1. From the IBM Endpoint Manager console, click the **BigFix Management** domain.
2. Click **Deployment Health Checks**.
3. Navigate to the **Deployment Optimization** section.
4. Expand the **Open Actions** node. The system provides information about the number of actions currently open. Review the results and identify if you need to take action.

Try to ensure that the number of closed actions on the system does not exceed 10,000. To check the number of closed actions on the system, complete the following:

1. From the IBM Endpoint Manager console, click the **BigFix Management** domain.
2. Click **Deployment Health Checks**.
3. Navigate to the **BES Console Health** section.
4. Expand the **Stopped And Expired Actions** section. Review the results and decide if you need to take action.

To reduce the number of closed actions, you can delete the actions from the server. However, when you delete actions from the server, they remain on the database. To completely remove closed actions, you can purge the actions from the system.

When you are designing your Automation Plan, make sure that you design your action applicability so that you are targeting only relevant endpoints. Ensure that the Site to which you publish your actions is suitable for the endpoints you want to target for Server Automation. For example, many of the endpoints on your network might not be relevant targets for your Automation Plan. Therefore, it is advisable to publish your actions to a more specific group of computers, such as servers.

Each Automation Plan is a Fixlet. To ensure that your Automation Plans are not evaluated by non-relevant endpoints, store your Automation Plans in a site that is not subscribed to by IBM Endpoint Manager endpoints.

Chapter 6. Sample Automation Plans

Server Automation is shipped with a number of sample Automation Plans that you can run out of the box. To run these Automation Plans out of the box, ensure that the Fixlets contained in them are available. Typically, you would substitute some of the Fixlets contained in these samples with particular Fixlets that you want to run. Use the information in each of the following sections to find out more about each of the sample plans.

Sample Automation Plan for client server patching

IBM Endpoint Manager for Server Automation provides a sample content Automation Plan. This sample Automation Plan contains Tasks to stop services on client and server endpoints, apply a patch to the server endpoint, and then restart the client and server services.

About this task

The patch step in this sample Automation Plan uses a simple Task from the TEM Patches for Windows site. Replace this Task with a patch management Task that you want to apply to your server endpoint. If you want to make a change, you need to make a copy of the Automation Plan.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 100 in the filter text box and press Enter. This is the ID of the sample Automation Plan.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 23. Parameters and targets

Step	Parameter and targets
Step 1 Stop Service (222)	1. Parameter: Client service name 2. Targets: Client endpoints
Step 2 Stop Service (222)	1. Parameter: Server service name 2. Targets: Server endpoint
Step 3 Block Automatic Delivery of IE9 Windows Vista/2008/7/2008 R2 (x64) (570)	1. No parameters applicable 2. Targets: Server endpoint
Step 4 Start Service (221)	1. Parameter: Server service name 2. Targets: Server endpoint

Table 23. Parameters and targets (continued)

Step	Parameter and targets
Step 5 Start Service (221)	<ol style="list-style-type: none"> 1. Parameter: Client service name 2. Targets: Client endpoints

7. Click **OK** to run the Automation Plan.

Results

The sample Automation Plan runs on the endpoints.

Sample Automation Plan for a physical server build

This sample Automation Plan completes a simple end-to-end physical server build. You must have Tivoli Provisioning Manager for OS Deployment set up and integrated with IBM Endpoint Manager to run this Automation Plan. The first step in the plan deploys an operating system to one or more computers. The second step patches the operating system on the virtual machine created in the first step. The third step installs Microsoft SQL Server 2008 Enterprise Server Edition on the computer or computers that you created in the first step. The final step patches Microsoft SQL Server 2008 Enterprise Server Edition is installed in step 3.

About this task

This Automation Plan uses some sample Fixlets that will not suit the requirements for your particular server build. Replace these Fixlets with relevant Fixlets that you want to run on your endpoints to complete a physical server build.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 102 and press Enter. This is the ID of the sample Automation Plan.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 24. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Deploy an operating system to one or more computers (133)	This step installs an operating system on computers.	<ol style="list-style-type: none"> 1. Parameter: For information about the required parameters, see "Fixlets for operating system deployment" on page 166. 2. Targets: The Tivoli Provisioning Manager for OS Deployment server.

Table 24. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 2 UPDATE: Internet Explorer 9 Available - Windows Server 2008 R2 (x64) (23157)	This Fixlet is a placeholder. Replace this Fixlet with a Fixlet that suits your requirements.	<ol style="list-style-type: none"> 1. Parameter: Any parameters required by the Fixlet that you include in step 2. 2. Targets: The computer name that you entered for the newly created computer in step 1.
Step 3 Install Microsoft SQL Server 2008 Enterprise Edition on Windows (72)	This step installs Microsoft SQL Server 2008 Enterprise Server Edition on the Windows virtual machine that you created in step 1.	<ol style="list-style-type: none"> 1. Parameter: The parameters are described in the Install Microsoft SQL Server 2008 Enterprise Edition on Windows (72) Fixlet. 2. Targets: The computer name that you entered for the newly created computer in step 1.
Step 4 UPDATE: SQL Server 2008 Service Pack 1 Available (x64) (68103)	This step patches Microsoft SQL Server 2008 Enterprise Server Edition that you installed in the previous step.	<ol style="list-style-type: none"> 1. Parameter: Any parameters required by the UPDATE: SQL Server 2008 Service Pack 1 Available (x64) (68103) Fixlet. 2. Targets: The computer name that you entered for the newly created computer in step 1.

7. Click **OK** to run the Automation Plan.

Sample Automation Plan for a virtual server build

This sample Automation Plan completes a simple end-to-end virtual server build. First, the plan creates a Windows virtual machine from a template. The second step is a step to patch the operating system on the virtual machine created in the first step. The third step installs Microsoft SQL Server 2008 Enterprise Server Edition on the computer or computers that you created in the first step. The final step patches Microsoft SQL Server 2008 Enterprise Server Edition that you install in step 3.

About this task

This Automation Plan uses some sample Fixlets that will not suit the requirements for your particular server build. Replace these Fixlets with relevant Fixlets that you want to run on your endpoints to complete a virtual server build. To replace some Fixlets, edit the Automation Plan and remove any Fixlet that does not suit your requirements and replace it with a suitable Fixlet.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 107 and press Enter. This is the ID of the sample Automation Plan.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 25. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 VMware Create Windows Virtual Machine from Template (84)	This step creates Windows virtual machines from an existing template.	<ol style="list-style-type: none"> 1. Parameter: For information about the parameters required for this step, see Table 1 in "Creating a Windows virtual machine from a template" on page 62 2. Targets: Enter the names of the new virtual machines to be created.
Step 2 UPDATE: Internet Explorer 9 Available - Windows Server 2008 R2 (x64) (23157)	This Fixlet is a placeholder. Replace this Fixlet with a Fixlet that suits your requirements.	<ol style="list-style-type: none"> 1. Parameter: Any parameters required by the Fixlet that you include. 2. Targets: The name of the virtual machines that you entered in step 1. You must enter these names manually because the computers do not yet exist.
Step 3 Install Microsoft SQL Server 2008 Enterprise Server Edition on Windows (72)	This step installs Microsoft SQL Server 2008 Enterprise Server Edition on the Windows virtual machine that you created in step 1.	<ol style="list-style-type: none"> 1. Parameter: The parameters are described in the Install Microsoft SQL Server 2008 Enterprise Server Edition on Windows (72) Fixlet. 2. Targets: The names of the virtual machines that you created in step 1.
Step 4 UPDATE: SQL Server 2008 Service Pack 1 Available (x64) (68103)	This step patches Microsoft SQL Server 2008 Enterprise Server Edition that you installed in the previous step.	<ol style="list-style-type: none"> 1. Parameter: Any parameters required by the UPDATE: SQL Server 2008 Service Pack 1 Available (x64) (68103) Fixlet 2. Targets: The names of the virtual machines that you created in step 1.

7. Click **OK** to run the Automation Plan.

Sample Automation Plan for server patching

This sample Automation Plan completes a scenario for server patching for DB2.

About this task

This Automation Plan uses some sample Fixlets that will not suit the requirements for your particular server patching scenario. Replace these Fixlets with relevant Fixlets that you want to run on your endpoints to complete server patching in your environment.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 103 and press Enter. This is the ID of the sample Automation Plan.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 26. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Stop Service (222)	This step stops the DB2 client service on the clients.	1. Parameter: Client service name, for example, db2_client. 2. Targets: Client endpoints.
Step 2 Stop Service (222)	This step stops DB2 server service on the DB2 server.	1. Parameter: Server service name, for example, db2_server. 2. Targets: DB2 server.
Step 3 UPDATE: Windows Installer 4.5 for Windows Server 2008 (x64) (25229)	Remove this Fixlet and include an operating system patch that suits your patching requirements. Depending on the Fixlet that you include for this step, you might or might not need to restart the endpoints targeted in this step in step 4.	1. Parameter: Any parameters required by the OS patch Fixlet that you include. 2. Targets: DB2 server.
Step 4 Restart Endpoint (94)	This step restarts the server endpoint.	1. Parameter: No parameter required. 2. Targets: DB2 server.

