HP Operations Smart Plug-in for JBoss Application Server

for the Windows® operating system

Software Version: 7.00

Installation and Configuration Guide

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Software Release Date: December 2009

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Contents

1 Introduction to HP Operations Smart Plug-in for JBoss Application Server

This chapter provides an overview of the basic concepts necessary to understand the HP Operations Smart Plug-in for JBoss Application Server SPI (JBoss AS SPI). The JBoss AS SPI enables you to manage the JBoss Application Servers from an HP Operations Manager (HPOM) for Windows console. From the HPOM for Windows console, you can monitor the availability, use, and performance of the JBoss Application Servers running on HPOM managed nodes. You can integrate the JBoss AS SPI with other HP Software products like HP Performance Manager (the product must be purchased separately) to get consolidated graphs. The graphs help you analyze trends in server usage, availability, and performance. For details on integrating the JBoss AS SPI with other HP products, see Chapter 6, Integrating the JBoss AS SPI with HP Graphing Solutions. The JBoss AS SPI extends the capabilities of HPOM by adding the following monitoring capabilities to HPOM:

- Availability Monitoring
- Resource Monitoring
- Process Monitoring

For more information on HPOM, see *HPOM console online help*.

Components of the JBoss AS SPI

The JBoss AS SPI consists of the following components.

Policies

The JBoss AS SPI consists of policies that monitor the JBoss Application Server. The policies contain settings that enable incoming data to be measured against predefined rules. These rules generate useful information in the form of messages. The messages have color-coding to indicate the severity level. You can review these messages to analyze and resolve the problem. There are several pre-defined corrective actions for specific events or threshold violations. These corrective actions can be triggered automatically or operator-initiated. Monitoring consists of generating alarms related to critical events of the tool, and logging important performance metrics of the application server. You can create graphs using the metrics that are logged. For more information on policies, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

Tools

In conjunction with HPOM, the JBoss AS SPI offers centralized tools that help you monitor and manage systems using the JBoss Application Server (AS). The JBoss AS SPI tools enable you to configure the management server's connection to selected server instances on specific managed nodes. The JBoss AS SPI tools include the tools for administrating and operating the JBoss AS and the JBoss AS SPI. The JBoss AS SPI tools consists of two tool groups:

- JBoss Server Admin
- SPI Admin

For more information on tools, see Chapter 4, Using Tools, *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

Graphs

The SPI package contains the default graphing policies provided by the SPI. Graphs are drawn from metrics that are logged in the datasources created by the SPI. The graphs help you analyze trends in server usage, availability, and performance. For details on integrating the JBoss AS SPI with HP Performance Manager to get consolidated graphs, see Chapter 6, Integrating the JBoss AS SPI with HP Graphing Solutions.

Functions of the JBoss AS SPI

The JBoss AS SPI messaging and action-executing capabilities are based on the HPOM concept of policies. The settings within these policies define various conditions that might occur within the JBoss AS, and enable information to be sent back to the HPOM management server. As a result, you can address potential or existing problems proactively and avoid serious disruptions to web transaction processing.

Server Performance and Logs

The JBoss AS SPI has several server-related metrics that collect and interpret data about the following:

- Server performance
  - JVM
  - Thread Pools
  - Transactions (JTA)
  - EJBs
  - Servlets
  - JCA/JDBC Connections
  - JMS
- JBoss AS logs

Display Information

The JBoss AS SPI policies generate messages when a threshold is exceeded. These messages can appear as:

Messages in the Message Browser – HP Operations Agent software compares the values gathered for the JBoss Application Server performance and availability against the settings in the monitor policy related to those specific areas. The agent software then forwards appropriate messages to the HPOM console. These messages appear with color-coded severity levels in the HPOM message browser.

Instruction Text – Messages generated by the JBoss AS SPI programs contain instruction text to help analyze and solve problems. You can perform corrective actions preassigned to the events manually or trigger the actions automatically.

Instruction text is available in the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

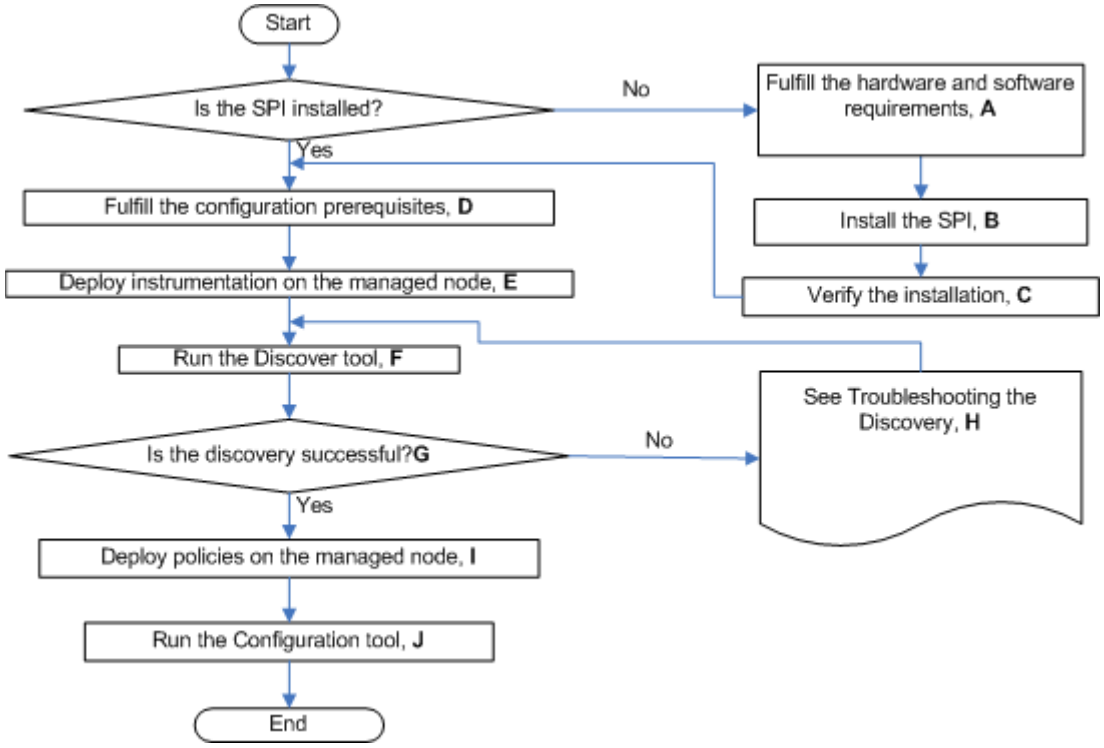
Graphs Data with HP Performance Manager

You can create graphs using the metrics collected by the JBoss AS SPI. The values can then be viewed for analyzing the trend. You can integrate the JBoss AS SPI with HP Performance Manager to generate and view graphs. These graphs show the values of the metrics collected by the JBoss AS SPI.

2 Installing the JBoss AS SPI

The chapter discusses all the required prerequisites and steps for installing the JBoss AS SPI. The following flowchart summarizes the steps for installing and configuring the JBoss AS SPI.

Figure 1 Flowchart on steps for installing and configuring the SPI



Click a hyperlink below to find the detailed information.

Table 1 References of the legends in the flowchart

Legend	Location
A	Installation Prerequisites on page 15
B	Installing the JBoss AS SPI on page 15
C	Verifying the Installation on page 19
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Table 1 References of the legends in the flowchart

Legend	Location
H	Troubleshooting Discovery Process on page 45
I	Deploy Policies on page 24
J	Launch Configure Tool on page 24

Installation Packages

SPI Package

The core package is the HP Operations Smart Plug-ins.msi, which contains all the SPI functionality. The package must be installed on a server managed by HPOM. The SPIs consists of policies and instrumentation (binaries or scripts) that monitor the application server. Monitoring consists of alarms related to critical events of the application, and the logging of important performance metrics of the application server. The metrics that are logged can be used to create graphs. The JBoss AS SPI package is present at the following location in the media: `<SPI DVD>\SPIs\JBoss SPI\JBSSPI-Server.msi`.

Graphing Package

This package contains the default graphing templates provided by the SPI. Graphs are drawn from metrics that are collected in the datasources created by the SPI. The name and location of the graphing package is `<SPI DVD>\SPIs\JBoss SPI OVPM Configuration Package\HPOvSpiJbsGc.msi`.

Installation Environments

Standard Installation of SPI Components on the HPOM Server

You can install the full version of HP Performance Manager on the HPOM server. You can select to install only the SPI packages and not the graphing packages through the HP Operations Smart Plug-Ins DVD. However, if the full version of Performance Manager is installed on the same machine, the corresponding packages can be installed or uninstalled on the HPOM server.

Standalone HP Performance Manager

For a standalone machine, only the corresponding package of the JBoss AS SPI is enabled and available for selection from the HP Operations Smart Plug-Ins DVD. For example, if a system has only HP Performance Manager installed, the graphing package of the JBoss AS SPI can be installed on the system.

Standard Installation in the HPOM Cluster Environment

In an HPOM cluster environment, you must have installed the HPOM server on each of the systems in the cluster. You can install the SPI on each of the nodes in the cluster environment.

