HP Operations Smart Plug-in for SAP

for HP Operations Manager for Windows®

Software Version: 12.00

Installation and Configuration Guide

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Contents

1 Introduction to the HP Operations Smart Plug-in for SAP

This chapter provides an overview of the basic concepts necessary to understand the HP Operations Smart Plug-in for SAP (SPI for SAP). The information in this section describes how the SPI for SAP integrates with HP Operations Manager (HPOM) for Windows and other HP software products and helps you understand how to customize both the SPI for SAP and other HP software products to meet the needs of your environment.

The SPI for SAP is a software package linking SAP NetWeaver to HPOM. The union offers a complementary and consolidated view of SAP performance information and overall resource characteristics.

This integration allows the correlation of SAP performance data with the performance data of the operating system, the database, and the network—all from one common tool and in one central management system. Integrating SAP performance data with the HPOM environment helps you detect and eliminate bottlenecks in a distributed environment. In addition, the integration allows for system optimization and service-level monitoring. The SPI for SAP performs the following tasks in a distributed HPOM environment:

- Collects real-time information about events and configuration—including useful on-line instructions for fast problem resolution
- Monitors SAP nodes to detect potential problem areas and keep track of systems and events
- Collects performance data to ensure system throughput and notifies you of any performance bottlenecks
- Provides a direct, context-sensitive access to the SAP front-end
- Complements and extends the SAP Computing Center Management System (CCMS)
- Stores events and action records for all SAP managed nodes into a central repository
- Runs routine SAP management tasks
- Integrates SAP environments with the service map—the SPI for SAP includes a policy that automatically generates service views of the SAP systems installed on your managed nodes.

Components of the SPI for SAP

The SPI for SAP components include *tools* and *policies* that allow you to configure and receive data in the form of service problem alerts, messages, and metric reports. The SPI for SAP service map alerts are shown in the HPOM service map, while SPI for SAP messages and automatic action reports are available through the HPOM message browser.

Tools

In conjunction with HPOM, the SPI for SAP offers centralized tools, that help you monitor and manage the SAP systems. The SPI for SAP tools enable you to configure the management server's connection to selected server instances on specific managed nodes. The SPI for SAP tools include the tools for administrating and operating the SPI for SAP.

The following are the SPI for SAP tools:

- **SAP R/3 Admin** - SAP R/3 Administration of Global Configuration.
- **SAP R/3 NT** - Tools for Windows managed nodes. These are only a subset of the Tools available for UNIX nodes.
- **SAP R/3 UN*X** - Tools for UNIX managed nodes. Some tools are also available for Windows nodes.

For more information on Tools, see Using SPI for SAP Tools on page 47.

Policies

SPI for SAP consists of policies that monitor the SAP systems. 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 comprises of generating alarms related to critical events of the tool, and logging important performance metrics of the application server.

The SPI for SAP creates the following policy groups/sub groups and configuration files under the *en* folder.

- **SAP NW Java Monitoring 7.0**
- **SAP NW Java Monitoring 7.1**
- **SAP R3 6.x/7.0AS/7.1kernel**
- **SAP R3 6.xCI**
- **SAP R3 7.0CI/7.1kernel**

For more information on policies, see Using and Customizing the SPI for SAP Policies on page 51.

Reports

SPI for SAP reports are web-based reports that are produced by HP Reporter (Reporter) using the default templates and viewed using a web browser. You can request both scheduled and on-demand versions of reports using Reporter.

SPI for SAP service reports correlate the data extracted from either the HP Software Embedded Performance Component (CODA) or the HP Performance Agent. You can use the correlated data to generate reports which display short-, medium-, or long-term views of your IT environment and supplement the detailed, real-time graphs that the Performance Manager provides. You can use these reports for trend analysis. For more information on Reports, see Integrating the SPI for SAP with HP Reporter on page 101.

Functions of the SPI for SAP

The SPI for SAP provides you with a centralized problem-management environment with HP Operations agents on the SAP NetWeaver managed nodes. The use of the central HP Operations management server avoids the duplication of administrative effort.

Server Performance and Availability Information

Availability management alerts you when something in your SAP NetWeaver environment is going wrong, for example: a disk is full or a key process has either stopped prematurely or failed to start at an appropriate time. The combination of the SPI for SAP and HPOM alerts SAP administrators about such conditions and provides the following additional assistance in the alert message:

- Advice about corrective action that should be taken

- A pre-defined action that the administrator can initiate.

- An automatic action, such as an e-mail message to a manager if a critical condition occurs

Display Information

The SPI for SAP 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 performance and availability of SAP against 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 SPI for SAP programs contain instruction text to help analyze and solve problems. You can manually perform corrective actions preassigned to events or they can be triggered automatically.

Instruction text is present in the Message Properties window. To view the text, right-click the message, select Properties, and chose the Instructions tab.

Metric Reports– In addition to the instruction text, some messages cause automatic action reports to be generated. These reports show conditions of a specific SAP instance. If a report is available, you can view it by clicking the Annotations tab in the Message Properties window.

Generating Reports using HP Reporter

You can integrate the SPI for SAP with HP Reporter to provide you with management-ready, web-based reports. The SPI for SAP Report package includes the policies for generating these reports. You can install the Report package on the Reporter Windows system.

After you install the product and complete basic configuration, by default, Reporter generates reports of summarized, consolidated data every night. You can use these reports to assess the performance of the system over a period of time.

Customizing Policies and Metrics

You can use the SPI for SAP policies without customization, or modify them to suit the needs of your environment. Some of the modifications and customizations that you can do are the following:

- Modify the default policies - Within a policy, you can change the default settings for:
  - Collection interval
  - Threshold
  - Message text
  - Duration
  - Severity level of the condition
  - Actions assigned to the condition (operator-initiated or automatic)
- Create custom policy groups – You can create custom policy groups using default policies as base. For more information, see Using and Customizing the SPI for SAP Policies.
- Create custom metrics– You can define your own metrics or User Defined Metrics (UDMs) to expand the monitoring capabilities of the SPI for SAP. For more information about UDMs see the *HP Operations Smart Plug-in for User Defined Metrics User Guide*.

2 Installing or Upgrading the SPI for SAP

This chapter provides the information you need to check the suitability of your systems for the installation of the Smart Plug-in for SAP.

Installation Packages

The following are the SPI for SAP packages available in the *HP Operations Smart Plug-ins DVD*.

SPI Package

The core package is the HP Operations Smart Plug-ins.msi contains all the SPI functionality. The package must be installed on a server managed by HPOM. The SPI for SAP package is available at the following location on the media:

<SPI DVD>`\SPIs\SAP SPI\SPI-SAP-ITO.msi`

Reporter Package

This package contains the default reporter templates provided by SPI for SAP. These templates are static and cannot be modified unless Crystal Reports 10.0 or later is installed. The Reporter gathers the data from the nodes managed by SPI for SAP through HPOM server, stores it in its local database, and then creates .html reports based on the default report templates. The SPI for SAP reporter packages are available at the following location on media:

<SPI DVD>`\SPIs\SAP SPI Reporter Package\sapspi_reporter.msi`

Console Package

This package contains SPI for SAP utilities that need to be installed on a server running as Console. To enable a remote console so that users can run Tools, SPI for SAP utilities must be installed on the console. The SPI for SAP console package is available at the following location on media:

<SPI DVD>`\SPIs\SPIs Console Packages\SPI-SAP-ITO-CONSOLE.msi`

Installation Environments

Standard Installation of SPI Components on an HPOM Server

By using the *HP Operations Smart Plug-ins DVD* you can select to install only SPI for SAP packages and not the reporter and graphing packages. However, if the full version of Reporter or Performance Manager is installed on the same system, the corresponding packages can be installed or uninstalled on the HPOM server.

Standard Installation on Remote Consoles

All the Remote Console packages on the SPI DVD including the SPI for SAP are installed at once on to remote consoles. No option is provided to select a particular remote console package if you use SPI DVD media to install the console package.

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 SPI on each of the nodes in the cluster environment.

Standalone HP Reporter and HP Performance Manager

For such a machine only the corresponding package of any SPI is enabled and available for selection from the *HP Operations Smart Plug-Ins DVD*. For example, if a system has only HP Reporter installed, the reporter package of any SPI could be installed on it. The same applies to the graphing package and HP Performance Manager.

Installation Overview

The following flowchart summarizes the steps for installing, upgrading, and configuring the SPI for SAP.

```
                              ┌──────────┐
                              │  Start   │
                              └──────────┘
                                   │
                                   ▼
┌──────────────────────┐  Yes  ◇──────────────────◇   No   ┌────────────────────────────┐
│ Upgrade the SPI for  │◄──────│ Is the SPI installed? │──────►│ Fulfill the hardware and   │
│         SAP          │       ◇──────────────────◇          │  software requirements     │
└──────────────────────┘                 │ Yes                └────────────────────────────┘
            │                             ▼                                   │
            ▼                  ┌────────────────────────────┐                 ▼
┌──────────────────────┐      │ Fulfill the configuration   │      ┌────────────────────────────┐
│ Verify the Installation│      │      prerequisites         │      │   Install the SPI for SAP   │
└──────────────────────┘      └────────────────────────────┘      └────────────────────────────┘
                                           │                                   │
                                           ▼                                   ▼
                              ┌────────────────────────────┐      ┌────────────────────────────┐
                              │ Assign/Deploy instrumentation│      │   Verify the Installation   │
                              │     on the managed node     │      └────────────────────────────┘
                              └────────────────────────────┘
                                           │
                                           ▼
                              ┌────────────────────────────┐
                              │ Configure policies on the   │
                              │       managed node          │
                              └────────────────────────────┘
                                           │
                                           ▼
                              ┌────────────────────────────┐
                              │ Assign/Deploy policies on   │
                              │     the managed node        │
                              └────────────────────────────┘
                   ┌───────────────────────┼───────────────────────┐
                   ▼                       ▼                       ▼
          ┌─────────────┐      ┌────────────────────┐      ┌─────────────┐
          │    Alerts   │      │   Performance      │      │  Discovery  │
          │             │      │   Data Logging     │      │             │
          │             │      │     CODA/PA        │      │             │
          └─────────────┘      └────────────────────┘      └─────────────┘
                   │                       │                       │
                   ▼                       ▼                       ▼
          ┌─────────────┐      ┌────────────────────┐      ┌─────────────┐
          │    HPOM     │      │     Reports        │      │ Service Map │
          │   browser   │      │                    │      │             │
          └─────────────┘      └────────────────────┘      └─────────────┘
                   └───────────────────────┼───────────────────────┘
                                           ▼
                                    ┌──────────┐
                                    │   End    │
                                    └──────────┘
```

Installation Prerequisites

For the SPI for SAP to run properly, your system must meet the requirements described in this section.

Before You Begin

Before installing the SPI for SAP, make sure you perform the following checks:

- Ensure that the systems on which you want to install the SPI for SAP software meet the requirements listed in the following sections:

  — Hardware, Operating System, and Disk Space Requirements on page 16.

  — Software Requirements on page 17.

- For each SAP instance, note the following:

  — Which SAP version is installed?

  — Is SAP installed on a central instance or an application server?

- Create a list of all the SAP clients you want to monitor with the SPI for SAP. For each client, list the following data:

  — The hostname of the SAP application server

  — The SAP system ID

  — The SAP Instance number

  — The SAP client number

  — The operating-system platform (UNIX, Linux, or Microsoft Windows)

  — User name/password to be used for monitoring

Use this information to set up the environment for the SPI for SAP.

Hardware, Operating System, and Disk Space Requirements

Before you install the SPI for SAP, use the information provided in Table 1 to ensure that your systems (HPOM management server and all the managed nodes) meet the requirements for hardware, software, operating-system support, and disk space.

Table 1   Hardware, Operating System, and Disk Space Requirements

Product	Operating Systems	Minimum Disk Space
SPI for SAP on the management server[a]	• Windows Server 2003 • Windows Server 2008 (only on x64)	1 GB

Table 1 Hardware, Operating System, and Disk Space Requirements (cont'd)

Product	Operating Systems	Minimum Disk Space
SPI for SAP on managed nodes	HP-UX	Approximately 40MB.[b] The disk-space requirement on the node will increase with the amount of data collected and logged by the SPI.
	AIX	
	Windows	
	Linux	
	Solaris	
SPI for SAP Reporter Package	Windows	1 GB

a. On the management server, make sure that the `PATH` system variable includes the locations of Windows utilities/commands and Windows Script Host.

b. Includes 5MB for the transports

Support Information: Detailed information on supported operating systems is available in the Support metrics available at **http://support.openview.hp.com/selfsolve/document/ KM323488**

Software Requirements

Before you configure or upgrade the SPI for SAP, use the information provided in Table 2 on page 17 and Table 3 on page 18 to ensure that you are using a version of HPOM that is compatible with the current version of the SPI for SAP. In addition, you will need to ensure the following:

- The HP Operations agent software must be available on the HPOM management server

- The standard HPOM management-server policies must be available on the HPOM management server

- HP Reporter must be available if you want to view service reports for SAP.

  ➤ HP Reporter lite is no longer bundled with HPOM; install the HP Reporter product to generate reports from the data collected by the SPI for SAP.

  If you want to edit existing (or create new) reports for the SPI for SAP, make sure that Crystal Reports (version 10.0 or later) is available on the machine hosting the HP Reporter (version 03.80 or later).

- To generate graphs from the data collected by the SPI for SAP, you must install HP Performance Manager in the HPOM environment.

Table 2 lists the software versions for the HPOM management server, which the current version of the SPI for SAP supports.

Table 2 Supported HPOM Management-Server Platforms

HPOM Version [a]	Operating System Platform
08.10	• Microsoft Windows Server 2008 (only x86) • Microsoft Windows Server 2003

a. Installed systems should be patched to the latest required level

Table 3 on page 18 shows which combinations of the SAP kernel and (in brackets) the SAP Basis versions of SAP the SPI for SAP supports. Note that the last three columns reflect a change to the SAP version-numbering system and show the SAP *basis* version and (in brackets) the SAP *kernel* version. For example, 6.40 (6.40) means SAP *basis* 6.40 (SAP *kernel* 6.40).

Table 3   Supported Managed-node Platforms and SAP Versions

Managed-Node Operating System	SAP Basis (Kernel)		
	6.40 (6.40)	7.0 (7.0)	7.1 (7.1)
AIX	•	•	•
HP-UX	•	•	•
Linux	•	•	•
Solaris	•	•	•
Windows	•	•	•

You must install the latest version of the Microsoft .NET Framework on all Windows nodes.

Obsoleted Software Versions

The following, features, software, or operating systems are no longer supported with this version of the SPI for SAP:

- SAP R/3 4.6C kernel (4.6C with 4.6D kernel support is dropped)
- SAP ITS 4.6/6.10/6.20
- HP-UX 11.00
- r3monsap, the CCMS 3.x alert monitor used with SAP R/3 3.1- 4.5
- r3monxmi, the SAP System-log monitor (replaced by r3monal for 4.6C and later)
- r3monits, the SAP ITS 6.20 monitor
- The SPI for SAP no longer provides support for the Windows 2000, 2000 Advanced Server operating systems on either the HPOM management server or the managed node.

The current release of the SPI for SAP no longer provides support for the HP-software Self-healing Services (SHS) feature, which is now obsolete.

Installing the SPI for SAP Software

Before you install and configure the SPI for SAP software, make sure that you install HPOM and patch it to the latest required level. After completing the installation of HPOM, use the *HP Operations Smart Plug-ins* DVD to install the SPI for SAP software.

Support Information: Detailed information on supported operating systems is available in the Support metrics available at **http://support.openview.hp.com/selfsolve/document/ KM323488**.

When you install the SPI for SAP on a management server or console system, follow these steps.

Installing Smart Plug-in for SAP on the Management Server or Console

1   Insert the *HP Operations Smart Plug-ins* DVD into the DVD drive of the management server or console system. The Installation Wizard opens.

2   Click **Next** to continue. The Smart Plug-ins Release Notes and Other Documentation screen appears.

3   Click **Next** to proceed. On the Program Maintenance screen, select **Install Products**.

4   In the Product Selection screen, select the **SPI for SAP** to install or upgrade.
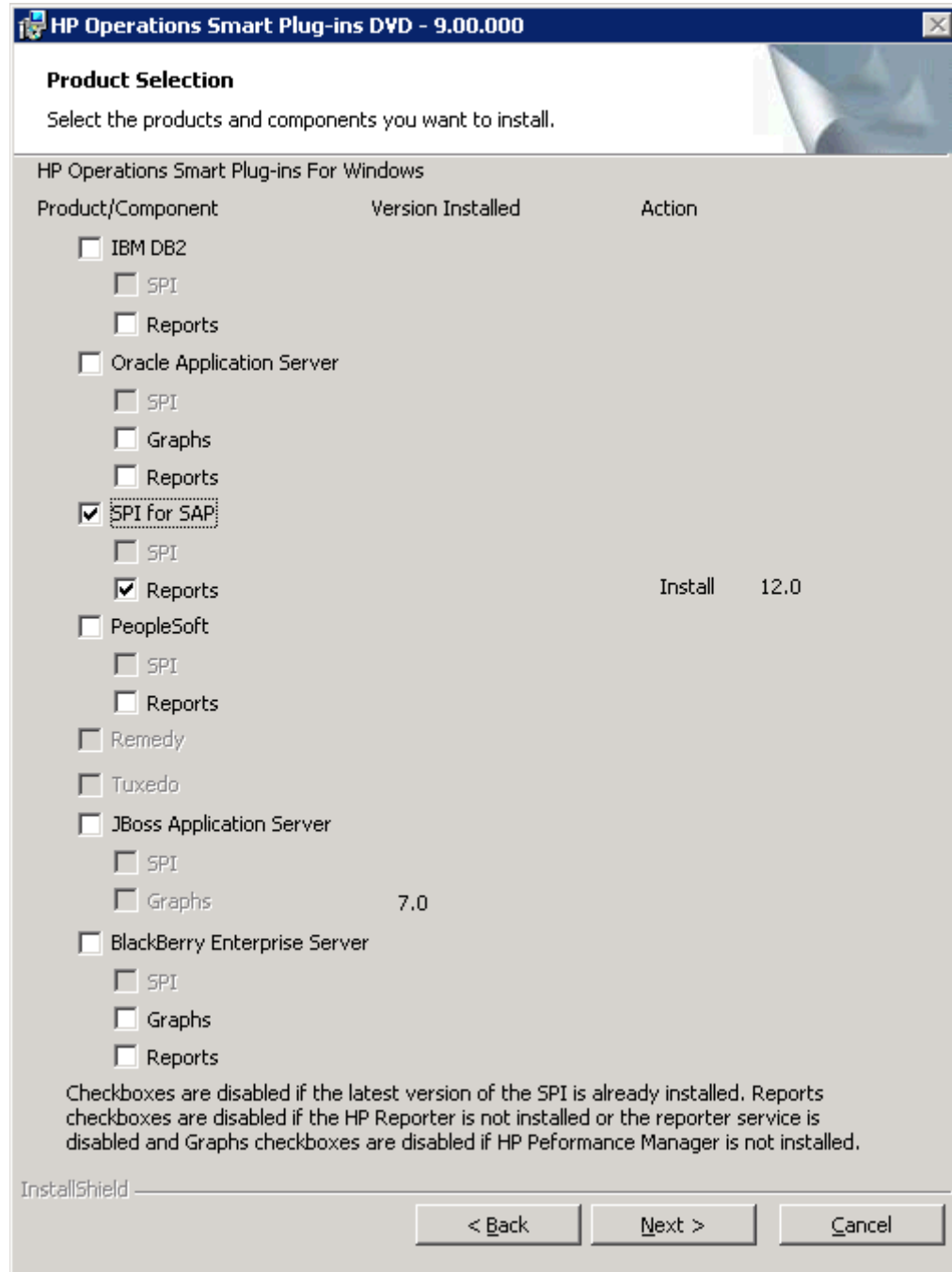
If HP Reporter is installed in the environment, you can select the Reports check box.

▶   If latest version of SPIs is already installed, SPI checkboxes are disabled. If Reporter is not installed, Reports checkbox is disabled.

5   Click **Next**. The Enable/Disable AutoDeployment screen appears.

6   Select an option to disable or enable the Auto Deployment feature.

7   Click **Next**. The License Agreement screen appears.

8   Indicate your acceptance of licensing agreement terms by selecting the **I accept the terms in the license agreement** button and click **Next**.

9   Click **Install** to begin the installation.

▶   Selecting the **Cancel** button after the installation has started 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.

10 Click **Finish** to conclude the installation.

Installing the SPI for SAP on a Remote Console

You can follow any of the following approach to install the SPI on a remote console.

•   Using SPI DVD media

•   Using the SPI for SAP console package

Using SPI DVD media

You can use the SPI DVD at the remote console to install the all SPI packages that are located at *<SPI DVD>*\SPIs\SPIs Console Packages on the SPI DVD media by performing the following steps.

1   At the console-only system, insert the *HP Operations Smart Plug-ins DVD*.

2   Follow the instruction screens until a dialog appears saying that a remote console installation has been found.

3   Click **Next**.

The upgrade of all previously installed packages now occurs.

Using the SPI for SAP console package

1   Install the SPI for SAP integration for the HPOM console on any additional system where you intend to run the HPOM console remotely in combination with the SPI for SAP. The SPI DVD Installer does not install the console-integration package automatically on remote systems; you have to install the package manually by locating the console-integration package file and double-clicking it to launch the set-up program. You can find the console-integration package on the *HP Operations Smart Plug-ins DVD* in the following location:

    <DVD>\SPIs\SPIs Console Packages\SPI-SAP-ITO-CONSOLE.msi

Before continuing with the configuration of the SPI for SAP software ensure the installation process completed correctly by following the instructions listed in Verifying the Installation of the SPI for SAP Software on page 24.

Remote Monitoring with the SPI for SAP

You can extend the scope of the SPI for SAP to monitor the status of SAP NetWeaver on remote SAP servers, which are *not* managed nodes and where the SPI for SAP is *not* installed. You can set up and perform the remote monitoring from a managed node, where the SPI for SAP software *is* installed, correctly configured, and running.

You can use the remote-monitoring feature provided by the SPI for SAP to monitor an SAP System running in an environment that is not supported by the SPI for SAP, for example; a mainframe environment.

You can use the alert-classes section at the end of the monitor-configuration file to associate an instance of a monitor with a specific host, SAP instance, or processes on the remote server in the same way as you can with a normal (local) managed node. For more information about the remote-monitoring feature, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

Upgrading the SPI for SAP

You can upgrade the SPI for SAP by using either of the following:

- Upgrade using the SPI Upgrade Toolkit
- Upgrade using the HPOM console

Upgrade using the SPI Upgrade Toolkit

The HP Operations Smart Plug-in Upgrade Toolkit (SPI Upgrade Toolkit) helps you upgrade HP Operations Smart Plug-ins to a higher version while retaining the customizations done on policies. During the SPI for SAP upgrade process, the SPI Upgrade Toolkit enables you to store the modifications done on the customer version of policies. For a specific policy, the SPI Upgrade Toolkit analyzes and compares three versions—base, customer, and factory. It helps you select the settings of the base, customer, or factory version of the policy—depending on your requirement.

To upgrade the SPI for SAP using the SPI Upgrade Toolkit, follow the instructions in the *HP Operations Smart Plug-in Upgrade Toolkit Windows User Guide*.

Upgrade using the HPOM Console

This section describes how to upgrade the SPI for SAP software from version 10.70, 11.10 to version 12.00. Before you upgrade the SPI for SAP software, read through the recommendations below.

1 Ensure you have read and understood the requirements in Hardware, Operating System, and Disk Space Requirements on page 16.

2 Use a backup facility to save the complete, current configuration. This enables you to restore the configuration in the event that the upgrade is unsuccessful.

3 Make safety copies of any configuration-file templates that contain modifications you made to the original configurations. Note the location of the policy templates:

```
%OvShareDir%\SPI-Share\sapspi
```

4   Although policies are protected by the version system, it is always a good idea to backup the SPI for SAP policies, which you have deployed to the managed nodes. If you have modified any of the SPI for SAP message-source policies, create a safety copy of the SPI for SAP policy group and all the policies it contains.

> You cannot simply overwrite the new policy templates delivered as part of the SPI for SAP version 12.00 with the backup copy of the previous template version: you have to merge any changes you made to the old policy templates into the new policy templates. Since the SPI for SAP includes revised and improved policy templates, overwriting them with an older version can result in unmatched messages and might even cause more serious problems.

5   If you are using (and want to upgrade) the SPI for SAP R/3 Performance Agent, you need to remove the old SPI for SAP performance monitor sub-agent from the managed nodes *before* you remove and upgrade the SPI for SAP. Read the section Upgrading the Performance Monitor on page 77 before continuing with the next step, which concerns the removal of the old SPI for SAP software.

6   Install the new SPI for SAP software on the HPOM management server according to the instructions provided in Installing the SPI for SAP Software on page 19.

> The set-up process removes the existing SPI for SAP software on the management server and replaces it with the newer version.

7   Install the SPI for SAP integration for the HPOM console on any additional system where you intend to run the HPOM console remotely in combination with the SPI for SAP. The SPI DVD Installer cannot perform this step automatically; you must perform this step manually by locating the console-integration package and double-clicking it to launch the set-up program.

> If the setup program finds an existing SPI for SAP console-integration package, it removes it and replaces it with the newer version.

For more information about the location of the console-integration package, see Installing Smart Plug-in for SAP on the Management Server or Console on page 19.

8   Configure the SPI for SAP to monitor SAP as described in Configuring SAP-Specific Tasks on page 29. These instructions take you through the process of setting up SAP to allow access to the SPI for SAP monitors and configuring the SPI for SAP monitors to look for and report the information you want to see.

9   Configure the SPI for SAP to work with HPOM as described in Configuring HPOM Administration Tasks on page 39. These instructions take you through the process of deploying the SPI for SAP instrumentation and policies.

10 Upgrade the SPI for SAP R/3 Performance Agent.

Before converting any data, read the instructions in Upgrading the Performance Monitor on page 77 and, in addition, in the section about upgrading the SPI for SAP R/3 Performance Agent in the *SPI for SAP Online Help*.

> When upgrading SPI for SAP from a previous version to the 12.00 version, perform the actions in the following order:
>
> 1   deploy the instrumentation
> 2   deploy all the configuration files except `r3itosap.cfg` file.
> 3   deploy the scheduled policies.

Upgrading the SPI for SAP on a local management server

Verify you have met the prerequisite: On the console or management server, verify that you have installed HPOM 8.10.

For purchased, evaluation, and complimentary SPIs: Upgrading SPIs that you purchase or are complimentary is the same as a new installation. Before starting, review the SPI documentation which describes in detail any steps required before upgrading SPIs. By completing all required steps, you avoid unnecessary data loss.

Verifying the Installation of the SPI for SAP Software

It is recommended that you carry out a number of simple checks to verify that the installation of the SPI for SAP software has completed successfully and that all the required elements are available before you continue with the configuration of the software.