Table 26. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 5 Start Service (221)	This step starts the DB2 client server on the clients.	<ol style="list-style-type: none"> 1. Parameter: Client service name, for example, db2_client. 2. Targets: Client endpoints.

7. Click **OK** to run the Automation Plan.

Sample Automation Plan for Windows Cluster Patching 2008-2012 with automated restart of endpoints

This sample automation plan provides a template for you to automate cluster patching on Windows 2008-2012 operating systems and contains a Fixlet to automatically reboot the targets endpoint. You can use this sample plan as a template if the patch Fixlet that you are including to patch the nodes in the cluster requires the endpoints to be restarted.

About this task

Use this plan with the Pending Restart settings in the Server Automation application and configure the Pending Restart settings to Continue to next step.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 130 (for the plan ID) and press Enter.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 27. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are patching.
Step 2 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.

Table 27. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 3 Placeholder Fixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 4 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 5 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Pause Node (Windows 2008-2012) (116)	This step pauses the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.
Step 7 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 8 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 10 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Sample Automation Plan for Windows Cluster Patching 2008-2012 without automated restart of endpoints

This sample automation plan provides a template for you to automate cluster patching on Windows 2008-2012 operating systems. You can use this sample plan as a template to patch the nodes in a Microsoft Windows cluster. This plan is designed for use where you do not configure the Pending Restart setting in the Server Automation user interface to automatically restart the endpoints. Set the Pending Restart option to Pause Plan. See the Settings tab of the plan in Server Automation.

About this task

There are no parameters required to run this plan.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 131 (for the plan ID) and press Enter.
4. Select the Sample plan Windows Cluster Patching Sample 2008-2012 without automated restart of endpoints plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 28. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are patching.
Step 2 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 3 Placeholder Fixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.

Table 28. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 4 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 5 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Pause Node (Windows 2008-2012) (116)	This step pauses the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.
Step 7 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 8 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 10 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Sample plan Microsoft Exchange 2007 SP1 Windows Cluster Patching for Windows 2008-2012 with automated reboot

This sample plan shows how you can patch Microsoft Exchange 2007 SP1 on a Microsoft Windows cluster. Use this plan as a template for patching Exchange 2007 SP1 on Windows clusters. Replace the placeholder baseline in this plan to include the baseline or Fixlet that you want to use to patch the Exchange mailbox server.

About this task

Use the Pending Restart settings in the Server Automation application to configure the restart. For this plan, set to Continue Plan. With this option, the endpoints are automatically restarted by the Restart Endpoint and Wait for Restart to Complete (126) Fixlet. To avoid two failovers of the Exchange mailbox server, target the passive node first.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 132 (for the plan ID) and press Enter.
4. Select the Sample plan Microsoft Exchange 2007 SP1 Windows Cluster Patching for Windows 2008-2012 with automated reboot plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 29. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Move Exchange 2007 MailboxServer from Node (121)	This step moves the Exchange 2007 mailbox server from the first node that you are patching. Important: It is best practice to patch the passive node first.	Target the system or systems for the first set of nodes that you are patching.
Step 2 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.

Table 29. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 3 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 4 Placeholder Fixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 5 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 7 Move Exchange 2007 MailboxServer from Node (121)	This step moves the Exchange 2007 mail box server from the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.
Step 8 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 10 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

Table 29. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 11 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Sample plan Microsoft Exchange 2007 SP1 Windows Cluster Patching for Windows 2008-2012 without automated reboot

This sample plan shows how you can patch Microsoft Exchange 2007 SP1 on a Microsoft Windows cluster. Use this plan as a template for patching Exchange 2007 SP1 on Windows clusters. Replace the placeholder baseline in this plan to include the baseline or Fixlet that you want to use to patch the Exchange mailbox server.

About this task

Use the Pending Restart settings in the Server Automation application to configure the restart. For this plan, set the Pending Restart setting to Pause Plan. With this option, the endpoints are not automatically restarted. To avoid two failovers of the Exchange mailbox server, target the passive node first.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 133 (for the plan ID) and press Enter.
4. Select the Sample plan Microsoft Exchange 2007 SP1 Windows Cluster Patching for Windows 2008-2012 without automated reboot plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 30. Plan steps and parameters and targets

Step	Description	Parameters and targets
Step 1 Move Exchange 2007 MailboxServer from Node (121)	This step moves the Exchange 2007 mailbox server from the first node that you are patching. Important: It is best practice to patch the passive node first.	Target the system or systems for the first set of nodes that you are patching.

Table 30. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 2 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 3 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 4 Placeholder Fixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 5 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 7 Move Exchange 2007 MailboxServer from Node (121)	This step moves the Exchange 2007 mail box server from the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.
Step 8 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

Table 30. Plan steps and parameters and targets (continued)

Step	Description	Parameters and targets
Step 10 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 11 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Sample Automation Plan template for deployment of Oracle Database 11g Enterprise Edition

This sample automation plan provides a template for you to automate the deployment of Oracle Database 11g Enterprise Edition on Linux. You can use this sample plan as a template.

The plan will first create the oracle user, then install Oracle Database 11g Enterprise Edition, then create the database, then install the Oracle Database 11g client, then configure the client. To use this sample plan, you must first create a package for the Oracle binaries for the database and the client and upload them to IBM Endpoint Manager for Software Distribution. This sample plans supports Oracle Database 11g Enterprise Edition on Red Hat Enterprise Linux.

To view a demo of this plan running, see this video.

Procedure

Automation template for setting Step Failure Threshold

This sample automation plan patches a number of Windows environments concurrently, using Server Automation parallel processing. It has Step Failure Threshold defined, which controls the success or failure of the patching step in the plan, depending on the number of target endpoints on which the patching step is successful. You can replace the patching fixlets used in this plan with different patching fixlets.

About this task

This sample plan defines the percentage of targets on which the patching step must be unsuccessful for the patching step to be failed. If this threshold is not reached, the step is regarded as successful. In addition, this plan automatically restarts all of the target endpoints that are in a Pending Restart state after the patch updates have completed.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 140 and press Enter.
4. Select the Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 31. Plan steps and targets

Step	Description	Parameters and targets
Step 1 Update IE 7 Available	This is placeholder fixlet. You can keep this fixlet in the plan, or replace it with another patching fixlet. Change the Step Failure Threshold settings as required, setting the threshold to the percentage of endpoint failures at which you want the step to be failed.	Target a set of Windows endpoints on a particular Windows operating system
Step 2 Update: IE 7 Available	This is placeholder fixlet. You can keep this fixlet in the plan, or replace it with another patching fixlet. Change the Step Failure Threshold settings as required, setting the threshold to the percentage of endpoint failures at which you want the step to be failed.	Target a set of Windows endpoints on an operating system different from those targeted in step 1.
Step 3 Update IE 7 Available	This is placeholder fixlet. You can keep this fixlet in the plan, or replace it with another patching fixlet. Change the Step Failure Threshold settings as required, setting the threshold to the percentage of endpoint failures at which you want the step to be failed.	Target a set of endpoints on a Windows operating system different from those targeted in steps 1 and 2.
Step 4 Restart Endpoint and wait for Restart to Complete.	This step restarts the targeted endpoints that are in a Pending Restart state after the Internet Explorer 7 update has been completed.	Target all of the endpoints targeted in the previous three steps.

7. Click **OK** to run the Automation Plan.

Automation template for Hyper-V Cluster Patching 2008-2012

This sample automation plan provides a template for you to automate cluster patching of Hyper-V operating systems on Windows 2008-2012 and contains a Fixlet to automatically reboot the targets endpoint. You can use this sample plan as a template if the patch Fixlet that you are including to patch the nodes in the cluster requires the endpoints to be restarted.

About this task

Use this plan with the Pending Restart settings in the Server Automation application and configure the Pending Restart settings to Continue to next step. There are no parameters required to run this plan.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 141 and press Enter.
4. Select the Sample Plan Hyper-V Cluster Patching Sample 2008-2012 Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 32. Plan steps and targets

Step	Description	Parameters and targets
Step 1 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are patching.
Step 2 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 3 PlaceholderFixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 4 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.

Table 32. Plan steps and targets (continued)

Step	Description	Parameters and targets
Step 5 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Pause Node (Windows 2008-2012) (116)	This step pauses the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.
Step 7 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 8 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 10 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Automation template for SQL Server Cluster Patching 2008-2012

This sample automation plan provides a template for you to automate cluster patching with Microsoft SQL Server is installed on Windows 2008-2012 operating systems and contains a Fixlet to automatically reboot the targets endpoint. You can use this sample plan as a template if the patch Fixlet that you are including to patch the nodes in the cluster requires the endpoints to be restarted.