Installation Prerequisites

Fulfill the hardware and software requirements before installing the SPI. Install the HPOM server and discovery package before installing the JBoss AS SPI. It is not necessary to stop HPOM sessions before beginning the JBoss AS SPI installation.

Hardware Requirements

See the *HP Operations Manager for Windows* documents for information on hardware requirements for the management server and managed nodes. See the Support Matrix (SUMA) link **http://support.openview.hp.com/selfsolve/document/KM323488** for information on hardware requirements for the managed nodes.

Software Requirements

Make sure that the following software requirements are completed prior to the installation of the JBoss AS SPI:

On the Management Server:

- HP Operations Manager for Windows: 8.10 and the latest patch
- HP Performance Manager (HP-UX, Solaris, Windows): 8.20 (required if you want to generate graphs)
- HP Reporter: 3.80 (required if you want to generate web-based reports)
- HP Operations SPI Data Collector (DSI2DDF): 2.40
- HP SPI Self-Healing Services (SPI-SHS-OVO)(automatically installed while installing the SPI using SPIDVD): 3.00
- JMX Component (JMXSPI)(automatically installed while installing the SPI using SPIDVD): 7.00

On the Managed Node:

- HP Performance Agent: 5.00 (required if you want to use HP Performance Agent for data logging)
- HP Operations Agent (version 8.60 must be installed and configured)

Installing the JBoss AS SPI

Follow the instructions provided in the sections given below to install the JBoss AS SPI on a local management server and in an HPOM cluster environment.

On a Local Management Server

If you need to install the Smart Plug-ins by copying the DVD to a network or local disk instead of directly from the DVD, run autorun.vbs and not the HP Operations Smart Plug-ins.msi file directly.

To install the JBoss AS SPI on the management server, follow these steps:

1. Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the management server.

   The HP Operations Smart Plug-ins InstallShield Wizard starts.

2. Click **Next.**

   The Smart Plug-ins Release Notes and Other Documentation window opens.

3. Click **Next.**

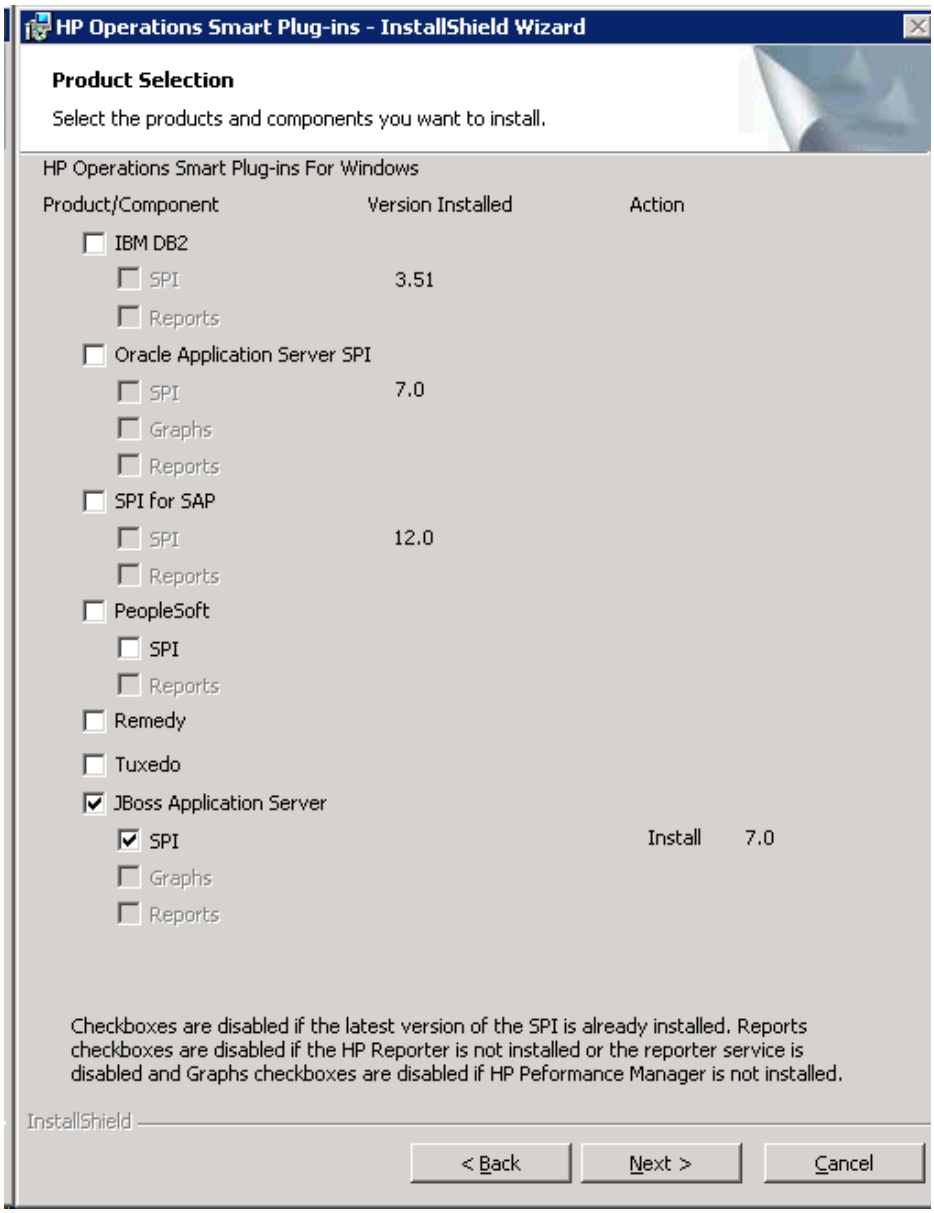
   The Program Maintenance window opens.

If no SPI is installed on the management server, the Product Selection window opens instead of the Program Maintenance window.

4. Select **Install Products** radio button and click **Next**.

   The Product Selection window opens.

5 From the options listed, select the JBoss AS SPI check box and click **Next**.



The Enable/Disable AutoDepolyment window opens.

6 HP Operations Manager deploys policies automatically only when required. Select to disable or enable the Auto Deployment feature and click **Next**.

The License Agreement window opens.

7 Accept the licensing agreement terms by selecting the **I accept the terms in the license agreement** radio button and click **Next**.

The Ready to Install/Modify the Program window opens.

8 Select **Back** to edit previous selections; otherwise, click **Install** to begin the installation.

Clicking **Cancel** after the installation does not halt the entire installation process, but only that of the product currently being installed (shown in the Status area). Installation of the next selected product then begins.

You will see various status dialogs as the install program proceeds. Depending on the speed of your system and the components selected for installation, this process could take several minutes or more.

9 Click **Finish** to complete the installation.

The JBoss AS SPI is installed.

In the HPOM Cluster Environment

You must first install the HPOM management server on each system in the cluster. When the management server cluster installations are complete, the setup for the installation of the JBoss AS SPI is ready. Make sure that each node in the cluster has sufficient disk space for the JBoss AS SPI.

After installing the HPOM management server, proceed as follows:

- For the first installation (Node A) in the cluster—Follow the standard installation procedure, making product choices. Once you complete the installation on Node A, you will receive an instruction to proceed to the next system, Node B.
- For the Node B installation in the cluster—Follow the same procedure. You no longer need to make product choices. The installation detects the cluster configuration and copies all the required product choices from Node A to Node B.
- For Node C and all remaining installations in the cluster—Proceed as you did with Node B, where you no longer choose products but allow the installation packages to be copied from Node B (the previously installed system within the cluster) to Node C (the current system within the cluster) until you complete installing the SPI on each of the nodes in the cluster.

Select and Install the JBoss AS SPI on the First Cluster-Aware Management Server

Before beginning, make sure that sufficient disk space is available on each management server for the JBoss AS SPI you plan to install. Cancelling the installation process before completion could result in partial installations and requires manual removal of the partially installed components.

Complete all the tasks in the section On a Local Management Server on page 16 and then proceed to the next management server.

Install the JBoss AS SPI on the Next Cluster-Aware Management Server

Repeat the following steps on each management server in the cluster (as defined in the HP Operations Manager cluster installation) until the installation is complete.

1 Insert the HP Operations Smart Plug-ins DVD in the DVD drive of the management server and follow the instructions as they appear.

2 After the installation is complete, proceed to the next management server until the installation on every management server in the cluster is complete.

The HPOM console will not function properly until installations are completed on all nodes in the cluster.

Verifying the Installation

Perform the following steps to verify the installation of the JBoss AS SPI:

- Verify the version of the policies of the installed SPI. It must be 7.00.
- Verify that all the instrumentation files are present in `\%OvShareDir%\Instrumentation\Categories`.
- Run the `cscript List_Installed_SPI_Versions.vbs` present under the `%ovinstalldir%` to check the versions of the installed SPI.

3 Configuring the JBoss AS SPI

Prerequisite

Before launching the Discover or Configure JBSSPI tool, make sure that the `jmx-remoting.sar` file (version 5.0.0.GA or below) is present within the deploy directory of the configuration because the instances of only those JBoss Application Servers can be identified for which the JSR 160 SAR has been specified. For example, `\ProgramFiles\EnterprisePlatform-4.3.0.GA_CP04\jboss-as\server\all\deploy\jmx-remoting.sar`.