To Verify the Installation of the SPI for SAP Software, follow these steps:
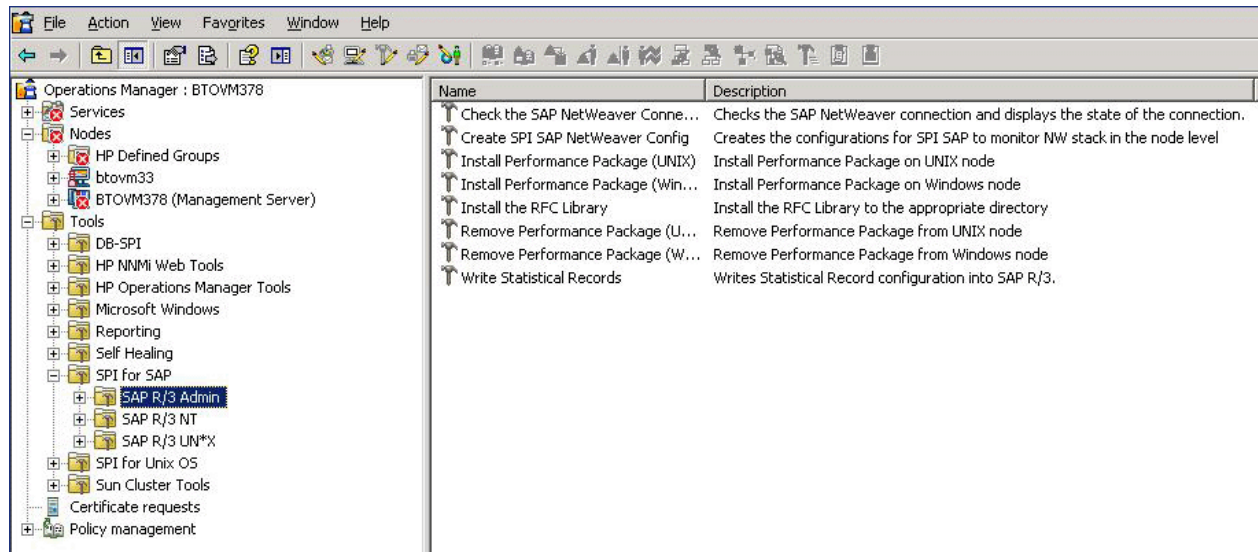
1 In the HPOM console, browse to the following item:

Tools > SPI for SAP

Check that the following sub-directories are present:

— SAP R/3 Admin

— SAP R/3 NT

— SAP R/3 UN*X

2 Click each sub-directory in turn to confirm tools are present as illustrated in Figure 1.

Figure 1   SPI for SAP tools sub-directory

3 Although the SPI for SAP does not install them, you should check that the ConfigFile policy packages are available, since they are required. In the HPOM console tree, browse to the following item:

Policy management > Deployment packages

The following items (belonging to the configuration-file policy type) should be present as illustrated in Figure 2.

— ConfigFile Policy Package for DCE Nodes

— Operations-agent

Figure 2   Check the Installed packages
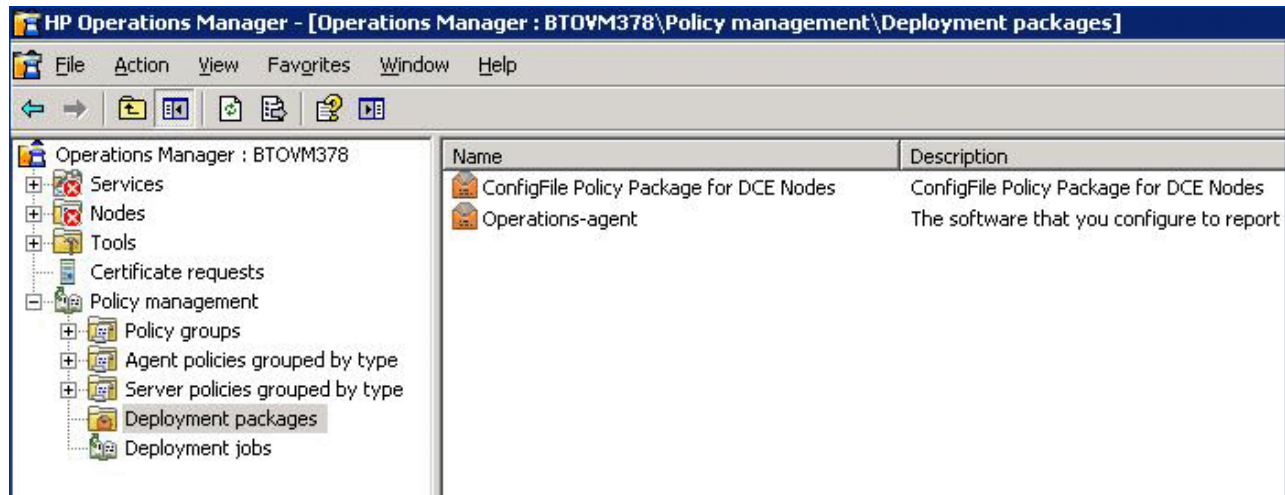
Installing the SAP GUI

In this step, you install the SAP GUI on the HPOM management server as well as on the machines where you want to run a HPOM console. You should use your SAP installation media to install the most recent version of the SAP GUI available in your environment. Most of the operator-initiated actions and tools included in the SPI for SAP start the SAP GUI to access and display SAP information. For this reason, a SAP GUI *must* be available on the machine hosting the HPOM management server and, in addition, on any system where you want to run a remote HPOM console. For more information about installing the native GUI for SAP, see the appropriate SAP documentation.
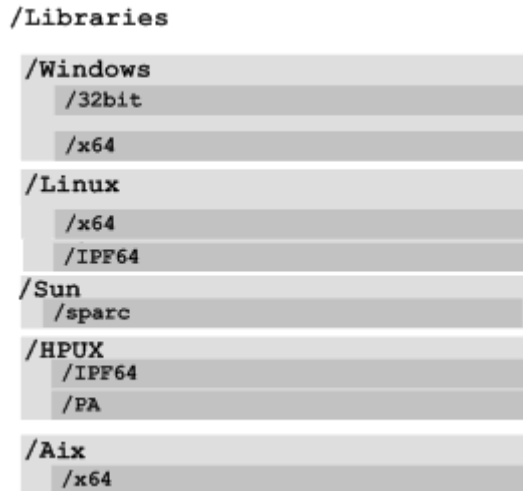
Downloading SAP Libraries

You must download the necessary SAP RFC libraries on the management server. To download the SAP RFC libraries, follow these steps:

1   Create the following folder on the management server:

    C:\temp\Sap_RFC_Downloads\Libraries

2   Inside the newly created Libraries folder, create the following folder structure.

a   Create the `Libraries` folder under the `C:\temp\Sap_RFC_Downloads` folder.

b   Under the `Libraries` folder, create the `Windows`, `Linux`, `Sun`, `HPUX`, and `Aix` folders.

c   Under the `Windows` folder, create the `32bit` and `x64` folders.

d   Under the `Sun` folder, create the `sparc` folder.

e   Under the `Aix` folder, create the `x64` folder.

f   Under the `HPUX` folder, create the `IPF64` and `PA` folders.

g   Under the `Linux` folder, create the `x64` and `IPF64` directories.

3   Download the appropriate flavors of the RFC SDK 6.40 from the SAP Software Distribution Center website (**http://service.sap.com/swdc**).

⚑   Regardless of the version of SAP deployed in your environment, always download the RFC SDK version 6.40.

Extract the contents of the RFC SDK and copy the library files into the directories created in step 2 as listed in the following table:

Table 4   SAP Libraries

Node Platform	Library File	Copy into the Folder
Windows 32-bit	`librfc32.dll`	`/Windows/32bit`
Windows X64	`librfc32.dll`	`/Windows/x64`
Linux	`librfccm.so`	`/Linux`
Linux	`librfccm.so`	`/Linux/x64`
Linux	`librfccm.so`	`/Linux/ipf64`
Solaris	`librfccm.so`	`/Sun/sparc`
HP-UX IA-64	`librfccm.so`	`/HPUX/IPF64`
HP-UX PA-RISC	`librfccm.sl`	`/HPUX/PA`
AIX[a]	`librfccm.so`	`/Aix/x64`

a.   For all supported flavors of AIX, use the **AIX 64-bit** RFC SDK (6.40).

4   After placing the library files into the newly created folders, run the `Install the RFC Library` tool on the management server from the `SAP R/3 Admin` tool group.

3 Configuring SAP-Specific Tasks

This section describes how to complete the SAP-specific part of the installation of the Smart Plug-in for SAP. The tasks in this phase require knowledge of SAP transactions and specific monitoring requirements. You will be working with the HPOM console as well as on the SAP system application servers and will need to log on to HPOM as an operator and to the SAP clients as a user with authority to perform the SAP tasks included in this phase.

➤ After you set up and deploy the configuration-file policies, you must also deploy the corresponding Smart Plug-in for SAP policies to the SAP managed nodes. See Deploying SPI for SAP Policies to Managed Nodes on page 43.

Applying the SAP Transports

In this step, you copy the transport files provided by the Smart Plug-in for SAP to the SAP transport directories on each HPOM managed node that is an SAP central instance.

The SPI for SAP Transports

The SPI for SAP provides a number of different transport files. Since the transports contain monitors that serve a specific purpose, it is important to understand where each transport needs to be imported and why. The SPI for SAP contains the following transports:

- `R3Trans.car`

  The `R3Trans.car` transport contains all the ABAP monitors that the SPI for SAP uses along with the default configuration settings; you import the `R3Trans.car` transport into each of the SAP's central monitoring system which monitors all the satellite systems connected to it through the r3monal monitor.

- `SAPSPI_CCMS_Monitors.car`

  The `SAPSPI_CCMS_Monitors.car` transport adds the SPI for SAP's CCMS-based monitors for J2EE, System security, standalone-enqueue servers, the Enterprise-Portal, and XI monitoring to the CCMS monitor set HP OV SAP-SPI. You import the `SAPSPI_CCMS_Monitors.car` transport either into the individual SAP systems whose CCMS alerts you want to monitor with the SPI for SAP or, if configured, into the central monitoring system (CEN). In SAP terms, the CEN is the system you configure as the central management point of control for any CCMS alerts originating from anywhere in the monitored SAP landscape.

For more information about the SPI for SAP monitors as well as instructions for modifying existing (or adding new) monitors to standard SPI for SAP monitor sets, see the *SPI for SAP Online Help*.

The SPI for SAP provides transports for supported SAP versions that include SPI for SAP functionality in the SAP name space "/HPOV/". As a result of this naming convention, administrators now must use the *new* SPI for SAP name-space transports if they want to use the SPI for SAP to monitor SAP Systems. For more information about the SAP versions that the SPI for SAP supports, see Installation Prerequisites on page 16.

➤   It is possible to import the new SPI for SAP name-space transport into an SAP System where previous versions of SPI for SAP transports have already been imported.

Table 5 lists the naming conventions used for the transport objects provided by the SPI for SAP.

Table 5   Naming Conventions for Transport Objects

Transport Class	Transport Object
Table of Contents	/HPOV/ZHPSPI0*
Development Class	/HPOV/SAPSPI
Domain	/HPOV/ZITO_*
Function Groups	/HPOV/NW04 /HPOV/ZBTO /HPOV/ZLPO /HPOV/ZSPA /HPOV/ZSPB /HPOV/ZSPY /HPOV/WEBAS /HPOV/WEBAS70 /HPOV/SOLMAN
Function modules	/HPOV/OV_*
Programs	/HPOV/YSPI* /HPOV/ZHPSPIB1 /HPOV/ZHPSPIB2 /HPOV/ZHPSPIT1 /HPOV/ZHPSPI00*
Roles	/HPOV/SAPSPI_MONITORING* /HPOV/SAPSPI_SECURITY_MON

To copy the SPI for SAP transport files to the managed nodes, follow these steps:

1   Use the Windows Explorer tool to locate the SAP transport packages, which by default reside in the following directory on the HPOM management server:

    `%OvShareDir%\Packages\SAPTransports`

The SAP transport package is stored in the SAP-specific `.car` format and is accompanied by a readme file explaining which SAP transports you must import into each SAP version.

2 Use the `ftp` method to transfer the package to each of the SAP central instances you want to manage with HPOM.

> ➤ The operating-system user executing the `ftp` operation requires write permission in the transport directory. If necessary, enable write access to the transport directory manually.

3 On each of the managed nodes, as SAP administrator (*<SID>*adm) use the `CAR` (or `SAPCAR`) command to unpack the transport files to `/usr/sap/trans`. Enter:

- **`CAR -xvf R3Trans.car`**

  `R3Trans.car` contains the SPI for SAP's ABAP monitors.

- **`CAR -xvf SAPSPI_CCMS_Monitors.car`**

  `SAPSPI_CCMS_Monitors.car` contains the transport files for the SPI for SAP's CCMS-based monitors.

- For more information about the SPI for SAP's transports, see The SPI for SAP Transports on page 29. For more information about the SPI for SAP's CCMS monitors, see *SPI for SAP Online Help*.

  > ➤ The SAPCAR command is available on any SAP Kernel CD and replaces the CAR command in versions of SAP from 4.6.

4 Continue importing the SAP transport files following the instructions described in the following sections; you can use either the command line or the SAP GUI.

To Import Transport Files using the Command Line, import the Smart Plug-in for SAP transport to your SAP central instance. For example, enter the following commands as SAP administrator (*<SID>*adm) on the appropriate HPOM managed node:

`cd \usr\sap\trans\bin`
`tp addtobuffer <transport_file_name> <SID>`
`tp import <transport_file_name> <SID> client=<client_number>`

In this example, *<SID>* is the SAP system ID and *<transport_file_name>* is the name of the transport file, which corresponds to the version of SAP running on the HPOM managed node, for example:

`tp addtobuffer SPIK900132 CIA`

The transport file name, `SPIK900132`, and the SAP System ID, CIA, are used here only to illustrate the correct syntax for the `tp` command. For more information about transport numbers and SAP versions, see the following file on the HPOM management server after installation of the software bits:

`%OvShareDir%\Packages\SAPTransports\readme`

If the `tp` command indicates that it cannot find files or required information, use the `pf=<path>\TP_DOMAIN_<SID>.PFL` option to define the location of the `tp`-parameters file. In the following example, we assume that you installed SAP in the `e:\` partition:

`pf=e:\usr\sap\trans\bin\TP_DOMAIN_<SID>.PFL`

If for any reason an error occurs, you can clean the buffer using the following command:

`tp cleanbuffer <SID>`

Repeat this procedure on each SAP system you want to manage with HPOM.

Alternatively, you can import transport files with the SAP GUI. To import transport files using the SAP GUI, follow these steps:

1   Log on to all SAP Systems where you want to apply the SPI for SAP transport file.

    ► Transports *must* be applied to *each* SAP System.

2   In the SAP GUI, enter the following transaction ID to display the SAP Transport Management System (SMTS) login page: **STMS**

3   In the SAP Transport Management System login page, click the **Transport** icon (or press the **F5** function key).

4   Select the SID of the SAP System into which you want to import the SPI for SAP transport.

5   In the file menu, click **Extras > Other requests > Add**.

6   In the Transport-Request-to-Import queue, enter the following:

    <Transport_file_name>

    A `readme` file lists the SPI for SAP transport file names; you can find the `readme` file on the HPOM management server in the following location:

        %OvShareDir%\Packages\SAPTransports

7   Highlight the desired transport.

    ► If you do not select any transport, SAP assumes you want to select *all* transports in the list.

8   Select **Request > Import**. The Import Request dialog box opens.

9   Select the **Check [✓]** icon or use the **Enter** key to add transaction requests.

10 Enter the target client number (000 is the default client number).

    ► You must import the SPI for SAP user role into the client where you created the SAP user "ITOUSER". For more information, see Setting Up an SAP User for HPOM on page 32. The default client for the SPI for SAP user-role transport is 099.

11 Check items in the Option tab that are appropriate for your system.

12 Click the **Check [✓]** icon or press **Enter**.

Setting Up an SAP User for HPOM

You need to provide HPOM with an SAP log on so that SPI for SAP tools, monitors, or actions have access to SAP. For each SID where you want to allow automated logon of HPOM users, perform the following actions:

1   Log on to SAP.

2   Call the transaction: **SU01**.

3 Create a new user named ITOUSER, using the parameters specified in the following table.

User roles: SAP User Roles need to be defined from SAP version 4.6C onwards. Use transaction `SU01`, as shown in Figure 3. Note that ITOUSER requires authorizations to be able to execute SPI for SAP ABAP functions. Select the following user roles:

- `/HPOV/SAPSPI_MONITORING_TCODE`

  Enables the use of certain SAP transactions and does not place any restrictions on the SPI for SAP functionality.

- `/HPOV/SAPSPI_MONITORING_NO_TCD`

  The role does not contain any SAP transaction authorizations (NO_TCD) and restricts the SPI for SAP functionality by preventing the SAP user from starting SPI for SAP applications or operator-initiated actions. The SAP user can, however, still logon to SAP.

- `/HPOV/SAPSPI_SECURITY_MON`

  If you plan to use the `r3monsec` monitor to monitor SAP System security, you must also assign to ITOUSER (or the user under which `r3monsec` runs) the authorizations defined in /HPOV/ SAPSPI_SECURITY_MON, the SPI for SAP security user role.

User type: **`DIALOG`** - If you do *not* set the user type to DIALOG and do *not* define a corresponding password, the SAP GUI will *not* work and many of the operator-initiated actions and applications within HPOM will *not* be available. However, performance and event monitoring *do* work with the CPIC/SYSTEM user.

Initial password: Any SAP-admissible value except **`HPSAP_30`** - The password **`HPSAP_30`** is associated with the use of the `=default` value in the SPI for SAP's central configuration file `r3itosap.cfg`. If you intend to use the `=default` value, you cannot enter **`HPSAP_30`** now as you will need it when you first log in to SAP (as ITOUSER) after completing setup, and SAP prompts you to set ITOUSER's password.

Since user-role transports are client-dependent, you must create the SAP user `ITOUSER` in the same SAP client as the import client of the SPI for SAP user-role transport. If you do not, it is not possible to assign user role `/HPOV/SAPSPI_MONITORING*` to the newly created `ITOUSER`.

4 Activate the profile and assign it to the SAP user `ITOUSER`, which you have already created.

While assigning SPI for SAP roles, it is important to verify that all required authorization objects are active and the user comparison completes successfully. SAP uses the color green to indicate that user authorization objects are active or that user comparisons complete successfully; the color red indicates that you need to activate user authorization objects or complete a user comparison.

5   Log on to SAP as the user `ITOUSER`.

6   SAP prompts you to change the password, which you initially defined for `ITOUSER`. If you do not need to define your own SAP user logins and intend to make use of the `=default` value in the SPI for SAP's central monitor-configuration file `r3itosap.cfg`, enter the following new password: **HPSAP_30**.

Figure 3   SAP User Roles for ITOUSER
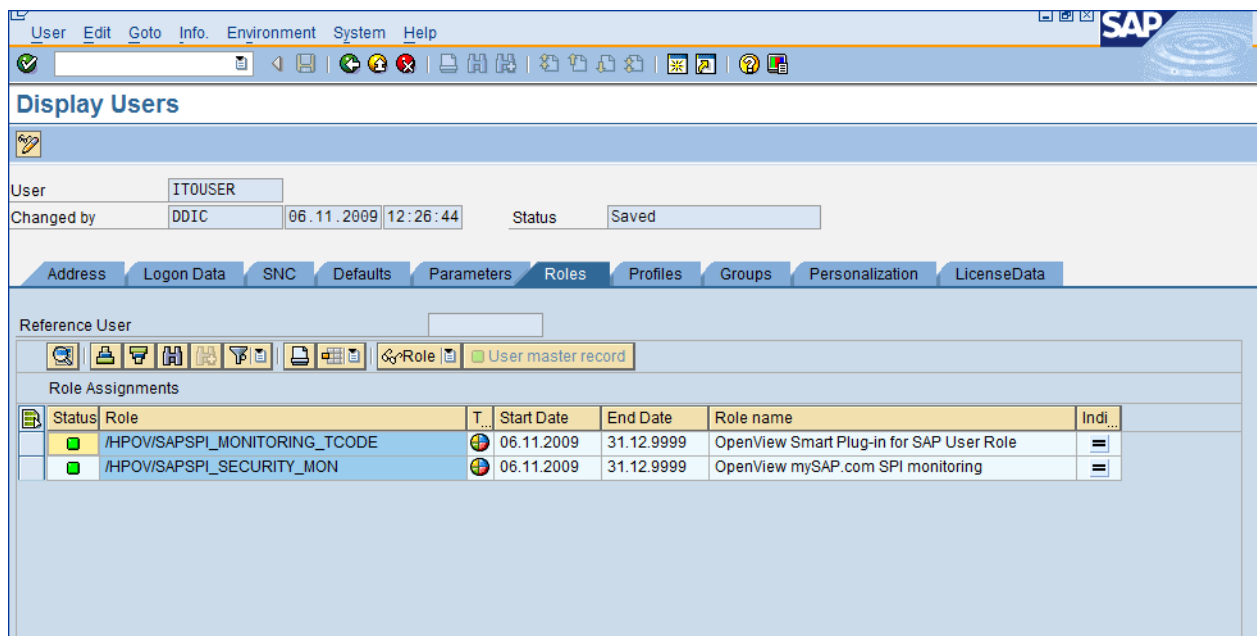
Setting Up Configuration Values for the SPI for SAP Monitors

To conclude the SAP-specific tasks, you have to set up initial configuration values in monitor-specific configuration files for each of the Smart Plug-in for SAP monitors *before* you deploy the configuration files to the managed nodes. The Smart Plug-in for SAP includes the monitors listed in Table 6 below.

Table 6   Smart Plug-in for SAP Monitors

Monitor Name	Description
r3monaco	Alert collector for TemSe calls
r3monale	ALE monitor
r3monal	CCMS monitor
r3monchg	System change monitor
r3moncts	Correction and Transport system monitor

Table 6   Smart Plug-in for SAP Monitors (cont'd)

Monitor Name	Description
r3mondev	Trace monitor of the SAP logfile: *<SID>/<INSTANCE>*/work/dev*
r3mondmp	ABAP/4 Dump monitor
r3mondisp	ABAP/4 Dispatcher monitor
r3monjob	Job monitor
r3monlck	Lock check monitor
r3monoms [a]	Operation mode switch monitor
r3monpro	Operating system process monitor
r3monrfc	SAP RFC destination monitor
r3monsec	Security monitor
r3monspl	Spool monitor
r3montra	Transport monitor
r3monupd	Update monitor
r3monusr	User monitor
r3monwpa	Work-process availability monitor
r3status	SAP status monitor

a.   Due to changes in SAP, the operation-mode monitor r3monoms is not supported with SAP Netweaver 04/WebAS 07.

The Smart Plug-in for SAP also includes two sets of configuration and distribution tools as follows:

Global   tools which apply to *all* managed nodes

Local   tools which apply only to a *specified* managed node

For more information about (and instructions for) configuring monitors see the *SPI for SAP Online Help*.

Modifying Configuration-File Policies

In this step, you use the configuration-file policy editor and the default policy templates to create your own global configuration-file policies for each of the SPI for SAP monitors, which run on the SAP servers you want to monitor with the SPI for SAP. HPOM keeps track of the

changes you make by saving the modified policy with an numeric suffix that increments with each new version of the policy; if the default policy version number is 11.0, the new version you save will be 11.10.

➤ The SPI for SAP provides a default configuration-file policy for each configuration file. Although you can use the default configuration for initial deployment, you will need to modify the configuration to suit the needs of your SAP environment.

To modify a configuration-file policy for the SPI for SAP monitors, follow these steps:

1 In the HPOM console, browse to the following directory:

   Policy Management > Policy Group > Agent policies grouped by type

2 In the details pane, double click the configuration-file policy corresponding to the SPI for SAP monitor that you want to modify, for example: `r3mondmp`. The configuration-file policy for `r3mondmp`, the ABAP Dump monitor, appears in the configuration-file policy editor.

   ➤ The filename `r3mondmp.cfg` is used here only as an example. If you want to modify the default configuration files, edit the global configuration file which corresponds to each of the Smart Plug-in for SAP monitors you want to deploy to (and run on) the SAP managed nodes.

3 Scroll down through the configuration-file policy and make the appropriate modifications for your environment.

4 Click **Save** to confirm the changes to your configuration-file policy and exit the editor. The new version of the configuration-file policy for the SPI for SAP monitor appears in the list of policies in the details pane.

   ➤ If you use HPOM tools to edit a configuration file which uses the `r3moncol` structure, the SPI for SAP automatically validates the contents of the file when you attempt to save it and will not allow you to save a file that contains a configuration error. For more information about the validation tool and the error messages it generates, see the *SPI for SAP Online Help*.

   If the SPI for SAP finds an error in the modified configuration file, it displays a message indicating what the problem is. For example, if you misspell the keyword TraceLevel when attempting to set the trace level (info, all, debug) in a monitor configuration file, you see the following (or similar) message when trying to save the modified file: "`TraceLeevel is an unknown keyword`", as illustrated in Figure 4 on page 37. You will have to locate and fix the problem before trying to save the file again. When the SPI for SAP is sure that the modified file is valid, it saves the file and increments the file version number, too.

5 Deploy the newly created configuration-file policies to the SAP managed nodes as described in Deploying SPI for SAP Policies to Managed Nodes on page 43.