About this task

Use this plan with the Pending Restart settings in the Server Automation application and configure the Pending Restart settings to Continue to next step. There are no parameters required to run this plan.

Complete the following steps to run the sample Automation Plan.

Procedure

1. Open the **Server Automation** domain.
2. From the navigation tree in the Domain Panel, click **Automation Plans**.
3. In the **Automation Plans** dashboard, enter 142 and press Enter.
4. Select the Sample Plan SQL Server Cluster Patching 2008-2012 Automation Plan from the list of Automation Plans.
5. Click **Copy** to copy the Automation Plan and then save the copy that you have just created.
6. To run the Automation Plan, click **Take Action**. The following table shows the parameters and targets that you need to input for each step in the sample Automation Plan.

Table 33. Plan steps and targets

Step	Description	Parameters and targets
Step 1 Pause Node (Windows 2008-2012) (116)	This step pauses the first node in the cluster that you want to patch.	Target the system or systems for the first set of nodes that you are patching.
Step 2 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you are pausing in step 1.	Target the system or systems for the first set of nodes that you are pausing in step 1. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 3 Placeholder Fixlet	This step is a placeholder. Replace this Fixlet with a Fixlet or baseline for your patching requirements.	Target the system or systems for the first set of nodes that you want to patch. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 4 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers that you patched in step 3.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 5 Resume Node (Windows 2008-2012) (115)	This step resumes the first set of computers that you are patching.	Target the system or systems for the first set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 1.
Step 6 Pause Node (Windows 2008-2012) (116)	This step pauses the second set of nodes that you are patching.	Target the system or systems for the second set of nodes that you are patching.

Table 33. Plan steps and targets (continued)

Step	Description	Parameters and targets
Step 7 Move Groups from Node (Windows 2008-2012) (114)	This step moves groups from the node that you paused in step 6.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 8 Placeholder Fixlet	This step is a placeholder. Replace this step with the patch or baseline for your patching requirements.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 9 Restart Endpoint and Wait for Restart to Complete (126)	This step restarts the computers patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.
Step 10 Resume Node (Windows 2008-2012) (115)	This step resumes the second set of nodes patched in step 8.	Target the system or systems for the second set of nodes that you are patching. You can select the Use same targets as option to quickly select the same targets you targeted for step 6.

7. Click **OK** to run the Automation Plan.

Chapter 7. Server Automation content

Server Automation provides content that you can use to automate processes and software deployment.

Patching Microsoft Windows clusters

You can use Server Automation to automate Microsoft Windows cluster patching. Server Automation contains preconfigured Fixlets that allow you to patch Microsoft Windows clusters.

The Server Automation cluster patching Fixlets support patching general Microsoft Windows clusters. For example, you can use the Server Automation Fixlets for patching scenarios such as Microsoft SQL Server cluster patching.

Patching Microsoft Windows clusters

You can patch Windows clusters using Server Automation Fixlets. The procedure to patch Windows clusters involves running a Fixlet to pause the node that you are patching. You then run another Fixlet to move any groups on the node to another node. You can then patch the node and when you have completed the patching, you run a Fixlet to resume the node. The Fixlets to pause and resume the nodes are operating system-specific and the supported operating systems are described in the Fixlet descriptions.

Before you begin

The Windows Cluster control scripts must be installed on the target nodes in the cluster. You can install these scripts by running the 110 Install Windows Cluster Control Application Fixlet.

About this task

The Server Automation cluster patching Fixlets support general Microsoft Windows clusters, including patching scenarios such as Microsoft SQL Server cluster patching.

The following procedure is designed for use with a cluster set up with a quorum configured for the following systems:

- DiskWitness only (2012 systems)
- NoMajority (Disk Only) (2008 systems)
- Standard Quorum (2003 systems)

With this setup, the cluster remains operational as long as at least one of the nodes in the cluster is still running. If the quorum for the cluster is configured in any other way, ensure that when targeting the nodes in the cluster that half of the total nodes +1 are operational at any time. For example, if there are 20 nodes in the cluster, 11 nodes (10 +1) nodes must be operational at any one time. If there are 16 nodes in the cluster, 9 nodes (8 +1) must be operational at any one time. Otherwise, the cluster stops working. The cluster does not resume functioning correctly until more than half the nodes have resumed the cluster service and the cluster is unavailable until this time. Complete the following steps to patch a

Windows cluster using the Server Automation Fixlets:

Procedure

1. Pause the node or nodes in the cluster that you want to patch. Run Fixlet 112 Pause Node in the Cluster (Windows 2003) to pause the node on Windows 2003 and Fixlet 116 Pause Node in the Cluster (Windows 2008-2012) to pause the node on Windows 2008 and 2012. When running the Fixlet to pause the node, target each node that you want to pause.
2. Move any groups on the node to another node. Use Fixlet 111 Move Groups from Node in the Cluster (Windows 2003) to move groups on Windows 2003 and use Fixlet 114 Move Groups from Node in the Cluster (Windows 2008-2012) to move groups on Windows 2008 and 2012.
3. Patch or update the node as required. If you use a Baseline to patch the node, check if the Baseline contains an action script that causes the node to report a status of Pending Restart, for example, action requires restart. If the node returns a Pending Restart status, the system determines this as a wait state and does not complete the step. To correct this, you must include a restart Fixlet as part of the Baseline.
4. Resume the node. To resume on Windows 2003, use Fixlets 113 Resume Node in the Cluster (Windows 2003). To resume on Windows 2008 or Windows 2012, use Fixlets 115 Resume Node in the Cluster (Windows 2008-2012).
5. Repeat this process for the remaining nodes in the cluster.

Patching Servers running Microsoft Exchange 2010 and 2013 (Exchange 2013 SP1 and later) Data Availability Groups

You can use Server Automation Tasks to patch an operating system running Microsoft Exchange 2010 and Exchange 2013 (Exchange 2013 SP1 and later versions) Data availability groups (DAG), while maintaining the DAG availability. You patch the operating system using a number of Tasks and a service. The Tasks automate the execution of Microsoft Exchange scripts provided with Exchange 2010 and Exchange 2013. You run these Tasks in an Automation Plan and you can combine them with custom Tasks for patching the underlying operating system to fully automate the patching process.

Before you begin

- For Exchange 2013, Exchange 2013 Service Pack 1 and newer versions are supported. All version of Exchange 2010 are supported.
- Before running any of the patching steps, the control scripts must be installed. Use Task 110-Install Windows Cluster Control Application to install the control scripts.
- The IBM Exchange Cluster Manager Service must be installed. Use Task 123 Install IBM Exchange Cluster Manager Service to install the service.
- .Net Framework 4.0 must be installed on each node. Use Fixlet 40301 UPDATE: Microsoft .NET Framework 4.0 Available -Site-Patches for Windows to install or update the .Net Framework 4.0 on each node.

About this task

The scripts that are run by your Automation Plan are provided by Microsoft. For more information about these scripts, see the following Microsoft resources:

- [http://technet.microsoft.com/en-us/library/ee861125\(v=exchg.141\).aspx](http://technet.microsoft.com/en-us/library/ee861125(v=exchg.141).aspx)
- [http://technet.microsoft.com/en-us/library/dd298065\(v=exchg.141\).aspx](http://technet.microsoft.com/en-us/library/dd298065(v=exchg.141).aspx)

There are three Server Automation Tasks available for automated patching of Exchange Database Availability Groups:

Table 34. Exchange cluster patching Tasks

Task	Description
Task ID 125 - Exchange 2010 and 2013 Start DAG (Database Availability Groups) Maintenance Task	Runs the startDagservermaintainence.ps1 powershell script against the target endpoint. Active DAGs on the node are moved off the endpoint. The endpoint is placed on a paused state. If the cluster group is present on the endpoint, it is also moved to another node. The DatabaseCopyAutoActivationPolicy is set to blocked after running this script. The script does not move any non-exchange 2010 groups off the node. When this script is run against an endpoint, the endpoint is in a state where any patch or custom Fixlets can be run.
Task ID 127 - Exchange 2010 and 2013 Stop DAG (Database Availability Groups) Maintenance Task	Runs the stopDagservermaintainence.ps1 powershell script against the target endpoint. This script resumes a node and also sets the DatabaseCopyAutoActivationPolicy to unrestricted for each database on the endpoint. No groups are failed back onto a node after running this script.
Task ID 128 - Rebalance Active Databases Task Exchange 2010 and 2013 DAG (Database availability Groups) Task	Runs the RedistributeActiveDatabases.ps1 powershell script against the target endpoint. This script redistributes the active databases across all nodes available to the DAGs. The script uses the BalanceDbsByActivationPreference switch. You can run this Task at the end of an Automation Plan against one of the endpoints if you want to redistribute the DAGs across the servers after all patching has been completed.