Configuring the JBoss AS SPI

Complete the following tasks from the management server:

Deploy Instrumentation

1. From the HPOM console for Windows, select the managed node.
2. Right-click the node and select **All Tasks** → **Deploy instrumentation...**.

   The Deploy Instrumentation window opens.
3. Press **Ctrl** key and select **JBoss**, **JMX**, **SHS_Data_Collector**, and **SPIDataCollector**.
4. Click **OK**.

   The instrumentation files are deployed.

Run Discover Tool

1. From the HPOM console for Windows, select **Tools** → **SPI for JBoss Application Server** → **SPI Admin**.
2. Double-click **Discover or Configure JBSSPI**.

   The Tool Selector window opens.
3. Select the Launch Discover Tool radio button and click **OK**. By default, the Launch Configure Tool radio button is selected.

   The Introduction window opens.
4. Click **Next**.

   The Configuration Editor opens.

If you have already set the LOGIN, PASSWORD, JAVA_HOME, and JBOSS_HOME_LIST, proceed to step 6.

If you have not set the LOGIN, PASSWORD, JAVA_HOME, and JBOSS_HOME_LIST, proceed to the step 5.

5 Perform the following steps to set the required properties.

Make sure that the LOGIN, PASSWORD, JAVA_HOME, and JBOSS_HOME_LIST properties are set since these are mandatory properties.

a Select default properties for all groups and nodes from the left-hand pane. Select LOGIN/PASSWORD from the **Select a Property to Set...** drop-down list.

The Set Access Info for Default Properties window opens. The LOGIN and PASSWORD properties set in this window are used as the default JBoss Admin Server login and password (they are set at the global properties level). If no NODE level or server-specific LOGIN and PASSWORD properties are set, this JBoss AS LOGIN and PASSWORD are used by the JBoss AS SPI to log on to all JBoss Admin Servers. For more information about the configuration structure, see *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

Case 1

If the JBoss Admin Server login and password are the same for all instances of the JBoss Application Servers on all HPOM managed nodes, set the LOGIN and PASSWORD properties in the Set Access Info for Default Properties window and click **OK**.

Case 2

If the JBoss Admin Server login and password are different for different instances of the JBoss Application Server, you must customize the JBoss AS SPI configuration by setting the LOGIN and PASSWORD properties at the NODE or server-specific level (for more information about the configuration structure, see *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*):

Set the LOGIN and PASSWORD properties to the most commonly used JBoss login and password in the Set Access Info for Default Properties window and click **OK**.

b Select JBOSS_HOME_LIST from the **Select a Property to Set...** drop-down list and click **Set Property**. Set the value for JBOSS_HOME_LIST.

c Select JAVA_HOME from the **Select a Property to Set...** drop-down list and click **Set Property**. Set the value for JAVA_HOME.

6 Perform the following steps if you have bound any instance of JBoss AS (using the **`-b`** option) to an address that is not accessible as “localhost”. If you did not bind any instance of JBoss AS (using the **`-b`** option), proceed to the next step.

a Right-click the managed node and click **Add Application Server**.

b Enter the name of the application server which you have binded (using the **`-b`** option).

c Enter the port number specified in the `jboss-service.xml` present in the following directory:

`JBOSS_HOME/server/<configuration>/deploy/JMX-remoting.SAR/META-INF`.

d For the selected instance of JBoss AS, select **ADDRESS** from the **Select a Property to Set** drop-down list.

e Click **Set Property**.

The ADDRESS property is set.

f Set the value that is the bind address.

7 Click **Next** to save the changes.

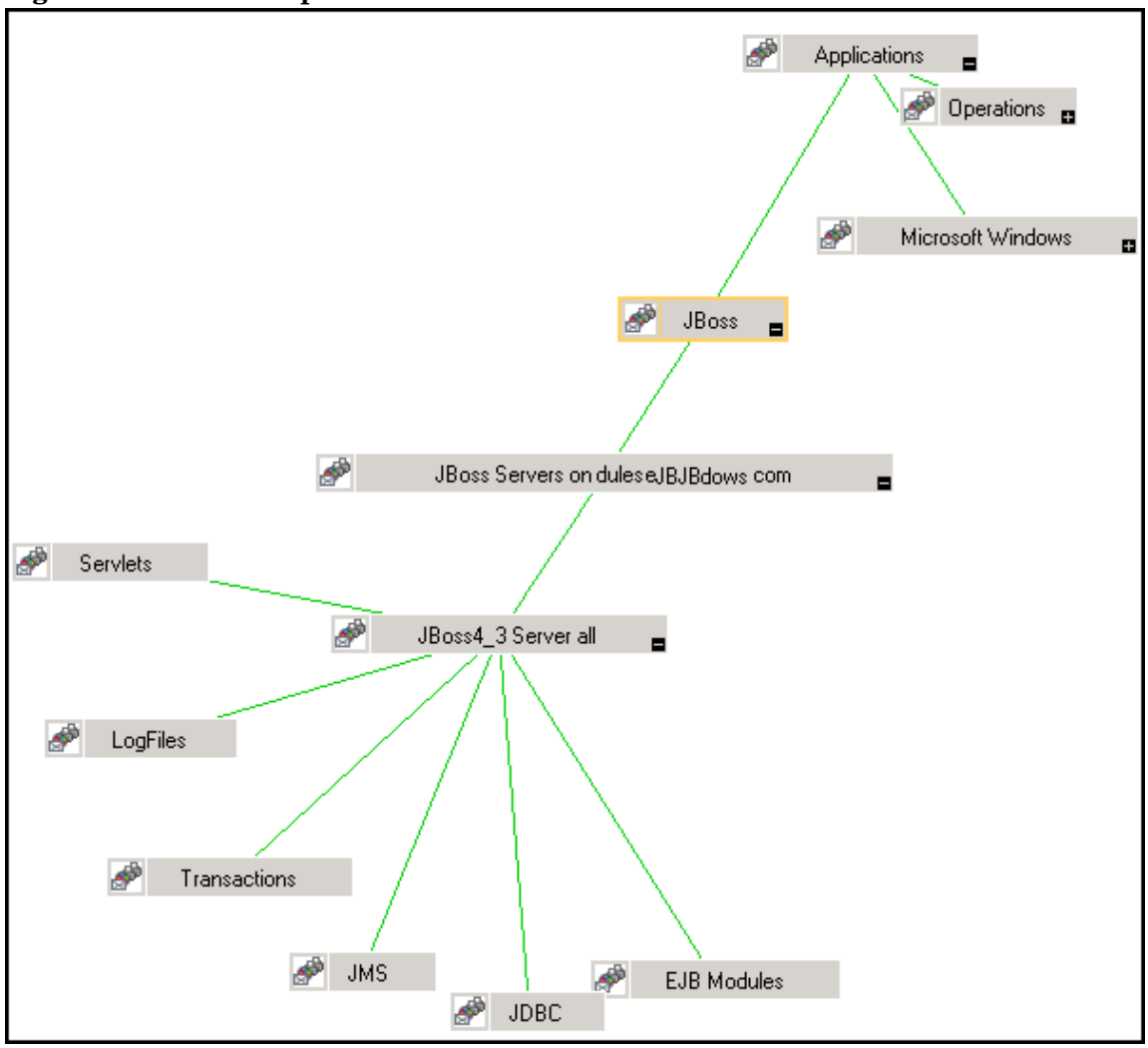
The Confirm Operation window opens.

8 Verify that the tool is launched on the selected node(s) and click **OK**.

Verify the Discovery Process

- Verify that the following message appears in the message browser for each managed node.
  `WASSPI-701 JBoss Discovery is successful`
- When the discovery is successful, the following Service Map appears. Using the Service Map, you can find out the application or services that have a problem (if any). The lines in the Service Map are color coded to show various levels of severity. For example, red lines show that the application has critical problems.

Figure 2 Service Map



Deploy Policies

1. From the HPOM console for Windows, select **Operations Manager** → **Policy management** → **Policy groups**.
2. Right-click **SPI for JBoss Application Server** → **All Tasks** → **Deploy on...**.
3. Select the managed node on which you want to deploy the policies.
4. Click **OK**.

   The policies are deployed on the nodes.

Launch Configure Tool

1. From the HPOM console for Windows, select **Tools** → **SPI for JBoss Application Server** → **SPI Admin**.
2. Double-click **Discover or Configure JBSSPI**.
3. Select the managed nodes on which you want to launch the tool.
4. Click **Launch**.

   The Tool Selector window opens.
5. Click **OK**. By default, the Launch Configure Tool radio button is selected.

   The Introduction window opens.
6. Click **Next**.

   The Configuration Editor opens.

   Make sure that the LOGIN, PASSWORD, JAVA_HOME, and JBOSS_HOME_LIST properties are set. You cannot proceed to the next window if the required properties are not set. See step 5 on page 22 for information on how to set the properties.
7. Set the configuration properties at the global or server specific level. For more information on using the configuration editor, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.
8. Select **Save** to save any changes made to the configuration. After you save the changes, you cannot undo the changes automatically.
9. Select **Finish** to exit the editor and start configuring the JBoss AS SPI on the managed node.