Figure 4   Configuration-File Parsing Error
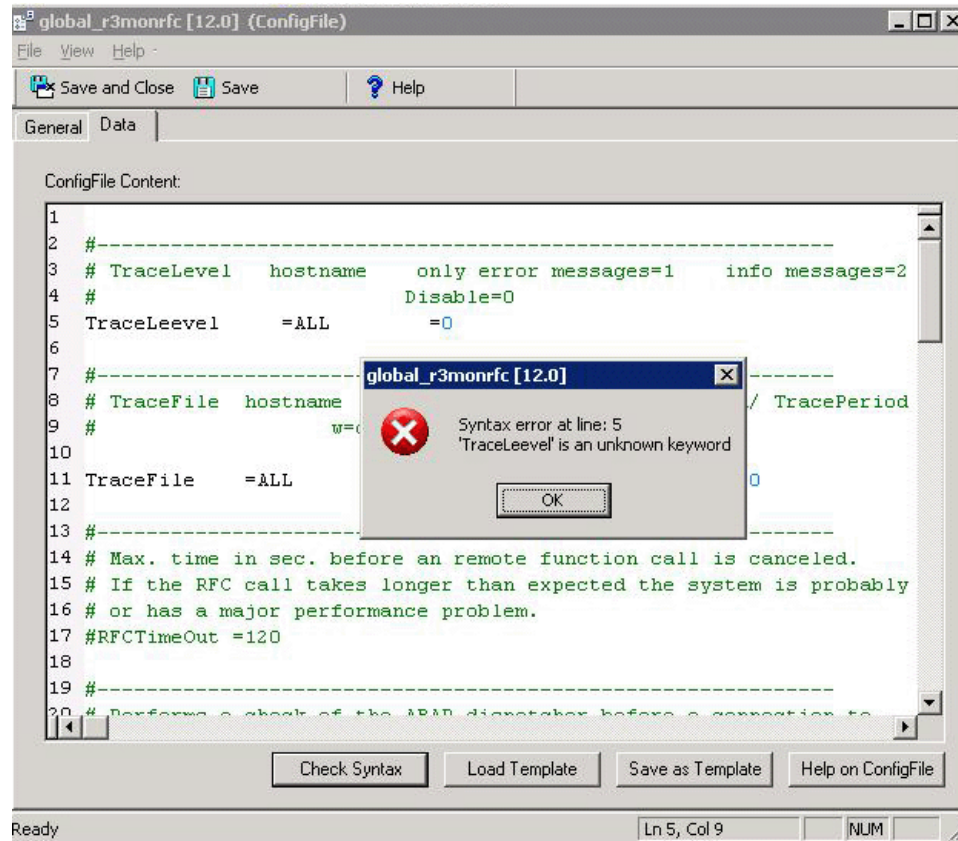
4 Configuring HPOM Administration Tasks

In this phase of the SPI for SAP configuration, you use the HPOM console to integrate the SPI for SAP with HPOM and bring all the SAP servers that you want to monitor under HPOM management.

▶ The tasks in this section assume that the SAP systems you want to monitor with the SPI for SAP are *already* HPOM managed nodes. If this is not the case, see the HPOM on-line help for instructions that explain how to add managed nodes to HPOM.

Specifying SAP Systems to Monitor

This section describes how to use the configuration-file policy editor to define which SAP Systems you want to monitor with the SPI for SAP. You must use the `r3itosap.cfg` configuration file to define the SAP Systems to monitor with the SPI for SAP.

To specify the SAP systems to monitor, follow these steps:

1 In the HPOM console, browse to the following directory:

   Policy management > Policy groups > SPI for SAP

   ▶ You must set up SAP users for each SAP client so that the users have permission to display and maintain CCMS. The list of SAP clients you made in Before You Begin on page 16 includes the information you need for each configuration line. For more information about how to set up SAP users for HPOM, see Setting Up an SAP User for HPOM on page 32.

2 In the HPOM console, locate and double-click the `global_r3itosap` policy template. The configuration-file policy editor displays the selected file as illustrated in Figure 5 on page 40.

3 Using the format of the examples in the `r3itosap.cfg` configuration file, add a `HostSapAssign` entry for each SAP instance, which you want to monitor with the SPI for SAP. When adding entries to `r3itosap.cfg`, bear in mind the following important points:

   • The language specified in each `HostSapAssign` entry determines the language the SPI for SAP monitors use when logging in to SAP and must be one of the languages currently supported by the SPI for SAP transports, for example: =EN (English) or =JA (Japanese). The language you specify here does not affect or determine the language used when starting the SAP GUI.

   • `r3status`, the tool the SPI for SAP uses to monitor the status of SAP Systems, does not attempt to verify or validate the existence of the SAP Systems specified in `r3itosap.cfg`. If `r3status` cannot find a named SID, for example: because of a spelling mistake, it reports the SID as unavailable.

- In the central, SPI for SAP, monitor-configuration file `r3itosap.cfg`, the string `=default` is associated with the default ITOUSER password "HPSAP_30". If you intend to make use of your own SAP user logins, you need to replace `=default` with the appropriate user password. As long as you use the HPOM policy editor to edit the `r3itosap.cfg` file, the password is encrypted automatically when you save the file. By default, the SPI for SAP resolves the name of the managed nodes that generate messages as the host name defined in the SAP variable, SAPLOCALHOST.

Figure 5   Editing the r3itosap.cfg File
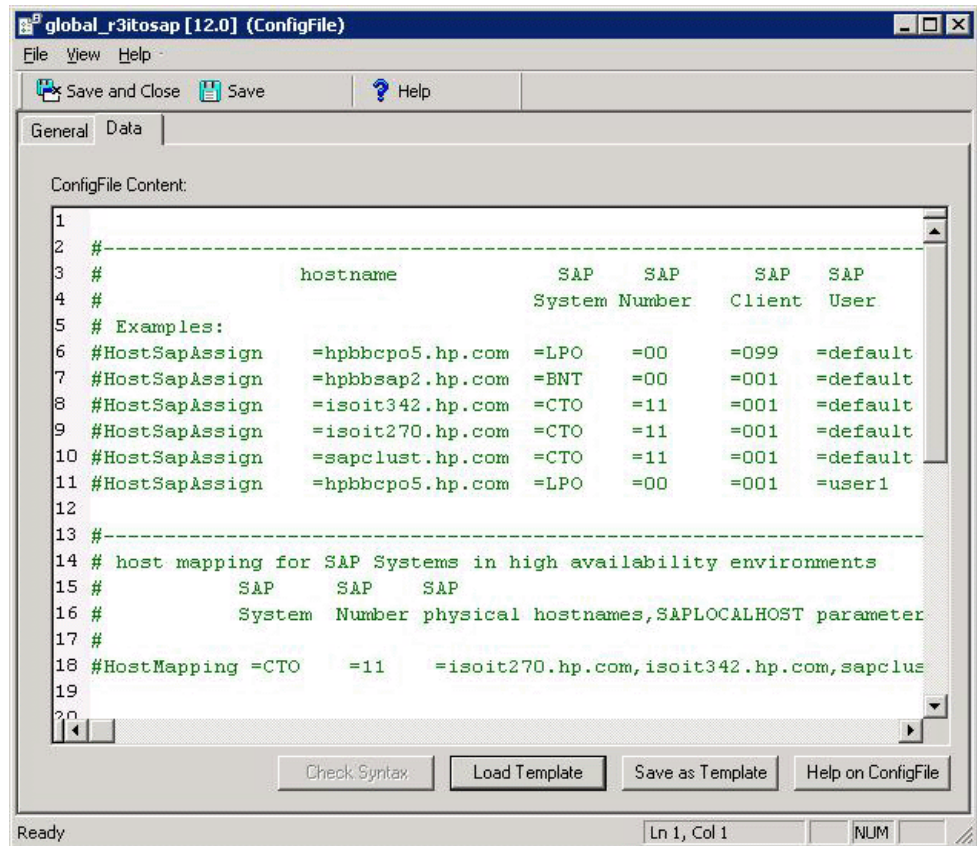
4   If the hosts you add to the `r3itosap.cfg` file are configured in a high-availability cluster, you need to add an extra entry to the host-mapping section of the `r3itosap.cfg` file: the information in the host-mapping section maps the names of the physical nodes in the high-availability cluster to the name of the node defined in the SAP variable, SAPLOCALHOST and, in addition, to the host name you want to associate with any messages from the cluster when they appear in the HPOM console or the Service Map.

The host names specified in the `r3itosap.cfg` file *must* be known to HPOM and be resolvable. Whether you choose to use long or short host names depends on how you have set up name resolution in your network.

The cluster host-names appear in the `HostMapping` entry in the form of a comma-separated list. The last item in the `HostMapping` entry defines the name of the host with which you want to associate any messages that are generated by nodes in the high-availability cluster. For example:

```
=ClusterHostA,ClusterHostB,SAPLOCALHOST =<HPOM_Msg_Node>
```

▶ Short host names are not allowed in the host-mapping section of the
`r3itosap.cfg` file. Make sure you use fully qualified host names for all the host
names you specify in the host-mapping section of the `r3itosap.cfg` file.

The example below shows the entry you would add to the host-mapping section of the
`r3itosap.cfg` file if you want to use the SPI for SAP to monitor a high-availability
cluster in which the names of the two physical nodes are `True` and `False`, the SAP
variable `SAPLOCALHOST` is defined as `maybe`, and the name of the host with which to
associate messages from the cluster is `example`.

Example: Mapping SAP hosts in a cluster

```
# cluster host mapping
HostMapping =EP7 =78 =true.com,false.com,maybe.com =example.com
```

In a high-availability cluster, the name of the host with which you associate HPOM
messages (*<HPOM_Msg_Node>* in the example above) is usually (but does not *have* to be)
the same as the host defined in `SAPLOCALHOST`. Whether `SAPLOCALHOST` is (or is not) the
same as *<HPOM_Msg_Node>* has an impact on what you need to include in the
host-mapping section, as follows:

- If `SAPLOCALHOST` and *<HPOM_Msg_Node>* are the same host:

  No entry for `SAPLOCALHOST` is required in the list of physical cluster nodes, for
  example:

  `=ClusterHostA,ClusterHostB =<HPOM_Msg_Node>`

- If `SAPLOCALHOST` and *<HPOM_Msg_Node>* are *not* the same host:

  You need to add an entry for `SAPLOCALHOST` at the end of the list of physical cluster
  nodes, for example;

  `=ClusterHostA,ClusterHostB,SAPLOCALHOST =<HPOM_Msg_Node>`

▶ All physical nodes in the high-availability cluster must appear in the HPOM
console. You also need to add to the HPOM console as node type `Other` (Message
only) the host which you define in *<HPOM_Msg_Node>* in the example above. For
more information about setting up the SPI for SAP in a high-availability
environment, see Configuring the SPI for SAP in a Cluster Environment on
page 66.

To ensure that automatic or operator-initiated actions are always able to open an SAP
GUI on the node where the SAP instance is running in the high-availability cluster, you
need to add a `HostSapAssign` entry to the `r3itosap.cfg` file, which specifies the
cluster-host name defined in the variable *<HPOM_Msg_Node>*.

See also Host Mapping on Cluster Nodes on page 67 for information about how to avoid
problems with HP Operations agent settings for host names and IP addresses overriding
settings defined in the host-mapping section of the SPI for SAP's central configuration
file, `r3itosap.cfg`, which could cause the wrong host name to appear in messages
originating from the cluster.

5 Save your changes and exit the policy editor. When saving the policy, we recommend you
use the configuration-file policy-type naming conventions, for example:
`global_r3itosap`.

6 Deploy the `r3itosap.cfg` policy to the managed nodes you want to monitor with the SPI
for SAP. Right-click the `r3itosap.cfg` policy you modified and use the following menu
option:

All Tasks > Deploy on...

The information in the `r3itosap.cfg` policy is used by the service auto-discovery policy, `r3sdisc`, to generate a service view of your SAP landscape. If you intend to use the service-views feature, make sure that you deploy the `r3itosap.cfg` policy to the managed node(s) for which you want to generate service views before you run the service auto-discovery.

The Host mapping entry in the r3itosap.cfg file should have the host name details as:

HostMapping <SID> =<NR> =<system_name>.true.hp.com =<system_name>.hp.com

where,

SID - system ID for the server

NR - the NR number of the server

For more information about running service discovery and setting up service views, see the *HP Operations Smart Plug-in for SAP Online Help*.

Configuring the SPI for SAP Monitors

The SPI for SAP monitors that you deploy to the SAP servers that are managed by HPOM require information about what to monitor and how. The monitors obtain this information from default configuration files, which are installed by the SPI for SAP. Each of the SPI for SAP monitors has its *own* default configuration file.

In this step, you use the configuration-file policy editor to edit global configuration files (from the default files) for *each* of the SPI for SAP monitors which runs on the SAP servers. After you have edited the configuration files, you deploy them to the SAP servers using the standard HPOM policy-deployment mechanism.

To modify an existing configuration-file policy for the SPI for SAP monitors, follow these steps:

1   In the HPOM console tree, browse to the following directory:

  Policy Management > Policy Groups > SPI for SAP

2   In the details pane, locate and double-click the configuration file associated with the monitor you want to configure, for example; the `global_r3mondmp` file. The configuration-file policy editor displays the selected file as illustrated in Figure 5 on page 40.

  ▶   The `r3itosap.cfg` file shown in Figure 5 on page 40 is not associated with any one, particular monitor; it is the SPI for SAP's central configuration file, which all the other monitors use to login to the SAP Systems you want to manage. This is the *only global* configuration file that *must* be edited.

3   Although all other *global* configuration files can be used in their default state, they generate a large number of messages, some of which you might not at first need. If you want to modify a configuration file, for example to ensure you only receive the messages you *do* need, scroll down to the end of the Configuration File content box, where you will find the alert definitions and can make any changes as required. For more information about the contents and syntax of the SPI for SAP monitors, see the *SPI for SAP Online Help*.

4   Save your policy and exit the configuration-file policy editor. The modified configuration-file policy for the SPI for SAP `r3mondmp` monitor appears in the list of policies in the details pane.

> ▶ If you use HPOM tools to edit a configuration file which uses the `r3moncol` structure, the SPI for SAP automatically validates the contents of the file when you attempt to save it and will not allow you to save a file that contains a configuration error. For more information about the validation tool and the error messages it generates, see the *HP Operations Smart Plug-ins SPI for SAP Online Help.*

5   Deploy the modified configuration-file policies to the SAP managed nodes.

Deploying SPI for SAP Policies to Managed Nodes

The SPI for SAP policies are organized into default groups, all of which are part of the policy group SPI for SAP. The SPI for SAP policy groups are:

- SAP R3 6.xCI
- SAP R3 6.x/7.0AS/7.1kernel
- SAP R3 7.0CI/7.1kernel
- SAP NW Java Monitoring 7.0
- SAP NW Java Monitoring 7.1

You can assign only *one* policy group to a managed node. Which policy group you assign is determined by the software and software version running on the managed node and whether the node is a central instance or an application server.

> ▶ Remember to deploy an alert monitor's configuration-file policy before deploying the corresponding alert monitor itself. The alert monitors read these configuration files on startup. For example, you need to deploy the `r3moncts` configuration-file policy before you deploy the corresponding alert monitor, `r3moncts`. For more information, see Configuring the SPI for SAP Monitors on page 42.

The SPI for SAP default policy groups contain all the SAP monitors supplied with the Smart Plug-in for SAP. Deploying a policy group automatically activates the monitors, which the group contains. In addition, since all SPI for SAP policies belong to the Category "SPI for SAP Instrumentation", when you deploy a SPI for SAP policy or policy group, the policy-deployment operation triggers the deployment of the required SPI for SAP instrumentation. The SPI for SAP instrumentation package contains the actions, commands, and monitors, which the SPI for SAP requires to ensure features and functionality work as expected.

To Avoid Receiving Unnecessary or Unwanted Messages, follow these steps:

1   Make copies of the default policy groups and modify the *copies* to create your own policy groups containing only those monitors and policies you need.

2   Tune the policies and monitors to suit the requirements of your environment before deploying them to the nodes you want to manage with the Smart Plug-in for SAP. This will help prevent additional unwanted messages.

Create Policy Groups

As HPOM administrator, make your own policy group as illustrated in Figure 6 on page 45. You should then remove those policies and monitors you *do not* need from the new policy group, as follows:

1   Expand the **Policy Groups** item and select and expand SPI for SAP to display all the default policy groups for the Smart Plug-in for SAP.

2   Create a new policy group by selecting and right-clicking SPI for SAP and selecting the following menu:

   New > Policy Group

3   Enter a name for the new policy group in the fields provided, and then click **OK**.

4   In the left pane, select the existing policy group from which you want to copy policies and, in the details pane, drag the policies you want to place in the new policy group over and drop them on to the policy group you have just created.

Deploy Policy Groups

The policies and policy groups you deploy depends on which SAP version is installed on the managed nodes and whether the nodes host a central instance or an application server.

1   In the console tree, select and right click the new policy group or groups you have created (containing the monitors you need) and use the following menu option:

   All Tasks > Deploy on...

2   Use the Deploy Policies on... window to select the managed nodes to which you want to deploy the new policy group.

3   Click **OK** to finish deploying policies.

▶   You can use this opportunity to deploy any other policies not present in the SAP -specific policy groups.

4   To check that the policies deployed successfully, right click a managed node and selecting the following menu option from the drop-down menu that appears:

   View > Policy Inventory

▶   Some of the monitors may require SAP configuration. See Configuring HPOM Administration Tasks on page 39 for additional information on SAP-Specific tasks.

Figure 6   Removing Policies from a Policy Group
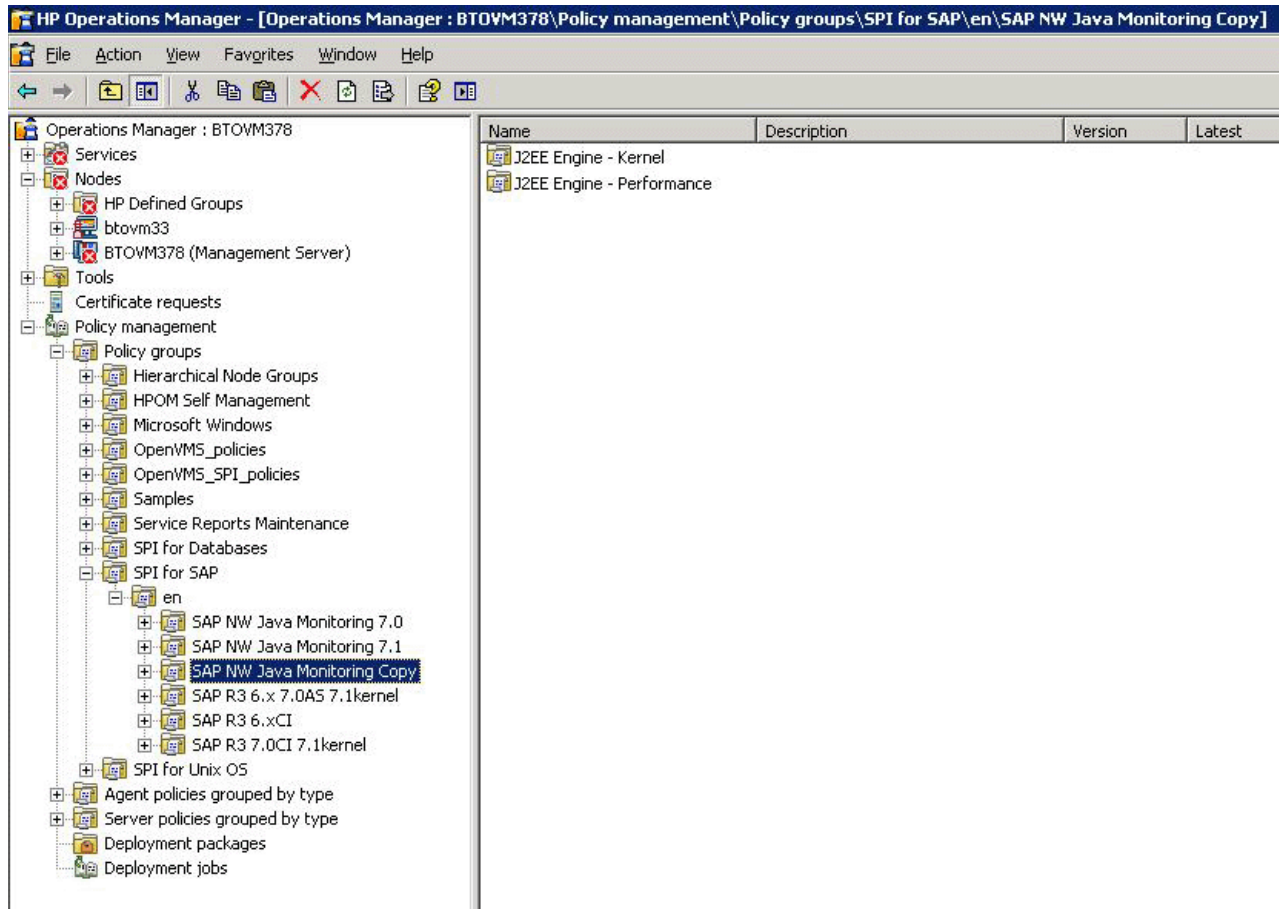
You can configure the HP Operations agent to use a non-privileged user on Windows nodes. For more information, refer to Using a Non-Privileged Windows User with the SPI for SAP on page 119.

5 Using SPI for SAP Tools

The `Tool Bank` window displays the tools which you can use to manage your SAP NetWeaver environment. You can do the following:

- Start tools
- Broadcast commands on selected nodes

SPI for SAP Tool Groups

The Tool Bank window represents a group of tools. You can click a group to open a second-level desktop containing the tools of the group. The following tool groups are added to the Tool Bank under the SPI for SAP group when the SPI for SAP is installed:

- SAP R/3 Admin
- SAP R/3 NT
- SAP R/3 UN*X

The SAP R/3 Admin Tool Group

The `SAP R/3 Admin` tool group includes tools for editing and distributing files for global configuration, as well as other administrative functions such as moving the SAP transport to the SAP transport directories on managed nodes.

The following table lists the tools which appear in the `SAP R/3 Admin` tool group and describes briefly what each of the tools does.
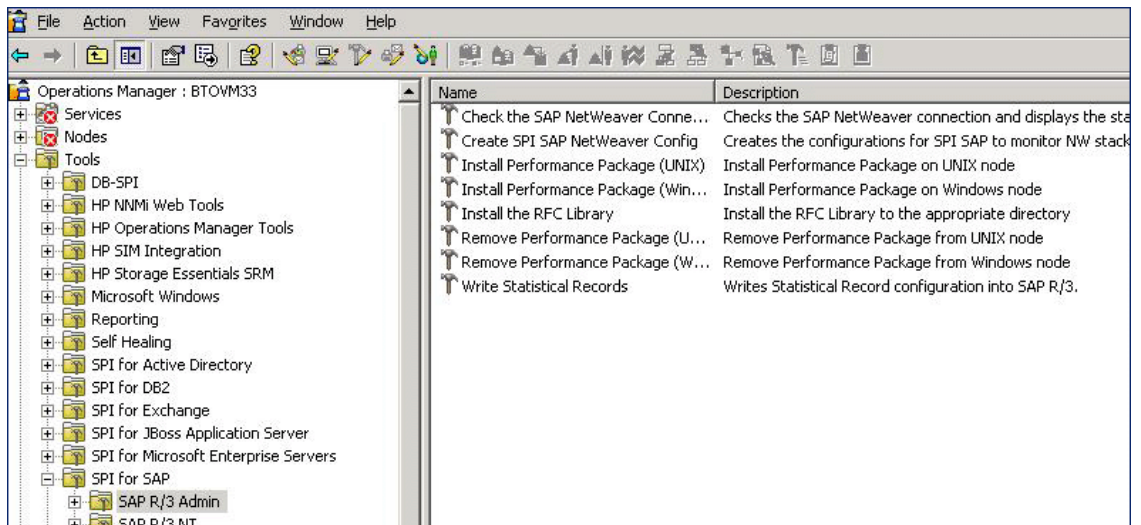
Table 1   SAP R/3 Admin Tools

Tools	Description
Check the SAP NetWeaver Connection	Checks if a successful connection was established between the SPI for SAP and the SAP NetWeaver Web Application Server
Create SPI SAP NetWeaver Config	Helps you configure the monitoring environment for the SAP NetWeaver Web Application Server (J2EE)
Install Performance Package (UNIX)	Installs Performance package on the UNIX nodes
Install Performance Package (Windows)	Installs performance package on the Windows nodes
Install the RFC Library	Installs the downloaded RFC libraries into appropriate directories on the management server
Remove Performance Package (UNIX)	Removes performance package on the UNIX nodes
Remove Performance Package (Windows)	Removes performance package on the Windows nodes
Write Statistical Records	Write statistical records in SAP

For more information about editing and distributing monitor configurations, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

The SAP R/3 UN*X and SAP R/3 NT Tool Groups

These two groups include tools that provide direct, context-sensitive startup of the SAP front-end on UNIX and Microsoft Windows platforms respectively. For instance, if you receive a performance alert, you can click the Performance icon and open the SAP performance analysis tool.

In addition, the SAP R/3 UN*X group includes a number of tools that involve interactive actions with terminal output, for example: Check R/3 Database, Status R/3 Config, or Version Verify. These tools are not supported on the Microsoft Windows platform.

Before you select a tool from one of these groups, you must select the managed node on which you want the tool to run. Make sure that you select the tool from the tool group that corresponds to the managed node's platform, for example: UNIX or Microsoft Windows.

The following table lists the tools which appear in the SAP R/3 UN*X and SAP R/3 NT Tool group and describes briefly what each of the tools does.

Table 2   SPI for SAP Tools that Call SAP Transactions

Tool	Description	SAP Trans-action code
Control Panel	CCMS control panel	RZ03
DB Performance	Shows database performance through tables and indexes.	DB02
Gateway	Gateway monitor	SMGW
Job Maintain	Define background jobs	SM36
Job Overview	Status of background jobs	SMX
Job Performance	Job performance	SM39
Maintain Thresholds	Maintenance thresholds	RZ06
Operation Modes	Maintain operation modes	RZ04
Operation Sets	Maintain operation sets	SM63
Performance	Workload analysis	ST03
Process	Process overview	SM50
Profile Maintain	Profile maintain	RZ10
Servers	Server overview	SM51
Syslog	System log, local analysis	SM21
Users	User overview	AL08

Launching Tools

To launch a tool, follow these steps:

1   At the HPOM console, select **Tools** → **SPI for SAP** → ***<Tools>***.

2   In the details pane, right-click on the tool you want to launch and select **All Tasks** → **Launch Tool**. The **Select where to launch this tool** dialog box opens.

3   In the dialog box, select the check box next to every node you want to configure and click the **Launch...** button.

6 Using and Customizing the SPI for SAP Policies

The SPI for SAP policies help you monitor the SAP Application servers. You can customize these policies depending on the requirements of your IT environment. This chapter includes general guidelines about the SPI for SAP policies and explains how you can customize them. For more information see the Policies section in the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

SPI for SAP Policy Group and Types

You can customize the SPI for SAP policies to suit the needs of your IT environment. However, you can use these policies without any modifications.

SPI for SAP Policy Groups

The SPI for SAP policies are organized under the SPI for SAP policy group.

The SPI for SAP contains the following policy groups:

SAP NW Java Monitoring 7.0 - This group monitors the health of the J2EE engine of the SAP NetWeaver Web Application Server. With the help of a series of policies, you can collect metrics indicating the health, availability, and performance of the J2EE engine of an SAP NetWeaver Web Application Server.

SAP NW Java Monitoring 7.1 - This group monitors the health of the J2EE engine of the SAP NetWeaver Web Application Server. With the help of a series of policies, you can collect metrics indicating the health, availability, and performance of the J2EE engine of an SAP NetWeaver Web Application Server.

SAP R3 6.x/7.0AS/7.1kernel - This group contains the policies for monitoring the availability and health of the Web Application server ABAP on the application server of the SAP versions 6.40, 7.0, and 7.1. This includes metrics related to trace files, dispatcher, and work processes.

