

HP Operations Smart Plug-in for SAP

for HP Operations Manager for UNIX[®]

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Installation Guide

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1 Introduction

The HP Operations Smart Plug-in for SAP (SPI for SAP) is a software package linking SAP NetWeaver to HP Operations Manager. The union offers a complimentary and consolidated view of SAP NetWeaver performance information and overall resource characteristics.

This integration allows correlation of SAP NetWeaver 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. Integration of SAP NetWeaver performance data into HP Performance Agent or HP Operations agent helps to detect and eliminate bottlenecks in a distributed environment. In addition, the integration allows for system optimization as well as service level monitoring. The SPI for SAP offers the following key benefits:

- Centralized problem management with HP Operations agents on the SAP NetWeaver managed nodes—the use of the central HPOM management server avoids the duplication of administrative effort.
- Real-time event and configuration information—including useful on-line instructions—for fast problem resolution
- Powerful monitors detect potential problem areas and keep track of system and SAP NetWeaver events
- Performance data collectors ensure system throughput and notify of any performance bottlenecks
- Direct, context-sensitive access to the SAP front-end
- Complements SAP NetWeaver Computing Center Management System (CCMS)
- Performance data collection, monitoring, and reporting
- Central data repository stores event and action records for all SAP NetWeaver managed nodes.
- Utilities run routine SAP NetWeaver management tasks automatically
- SAP service discovery and integration of SAP NetWeaver environments with HP Navigator—the SPI includes an application that will automatically generate service views of the SAP systems installed on your managed nodes.

Features and Benefits

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

Availability Management

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

The SPI for SAP provides an interface with CCMS, which monitors availability issues with SAP NetWeaver. This interface is easy-to-use and notifies the SPI for SAP of any availability problems identified by CCMS. The SPI for SAP monitors over 70 SAP-related conditions in the overall SAP System. When problems occur, the SPI for SAP can call on a wide range of UNIX, Microsoft Windows, and SAP management tools to fix the problems.

Availability management monitoring includes:

- **CCMS alert monitoring, including:**

- ABAP/4 database events
- SAP NetWeaver instance buffer problems
- Tracing information
- Enqueue server messages
- SAP NetWeaver general messages
- Rolling and paging activities
- Internal SAP NetWeaver database events
- Configuration status information
- Syslog messages

- **Syslog monitoring**

The SPI for SAP monitors the SAP syslog through CCMS syslog alerts.

- **Batch job monitoring**

- Aborted jobs
- Long-time running jobs
- Jobs that failed to start

- **Process monitoring**

Monitoring of all processes and conditions associated with an instance

- **File monitoring**

Monitoring relevant external files for SAP (log files, trace files)

- **SAP NetWeaver status and events**

Monitoring SAP status and events through SPI ABAP modules. Status and events include:

- Change of system operating mode

- SAP locks
- ABAP/4 dumps
- Work process availability
- Work processes modes (debug, private, no restart)
- System change options
- TemSe consistency
- ALE monitoring
- RFC-destination monitoring
- Solution-Manager integration
 - Read CCMS alerts from satellite systems
 - Write HPOM messages to CCMS
 - Assign alerts to Solution-manager process steps and use HPOM to monitor the alerts

Managing from a Business Perspective

Using HP Service Navigator, you can view the impact of events that trigger messages in the browser in a graphical format that makes you immediately aware of the business impact of lower level component failures or performance degradations.

Using HP Service Navigator, you can quickly reach the root cause of a service failure, by simple point-and-click navigation to faulty components for further diagnosis and problem resolution.

The SPI for SAP can also perform service discovery and can automatically generate a service view that shows your SAP NetWeaver environments from a service perspective. You can use the components of this service view as building blocks to create line-of-business views that reflect the impact of SAP events on your business.

Performance Management

Performance management tells you about slowdowns that may affect end-user productivity within your SAP NetWeaver environment. The metrics analyzer/viewer of the SPI for SAP alerts SAP administrators to such conditions.

This offers a complementary and consolidated view of SAP performance information and overall system resource characteristics. These fully integrated HP Operations products allow correlation of SAP performance metrics with a variety of other performance data such as metrics for operating systems, databases, and networks.

This detects and eliminates bottlenecks in a distributed environment. In addition, the integration allows for system optimization as well as service level monitoring, resulting in improved user productivity and maximum return on investment.

The SPI for SAP monitors the following SAP R/3 and NetWeaver metrics:

- Work-process number, type, and status
- Job statistics and state
- End-to-end transaction times

- Spool and print jobs
- Work-load statistics
- Buffer statistics
- Memory-performance indicators
- Logged-in users
- Document volume
- SAP Internet Communication Manager (ICM) status and performance

Remote Monitoring with the SPI for SAP

The SPI for SAP allows you to monitor the status of SAP on remote SAP servers, which are *not* HPOM managed nodes and where the SPI for SAP is *not* installed. You can set up and perform the remote monitoring from an HPOM managed node, where the SPI for SAP software is installed, correctly configured, and running.



Although the remote host is not an HPOM managed node, it must nonetheless be present in the HPOM node bank (for example, as a *message allowed* node) and within a suitable node group. Set the responsibility matrix of the HPOM user in such a way that SPI for SAP messages from this node are displayed in the message browser. If you do not add the remote host to the HPOM node bank, HPOM cannot resolve the hostname associated with the remote host and, as a consequence, will not be able to display any messages from the remote host in the Message Browser window.

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.

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.

Monitoring ITS

The SPI for SAP includes a dedicated SAP ITS (Internet Transaction Server) monitor, which allows you to check and report on the following areas:

- **Status and availability**

Check the availability of the various components of the ITS server, including; AGate, WGate, and Web Server

- **Multi-instance environments**

Pinpoint communication problems between the ITS components even in an environment with multiple ITS instances and complex load sharing

The collected data can then be used with HP Reporter to investigate problems and general availability issues.

Monitoring SAP Web AS Java (J2EE)

In order to make sure that complex SAP NetWeaver environments remain available around the clock, it is essential to be able to monitor both the Web AS ABAP and the new Web AS Java. The SPI for SAP is perfectly suited to this task providing as it does, on the one hand,

pre-defined monitoring policies for ABAP Web AS and, on the other hand, new capabilities to manage the Web AS Java. The SPI for SAP now allows you to extend the CCMS alert monitor `r3monal` to monitor the SAP J2EE Engine, which is an integral part of the SAP Web Application Server Java (WebAS Java).

Monitoring Stand-Alone Enqueue Servers

The enqueue server manages information about the locks currently in use by the users logged into the SAP System; the lock-related information is stored in the lock table of the main memory. If the host on which the enqueue server is running fails, the lock data is lost and cannot be restored even when the enqueue server restarts. In a high-availability environment, you can avoid problems of this kind by configuring a stand-alone enqueue server in combination with an enqueue-replication server running on a separate host.

The SPI for SAP allows you to monitor alerts generated by a stand-alone enqueue server configured in a high-availability WebAS environment. For more information about configuring `r3monal` to monitor a stand-alone enqueue server in WebAS, see *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Monitoring Security

The availability and smooth operation of the ERP environment is critical for many companies, which often have to invest precious time and money in the constant and proactive protection of these systems against potential attackers.

The challenge is not just to monitor security-related events around the clock but also to identify insecure system settings, investigate unauthorized attempts to gain access to critical systems, or check any attempts to change system configuration. The SPI for SAP now allows you to extend the CCMS alert monitor `r3monal` to monitor security events in the SAP sub-system by using the SAP security-audit feature.

Alternatively, the security monitor `r3monsec` monitors many different aspects of the SAP System's security such as: failed logins, access privileges, and SAP security parameters. You can configure `r3monsec` to send messages if it notices that security information has changed, default passwords are still in use, or unauthorized users are attempting to access SAP.

Monitoring the ABAP Dispatcher

The ABAP-dispatcher monitor `r3mondisp` checks the size, content, and status of the queues for the different types of SAP work-processes and generates an alert if a queue becomes so full that it could have an adverse effect on SAP-System performance, or if a low percentage of work processes is idle. You can use this feature to help you troubleshoot performance issues in the SAP Systems you are monitoring with the SPI for SAP and, in addition, improve the performance of the monitored SAP-Systems by requiring the SPI for SAP monitors that need to login to SAP to check the status of the dispatcher queue before they request a dialog process.

Service Reporting

The SPI for SAP includes a predefined set of service reports. Service reports are web-based reports that are produced by HP Reporter using Crystal Reports templates. They can be viewed using a web browser.

Reports use data extracted from HP Performance Agent. They correlate and present long-term data about your IT environment and supplement the real-time reports presented by HP Performance Manager, providing a useful tool for analyzing trends.

Combined Availability and Performance Management

When using both the availability and the performance management capabilities, performance alarms can be automatically forwarded to an SAP administrator. The SAP administrator can then start HP Performance Manager to view the performance problem directly. This consolidated approach allows availability and performance problems to be managed in a consistent, fast, and efficient way.

High-availability Environments

The SPI for SAP provides full support for high-availability environments, allowing you to continue to make use of the product's functionality, even after a fail over, regardless of where the package is running. Whether it is the HPOM management server or the SAP servers that are configured to run in a high-availability environment or indeed a combination of the two, you can install and configure the SPI for SAP quickly and easily to monitor SAP in the way that you see fit. For more information about installing and configuring the SPI for SAP in a high-availability SAP environment, see [The SPI for SAP in a high-availability Cluster](#) on page 57.

Integration with HPOM

At the heart of the SPI for SAP is a set of monitors or data collectors, which regularly check different aspects of the health of SAP NetWeaver Systems. The SPI for SAP includes the following monitors:

- **CCMS Alert**
Collects alerts from the SAP NetWeaver internal monitor, the CCMS alert monitor.
- **Syslog**
Collects messages from the SAP NetWeaver syslog (from CCMS).
- **Jobs**
Identifies SAP NetWeaver batch jobs that are in an abnormal state; for example, aborted jobs.
- **Processes**
Reports on the availability of SAP NetWeaver work processes and database processes at operating system level.
- **Files**
Reports on errors in the SAP NetWeaver trace and log files.
- **SPI ABAP**
Modules which carry out monitoring tasks within SAP NetWeaver, for example; checks on SAP processing modes, SAP dumps, the availability of work (and other) processes.

The SPI for SAP monitors are completely integrated into HPOM, both in their configuration and distribution, as well as in the day-to-day tasks of receiving messages and taking action to resolve problems. This section also discusses the following topics:

- [Configuration and Distribution Concepts](#)
- [Messages and Actions](#)

Configuration and Distribution Concepts

For the purposes of configuration and distribution, the SPI for SAP monitors have two points of integration to HP Operations Manager, namely:

- **The SPI for SAP message-source template group.**
- **The SAP R/3 Admin and SAP R/3 Admin Local application groups**, which include applications for the configuration and distribution of global and local configurations, respectively.

The procedure for *global* configuration distribution described below:

- 1 You edit the configuration file using the appropriate SAP R/3 Admin application. This configuration can include definitions that apply to systems on multiple SAP NetWeaver servers.
- 2 The newly defined global configuration is distributed to the managed nodes by means of the Install Config application.

The procedure for *local* configuration distribution described below:

- 1 You edit a configuration file for each node that has local configuration using the appropriate SAP R/3 Admin Local application. This configuration includes definitions that apply only to a selected node. Each *local* configuration file is stored in a directory on the HPOM management server, which is specifically named to reflect the managed node to which the configuration applies.
- 2 Each local configuration is copied to its target node using the SPI for SAP application Distribute Local Config.

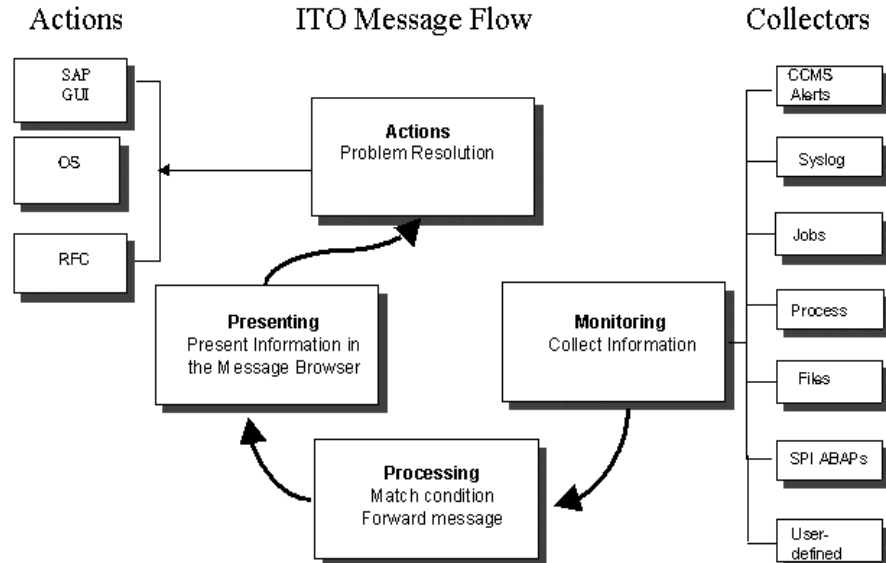
Messages and Actions

The day-to-day monitoring of the SAP NetWeaver systems by the SPI for SAP monitors is completely integrated with the facilities offered by HPOM.