If you click **Cancel**, the changes made by you are not saved to the selected managed nodes' configuration and remain in the configuration on the management server.

Configuring creates data sources for datalogging (graphing) and sets up the JBoss AS log files and the JBoss AS SPI error log file for monitoring.

For more information about the configuration structure, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

JBoss AS SPI in High Availability Environments

High availability is a general term used to characterize environments that are business critical and therefore are protected against downtime through redundant resources. Very often, cluster systems are used to reach high availability.

You can configure the JBoss AS SPI to accommodate cluster environments where failovers allow uninterrupted availability of JBoss AS. The JBoss AS SPI monitoring, when synchronized with the cluster environment, can switch off from the failed node to the active node.

Configuration Prerequisites

The prerequisites for using the JBoss AS SPI in high availability environments are:

- Management Server: HPOM for Windows 8.10 and the latest patch
- Node: Veritas cluster
- HPOM 8.x HTTPS Agent version (for details see Agent cluster support matrix)

Configuring the JBoss AS SPI for High Availability Environments

To configure the JBoss AS SPI for use in high availability environments complete the following tasks:

Create the JBoss AS SPI monitoring configuration file

The JBoss AS SPI uses a monitoring configuration file `<appl_name>.apm.xml` that works in conjunction with the clustered application configuration file.

<appl_name> is the namespace_name. For more information, see *HP Operations Manager for UNIX HTTPS Agent Concepts and Configuration Guide*.

The `<appl_name>.apm.xml` file lists all the JBoss AS SPI templates on the managed node so that you can disable or enable these templates as appropriate, for inactive and active managed nodes.

To create this clustered application configuration file for your JBoss AS environment, follow these steps:

1 Use the following syntax to create the `<appl_name>.apm.xml` file:

```
<?xml version="1.0"?>
<APMApplicationConfiguration>
   <Application>
      <Name> ... </Name>
      <Template> ... </Template>
      <StartCommand>wasspi_perl -S wasspi_clusterSvrApp -opt startMonitor
      $instancename</StartCommand>
      <StopCommand>wasspi_perl -S wasspi_clusterSvrApp -opt stopMonitor
      $instancename</StopCommand>
   </Application>
</APMApplicationConfiguration>
```

2 Enter the namespace_name within the `<Name></Name>` tag.

3 After the file is created, save it in the `$OvDataDir/bin/instrumentation/conf` directory.

Sample jbsspi.apm.xml file

```
<?xml version="1.0"?>
<APMApplicationConfiguration>
   <Application>
      <Name>jbsspi</Name>
      <Template>JBSSPI Java Discovery Error Log</Template>
      <Template>JBSSPI Java Collector Error Log</Template>
      <Template>JBoss Server Log Monitor</Template>
      <Template>JBoss Error Log</Template>
      <Template>JBSSPI-05min</Template>
      <Template>JBSSPI-Performance</Template>
       <StartCommand>wasspi_perl -S wasspi_clusterSvrApp -opt startMonitor
$instanceName</StartCommand>
        <StopCommand>wasspi_perl -S wasspi_clusterSvrApp -opt stopMonitor
$instanceName</StopCommand>
    </Application>
</APMApplicationConfiguration>
```

To prevent the agent from running the policies on a passive node, you must mention the policy names within the `<template></template>` tag.

`<appl_name>.apm.xml` is dependent on the application namespace. It is not dependent on the instance level. Therefore, the start and stop actions are provided with the associated instance name as their first parameter when they are executed at package switch time. The environment variable $instanceName is set by ClAw when start or stop tasks are performed.

Create the clustered application configuration file

The clustered application configuration file `apminfo.xml`, working in conjunction with the *`<appl_name>`*`.apm.xml` file of the JBoss AS SPI, allows you to associate the JBoss AS SPI monitored instances with cluster resource groups. As a result, when you move a resource group from one node to another, in the same cluster, monitoring stops on the failed node and starts on the new node.

To create the clustered application configuration file `apminfo.xml` follow these steps:

1 Use a text editor to create the file. The syntax is:

```
<?xml version="1.0" ?>
<APMClusterConfiguration>
   <Application>
      <Name>namespace_name</Name>
      <Instance>
        <Name><Instance Name></Name>
        <Package><Package Name></Package>
      </Instance>
   <Application>
</APMClusterConfiguration>
```

2 Enter namespace_name within the `<Name></Name>` tag.

3 Save the `apminfo.xml` file in the `$OvDataDir/conf/OpC` directory.

Sample apminfo.xml file

```
<?xml version="1.0" ?>
 <APMClusterConfiguration>
    <Application>
       <Name>jbsspi</Name>
       <Instance>
         <Name>all</Name>
         <Package>ClusterService</Package>
       </Instance>
    </Application>
</APMClusterConfiguration>
```

Configure the JBoss AS SPI

To configure the JBoss AS SPI, follow these steps:

1. Deploy the instrumentation files on the target cluster nodes.
2. Launch the Discover or Configure JBSSPI tool with the active cluster node as the target. For details about launching the discovery tool, see Run Discover Tool on page 21.
3. Launch the Discover or Configure JBSSPI tool with the active cluster node as the target. For details about launching the configure tool, see Launch Configure Tool on page 24.
4. Deploy all the required policies on the active node. For details about deploying the policies, see Deploy Policies on page 24.
5. Repeat the steps 2, 3 and 4 on the passive node. To perform these steps on the passive node, you must failover to the passive node (for JBoss AS to be available).

4 Using Tools

The JBoss AS SPI offers centralized tools that help you monitor and manage systems using the JBoss Application Server. The JBoss AS SPI tools enable you to configure the management server's connection to selected server instances on specific managed nodes. The JBoss AS SPI tools include the tools for administrating and operating the SPI for JBoss Application Server.

The JBoss AS SPI tools contain the following two tool groups:

- JBoss Server Admin
- SPI Admin

SPI Admin Tools Group

The SPI Admin tools group consists of the following tools that enable you to perform the tasks related to the JBoss AS SPI.

- **Self-Healing Info** – Gathers data that you can send to your HP support representative.
- **Discover or Configure JBSSPI** – Enables you to identify instances of a JBoss Application Server on a managed node monitored by the JBoss AS SPI and displays the status in the HPOM console Service map or enables you to maintain the JBoss AS SPI configuration by viewing, editing, or setting configuration properties in the configuration editor.
- **Start Monitoring**– Starts the collection of metrics for one application server or all application servers on a managed node. By default, monitoring is on.
- **Stop Monitoring**– Stops the collection of metrics for one application server or all application servers on a managed node.
- **Start Tracing**– Starts logging the information about each of the activities performed by the SPI on the managed node. Launch this tool only when instructed by your HP support representative.
- **Stop Tracing**– Stops saving the information about each of the activities performed by the SPI on the managed node into a file. Run this tool only when instructed by your HP support representative.
- **Verify**– Verifies that the JBoss AS SPI is properly installed on the server or managed node.
- **View Error Files**– Enables you to view the contents of the JBoss AS SPI internal log files.
- **Create JBSSPI Node Groups**– Enables you to create SPI for JBoss Application Server node groups that contains all the managed nodes running supported versions of JBoss AS.

For more information on the tools see, *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

JBoss Server Admin Tools Group

The JBoss Server Admin tools group consists of the following tools that enable you to perform the tasks related to the JBoss Application Server.

- **Start JBoss Server** – Enables you to start one or more JBoss Application Servers on the selected managed nodes from the HPOM console.
- **JBoss Server Status**– Enables you to find the status of the JBoss Application Servers (server name, server state, start date) from the HPOM console.
- **Stop JBoss Server**– Enables you to stop one or more JBoss Application Servers on the selected managed nodes from the HPOM console.
- **View JBoss Logs**– Enables you to select a JBoss Application Server log file for viewing without logging in to the system on which the JBoss Application Server is running.

Launching Tools

This section describes how you can launch the tools for the JBoss AS SPI. The steps in Launching Discover or Configure JBSSPI Tool and Launching All Tools describes how you can launch the Discover or Configure JBSSPI tool and all the tools (excluding Discover or Configure JBSSPI) respectively.

Launching Discover or Configure JBSSPI Tool

See Run Discover Tool on page 21 and Launch Configure Tool on page 24.

Launching All Tools

1. From the HPOM console, select **Tools** → **SPI for JBoss Application Server** → ***<Tool Group>***.
2. Double-click ***<Name of the Tool>***.
3. Select the managed nodes on which you want to launch the tool.
4. Click **Launch**.

   The Tool Status window opens.
5. In the Launched Tools field, check the Status of the tool for each node:
   - Started/Starting – The tool is running.
   - Succeeded – A status report is available for each instance of the JBoss AS on the managed node. Select the node in the Launched Tools field and scroll through the Tool Output field.
   - Failed – The tool did not succeed. Select the node in the Launched Tools field and scroll through the Tool Output field for more information about the problem.
6. Click **Close** to close the Tool Status window.