You can use the Server Automation template sample plans, changing the template to add your patching Fixlets. Server Automation template sample plans for Exchange 2010 are Fixlet IDs 134 and 135. The recommended Automation Plan patching process is as follows, where you complete steps 1 to 4 for the first node in the cluster, and then repeat these steps for the other nodes in the cluster:

Procedure

1. Add Task ID 125 Exchange 2010 and 2013 Start DAG (Database Availability Groups) Maintenance to your plan.
2. Add your patching Fixlets to the plan.
3. If a restart is required after the patching Fixlets have completed, add Server Automation Fixlet ID 126 Restart Endpoint and Wait for Restart to Complete to the plan.
4. Add Task ID 127 Exchange 2010 and 2013 Stop DAG (Database Availability Groups) Maintenance to your plan.

5. Add four more steps to the plan, repeating each of steps 1 to 4 for each node in the cluster.
6. Run the plan.

Results

Monitor the execution of the plan from the **Automation Plan Action Status** dashboard. On successful completion of the plan, the Exchange DAGs have been patched with the patching Fixlets you included in the plan.

Automating patching of operating system servers in a Microsoft Hyper-V cluster

You can use Server Automation to automate patching of operating system servers in a Microsoft Hyper-V cluster, without affecting the data availability groups operations. Server Automation enables you to automate the patching process using a number of Tasks which manage the cluster as it is being patched. The Tasks prepare nodes for patching by pausing them and moving all virtual machines, groups, and resources off the nodes. The required patches are then applied to the operating system as part of the automation flow. After the operating system is patched, the automation flow restores the nodes to their original pre-patching state.

Before you begin

- Control scripts must be installed on each of the endpoints that you are patching. Use Server Automation Task 110 **Install Windows Cluster Control Application** to install the control scripts.
- The Powershell feature must be installed on each node that you are patching. By default this is installed on all instances of Microsoft Server from 2008 Release 2 onwards, except for core installations. For core installations, use the following links to install Powershell:
 - <http://support.microsoft.com/kb/976736>
 - http://technet.microsoft.com/en-us/library/hh847837.aspx#BKMK_InstallingOnServerCore

About this task

There are two phases in the automated patching flow. In the first phase, one node or group of nodes is patched. In the second phase, the second node or group of nodes is patched. By managing the patching in this way, the cluster remains operational at all times. In phase one, you run a sequence of Tasks to manage the patching of the first node or group of nodes in the cluster. Then you repeat these same steps on the second node or nodes in the cluster. The following operating systems are supported:

- Windows 2012
- Windows 2012 Release 2
- Windows 2008 Release 2 and later

To automate the patching process, you run an automation plan. The automation plan contains a number of steps, each of which represents a stage in patching process. You can create a new automation plan or modify an existing plan, such as an out-of-the-box sample plan by changing some of the steps.

Procedure

1. Add Task ID 117 Pre-patching Task for clustered Microsoft HyperVisor Servers to the plan as step 1 in the plan. When you are running the plan, target the first node or group of nodes in the cluster.

This Task performs the following functions:

- a. Creates a file detailing all groups and virtual machines in the cluster, including what nodes they are on and the states of each resource in the cluster. If there are empty groups (groups with no resources) in the cluster, a second file is created detailing these groups.
- b. Pauses the node.
- c. Checks to see if there are other nodes available to which to move the virtual machines. If other nodes are available, virtual machines are moved using the method you select (either live migrated or quick migrated). If the virtual machines are set up to be online only on the current node (no other possible owners set) the virtual machine is taken offline. If the virtual machine has other possible owners but these owners are not available, the Task fails because it is not possible to move the virtual machine off the node.
- d. Moves groups that have other available owners. If no other owners are available to take groups, the Task fails. Any groups set up to be online only on the current node (only target set as possible owner of the group or at least one resource in the group) are the taken offline.
- e. Takes any empty groups offline.
- f. Checks to ensure the node is paused and has no active groups remaining and is a state suitable for patching the server operating system.

Note: This Task does not move any groups that were offline before the Task was run.

2. Add the required operating system patching Fixlet, Task, or Baseline as the second step in the plan. When you are running the plan, target the first node or group of nodes in the cluster.
3. Add Server Automation Task 126 Restart Endpoint and Wait for Restart to Complete to restart the first node or group of nodes in the cluster. When you are running the plan, target the first node or group of nodes in the cluster.
4. Add the post patching Task 129 Post Patching task for Microsoft Server Clusters (Server 2008 R2 onwards including Hyper-V Clusters) to restore the node or nodes to their original state. After this Task has run successfully, the first node or nodes in the cluster are patched and back up and running. When you are running the plan, target the first node or group of nodes in the cluster.

This Task performs the following functions:

- a. Resumes the node.
 - b. If the cluster detail file is found on the targeted endpoints, the Task checks this file and moves any virtual machines and groups back on to the node if they were moved off the node during patching. The Task then brings back online any empty groups or groups which had the target node as the only possible owner of the group before patching.
5. Add four more steps to the plan, to repeat steps 1 to 4 for the second node or group of nodes. For each of these steps, you need to target the second node or nodes in the cluster.

Patching Microsoft Exchange 2007 on Windows clusters

You can use Server Automation Fixlets to patch a Windows Cluster that is running Microsoft Exchange 2007 on Windows Server 2003 or Windows Server 2008. As per industry standard, patch the passive node first. This avoids moving the Mailbox server twice in a patching scenario. You add the Server Automation Fixlets into a plan to automate the patching process. You can use Fixlet 121 Move Exchange 2007 Mailbox Server from Node to identify the active node as this Fixlet will only be relevant on the node running the Mailbox server.

Before you begin

- Before running any of the patching steps the control scripts must be installed. Use Task 110-Install Windows Cluster Control Application to install the control scripts.
- The IBM Exchange Cluster Manager Service must be installed. Use Task 123 Install IBM Exchange Cluster Manager Service to install the service.
- .Net Framework 4.0 must be installed on each node. Use Fixlet 40301 UPDATE: Microsoft .NET Framework 4.0 Available -Site-Patches for Windows to install or update the .Net Framework 4.0 on each node.

About this task

The IBM cluster patch solution works by using a number of Fixlets and a service to enable patching of an Exchange cluster environment. To move an Exchange Mailbox Server from node to node you must be a domain level user. To achieve this a service is installed on each node which runs with the domain level credentials. Moving the clustered mailbox is governed by a Microsoft Shell Command and might not always successfully move the mailbox. For more information, see this Microsoft tech note.

Start the patching process by patching the passive node. Then repeat the procedure for the active node.

Procedure

1. Optional: Use Fixlet 121 Move Exchange 2007 MailboxServer from Node to move the Mailbox Server from the node.
2. Pause the node or nodes in the cluster that you want to patch. Run one of the following Fixlets:
 - a. Fixlet ID 112 Pause Node for Windows 2003 Servers.
 - b. Fixlet ID 116 Pause Node for Windows 2008 Servers.
3. Move any groups on the node to another node using one of the following Fixlets:
 - a. Fixlet ID 111 Move Groups for Windows 2003 Servers.
 - b. Fixlet ID 114 Move Groups for Windows 2008 Servers.
4. Patch or update the node as required. If you use a Baseline to patch the node, check if the Baseline contains an action script that causes the node to report a status of Pending Restart, for example, action requires restart. If the node returns a Pending Restart status, the system determines this as a wait state and does not complete the step. To correct this, you must include a restart Fixlet as part of the Baseline.
5. Resume the node using one of the following Fixlets, depending on your operating system:
 - a. Fixlet ID 113 Resume Node for Windows 2003 Servers

- b. Fixlet ID 115 Resume Node for Windows 2008 Servers
6. Repeat this process for the active node in the cluster.

Cluster patching terms and concepts

The following table describes some key cluster patching terminology and concepts.

Table 35. Cluster patching key terms and concepts

Term	Description
Cluster	One or more servers working together, which appear to the end user as one entity to provide a platform to run applications and services. The system of clustering provides a backup and reserve capability for the applications running on the cluster.
Node	One server or unit member of a cluster. A cluster is made up of a number of nodes.
Group	A container for resources. Resources that have a link or dependency on each other must be in the same group.
Resource	The lowest entity managed by a cluster. Some resources can have a dependency on others and require other resources to be online before they come online. This is sometimes built in as some resources are integral to a cluster being formed and maintaining functionality. These resources are created and grouped by the Windows cluster management application.
Quorum	The quorum is a set of files used by the cluster to maintain the cluster. The quorum is integral to a cluster functioning. The quorum contains the configuration files used by the cluster to ensure the cluster is maintained in an operational state.
Quorum configuration	Describes how the quorum is set up in the cluster. Each cluster has one quorum configuration. For more information, see the following resources: <ul style="list-style-type: none"> Windows 2003 systems: http://technet.microsoft.com/en-us/library/cc779076(v=ws.10).aspx Windows 2008 systems: http://technet.microsoft.com/en-us/library/cc731739.aspx Windows 2012 systems: http://technet.microsoft.com/en-us/library/jj612870.aspx#BKMK_option_overview
Failover	The process of groups being moved from one node to another node in the event of a failure of the node the resource is currently running on.
Node up or active	When a node is active, the node can receive and run groups from another node and participate fully in all clustering functions and is available to receive groups in the event of a failure of another node in the cluster.
Pause or paused node	Pause node brings the node into a paused state. While a node is paused the clustering service is still running on the node, however, the node no longer accepts any new groups onto the node and therefore is not available in a failover situation. The node continues to run any groups on the node before it was paused.
Resume node	Resuming a node restarts the clustering service on the node and changes the node from a paused or down state to an up state.
Node down	If a node is down it is no longer running the cluster service and is not available for any clustering activity. It is not available to run any applications or services for the cluster. Any groups running on the node before it goes down are failed over onto a different node.