The conditions identified by the monitors are passed to the HPOM agent on the managed node. Conditions are compared to conditions defined in the message-source templates, and matching conditions are forwarded to the management server. Messages from the monitors are assigned to SAP-specific HPOM message groups, which are added to HPOM when the SPI for SAP is installed. These groupings of messages allow you to easily assign responsibility for SAP-related messages to selected operators.

Messages that are sent to the management server are displayed in the HPOM message browser. The full range of HPOM message facilities are available for SPI for SAP messages, including differentiation of messages according to severity, detailed description of the condition and advice on problem resolution, and pre-defined operator-initiated and automatic actions.

Figure 1 Message Flow between SAP NetWeaver and HPOM



The sequence of events within the HPOM message flow phase is as follows:

- 1 An event occurs on an object that is being monitored by one of the collectors, and a message is created as a result, for example, a batch job aborts.
- 2 The HP Operations agent on the managed node receives the message.
- 3 The message is compared to filters. Messages matching suppress conditions or duplicate messages are suppressed. Other messages are forwarded.
- 4 Messages matching filters are converted to the HPOM message format, and forwarded to the management server.
- 5 The active message is stored in the database.
- 6 The message is displayed in the message browser window for operators who have responsibility for the appropriate message group and managed node.
- 7 The message can now be selected and any operator-initiated actions that are defined can be started. An operator-initiated action can be:

Opening the SAP GUI if, for example, a job aborts. The related message could have an operator-initiated action which calls the job-overview transaction and displays it in the SAP GUI.
- 8 When the message is acknowledged, it is removed from the active database and put into the history database, where it is available for further analysis, if necessary.

Easy Customization

This section explains how you can customize the flow of messages from SAP NetWeaver to HPOM in both the SAP NetWeaver environment and HPOM, as described in the following two sections:

- [Customization in SAP](#) on page 17
- [Customization in HPOM](#) on page 17

Customization in SAP

- Enable or disable SAP NetWeaver client groups so that these are tracked or not tracked in the CCMS alert monitor. This method is discussed in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
 - Enabled messages cause a CCMS alert to be created, which can then be identified by the SPI for SAP CCMS alert monitor and forwarded to the HPOM management server.
 - If a message is disabled in the CCMS alert monitor, there will be no internal SAP NetWeaver CCMS alert, so there will also be no HPOM message.
- Set thresholds for the inclusion of alert messages in the SAP NetWeaver CCMS alert monitor. This method is discussed in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
- Set up selected alert messages so that they are included in the SAP NetWeaver system log file. This method is discussed in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Customization in HPOM

- Use powerful monitors to tune the control of your distributed SAP NetWeaver environment. For details see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
- Apply filters to display only the relevant types of messages. This method is discussed in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
- Change the severity of messages in accordance with your specific requirements. This method is discussed in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

2 Before you Begin

This chapter provides the information you need to check the suitability of your systems for the installation of the Smart Plug-in for SAP. For instructions on installing the SAP/Performance subagent, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Installation Pre-requisites

Before starting to install (or upgrade) the SPI for SAP, you must perform the following tasks:

- Make sure that your system meets the requirements detailed in the following sections:
 - [System Requirements](#) on page 19
 - [Compatible Software Versions](#) on page 22
 - [Obsolete Software Versions](#) on page 22
- 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 to monitor. For each client, list the following data:
 - Hostname of the SAP application server
 - SAP system ID
 - SAP Instance number
 - SAP client number
 - Operating system platform (UNIX or Microsoft Windows)

You will use this information to set up the environment configuration file for the SPI for SAP.

- ▶ If you are upgrading from a previous version of the SPI for SAP, read [Upgrading the SPI for SAP](#) on page 32 for guidance on how to retain data and reduce or avoid the loss of existing customization, for example: to configuration files or message-source templates.

System Requirements

Before you install (or upgrade) the SPI for SAP, use the information provided in [Table 1](#) to ensure that your systems (management server and managed nodes) meet hardware, operating system, and disk space requirements.

[Table 1](#) lists the disk space requirements for both the management server and the managed node.

Table 1 Disk Space Requirements

Product	Minimum Disk Space	
SPI for SAP on the management server	8.28, 8.29, 8.30	1.4 GB ^a
SPI for SAP on managed nodes		Approximately 40 MB. ^b The disk-space requirement on the node will increase with the amount of data collected and logged by the SPI.
SPI for SAP Reporter Package		1 GB

a. 300 MB for installation, 600MB for configuration, 200MB for uncompress action after first distribution

b. Depends on the operation system installed

Table 2 lists the versions of HPOM for UNIX versions supported with this version of the SPI for SAP.

Table 2 Supported HPOM Management-Server Platforms

Product	Version	Operating System Platform
HPOM for UNIX	8.28, 8.29, 8.30	HP-UX
		Sun Solaris

Table 3 shows which combinations of the SAP NetWeaver kernel and (in brackets) the SAP NetWeaver Basis version are supported by the SPI for SAP and, in addition, on which HPOM managed-node platforms the combination must be running. For example, 4.6D (4.6C) indicates support for the combination of version 4.6D of the SAP NetWeaver *kernel* and 4.6C

basis version. The third column of [Table 3](#) reflects a change to the SAP NetWeaver version-numbering system and shows the SAP NetWeaver *basis* version and (in brackets) the SAP NetWeaver *kernel* version.

Table 3 Managed Node Platforms and SAP Kernel Versions

Managed Node Operating System	SAP NetWeaver Kernel (<i>Basis</i>) Version	SAP NetWeaver Basis (<i>Kernel</i>)			7.1 (7.1) ^d
		4.6D ^a (4.6C)	6.20 (6.20/6.40)	6.40 (6.40) ^b	
AIX ^e	✓	✓	✓	✓	✓
HP-UX	✓	✓	✓	✓	✓
Linux ^f	✓	✓	✓	✓	✓
Solaris	✓	✓	✓	✓	✓
Windows	✓	✓	✓	✓	✓

- a. SAP 4.6D is *not* a complete SAP NetWeaver release; it is a downward-compatible kernel shipped with SAP NetWeaver 4.6C SR 1 or later.
- b. The ITS monitor `r3monits` monitors ITS 6.20 AGate servers; `r3monits` cannot be used with SAP ITS 6.40.
- c. Due to changes in SAP, the operation-mode and SAP ITS 6.20 monitors, `r3monoms` and `r3monits`, are not supported.
- d. ABAB-stack only
- e. 64-bit OS runtime only
- f. SuSE Linux Enterprise Server (SLES) ; Red Hat Enterprise Linux (RHEL). To monitor Linux nodes on IA-32 platform, you must install the 32-bit emulation layer, compatibility layer (for running the x86 binaries), and compatible standard C++ libraries on all Linux nodes. Since the SPI for SAP supports RHEL5 and SLES10 through the emulation mode, refer to the Red Hat Enterprise Linux /SuSE Linux Enterprise Server documentation to understand the prerequisites of running 32-bit applications.



The SPI for SAP supports additional SAP application components, for example; BBP (Business-to-Business Procurement) and BW (Business Warehouse), *only* if the application component is compatible with one of the combinations of SAP NetWeaver Kernel/Basis versions specified in [Table 3](#). The SPI for SAP does *not* support specific SAP technology-components. The only exception to this rule is the Internet Transaction Server (ITS), which the SPI for SAP monitors with a dedicated tool.

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

For more details on the supported management server and managed node platforms by the SPI for SAP, see the Support Matrix (http://h20230.www2.hp.com/sc/support_matrices.jsp).

Compatible Software Versions

Before you install (or upgrade) the SPI for SAP, use the information provided in this section to ensure that the installation or upgrade process proceeds without problems. For example, note the following important points:

- Use [Table 2](#) to check that you are using a version of HPOM that is compatible with the current version of the SPI for SAP.
- Are both the HPOM server software and the HPOM agent software installed on the HPOM management server?
- Are the standard, HPOM, management-server templates assigned and distributed to the HPOM management server?
- Is HP Reporter available to view service reports for SAP NetWeaver, SAP NetWeaver performance, and SAP ITS Performance Monitor data?

If you want to edit existing (or create new) Service Reports for the SPI for SAP, Crystal Reports version 8.5 must be running on the machine hosting the HP Reporter A.03.50 (or higher).

- For Performance Agent functionality (see also the *HP Operations Smart Plug-in for SAP Administrator's Reference*):
 - HP Performance Manager must be available if you want to use performance graphing
 - HP Performance Agent software must be installed on all the SAP application servers you wish to monitor

The HP Operations Smart Plug-in's DSI-to-DDF wrapper utilities must be installed and running on the HPOM management server. You can check using the command;
swlist DSI2DDF

```
# DSI2DDF X.X.X HP OpenView Smart Plug-Ins DSI-to-DDF wrapper utilities
```

Note that the SPI for SAP currently works with DSI2DDF version A.02.02 on supported versions of HP-UX and Solaris.

[Table 2](#) lists which versions of the HPOM management server software the SPI for SAP supports.

For information about the versions of other related software that is supported by the SPI for SAP, see the *HP OpenView Smart Plug-in for SAP Software Release Notes*.

Obsolete Software Versions

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

- SAP Shared-memory Interface
- SAP R/3 3.1- 4.6B
- SAP R/3 4.6C kernel (4.6C with 4.6D kernel will continue to be supported)
- SAP ITS 4.6/6.10
- 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)

Changes and Modifications to the SPI for SAP

This section provides information that is designed to help you complete the post-installation phase of the upgrade process by listing the changes and additions, which are introduced with the latest version of the SPI for SAP.

For more detailed information about the topics covered in this section, see [Using the Smart Plug-in for SAP](#) on page 75 and, in addition, the section about customizing the SPI for SAP monitors in the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Node Groups

This release of the product makes no changes to node groups. However, note that when uploading the node group `sap`, the SPI for SAP no longer replaces an existing node group of the same name; it uploads node groups with the `-add` option instead of `-replace` option.

Applications and Application Groups

The current release of the SPI for SAP contains the following changes or additions to the SPI for SAP applications and application groups:

- **Windows non-privileged users for agent**

The SPI for SAP supports non-privileged users that can be used with the HP Operations agent on Windows nodes. For more information, see [Using a Non-Privileged Windows User with the SPI for SAP](#) on page 97.

- **New applications**

This version of the SPI for SAP introduces the following new applications:

- **Install the RFC Library:** Use this application to place the downloaded SAP RFC libraries into the appropriate directories on the management server.
- **Install/Remove Performance Package:** Use these applications to install and remove the SAP/Performance subagent.
- **Check the SAP NetWeaver Connection:** Use this application to check the connection with the SAP NetWeaver Web AS before you start monitoring.
- **Configure SPI SAP NetWeaver Monitors:** Use this application to perform necessary configuration tasks on the SAP NetWeaver Web AS.

- **New application group**

This version of the SPI for SAP introduces a new application group: **SPI for SAP**. All the available applications for the SPI for SAP are included in this group.

Templates and Template Groups

The current release of the SPI for SAP provides the following changes and additions to template groups:

New Template Groups

The SAP NetWeaver Java Monitoring template group is introduced in this version. This template group adds several policies that help you monitor the SAP NetWeaver Web Application Server (J2EE) environment. This group includes *scheduled action* and *monitor* templates. For more information, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Reports

Along with the capability to monitor the SAP NetWeaver WebAS J2EE environment, this version of the SPI for SAP introduces the following reports that reflect the state of health and performance of the SAP NetWeaver WebAS J2EE engine:

- Threads usage rate for different ports
- Connections count
- Memory Consumption
- Sessions view
- Requests view
- Comparison of application and system threads
- Comparison of application and system waiting tasks

3 Installing the Smart Plug-in for SAP

This chapter provides the information and instructions you need to install and set up the Smart Plug-in for SAP.

Installation and Configuration Overview

The installation and configuration of the SPI for SAP is completed in three phases, performed in the following sequence:

Task 1: [Installing the SPI for SAP Software on page 25](#)

You install the SPI for SAP software bundle on the HPOM management server and upload the configuration to HPOM.

Task 2: [Configuring SAP on page 35.](#)

You set up an SAP user and the SAP transport for the SPI for SAP so that it can log in to and communicate with SAP NetWeaver, and configure the SPI monitors to suit the monitoring requirements of your environment.

Task 3: [Configuring HPOM on page 45.](#)

You integrate the SPI for SAP with HPOM and bring all SAP application servers under HPOM management.

Installing the SPI for SAP Software

The first phase of the installation and configuration of the SPI for SAP includes the following sequence of task, each of which is described in detail in the individual sections that follow:

- 1 [Installing the SPI for SAP Software on the HPOM Management Server on page 26](#)
- 2 [Install the Generic JMX Component on page 27](#)
- 3 [Verifying the SPI for SAP Installation on page 28](#)
- 4 [Selecting the Performance Data Source on page 28](#)
- 5 [Installing the SAP GUI on the HPOM Management Server on page 30](#)
- 6 [Downloading SAP Libraries on page 30](#)

Installing the SPI for SAP Software on the HPOM Management Server

This section describes how to install the SPI for SAP software bundle from the DVD. To install the software:

- 1 Insert the DVD containing the SPI for SAP software in the DVD drive
- 2 As user root, test the connection to the DVD drive to ensure that the Smart Plug-in for SAP product is accessible by using the following commands:

```
mkdir /CDROM  
mount /dev/dsk/c1t2d0 /CDROM
```

On HP-UX:

```
swlist -d @ /CDROM/HPUX/OV_DEPOT/11.0HPUX.depot
```

On Solaris:

```
pkginfo -d /CDROM/SOLARIS/OV_DEPOT/HPOMSpiDVD-8.1.sparc
```

Note that `/dev/dsk/c1t2d0` is used here only as an example. You should replace `/dev/dsk/c1t2d0` with the path to and the name of the appropriate device file on your machine.