5 Customizing the JBoss AS SPI Policies

The JBoss AS SPI consists of policies that monitor the JBoss Application Server. The SPI for JBoss Application Server policy group two broad categories of policies:

- JBSSPI
- JBSSPI Discovery

The JBSSPI policy group contains the following policy sub-groups and individual policies.

- **JBSSPI-Logfiles** – Contains policies that monitor the information logged in the JBoss Application Server log file and generates messages based on the information.
- **JBSSPI-Metrics** – Contains metric policies that monitor the performance levels and availability of a JBoss Application Server.

  Each metric policy determines the threshold conditions for the monitored metric, the message text that is sent to the HPOM message browser when the threshold is exceeded, the actions to execute, and instructions that appear.
- **JBSSPI-Monitors** – Contains collector policies that specify the collection interval of metric policies. Within the name of each collector policy is its collection interval.

  Each collector policy controls when and what metrics are collected. The collector policy performs the following actions:

  — Runs the collector or analyzer at each collection interval

  — Specifies which metrics are collected

For more information on policies, see *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

Basic Policy Customizations

This section covers basic policy customizations like modifying metric policies and alarm generation.

Modifying Monitor Policies

You can modify the following metric attributes for a metric policy.

Table 2 Metric Attributes

Attributes	Description
Threshold	Enter a value for the metric data that when exceeded, would signify a problem either about to occur or already occurring.
Duration	Enter a value for the length of time that the incoming data values for a metric can exceed the established threshold before an alarm is generated.
Severity	Click the **Start Actions** tab and then the **Message** tab. Select the desired severity setting from the **Severity** drop-down list.
Message Text	Be careful not to modify any of the parameters that are enclosed within <> brackets and beginning with $, in a message.

To modify the metric attributes listed in Table 2 of a policy, follow these steps:

1. From the HPOM console, select **Operations Manager → Policy management → Policy groups → SPI for JBoss Application Server → JBSSPI → JBSSPI-Metrics**.
2. Double-click the policy for which you want to modify the threshold level and actions.

   The Policy window opens.
3. Click the **Thresholds level** tab.
4. From the level summary pane, select **Threshold level**.

   The Threshold level "*Metric Name:Threshold level*" window opens.
5. You can modify the following metric attributes in this window:
   - Threshold limit – Edit the threshold limit in the Threshold limit text field to change the value for the metric policy.
   - Short-term peaks – Edit the duration if you want to assign or change the minimum time period over which the monitored value must exceed the threshold before generating a message. For a message to be sent, the value must be greater than the threshold each time the value is measured during a duration that you select. If the duration is set to zero or the box is left empty, an alarm is generated as soon as HPOM detects that the threshold has been reached or exceeded.
   - Reset – Change the selection to change the limit below which the monitored value must drop (or exceed, for minimum thresholds) to return the status of the monitored object to normal.
6. Click any of the actions tab (**Start actions**, **Continue actions**, and **End actions**) to edit the related action.
7. To modify the message text and severity, click the **Start Actions** tab.

   The Outgoing Message window opens.
8. You can modify the following metric attributes in this window:
   - Severity – Select an option from the **Severity** drop-down list if you want to change the severity of the metric policy.
   - Message text – Modify the text of the message

   Do not modify any of the parameters, beginning with $ and surrounded by <> brackets, in a message.

9 Click **OK**.

Advanced Policy Customizations

Advanced policy customizations range from making copies of default policy groups in order to customize a few settings, to deleting whole groups of metrics within a policy's command line.

Choosing Metrics to Customize

Determine which metrics you want to customize and what policies within the group you want to use.

To customize the metrics follow these steps:

1 Create a new policy group:

   a From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for JBoss Application Server**.

   b Right-click the policy group you want to copy and select **Copy**. For example, right-click the Metrics policy group under JBSSPI and select **Copy**.

   c Right-click the group under which you want to place this policy group and select **Paste**. For example, right-click JBSSPI and select **Paste**.

   d Right-click the new group and select **Rename**. Type in a new name. For example, right-click Copy of JBSSPI-Metrics and select **Rename**.

2 Rename the original policies within the new policy group:

   a Double-click the new policy group to get a list of the policies.

   b Double-click a policy.

   The policy window opens.

   c Click **File** → **Save As**.

   The Save As window opens.

   d Enter a new policy name and click **OK**.

   e Click **File** → **Exit** to close the policy window.

3 To delete all original policies within the new policy group, select the policies and press the **Delete** key.

   The Confirm Multiple Item Delete window opens.

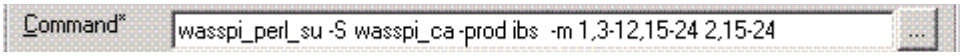
   Click **Yes** to confirm deletion; otherwise click **No**.

4 Alter the renamed policies within the new group as necessary.

Using the JBoss AS SPI Collector/Analyzer Command with Parameters

The **`wasspi_perl_su -S wasspi_ca -prod jbs`** command is used in every collector policy. You can view the default command line parameters within each collector policy in the Command box in HPOM console. Double-click the policy to open the policy window. The Command box is within the policy window.

Figure 3 Command line parameters in collector policy



JBoss Application Server Command Parameters

The **`wasspi_ca`** command is required to start the JBoss AS SPI data collections. You can add other parameters to this command. The following table lists the parameters used by the default collector policies.

Table 3 List of JBoss Application Server Command Parameters

Parameter	Description	Syntax with Example
`-e` (exclude)	Enables you to exclude specific servers. This option should not be used with `-i` option.	**Syntax**: `-e` *<server_name>* **Example:** `-e server1,server4`
`-i` (include)	Enables you to list specific servers to monitor. This option should not be used with `-e` option.	**Syntax**: `-i` *<server_name>* **Example:** `-i server2,server3`
`-m` (metric)	Specifies the metric numbers or number ranges on which to collect data.	**Syntax**: `-m` *<metric_number,metric_number_range>* **Example**: `-m 1,3-6,9-11,17`
`-matchver` (match version)	Specifies the exact JBoss Application Server version to monitor. This option should not be used with the `-minver` nor `-maxver` options. If no matching versions are found, the command does not run.	**Syntax**: `-matchver` *<version_number>* **Example**: `-matchver 4.3`
`-maxver` (maximum version)	Specifies the highest JBoss Application Server version to monitor. Use with `-minver` to specify a range of versions. If no versions are found, the command does not run.	**Syntax**: `-maxver` *<version_number>* **Example**: `-matchver 4.3`

Table 3 List of JBoss Application Server Command Parameters

Parameter	Description	Syntax with Example
`-minver` (minimum version)	Specifies the lowest JBoss Application Server version to monitor. Use with `-maxver` to specify a range of versions. If no matching versions are found, the command does not run.	**Syntax**: `-minver <version_number>` **Example**: `-matchver 4.2`
`-prod`	(production) Identifies the SPI(s) on which the command is run on the node.	**Syntax:** `-prod <Name of the SPI>-` **Example:** `wasspi_perl -S wasspi_ca -prod jbs -m 10-13 -t DEV-`

`-x`	Enables you to specify the following property and value:
	• `alarm`: When `off`, overrides any alarming condition as set up in the metric policy.
	• `prefix`: Default: `JMXUDM_`. Specify the prefix of the metric ID.
	• `print`: When `on`, prints the metric name, instance name, and metric value to STDOUT in addition to any configured alarming or logging.
	• `graph`: When `off`, prevents graphing function.
		Syntax: `-x <property>=<property_value>\`
		Example:
		`-x alarm=off`
		`-x prefix=SALES_`
		`-x print=on`
		`-x graph=off`

Examples

- To collect specific data on all configured servers:

  ```
  wasspi_ca -prod jbs -m 10-13,25,26
  ```

- To collect data from specific servers only:

  ```
  wasspi_ca -prod jbs -m 245,246,260 -i all,production
  ```

- To not collect data from specific servers:

  ```
  wasspi_ca -prod jbs -m 220-223 -e all,production
  ```

Changing the Collection Interval for All Monitored Metrics

1. From the HPOM console, select **Operations Manager → Policy management → Policy groups → SPI for JBoss Application Server → JBSSPI → JBSSPI-Monitors**.
2. Double-click the collector policy JBSSPI-05min.

   The Measurement window opens.

3 Click **File** → **Save As**.

The Save As window opens.

4 Change the existing name in the **Name** text-box to JBSSPI-10min.

5 Set the new interval.

a Click the **Schedule** tab.

b From the **Schedule Task** drop-down list, select “Once per interval”.

c Set the interval to 10 minutes.

6 Deploy the new policy.

a Right-click JBSSPI-10min and select **All Tasks** → **Deploy on...**.

b Select the nodes on which to deploy the policy.

c Click **OK**.

Changing the Collection Interval for Selected Metrics

To change the collection interval for selected metrics, copy the appropriate collector policy. Rename the policy with a name reflecting the new interval, deleting all but the metrics you are changing. Set the new interval. Edit the original policy to remove the changing metrics. For example, to change the collection interval to 10 minutes for metrics 5-8, follow these steps:

1 Rename the selected metrics to reflect the new interval.

a From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for JBoss Application Server** → **JBSSPI** → **JBSSPI-Monitors**.

b Double-click the collector policy JBSSPI-05min.