Table 35. Cluster patching key terms and concepts (continued)

Term	Description
Move group	A move group command moves groups from the node the command is run against to another available node in the cluster. Other nodes must be available for this command to work successful.

Server Automation middleware content

You can use the IBM Endpoint Manager for Server Automation middleware Tasks to automate the deployment of middleware applications. You can include these Tasks as steps in your Automation Plans.

IBM Endpoint Manager V9.1 supports the SHA-256 algorithm. Depending on the configuration you have set for the SHA algorithm in IBM Endpoint Manager V9.1, the Server Automation middleware Tasks show different options. If you have enabled SHA-256 in IBM Endpoint Manager V9.1, you must use SHA-256 in the Server Automation middleware Tasks. If you have not enabled SHA-256 in IBM Endpoint Manager V9.1, you can use SHA-1 in the Server Automation middleware Tasks.

Before you begin using the Tasks, ensure that you read the prerequisite information described here.

Prerequisites

To use the Server Automation middleware Fixlets, you must create packages containing the specific version of the software that you are deploying. You create the packages in the **Manage Software Distribution** dashboard in IBM Endpoint Manager. This allows the Fixlets to access the software that you are deploying. You must also configure the IBM Endpoint Manager server to allow dynamic downloads. You need access to the **Systems Lifecycle** domain and the Software Distribution site.

For each Fixlet, you must create a corresponding package for the middleware component that you want to deploy and add it to the **Manage Software Distribution** dashboard in IBM Endpoint Manager. Then when you are running the Fixlet, you specify the URL for the package that you created. The Fixlet can then download the package and deploy the contents.

Important: When you are creating packages and adding them to the **Manage Software Distribution** dashboard, you need to extract the contents of ZIP files before you upload them to the **Manage Software Distribution** dashboard. If you upload ZIP files without first extracting the contents, the Fixlets are unable to deploy the middleware correctly.

Important: When uploading binary files the **Manage Software Distribution** dashboard, remove any hyphens or special characters from the binary name. Only the following characters work correctly when uploading packages to the **Manage Software Distribution** dashboard:

- Uppercase or lowercase letters from a to z.
- Numerical values from 0 to 9.
- Underscore _
- Period .

If you include hyphens or any other multi-byte characters other than those listed above, the file name of the uploaded package is renamed to its sha 1 value and the download does not work. Only single byte characters work correctly.

For each file to be downloaded in IBM Endpoint Manager, there are three required fields.

URL The URL from which the file can be downloaded. This is generally http, https, or ftp.

SHA-1

The SHA-1 is a generated checksum to ensure that the downloaded file is correct.

Note:

IBM Endpoint Manager V9.1 supports the SHA-256 algorithm. Depending on the configuration you have set for the SHA algorithm in IBM Endpoint Manager V9.1, the Server Automation middleware Tasks show different options. If you have enabled SHA-256 in IBM Endpoint Manager V9.1, you must use SHA-256 in the Server Automation middleware Tasks. If you have not enabled SHA-256 in IBM Endpoint Manager V9.1, you can use SHA-1 in the Server Automation middleware Tasks.

Size The size of the file in bytes is used with the SHA-1 to validate the file is correct.

You can use the **Manage Software Distribution** dashboard to download the required files. When the files are downloaded, select the correct binary file from the **Select a binary file** list in the Fixlet description to populate the **URL**, **SHA-1**, and **Size** fields. To use the **Manage Software Distribution** function, you must configure the IBM Endpoint Manager server for dynamic downloads.

Note: For binary files larger than 2 GB, you might experience issues. Ensure that these files are successfully archived in the **Manage Software Distribution** dashboard. Large files might display in the Fixlet **Select a binary file** list even if they are not fully uploaded.

Manage Software Distribution dashboard

You can download the required files to the IBM Endpoint Manager Server Uploads directory, by clicking **Manage Software Distribution** in the middleware Fixlet **Description** tab. Specific instructions about how to do this are included in the **Description** tab of each Fixlet. The **Manage Software Distribution** dashboard is part of the Systems Lifecycle domain and the Software Distribution site. To use the **Manage Software Distribution** dashboard, you must acquire the Software Distribution site. For information about setting up the Manage Software Distribution dashboard, see Software Distribution dashboards Setup.

To download the required files, you must create a package and add one or more files to the package. For information about creating a Software Distributions package and adding files to packages, see Managing Packages.

Configuring the system for dynamic downloads

The DownloadWhitelist.txt file specifies all of the formats that are allowed for dynamically downloaded files. If your system contains an empty or nonexistent whitelist file, all dynamic downloads fail.

The DownloadWhitelist.txt file is on the IBM Endpoint Manager server in the following directory:

On Windows systems:

C:\Program Files (x86)\BigFix Enterprise\BES Server\Mirror
Server\Config

On Linux systems:

/var/opt/BESServer/Mirror Server/config

To configure the DownloadWhitelist.txt file, complete the following steps:

1. If it does not exist, create the DownloadWhitelist.txt file in specified directory on the IBM Endpoint Manager server.
2. Specify the formats that you want to enable for dynamic downloading. For example, the following contents in the DownloadWhitelist.txt file specify IBM Endpoint Manager server locations or external locations:

```
http://127.0.0.1:52311/*  
http://software.bigfix.com/*  
http://127.0.0.1:52311/bfmirror/downloads/ScriptManifest.lst
```

The .* entries allow all files to be downloaded. This is a potential security concern and you might choose not to use this option.

3. Save the DownloadWhitelist.txt file.

Important: This does not affect static downloading, for example, if you specify a full path name to a file.

For more information about static and dynamic downloading, see the Actions Guide and search for dynamic downloads.

IBM Endpoint Manager for Server Automation middleware Tasks

This section lists all of the IBM Endpoint Manager for Server Automation middleware Tasks and provides a short description of each Task.

Table 36. Product IDs for some middleware applications

Product	Operating system (64-bit)	IBM Product ID
DB2 Enterprise Server Edition 9.7	Linux	CZ19NEN
	AIX	CZ19JEN
	Windows	CZ19HML (32-bit only)
DB2 Data Server Client 9.7	Linux	CZ1ATEN
	AIX	CZ1ANEN
	Windows	CZ1AMML
WebSphere Application Server Base V7.0	Linux	C1FZ9ML
	AIX	

Table 36. Product IDs for some middleware applications (continued)

Product	Operating system (64-bit)	IBM Product ID
	Windows	C1G0TML
WebSphere Application Server Network Deployment V7.0	Linux	C1G35ML
	AIX	
	Windows	C1G2JML

Table 37. DB2 Tasks for Windows

ID	Task name	Description
26	Create Instance for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task creates an instance for IBM UDB DB2 Enterprise Server Edition 9.x on Windows.
29	Install IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task installs IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems. It also supports installation of Advanced Enterprise Server Edition.
53	Create Instance for IBM DB2 Data Server Client 9.x on Windows	This Task creates an Instance for IBM DB2 Data Server Client 9.x on Windows.
25	Create DAS for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task creates a Database Administration Server (DAS) for IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems.
27	Drop DAS for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task drops Database Administration Server (DAS) for IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems.
28	Drop Instance for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task drops an Instance for IBM DB2 9.x on Windows operating systems.
30	Start DAS for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This task starts Database Administration Server (DAS) for IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems.
31	Start Instance for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task starts an Instance for IBM DB2 9.x on Windows operating systems.
32	Stop DAS for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task stops Database Administration Server (DAS) for IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems
33	Stop Instance for IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task stops an Instance for IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems.
34	Uninstall IBM DB2 UDB Enterprise Server Edition 9.x on Windows	This Task uninstalls IBM DB2 UDB Enterprise Server Edition 9.x on Windows operating systems.
52	Install IBM DB2 Data Server Client 9.x on Windows	This Task installs IBM DB2 Data Server Client 9.x on Windows operating systems.

Table 37. DB2 Tasks for Windows (continued)

ID	Task name	Description
54	Drop Instance for IBM DB2 Data Server Client 9.x on Windows	This Task drops an Instance for IBM DB2 Data Server Client 9.x on Windows operating systems.
55	Uninstall IBM DB2 Data Server Client 9.x on Windows	This Task uninstalls IBM DB2 Data Server Client 9.x on Windows operating systems.