Ensure that the product `SPI-SAP-ITO` or `HPOvSpiSap` is present in the list of software products that is displayed. If it is not, check to make sure that the path to the drive is correct, and that the correct media is in the drive.

- 3 Install the software product.

To install the SPI for SAP software product on an HPOM management server on HP-UX, enter:

```
swinstall -s /CDROM/HPUX/OV_DEPOT/11.0HPUX.depot SPI-SAP-ITO
```

To install the SPI for SAP software product on an HPOM management server version 8.30 on Solaris, enter:

```
pkgadd -d SOLARIS/OV_DEPOT/HPOMSpiDVD-8.1.sparc HPOvSpiSap
```

- 4 If you are installing the SPI for SAP on an HPOM management server running in a high-availability cluster, no special customization is required. However, you need to bear in mind the following points:
 - a Use the `swinstall` command to install the SPI for SAP bits on *all* nodes in the high-availability cluster, where the HPOM management server is configured.
 - b On the node in the high-availability cluster where the HPOM management-server package is up and running, use the `r3itoin`s command to configure the SPI for SAP. You only need to configure the SPI for SAP *once* in the high-availability cluster: you do not need to configure the SPI for SAP on the nodes in the high-availability cluster where the HPOM management server package is not running.
 - c On each *back-up* node in the high-availability cluster (where the HPOM management-server package is not running), use the `r3itoin`s command to specify the ports which SAP will use to access the HPOM management server on the back-up node in the event of a fail over:

```
r3itoin -services
```

You can accept the port range proposed by default or specify the ports manually. In either case, note that you must specify the same ports for all nodes in the high-availability cluster.

Install the Generic JMX Component

If you want to monitor the SAP NetWeaver Web AS J2EE environment, you must install the generic JMX component along with the SPI for SAP. If you choose not to monitor the SAP NetWeaver Web AS J2EE environment, you can skip to the next procedure. To install the generic JMX component, follow these steps:

- 1 Insert the DVD containing the SPI for SAP software in the DVD drive.
- 2 As user root, test the connection to the DVD drive to ensure that the Smart Plug-in for SAP product is accessible by using the following commands:

```
mkdir /CDROM  
mount /dev/dsk/c1t2d0 /CDROM
```

On HP-UX:

```
swlist -d @ /CDROM/HPUX/OV_DEPOT/11.0HPUX.depot
```

On Solaris:

```
pkginfo -d /CDROM/SOLARIS/OV_DEPOT/HPOMSpiDVD-8.1.sparc
```

Note that `/dev/dsk/c1t2d0` is used here only as an example. You should replace `/dev/dsk/c1t2d0` with the path to and the name of the appropriate device file on your machine.

- 3 Install the generic JMX component.

To install the generic JMX component on an HPOM management server on HP-UX, enter:

```
swinstall -s /CDROM/HPUX/OV_DEPOT/11.0HPUX.depot JMXSPI
```

To install the generic JMX component on an HPOM management server version on Solaris, enter:

```
pkgadd -d /CDROM/SOLARIS/OV_DEPOT/HPOMSpiDVD-8.1.sparc HPOvSpiJmx
```

Uploading SPI for SAP Components

After installing the SPI for SAP, you must upload the necessary SPI components to the HPOM database with the `r3itoin` script. The `r3itoin` script uses the `opccfgupld` command. See the `opccfgupld` man pages for more information.

To upload the SPI components, follow these steps:

- 1 Log on to the management server as the user root.
- 2 Go to the `/opt/OV/lbin/sapspi` directory and run the following command:

```
./r3itoin
```

The following messages appear in the given sequence:

```
a Do you want to upload the SAPSPI UI integration? <y,n>
```

Select **y** to upload the necessary UI components to the HPOM database. If the UI components are already uploaded, selecting this option (**y**) will overwrite the existing components. You can select **n** to retain the existing configuration.

```
b Do you want to modify the /etc/services files with the following entry ranges:
```

```
A) From sapdp01 3200/tcp to sapdp99 3299/tcp
```

```
B) From sapgw01 3300/tcp to sapgw99 3399/tcp <y,n>
```

Select **y** to upload the necessary modifications to the configuration files. If the modification is already done, selecting this option (**y**) will overwrite the existing configuration. You can select **n** to retain the existing configuration.

Verifying the SPI for SAP Installation

To verify that the installation of the SPI for SAP completed successfully, follow these steps:

- 1 Launch the HPOM GUI as the HPOM administrator. To launch the console, run the following command from the command prompt:

```
opc
```

The User Login dialog box opens. You can log on with the following default administrative credentials:

User name: `opc_adm`

Password: `opc_adm`

- 2 Click **Window > Node Group Bank**. The Node Group Bank window opens.

Check that the SPI for SAP node group `sap` is present. The `sap` node group must be empty at this point in time.

- 3 Click **Window > Application Bank**. The Application Bank window opens.

Check that the SPI for SAP application groups—SAP R/3 Admin, SAP R/3 Local Admin, SAP R/3 NT, and SAP R/3 UN*X—are present under the SPI for SAP group. You must also make sure that each of the SPI for SAP application groups contains applications.

- 4 Click **Window > Message Group Bank**. The Message Group Bank window opens.

Check that the SPI for SAP message groups are present. SPI for SAP message groups start with `R3_`, for example; `R3_CCMS`.

- 5 Click **Window > User Profile Bank**. The User Profile Bank window opens.

Check that the SPI for SAP User Profiles—SAP Administrator, SAP Backup, SAP Database, and SAP Operator—are all present.

- 6 Click **Window > Message Source Templates**. The Message Source Templates window opens.

Check that the top-level SPI for SAP template group `SPI for SAP` is present in the list of template groups in the left pane and, by clicking it, contains the main SPI for SAP template groups, for example; `SAP R3 4.6/6.x/7.0AS/7.1kernel`, `SAP R3 4.6/6.xCI`, `SAP R3 7.0CI/7.1kernel`, and `SAP NetWeaver Java Monitoring`.

Selecting the Performance Data Source

By default, HPOM for UNIX deploys the HP Performance Agent (previously MWA) with all HPOM A.08.x agents. HPOM Smart Plug-ins use the HP Performance Agent as the default source for the performance data required for graphing in HP Performance Manager and for reporting with the HP Reporter. Previously installed HP Operations products that use the HP Performance Agent will continue to use Performance Agent as the data source.

The information in this section explains what to do if you are using the Embedded Performance Component (also known as CODA) as the data source on the managed node and wish to switch to the Performance Agent. You can override the use of the Embedded Performance Component by setting up a small text file, `nocoda.opt`, which changes the data source from CODA to the Performance Agent.

Once configured, the `nocoda.opt` file must be stored in a specific location on each managed node, whose performance-data source you want to change from the Embedded Performance Component to Performance Agent. 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 4](#) shows the location of the `nocoda.opt` file on nodes managed by an HPOM for UNIX management server.

Table 4 HPOM 8.x for UNIX Management Servers

Managed Node Operating System	Location of the <code>nocoda.opt</code> File
AIX	<code>https: /var/opt/OV/conf/dsi2ddf/nocoda.opt</code>
HP-UX, Linux, and Solaris	<code>https: /var/opt/OV/conf/dsi2ddf/nocoda.opt</code>
Microsoft Windows	<code>https: %OvDataDir%\conf\dsi2ddf\nocoda.opt</code>

To change the default setting for the data source from the Embedded Performance Component to Performance Agent, open the `nocoda.opt` file in a text editor and manually enter the appropriate information using the format and syntax illustrated in [An Example of the `nocoda.opt` File](#).

- 1 To designate Performance Agent as the agent for all data sources, enter the key word ALL at the top of the file.
- 2 To designate Performance Agent as the agent for a data source tied to a specific SAP NetWeaver (or SAP NetWeaver ITS) instance, include a reference to each instance on a separate line of the `nocoda.opt` file, as shown in [An Example of the `nocoda.opt` File](#) and using the following format:

For...	Use the following format...
SAP NetWeaver:	<code>R3_<SAP_Hostname>_<SAPSID>_<SAP_Instance_ Number>_ DATA</code>
SAP NetWeaver ITS	<code>R3ITS_<Virtual_SAPITS_Instance_Name>_ <SAPITS_Hostname>_ DATA</code>

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

An Example of the `nocoda.opt` File

```
#####
# Add to (or modify) the contents of this file to change the
# data-source from the default CODA to the Performance Agent
#####
# All hosts:
# ALL
# SAP R/3 hosts/instances:
R3_ovdsap_DEV_00_DATA
# SAP R/3 ITS hosts/instances:
R3ITS_SP6_00_ovspi_DATA
-----
```

Installing the SAP GUI on the HPOM Management Server

In this step, you install the SAP GUI on the HPOM management server using your SAP NetWeaver installation DVD; the SAP NetWeaver installation media contains all the instructions and information about pre-requisites that you need to perform the installation process. You should use the most recent version of the SAP GUI available for your environment. Note that most of the operator-initiated actions and applications included in the SPI for SAP have to start the SAP GUI. For this reason, a SAP GUI binary *must* be installed on the HPOM management server.



SAP does not support the SAP GUI on HP-UX/Itanium. The SPI for SAP functionality that depends on an SAP GUI being installed on the HPOM management server is not available when installing the HPOM management server on Itanium. Instructions and pre-requisites for installing the Java GUI for SAP may be found on the SAP installation DVD.

After installing the SAP GUI from your SAP NetWeaver installation media, you need to make the location of the SAP GUI binaries known to the SPI for SAP by running the following commands as user root on the HPOM management server:

1 Set the umask. Enter: `umask 22`

2 Set up a link to the SAP GUI. Enter:

```
ln -s <your_install_path_to_the_SAPGUI>/sapgui \
/opt/OV/lbin/sapspi/sapgui/sapgui
```

```
ln -s <your_install_path_to_the_SAPGUI>/guilogon \ /opt/OV/lbin/
sapspi/sapgui/javaguilogon
```

3 Start the SAP GUI using the following command:

```
/opt/OV/lbin/sapspi/sapgui/sapgui \
/H/<hostname>/S/<port_nr>
```

where *<hostname>* is the name of the server on which the SAP NetWeaver instance you want to connect to is running, and *<port_nr>* is the port number allocated to the SAP process as defined in `/etc/services`.

4 Configure your SAP GUI to use the SPI for SAP application Java R/3 Frontend. For example, you need to create a `platin.ini` file in the home directory of the user calling the application. The `platin.ini` file lists the SAP hosts and instances which are available for login. Refer to the SAP GUI installation instructions on the SAP NetWeaver installation media for more details.

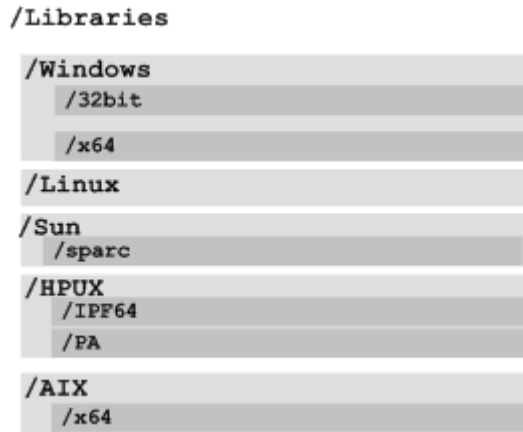
Downloading SAP Libraries

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 directory on the management server:

```
/tmp/Sap_RFC_Downloads/Libraries
```

- 2 Inside the newly created `Libraries` directory, create the following directory structure:



- a Create the `Libraries` directory under the `/tmp/Sap_RFC_Downloads` directory.
 - b Under the `Libraries` directory, create the `Windows`, `Linux`, `Sun`, `HPUX`, and `AIX` directories.
 - c Under the `Windows` directory, create the `32bit` and `x64` directories.
 - d Under the `Sun` directory, create the `sparc` directory.
 - e Under the `AIX` directory, create the `x64` directory.
 - f Under the `HPUX` directory, create the `IPF64` and `PA` 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:

Node Platform	Library File	Copy into the Folder
Windows 32-bit	<code>librfc32.dll</code>	<code>/Windows/32bit</code>
Windows X64	<code>librfc32.dll</code>	<code>/Windows/x64</code>
Linux ^a	<code>librfccm.so</code>	<code>/Linux</code>
Solaris	<code>librfccm.so</code>	<code>/Sun/sparc</code>
HP-UX IA-64 64-bit	<code>librfccm.so</code>	<code>/HPUX/IPF64</code>
HP-UX PA-RISC	<code>librfccm.sl</code>	<code>/HPUX/PA</code>
AIX ^b	<code>librfccm.so</code>	<code>/AIX/x64</code>

- a Use the RFC SDK 6.40 for the Linux IA-32 platform
- b 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 directories, run the `Install the RFC Library` application on the management server from the **SPI for SAP > SAP R/3 Admin** application group.

Upgrading the SPI for SAP

This section describes how to upgrade the SPI for SAP software from a previous version to the current version. Once you have upgraded the SPI for SAP software on the HPOM management server, you will need to use the information in [Verifying the SPI for SAP Installation](#) on page 28 to ensure that the software upgrade completed successfully.