The Measurement Threshold window opens.

c Click **File** → **Save As**.

The Save As window opens.

d In the Name text box change the existing name to JBSSPI-10min.

e Click **OK** to save or click **Cancel** to discard changes.

2 In the Command text box, delete all metrics after the -m except 5-8.

3 Set the new interval.

a Click the **Schedule** tab.

b From the Schedule task drop-down list, select “Once per interval” and set the interval to 10 minutes.

c Click **Save** and **Close** to confirm the changes and close the policy window.

4 Edit the original policy to remove the modified metrics.

a Right-click the collector policy JBSSPI-05min and select **All Tasks** → **Edit**.

The policy window opens.

b In the Command text box, delete metrics 5-8 after -m.

c Select **Save** and **Close** to save the changes.

5 Deploy the policies.

a. Right-click JBSSPI-10min and select **All Tasks → Deploy on...**.

b. Select the nodes on which to deploy the policy.

c. Click **OK**.

d. Right-click JBSSPI-05min and repeat steps a-c.

Policy Variables

If you are creating your own JBoss AS SPI policies, you can use the following variables. These variables are used by the JBoss AS SPI policies.

Table 4 Policy Variables for the JBoss AS SPI

Name	Description
instancename	The instance for which the metric is being reported for multi-instance metrics.
map_port	See port. This variable could be deprecated in future releases.
map_servername	The application server name with spaces replaced with underscores (“_”). Used for service map keys where spaces are prohibited. Example: `production`
node	The node on which the application server is running. Example: `node1.hp.com`
port	The port on which the application server is listening. Corresponds to the `PORT` configuration property. Example: `1090`
servername	The application server name. Corresponds to the NAME configuration property. Example: `production`

6 Integrating the JBoss AS SPI with HP Graphing Solutions

This chapter provides information on the integration of the JBoss AS SPI with different HP graphing products which help in performance and analyzing the trend.

Using Graphs

The JBoss AS SPI can be integrated with the following HP graphing products (these products must be purchased separately):

- **HP Performance Agent:** HP Performance Agent collects, summarizes, time stamps, and detects alarm conditions on current and historical resource data across your system. HP Performance Agent provides performance, resource, and end-to-end transaction response time measurements, and supports network and database measurement information. See the *HP Performance Agent for UNIX User's Manual* for more information about HP Performance Agent. If you are using HP Performance Agent, the JBoss AS SPI automatically uses HP Performance Agent. If you want to use the HP Operations subagent—CODA that is included with HPOM (does not support HP Performance Agent), you must configure your managed nodes to do so. *See HP Performance Agent for* Windows *Users Guide* for more information.
- **HP Performance Manager:** HP Performance Manager is a web-based analysis tool that helps you to evaluate system performance, look at usage trends, and compare performance between systems. You can create graphs using the JBoss AS SPI metrics on integrating with the HP Performance Manager. This is not the version of HP Performance Manager that is included with HPOM. For more information on how to integrate the JBoss AS SPI with HP Performance Manager, see Integrating with HP Performance Manager on page 39. After integrating the JBoss AS SPI with HP Performance Manager, graphs are available the following day.

JBoss AS SPI Graphs

Metrics collected by the JBoss AS SPI can be used to create graphs. The values can then be viewed for analyzing the trend. You can integrate the JBoss AS SPI with HP Performance Manager to generate and view graphs. These graphs show the values of the metrics collected by the JBoss AS SPI.

Integrating with HP Performance Manager

To integrate the JBoss AS SPI with HP Performance Manager, follow these steps:

1 Install and configure the JBoss AS SPI.

2 Install the JBoss AS SPI graph package on the Windows system running HP Performance Manager:

   a Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the Windows system.

     The HP Operations Manager InstallShield Wizard opens.

   b Click **Next**.

     The Program Maintenance window opens.

   c Click **Install Products**.

     The Product Selection window opens.

   d From the options listed (there are three Product Selection windows), select the **Graph** option of the JBoss AS SPI and click **Next**.

   e Complete the installation by following the instructions as you proceed.

3 To create graphs using JBoss AS metric, use the data source name `JBSSPI_METRICS`.

For information on how to view the graphs, see the HP Performance Manager documentation. Graphs are available the day following integration.

Viewing Graphs that Show Alarm Conditions

For graphing purposes, the JBoss AS SPI organizes metrics according to type. When a message is generated for any metric (listed in the *HP Operations Smart Plug-in for JBoss Application Server Online Help or Online Help PDF*), you can view a chart of that metric along with other metric values.

To view a graph associated with an alarm condition (operator-initiated action has been defined with the JBoss AS SPI policy), follow these steps:

1 In the HPOM message browser, double-click the message for which you want to view the graph.

  The Message Properties window opens.

2 Click the **Commands** tab.

3 Click **Start** in the section Operator Initiated to start the operator-initiated command.

  The operator action launches your web browser, where you can view the graph.

Viewing Graphs that Show Past or Current Conditions

To generate an available graph manually, follow these steps:

1 From the HPOM console, select **Operations Manager → Graphs → SPI for JBoss Application Server**.

2 Double-click the graph you want to generate.

  A new window opens.

3 Select the nodes from which you want to retrieve data. Select the date range and the granularity for the graph.

4 Click **Finish**.

Graphs appears in the HPOM console tree only if you install HP Performance Manager on the same system as the HPOM management server.

Viewing Graphs from the HP Performance Manager Console

If you did not install HP Performance Manager on the same system as HPOM management server, you can view the JBoss AS SPI Graphs from the HP Performance Manager console. Follow these steps:

1 Click **Start** → **All Programs** → **HP** → **HP BTO Software** → **Performance Manager** → **Performance Manager**.

The Performance Manager console opens.

2 From the Select Nodes pane, select the node for which you want to see graph. If the node is not listed in the list, add the node:

a Click **Admin** in the menu bar.

The Manage Nodes window opens.

b Click the **Add a Node**  icon.

The Add a Node window opens.

c Type the node name and click **Add**.

d Click **Home** on the menu bar.

3 From the Select a Graph pane, select **SPI for JBoss Application Server**.

4 Select the graph you want to view and click **Draw**.

7 Troubleshooting

This chapter provides information on basic troubleshooting and overview on error messages for the JBoss AS SPI.

Self-Healing Info Tool

The Self-Healing Info tool gathers SPI troubleshooting data and stores the data in a file that you can submit to HP support for assistance.

The file created by the Self-Healing Info tool might be hidden on some Windows managed nodes. If you do not see the file, open Windows Explorer and, from the **Tools** menu, select **Folder Options**. Click the **View** tab. Under Hidden files and folders, select **Show hidden files and folders**.

Logging

This section discusses the files required for logging on the management server and managed nodes and their respective locations.

Management Server

The following log file is found on the management server (typically, `/<%OvInstallDir%>/` is `/var/opt/OV`)

File Type	Log
Filename	`/<%OvInstallDir%>/WASSPI/jbs/log/<managed_node>_disc_server.log`
Description	Records the updates done by the JBSSPI Service Discovery policy to the management server's configuration for each managed node. Log files are overwritten each time the discovery policy is run on the managed node. Logging to this file is always enabled.

Managed Nodes

The following files for logging are found on the managed nodes running on UNIX or Windows (typically, *<Agent_Dir>*/ is `/var/opt/OV/` for UNIX and `\Documents and Settings\All Users\Application Data\HP\HP BTO Software\` for Windows):

Directory <*Agent_Dir*>/wasspi/jbs/log/wasspi_perl.log (archived files have a one digit number appended to the filename)

Description File used by your HP support representative for debugging. This file gives you information about the Perl logging (configuration, discovery, and collection). By default, you can only view the error messages. To view all types of messages (info, warn, and error), run the Start Tracing tool. To stop the tracing, run the Stop Tracing tool. For more information on how to run these tools, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*. Three archived versions of the size 10MB are kept.

Directory <*Agent_Dir*>/wasspi/jbs/log/Discovery.log (archived files have a one digit number appended to the filename)

Description File used by your HP support representative for debugging. This file gives you information about the Java discovery logging. By default, you can only view the error messages. To view all types of messages (info, warn, and error), run the Start Tracing tool. To stop the tracing, run the Stop Tracing tool. For more information on how to run these tools, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*. Three archived versions of the size 10MB are kept.

Directory <*Agent_Dir*>/wasspi/jbs/log/Collector.log (archived files have a one digit number appended to the filename)

Description File used by your HP support representative for debugging. This file gives you information about the Java Collector logging for the CollectorServer. By default, you can only view the error messages. To view all types of messages (info, warn, and error), run the Start Tracing tool. To stop the tracing, run the Stop Tracing tool. For more information on how to run these tools, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help or HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*. Three archived versions of the size 10MB are kept.