Table 38. DB2 Tasks for Linux platforms

ID	Task name	Description
10	Uninstall IBM DB2 Data Server Client 9.x on RHEL, SLES and IBM AIX	This Task removes all installed DB2 database products from the targeted computer. This Task queries your system for existing DB2 installations and automatically retrieves the file path.
11	Create DAS for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task creates a Database Administration Server instance for IBM DB2 UDB Enterprise Server Edition 9.x with a default username as dasusr1 belonging to default group dasadm1. There is only one DAS per computer. One DAS services one or more database instances, including database instances that belong to different installations.
12	Drop DAS for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task drops the Database Administration Server for IBM DB2 UDB Enterprise Server Edition 9.x instance on RHEL,SLES and IBM AIX. You can have only one DAS in a database server.
13	Start DAS for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task starts the Database Administration Server for IBM DB2 UDB ESE 9.x on RHEL,SLES and AIX.
14	Stop DAS for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task stops the Database Administration Server for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL,SLES and IBM AIX.
15	Create Instance for IBM DB2 Data Server Client 9.x on RHEL and SLES	This Task creates an instance for IBM DB2 Data Server Client on RHEL and SLES.
16	Create Instance for IBM DB2 UDB Enterprise Server Edition 9.x on IBM AIX	This Task creates an instance for IBM DB2 UDB Enterprise Server Edition 9.x on IBM AIX. This task creates two operating system users with the instance and fence names specified.
17	Drop Instance for IBM DB2 Data Server Client 9.x on RHEL, SLES and IBM AIX	This Task drops an instance for IBM DB2 Data Server Client 9.x on RHEL,SLES and IBM AIX.
18	Drop Instance for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL,SLES and IBM AIX	This Task removes an instance for IBM DB2 UDB ESE 9.x on RHEL,SLES and IBM AIX.

Table 38. DB2 Tasks for Linux platforms (continued)

ID	Task name	Description
20	Start Instance for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task starts an instance for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL,SLES and IBM AIX.
21	Install IBM DB2 Data Server Client 9.x on RHEL, SLES and IBM AIX	This Task installs DB2 on RHEL, SLES and IBM AIX.
22	Stop Instance for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL,SLES and IBM AIX	This Task stops an instance for IBM DB2 Enterprise Server Edition 9.x on RHEL,SLES and IBM AIX.
23	Install IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This task installs DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX systems.
24	Uninstall IBM DB2 UDB Enterprise Server Edition 9.x on RHEL, SLES and IBM AIX	This Task removes the DB2 product that is installed on a computer. This Task queries your system for existing DB2 installations and retrieves the path.
50	Create Instance for IBM DB2 Data Server Client 9.x on IBM AIX	This Task creates an instance for IBM DB2 Data Server Client 9.x on IBM AIX. This Task creates an operating system users with the same name as the instance name specified. It also creates a default group with the name "db2iadm1" provided it does not exist.
51	Create Instance for IBM DB2 UDB Enterprise Server Edition 9.x on REEL and SLES	This Task creates an instance for IBM DB2 UDB Enterprise Server Edition 9.x on RHEL and SLES. This Task creates two operating system users with the same name as the instance name specified.

Table 39. Multi-operating system DB2 Tasks

ID	Task name	Description
82	Create Database for IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES and IBM AIX	This Task creates a database for IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES and IBM AIX.
83	Drop Database for IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL,SLES and IBM AIX	This Task drops a database for IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES and IBM AIX.
89	Backup a database for IBM UDB Enterprise Server Edition 9.x on Windows, Linux and AIX	This Task creates a database backup for IBM UDB Enterprise Server Edition 9.x on Windows, Linux and AIX operating systems
90	Restore a database for IBM UDB Enterprise Server Edition 9.x on Windows, Linux and AIX	This Task restores a database for IBM UDB Enterprise Server Edition 9.x on Windows, Linux and AIX operating systems.
96	Execute SQL and DDL scripts on IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES and IBM AIX	This Task executes a SQL and DDL scripts on IBM DB2 UDB Enterprise Server Edition 9.x on Windows, RHEL, SLES and IBM AIX.

Table 40. WebSphere Application Server base Tasks for Windows

ID	Task name	Description
36	Install IBM WebSphere Application Server Base (Distributed operating systems) 7.x on Windows	This Task installs IBM WebSphere Application Server (Base) 7.x on Windows operating systems. Note: Do not use the Disable OS prerequisite check on this Task or the Task does not run successfully.
37	Create profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on Windows	This Task creates a profile using the manageprofiles command for IBM WebSphere Application Server Base 7.x on Windows operating systems.
38	Start a profile for IBM WebSphere Application Server Base (Distributed operating systems) 7.x on Windows	This Task starts a profile for IBM WebSphere Application Server Base 7.x on Windows operating systems.
39	Stop a profile for IBM WebSphere Application Server Base (Distributed operating systems) 7.x on Windows	This Task stops a profile for IBM WebSphere Application Server Base 7.x on Windows operating systems.
40	Uninstall IBM WebSphere Application Server Base (Distributed operating systems) 7.x on Windows	This Task uninstalls 32-bit and 64-bit IBM WebSphere Application Server Base 7.x on Windows operating systems. Note: Because of compatibility issues with WebSphere Application Server, this Task does not work on Windows 2012 and Windows 2012 R2.
56	Delete profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on Windows	This Task deletes a profile using the manageprofiles command for IBM WebSphere Application Server Base 7.x on Windows operating systems. Note: Because of compatibility issues with WebSphere Application Server, this Task does not work on Windows 2012 and Windows 2012 R2.

Table 41. WebSphere Application Server network deployment tasks for Windows

ID	Task name	Description
41	Install IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task installs IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX systems.
43	Install IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX	This Task installs IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX systems.
57	Install IBM WebSphere Application Server Network Deployment (Distributed operating systems) 7.x on Windows	This Task installs IBM WebSphere Application Server (Network Deployment) 7.x on Windows operating systems.
60	Create Profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL, SLES and IBM AIX	This Task creates a profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL, SLES and IBM AIX systems.

Table 41. WebSphere Application Server network deployment tasks for Windows (continued)

ID	Task name	Description
61	Stop a profile for IBM WebSphere Application Server (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task stops a profile for IBM WebSphere Application Server (Distributed Operating Systems) 7.x on RHEL, SLES and IBM AIX systems.
62	Stop a profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX	This Task stop a profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX systems.
63	Start a profile for IBM WebSphere Application Server Network Deployment (Distributed operating systems) 7.x on Windows	This Task starts a profile for IBM WebSphere Application Server Network Deployment (Distributed Operating Systems) 7.x on Windows.
64	Stop a profile for IBM WebSphere Application Server Network Deployment (Distributed operating systems) 7.x on Windows	This Task stops a profile for IBM WebSphere Application Server (Network Deployment) 7.x on Windows operating systems.
65	Create profile for IBM WebSphere Application Server Network Deployment (Distributed Operating Systems) 7.x on Windows	This Task creates a profile using the manageprofiles command for IBM WebSphere Application Server Network Deployment 7.x on Windows operating systems.
67	Create a cell profile for IBM WebSphere Application Server Network Deployment (Distributed Operating Systems) 7.x on Windows	This Task creates a cell profile using the manageprofiles command for IBM WebSphere Application Server Network Deployment 7.x on Windows operating systems.
48	Uninstall IBM WebSphere Application Server Network Deployment (Distributed operating systems) 7.x on Windows	This Task uninstalls IBM WebSphere Application Server (Network Deployment) 7.x on Windows operating systems. Note: Because of compatibility issues with WebSphere Application Server, this Task does not work on Windows 2012 and Windows 2012 R2.
64	Stop a profile for IBM WebSphere Application Server Network Deployment (Distributed operating systems) 7.x on Windows	This Task stops a profile for IBM WebSphere Application Server (Network Deployment) 7.x on Windows operating systems.
66	Delete profile for IBM WebSphere Application Server Network Deployment (Distributed Operating Systems) 7.x on Windows	This Task deletes a profile using the manageprofiles command for IBM WebSphere Application Server Network Deployment 7.x on Windows operating systems. Note: Because of compatibility issues with WebSphere Application Server, this Task does not work on Windows 2012 and Windows 2012 R2.
69	Install IBM Update Installer 7.x for IBM Websphere Software on Windows	This Task installs IBM Update Installer 7.x for IBM Websphere Software on Windows operating systems.

Table 41. WebSphere Application Server network deployment tasks for Windows (continued)

ID	Task name	Description
70	Install fixpack for IBM WebSphere Application Server (Base or Network Deployment) 7.x on Windows	This Task installs IBM WebSphere Application Server fixpack 7.x for base and network deployments on Windows operating systems.