To migrate the SPI for SAP from an older version to the latest version, follow these steps:

- 1 Ensure you have read and understood the requirements in [System Requirements](#) on page 19 and [Compatible Software Versions](#) on page 22.
- 2 Use the `opc_backup` command to save the complete, current configuration. This enables you to restore the configuration in the event that the upgrade is unsuccessful:
 - a It is recommended but not *absolutely* necessary that you download all configuration data using the HPOM GUI (and the `All` option) before you back up the HPOM installation. You can also use the command `opccfgdwn(1m)`, which downloads *all* configuration data by default.

You should also consider downloading history messages and audit entries using the `opchistdwn(1m)` and `opcauddwn(1m)` commands, respectively.

- b Exit all running HPOM GUIs.
- c Make a full backup of the current installation. Enter:

```
/opt/OV/bin/OpC/opc_backup
```

When prompted:

```
Do you want to use the full or configuration backup?
```

```
(f | c) ==>
```

Enter: **f** for a *full* backup that includes the HPOM binaries and the configuration data.

- d Make safety copies of any configuration files that contain modifications you made to the original configurations. [Table 5](#) shows the directories where configuration files can be found. Note that the configuration has changed from the previous SPI for SAP version to the current version, for example; message conditions. In addition, although the configuration files from the older version are compatible with the current version, the default configuration has changed for some of the monitors..



 It is not recommended to overwrite newly installed configuration files with old ones. Rather, you should carefully incorporate into the new configurations files any changes that were made to the old configuration files

Table 5 Locating SPI for SAP Configuration Files

Configuration Files	Directory Location
Originals ^a	/opt/OV/newconfig/var/opt/OV/share/conf/sapspi
Global ^b	/var/opt/OV/share/conf/sapspi/global
Local	/var/opt/OV/share/conf/sapspi/local

- a. Originals: placed here during installation of the SPI for SAP software. Note that older versions of the SPI for SAP installed the configuration files to: /opt/hpitosap/config/[cmds|monitors], a directory which is not removed as part of the upgrade to 11.00.
- b. Working copies of the originals, which are placed here during configuration of the SPI for SAP.

- 3 If you have modified any of the SPI for SAP message-source templates, create a safety copy of the SPI for SAP template group and all the templates it contains. For instructions concerning how to copy templates, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

 You cannot simply overwrite the new templates delivered as part of SPI for SAP version 11.00 with the backup copy of the previous template version. You have to merge any changes you made to the old templates into the new templates. Since some of the new templates have been revised and improved, overwriting them with an older version will result in unmatched messages. For more information, see [Changes and Modifications to the SPI for SAP](#) on page 23.

- 4 If you are using the SPI for SAP performance-monitor sub-agent version 11.00, please read the section about upgrading the performance-monitor subagent in the *HP Operations Smart Plug-in for SAP Administrator's Reference* before continuing with the next step, which concerns the removal of the old SPI for SAP software.

 You need to remove the old SPI for SAP performance monitor subagent before you remove and upgrade the SPI for SAP.

- 5 Remove the old SPI for SAP software from the management server and the managed nodes:
 - a Remove the SPI for SAP components and the agent software from the managed nodes using the HPOM GUI.
 - b Remove the SPI for SAP/Performance Agent sub-agent components from the managed nodes using the HPOM GUI.
- 6 Remove the old SPI for SAP software from the management server and the managed nodes:
 - a Do *not*, even if prompted, delete any HPOM UI-integration elements: most elements remain unchanged between the previous and current versions of the SPI for SAP.
 - b Before removing the existing SPI for SAP software from the HPOM management server, remember to run the command `r3itoinf -u`, which removes the SPI for SAP binaries from the HPOM database. The following message is displayed:

Removing SPI for SAP instrumentation from OVO instrumentation directory tree.

- c Use the `swremove(1M)` command to remove the SPI for SAP software from the management server. On the management server, as user `root`, enter:

```
swremove SPI-SAP-ITO
```

- 7 Install and configure the new SPI for SAP software according to the instructions provided in [Installing the SPI for SAP Software](#) on page 25.

Answer “No” when SPI for SAP’s `r3itoin`s script asks whether to overwrite the existing version of the configuration-file with the new SPI for SAP factory defaults, as follows:

```
A set of SPI for SAP configuration files is already in use. Uploading the
factory defaults now will overwrite the configuration files already in
use. Overwrite the existing configuration files with the factory defaults?
<y,n> No
```

- 8 HPOM provides a number of tools to help you cross check duplications and changes, which result from the upgrade. For example the `opcdbidx` command checks for any duplication of applications. For information about what tools are available with HPOM to help you merge old and new configurations *after* the upgrade, see the upgrade section in the *HP Operations Manager for UNIX Installation Guide for the Management Server*.

- 9 Upgrade the SPI for SAP performance monitor Subagent

Read carefully the instructions in the section about upgrading the SPI for SAP performance-monitor subagent in the *HP Operations Smart Plug-in for SAP Administrator’s Reference* before converting any data.

- 10 Starting with the version 10.20, the SPI for SAP uses a new directory structure. If you are upgrading from a version of the SPI for SAP that is older than the version 10.20, you can safely remove the directory structure used by the old version of the SPI for SAP, but only after successfully completing the upgrade procedure and ensuring that everything works as expected. To remove the old directory structure, enter:

```
rm -r /opt/hpitosap
```

4 Configuring SAP

This chapter provides the information you need to configure SAP NetWeaver to recognize and work with the Smart Plug-in for SAP.

In this Section

The tasks in this phase require knowledge of SAP transactions and specific monitoring requirements. You will be working with the HPOM GUI as well as on the SAP system application servers. You will need to log in to HPOM as an operator and to the SAP clients as a user with sufficient authority to perform the SAP tasks included in this phase. These tasks are summarized as follows:

- 1 [Applying the SAP Transport](#) on page 35.

In this step, you copy the SPI for SAP transport files to the SAP transport directories on each SAP NetWeaver central instance and apply them. These files are placed temporarily in the HPOM directory to facilitate the HPOM administrator task of distribution of SPI for SAP components to SAP nodes.

- 2 [Setting Up an SAP User for HPOM](#) on page 38.

This is necessary so that the SPI for SAP can log on to SAP whenever SPI for SAP applications, monitors, or actions need access to SAP.

- 3 [Configuration Values for SPI for SAP Monitors](#) on page 40. For more information, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

▶ After you have set up and distributed the configuration values, the SPI templates must be distributed to the SAP nodes. See [Configuring HPOM](#) on page 45.

- 4 [Modifying Configuration-File Templates](#) on page 42.

The SPI for SAP validates the contents of `r3moncol`-based configuration files when you attempt to save them and will not allow you to save a file that contains a configuration error.

Applying the SAP Transport

In this step, you copy the transport files that are delivered with the SPI for SAP to the SAP transport directories on each SAP central instance. The transport that you import in this step contains SAP roles and authorization profiles, which are required to complete the configuration of the SAP user later in this section.

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.



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 already exist.

The SPI for SAP includes the following transport files:

- **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 the SAP's central monitoring system(CEN) 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.

The naming conventions used for the transport objects are as follows:

Objects in SPI for SAP

Development Class: /HPOV/SAPSPI

Function Groups: /HPOV/ZLPO
/HPOV/ZSPA
/HPOV/ZSPB
/HPOV/ZSPY
/HPOV/WEBAS
/HPOV/WEBAS70
/HPOV/SOLMAN

Function modules: /HPOV/OV_*

Programs: /HPOV/YSPI*
/HPOV/ZHPSPI*

Roles: /HPOV/SAPSPI_MONITORING*
Roles: /HPOV/SAPSPI_SECURITY_MON




The following procedure requires the CAR/SAPCAR command, which you can find on the SAP Kernel CD. The SAPCAR command appears with SAP 4.6 or later

To copy the SPI for SAP transport files to the managed nodes:

- 1 Open the HPOM Node Bank window on the HPOM management server.

- 2 In the HPOM Application Bank window, open the **SPI for SAP > SAP R/3 Admin** application group.
- 3 Select one (or several) SAP node(s).
- 4 In the SAP R/3 Admin application group, double-click the Move SAP Transport icon. A message appears in the message browser indicating that the transport has been moved to the specified directory.

 The copy operation fails if the operating-system user executing the Move SAP Transport application does not have write permission in the transport directory (/usr/sap/trans) on the managed node (SAP server). Either enable write access to the transport directory or copy the files manually.

- 5 As SAP administrator (<SID>adm) on the HPOM managed node, use the CAR (or SAPCAR) command to unpack the transport files to /usr/sap/trans. Enter:

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

The SPI for SAP transport package contains a number of different transport files, for example: the main SPI for SAP transport, test programs, user-roles, and special localized text symbols. Some transports are mandatory; some are optional. Which transports you need to import depends on the version of SAP running in the System you want to monitor with the SPI for SAP. For more information about the SPI for SAP transports, their contents, and whether they are mandatory, see the transport read-me file on the management server: /usr/sap/trans/readme.

- 6 You can import the SPI for SAP transport either by using command line or SAP GUI.

To import SPI for SAP transport using command prompt, follow these steps:

Import the SPI for SAP-related transport to your SAP application servers. Enter the following commands as SAP administrator (<SID>adm) on the managed node:

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

Where the <SID> is the SAP System ID on the HPOM managed node and <transport_file_name> is the name of the transport file, which corresponds to the version of SAP NetWeaver 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 NetWeaver versions, see the following file on the HPOM management server after installation of the SPI for SAP bits: /opt/OV/lbin/sapspi/trans/readme.

If, when running the tp addtobuffer or tp import commands with versions of SAP NetWeaver up to and including SAP 4.5, the tp command indicates that it cannot find files or required information, you can use the pf=<path>/TPPARAM option to show the location of the tp-parameters file:

```
pf=/usr/sap/trans/bin/TPPARAM
```

The TPARAM file contains the configuration parameters, which the tp command uses. The configuration parameters include such things as the SAPSID, the database hostname, and the database configuration paths. Note that, from SAP 4.6 onwards, the name and format of the TPARAM file has been changed as follows:

```
pf=/usr/sap/trans/bin/TP_DOMAIN_<SID>.PFL
```

If you encounter errors when using the `tp addtobuffer` command, you can clean the `tp` buffer using the following command:

```
tp cleanbuffer <SID>
```