SAP R3 6.xCI - This group contains the policies for monitoring the health and availability of the Web Application server ABAP for the Central instance of the SAP version 6.40. It includes metrics related to Idocs, CTS, ABAP dumps, locks, jobs, rfc destinations, spool, security, update, users, work processes.

SAP R3 7.0CI/7.1kernel - This group contains the policies for monitoring the health and availability of the Web Application server ABAP for the central instance of the SAP versions 7.0 and 7.1. It includes metrics related to Idocs, CTS, ABAP dumps, locks, jobs, rfc destinations, spool, security, update, users, and work processes.

SPI for SAP Policy Types

The SPI for SAP policies are of two types:

- *Measurement Threshold* policies pertain only to individual metrics
- *Scheduled Task* policies pertain to all metrics collected in a specific interval

Measurement Threshold and Scheduled Task Policies

Measurement threshold policies define how the collected data is interpreted for the individual metric. The rules it contains pertain to threshold values and actions that occur when those values are met or exceeded. In general an exceeded threshold generates alerts/messages in the HPOM message browser. In HPOM, you can change the threshold within a measurement threshold policy by double-clicking the policy and selecting the **Threshold levels** tabbed page.

Scheduled Task policies define what metrics are collected in the specified collection interval. You can see how this works by double-clicking a Scheduled Task policy. On the policy's Task tabbed page a list of targeted metrics appear in the Command text box.

Incoming values for metric SPISAP_0231 are compared against its threshold limits. In the following illustration, the threshold limit is set to 500.
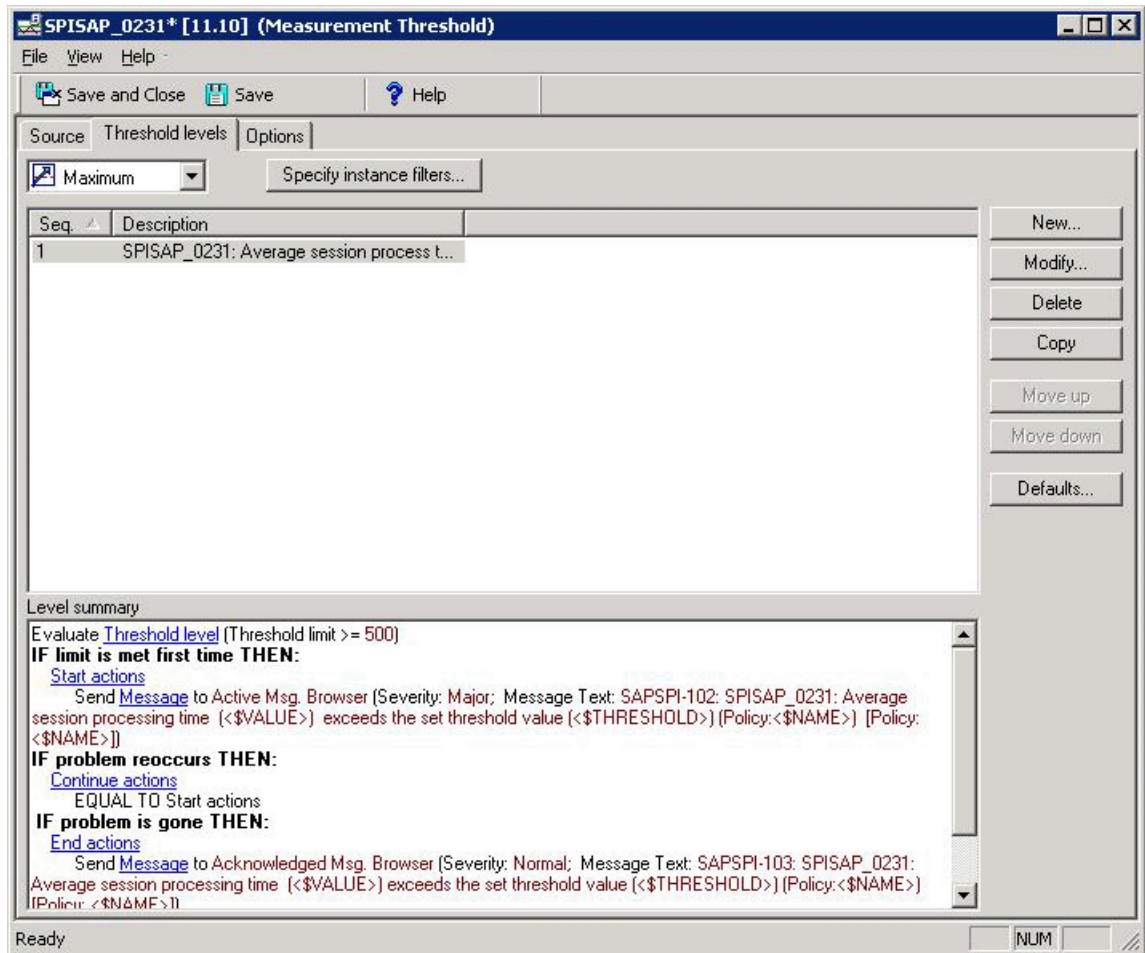
Monitor policies define all metrics for the SPI for SAP application that are scheduled for collection at specified interval. Within the name of each monitor policy is its collection interval (for example, SPISAP-71-High_1h, where collection interval is one hour). When you open any monitor policy, you can see all metrics listed as number and collected within the interval following the -m option.

Basic Policy Customizations

This section covers basic policy customizations like changing threshold values, scheduling or deleting a metric from data collection, opening a metric policy or collector policy, and so on.

Before you begin to customize any of the policies, you must make copies of the original policies so that the default policies remain intact.

Modifying Metric Policies

You can modify the metric attributes for all monitored instances of SPI for SAP.

Threshold Level and Actions

To modify the threshold level and actions, follow these steps:

1 From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for SAP**.

2 Select the appropriate policies.

3 Double-click the policy for which you want to change the threshold value. The policy window opens.

4 Select the **Threshold levels** tab.

5 From the Level summary pane, click **Threshold level**. The Threshold Level window opens.
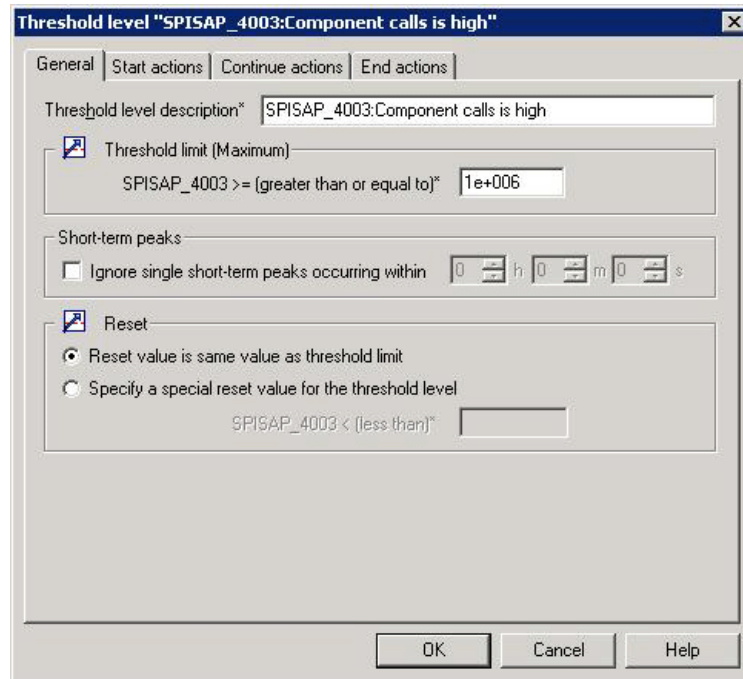
You can modify the metric attributes from this window.

In the above figure, the threshold limit is set to 1e+006. An alert message is raised with the severity when the threshold limit exceeds 1e+006.

The following metric attributes can be modified:

• **Threshold limit**: The value that triggers a message if it is met or crossed.

• **Short-term peaks**: A 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 0 or the box is left empty, an alarm is generated as soon as HPOM detects that the threshold has been equaled or crossed.

• **Reset**: A limit below which the monitored value must drop (or exceed, for minimum thresholds) to return the status of the monitored object to normal.

As the following illustration shows, the Threshold Level window has three action tabs. You can click any of the action tabs to set the related action.
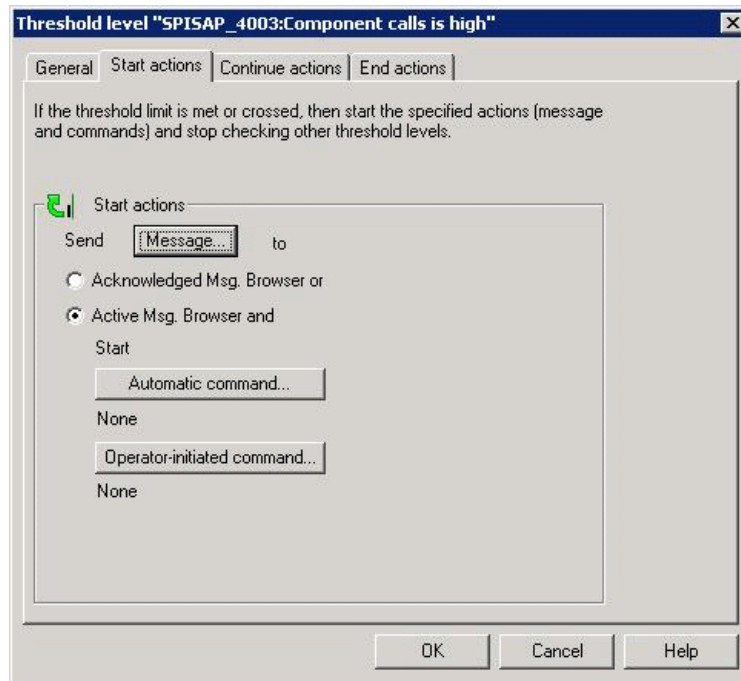
- **Start actions**: Actions carried out the first time that the threshold is crossed.

- **Continue actions**: Actions carried out at each subsequent polling interval if the reset value is not reached.

- **End actions**: Actions carried out after the threshold crosses the reset value.

In each of the actions tabs, you can set the type of actions to perform.

The SPI for SAP lets you generate Performance Manager graphs or Reports, or to add custom programs. You can generate the reports and graphs through:

- **Automatic command**. A command run when the rule is matched. The automatic command delivered with the SPI for SAP generates a snapshot annotations report that shows the data values at the time the action was triggered from an exceeded threshold. You can view the report in the message annotations.

- **Operator-initiated command**. A command attached to the message that the rule sends to the message browser. You can run this command from the message browser. The operator-initiated command delivered with the SPI for SAP lets you click the Perform Action button to view a graph of the metric whose exceeded threshold generated the message, along with other related metric values.

Message Severity

To modify the message and severity of a policy, follow these steps:

1   From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for SAP** → **en**.

2   Double-click the policy you want to modify the severity and message text. The Measurement Threshold window opens.

3   From the Level summary pane, click **Threshold level.** The Threshold Level window opens.

4   Click the **Start Actions** tab and click **Message...** The Outgoing Message window opens.
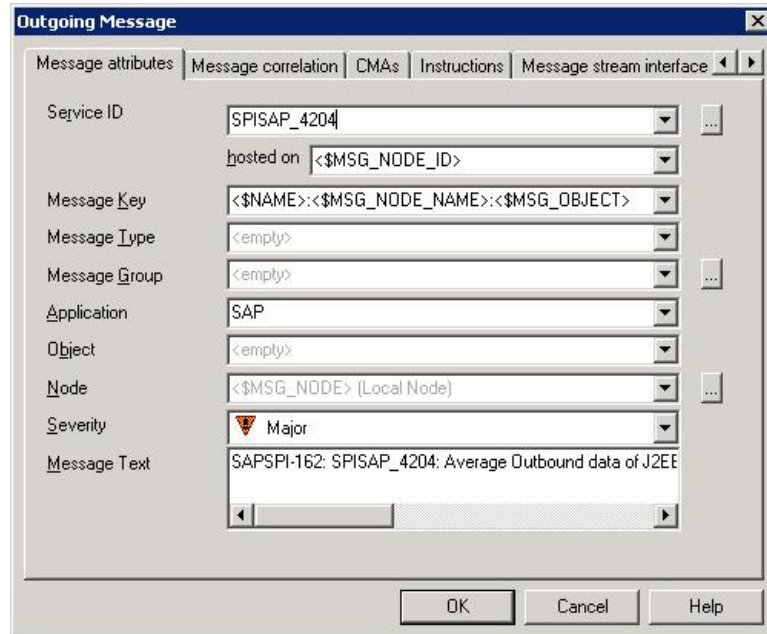
You can modify the following attributes:

Severity: Indicates the importance of the event that triggers this message.

Message Text: You can modify the text of the message but do not modify any of the parameters—beginning with $and surrounded by <> brackets—in a message.

5   Click **OK** to save the changes.

Advanced Policy Customization

Advanced policy customizations include making copies of default policy groups to customize a few settings and deleting whole groups of metrics within a policy's command line.

Creating New Policy Groups

You can separate the custom policies that you create from the original default policies by creating new policy groups. Before you create a new policy group you must first determine the metrics and policies you want to modify. To create a new policy group, follow these steps:

1 Create a new policy group:

   a In the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for SAP**.

   b Right-click the policy group you want to copy and select **Copy**. For example, right-click the Metrics policy group under SAP NW Java Monitoring 7.0 and select **Copy**.

   c Right-click the group under which this policy group is located and click **Paste**. For example, right-click SAP NW Java Monitoring 7.0 and click **Paste**.

   d Right-click the new group name and select **Rename**.

2 Right-click the original policies within the new policy group:

   a Double-click the new policy group to get the list of 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 Delete all the policies within the new policy group. To do this, select the policies and delete it.

Viewing Text-Based Reports

Some policies have actions defined with threshold violations or error conditions. These actions automatically generate reports. The reports are snapshots of data values collected from the server around the time that the alarm occurred.

▶   The reports discussed in this section are different from HP Reporter reports that show consolidated data generated as web pages in a management-ready presentation format. See

Automatic Command Reports

Many metrics generate Automatic Command Reports. These reports are generated as soon as an alarm is triggered in HPOM. Automatic Command reports are generated for a single SPI for SAP instance with the exceeded threshold.

When an Automatic Command report is executed from HPOM, the server is queried for additional data. If you set the HPOM console message browser to display the SUIAON column, you can see an "S" under the "A" column (see the following figure), which indicates that a generated report is available in the Annotations area of the Message Properties.

To view Automatic Command reports, do one of the following:

- Double-click a message in the HPOM message browser. The Message Properties window opens. Select the Annotations tab.

- Right-click a message and select Annotations. The Message Properties window opens.

The reports are available in the Message Properties window. These reports show data values of a single server. Column descriptions in the window provide further information.

Manually Generated Reports

Reports are generated for all SPI for SAP instances configured on the managed node. In contrast to Automatic Command reports that are generated for a single SPI for SAP instance, manually generated reports reflect the current state of all SPI for SAP instances on the managed node.

To generate a report manually, follow these steps:

1   From the HPOM console, select **Operations Manager** → **Tools** → **SPI for SAP** → **en**.

2   Double-click the report you want to see. The Select Where to Launch This Tool window opens.

3   Select the managed node for which you want to see reports and click **Launch**. The Tool Status window opens.

4   View the report in the tool output field.

5   Click **Close** to close the field.

7 The SPI for SAP in a High-Availability Environment

The information in this section helps you to understand the process of installing and configuring the SPI for SAP in a high-availability environment such as MC/ServiceGuard or Microsoft cluster. Although the information provided in this section concentrates on example configurations, the basic concepts are the same for any high-availability environment as far as the SPI for SAP is concerned.

➤ The information in this section explains how to set up the SPI for SAP to manage SAP on *managed nodes*, which are configured in a high-availability environment. If you want to set up the HPOM management server in a high-availability environment, see the HPOM documentation.

Cluster Configurations

The most typical implementations of high-availability software in SAP landscapes involve configuring the central-instance server and the database server in a cluster and installing either one *combined* high-availability package on the central-instance server, or alternatively, two *separate* high-availability packages on the central-instance server and the database server, respectively. Typically, application servers are not configured as part of the high-availability cluster. The two configurations which we describe in more detail in this section are as follows:

- **single-package configuration**

  In the single-package configuration, the SAP database and central instance are located on the *same* server and included in the same high-availability package. The combined package can be switched temporarily to the *secondary* node in the event of problems.

- **twin-package configuration**

  In the twin-package configuration, the SAP database and central instance are located on *different* servers. Either package can be switched temporarily to the alternative node in the event of a problem on the *primary (physical host 1)* or *secondary (physical host 2 or backup)* node.

The Single-Package Configuration

In the single package concept, the server where the database and central instance normally run is included in a cluster with another server, which will act as the *secondary* node in the event of a package switch. The *secondary* node can perform any one of the following roles:

- SAP application server
- SAP test or development system
- Stand-by

In Figure 1 on page 60, the application servers, which are not included in the cluster, reference the cluster package (❸) by means of its re-locatable IP address, not by reference to the fixed IP address of the node on which the cluster package is running. If a problem occurs, the central instance and database are taken down on the *primary or physical host 1* node (cluster node ❶), and then brought up again on the *secondary or physical host 2* node (cluster node ❷). At the same time, the shared disks are deactivated on the *primary* node and reactivated on the *secondary* node.

**Figure 1   The Single-Package Configuration**
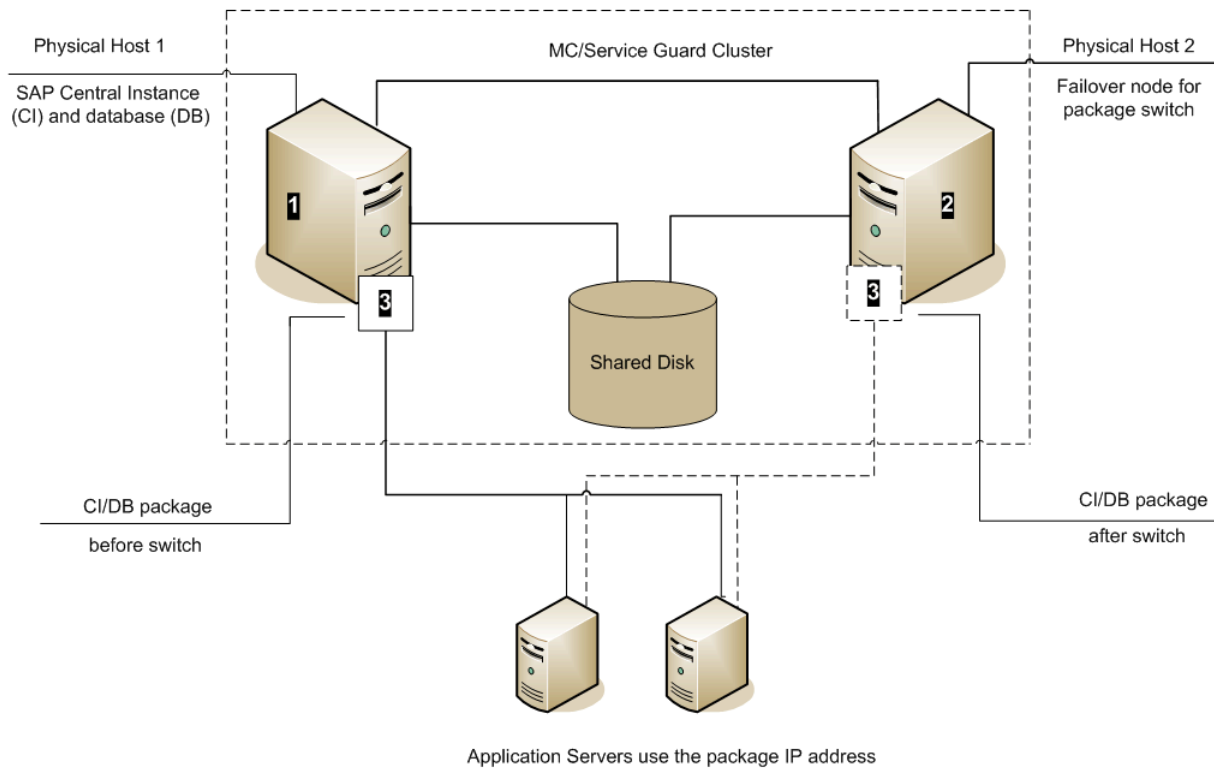
After the cluster software completes these actions, the application servers can reconnect to the central instance and database (❸ in Figure 1 on page 60) using the same relocatable IP address, which, as the name suggests, moves with the package.

The Twin-Package Configuration

In the twin-package configuration, the central instance and the database are installed on different servers, which for the sake of convenience we can call cluster nodes ❶ and ❷ respectively, as illustrated in Figure 2 on page 61. The central-instance server and the database server form a high-availability cluster, where each server can act as the *secondary* node for the other in the event of a package switch.

**Figure 2   The Twin-Package Configuration before a Package Switch**

Application Servers use the package IP address
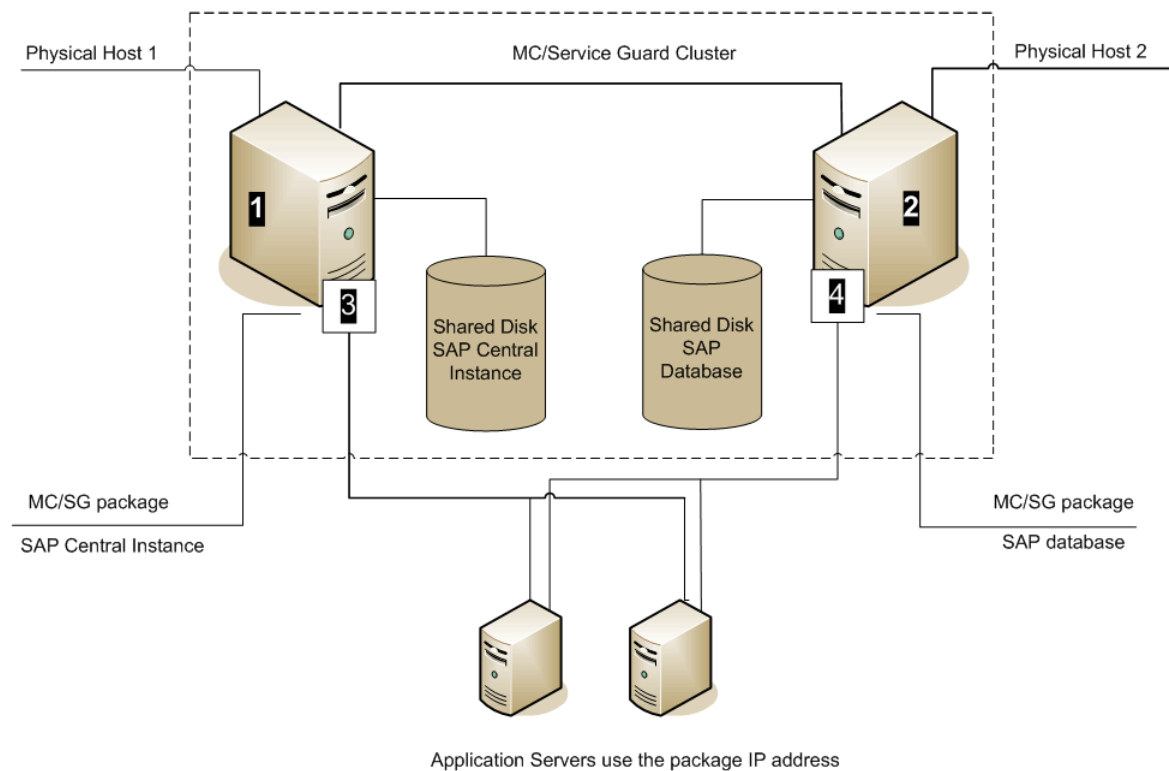
The application servers are not included in the cluster and, as illustrated in Figure 2 on page 61, reference each package by means of each package's own relocatable IP address—not the fixed IP addresses of cluster-nodes ❶ and ❷.

If a problem is identified on the central-instance server, the central instance (❸) is taken down on cluster node (❶), and then brought up again on the cluster node (❷). At the same time, the central instance shared disk is deactivated on the host node and reactivated on the *secondary* node.

Figure 3 on page 62 shows the situation *after* the switch of the SAP central- instance package (❸). As soon as the central-instance package is up and running on the cluster node (❷), the application servers can reconnect to the central instance using the same IP address as before the failover, namely; the central-instance package's relocatable IP address, which moves along with the package at the time the failover occurs.

Figure 3   The Twin-Package Configuration after a Package Switch
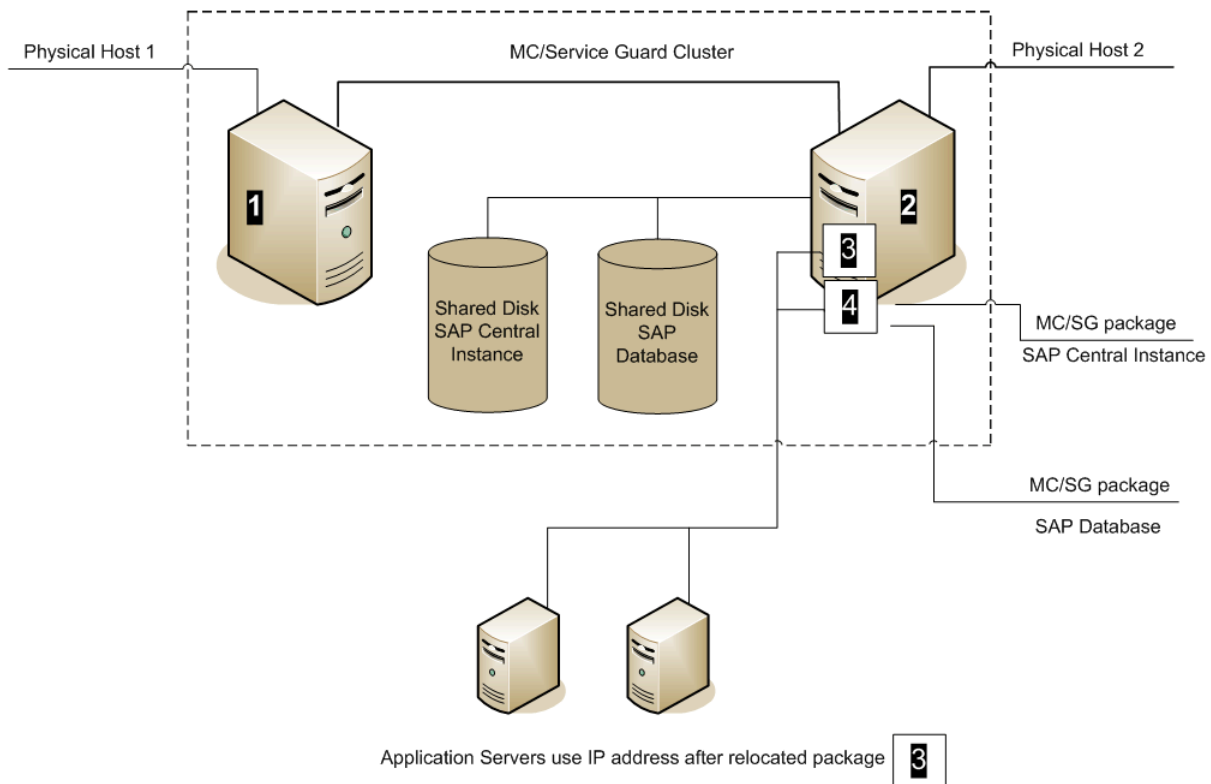
Pre-requisites

The information in this section is designed to help you install and configure the SPI for SAP in a high-availability environment: it is not intended to explain either how to set up the high-availability software or HPOM. Before you start the process of installing the SPI for SAP in a high-availability environment, please read through and consider the information included in the following sections:

- Software Requirements on page 62
- Configuration Requirements on page 63
- Service Reports and Performance Graphs on page 63
- Service Views on page 63

Software Requirements

The cluster software must already be correctly installed and configured in your SAP landscape, and the cluster should function correctly. For example, you have to decide whether to configure one package for the central instance and the Database Server or set up separate packages for each part. These decisions become important later in the configuration process.