Table 42. WebSphere Application Server Tasks for Linux platforms

ID	Task name	Description
42	Uninstall IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x from RHEL,SLES and IBM AIX	This Task uninstalls IBM WebSphere Application Server (Distributed Operating Systems) 7.x from RHEL,SLES and IBM AIX. It retrieves the install location using the WAS registry file.
44	Create Profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task creates a profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX
45	Start a profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task starts a profile for WebSphere Application Server 7.x on RHEL,SLES and IBM AIX.
46	Start a profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX	This Task starts a profile for WebSphere Application Server 7.x on RHEL,SLES and IBM AIX.
47	Uninstall IBM WebSphere Application Server (Network Deployment) 7.x from RHEL,SLES and IBM AIX	This Task uninstalls IBM WebSphere Application Server (Network Deployment) 7.x from RHEL,SLES and IBM AIX. It retrieves the install location using the WAS registry file.
59	Delete Profile for IBM WebSphere Application Server Base (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task deletes a profile for IBM WebSphere Application Server (Distributed Operating Systems) 7.0 on RHEL,SLES and IBM AIX. The profile directory is deleted when you delete the profile so that you can recreate the profile without having to manually delete the directory.
68	Delete Profile for IBM WebSphere Application Server (Network Deployment) 7.x on RHEL,SLES and IBM AIX	This Task deletes a profile for IBM WebSphere Application Server (Network Deployment) 7.0 on RHEL,SLES and IBM AIX. The profile directory is deleted when you delete the profile so that you can recreate the profile without having to manually delete the directory.
80	Install IBM Update Installer 7.x for IBM Websphere Software on RHEL,SLES and IBM AIX	This Task installs IBM Update Installer 7.x for IBM Websphere Software on RHEL,SLES and IBM AIX.
81	Install fixpack for IBM WebSphere Application Server (Base and Network Deployment) 7.x on Linux and IBM AIX	This Task installs a fixpack for IBM WebSphere Application Server Base and Network Deployment 7.x on Linux and IBM AIX.

Table 42. WebSphere Application Server Tasks for Linux platforms (continued)

ID	Task name	Description
98	Create a cell profile for IBM WebSphere Application Server Network Deployment (Distributed Operating Systems) 7.x on RHEL,SLES and IBM AIX	This Task creates a cell profile using the manageprofiles command for IBM WebSphere Application Server Network Deployment 7.x on RHEL,SLES and IBM AIX operating systems.

Table 43. Multi-operating system WebSphere Application Server Tasks

ID	Task name	Description
91	Execute a script against IBM WebSphere Application Server (Base or Network Deployment) on Windows, Linux and IBM AIX	This Task executes a script against IBM WebSphere Application Server (Base or Network Deployment) on Windows, Linux and IBM AIX systems.
99	Install an application on IBM WebSphere Application Server (Base or Network Deployment) on Windows, Linux and IBM AIX	This Task installs an application on IBM WebSphere Application Server (Base or Network Deployment) on Windows, Linux and IBM AIX systems.

Table 44. Microsoft SQL Server Tasks for Windows

ID	Task name	Description
35	Create Database for Microsoft SQL Server 2008 or 2008 R2 Enterprise Server Edition on Windows	This Task creates a database for Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
71	Drop Database for Microsoft SQL Server 2008 or 2008 R2 Enterprise Server Edition on Windows	This Task drops a database for Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
72	Install Microsoft SQL Server 2008 or 2008 R2 Enterprise Server Edition on Windows	This Task installs Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
73	Uninstall Microsoft SQL Server 2008 or 2008 R2 Enterprise Server Edition on Windows	This Task uninstalls Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
74	Pause an Instance of Microsoft SQL Server 2008 or 2008 R2 on Windows	This Task pauses an instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
75	Resume an Instance of Microsoft SQL Server 2008 or 2008 R2 Enterprise Edition on Windows	This Task resumes an instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.

Table 44. Microsoft SQL Server Tasks for Windows (continued)

ID	Task name	Description
76	Start an Instance of Microsoft SQL Server 2008 or 2008 R2 Enterprise Edition on Windows	This Task starts an instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
77	Start Server Agent Instance of Microsoft SQL Server 2008 or 2008 R2 Enterprise Edition on Windows	This Task starts a server agent instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
78	Stop an Instance of Microsoft SQL Server 2008 or 2008 R2 Enterprise Edition on Windows	This Task stops an instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
79	Stop Server Agent Instance of Microsoft SQL Server 2008 or 2008 R2 Enterprise Edition on Windows	This Task stops a server agent instance of Microsoft SQL Server 2008 or Microsoft SQL Server 2008 Release 2 Enterprise Server Edition on Windows Server 2003 to Windows Server 2012 operating systems.
320	Install Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task installs Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
321	Uninstall Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task uninstalls Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
322	Create Database for Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task creates the database for Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
323	Drop Database for Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task drops the database for Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
324	Start an Instance of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task starts an instance of Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
325	Stop an Instance of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task stops an instance of Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
326	Pause an Instance of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task pauses an instance of Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.

Table 44. Microsoft SQL Server Tasks for Windows (continued)

ID	Task name	Description
327	Resume an Instance of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task resumes an instance of Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
328	Start Server Agent of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task starts the server agent for Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
329	Stop Server Agent of Microsoft SQL Server 2012 Enterprise Edition on Windows	This Task stops the server agent for Microsoft SQL Server 2012 Enterprise Edition on Windows Server 2003 to Windows Server 2012 operating systems.
330	Install Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task installs Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
331	Uninstall Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task uninstalls Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
332	Create Database for Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task creates the database for Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
333	Drop Database for Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task drops the database for Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
334	Start an Instance of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task starts an instance of Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
335	Stop an Instance of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task stops and instance of Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
336	Pause an Instance of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task pauses an instance of Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
337	Resume an Instance of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task resumes an instance of Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
338	Start Server Agent of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task starts the server agent for Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.
339	Stop Server Agent of Microsoft SQL Server 2014 Enterprise Edition on Windows	This Task stops the server agent for Microsoft SQL Server 2014 Enterprise Edition on Windows Server 2008 to Windows Server 2012 operating systems.

Table 45. Oracle Database 11g Tasks on Linux

ID	Task name	Description
306	Create the oracle user on Linux	This Task create the oracle user on Red Hat Enterprise Linux.
309	Install Oracle 11g Enterprise Edition on Linux	This Task installs Oracle 11g Enterprise Edition on Red Hat Enterprise Linux.
311	Create an Oracle 11g Database on Linux	This Task creates a database for Oracle 11g Enterprise Edition on Red Hat Enterprise Linux.
300	Startup an Oracle 11g database on Linux	This Task starts up an Oracle 11g database on Red Hat Enterprise Linux.
304	Install Oracle Client 11g on Linux	This Task installs Oracle Client 11g on Red Hat Enterprise Linux.
308	Configure Oracle 11g Client on Linux	This Task configures Oracle 11g Client on Red Hat Enterprise Linux.
313	Uninstall Oracle 11g Client on Linux	This Task uninstalls Oracle 11g Client on Red Hat Enterprise Linux.
302	Delete oracle user on Linux	This Task delete the oracle user for Oracle 11g Enterprise Edition on Red Hat Enterprise Linux.
301	Shutdown an Oracle 11g database on Linux	This Task shuts down Oracle 11g Enterprise Edition on Red Hat Enterprise Linux.
310	Uninstall Oracle Enterprise Edition 11g on Linux	This Task uninstalls Oracle 11g Enterprise Edition on Red Hat Enterprise Linux.
303	Drop an Oracle 11g Database on Linux	This Task drops an Oracle 11g Enterprise Edition Database on Red Hat Enterprise Linux.

Log file locations

After you run any of the middleware Tasks, you can access log files for the tasks to help troubleshoot any issues.

You can access the log files for Tasks from the <your_site>/mw-logs/ directory. For example,

- On Linux platforms, the /var/opt/BESClient/___BESData/<site_name>/mw-logs directory.
- On Windows platforms, C:\Program Files (x86)\BigFix Enterprise\BES Client___BESData\<site_name>\IEMFSA Main\mw-logs directory.

Server Automation operating system deployment content

IBM Endpoint Manager for Server Automation provides a number of Fixlets that allow you to deploy operating systems from within IBM Endpoint Manager. These Fixlets connect to the Tivoli Provisioning Manager for OS Deployment server, which carries out the actual provisioning. You can include these Fixlets in your Automation Plans.

Before you begin using the Fixlets, review the example and other documentation included here.

This version of Server Automation supports operating system deployment for Windows server operating systems and Linux operating systems.

Example: end-to-end provisioning

In this example we are going to look at how you can use the IBM Endpoint Manager Operating System deployment and Server Automation applications to complete an end-to-end server deployment. This example shows a process starting with the deployment of an operating system profile on a newly created computer through to the point where the newly created computer is up and running as a web server. The entire process is fully automated end-to-end using an Automation Plan.