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

- a 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.
 - b In the SAP GUI, enter the following transaction ID to display the SAP Transport Management System (SMTS) login page: **STMS**
 - c In the SAP Transport Management System login page, click the **Transport** icon (or press the **F5** function key).
 - d Select the SID of the SAP System into which you want to import the SPI for SAP transport.
 - e In the file menu, click **Extras > Other requests > Add**.
 - f 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
```

 - ▶ 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 38. The default client for the SPI for SAP user-role transport is 099.
 - g Select the **Check [✓]** icon or use the **Enter** key to add transaction requests.
 - h Highlight the desired transport.
 - ▶ If you do not select any transport, SAP assumes you want to select *all* transports in the list.
 - i Select **Request > Import**. The Import Request dialog box opens.
 - j Enter the target client number (000 is the default client number).
 - k Check items in the Option tab that are appropriate for your system.
 - l Click the **Check [✓]** icon or press **Enter**.
- 7 Repeat this procedure for each SAP System you want to manage with HPOM.

Setting Up an SAP User for HPOM

For every SAP SID where you want to allow the automated log on of HPOM operators:

- 1 Log on to SAP.
- 2 Call the following transaction: `/nsu01`

- 3 Create a new user named ITOUSER using the parameters specified in the following list:

- ▶ Since user-role transports are client dependent, the SAP user "ITOUSER" must be created in the same SAP client as the import client of the SPI for SAP user-role transport. Otherwise it is not possible to assign user role "/hpoov/sapspi_monitoring*" to the new "ITOUSER".

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 be unavailable. 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, monitor-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.

User Roles SAP User Roles need to be defined from SAP version 4.6C onwards. Use transaction /nsu01, as shown in [Figure 2](#) on page 40. Note that ITOUSER requires authorizations to be able to execute SPI for SAP ABAP functions. Select the following user role:

- /HPOV/SAPSPI_MONITORING_TCODE

This user role enables the use of certain SAP transactions and does not place any restrictions on the SPI for SAP functionality.

- /HPOV/SAPSPI_MONITORING_NO_TCD

This user 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

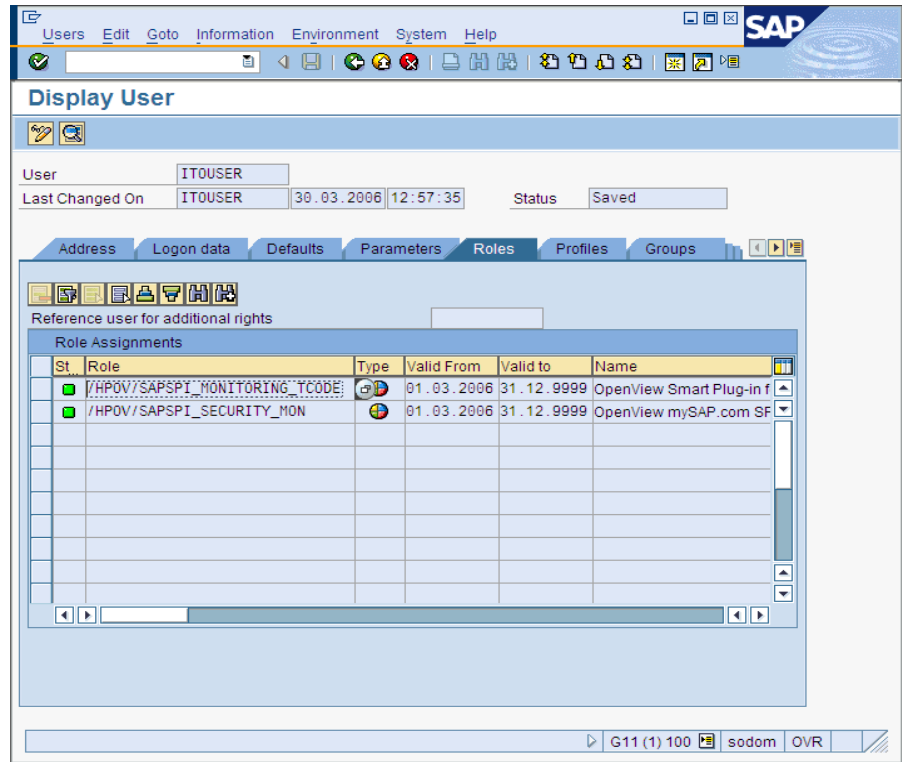
- 4 Activate the profile and assign it to the SAP user "ITOUSER", which you have already created.

When assigning SPI for SAP roles, it is important to verify that all required authorization objects are active and the user comparison completed successfully. SAP uses the color green to indicate that user-authorization objects are active or that user comparisons completed successfully; the color red indicates that you need to activate user-authorization objects or complete a user comparison. Transaction SU01 displays details of SAP user roles.

- 5 Log on to SAP as user ITOUSER.

- SAP NetWeaver prompts you to change the password initially specified for ITOUSER. If you have not specified 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 2 SAP 4.6C User Roles for ITOUSER



Configuration Values for SPI for SAP Monitors

To conclude the SAP-specific tasks, you have to set up initial configuration values for the SPI for SAP monitors *before* you distribute the configuration files to the managed nodes. Note that this step requires detailed and expert knowledge of SAP and the SAP Systems, which you intend to monitor with the SPI for SAP. For example, when setting up the r3monale monitor to check the status of incoming and outgoing iDOCs, you need to understand the iDOC system to be able to decide what information is important and how you want the SPI for SAP to monitor it. The SPI for SAP includes the monitors listed in [Table 6](#).

Table 6 SPI for SAP Monitors

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

Table 6 SPI for SAP Monitors (cont'd)

Monitor Name	Description
r3mondev	Trace monitor of the SAP logfile: <SID>/<INSTANCE>/work/dev*
r3mondisp	ABAP dispatcher monitor
r3mondmp	ABAP/4 Dump 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	SAP-security monitor
r3monspl	Spool monitor
r3status	SAP NetWeaver status monitor
r3montra	Transport monitor
r3monupd	Update monitor
r3monusr	User monitor
r3monwpa	Work-process availability monitor

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

The SPI for SAP provides two sets of applications to help you configure and distribute monitors:

- **Global Applications**

For the configuration of monitors which apply to *all* managed nodes. For more information about which applications open which monitor-configuration files, see [SAP R/3 Admin Application Group](#) on page 82.

- **Local Applications**

For the configuration of monitors which apply only to a *specified* managed node. For more information about which applications open which monitor-configuration files, see [Application Desktop for SAP R/3 Admin Local](#) on page 85.

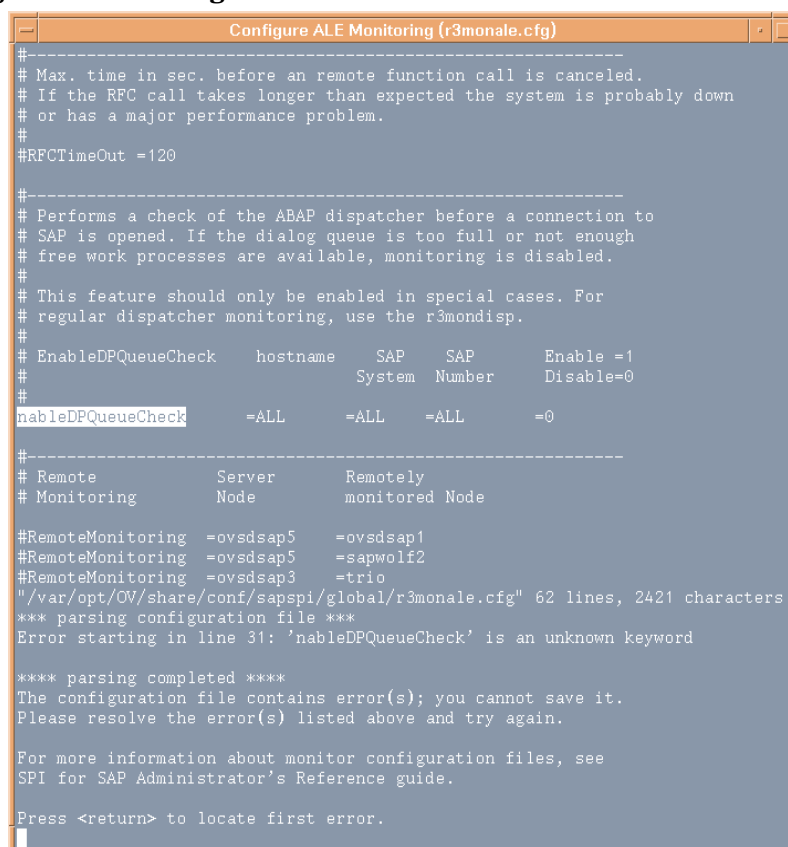
For more detailed information about (and instructions for) configuring the SPI for SAP monitors, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*. For more information about installing Performance Agent agent-related functionality, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Modifying Configuration-File Templates

If you use HPOM tools to edit a SPI for SAP monitor-configuration file that 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, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Figure 3 on page 42 shows the information the SPI for SAP displays if the configuration parser discovers that an error exists in the monitor-configuration file when you try to save it.

Figure 3 Parsing Monitor-Configuration Files



```
Configure ALE Monitoring (r3monale.cfg)
#-----
# Max. time in sec. before an remote function call is canceled.
# If the RFC call takes longer than expected the system is probably down
# or has a major performance problem.
#
#RFCTimeOut =120
#-----
# Performs a check of the ABAP dispatcher before a connection to
# SAP is opened. If the dialog queue is too full or not enough
# free work processes are available, monitoring is disabled.
#
# This feature should only be enabled in special cases. For
# regular dispatcher monitoring, use the r3mondisp.
#
# EnableDPQueueCheck    hostname    SAP    SAP    Enable =1
#                       System      Number Disable=0
#
nableDPQueueCheck      =ALL      =ALL    =ALL    =0
#-----
# Remote      Server      Remotely
# Monitoring  Node        monitored Node
#RemoteMonitoring =ovdsap5   =ovdsap1
#RemoteMonitoring =ovdsap5   =sapwolf2
#RemoteMonitoring =ovdsap3    =trio
"/var/opt/OV/share/conf/sapspi/global/r3monale.cfg" 62 lines, 2421 characters
*** parsing configuration file ***
Error starting in line 31: 'nableDPQueueCheck' is an unknown keyword

**** parsing completed ****
The configuration file contains error(s); you cannot save it.
Please resolve the error(s) listed above and try again.

For more information about monitor configuration files, see
SPI for SAP Administrator's Reference guide.

Press <return> to locate first error.
```

After the parsing is complete, the configuration parser indicates that it has found errors and explains that you cannot save the file until the errors have been fixed. The message displayed at the bottom of the configuration file you are modifying invites you to press Enter to display the first error (if more than one error exists) that needs to be fixed.

If the monitor-configuration file you want to save does not contain any errors, the SPI for SAP displays a message similar to the one illustrated in [Saving Valid Monitor-Configuration Files](#) on page 42, which indicates that the modified configuration file for the SAP iDOC-status monitor `r3monale` is valid and reminds you to activate the new configuration and distribute it to the managed nodes.

Saving Valid Monitor-Configuration Files

```
"/var/opt/OV/share/conf/sapspi/global/r3monale.cfg" 62 lines, 2422 characters
*** parsing configuration file ***
**** parsing completed ****
```

Use the 'Install Config' application to activate and distribute the configuration to the managed node(s).
Press <return> to continue

5 Configuring HPOM

This chapter provides the information you need to configure HPOM to recognize and work with the Smart Plug-in for SAP.

In this Section

In this phase of the installation, you use the HPOM administrator GUI to integrate the SPI for SAP with HPOM and bring all SAP application servers under HPOM management. In this section, you complete the following tasks:

- 1 [Specifying SAP Clients to Monitor](#) on page 45
In this step, you use the HPOM GUI to specify which SAP Systems you want the SPI for SAP to monitor.
- 2 [Assigning the SAP Servers to the SAP Node Group](#) on page 49
In this step you assign the SAP servers you want to manage with HPOM to the newly created `sap` node group.
- 3 [Assigning SAP Responsibilities](#) on page 49
The SPI for SAP creates four new operator profiles, which you can then use as a basis for creating your own SAP operators.
- 4 [Assigning SPI for SAP Templates to SAP Nodes](#) on page 52
The SPI for SAP's default template groups contain templates for *all* the SAP NetWeaver monitors supplied with the SPI for SAP. Assigning and distributing a template group automatically activates the monitors, which the group contains.
- 5 [Distributing SPI for SAP Components to the SAP nodes](#) on page 54
In this step, you distribute the SPI for SAP actions, commands, monitors, and templates to the SAP managed nodes.

Specifying SAP Clients to Monitor

This section describes how to provide HPOM users and applications with automatic access to the SAP GUI and, in addition, tell the HPOM monitors which SAP Systems to monitor. The SPI for SAP application `SAP R/3 GUI` allows you to enter all the information that is required to complete this task.

- 1 In the HPOM GUI, open the application-groups window and locate the `SAP R/3 GUI` application, which you can find in the application group, **SPI for SAP > SAP R/3 Admin**. The `SAP R/3 GUI` application opens the `r3itosap.cfg` configuration file in a text editor so

that you can enter the required information concerning the SAP Systems you want to monitor with the SPI for SAP. Examples entries in the `r3itosap.cfg` file (commented out by default) illustrate the required content and syntax of a configuration line.



SAP users must be set up for each SAP client and have permission to display and maintain CCMS. The list of SAP clients you made in [Installation Pre-requisites](#) on page 19 includes the information you need for each configuration line. For more information on how to set up SAP users for HPOM, see [Setting Up an SAP User for HPOM](#) on page 38.

- 2 Using the pattern 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:

- Make sure you use fully qualified host names for all the host names you specify in the `r3itosap.cfg` file.
- 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 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 SPI for SAP application R/3 SAP GUI to edit the `r3itosap.cfg` file, the password is encrypted automatically when you save the file.

Non-ASCII characters are not allowed in SAP-login names or passwords that you specify in the `r3itosap.cfg` file; the SPI for SAP is currently able to resolve only ASCII characters in configuration files.

- 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`.
 - You must add an entry to the `r3itosap.cfg` file for each SAP instance running on a node that you want to monitor remotely from a managed node. For more information about remote monitoring with the SPI for SAP, refer to the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
- 3 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. If the hosts you add to the `r3itosap.cfg` file are *not* configured in a high-availability cluster, you can skip this step and proceed to the next step in the configuration process.

The information in the host-mapping section of the `r3itosap.cfg` file 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 message browser or the Navigator.

The “physical” nodes are the hosts in the high-availability cluster on which you install and configure the SPI for SAP. 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.

- ▶ 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 for your high-availability cluster in the host-mapping section of the `r3itosap.cfg` file.

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>
```

In [Mapping physical and relocatable host names](#), CTO and 11 are the SID and number of the SAP instance running in the high-availability cluster. [Mapping physical and relocatable host names](#) also shows the entry you add to the HostMapping 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”.

Mapping physical and relocatable host names

```
# cluster host mapping
HostMapping =CTO =11 =true.hp,false.hp,maybe.hp =example.hp
```

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 cluster nodes, for example:

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

- If SAPLOCALHOST and <HPOM_Msg_Node> are *not* the same host, an entry for SAPLOCALHOST *is* required in 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 node bank. You also need to add to the HPOM node bank as node type “Message allowed” the host which you define in <OVO_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 High-availability Environment](#) on page 65.

To ensure that automatic or operator-initiated actions are always able to open a 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`.

To avoid problems with HPOM 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 be displayed in messages coming from the cluster, see [Host Mapping on Cluster Nodes](#) on page 66.

- 4 Save your changes and exit.

To ensure that any new passwords you enter in the monitor configuration files are encrypted, use the SPI for SAP application R/3 SAP GUI to edit the `r3itosap.cfg` configuration file. If you use a text editor such as `vi` or `emacs` to enter passwords in the monitor configuration file, any new passwords you enter are *not* automatically encrypted when you save the file and exit.