Directory	<*Agent_Dir*>`/wasspi/jbs/log/CollectorClient.log` (archived files have a one digit number appended to the filename)
Description	File used by your HP support representative for debugging. This file gives you information about the Java Collector logging for the CollectorClient. By default, you can only view the error messages. To view all types of messages (info, warn, and error), run the Start Tracing tool. To stop the tracing, run the Stop Tracing tool. For more information on how to run these tools, see the *HP Operations Smart Plug-in for JBoss Application Server Online Help or HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*. Three archived versions of the size 10MB are kept.

Troubleshooting Discovery Process

Problem	On launching the Discover or Configure JBSSPI tool, `NoClassDefinitionFoundError` message appears in the Tool Output window.
Solution	Deploy the JMX and JBoss instrumentation categories on the node.

Problem	On completing the discovery, the success message appears in the message browser but the service map for JBoss is empty.
Solution	• Make sure that the instance(s) of JBoss EAP are running on the node. • Verify that you have entered the correct value for JBOSS_HOME_LIST in the configuration editor.

Problem	On completing the discovery, the success message appears in the message browser but the service map does not appear.
Solution	• Publish the service XML by running the **`agtrep -publish`** command on the node. • Verify whether the JMX and JBoss instrumentation categories are deployed on the node. If no, deploy the JMX and JBoss instrumentation categories on the node and run the discovery.

Problem	The instance(s) of JBoss EAP are running and all the required instrumentation is deployed but the discovery is still failing.
Solution	• Verify that the `jmx-remoting.sar` is copied to the `deploy` directory of all the running instances of JBoss EAP. • If the running instance of JBoss EAP is bound to an IP address or hostname using **`-b`** option, refer step7 in Run Discover Tool on page 21.

Problem	The discovery is successful even if you have entered the incorrect LOGIN and PASSWORD.
Solution	This is a limitation with JSR-160 implementation of JBoss Inc.

Problem	The JBSSPI Discovery policy does not automatically discover and update the JBoss AS SPI configuration.
Solution	1 Verify that the Discover or Configure JBSSPI tool is not running or a configuration is not open in the configuration editor. Only one process can access a configuration at a time. If a configuration is open, other processes that must access that file (like the discovery policy) hang until the file becomes available. 2 Check for any error in the message browser for the managed nodes which have not been discovered. Follow the instruction text of any error messages displayed. 3 Check for errors in the `<Agent_Dir>/wasspi/jbs/log/wasspi_perl.log` and `<Agent_Dir>/wasspi/jbs/log/Discovery.log` file on the managed node. 4 If there are multiple instances of JBOSS_HOME on the managed node, set the JBOSS_HOME_LIST property correctly in the configuration editor. 5 Check if the JBSSPI Discovery policies are being deployed.: From the HPOM console, select **Operations Manager → Policy management → Deployment jobs**. 6 If the state of a JBSSPI Discovery policy is Active, the policy is still being deployed. Wait for the deployment of the policy to complete. 7 If the state of a JBSSPI Discovery policy is Suspended or Error, then check for any error messages in the message browser and continue to troubleshoot the problem by reading the rest of this section. 8 If the JBSSPI Discovery policies are not listed, check the message browser for the following message: `JBSSPI-131: JBoss Discovery is Successful`. If this message is present, the JBSSPI Discovery policies are successfully deployed. If this message is not present, the policies were not successfully deployed. Continue to troubleshoot the problem by reading the rest of this section. 9 Verify that an instance of JBoss EAP is installed on the managed node. If the JBoss AS is not installed, uninstall the JBSSPI Discovery policy group from the managed node, install an application server, and perform the steps for configuring the JBoss AS SPI in Chapter 3, Configuring the JBoss AS SPI. 10 Verify the status of the JBoss Application Server. The application server must be running. 11 Verify that the discovery agent is running on the managed node: a Run the command **`opcagt -status`**. b Search for the following message: `Service Discovery Agent OvSvcDiscAgent.cmd (1084) is Running`. If the agent is not running, start it by running the command **`opcagt -start -id 13`**.

Problem	The JBSSPI Discovery policy does not automatically discover and update the JBoss AS SPI configuration.
Solution	12 If you deployed the Discovery policies at the JBSSPI Discovery level or not in the order shown in Manually Deploying the Discovery Policies on page 49, remove and redeploy the Discovery policies: a From the HPOM console, select **Operations Manager → Policy management → Policy groups → SPI for JBoss Application Server**. b Right-click **JBSSPI Discovery** and select **All Tasks → Uninstall all**. The Uninstall policies on... window opens. c Select the nodes from which to uninstall the Discovery policies and click **OK**. d Follow the steps given in the section Manually Deploying the Discovery Policies on page 49 to redeploy the discovery policies. Deploy the policies in the order mentioned and not as a group. If you deploy the policies as a group, the policies may not be deployed in the correct order.

Problem	The following error message appears in the message browser: `PMD51) Error: Unable to deploy instrumentation files from directory <directory_name>: (NUL16389E) Unspecified error (0x80004005). Please check the error log on the managed node.`
Solution	1 From the HPOM console, select **Operations Manager → Policy management → Deployment jobs**. 2 Find the jobs in an error state. 3 For each job you want to restart, right-click it and select **All Tasks → Restart job**.

Problem	The property of critical error messages in the HPOM console is: `Errors occurred during the distribution of the monitors. Solve the problems and distribute the monitors again.(OpC30-1030.`
Solution	1 From the HPOM console, select **Operations Manager → Policy management → Deployment jobs**. 2 Find the jobs in an error state. 3 For each job you want to restart, right-click it and select **All Tasks → Restart job**.

Manually Deploying the Discovery Policies

If the JBSSPI Discovery policies are not deployed successfully when you run the Discover or Configure JBSSPI tool, you can manually deploy the policies on the managed nodes on which the instance(s) of JBoss EAP are running (you must deploy the policies in the given order only):

1. From the HPOM console, select **Operations Manager → Policy management → Policy groups → SPI for JBoss Application Server → JBSSPI Discovery**.
2. Right-click JBSSPI-Messages and select **All Tasks → Deploy on**.

   The Deploy Policies on... window opens.
3. Select the nodes on which you want to deploy the auto-discovery policies and click **OK**.
4. Right-click JBSSPI Service Discovery and select **All Tasks → Deploy on**.

   The Deploy Policies On... window opens.
5. Select the nodes on which you want to deploy the auto-discovery policies and click **OK**.

Troubleshooting Configuration

Problem	JBSSPI configuration does not write complete or accurate information on the managed node.
Solution	• Verify if the discovery was successful for this node. • Verify if the SPIDataCollector instrumentation category was deployed on this node.

Problem	The message: `JBoss Server is not running` is appearing in the message browser but the server is running.
Solution	Run the Verify tool to check if there are any missing files on the node.

Troubleshooting Collection

Problem	Following message is appearing in the message browser repeatedly: `JBSSPI: Task failed for "wasspi_perl_su -S wasspi_ca -prod jbs -m 1-12,15-42" and user "$AGENT_USER". [Policy: JBSSPI-05min]`
Solution	• Make sure all the discovered instances of JBoss EAP are running. • Redeploy JBSSPI-05min scheduled policy to the node. • Check for errors in the files `Collector.log` and `CollectorClient.log` located in the <*Agent_Dir*>`/wasspi/jbs/log/` directory.

Problem	No alarms are received for a metric
Solution	• Verify that the monitor policy corresponding to the metric is deployed on the node. • Verify that **`alarm=yes`** is specified in the <*Agent_Dir*>`/wasspi/jbs/conf/MetricDefinitions.xml` file for the metric.

Problem	On manually running the collector command on the managed node, the value of the metric is printed as `No instance,No data` on `STDOUT`
Solution	Check the JBoss JMX-Console for the presence of corresponding MBeans.

Problem	Data is not getting logged
Solution	• Verify that the SPIDataCollector instrumentation category is deployed on the managed node. This is required to create the datasource JBSSPI_METRICS. • Verify that the JBSSPI-Performance policy is deployed on the node. • Check if the `<servername>.dat` file is created in <*Agent_Dir*>`/wasspi/jbs/datalog`. • Check if the datasource JBSSPI_METRICS is created. • Verify that **`graph=yes`** is specified in the <*Agent_Dir*>`/wasspi/jbs/conf/MetricDefinitions.xml` for the metrics which are being monitored. Only the metrics which are specified as **`graph=yes`** in the `MetricDefinitions.xml` get logged. The default value is **`no`**.

Troubleshooting Tools

Problem	When launched, the JBoss Server Status tool gives incorrect or no output.
Solution	• Make sure all the discovered instances of JBoss EAP are running. • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Start JBoss Server tool gives incorrect or no output.
Solution	• Make sure the values of JBOSS_HOME_LIST and JAVA_HOME are unchanged since last discovery. If these are changed, run Discovery and Configuration again. • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When the Start JBoss Server tool is launched, the message `JBoss server started` appears in the Tool Output window but the JBoss Application Server is not started.
Solution	• Make sure the values of JBOSS_HOME_LIST and JAVA_HOME are unchanged since last discovery. If these are changed, run Discovery and Configuration again. • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Stop JBoss Server tool gives incorrect or no output.
Solution	• Make sure all the discovered instances of JBoss EAP are running. • Verify that the configuration of the JBoss AS SPI is completed without any error(s). • Verify that the LOGIN/PASSWORD entered during discovery and configuration are still valid. If not, run configuration again.