To begin the process, we first create a simple two step Automation Plan, as follows:

- For step 1, we want to provision a new computer with an operating system and a software image. We can do this by adding the Deploy operating system to one or more registered computers Fixlet as the first step in our Automation Plan. The operating system profile contains a version of the Red Hat Enterprise Linux operating system. This version of Red Hat Enterprise Linux contains an Apache HTTP system.
- Then we add a second step to our Automation Plan. This step is a baseline with six components that we have created for this purpose. Step 2 will apply a patch to the Apache HTTP system and then start the Apache web server so that when the Automation Plan has completed, we have provisioned a new computer and it will be up and running as a web server. The baseline contains components for the following:
 - Change the CPU usage
 - Stop the Apache server
 - Apply a patch
 - Restart the computer
 - Start Apache
 - Set the CPU usage back to normal level

To run the Automation Plan we click **Take Action**:

1. For step 1, we need to target the Bare Metal Server that contains the operating system profile that we want to deploy for the new computer. We also need to specify the required parameters for step 1 in our Automation Plan. These required parameters are:
 - MAC address of the new computer.
 - The new computer's computer name. We need to note this as we need to provide it when specifying the target for step 2.
 - We select the Bare Metal Profile that we want to deploy on the new computer. This is the operating system profile that we want to deploy on the new computer.

This completes the first step in the Automation Plan, and by the time this step has completed, the new computer will be provisioned with an operating system and an Apache web server.

2. For step 2 in the Automation Plan, which is to apply a baseline to this new computer created in step 1, we must specify the target computer. Because the target computer does not yet exist and we cannot select it in the system, we

need to target it by its computer name that we entered in step 1. We enter the computer name that we specified for the new computer in step 1 of the Automation Plan.

3. The Automation Plan is now ready to go so we click **OK**. The Automation Plan is then executed and we can track its progress.

After the Automation Plan has completed, a new computer has been created and is up and running as a web server.

How it works

You must have Tivoli Provisioning Manager for OS Deployment set up and you need to complete some configuration to connect Tivoli Provisioning Manager for OS Deployment to your IBM Endpoint Manager system.

Requirements

You need to configure your IBM Endpoint Manager system to work with the Tivoli Provisioning Manager for OS Deployment application. For information about how to configure this, see OS Deployment User's Guide Setup.

How it works

This version of Server Automation supports operating system deployment for Windows server operating systems and Linux operating systems.

You create and manage your .RAD bare metal profiles, also known as operating system profiles, in Tivoli Provisioning Manager for OS Deployment. Note that only .RAD format profiles are supported. You can then use the **OS Deployment and Bare Metal Imaging** application in the **Systems Lifecycle** domain in IBM Endpoint Manager to import those profiles into your IBM Endpoint Manager system. After you have imported these bare metal profiles into the IBM Endpoint Manager system, the profiles become available for selection in the Server Automation Fixlets. For more information about how to use the **OS Deployment and Bare Metal Imaging** application, see OS Deployment User's Guide.

Fixlets for operating system deployment

Server Automation provides a number of Fixlets that you can use for operating system deployment provisioning. You can include these in your Automation Plans. Including these Fixlets in your Automation Plans allows you to complete end-to-end provisioning, where you can add a step to your Automation Plan to perform the bare metal provisioning, and then other steps to deploy software and patch the computers.

Server Automation includes the Fixlets described in the following table.

Table 46. Server Automation operating system deployment Fixlets

Fixlet	Description
Deploy operating system to one or more registered computers	<p>This Fixlet deploys an operating system profile to one or many computers that are registered in a bare metal server.</p> <ul style="list-style-type: none"> Specify the MAC addresses of the computer or computers that you are creating, entering them as a comma separated list. Specify the operating system profile, known as the bare metal profile, that you want to deploy. Optional: You can select the Wake on LAN option if you want to power on the computers.
Deploy operating system to one or more computers	<p>This Fixlet deploys an operating system profile to one or many computers that are already registered in a bare metal server.</p> <ul style="list-style-type: none"> Specify the MAC addresses of the computer or computers that you are creating, entering them as a comma separated list. Enter the name or names for the computers that you are creating. Use commas to separate entries. Do not include spaces. Specify the operating system profile, known as the bare metal profile, that you want to deploy. Optional: You can select the Wake on LAN option if you want to power on the computers.
Register computer in a bare metal server	<p>This Fixlet registers new computers in the bare metal server. To register the computers in a bare metal server, you enter one or more MAC addresses and associated computer names. For each entry, a corresponding entry is created in a bare metal server, recording the MAC address and computer name for each. Enter the MAC address and computer names as a comma separated list.</p> <ul style="list-style-type: none"> Specify the MAC addresses of the computer or computers that you are creating, entering them as a comma separated list. Enter the name or names for the computers that you are creating. Use commas to separate entries. Do not include spaces.
Change boot order to allow re-imaging	<p>This Fixlet changes the boot order of a computer so that it can be re-imaged. This Fixlet changes the boot order for a computer, forcing it to boot on the network instead of from the operating system. It allows the computer to skip booting from the operating system just once. It finishes by initiating a reboot of the computer. This allows Tivoli Provisioning Manager for OS Deployment to capture the computer and re-image a new operating system on the computer as part of an Automation Plan. There are no parameters required to run this Fixlet. To run it you target the computer for which you want to change the boot order.</p>

The following graphic shows the Deploy operating system to one or more computers Fixlet.

Task: Deploy operating system to one or more computers

Take Action Edit Copy Export Hide Locally Hide Globally Remove

Description Details Applicable Computers (1) Action History (28)

Description

This Fixlet deploys a Bare Metal Profile to one or more computers.

This Fixlet does not work with WIMs.

Complete the following form and click Take Action:

Parameter name	Parameter value
*MAC Address of one or more computers (separated by ', ' i.e. comma):	<input type="text"/>
*Name of one or more computers (separated by ', ' i.e. comma):	<input type="text"/>
*Name of the Bare Metal Profile :	Rhel6_4_32bit.rad
Use Wake-On-LAN:	<input type="text"/>
Namespace:	<input type="text"/>

Actions

Click [here](#) to deploy this action.

Server Automation Chef-Solo content

You can use IBM Endpoint Manager for Server Automation Chef-Solo Tasks to automate the installation of Chef-Solo and download and run Chef-Solo cookbooks and recipes. The Chef-Solo installation and Chef-Solo cookbooks are downloaded from the Opscode Community web site.

IBM Endpoint Manager for Server Automation Chef-Solo Tasks

This section lists all of the IBM Endpoint Manager for Server Automation Chef-Solo Tasks and provides a description of each Task.

The following platforms are supported:

- Windows Server 2003 R2
- Windows Server 2008
- Windows Server 2008 R2
- Windows Server 2012
- Windows 7

The following table lists the Chef-Solo Tasks. For more detailed information about each Task, see the descriptions in the Tasks.

Table 47. Server Automation Chef-Solo Tasks

ID	Task	Description
200	Set Up Chef-Solo Development Environment for Windows	This Task configures the development environment for Chef-Solo on a Microsoft Windows target computer.
201	Install Chef-Solo for Windows	This Task installs Chef-Solo on a Microsoft Windows target computer and creates the Chef-Solo repository in a location that you specify.

Table 47. Server Automation Chef-Solo Tasks (continued)

ID	Task	Description
202	Download Chef-Solo Cookbook from Opscode	This Task downloads a Cookbook from the Opscode Community site and adds it to the Chef-Solo repository on the target computer.
203	Download Chef-Solo Cookbook from url	This Task downloads a Cookbook from a URL and adds it to the Chef-Solo repository on the target computer.
204	Run a downloaded Chef-Solo Cookbook	This Task runs a Chef-Solo Cookbook that has previously been downloaded to a Microsoft Windows target computer.
205	Run a downloaded Chef-Solo Recipe	This Task runs a Chef-Solo Recipe that has previously been downloaded to a Microsoft Windows target computer.

Server Automation RXA

You can use Server Automation content to install RXA on a system on which the IBM® Endpoint Manager agent is installed. RXA allows you to use that system as an intermediary to execute IBM® Endpoint Manager functionality on a different system, one that does not have the IBM Endpoint Manager agent installed, for example, Linux embedded targets.

Installing RXA

You can install RXA on IBM Endpoint Manager versions 9.0 and 9.1.

About this task

Ensure that the endpoints that you are planning to run RXA actions against are capable of receiving RXA commands. Make sure that these endpoints are not secured so that no communication can be established. For example, the sshd daemon in the case of a Unix systems should be running and accessible. For the current release, you must install RXA on a Windows system.

Complete the following steps to install RXA on a Microsoft® Windows® system:

Procedure

1. Open the IBM® Endpoint Manager console.
2. Search for Fixlet 120 Install TEM RXA Tool v8.2.1.
3. Target the Microsoft® Windows® system on which you want to install RXA.
4. Click OK to run the installation.

Results

RXA is installed. After the installation is completed, an Applications folder is created in the Bes Client\Applications and you can review the contents of the installation in the Bes Client\Applications\IEM_RXA_8.2. To uninstall RXA, delete the Allocations folder.

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