Check that the SAP systems have been correctly added by watching the bottom of the screen for output similar to [Adding SAP SIDs to the r3itosap.cfg File](#):

Figure 4 Example r3itosap.cfg File

```

-----
#
#          hostname          SAP   SAP   SAP   SAP   SAP   SAP   Hardware
#                          System Number Client User   Password Lang  [UX,NT]
# Examples:
#HostSapAssign   =hpbbcpo5.hp.com =LPO  =00   =099  =default =default =default =UX
#HostSapAssign   =hpbbsap2.hp.com =BNT  =00   =001  =default =default =default =NT
#HostSapAssign   =isoit342.hp.com =CTO  =11   =001  =default =default =default =NT
#HostSapAssign   =isoit270.hp.com =CTO  =11   =001  =default =default =default =NT
#HostSapAssign   =sapclust.hp.com =CTO  =11   =001  =default =default =default =NT
# Example for SAP R/3 3.x
#HostSapAssign   =hpbbcpo5.hp.com =LPO  =00   =001  =user1  =pass1  =E       =UX
# Example for SAP R/3 4.
#HostSapAssign   =hpbbcpo5.hp.com =LPO  =00   =001  =user1  =pass1  =EN      =UX

#-----
# host mapping for SAP Systems in high availability environments
#          SAP   SAP   SAP
#          System Number physical hostnames,SAPLOCALHOST parameter          OVO
#          message hostname
#
#HostMapping =CTO   =11   =isoit270.hp.com,isoit342.hp.com,sapclust.hp.com =sapclust.hp.com

```

Adding SAP SIDs to the r3itosap.cfg File

```

"/var/opt/OV/share/conf/sapspi/r3itosap.cfg" 15 lines,1175 char
>>> Encoding passwords in file
>>> /var/opt/OV/share/conf/sapspi/r3itosap.cfg started
>>> Encoding of passwords done
>>> Scanning SAP systems for existing front-end done
>>> Symbolic link /usr/sap/SP6/SYS/exe/run -> /opt/OV/lbin/sapspi/sapgui
created
>>> Directory /usr/sap/SP6/D0/work created

```

In order to activate this configuration, execute "Install Config" and distribute the Monitors and Commands to the SAP R/3 managed node

Press return to continue

The information in the `r3itosap.cfg` file is used by the service- discovery application, R/3 Service Discovery, to generate a service view of your SAP Landscape. If you intend to use the Service-Views feature, make sure that you assign and distribute the `r3itosap.cfg` file to

the managed node(s) for which you want to generate service views before you run the service-discovery. For more information about running service-discovery and setting up service views, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Assigning the SAP Servers to the SAP Node Group

Installing SPI for SAP automatically creates a new node group called `sap`, to which you assign your SAP servers. Note that this step is mandatory; if you do not perform this step, you will not see any messages from the SAP servers in the HPOM message browser.



Before you start adding the nodes, make sure that the latest version of the Microsoft .NET framework is installed on all nodes with the Windows operating system.

- 1 In the `Node Group Bank` window, select the `sap` node group.
- 2 Assign all the SAP servers you wish to monitor to the `sap` node group, following the instructions given in [Table 7](#).

Table 7 Assigning Managed Nodes to Node Groups

IF...	THEN...
the node <i>already</i> exists in HPOM node bank	<ol style="list-style-type: none"> 1 Open the <code>Node Bank</code> window 2 Select the SAP node 3 Drag it to the <code>sap</code> node group icon, and drop it.
the node does <i>not</i> already exist in the HPOM node bank	<ol style="list-style-type: none"> 1 Open the <code>Node Bank</code> window and from the menu bar select: Actions:Node-> Add 2 Specify the <code>sap</code> node group as the group for the new node. 3 Install the HPOM agent software on the new managed node before continuing.

Assigning SAP Responsibilities

In HPOM, you can assign operator responsibilities by means of user profiles. The SPI for SAP creates four new operator profiles, which may be used as a basis for creating your own SAP operators. The four SAP-specific user profiles appear in the `User Profile Bank` window, as follows:

- SAP Administrator
- SAP Backup
- SAP Database
- SAP Operator

The easiest way to add a new HPOM user is to copy an existing user, change the new user's name, and modify the responsibilities of the new user appropriately.

- 1 Open the User Bank and the User Profile Bank windows
- 2 In the User Bank window, select and right-click an existing user, for example `opc_op`, and click the Copy . . . menu item. The Copy User window appears.
Change the Name and Label fields, for example, to: **SAP_op** and **SAP_op**
- 3 Assign default responsibilities and applications to the new user by clicking Profiles . . . The Profiles of New User window appears.
- 4 Open the User Profile Bank window to see the available profiles. Select the appropriate user profile, for example SAP Operator, drag it over and drop it into the Profiles of New User window.
- 5 Return to the Copy User window and click OK. The user `SAP_op` appears in the User Bank window with the combined (default) responsibilities of the `opc_op` operator you used as a base *and* the SAP Operator user profile.

▶ The responsibilities assigned in a user profile are *global* and, as a result, *not* immediately visible in the responsibilities matrix of the individual user you create. Similarly, the responsibilities of the new user you create are *local* and only visible in the new user's own responsibilities matrix. However, if you assign the SAP Operator user profile to the `SAP_op` user, *all* the message and node groups included by default in the SAP Operator user profile are indeed assigned to the `SAP_op` user even if it does not initially appear so.

You can check which responsibilities are associated with a given user by selecting the user you want to check in the User Bank window and generating a report:

Actions: Utilities > Reports... > Operator Report

To change or modify the responsibilities and applications for any given operator:

- 1 In the User Bank window, select and right-click an existing user, for example `SAP_op`, and click the Modify . . . menu item. The Modify User window appears.
- 2 Click the Responsibilities . . . button if you want to modify default responsibilities for an existing user. The Responsibilities for Operator window appears. [Table 8](#) lists the standard user profiles included with the SPI for SAP and indicates which message groups are assigned by default to which SAP operator profiles.

Table 8 Message-Group Assignments for SPI for SAP User Profiles

Message Group	Default SPI for SAP User Profiles			
	SAP Admin.	SAP Backup	SAP Database	SAP Operator
R3 ABAP-4	✓			✓
R3 ALE	✓			✓
R3_Buffers	✓			✓
R3_Backup	✓			✓
R3 CCMS	✓			✓
R3_CTS	✓			

Table 8 Message-Group Assignments for SPI for SAP User Profiles

Message Group	Default SPI for SAP User Profiles			
	SAP Admin.	SAP Backup	SAP Database	SAP Operator
R3_DB	✓	✓	✓	✓
R3_Dispatch	✓			✓
R3_Enqueue	✓		✓	✓
R3_General	✓			✓
R3_ITS	✓			✓
R3_Jobs	✓			✓
R3_MON_ERROR	✓			✓
R3_Performance	✓			✓
R3_Roll-Paging	✓			✓
R3_RFC	✓			✓
R3_Security	✓			✓
R3_Spooler	✓			✓
R3_State	✓			✓
R3_Syslog	✓	✓	✓	✓
R3_Trace	✓			✓
R3_Transport	✓			
R3_Update	✓		✓	✓
R3_User	✓			✓
R3_WP	✓			✓
R3_XMI	✓	✓	✓	✓

- Click the Applications... button if you want to modify default application assignments for an existing user. The Applications of Operator window appears. Table 9 lists the standard user profiles included with the SPI for SAP and indicates which application groups are assigned by default to which SAP operator profiles.

Table 9 Application-Group Assignments for SPI for SAP User Profiles

Application Group	Default SPI for SAP User Profiles			
	SAP Admin.	SAP Backup	SAP Database	SAP Operator
SAP R/3 Admin	✓			
SAP R/3 Admin Local	✓			
SAP R/3 NT	✓			✓
SAP R/3 UN*X	✓			✓

- When you have finished making your modifications, save the changes by returning to the Modify User window and clicking OK.

Assigning SPI for SAP Templates to SAP Nodes

Message-source templates for the SPI for SAP are organized into default groups, all of which are part of the template group SPI for SAP. The SPI for SAP template groups are:

- SAP ITS 6.20
- SAP R3 4.6/6.xCI
- SAP R3 4.6/6.x/7.0AS/7.1kernel
- SAP R3 7.0CI/7.1kernel
- SAP NetWeaver Java Monitoring

Only one template group should be assigned to any one managed node. Which template group you assign is determined by the SAP version running on the node and whether the node is a central instance or an application server.



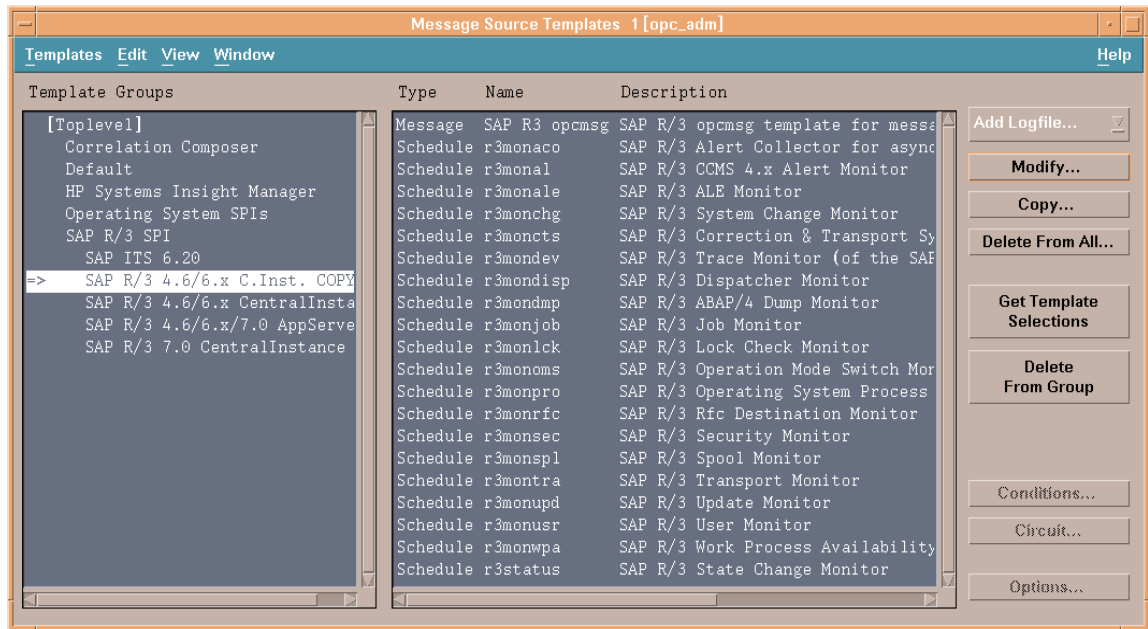
The SPI for SAP's default template groups contain templates for *all* the SAP NetWeaver monitors supplied with the SPI for SAP. Assigning and distributing a template group automatically activates the monitors, which the group contains. To avoid receiving messages from unnecessary monitors, we recommend you use the default template groups as a basis to create your own template groups, which contain only those monitors and templates you need. We also recommend that you tune the monitors and templates to suit the requirements of your environment *before* assigning and distributing them to the nodes you want to manage with the SPI for SAP. This will prevent additional unwanted messages.

To create your own template group, copy an existing template group and modify the contents of the new group as follows:

- Use the Message Source Templates window illustrated in Figure 5 on page 53 to make your own template group from which you should remove those templates and monitors you do not need, as follows:

- a Open the Message Source Templates window, select the template group you want to copy, and click the Copy . . . button
- b Enter a name and description for the new template group in the fields provided and click OK
- c In the left pane, select the new template group: In the right pane select the templates and monitors you do *not* need and remove them using the Delete From Group button.
- d Configure the monitors and templates you *do* need. For more information, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

Figure 5 Removing Templates from Template Groups



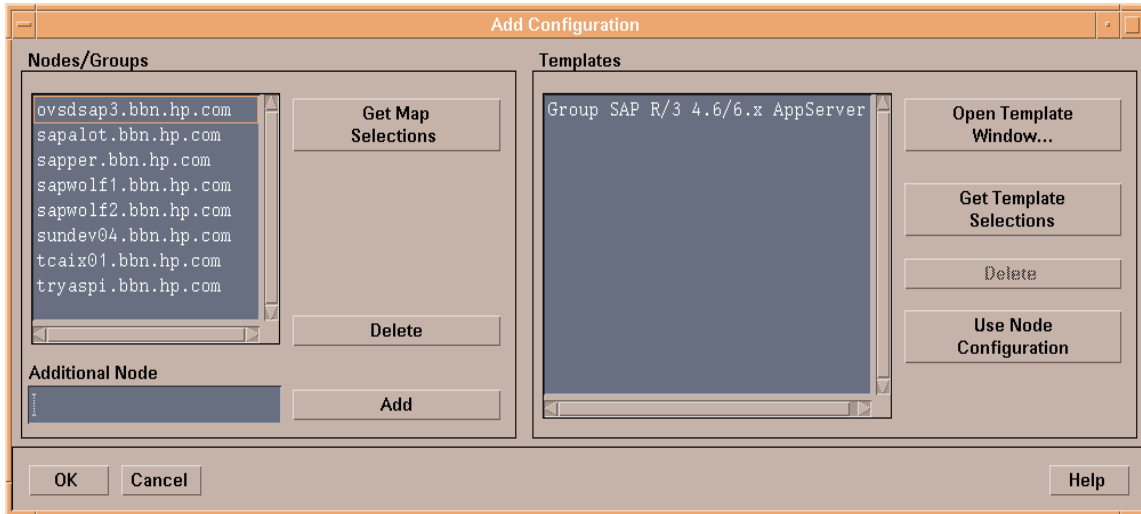
- 2 In the Node Bank window, select the SAP nodes to which you want to assign templates. Nodes selected together must:
 - all run the same SAP version, for example: 4.6/6.x
 - all have the same usage—application server or central instance
- 3 From the menu bar, select the following menu option:

Actions:Agents-> Assign Templates....