Configuration Requirements

The SAP servers in the high-availability cluster must already be configured as HPOM managed nodes with the appropriate HPOM agent software and functionality installed and running.

➤ All physical nodes in the high-availability cluster must be added to the HPOM console. You also need to add to the HPOM console as node type "Other" (Message only) the host name which you define as the HPOM message host name in the host-mapping section of the `r3itosap.cfg` file. For more information, see Specifying SAP Systems to Monitor on page 39.

Service Reports and Performance Graphs

If you want to generate SPI for SAP service reports and performance graphs for all the nodes in the high-availability cluster, make sure that the following conditions are true:

- The appropriate performance-agent functionality (HP Software Embedded Performance Component or the HP Performance Agent) must be installed, configured, and available on all the nodes in the cluster.

- The appropriate SPI for SAP R/3 Performance Agent functionality must be installed, configured, and available on all the physical nodes in the high-availability cluster. For more information about installing and configuring the SPI for SAP R/3 Performance Agent, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

- Both HP Performance Manager and HP Reporter must be installed, correctly configured, and available on a machine that can see the nodes in the high-availability cluster. Note that these services are not usually (and do not need to be) part of the cluster itself.

Service Views

You can use tools provided by the SPI for SAP to generate Service Views automatically. If you want to make use of Service Views with the SPI for SAP, you need to set it up to see the services you want the SPI for SAP monitor in the SAP environment.

➤ The service-discovery process uses information stored in the `r3itosap.cfg` file to determine which SAP Systems are to be monitored. You need to ensure that you have entered in the Host Mapping section of the `r3itosap.cfg` file the names of the nodes in the high-availability cluster. For more information, see Configuring the SPI for SAP in a Cluster Environment on page 66.

Installing the SPI for SAP in a Cluster Environment

To use the SPI for SAP in a high-availability environment, you have to install the HPOM agent, the SPI for SAP instrumentation, and policies on *all* nodes in the cluster where the SAP package can run—this means, both the *primary* node and *secondary* node(s).

▶ It is always a good idea to make sure that the daily backup of the SAP environment is correctly set up and that there is a valid backup available for restore *before* you start the installation of the SPI for SAP actions, commands, monitors, and policies.

Before you deploy the SPI for SAP to the cluster nodes, you need to deploy the appropriate SPI for SAP policies. For example, you have to deploy a central-instance policy group such as `SAP R3 6.xCI` to all managed nodes, where a package that includes a SAP R/3 6.x central instance runs or the policy group `SAP R3 7.0CI/7.1kernel` to all managed nodes where a package that includes a SAP R/3 7.0 central instance runs.

If no SAP instance is running on the node, the SPI for SAP monitors will work immediately after installation, but will not generate any messages.

▶ However, the `r3status` monitor sends an SAP System down message after you run the monitor for the first time. The HostMapping entry in the `r3itosap.cfg` file maps the physical hostname of the system to the virtual hostname of the central instance. The message browser indicates that this message originates from the virtual hostname. If the r3status monitor on the other node (where SAP is running) also runs for the first time, the monitor will send an SAP System up message, which again appears to be arriving from the virtual hostname. In effect, there will be two contradictory messages from the virtual host at the same time. The order of these messages cannot be predicted. This event occurs only for the first `r3status` run because initially the `r3status.his` files are not available on each node. The `r3status` monitor sends messages only if the current status of the node is different from the status at the last run, which is maintained in the `r3status.his` file.

Note that SPI for SAP tools which open a SAP dialog will return an error if you try to execute them on a stand-by node, where no SAP package is running.

If an application-server instance is already running on the managed cluster-node, the monitors will run and generate messages relating to the Application-server instance. You should configure the monitors that normally only run on a central-instance server in such a way that, when they start after a package switch, they do not generate messages relating to problems with the Application-server instance, too, since this could lead to the generation of duplicate or misleading messages. For more information, see Special-Case Scenarios on page 70.

Installing the SPI for SAP Monitors

You install the SPI for SAP monitors in a high-availability environment in the same way as in a normal environment, that is; using the standard HPOM policy-deployment mechanisms. The only difference is that you have to perform the operation once for each physical node in the cluster, as follows:

1 **Pre-requisites:**

Before you start the installation of the SPI for SAP monitors described in this section, make sure that you have completed *all* the steps described in the section Configuring SAP-Specific Tasks on page 29, which walks you through the process of setting up the appropriate accounts, logins, paths, and permissions required to ensure that SAP and HPOM can communicate efficiently.

▶ If you do not ensure that the appropriate user accounts and permissions have been set up in both SAP and HPOM *before* you start the installation and configuration of the SPI for SAP described in this section, the SPI for SAP action, commands, and monitors will not function correctly. This could lead to the generation of incorrect or duplicate messages and the collection of misleading performance data.

2 **Set up the `r3itosap.cfg` file to reflect the high-availability cluster**.

You need to enter information about the configuration of the high-availability cluster in the Host-mapping section of the `r3itosap.cfg` file: the `r3itosap.cfg` file is the file you use to specify the SAP Systems, which you want to monitor with the SPI for SAP. For more information about the `r3itosap.cfg` file, see Specifying SAP Systems to Monitor on page 39.

3 **Check the monitor configuration**:

Configure the SPI for SAP monitors, which you want to run on the cluster nodes. The configuration must be identical for all the nodes in the high-availability cluster in order to avoid the generation of confusing messages and potentially misleading performance data after a package switch. For more information, see Setting Up Configuration Values for the SPI for SAP Monitors on page 34.

▶ The only exception to this rule is when the adoptive node is already configured as an application server. For more information, see Special-Case Scenarios on page 70.

4 **Deploy the SPI for SAP components**:

Use the HPOM console to deploy the appropriate SPI for SAP components to *each* physical node in the cluster. The policies you deploy must match the version of SAP, which is running on the managed node. In addition, you must make sure that you deploy exactly the same components (instrumentation and policies) to *all* the nodes in the cluster. In this way, you ensure that the SPI for SAP continues to monitor the same SAP instances in the same way, regardless of where the SAP instance is running.

For more information about deploying SPI for SAP components to HPOM managed nodes, see Configuring HPOM Administration Tasks on page 39. You will need to complete all the instructions for *each* node in the high-availability cluster.

5 **Special considerations**:

On each node in the high-availability cluster, ensure that each monitor can see its history file, `r3<monitor_name>.his`, both before and after a failover package switch by setting the history path in each monitor's configuration file, `r3<monitor_name>.cfg`. For more information about the location of SPI for SAP monitor history files and the options you need to set and change, see Monitor History Files in a High-availability Cluster on page 68.

Configuring the SPI for SAP in a Cluster Environment

In a high-availability cluster where the *primary* and *secondary* nodes have identical roles, you approach the process of configuring the SPI for SAP in the same way as if you had to configure the SPI for SAP twice, with the following caveats:

1 **SAP logins and user accounts for the SPI for SAP**

   Use the HostSapAssign section in the `r3itosap.cfg` file to set up the SAP logins, accounts and so on required by the SPI for SAP on *all* physical nodes in the cluster. For more information, see Defining SAP Logins in a High-availability Environment on page 70.

2 **Tell the SPI for SAP about the high-availability cluster nodes, which you want to monitor.**

   You need to enter information about the configuration of the high-availability cluster in the Host-mapping section of the `r3itosap.cfg` file: the `r3itosap.cfg` file is the file you use to specify the SAP Systems, which you want to monitor with the SPI for SAP. For example, you need to specify the names of the *physical* hosts in the high-availability cluster and the name of the virtual or relocatable host with which you want to associate the messages originating from the cluster when the messages appear in the HPOM console. You might also need to specify the name of the host defined in SAPLOCALHOST, but only if it is different from the host you want to associate with incoming messages.

   ➤ If the HPOM agents are running on the physical nodes in the cluster, you must perform an additional, manual, configuration step to ensure that messages in the console display the correct node name. For more information, see Host Mapping on Cluster Nodes on page 67.

   For more information about the `r3itosap.cfg` file, the entries you need to add to the host-mapping section, and the required syntax, see Specifying SAP Systems to Monitor on page 39.

3 **Configure the SPI for SAP Monitors**

   You have to configure the SPI for SAP monitors in exactly the same way on *all* the physical nodes in the cluster, where the package is configured to run. For more information about configuring the SPI for SAP monitors, see Configuring the SPI for SAP Monitors on page 42.

   A local configuration that is specific to one particular node in the cluster is not recommended as it can lead to a situation where different monitoring conditions are applied after a package is switched. Special-Case Scenarios on page 70 describes one or two exceptions to this rule.

4 **Deploy the SPI for SAP components**

   In this task, you assign and distribute the appropriate SPI for SAP components to *all* the physical nodes in the high-availability cluster, where the package is configured to run. For more information about deploying the SPI for SAP components, see Deploying SPI for SAP Policies to Managed Nodes on page 43.

5 **History files for the SPI for SAP Monitors**

   Make sure that the correct history file is available for each SPI for SAP monitor both before and after a failover package switch. For more information, see Monitor History Files in a High-availability Cluster on page 68.

6 **Special Requirements in your SAP environment**

Make sure that any special requirements in your SAP environment are known to the SPI for SAP monitors. For more information, see Special-Case Scenarios on page 70.

➤ If the *secondary* node in the cluster has the additional role of application server, make sure you read the instructions in Special-Case Scenarios on page 70 before you start the configuration process.

Host Mapping on Cluster Nodes

If the HPOM DCE agent discovers that multiple IP addresses are assigned to a single physical node in the high-availability cluster, the messages the agent sends show the host name associated with the IP address that is registered on the HPOM management server for the cluster node. This is the name of the node where the cluster package is running at the time the message is sent.

Although this behavior is a feature of the HPOM DCE agent in cluster environments, it overrides the SPI for SAP's host-mapping functionality, which can lead to a situation where the wrong name appears to be associated with messages displayed in the console. To ensure that the host-mapping feature works as intended and the correct host name is displayed in SPI for SAP messages coming from the high-availability cluster, you must disable the DCE agent feature on HPOM nodes, as follows:

1   Log on as a user with administrative privileges to each physical node in the high-availability cluster where an HPOM DCE agent is running and open a command shell.

2   Locate and open the `opcinfo` file for editing; you can find the `opcinfo` file in the following locations:

   •   UNIX and Linux operating systems:

        `/opt/OV/bin/OpC/install/opcinfo`

   •   Microsoft Windows operating systems:

        `%OvAgentDir%\bin\OpC\install\opcinfo`

3   For DCE agents managed by HPOM, use the keyword `OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES` in the `opcinfo` file on each physical node in the high-availability cluster to specify the IP address of the package (the virtual node) that you want to replace the cluster-node name as registered on the HPOM management server, when a message from one of the cluster nodes appears in the console. For example:

   `OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES <Pkg_IP_Address>`

   If your high-availability cluster has multiple packages running (for example, for SAP and for Oracle), use commas "," to separate multiple IP addresses in the list, as follows:

   `OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES \`
   `<SAP_Pkg_IP_Address,Oracle_Pkg_IP_Address,...>.`

   ➤ Spaces are *not* allowed in the list of IP addresses defined by OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES. Never include the IP address specified in OPC_IP_ADDRESS in the list of IP addresses.

4   Restart the agent with the new configuration using the following commands:

   `opcagt -kill; opcagt -start`

Setting the proxy flag in the opcinfo file shows how to set the proxy flag in the `opcinfo` file.

```
############################################################
# File:        opcinfo
# Description:  Installation Information of HPOM Managed Node
# Package:      HP Operations
############################################################
OPC_INSTALLED_VERSION A.07.29
PERF_INSTALLED_VERSION A.07.27
SVCDISC_INSTALLED_VERSION A.07.28
COMM_INSTALLED_VERSION 2.6.8.0
OPC_MGMT_SERVER pc057.test.test
OPC_INSTALLATION_TIME 01/15/06 16:58:51
OPC_SG FALSE
OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES 12.34.67.89
```

Monitor History Files in a High-availability Cluster

The SPI for SAP alert monitors `r3monal`, `r3mondev`, `r3monpro` and `r3status` have their own history file with the extension `.his`, for example; `r3monal.his`. Each time one of these SPI for SAP monitors starts, it relies on the contents of its history file `r3<monitor_name>.his` to determine the last events monitored and, as a result, the point at which the current monitor run should start. This mechanism is designed to avoid the problem of duplicate messages.

Note that `r3monal` writes new information to their respective history files only if the SAP System they are monitoring is available and the SPI for SAP monitors can connect. If the SAP System being monitored is *not* available, these monitors only update the time stamp to reflect the time of the latest monitor run. The monitors `r3mondev`, `r3monpro`, and `r3status`, on the other hand, write to their respective history file after each monitor run whether or not the SAP System they are monitoring is available or not.

The r3monal Monitor's History File r3monal.his

```
#-----------------------------------------------------------
# Keyword           SAP     SAP     SAP          Last Scan
#                   System  Number  Instance     Time
LastScannedSystem   =SP6    =33     =DVEBMGS33   =1073908785
-----------------------------------------------------------
```

The history files for the SPI for SAP monitors reside on the managed node where the monitors are running in a directory specified in each monitor's configuration file, `r3<monitor_name>.cfg`. By default, this directory is `%OVAGENTDIR%\conf\sapspi` for Microsoft Windows managed nodes and `/var/opt/OV/conf/sapspi` for all UNIX managed nodes except AIX, which uses the directory `/var/[lpp | opt]/OV/conf/sapspi` for [DCE | HTTPS] managed nodes.

▶ If the SPI for SAP monitor cannot find or read its history file, it does not know when the last monitor run took place and, as a consequence, has no way of determining which alerts need reporting and which it can safely ignore.

If a SPI for SAP monitor cannot find or read its history file, the monitor assumes it is starting for the first time and, with the exception of the alert monitor `r3moncol` which reads the relevant tables in the SAP-alerts log database, parses the SAP trace and log files for any information gathered in the one day prior to the monitor start time. This could lead to the generation of a large number of duplicate messages.

If the cluster package switches to another node, then the SPI for SAP monitors can no longer access the most recent history files stored on the failed cluster node. This may lead to the generation of duplicate messages—messages that have already been sent to HPOM. For r3monal, the duplicate messages can be avoided by enabling CCMSAcknowledgeMessage. Refer to the *r3monal: CCMS Acknowledge Message* section of the *SPI for SAP Administrator's Reference* for more information on CCMSAcknowledgeMessage.

▶ The r3moncol monitors keep their history information in the SAP tables. As a result, they do not have a .his history file. The r3mondev monitor reads the SAP trace and log files, and keeps the line number for each file in r3mondev.his. Therefore, in principle, r3mondev is prone to sending duplicate messages if the package is switched to the other node. If r3mondev.his is stored on the local disks and r3mondev on the new node, the SPI for SAP starts scanning from a point that was scanned on the previous node already.

However, after starting an SAP instance, new dev_* files will be created. Most of the dev_* files will be copied to dev_*.old files before creating new files. Therefore, r3mondev *never* monitors the dev_*.old files.

r3mondev detects (through the Inode column in r3mondev.his) if a file is created new, and then starts scanning the new file from the beginning. Therefore, you can use the default configuration for r3mondev and it is not necessary to place r3mondev.his on a shared disk.

Special Considerations for the Alert Monitors

This section contains information which is intended to help you set up the SPI for SAP alert monitors in a high-availability environment. For more detailed information about the alert-monitor configuration files and keywords for r3monal in particular, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*. To set up the SPI for SAP alert monitors in a high-availability environment, you need to carry out the following steps:

1   Enable (=1) the r3monal monitor's auto-acknowledgement feature for CCMS alerts in SAP to avoid duplicate messages appearing in the HPOM console

2   Define a CCMS Monitor Set, for example; "HPOM", and a CCMS Monitor, for example; "SPI Monitoring", for the messages you want to forward from CCMS to the HPOM console. Note that the monitor-set feature can be only used with the XMI/XAL interface.

CCMS Monitor Sets on page 69 shows which parameters you should use in r3monal.cfg file to set up the r3monal monitor to use the XMI/XAL interface, which is available with SAP 4.6 and higher and *must* be enabled for the r3monal monitor in a cluster environment.

CCMS Monitor Sets

```
# Triggers auto-acknowledge of CCMS alerts
#-----------------------------------------------------------
# CCMSAcknowledgeMessage SAP      Ack. filtered    Enable=1
#                        System  Messages         Disable=0
CCMSAcknowledgeMessage  =SP6    =0               =1

# A Monitor Set defines the messages you want to forward to
# the HPOM console.
#-----------------------------------------------------------
# Monitor Set    SAP      SAP      Monitor Set   Monitor
#                System   Number
CCMSMonitorSet   =SP6     =33      =HPOM     =SPI-Monitoring
```

```
---------------------------------------------------------
```

In addition, in order to prevent `r3monal` sending duplicate messages in the event of a package failover, you have to use the keyword `CCMSAcknowledgeMessage` to enable the `r3monal` monitor's auto-acknowledgement feature for CCMS alerts in SAP. This feature automatically acknowledges CCMS Alerts in SAP so that they are not repeatedly found by the SPI for SAP and used to generate messages.

Defining SAP Logins in a High-availability Environment

When setting up the SPI for SAP in a high-availability environment, remember to include references to SAP instances running on all *physical* nodes in the cluster in the `r3itosap` file, the file which the SPI for SAP uses to define all SAP logins. When you enter the information for the SAP logins in this file, it is essential that you use the names of the *physical* nodes in the high-availability cluster, since the SPI for SAP monitors reference the physical node (and not the relocatable IP address associated with the package) when they do a host-name lookup. For more information about specifying SAP logins in a cluster environment, see Specifying SAP Systems to Monitor on page 39.

▶ The SPI for SAP uses the host-mapping section of the `r3itosap.cfg` file to define information about the configuration of the high-availability cluster, such as the names of the physical hosts and the name of the managed node to be associated with messages originating from the cluster. For more information, see Configuring the SPI for SAP in a Cluster Environment on page 66.

If the *secondary* node in the high-availability cluster is already configured as an application server, then the logins for both the central instance (=CI) and the application server (=APP) can lead to problems with some of the SPI for SAP components, for example; `r3moncol` and `r3monpro`, both of which require special configuration as described in Special-Case Scenarios on page 70.

To ensure that automatic or operator-initiated actions are always able to open an SAP GUI on the virtual node in the high-availability cluster, add a `HostSapAssign` entry to the `r3itosap.cfg` file, which specifies the host name defined in the variable `SAPLOCALHOST`.

Special-Case Scenarios

For reasons of efficiency or cost, the *secondary* node in a high-availability cluster might already be in use as an application server. If this is the case in your environment and regular high loads mean that you need the central instance to maintain the same performance level after the failover package switch as before, you have the option of shutting down the application server on the *secondary* node after the failover so that the machine's performance is available solely to the central instance. You can then share the user load between any other available application servers.

If performance is not an issue in your environment, you can choose to keep the application server instance running on the *secondary* node even after the failover package switch. However, if an instance of an SAP application server is running on the same machine as an SAP central instance, you will need to ensure that the SPI for SAP monitors are made aware of this fact and do not generate messages for both the central-instance and the Application-Server. The SPI for SAP monitors which are only designed to work with the central instance should be set up to exclude monitoring of the Application-Server instance. The `r3moncol` and `r3monpro` monitors, for example, require special attention.

Each SPI for SAP monitor has a configuration file that you use to define which SAP instances in your SAP landscape it should watch and, in addition, what information it should collect. For example, you use the `r3monpro.cfg` file to configure the `r3monpro` monitor to collect information about either the central-instance processes or the processes tied to the Application-Server instance. Note that the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help* has much more information about the individual SPI for SAP monitors as well as additional hints about what aspects you can configure to suit the requirements of your environment.

➤ The SAP instance number associated with the application server already running on the adoptive node cannot be the same as the SAP instance number associated with the SAP central instance, which starts on the *secondary* node after the failover package switch.

Table 1 shows which monitors apply to which SAP instance types.

Table 1   SPI for SAP Monitors and SAP Instance Types

SPI for SAP Monitor Name	Central Instance	Application Server
`r3monaco`	✓	
`r3monale`	✓	
`r3monal` [a]	✓	
`r3monchg`	✓	
`r3moncts`	✓	
`r3mondev`	✓	✓
`r3mondisp`	✓	✓
`r3mondmp`	✓	
`r3monjob`	✓	
`r3monlck`	✓	
`r3monoms` [b]	✓	
`r3monpro`	✓	✓
`r3monrfc`	✓	
`r3monsec`	✓	
`r3monspl`	✓	
`r3status`	✓	✓
`r3montra`	✓	
`r3monupd`	✓	
`r3monusr`	✓	
`r3monwpa`	✓	

a.   CCMS 4.x only

b. Due to changes in SAP, the operation-mode monitor r3monoms is not supported with WebAS 7.0.

The r3moncol Monitor in a High-Availability Cluster

The `r3moncol` monitor collects alerts from all the SPI for SAP alert-collector monitors such as; `r3monale`, the iDOC-Status Monitor, and `r3mondmp`, the ABAP-dump monitor. The alert monitors themselves ensure that alert collectors are executed according to a defined schedule and report any messages that come back from the called function.

The `r3moncol` monitor is only intended to run on an SAP central instance: it is not designed to run on an application server. As a consequence, if the *secondary* node in a high-availability cluster is running an application server, care has to be taken to ensure that the monitors that are started when the central instance comes up on the *secondary* node after the failover switch do not become confused about which SAP instance to monitor—application server or central instance.

To avoid problems when the central instance and the application server are running on the same cluster node at the same time, for example; after a system failover, you need to ensure that each of the monitors which the `r3moncol` starts when the central instance comes up on the *secondary* node is configured to ignore alerts associated with the application server and monitor *only* those alerts that belong to the central instance. This means modifying the configuration file of *each* of the SPI for SAP's central-instance monitors listed in Table 1 on page 71 in such a way as to make sure that the monitor is tied to a particular SAP central-instance number, for example; 00. By default, the SPI for SAP monitors are configured to monitor *all* SAP instances present on the node, which in this special-case scenario would include the unwanted Application-Server instance, too.

Tying the r3monale Monitor to an SAP Instance Number illustrates how the configuration file for the `r3monale` monitor on the *adoptive* node would look if you configured `r3monale` to monitor only the central instance (for example=00) on the *secondary* node `nodename2.com` and *not* the instance of the application server (=01), which is already running. Note that the node name you specify in this file is the name of the *physical* cluster node: *<CI>* refers to the SID for the central instance. Note, too, that the configuration files illustrated in Tying the r3monale Monitor to an SAP Instance Number and Tying the r3monpro Monitor to an SAP Instance Number are incomplete (...) and are included in this form only for the purposes of illustration.

Tying the r3monale Monitor to an SAP Instance Number

```
#AlertMonFun SAP SAP SAP SAP Alert Enable=1 (...)

# Host System Number Client Monitor Disable=0 (...)

#--------------------------------------------------------------------------------
--

AlertMonFun =ClusterNodeA =CI =00 =099 =ALE =1 (...)

AlertMonFun =ClusterNodeB =CI =00 =099 =ALE =1 (...)
```

The r3monpro Monitor in a High-Availability Cluster

The `r3monpro` monitor scans for and checks all processes associated with a given SAP instance, for example; the dialog, enqueue, update, batch, dispatch, message, gateway, and spool work processes. However, the `r3monpro` monitor can be used to monitor database processes, too.

If the *secondary* node in a high-availability cluster is running an application server, then care has to be taken after a package switch that the r3monpro monitor started by the package does not assume that the processes associated with the application server also need to be monitored along with the processes belonging to the central instance. One way of ensuring this is to specify the exact number of processes to be monitored by r3monpro in the r3monpro.cfg file (in the column: Process number=#). The number of processes to monitor must be the same on each node both before and after the failover package switch.

In addition, if you want to ensure that the r3monpro monitors only those processes belonging to a specific SAP instance on a node where multiple SAP instances are running, for example; after a package switch, you have to make sure that the r3monpro monitor knows which SAP instances it is supposed to watch. You can do this by modifying the r3monpro.cfg file on the adoptive node in the cluster in such a way that each SAP instance number (defined in the column: SAP Num=) is linked to a specific process name, and a defined number of process instances, as illustrated in Tying the r3monpro Monitor to an SAP Instance Number.

Tying the r3monpro Monitor to an SAP Instance Number

```
#AlertInstMonPro  SAP    SAP    Process     Enable  Mode   Proc  (...)
#                 Sys    Num    Name        =1             Num   (...)
#-------------------------------------------------------------------
AlertInstMonPro   =T11   =00    =dw.sapSID* =1      =Min   =9    (...)
AlertInstMonPro   =T11   =01    =dw.sapSID* =1      =Min   =6    (...)
```

Performance Tools in a Cluster Environment

If you are using the Performance Agent (or HP Software Embedded Performance Component) to monitor SAP in a high-availability environment, you must install the performance agents on both nodes in the cluster, namely; the *primary* and *secondary* nodes, and then configure the performance agent to monitor the same SAP System IDs on both nodes.

► Since r3perfagent will always use the physical hostname in a cluster environment, you must specify the clustered SAP-system details by configuring r3perfagent with the manual mode (**888**). If you are configuring r3perfagent on a physical cluster node, r3perfconfig *may* offer you the option (**x**) on the SAP system with the virtual node. In this case, use the manual configuration (**888**) by specifying the physical cluster node name.

In the event of a failover and subsequent package switch, the Performance Agent stops collecting values for the SAP metrics on the host node and, as soon as the package comes up on the adoptive node, starts to monitor and report the appropriate SAP metrics on the *secondary* node. Metrics for physical components such as CPU and disk performance continue to be collected on both nodes irrespective of where the package is running. This needs to be taken into account when generating and publishing performance reports and graphs.