Problem	When launched, the View JBoss Logs tool gives incorrect or no output.
Solution	• Make sure the values of JBOSS_HOME_LIST and JAVA_HOME are unchanged since last discovery. If these are changed, run Discovery and Configuration again. • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Self-Healing Info tool gives improper output.
Solution	• Make sure SHS_Data_Collector instrumentation category is deployed on the node. • Run the Verify tool to check for missing files (if any). • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Start/Stop Monitoring tool gives improper output.
Solution	Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Start/Stop Tracing tool gives improper output.
Solution	Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Problem	When launched, the Verify tool gives improper output.
Solution	• Make sure SHS_Data_Collector instrumentation category is deployed on the node. • Verify that the configuration of the JBoss AS SPI is completed without any error(s).

Overview of Error Messages

The JBoss AS SPI error messages contains the following information:

- Error Message Number
- Description
- Severity
- Help Text (Probable Cause and Suggested Action)

Error messages can be viewed from the HPOM Message Browser. Double-click the error message to open the message. The Message Properties window opens. Click the Text tab to view the error message.

For more information on error messages, see *HP Operations Smart Plug-in for JBoss Application Server Online Help* or *HP Operations Smart Plug-in for JBoss Application Server Online Help PDF*.

8 Removing the JBoss AS SPI

Using the DVD

You must remove the SPI components manually before removing the SPI from the management server using a DVD.

Removing the SPI Components

Remove All the JBoss AS SPI Policies from the Managed Nodes

1. In the console tree, select **Policy management** → **Policy groups**.
2. Right-click SPI for JBoss Application Server and select **All Tasks** → **Uninstall from**.

   A node selection window appears.
3. Select the nodes on which the policies are installed.
4. Click **OK**.
5. Verify that the policies are uninstalled. Check the status of the job in Deployment jobs under Policy groups.

   All the JBoss Application Server SPI policies must be uninstalled before you start the next task.

If you have customized policies (copies of the JBoss AS SPI default policies) residing in other HPOM policy groups, you must remove them as well.

Remove the JBoss AS SPI Node Groups on the Management Server

If you created the SPI for JBoss Application Server node group (by running the Create JBSSPI Node Groups tool), you must remove the group.

1. In the console tree, select **Nodes** → **SPI for JBoss Application Server**.
2. Open the Node Configuration editor.
   a. Select the Nodes folder in the console tree.
   b. Click the node icon  on the Configuration toolbar to open the editor. A node list appears.
3. Select the name of the node group you want to delete and press the **Delete** key. You can also right-click the node group and select **Delete**.

   The Confirm Delete window opens.
4. Click **Yes**.
5. Click **OK** to close Configure managed nodes window.

Removing the SPI Software from the Management Server

To remove the JBoss AS SPI, follow these steps:

1. Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the management server.

   The HP Operations Smart Plug-ins - InstallShield Wizard starts.

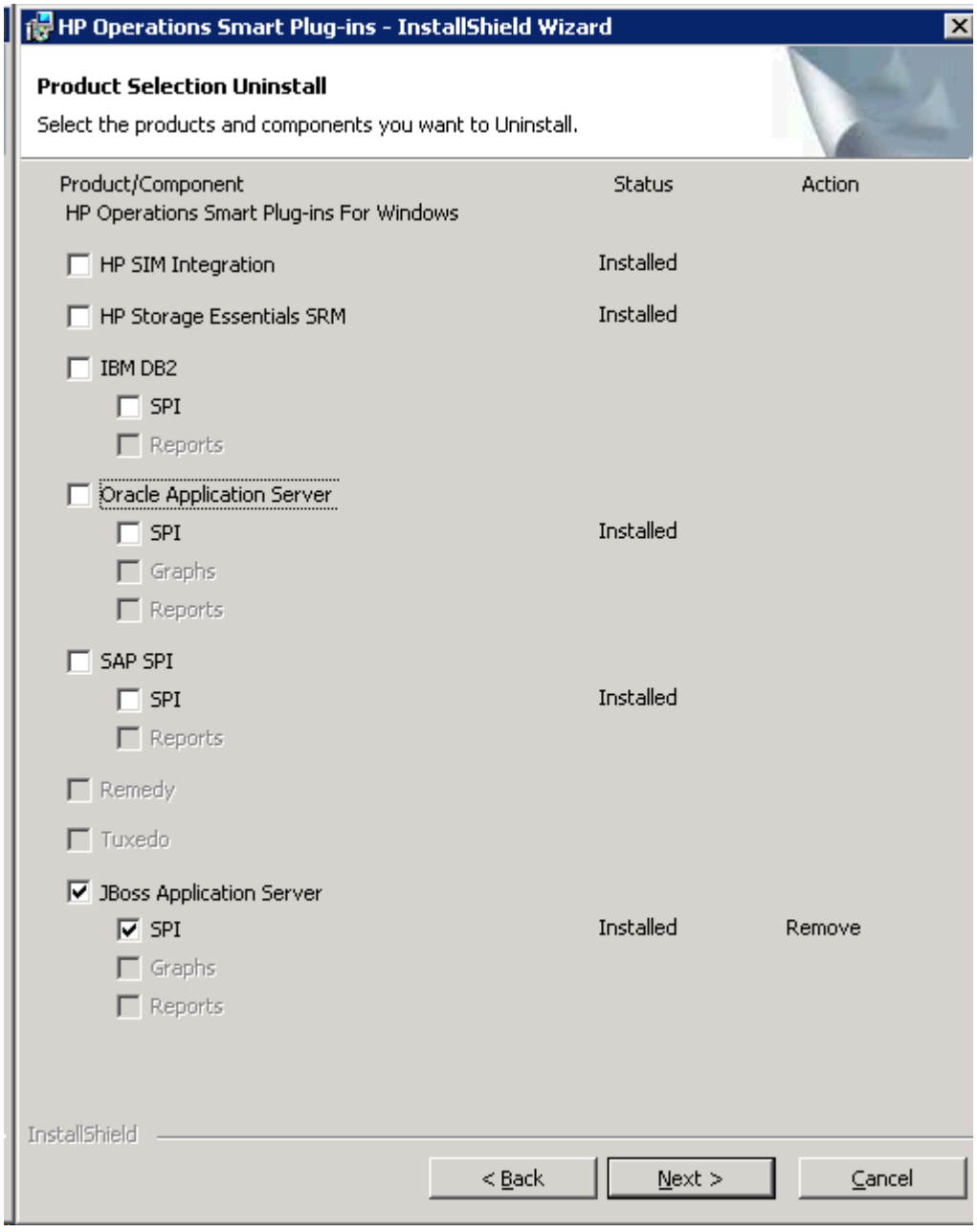
2. Select **Next**.

   The Program Maintenance window opens.

3. Select **Remove products** radio button and **click Next**.

   The Product Selection window opens.

4. Select the JBoss SPI check box and click **Next**.



5 Complete the removal by following the instructions that appear as you proceed.

The JBoss AS SPI is removed.

Using the Windows Control Panel – Add/Remove Products

Remove the SPI components before removing the SPI from the management server. To remove the SPI components manually, perform the tasks in Removing the SPI Components on page 53.

To remove the SPI from the management server, follow these steps:

1 From the **Start** menu, select **Settings →Control Panel** and open **Add/Remove Programs**.

When you use the Windows Control Panel to remove any SPI, you have two options: remove selected SPIs or remove HPOM for Windows altogether. To remove both HPOM and the SPIs, you must first remove all Smart Plug-ins from managed nodes and the management server. You can then remove HPOM.

2 Select **HP Operations Smart Plug-ins** and click **Change**.

3 On the Welcome screen click **Next**.

4 Select **Remove Products** and select JBoss SPI.

5 Complete the removal by following the instructions that appear as you proceed.

The JBoss AS SPI is removed.

Removing Smart Plug-ins in a Cluster Environment

Remove Smart Plug-in components from managed nodes

Follow the steps in the section Remove All the JBoss AS SPI Policies from the Managed Nodes on page 53.

Remove the JBoss AS SPI from the cluster-aware management servers

Remove the product from each system in the cluster as described below.

1 At the management console, select **Start →Settings→Add or Remove Programs** and select **HP Operations Smart Plug-ins** and select **Change**.

or
Insert the HP Operations Smart Plug-ins DVD in the DVD drive.

2 Whether using the Smart Plug-ins DVD or the Control Panel, proceed to product selection and select JBoss AS SPI installed on the cluster-aware management server.

3 Click **Next**.

4 Click **Remove**.

Be certain you want to follow through the removal process before beginning. To cancel the removal in a cluster after the process has begun could result in the need to manually remove program components later.

5 When you finish the removal on one management server, proceed to the next management server in the cluster. (You can choose any management server in the cluster to begin the removal. When the first removal completes, you are prompted to proceed to each subsequent management server until you reach the last.)

6 After selecting JBoss AS SPI to remove from the first node in the cluster and completing the removal on that node, you are prompted to proceed to the next node. Your initial selections on the first node are used for removing the identical Smart Plug-ins from the second.

7 You are notified that the removal is complete.

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