The Define Configuration window opens.
- 4 Click **Add...**; the Add Configuration window opens.
- 5 Click Open Template Window; the Message Source Templates window appears.
- 6 In the left pane, expand the SPI for SAP template group and select the template group or groups you have created (containing the monitors you need) depending on which SAP version is installed on the managed nodes and whether the nodes are central instances or application servers. For example: SAP R/3 4.6/6.x C. Inst. COPY.
- 7 Return to the Add Configuration window (see Figure 6) and click Get Template Selections.

The newly assigned template is displayed in the Templates list.
- 8 Click OK to finish assigning templates.

Figure 6 Add Configuration Window



Distributing SPI for SAP Components to the SAP nodes

In this step, you distribute and install the configuration files to the SAP managed nodes and, once this has been successfully completed, distribute the SPI for SAP actions, commands, monitors, and templates to the SAP managed nodes, too, as follows:

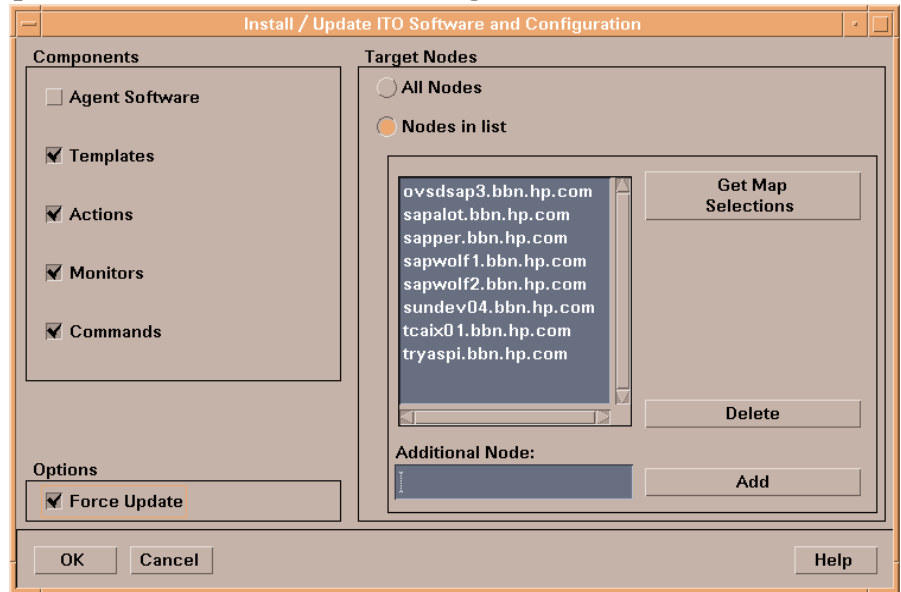
- 1 Distribute and install the SPI for SAP configuration files for the alert monitors and the alert-collector monitors to the SAP managed nodes:
 - a In the Node Bank window, select the SAP servers to which you wish to distribute SPI for SAP configuration files. Note that for the first distribution, this selection should include *all* SAP nodes.
 - b Drag the selected nodes over to the **SPI for SAP > SAP R/3 Admin** application group window and drop them onto the `Install Config` application.

The SPI for SAP monitor configuration files are distributed to and installed on the selected SAP Servers. For more information about the `Install Config` application, see [SAP R/3 Admin Applications](#) on page 83.

- 2 Distribute the SPI for SAP actions, commands, monitors, and templates to the SAP managed nodes:
 - a Select the SAP servers to which you wish to distribute SPI for SAP components. Note that for the first distribution, this selection should include *all* SAP nodes.
 - b From the menu bar of the Node Group window, select the following menu option:
`Actions:Agents-> Install/Update SW & Config`
The `Install/Update HPOM Software and Configuration` window appears as shown in [Install/Update HPOM Software and Configuration](#) on page 55.
 - c Select the components you wish to distribute. Note that you must perform this step twice, each time selecting different components, as follows:
 - If this is the first distribution, *before* you complete the monitor configurations, select:

- Actions
 - Monitors
 - Commands
- This step transfers all the commands required by the templates.
- If this is the second distribution, *after* you complete the monitor configurations, select:
 - Templates
- d Select Force Update.
- e Click OK to finish the distribution.

Figure 7 Install/Update HPOM Software and Configuration



- For more information about the options for installing and updating software, see the on-line help for HPOM administrators.

6 The SPI for SAP in a high-availability Cluster

This chapter explains how to install the SPI for SAP in a high-availability environment such as an MC/ServiceGuard cluster.

In this Section

The information in this section helps you to understand the process of installing and configuring the SPI for SAP on SAP servers running in a high-availability environment such as an MC/ServiceGuard cluster. For information about installing the SPI for SAP on an HPOM management server running in a high-availability cluster, see [Installing the SPI for SAP Software](#) on page 25.

Although the information provided in this section uses MC/ServiceGuard to explain cluster configurations, the basic concepts are the same for any high-availability environment as far as the SPI for SAP is concerned. This section covers the following topics:

- [Cluster Configurations](#) on page 58
A short description of the most common implementations of high-availability software in an SAP NetWeaver Landscape
- [Before you Begin](#) on page 61
A check list of points to be aware of before you install and configure the SPI for SAP in a high-availability environment
- [Installing the SPI for SAP in a High-availability Environment](#) on page 63
Instructions which walk you through the process of installing the SPI for SAP in a high-availability cluster
- [Configuring the SPI for SAP in a High-availability Environment](#) on page 65
Helpful tips and tricks to consider when configuring the SPI for SAP in a high-availability cluster
- [Performance Tools in a High-availability Environment](#) on page 71
How to set up and use the HP Operations performance tools to best effect with the SPI for SAP in a high-availability cluster
- [Service Reports and Performance Graphs in a High-availability Environment](#) on page 72
How to generate SPI for SAP Service Reports and Performance Graphs for managed nodes in a high-availability cluster
- [Service Views in a High-Availability Environment](#) on page 72
Using tools provided by the SPI for SAP, you can generate Service Views of the SAP environment automatically.
- [Removing the SPI for SAP in a High-availability Environment](#) on page 73

Instructions which take you through the process of removing the SPI for SAP from the managed nodes in a high-availability cluster

Cluster Configurations

The most common implementations of high-availability software in an SAP NetWeaver Landscape involve configuring the central-instance server and the database server in a cluster and installing either one, combined package on the central-instance server or two, separate packages on the central-instance server and the database server, respectively. Typically, application servers are not configured as part of the MC/ServiceGuard cluster. The two configuration which we describe in more detail in this section are:

- **single package**

The SAP database and central instance are located on the *same* server and included in the same MC/ServiceGuard package. The combined package can be switched temporarily to the adoptive node in the event of problems.

- **twin package**

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 host or adoptive node.

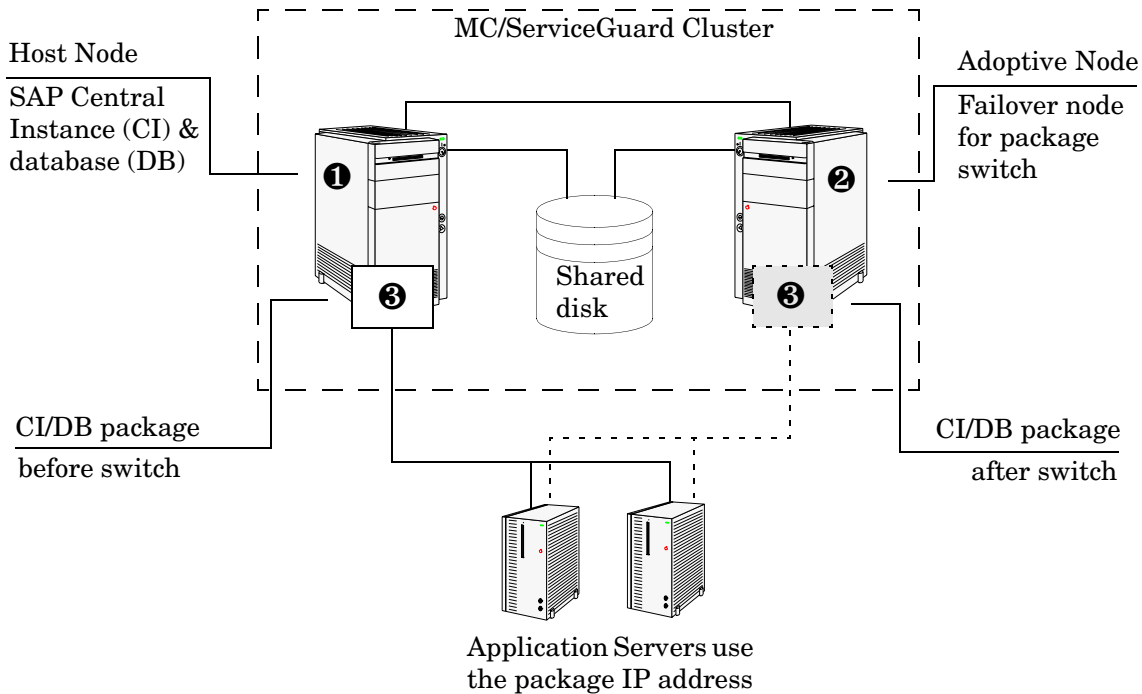
The Single-Package Configuration

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 adoptive node in the event of a package switch. The adoptive node can perform any one of the following roles:

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

The application servers, which are not included in the cluster, reference the MC/ServiceGuard package (⊕) by means of its relocatable IP address, not by reference to the fixed IP address of the node on which the MC/ServiceGuard package is running. If a problem occurs, the central instance and database are taken down on the *host* node (cluster node ①), and then brought up again on the *adoptive* node (cluster node ②). At the same time, the volume groups are deactivated on the host node and reactivated on the adoptive node.

Figure 8 The Single-Package Configuration

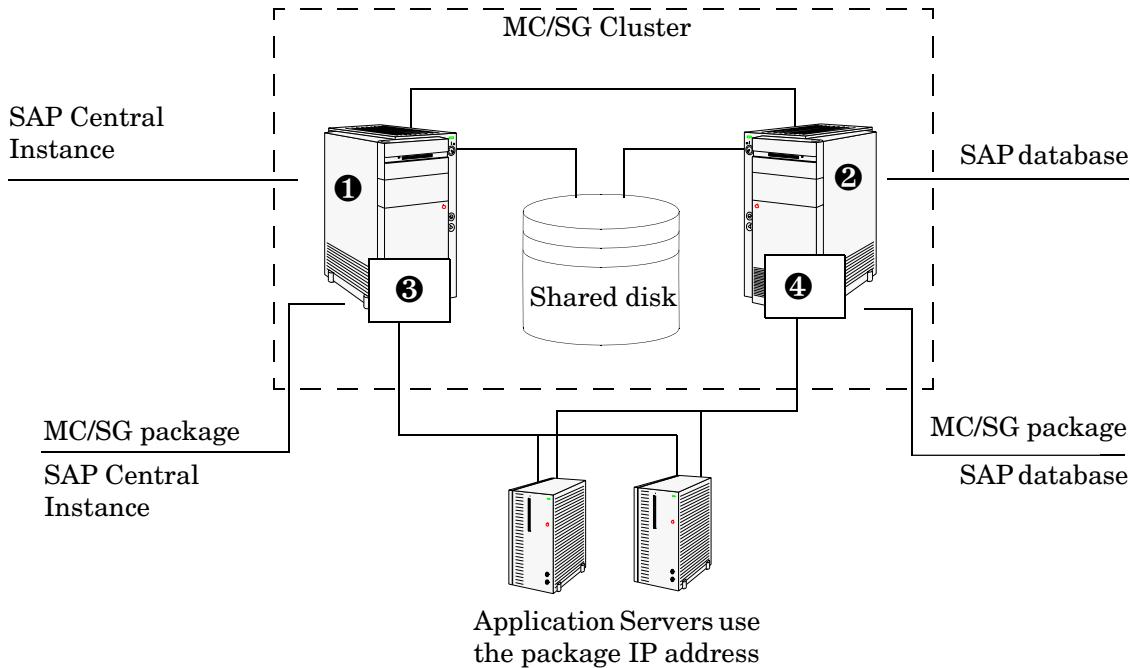


Once these actions have been completed by MC/ServiceGuard, the application servers can reconnect to the central instance and database (③ in Figure 8 on page 59) using the same relocatable IP address, which, as the name suggests, moves with the package.

The Twin-Package Configuration

In the two-package concept, the central instance and the database are installed on different servers, which for the sake of convenience we can call cluster nodes 1 and 2 respectively, as illustrated in Figure 9. The central-instance server and the database server form a high-availability cluster, where each server can act as the adoptive node for the other in the event of a package switch.