► The SPI for SAP service reports do not correlate the values collected by the Performance Agent on the cluster over time. The reports process the data separately for each cluster node. This means that if a package switches from the primary node to the *secondary* (backup) node, the values for the switched instance will be split between the two nodes in the cluster. If the scenario described reflects the situation in your environment, you will have to use the reports from both nodes to get a complete view of SAP performance.

Service Reports and Performance Graphs in a Cluster Environment

If you want to generate SPI for SAP service reports and performance graphs for all the nodes in the high-availability cluster, make sure that both the HP Performance Manager and HP Reporter are installed, correctly configured, and running on a machine which can see the cluster nodes. You will also have to ensure that the appropriate performance-agent functionality (HP Software Embedded Performance Component or the HP Performance Agent) is installed, configured, and available on all the physical nodes in the high-availability cluster and the appropriate SPI for SAP R/3 Performance Agent integration functionality is installed and correctly configured.

▶ Note that operating system reports are tied to the individual physical nodes in the cluster. This means that the SPI for SAP monitors are collecting operating system data even when the SAP package is not running, for example; on the *secondary* (backup) node.

You can generate reports and graphs for the high-availability cluster using SAP-, hardware-, and network-related metrics, which the performance agents collect from the physical nodes in the cluster. Since the Performance Agents run on all the physical nodes in the cluster and are independent of the SAP package, reports which use hardware- or network-related metrics can even be configured to include the periods during which the SAP package is not running, for example; on the *secondary* node *before* a package switch and on the host node *after* the package switch. Note that SAP-related metrics such as status and availability are linked to the physical node where (and during the time which) the package is running.

Service Views in a Cluster Environment

You can use tools provided by the SPI for SAP to generate Service Views of the SAP environment automatically. If you want to make use of Service Views with the SPI for SAP, you need to set it up to see the services you want the SPI for SAP to monitor in the SAP landscape and ensure that incoming messages are linked to the correct physical nodes in the cluster.

The service-discovery policy needs to be able to read the r3itosap.cfg file to determine the SAP Systems which the SPI for SAP is monitoring and, more specifically, the host-mapping section. The information in the host-mapping section of the r3itosap.cfg file specifies the names of the nodes in the high-availability cluster and, in addition, which node name should be associated with messages generated by nodes in the cluster. For more information about the contents of the r3itosap.cfg file, see Configuring the SPI for SAP in a Cluster Environment on page 66 and Specifying SAP Systems to Monitor on page 39.

▶ Only physical nodes can appear in the service tree, and data can only be collected for the physical node on which the package is running at a given point in time.

Removing the SPI for SAP Software in a Cluster Environment

The SPI for SAP software and functionality has to be removed from each individual physical node in the high-availability cluster, where the product was installed and configured. This will involve the following steps:

1   If you installed the SPI for SAP R/3 Performance Agent on the managed nodes in the cluster, you will have to remove it and its components from the SAP managed nodes in the high-availability cluster before you proceed to step two. For more information, see Uninstalling the SPI for SAP on page 113.

2   After removing the SPI for SAP R/3 Performance Agent, you have to remove the SPI for SAP components from the SAP managed nodes in the high-availability cluster. For more information, see Removing SAP-management Functionality from Managed Nodes on page 113.

8 Smart Plug-in for SAP Performance Monitors

This section describes how to install and configure the SPI for SAP performance-integration package. It also provides information about how to put the performance monitors to best use and supplement the information provided by the SPI for SAP performance monitors with information supplied by the Performance Agent.

Performance Monitors Overview

The SPI for SAP performance monitors collect SAP performance data which can then be used to compare trends between SAP business transactions and other system metrics. The performance monitors can be used to monitor, manage, and correlate the collected data centrally along with any other application, database, system and network data.

The SPI for SAP accesses ABAP-function modules inside SAP by using an RFC-call. The performance monitors gather a snapshot of SAP runtime performance data. Including the SAP-performance alert monitor (**rz03**) which is part of the SAP CCMS subsystem, the SPI for SAP Performance Agent is able to collect over 100 additional metrics.

The new SPI for SAP Performance Agent can be configured to specify which performance monitors should be run on which SAP instances and how frequently. The Performance Agent or HP Software Embedded Performance Component send an alert to the HPOM management server when they detect the violation of a defined performance threshold.

The SPI for SAP Performance Agent runs under Windows as a service and under Unix as a daemon process that runs independently of the HPOM agent processes. In order to start or stop the SPI for SAP performance-agent processes, use the appropriate HPOM tools, which you can find in the HPOM console.

Upgrading the Performance Monitor

You cannot always use the data sources you defined in previous versions of the SPI for SAP R/3 Performance Agent with the latest version of the SPI for SAP R/3 Performance Agent: sometimes you have to migrate the data to the new format required by the current release of the SPI for SAP. Whether you can or cannot use existing data-sources with the current version of the SPI for SAP depends on whether you are upgrading from a recent or (much) older version of the SPI for SAP. However, HP Reporter can still use the *data* collected by the old performance agents in the generation of new service reports.

Note, too, that if you want to upgrade the SPI for SAP R/3 Performance Agent, you cannot do it in isolation. To upgrade the SPI for SAP R/3 Performance Agent, you will have to perform the following high-level steps:

1   Remove the existing SPI for SAP R/3 Performance Agent.

For more information about de-installing the SPI for SAP R/3 Performance Agent, see Installing the Performance Monitor on page 78.

2 Remove existing SPI for SAP R/3 Performance Agent data and data sources

   • SPI for SAP 11.10

     If you are upgrading from version 11.10 to the current version of the SPI for SAP, you do not need to perform this step; existing data and data sources can continue to be used.

3 Upgrade the SPI for SAP software

4 Install the new SPI for SAP R/3 Performance Agent software.

   For more information about installing the SPI for SAP R/3 Performance Agent, see Installing the Performance Monitor on page 78.

5 Configure the new SPI for SAP R/3 Performance Agent.

   For more information about installing the SPI for SAP R/3 Performance Agent, see Configuring the Performance Monitor on page 85.

6 Upgrade the SPI for SAP/HP Reporter Integration.

   For more information about upgrading the SPI for SAP Reporter integration, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

Installing the Performance Monitor

The information in this section walks you through the steps required to install and configure the SPI for SAP performance integration.

▶ The instructions in this section assume the following are true:

   — Either the Performance Agent or the HP Software Embedded Performance Component is installed.

   — The supported SAP version is installed, as listed in Table 3 on page 18.

   — The HPOM Enterprise Message/Action Agent is already installed and running on the SAP servers, which you want to manage with HPOM.

Selecting the Performance Data Source

The HP Software Embedded Performance Component is, as the name suggests, embedded in the HPOM software and available, by default, in any HPOM installation. However, you can use the HPOM console to deploy the HP Performance Agent to the managed nodes, too.

If you prefer to use the HP Performance Agent as the agent for newly installed HP software products rather than the HP Software Embedded Performance Component (for example, to be able to use Performance Manager, which does not support the HP Software Embedded Performance Component), you can override the default use of the HP Software Embedded Performance Component by setting up a small text file, `nocoda.opt,` which changes the default data source from the HP Software Embedded Performance Component to the HP Performance Agent.

After configuring the `nocoda.opt` file, you must store it in a specific location on each managed node, whose performance-data source you want to change. The location of the `nocoda.opt` file on the managed node varies according to the operating system running on the HPOM management server and managed node. Table 2 on page 79 displays the location of the `nocoda.opt` files on nodes managed by an HPOM management server.

Table 2   HPOM 8.x for Windows Management Servers

Managed-Node Operating System	Location of the nocoda.opt file
AIX {DCE | HTTPS}	`/var/[lpp	opt]/OV/conf/dsi2ddf/` `nocoda.opt`
HP-UX/Linux/Solaris	`/var/opt/OV/conf/dsi2ddf/nocoda.opt`
Windows	`%OvDataDir%\conf\dsi2ddf\nocoda.opt`

Changing Default Settings for the Performance Data Source

To change the default setting for the data source, use your favorite text editor to open the `nocoda.opt` file on the managed node whose data source you want to modify and follow the instructions below. You will need to enter the appropriate information manually using the format and syntax illustrated in Table 3 and Excerpt from the nocoda.opt File on page 79. If a `nocoda.opt` file does not already exist, you will need to create a new one.

1   To designate the HP Performance Agent as the agent for all data sources, enter the key word **ALL** at the top of the file.

2   To designate the HP Performance Agent as the agent for a data source tied to a specific SAP instance, include a reference to each instance on a separate line of the `nocoda.opt` file, using the format and syntax indicated in Table 3 and illustrated in Excerpt from the nocoda.opt File:

Table 3   nocoda.opt File Syntax

For...	Use the following format...
SAP NetWeaver	**R3**_<*SAP_hostname*>_<*SAPSID*>_<*SAP_instance_number*>_**DATA**

3   Save the changes to the `nocoda.opt` file.

4   Restart the HPOM agent on the managed node where the `nocoda.opt` file has been modified.

Excerpt from the nocoda.opt File

```
###########################################
# Add to (or modify) the contents of this file to change the
# data-source from the default Coda to MeasureWare
###########################################
# All hosts:
# ALL
# SAP R/3 hosts/instances:
```

Deploying the Performance Monitor Packages

The instructions in this section describe how to deploy the SPI for SAP performance-monitor instrumentation from the HPOM management server to the HPOM managed node systems.

1   From the HPOM console, select and right-click the SAP managed (s) where you want to deploy the instrumentation.

2   Browse to the following menu option:

   All tasks > Deploy instrumentation

3   Select the following files as illustrated in Figure 4:

   • SAP Instrumentation

4   Select **OK**.

Figure 4   Deployment Package Selection
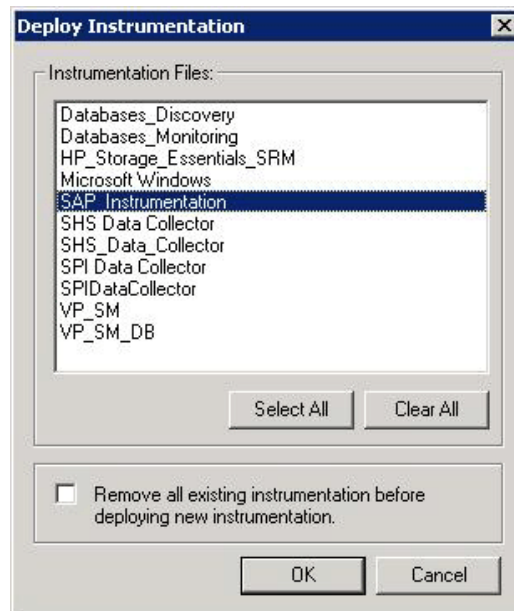
Installing the SPI for SAP Performance Packages

After you successfully complete the deployment of the SPI for SAP performance packages as described in the previous step, follow the instructions in this section to *install* the SPI for SAP performance packages on the HPOM managed nodes:

1   From the HPOM console, browse to the following tools folder:

   Tools > SPI for SAP > SAP R/3 Admin

2   Select and right click the tool corresponding to your operating system (Unix or Windows), for example; Install Performance Package (UNIX), and select the following option from the menu that pops up:

   All Tasks > Launch Tool...

3   Select the SAP managed node(s) where you want to start the SPI for SAP performance package installation, as illustrated in Figure 5 below. Remember to ensure that the nodes you select correspond to the operating system associated with the chosen tool (UNIX or Microsoft Windows).

4   Click **Launch...** to start the installation.

Figure 5   Installing the Performance Package
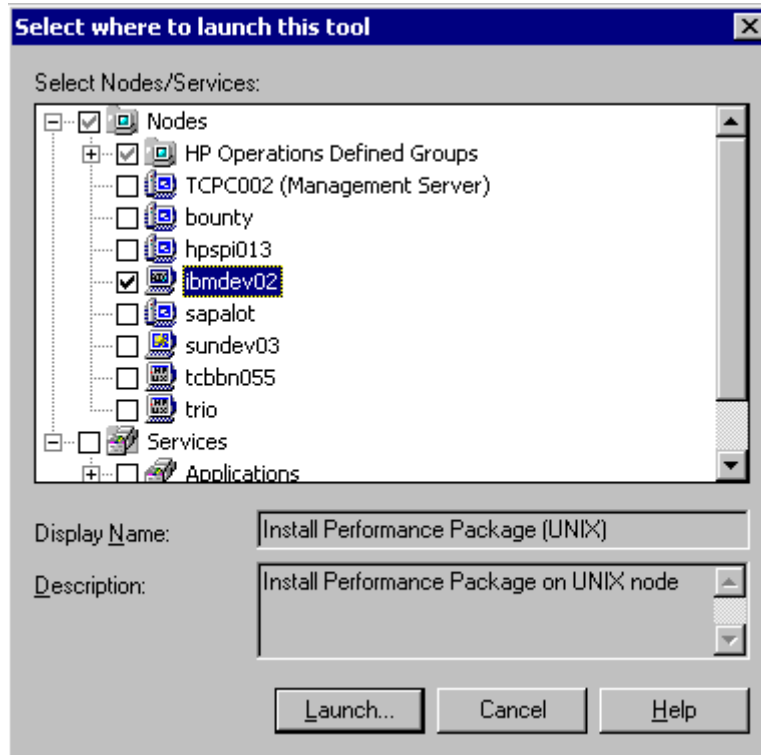
Uninstalling the SPI for SAP Performance Packages

The procedure for removing the SPI for SAP performance package from a managed node is very similar to the procedure described in Installing the SPI for SAP Performance Packages on page 80 except that, at the appropriate moment, you select and launch the *removal* tool rather than the installation tool.

➤   Note that you must stop the performance agent before removing the SPI for SAP performance package and, after the removal is complete, you need to remove the SPI for SAP performance monitor from the managed nodes, too. For more information about stopping and starting the performance agent, see SPI for SAP Tools on page 91 and Command-Line Options on page 90.

To remove SPI for SAP performance packages from SAP managed nodes:

1   Stop the SPI for SAP performance agent. You can do this either with a SPI for SAP tool, or on the command line:

•   Use the SPI for SAP application, PerfAgt Stop, which you can find in the SAP R/3 UN*X or SAP R/3 NT tools group.

- Login to the SAP server (managed node) and run the following command on the command line: `r3perfagent stop`

2 From the HPOM console, browse to the following tools folder:

Tools > SPI for SAP > SAP R/3 Admin

3 Select and right click the tool corresponding to your operating system (Unix/Linux or Microsoft Windows), for example:

- **Remove Performance Package (UN*X)**

- **Remove Performance Package (Windows)**

4 Start the Remove Performance Package tool you have selected using the following menu option:

All tasks > Launch Tool...

5 Select the SAP managed node(s) from which you want to remove the performance package. Remember to ensure that the nodes you select correspond to the operating system for the chosen tool (UNIX/Linux or Microsoft Windows).

6 Click **Launch...** to start the removal process.

Figure 6   Stopping the Performance Agent
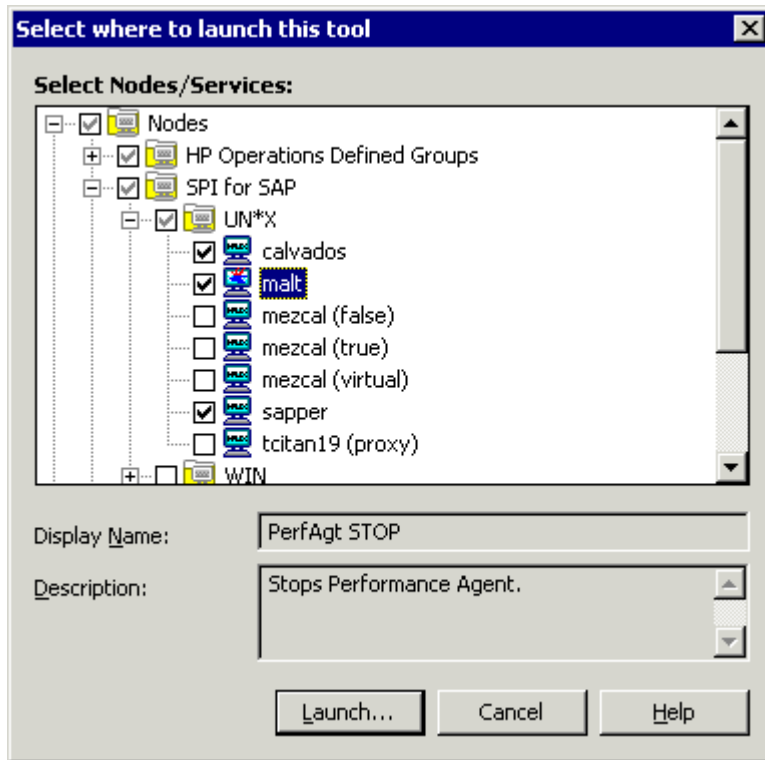
Locating the Performance Monitor Files

The information in this section describes the files installed as part of the SPI for SAP performance package for the following platforms, for example:

- Performance Monitor Files on AIX on page 83

The performance-related files listed in this section belong to the following categories: binaries and executable files, configuration files, the `dsilog` files required by the HP Performance Agent, and templates.

> The `dsilog` files are only required by the HP Performance Agent; the HP Software Embedded Performance Component does not require or make use of the dsi log files.

Performance Monitor Files on AIX

This section lists the files installed as part of the SPI for SAP performance package for AIX. The paths distinguish between [DCE | HTTPS] managed nodes:

- Binaries: `/var/[lpp | opt]/OV/bin/R3PerfAgent/bin`
    - `r3perfconfig`

      SPI for SAP performance-monitor configuration tool.

    - `r3perfagent`

      SPI for SAP performance-monitor agent.

- Configuration files:
  `/var/[lpp | opt]/OV/conf/sapspi/[local | global]`
    - `r3perfagent.cfg`

      Global and local configuration file for the various performance monitors.

- `Dsilog` files: `/var/[lpp | opt]/OV/bin/R3PerfAgent/data`
    - `R3_<`**`HOSTNAME`**`>_<`**`SID`**`>_...`:

      Immediately after installation, this directory is empty; the SPI for SAP uses the directory to store the `dsilog` files, which `r3perfconfig` and `compdsifile.sh` compile for the HP Performance Agent.

- Templates: `/var/[lpp | opt]/OV/bin/R3PerfAgent/template`
    - `R3statistics.<`**`PERF-MONITOR`**`>`

      Files the SPI for SAP uses to compile the dsi log files.

    - `Parm.UX`:

      Template for the performance-agent parameter file.

Performance Monitor Files on HP-UX, Solaris, and Linux

This section lists the files installed as part of the SPI for SAP performance package for HP-UX, Solaris, and Linux operating systems:

- Binaries: `/var/opt/OV/bin/R3PerfAgent/bin`
    - `r3perfconfig`

      SPI for SAP performance-monitor configuration tool.

    - `r3perfagent`

      SPI for SAP performance-monitor agent.

- Configuration files: `/var/opt/OV/conf/sapspi/[local | global]`

  — `r3perfagent.cfg`

  Configuration file for the various performance monitors. Note that the SPI for SAP creates this directory after you deploy the SPI for SAP performance-agent policies for the first time.

- `Dsilog` files: `/var/opt/OV/bin/R3PerfAgent/data`

  — `R3_<HOSTNAME>_<SID>_...:`

  Immediately after installation, this directory is empty; the SPI for SAP uses the directory to store the `dsilog` files, which `r3perfconfig` and `compdsifile.sh` compile for the HP Performance Agent.

- Templates: `/var/opt/OV/bin/R3PerfAgent/template`

  — `R3statistics.<`***PERF-MONITOR***`>:`

  Files which the SPI for SAP uses to compile the dsi log files.

  — `Parm.UX`

  Template for the performance-agent parameter file.

Performance Monitor Files on Windows

This section lists the files installed as part of the SPI for SAP performance package for Windows:

- Binaries: `%OvDataDir%\bin\R3PerfAgent\bin`

  — `r3perfconfig`

  SPI for SAP performance-monitor configuration tool.

  — `r3perfagent`

  SPI for SAP performance-monitor agent.

  — `r3perfagent_service`

  Starts the SPI for SAP performance-monitor agent as a service in Microsoft Windows.

- Configuration files: `%OvAgentDir%\conf\sapspi\global`

  — `r3perfagent.cfg`

  Configuration file for the various SPI for SAP performance monitors. Note that the SPI for SAP creates this directory after you deploy the SPI for SAP performance-agent policies for the first time.

- `Dsilog` files: `%OvDataDir%\bin\R3PerfAgent\data`

  — `R3_<HOSTNAME>_<SID>_...`

  Immediately after installation, this directory is empty; the SPI for SAP uses the directory to store the `dsilog` files, which `r3perfconfig.bat` and `compdsifile.bat` compile for the HP Performance Agent.

- Templates: `%OVDATADIR%\bin\R3PerfAgent\template`

  — `R3statistics.<`***PERF-MONITOR***`>`

  Files which the SPI for SAP uses to compile the dsi log files.

  — `Parm.NT`

Template for the performance-agent parameter file.

Configuring the Performance Monitor

Before starting to configure the performance monitor note that if the Performance Agent is used instead of HP Software Embedded Performance Component, then you need to stop the Performance Agent on the managed node using the commands listed in Table 4 appropriate to your system environment:

Table 4   Stopping the Performance Agent

Platform	Command
AIX	`/usr/lpp/perf/bin/mwa stop`
HP-UX/Solaris/Linux	`/opt/perf/bin/mwa stop`
Microsoft Windows	`mwacmd stop`

After you stop the HP Performance Agent, you can proceed with the configuration of the performance monitor. Note that if you are using the HP Software Embedded Performance Component, you do not need to perform any special action before you start configuring the performance monitor.

This section also includes information about using the SPI for SAP to monitor performance thresholds on remote machines, where the SPI for SAP in not installed. The information in this section also explains the concepts underlying the Performance-monitor scheduler, which ensures that the performance monitors run according to the defined schedule:

- Monitoring System-Performance Remotely on page 89

- The Performance-Monitor Scheduler on page 90

To Configure the Performance Monitor, follow these steps:

1   On the node where you installed the SPI for SAP performance monitor, locate and enter the following command to run the configuration script:

- Microsoft Windows operating systems: `r3perfconfig`

- UNIX and Linux operating systems: `./r3perfconfig`

Follow the instructions which appear on screen. Installed SAP Instances shows how the script lists the SIDs it finds together with a number (SapNr), and prompts you to select the SAP NetWeaver instance to be configured.

Installed SAP Instances

```
        SID    SapNr    HostName
        ------------------------
(0)     AST     45        sapper
(1)     DEV     50        sapper
(2)     SP1     80        sapper
```

```
Choose:
(x) to configure shown system
888 to manually configure a SAP system
999 to quit
-------------------------------------------
```

Enter the appropriate identification number, for example; **0** for AST, or **1** for DEV, **2** for SP1, or **888** to configure a new SAP System.

a   If a valid data source already exists for the given SAP System ID, `r3perfconfig` lists the data source and prompts you to select an option, as follows:

```
Choose:
(x) to configure shown system
888 to manually configure a SAP system
999 to quit
0
Valid datasource already exists: R3_sapper_AST_45_DATA
```

b   If `r3perfconfig` finds an existing data source, which it can migrate to the required *new* format, it lists the old data source and asks you what to do:

```
Choose:
(x) to configure shown system
888 to manually configure a SAP system
999 to quit
1
Found an old datasource: R3_sapper_DEV_50_DATA
Should the existing datasource be migrated <yes/no>?
```

Note the following before you respond to the prompt:

yes   automatically migrates the old data source to the format required by the new version of the SPI for SAP performance agent

no   leaves the existing data source unchanged: the old data source *cannot* be used with the new version of the SPI for SAP performance agent

c   If `r3perfconfig` finds an existing data source which *cannot* be migrated to the new format, for example; because it belongs to a version of the SPI for SAP that is older than 10.70, it lists the old, *invalid* data source and prompts you to select an option, as follows:

```
Choose:
(x) to configure shown system
888 to manually configure a SAP system
999 to quit
2
Found an invalid datasource: R3_sapper_SP1_80_DATA
Existing datasource cannot be migrated
```

d   If you choose **888** to configure an SAP SID manually, you have to answer a series of questions concerning the SAP SID you want to configure. To answer these questions, you might need to talk to an SAP administrator.

After you finish migrating the performance data, the `dsilog` files are compiled and the data sources added to the HP Performance Agent configuration file, namely:

—   `perflbd.rc` for UNIX and Linux operating systems

— `perflbd.mwc` for Microsoft Windows operating systems

➤ If you are using the HP Software Embedded Performance Component, the names of the configuration files are `ddflbd.rc` for UNIX and Linux operating systems and `ddflbd.mwc` for Microsoft Windows operating systems.

After completing the data migration, the `r3perfconfig` script prompts you to restart the Performance Agent. However, it makes sense to update the `parm.mwc` file as described in the next step *before* you start the Performance Agent.

2 Update the Performance-agent parameter file

➤ This step does *not* apply to the HP Software Embedded Performance Component.

If you are using the Performance agent, append the template file `parm.NT` (or `Parm.UX`, depending on the installed operating system on the managed node) to the `parm` file of the Performance agent, as follows:

• UNIX and Linux operating systems: **cat parm.UX >> parm**

  The parm file is located in: `/var/opt/perf/parm`

• Microsoft Windows operating systems: **type parm.NT >> parm.mwc**

  The parm file is located in the following directory:

  <*drive_letter*>`\rpmtools\data\parm.mwc`

➤ You can represent several SAP NetWeaver instances in the `parm` file by using the asterisk (*) wild card.

3 On the HPOM management server, you configure the SPI for SAP performance monitors in the `r3perfagent.cfg` file. If you do not complete this task, all monitors run with the default settings illustrated in Figure 7 on page 89, which could lead to a large number of unwanted messages appearing in the HPOM console.

There are two possible configurations:

• **Global:** `global_r3perfagent.cfg`

  SPI for SAP performance-monitor settings for all SAP servers

• **Local:** `local_r3perfagent.cfg`

  SPI for SAP local performance-monitor settings for individual SAP servers

➤ The settings in the *global* configuration files are used for all nodes which do not have local configuration settings. Where both files are present, *local* settings override global settings.

You should use the configuration-file policy editor to create a new (or modify an existing) `r3perfagent.cfg` file.

4 To modify an existing configuration file:

a Select the policy view and, in the details pane, select and right-click the appropriate `r3perfagent.cfg` file, and click the following menu option:

   All Tasks > Edit...

b The `r3perfagent.cfg` file is displayed as illustrated in Figure 7 on page 89.

5 To create a new configuration-file:

a In the HPOM console tree, expand the Policy Management policy group, select and right-click the SPI for SAP policy group, and add a new configuration file by selecting the following option from the pop-up menu that appears:

New > ConfigFile

b Load the default `global_r3perfagent.cfg` file, change any values as required, and save the file. If you want to create a *local* configuration file, we recommend you include the name of the machine for which the local configuration is intended in the local-configuration file name as outlined below:

`<machine_name>_r3perfagent.cfg`

You have to deploy the modified policy to the managed node (*<machine_name>*) and restart both the Performance Agent and the SPI for SAP performance monitor in order to upload and apply the modified configuration. Note that, by default:

– all SPI for SAP performance monitors are enabled for all SAP hostnames, systems, numbers, and clients

– the polling intervals are set for each monitor in minutes

– the Hold-Connections option is disabled

– the Performance-monitor Scheduler sends a message if it is 10 minutes behind schedule

– the Performance-monitor Scheduler is set to restart if it is 13 minutes behind schedule

6 Deploy the modified policies:

a Select and right click the policies you want to deploy

b Select the Deploy option from the menu which pops up

7 Start (or stop and restart) the Performance Agent on the managed node by entering the following command in a shell or by using the menu options in the appropriate SPI for SAP tools group.

• UNIX and Linux operating systems:

mwa [stop | start]

• Microsoft Windows operating systems:

mwacmd [stop | start]

Figure 7 The Default Global r3perfagent.cfg File


```
32
33 #RemoteMonitoring  =sapwolf2      =ovsdsap1
34
35 #------------------------------------------------------------
36 # PerfMon    SAP         SAP      SAP         SAP         RFC FUNCTION
37 #           hostname   System   Number    Client
38 #
39
40 # SAP SID ----------------------------------------------------
41 # These Performance Monitors collect SID related Metrics and should
42 # run only once per SID (either on the Central Instance, or on ONE A
43
44 PerfMon     =ALL        =ALL     =ALL      =ALL        =DBINFO_PERF       =1
45 PerfMon     =ALL        =ALL     =ALL      =ALL        =JOBREP_PERF       =1
46 PerfMon     =ALL        =ALL     =ALL      =ALL        =UPDATE_PERF       =1
47 PerfMon     =ALL        =ALL     =ALL      =ALL        =SPOOL_PERF        =1
48 PerfMon     =ALL        =ALL     =ALL      =ALL        =DOCSTAT_PERF      =1
49 PerfMon     =ALL        =ALL     =ALL      =ALL        =EP_PERF        =1
50
51 # SAP AppServer
```

8   On the managed node, locate the `r3perfagent` command and start (or stop and restart) the SPI for SAP performance monitor. For information about locating the SPI for SAP performance monitor files, see Locating the Performance Monitor Files on page 82). You can control the SPI for SAP performance monitor by using the SPI for SAP tools or entering the following commands in a shell on the managed node:

- UNIX and Linux operating systems:

  `./r3perfagent [stop | start]`

- Microsoft Windows operating systems:

  `r3perfagent_service [-e | -s]`

Monitoring System-Performance Remotely

The SPI for SAP includes a feature which allows you to extend the scope of the SPI for SAP performance monitor to monitor the health of additional, remote SAP servers (which are *not* managed nodes) from an SAP server, which *is* already configured as an HPOM managed node.

▶   Although the remote host is *not* an HPOM managed node, it must still be present in the HPOM node list. If you do not add the remote host to the HPOM node list, HPOM cannot resolve the host name associated with the remote host and, as a consequence, messages from the remote host do not appear in the HPOM console.

To make use of the remote-monitoring feature provided by the SPI for SAP, for example; to collect SAP performance metrics from an SAP System running an operating system that is not supported by the SPI for SAP, you need to use the `r3perfconfig` command to manually

add an additional datasource for each SAP System you plan to monitor remotely and then activate the `RemoteMonitoring` keyword (by removing the leading hash symbol "#") in the `r3perfagent.cfg` file on the local managed node, where the performance monitor runs. Activating Remote Performance Monitoring shows an excerpt from the *global* `r3perfagent.cfg` file with the remote-monitoring feature enabled; the *local* `r3perfagent.cfg` file, if present, would only contain references to the managed node on which the local configuration file is located.

Activating Remote Performance Monitoring

```
#------------------------------------------------------------
# Remote            LocalHost    RemoteHost
# Monitoring

RemoteMonitoring    =sapwolf2    =sapprod1
RemoteMonitoring    =sapwolf3    =sapprod2
RemoteMonitoring    =sapper      =sapprod3
#------------------------------------------------------------
```

For more information about remote performance monitoring, see the section about performance monitors in the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

The Performance-Monitor Scheduler

The performance agent uses an internal scheduler to ensure that the performance monitors run according to the desired schedule. The scheduler keeps track of time and the number of runs that have been completed and uses this information to ensure that the performance monitors run at the correct time and collect the appropriate performance-related data.

For more information about the Performance-monitor scheduler, see the section about performance monitors in the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

Managing the Performance Agent

The SPI for SAP performance monitor can be controlled either by using command-line options which differ according to the platform and operating system, or the tools that are installed by the SPI for SAP. For more information on either of these topics, see the following sections:

- Command-Line Options on page 90.
- SPI for SAP Tools on page 91.

Command-Line Options

On UNIX and Linux operating systems, you can use the `r3perfagent` command to manage the SPI for SAP performance monitor. The `r3perfagent` command accepts the following command-line options:

`r3perfagent [start | status | stop]`

- **start** - to *start* the SPI for SAP performance monitor

- **stop** - to *stop* the SPI for SAP performance monitor

- **status** - to determine the current *status* of the SPI for SAP performance monitor

On Microsoft Windows operating systems, you can manage the SPI for SAP performance monitor with the `r3perfagent_service` command, which accepts the following command-line options:

`r3perfagent_service -e -i -s -u`

-e   stops the service

-i   registers the service

-s   starts the service

-u   de-registers the service

➤ Note that on Microsoft Windows operating systems, you can control the `r3perfagent` services from the services dialog, which you can access in the Microsoft Windows control panel.

SPI for SAP Tools

Table 5 lists the tools that are available for the SPI for SAP performance monitor and shows which tools appear in which SPI for SAP tool group, for example: SAP R/3 NT or SAP R/3 UN*X.

Table 5   Performance Monitor Tools

Application Name	SAP R/3 NT	SAP R/3 UN*X
PerfAgt START	•	•
PerfAgt STOP	•	•
PerfAgt STATUS		•

9 Using the Smart Plug-in for SAP

After you install and configure the Smart Plug-in for SAP you can begin to use it to monitor your SAP environment. As soon as you deploy the SPI for SAP policies and instrumentation, you begin to see SAP-related messages in the HPOM console.

This chapter provides an overview of the components which the SPI for SAP integrates into HPOM and describes the steps and procedures that you need to perform if you want to run a typical SPI for SAP session.

SAP Administration Tools

The SAP R/3 Admin group includes tools for administrative functions such as writing SAP R/3 statistical records and activating alerts. The following table lists the tools which appear in the SAP R/3 Admin tool group and describes briefly what each of the tools does.

For more information about editing and distributing monitor configurations, see the *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

SPI for SAP Tools for SAP Managed Nodes

The SPI for SAP provides a wide range of tools for administrators of HPOM managed nodes which host SAP Systems running on either UNIX or Microsoft Windows operating systems. Some of the tools included in the SAP R/3 UN*X and SAP R/3 NT tools groups allow direct, context-sensitive access to SAP through SAP's native graphical user interface. For example, if you want to investigate a performance alert, you can run the Performance tool, which starts the SAP GUI and displays an SAP performance-analysis window.

> First select the SAP managed node(s) on which you want the tool to run. Make sure you select the tool from the tools group that corresponds to the managed node's operating system, for example; UNIX. Note that SPI for SAP tools cannot start a SAP GUI on an SAP System, which is monitored remotely from an HPOM managed node.

For more information about the tools that access data on the managed nodes, see Accessing Data on SAP Managed Nodes on page 95.

Using the Smart Plug-in for SAP Tools

Expand the `Tools > SPI for SAP` item in the HPOM console to display in the details pane the tools and tools groups installed by the Smart Plug-in for SAP. During installation and setup, the Smart Plug-in for SAP adds the following tool groups to the HPOM console:

- SAP R/3 Admin

- SAP R/3 NT

- SAP R/3 UN*X

▶ Since most SPI for SAP tools make use of the SAP GUI, make sure that the SAP GUI is available on the HPOM management server and, in addition, on any machine where an HPOM console runs. For more information, see Installing the SAP GUI on page 25. SPI for SAP tools cannot start an SAP GUI on an SAP System, which the SPI for SAP is monitoring remotely from an HPOM managed node.

To launch a Smart Plug-in for SAP tool

1 Expand the tool group containing the tool you want to launch.

2 Right click the tool you want to launch and select the following option from the menu which pops up:

   All Tasks > Launch Tool...

3 In the window which appears, select the SAP nodes on which you want to run the Smart Plug-in for SAP tool and click the **Launch...** button.

R/3 Info is one of a number of tools which display information in the Tool Output pane of the Tool Status dialog illustrated in Figure 9. For more information about the R/3 Info tool, see Accessing Data on SAP Managed Nodes on page 95.

Figure 8   Context-Sensitive Access to SAP
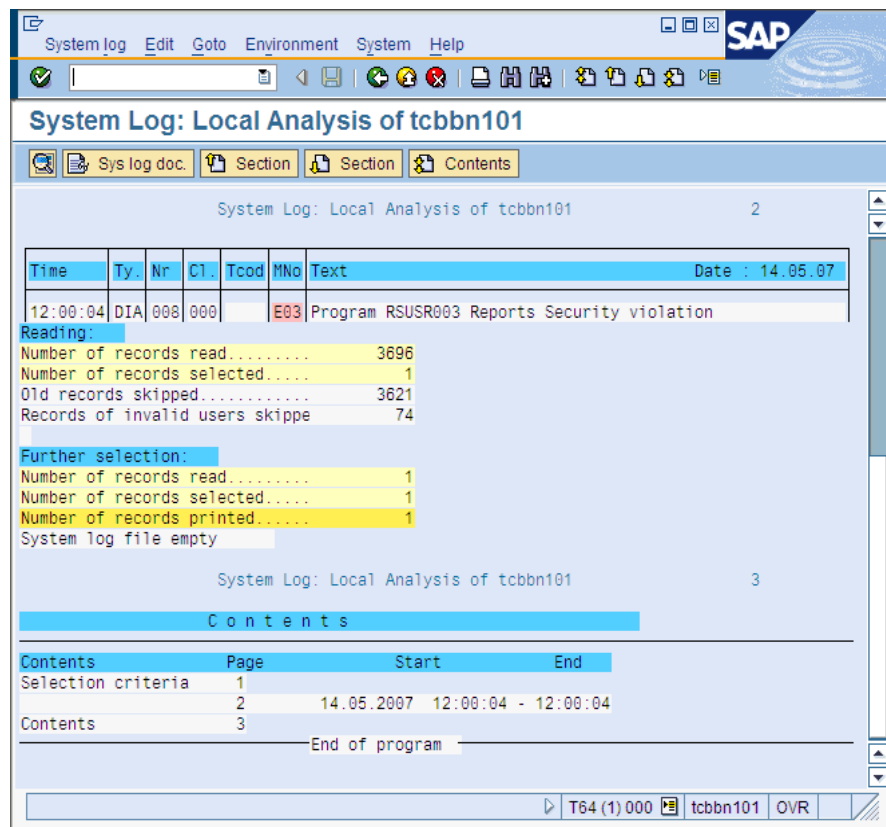
The majority of SPI for SAP tools provide context-sensitive access to SAP by starting the SAP GUI and calling the appropriate SAP transaction. For example, Figure 8 on page 94 shows the window that appears when you launch the Syslog tool, which you can find in the SAP R/3 UN*X and SAP R/3 NT tool groups.

Accessing Data on SAP Managed Nodes

The following SPI for SAP tools provide quick access to SAP-related information from the selected managed node. The R/3 Info and Java R/3 Frontend tools are available on both UNIX and Linux operating systems and Microsoft Windows operating systems, too; some other tools are available on UNIX and Linux operating systems only.

Each of the tools in the following list is explained in greater detail in the sections which follow.

- Check R/3 Database

  Establishes a connection to the SAP database server and provides a quick way of checking the database connection. If multiple instances are installed, the tool prompts you to enter the System ID in which the database you want to check resides.

- R/3 Info

  Returns the following information for SAP R/3 instances on a selected node:

  — host name

  — SAP System name

  — SAP instance name and number

  — list of processes for the selected instance

  The R/3 Info tool collects and uses the same information as `r3disc`, the SPI for SAP's service- discovery policy. However, note that the R/3 Info tool displays the information it collects; it does not use the information to generate a service tree. For more information about the `r3disc` policy and Service Views in general, see *HP Operations for Windows Smart Plug-in for SAP Administrator's Online Help*.

- Java R/3 Frontend

  Uses the local SAP GUI utility (running on the HPOM management server) and profile to connect to the desired SAP system.

- Status R/3 Config

  Displays a list of all SAP NetWeaver Systems (and the functional modules per System) present on the selected managed node. In addition, it lists all established SAP processes and indicates their current status.

For example, launching the R/3 Info tool displays a dialog similar to the one illustrated in Figure 9. The Tool Status dialog indicates which command is being executed, on which node, and the command's current status.

Figure 9   Output from the R/3 Info Tool


```
[R3Instance]
Hostname=ovsdsap
SystemName=T06
InstanceName=DVEBMGS00
Number=0
Release=40B
DBName=T06
DBHostname=ovsdsap
Process=Dialog
Process=Update
```
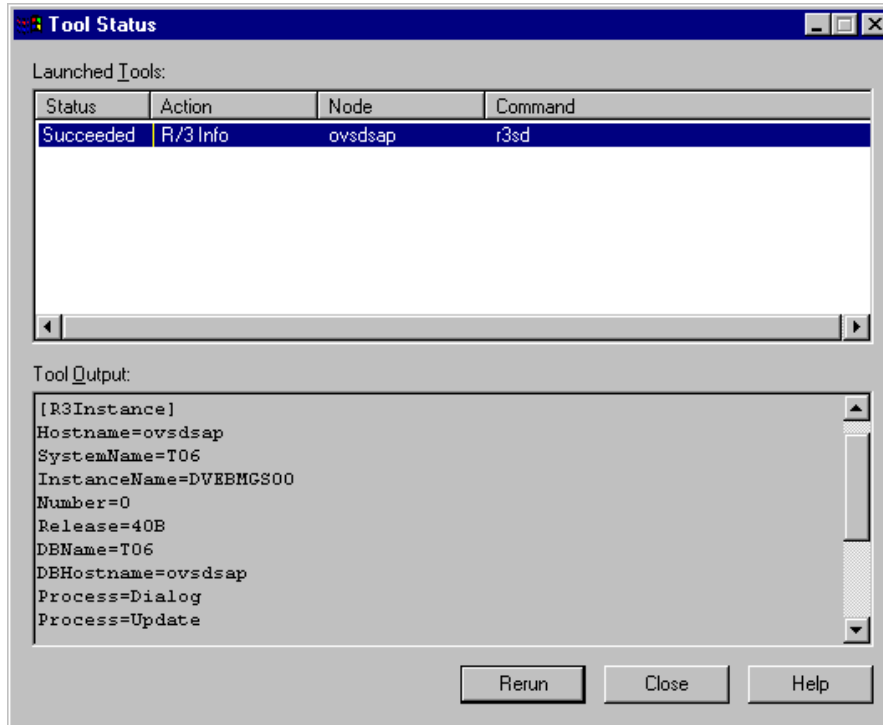
The Status R/3 Config tool runs on the selected managed node and displays the current local SAP configuration. It lists all SAP systems installed on the selected node and the functional modules installed per SAP System. In addition, the R/3 process status provides a list of all established SAP processes and their current status.

Figure 10 R/3 Configuration Status Window

Working with SAP Messages

The message browser in the HPOM console is an important source of information about the status of the SAP servers, for which you are responsible. If you log in to HPOM as an user with SAP responsibilities, the message browser displays, among others, messages from SAP R/3 and Netweaver servers, which you are monitoring with the SPI for SAP.

➤ You can use the SPI for SAP to monitor SAP instances running on a remote host, where the SPI for SAP is not available. Although the remote host is not an HPOM managed node, it must still be present in the HPOM console. If you do not add the remote host to the HPOM console, HPOM cannot resolve the host name associated with the remote host and, as a consequence, will not be able to display any messages from the remote host in the console.

Selecting and double-clicking a message in the message browser displays the selected message's properties and allows you to perform the following tasks:

- View a detailed description of a problem
- View instructions designed to help you solve the problem to which the message relates
- Initiate a pre-defined action, attached to a message
- Add an annotation to a message in order to document the actions you took to solve a problem
- Acknowledge a message so that it is moved to the acknowledged-messages database

The following example shows a typical sequence of events which occur when a critical message appears in the HPOM console.

1 In the active-messages browser, locate and double-click the critical message sent by the SPI for SAP.

   ➤ HPOM displays the message's text property sheet by default.

2 Click the Instructions tab to see if any instructions have been provided to help you sort out the problem that has been reported.

3 After you have read and understood the information provided in the Instructions tab, click the Commands tab to see if an *automatic* or an *operator-initiated* action is available to help solve the problem reported by the incoming message. In many cases, the SPI for SAP uses these actions to provide context-sensitive access to SAP and automatically displays the appropriate SAP transaction window.

Figure 11 Message Details
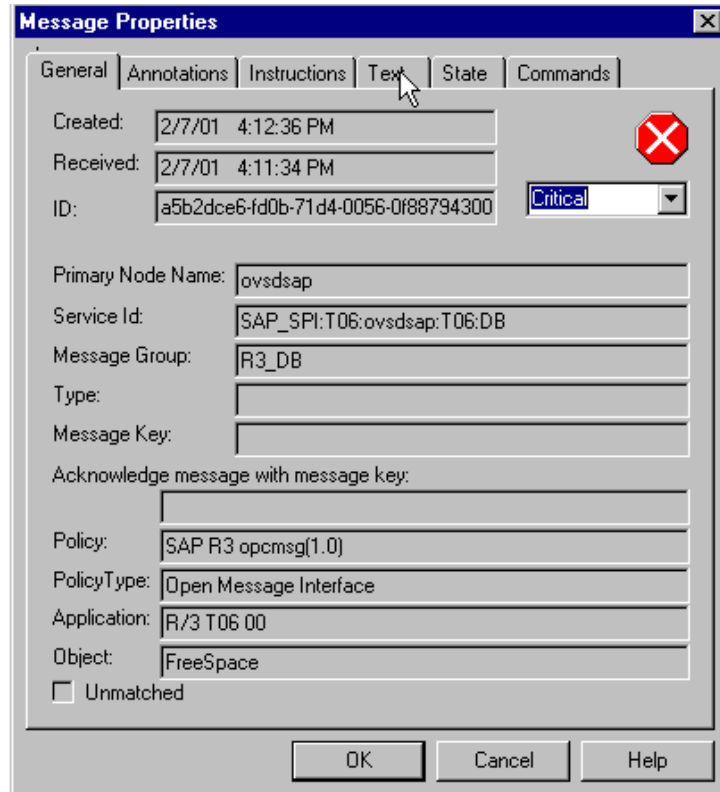
4   If an operator-initiated action is available, click the **Start** button in the
     Operator-initiated field of the `Commands` property sheet to launch it. You can watch the
     progress of the action in the Status field. In the message field, the action starts the SAP
     GUI and displays the Workload- analysis transaction illustrated in Figure 12.

5   Click the [*<server_name>*] button indicated in the This Application Server field and use
     the tools available with SAP to solve the problem.

6   When you have finished, log out of SAP and return to the Message Details window.

7   Click **Acknowledge** to confirm that you are aware of the message to which you just
     responded. As soon as you acknowledge the message, the message moves from the
     active-messages browser to the acknowledged-messages browser.

Figure 12 SAP Performance: Workload Analysis
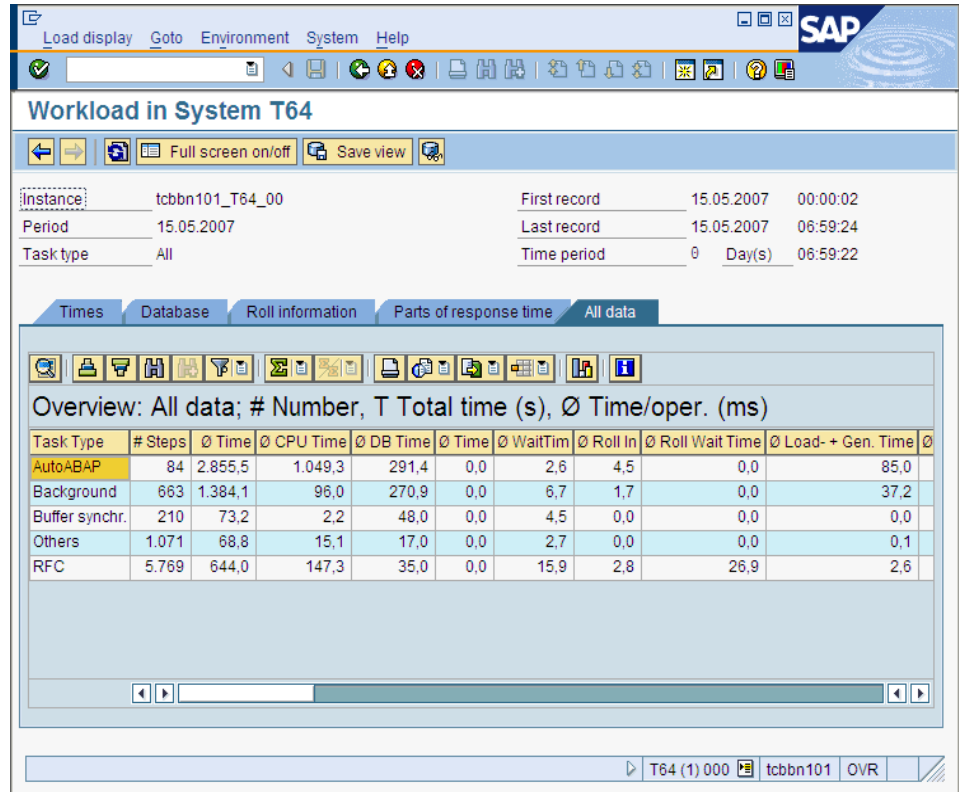
10 Integrating the SPI for SAP with HP Reporter

This section introduces the concept of service reports and explains how to use them in conjunction with the SPI for SAP and HPOM. The information in this section is designed specifically to help you use the service reports to manage the SAP environment in an efficient and convenient manner.

Service Reports

Service reports are web-based reports that are produced by HP Reporter (Reporter) using default templates and viewed using a web browser. Reporter allows you to request both scheduled and on-demand versions of reports.

SPI for SAP service reports correlate the data extracted from either the HP Software Embedded Performance Component (CODA) or the HP Performance Agent. You can use the correlated data to generate reports which display short-, medium-, or long-term views of your IT environment and supplement the detailed, real-time graphs that the Performance Manager provides. The combination of reports and graphs is a powerful tool for trend analysis. For example, you can:

- Identify potential bottlenecks in your IT system, so that you can take action before problems become acute.

- Use the information to help you to make accurate predictions for future upgrades.

- Collect accurate information to be used in measuring service levels.

Figure 13 SPI for SAP Service Reports
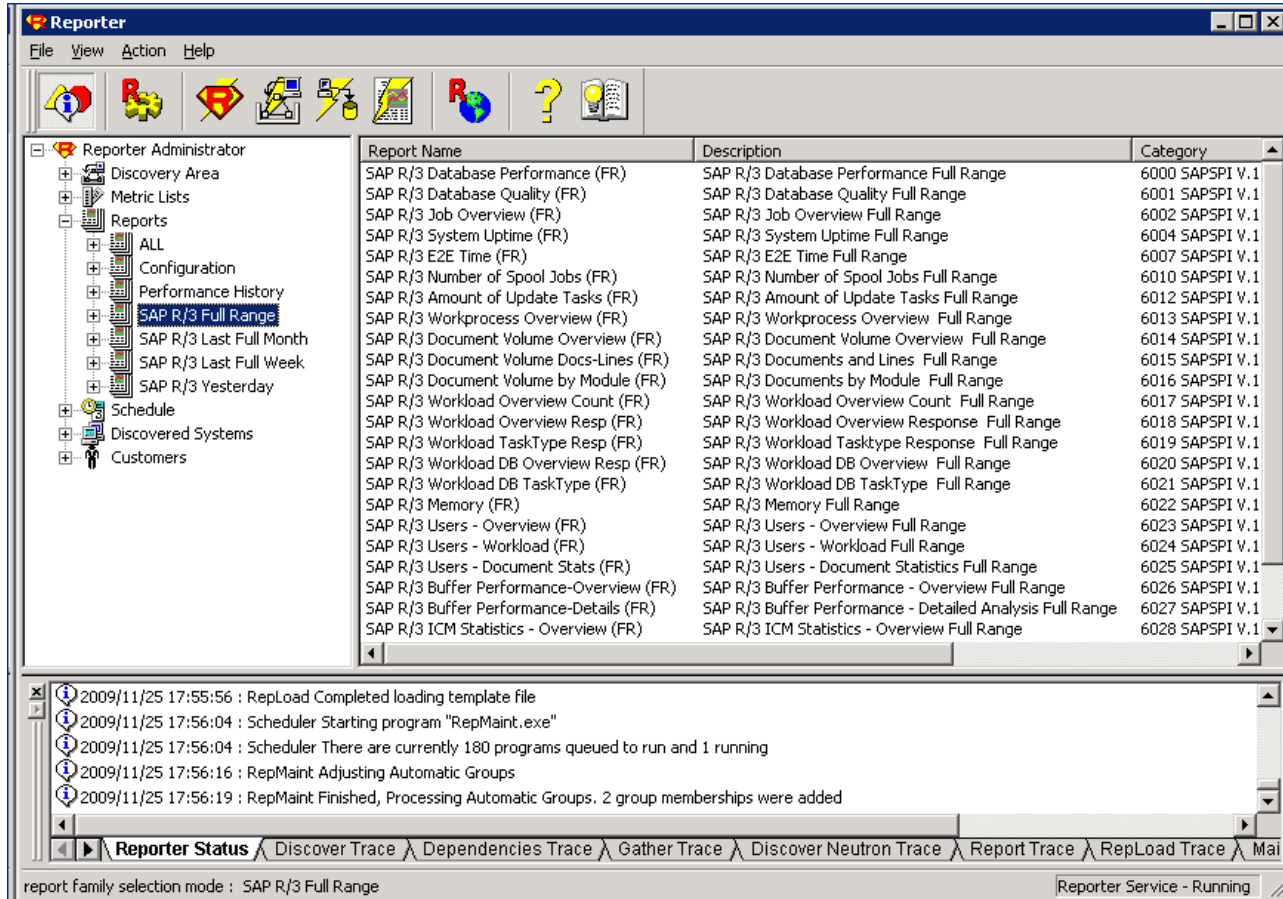
Upgrading the SPI for SAP Reports

If you are upgrading to version 11.10 from earlier versions, you can continue to use existing data and monitors.

➤ Upgrading the SPI for SAP reports in the manner described in this section removes from the Reporter system *all* old report data collected by the SPI for SAP. However, you can use database tools to preserve the tables containing information that you want to use after completing the upgrade process. For more information, see the documentation provided with the database product.

1 Remove the old SPI for SAP reporter-integration package using the standard Microsoft Windows software-removal method:

Start: Settings > Control Panel > Add/Remove Software

2 Install the new SPI for SAP reporter integration as described in Installing the SPI for SAP Reports on page 103.

Installing the SPI for SAP Reports

This section explains how to install the SAP service report which come with the SPI for SAP and, in addition, provides information designed to help you prepare for the installation.

Before You Begin

Before you install and setup the SPI for SAP service reports, you must complete the following tasks:

1 Make sure either the HP Software Embedded Performance Component or the HP Performance Agent is running on all SAP managed nodes for which you want to generate service reports.

2 Make sure HP Reporter is available on a Microsoft Windows host.

   ➤   HP Reporter lite is no longer bundled with HP Operations Manager; you must install and use the *full* version of the HP Reporter to view SPI for SAP reports.

   You can install HP Reporter either on the HPOM management server or, to improve overall performance, on a separate system dedicated to the generation and display of service reports.

3 Make sure the SPI for SAP R/3 Performance Agent is available and configured on the machines for which you want to generate reports.

4 If you want to edit existing (or create new) service reports for the SPI for SAP, make sure that Crystal Reports is available on the machine hosting the HP Reporter.

Installing SAP Service Reports

The SPI for SAP inserts the SAP service reports into the HP Reporter product as a snap-in package using InstallShield. This means that the HP Reporter must already be installed before you install the SPI for SAP service reports. During set-up of the SPI for SAP service reports you will be asked to confirm or specify the common application path for HP Reporter.

➤   The common application path is the folder where HP Reporter is installed. The set-up attempts to discover this path automatically, and in most circumstances you should avoid changing it.

The set-up copies components to the directories listed in Table 6. All directory paths are relative to the Reporter common-installation path.

Table 6   Locations of SPI for SAP Service-Reports Components

Component	Directory
Installation script	`%OvInstallDir%\newconfig\`
Configuration files	
SAP report template files	`%OvReporter%\data\reports\SAP`

To Install HP Reporter on the HPOM Management Server

To be able to generate and view service reports for the SAP Systems you are monitoring with the SPI for SAP, you first need to install the full version of the HP Reporter. You can install the HP Reporter either on the HPOM management server or, alternatively, on a separate machine, which is *not* the HPOM management server. For more information about installing the HP Reporter, see the HP Reporter product documentation. After you install and configure the HP Reporter, you need to install and configure the SPI for SAP reports package on the same machine.

➤ If you install the HP Reporter on a machine which is *not* the HPOM management server, make sure the machine on which you install the HP Reporter can see the HPOM managed nodes, for which you want to generate service reports.

To Install the SPI for SAP Reports

The information in this section describes the steps required to add the SPI for SAP service-reports to an existing HP Reporter installation. When you have completed this task, the SPI for SAP service reports will be available in the HP Reporter GUI, and you will be able to use them to generate SAP-specific service reports, which you can view in a web browser.

1   Make sure that the HP Reporter is installed and configured on the machine where you want to install the SPI for SAP service reports.

2   Insert the *HP Operations Smart Plug-ins* media into the DVD drive of the machine where you installed and configured the HP Reporter.

3   Browse to the following folder:

    SPIs\SAP SPI Reporter Package

4   Locate, select, and run the following file:

    sapspi_reporter.msi

5   Follow the instructions to complete the installation.

Figure 14: SPI for SAP Reports InstallShield Wizard.
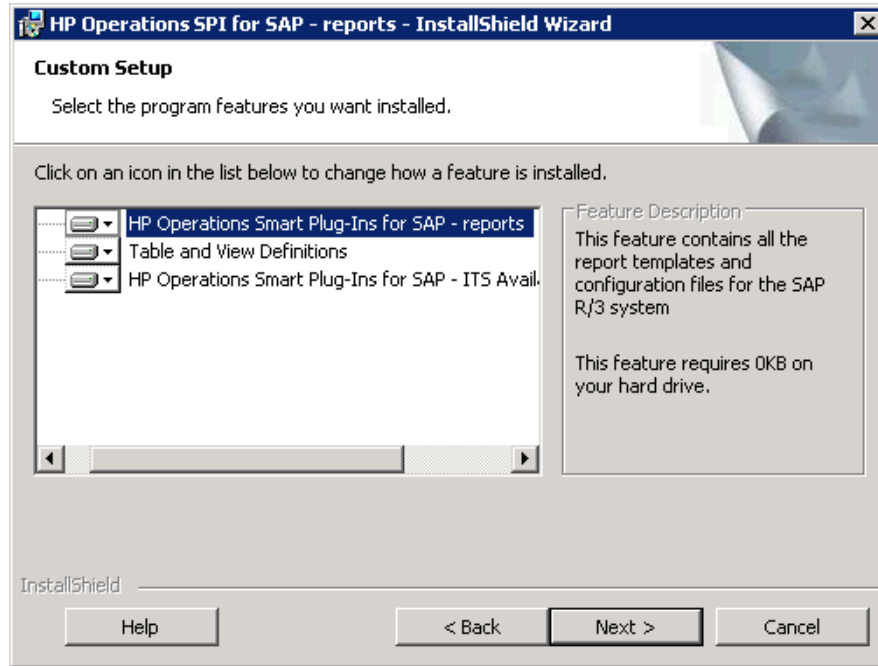
Configuring Report Packages

The set-up process of the SPI for SAP's service-report integration automatically performs the following tasks:

- Creates new report group: SAP_R3

- Assigns new *metric list* to the new SAP_R3 group

- Assigns new group *report* to the SAP_R3 group

- Assigns new *system reports* to the SAP_R3 group

To Configure Report Packages

1   Verify that the installation of the SPI for SAP service reports completed successfully by confirming that the set-up process created the report and metrics groups listed in Configuring Report Packages on page 105.

2   In the Reporter console, browse to the Configure Report Packages window using the following menu option:

File > Configure > Report Packages

Check that the following package is present in the list of installed packages.

- SPI for SAP

3   If you choose to add SAP Systems manually to the HP Reporter, note that you can use the following values in the Add System window:

```
System        host.name.com

Network       SAP
```

```
Domain         "SAP" as appropriate
```

Check that the set-up process added your SAP NetWeaver host to the appropriate Reporter group, namely; SAP_R3. The set-up process automatically assigns hosts to a report group according to the kind of data source (SAP NetWeaver), which it discovers on the monitored host.

4   Click **OK**; the systems appear in the Reporter's details pane.

5   Use the Reporter GUI to schedule the generation of the SPI for SAP reports or generate them now using the option indicated below and illustrated in

Actions > Run > Generate Reports

Figure 15 SPI for SAP Reports and Metrics
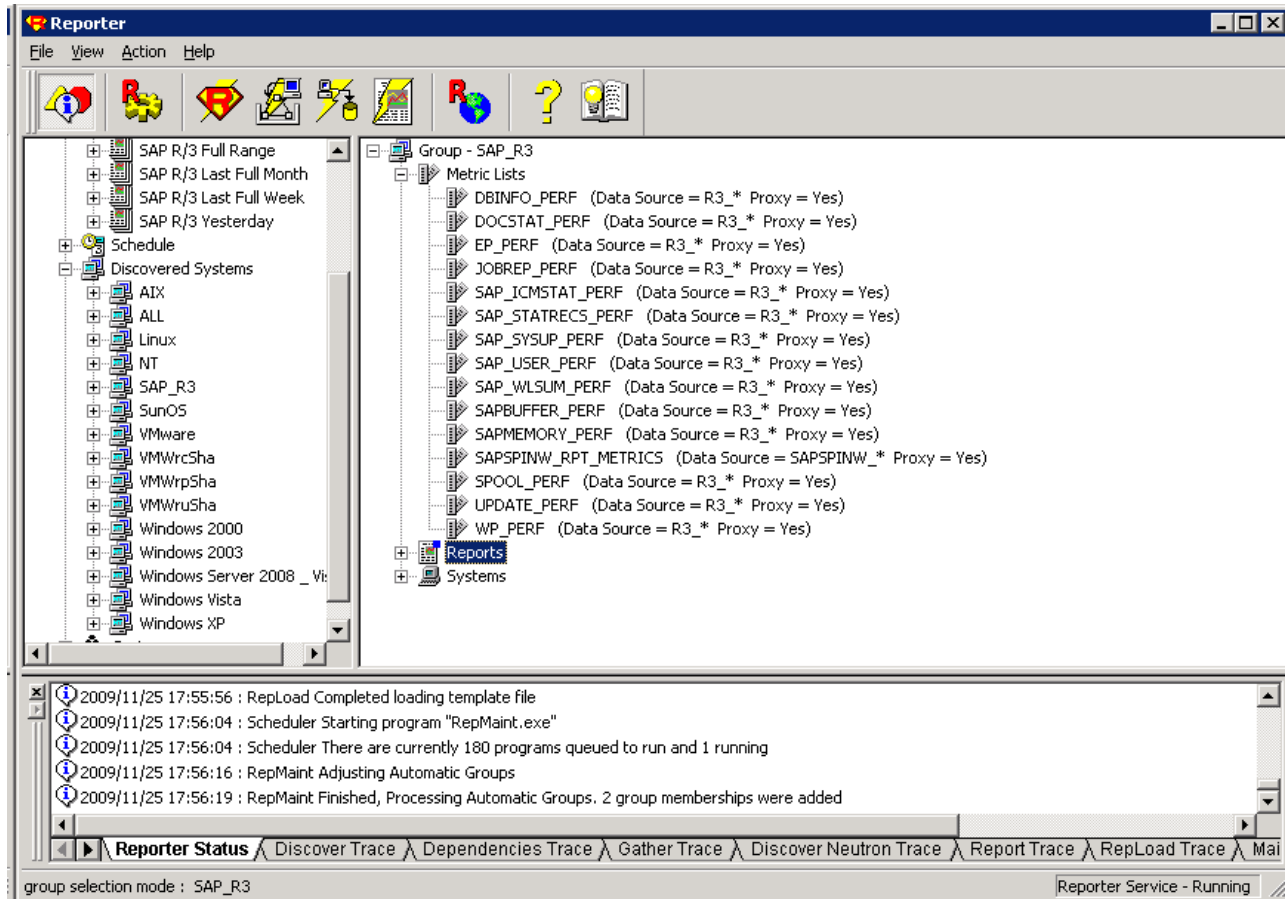
Removing the SPI for SAP Reports

To completely remove the SPI for SAP reports, you need to perform the following steps in the order specified:

To Remove Reporter Snap-in Packages

1   In Reporter, browse to:

File > Configure > Reporter Packages

2   Select the following files from the Installed Packages window located in the right pane of the Configure Report Packages window:

- SPI for SAP

3   Double-click the left arrow button to remove the selected packages from the Available Packages window: the selected packages appear in the list of Available Packages in the left pane of the Configure Report Packages window.

4   Click **OK** to finish.

Removing Binaries from the HP Reporter System

1   Go to the HP Reporter system.

2   Insert the *HP Operations Smart Plug-ins* media into the DVD drive of the machine where you installed and configured HP Reporter.

3   Run the HP Operations Smart Plug-ins wizard to remove programs.

4   Select **Remove Products**.

5   Select **Reports** under SAP SPI, and then follow the on-screen instructions to complete the deinstallation process.

11 Troubleshooting

This section describes the troubleshooting services feature for the SPI for SAP. The troubleshooting services feature provides tools that enable you to collect quickly and easily all the system and application data that you need to begin investigating problems that occur when using an HP software application.

To use the troubleshooting services with the Smart Plug-in for SAP, you need to trigger the collection of the data required for troubleshooting manually and save the collected data to a file. You can then review the contents of the file containing the collected data and, if necessary, send a copy of the file by e-mail to the support engineers.

The SPI for SAP provides the following troubleshooting tools:

- Self-Healing Info

  Use the Self-Healing Info tool to manually trigger the collection of the data required for troubleshooting. For more information about the data-collection process, see To trigger data collection for troubleshooting services on page 110.

- Version Verify

  The Version-Verify tool compares the base version of the SPI for SAP installed with the version of any SPI for SAP components installed on the system. For more information about verifying installed software versions, see To check the version of the installed product components on page 111.

Self-Healing Info Tool

This tool can be run on any managed node managed by the SPI for SAP. When the tool is running it gathers data that you can send to HP support to diagnose the SPI problem.

This tool is bundled along with each Smart Plug-in and is installed automatically in the Smart Plug-in Tools group. The tool has the capability of gathering troubleshooting data. After you run the tool and save the data to a file, you must contact HP support and email the file to them according to their instructions.

To deploy SPI-SHS Instrumentation (as needed):

1   At the HPOM console, select the right-click the node(s) on which you want to run the tool.

2   Select **All Tasks Æ Deploy instrumentation**.

3   Select the **SAP Instrumentation** and **SHS Data Collector**.

4   Click **OK**.

To use the tool:

1   At the HPOM console, select **Tools ëÆ SPI for SAP**.

2   Locate the **Self-Healing Info** tool, right-click it and select **All TasksÆLaunch Tool...**

3 Select the node on which to deploy the tool and click **Launch...**

4 In the message that appears, note the file name and location where the gathered data is saved; then contact support for instructions on where to email it.

To trigger data collection for troubleshooting services

1 In the HPOM console, expand the SPI for SAP tool group containing the tool you want to launch, for example for UNIX and Linux managed nodes:

Tools > SPI for SAP > SAP R/3 UN*X

2 Locate and right click the Self-Healing Info tool and select the following option from the menu which pops up:

All Tasks > Launch Tool...

3 In the window which appears, select the SAP nodes (or groups of nodes) on which you want to run the troubleshooting services data-collection tool and click `Launch...`

4 The collected data is stored in the following file, which you will need to forward to the support engineers for evaluation:

• UNIX and Linux operating systems:

`/tmp/SPI_MYSAP_support.tar`

• Microsoft Windows operating systems:

`C:\WINDOWS\TEMP\SPI_MYSAP_support.zip`

You can follow the status of the data-collection progress by monitoring the output, which is displayed in the Tool-Output pane at the bottom of the Tool Status dialog, as illustrated in

Figure 16 Collecting data for troubleshooting services
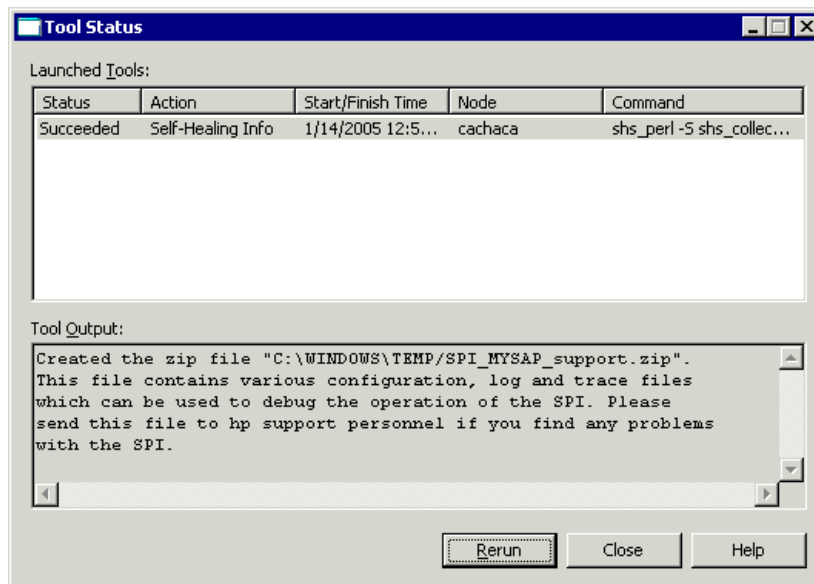
To check the version of the installed product components

1 In the HPOM console tree, expand the tool group containing the tool you want to use verify product version information:

Tools > Self Healing

2 Locate and right click the Version Verify tool and select the following option from the menu which pops up:

All Tasks > Launch Tool...

3 In the dialog which appears, select the SAP nodes (or groups of nodes) on which you want to run the troubleshooting services, Version-Verify tool and click `Launch...` You can follow the status of the verification progress by monitoring the output, which is displayed in the tool-output pane, as illustrated in Checking the Installed Software Versions on page 111.

Figure 17 Checking the Installed Software Versions
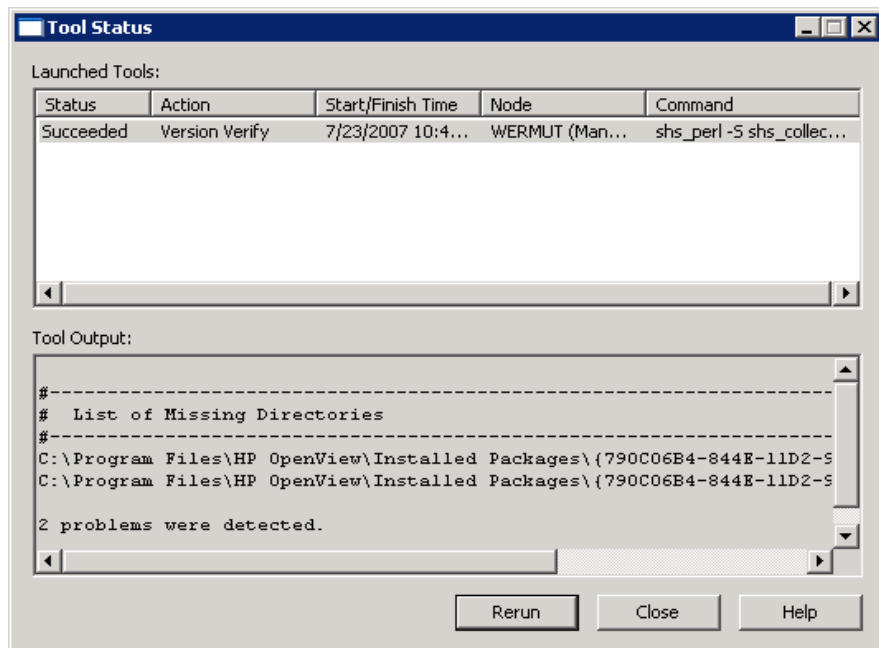
12 Uninstalling the SPI for SAP

This section describes how to uninstall the SPI for SAP software quickly and cleanly. You need to perform the following tasks, as appropriate, on either the SAP managed nodes or the HPOM management servers on which you installed the SPI for SAP software.

Removing the SPI for SAP Objects from Managed Nodes

Apply the removal transport from the `R3Trans.car` file on all the SAP nodes to remove all objects added by the SPI for SAP. See Applying the SAP Transports on page 29 for information on applying an SAP transport.

Removing SAP-management Functionality from Managed Nodes

To de-assign SAP management functionality from HPOM managed nodes:

1   On each managed node where you installed the SPI for SAP performance monitor, follow the corresponding deinstallation instructions in Uninstalling the SPI for SAP Performance Packages on page 81.

2   Remove the SPI for SAP policies from the SAP NetWeaver managed node.

   a   In the HPOM console, locate and expand the following policy group:

      Policy Management > Policy Group > SPI for SAP > en

   b   Select and right click the SPI for SAP policy group and remove the policies by using the following option:

      All tasks > Uninstall from...

   c   In the Uninstall Policies from... window which appears, select the managed nodes from which you want to remove the SPI for SAP policies as illustrated in Figure 18 and click **OK**.

Figure 18 Uninstalling SPI for SAP Policies
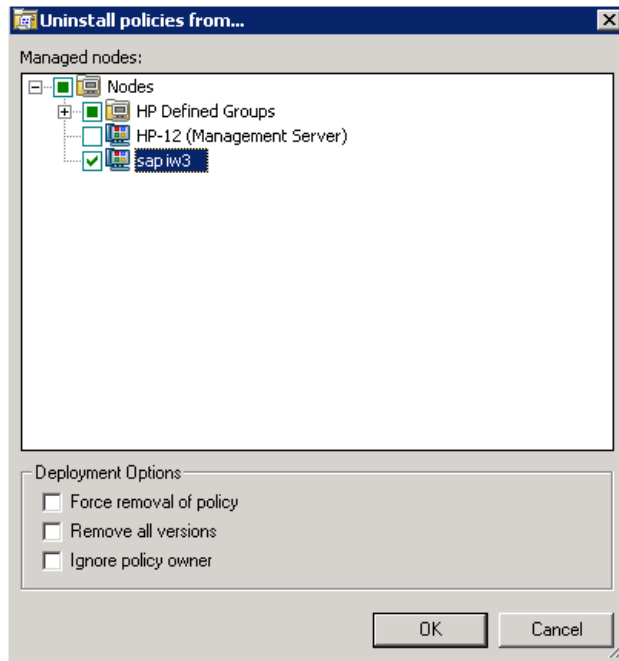
d   Verify that the polices have indeed been removed from the SAP managed nodes by selecting and right-clicking the managed node in the console tree and using the following option in the pop-up menu, which appears:

View > Policy Inventory

Uninstalling the SPI for SAP using the DVD

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

2   Select the Remove products to proceed to the product selection dialog.

3   In the Product Selection dialog, select SAP SPI and click **Next**.

Figure 19 InstallShield Wizard Removal Dialog
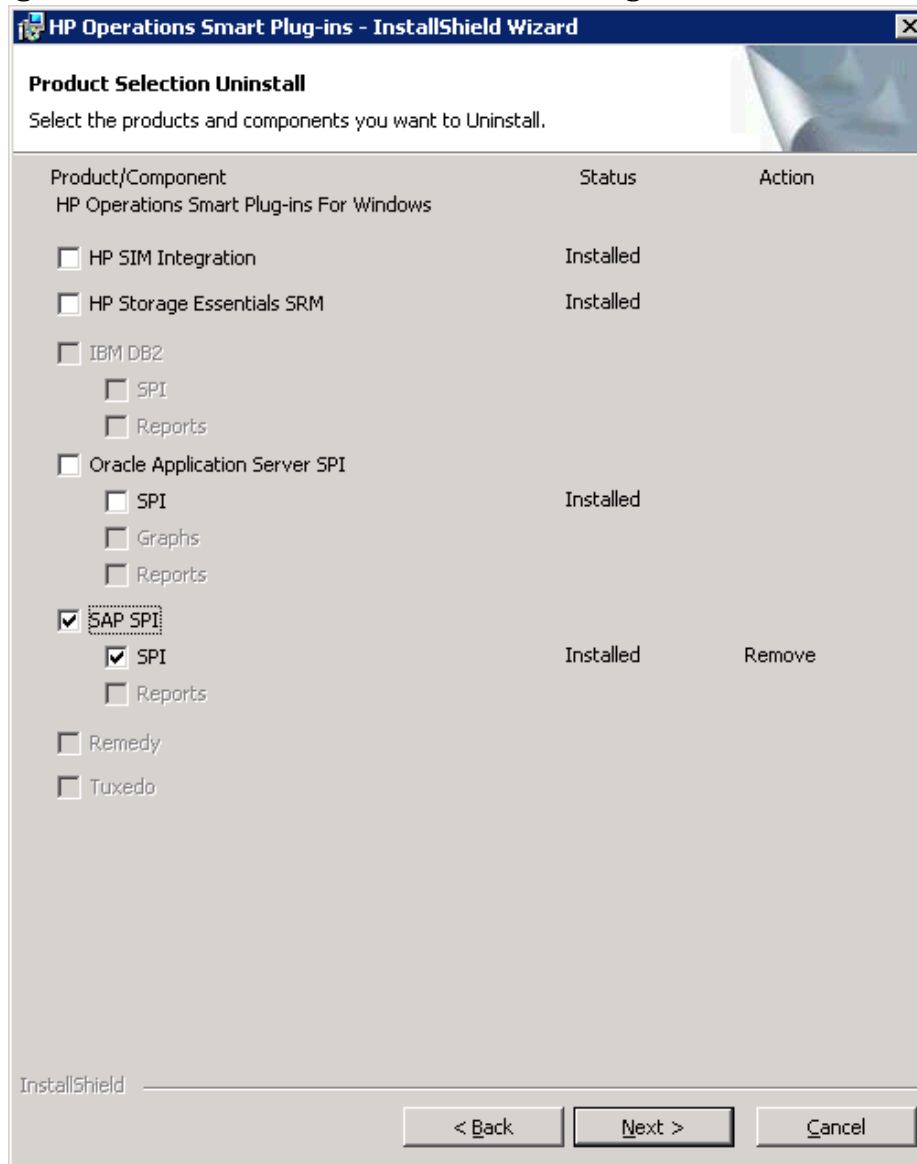
➤ The SPI for SAP does not appear on the first page of installed product components; click Next to scroll through the list of components to remove, as shown in

4 Click **Remove** to uninstall the SAP SPI.

5 In the HPOM console, remove manually any remaining SPI for SAP GUI components, for example:

   • Remove any configuration-file policies you have added.

   • Remove any policy groups you have created.

Uninstalling the SPI for SAP using the Windows Control Panel

1 In the Windows control panel, use the Add or Remove Programs tool to start the removal process; select HP Operations Smart Plug-ins from the list of installed programs and click **Change**.

2 In the HP Operations Smart Plug-ins InstallShield Wizard which opens, click **Next** and read the instructions displayed.

3 Click **Next** again to open the Program Maintenance dialog, which you can use to install and remove HP Operations programs.

4 Check the **Remove** Products option and click **Next** to open a dialog which asks you to select the product you want to remove.

A Using a Non-Privileged Windows User with the SPI for SAP

By default, the SPI for SAP tools and policies run under the $AGENT_USER account that has been configured with HP Operations Manager (HPOM) for Windows while adding the SAP node to the management server. If you use an HP Operations agent version that supports the use of a non-privileged user, $AGENT_USER does not need to be an administrative user.

To use a non-privileged Windows user with the SPI for SAP, follow these steps:

1   Install the HP Operations agent on the managed node. Refer to the *Manual Agent Installation* or *Remote Agent Installation* section in the HPOM online help for more information.

2   Change the default agent user (Local System) to a non-privileged user. Refer to the *Change the user of an HTTPS agent on a Windows node* section of the HPOM online help for more information.

Additional Requirements

While using a non-privileged user as $AGENT_USER with the SPI for SAP, the following policies and tools must be provided with the user credentials of a user with additional privileges:

• **PerfAgt START and PerfAgt STOP tools:** You must provide these tools with the rights to be able to start or stop the SPI for SAP R/3 Performance Agent service. Alternatively, you can enable the non-privileged user—which you plan to use as $AGENT_USER—to be able to start and stop the SPI for SAP R/3 Performance Agent service.

• **Install Performance Package (Windows) and Remove Performance Package (Windows) tools:** You must use the Install Performance Package (Windows) and Remove Performance Package (Windows) tools with an administrative user.

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