Figure 9 The Twin-Package Configuration before a Package Switch

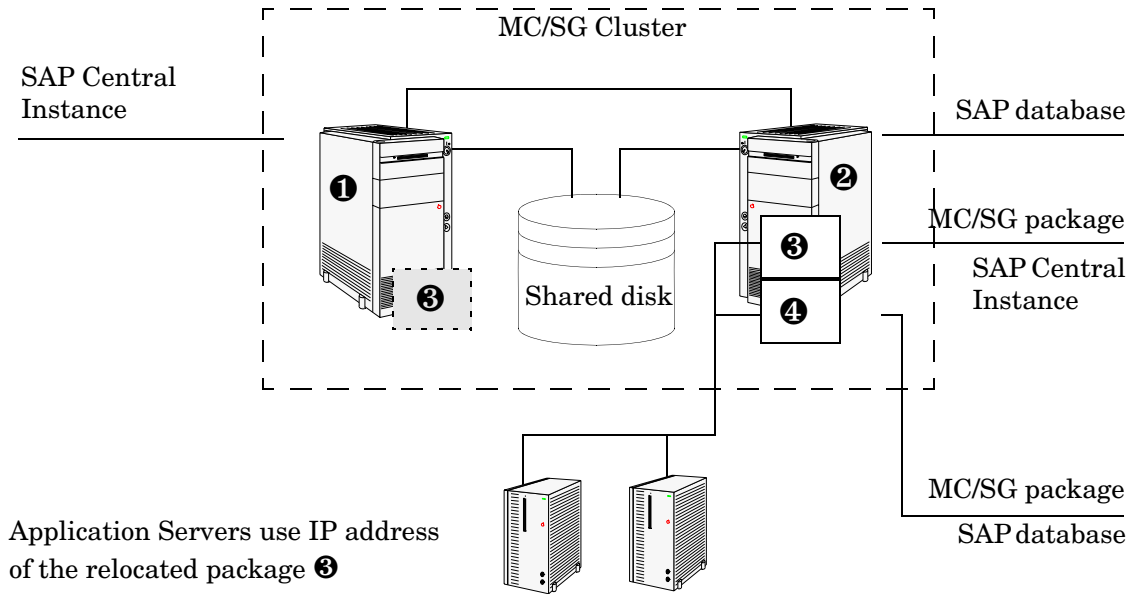


The application servers are not included in the cluster and, as illustrated in [Figure 9](#) on page 60, reference each package by means of each package's own relocatable IP address—not the fixed IP addresses of cluster-nodes 1 and 2.

If a problem is identified on the central-instance server, the central instance (3) is taken down on cluster node (1), and then brought up again on the cluster node (2). At the same time, the central instance volume group is deactivated on the host node and reactivated on the adoptive node.

[Figure 10](#) shows the situation *after* the switch of the SAP central- instance package (3). Once the central-instance package is up and running on the cluster node (2), the application servers can reconnect to the central instance using the same IP address as before the fail over, namely; the central-instance package's relocatable IP address, which moves along with the package at the time the fail over occurs.

Figure 10 Twin-Package Configuration after a Package Switch



Before you Begin

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 HP Operations Manager. 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 61
- [Configuration Requirements](#) on page 62
- [Service Reports and Performance Graphs](#) on page 62
- [Service Views](#) on page 62

Software Requirements

High-availability 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 MC/ServiceGuard 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 *Managed Nodes* window. You also need to add to the HPOM *Managed Nodes* window (as node type "Other"- Message only) the host you define as the HPOM-message host name in the host-mapping section of the `r3itosap.cfg` file. For more information about defining HPOM-message host name, see [Specifying SAP Clients to Monitor](#) on page 45.

Service Reports and Performance Graphs

If you want to generate SPI for SAP service reports and performance graphs for all the nodes in the MC/ServiceGuard cluster, make sure that:

- the appropriate performance-agent functionality (Embedded Performance Component or the HP Performance Agent) is installed, configured, and available on all the nodes in the MC/ServiceGuard cluster
- the appropriate SPI for SAP performance sub-agent integration functionality is installed, configured, and available on all the nodes in the MC/ServiceGuard cluster. For more information about installing and configuring the SPI for SAP performance sub-agent, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.
- both HP Performance Manager and HP Reporter, are installed, correctly configured, and available on a machine, which can see the cluster nodes. 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 install the Navigator and set it up to see the services you want the SPI for SAP monitor in the SAP environment. You will also have to ensure that the SPI for SAP performance integration is installed and configured to collect the appropriate performance-related data.

- ▶ 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 High-availability Environment](#) on page 65.

Installing the SPI for SAP in a High-availability Environment

To use the SPI for SAP in an MC/ServiceGuard environment, you have to install the HPOM agent and SAP SPI actions, commands, monitors, and templates on *all* nodes in the cluster where the SAP package can run—both the host node and adoptive (or backup) node.

- ▶ It is always a good idea to ensure 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 templates.

Before you distribute the SPI for SAP to the cluster nodes, you need to assign the appropriate SPI for SAP message-source templates. For example, you have to assign a central-instance message-source template group such as `SAP R3 4.6/6.xCI` to all managed nodes where a package that includes a SAP R/3 4.6/6.x central instance can run, or `SAP R3 7.0CI/7.1kernel` to all managed nodes where a package that includes a SAP R/3 7.0 central instance can run.

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. Note that SPI for SAP applications 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.

- ▶ 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.

If an application-server instance is already running on the managed cluster-node, the monitors will run and generate messages relating to the application 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 68.

To Install the SPI for SAP Monitors

You install the SPI for SAP monitors in an MC/ServiceGuard environment in the same way as in a normal environment, that is; using the standard HPOM template-assignment and template-distribution mechanisms. The only difference is that you have to perform the operation 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](#) on page 35, 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 Clients to Monitor](#) on page 45.

3 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 MC/ServiceGuard cluster in order to avoid the generation of confusing messages and potentially misleading performance data after a package switch. For more information, see [Configuration Values for SPI for SAP Monitors](#) on page 40.

➤ 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 68.

4 Assign and distribute components

Use the HPOM GUI to assign and distribute the appropriate SPI for SAP components to *each* physical node in the cluster. The templates you assign must match the version of SAP, which is running on the managed node. In addition, you must make sure that you assign exactly the same components (actions, commands, monitors, and templates) 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 in the high-availability cluster the SAP instance is running.

For more information about assigning and distributing SPI for SAP components to HPOM managed nodes, see [Configuring HPOM](#) on page 45. You will need to complete all the instructions for *each* node in the high-availability cluster.

5 Special considerations

On each node in the MC/ServiceGuard cluster, ensure that each monitor can see its history file, `r3<monitor_name>.his`, both before and after a fail-over 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 configuration files and the options you need to set and change, see [Monitor History Files in a High-availability Cluster](#) on page 66.

Configuring the SPI for SAP in a High-availability Environment

In a “normal” high-availability cluster where the host and adoptive nodes are intended to have identical roles, you approach the process of installing the SPI for SAP in the same way as if you had to install the SPI for SAP twice, with the following caveats:

1 SAP logins and accounts for the SPI for SAP

Use the HostSapAssign section in the `r3itosap.cfg` file to set up the SAP logins, accounts etc. required by the SPI for SAP on *all* physical nodes in the cluster. For more information, see [Defining SAP Logins in a High-Availability Cluster](#) on page 68.

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 message browser.

You might also need to specify in the list of physical nodes the name of the host defined in SAPLOCALHOST, but only if it is different from the host you want to associate with incoming messages. 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 Clients to Monitor](#) on page 45.

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

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 *HP Operations Smart Plug-in for SAP Administrator's Reference*.

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 68 describes one or two exceptions to this rule.

4 Assign and distribute 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 assigning and distributing components to the managed nodes, see [Assigning SPI for SAP Templates to SAP Nodes](#) on page 52 and [Distributing SPI for SAP Components to the SAP nodes](#) on page 54.

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 fail-over package switch. For more information, see [Monitor History Files in a High-availability Cluster](#) on page 66.

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 68.



If the adoptive node in the cluster has the additional role of application server, make sure you read the instructions in [Special-Case Scenarios](#) on page 68 before you start the configuration process.

Host Mapping on Cluster Nodes

If the HPOM HTTPS 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 HTTPS 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 message browser. To ensure that the host-mapping feature works as intended and the correct hostname is displayed in SPI for SAP messages coming from the high-availability cluster, you must disable the HPOM HTTPS agent feature on the managed node, as follows:

- 1 Log on as a user with administrative privileges to each physical node in the high-availability cluster where an HPOM HTTPS agent is running and open a command shell.
- 2 On HTTPS agents managed by HPOM for UNIX:

```
ovconfchg -ns eaagt -set OPC_SET_PROXY_FLAG_FOR_IP_ADDRESSES  
'<IP_Address, IP_Address, ...>'
```

Use the `ovconfchg` command 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 message browser. If multiple packages are running in the cluster (for example, for HPOM and for Oracle), use commas "," to separate multiple IP addresses in the list.



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.

- 3 Restart the agent with the new configuration using the following commands:

```
opcagt -kill; opcagt -start
```

Monitor History Files in a High-availability Cluster

The SPI for SAP alert monitors `r3monal`, `r3mondev`, `r3monpro`, and `r3status` have their own history files 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 its history file if, and only if, the SAP System it is monitoring is available and the SPI for SAP monitors can connect. If the SAP System being monitored is *not* available, `r3monal` only updates 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 the SAP System they are monitoring is available or not.

History File `r3monal.his` for the `r3monal` Monitor

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

The history files for the SPI for SAP monitors are usually stored 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 `/var/opt/OV/conf/sapspi` for all UNIX managed nodes except AIX, which uses the directory `/var/lpp/OV/conf/sapspi`, and `%OVAGENTDIR%\conf\sapspi` for Microsoft Windows managed nodes. However, 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 anew, 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 Smart Plug-in for SAP Administrator's Reference*. 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 OVO message browser
- 2 Define a CCMS monitor set, for example; "OpenView", and a CCMS monitor, for example; "SPI Monitoring", for the messages you want to forward from CCMS to the OVO message browser. Note that the monitor-set feature can be only used with the XMI/XAL interface.

Defining SAP Logins in a High-Availability Cluster

When setting up the SPI for SAP in a high-availability environment, remember to include references to SAP instances on all *physical* nodes in the cluster in the `r3itosap.cfg` file, the file which the SPI for SAP uses to define all SAP logins. If you make any changes or additions to 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.



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 High-availability Environment](#) on page 65.

If the adoptive node in the high-availability cluster is already configured as an SAP application server, then the logins for both the SAP 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 68.

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 adoptive (or backup) 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 fail-over package switch as before, you have the option of shutting down the application server on the adoptive node after the fail-over 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 adoptive node even after the fail-over 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 NetWeaver 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 Smart Plug-in*

for *SAP Administrator's Reference* 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 adoptive node after the fail-over package switch.

Table 10 shows which monitors apply to which SAP instance.

Table 10 SPI for SAP Monitors

SPI for SAP Monitor Name	Central Instance	Application Server
r3monaco	✓	
r3monale	✓	
r3monal ^a	✓	
r3monchg	✓	
r3moncts	✓	
r3mondev	✓	✓
r3mondisp	✓	✓
r3mondmp	✓	
r3monjob	✓	
r3monlck	✓	
r3monoms ^b	✓	
r3monpro	✓	✓
r3monrfc	✓	
r3monspl	✓	
r3monsec	✓	
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 monitors such as, for example; `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 adoptive 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 adoptive node after the fail-over 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 fail over, you need to ensure that each of the monitors which the `r3moncol` starts when the central instance comes up on the adoptive 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 10](#) on page 69 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](#) on page 70 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 adoptive 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.

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 adoptive 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 fail-over 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 Number=`) is linked to the appropriate process name, 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  Process  (...)
#                  System Number  name     =1      =1     number  (...)
#-----
AlertInstMonPro   =T11    =00      =saposcol  =1      =Exact  =1       (...)
AlertInstMonPro   =T11    =01      =saposcol  =1      =Exact  =1       (...)
```

Performance Tools in a High-availability Environment

If you are using the Performance Agent (or Embedded Performance Component) to monitor SAP NetWeaver in an MC/ServiceGuard environment, you must install the performance agents on both nodes in the cluster, namely; the *host* and *adoptive* nodes, and then configure the performance agent to monitor the same SAP System and Instance 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 fail over 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 adoptive 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 host node to the adoptive (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 High-availability 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 available on a machine that is visible to the cluster nodes. You will also have to ensure that the appropriate performance-agent functionality (Embedded Performance Component or the HP Performance Agent) is installed, configured, and available on all the nodes in the high-availability cluster and the appropriate SPI for SAP performance sub-agent integration functionality is installed and correctly configured.

- ▶ Note that operating-system (OS) reports are tied to the individual physical nodes in the cluster. This means that the SPI for SAP monitors are collecting OS data even when the SAP package is not running, for example; on the backup (adoptive) 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 Agent 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 adoptive 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 High-Availability 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 install the Navigator and set it up to see the services you want the SPI for SAP to monitor in the SAP landscape. You will also have to ensure that the SPI for SAP performance integration is installed and configured to collect the appropriate performance-related data.

The service-discovery template 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 High-availability Environment](#) on page 65 and [Specifying SAP Clients to Monitor](#) on page 45.

- ▶ 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 in a High-availability Environment

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

- 1 If you installed the SPI for SAP performance sub-agent on the managed nodes in the cluster, you will have to remove it and its components from the SAP managed nodes in the MC/ServiceGuard cluster before you proceed to step two. For more information, see [Removing SAP/Performance Subagents from SAP Managed Nodes](#) on page 93.
- 2 After removing the SPI for SAP performance sub-agent, you have to remove the SPI for SAP components from the SAP managed nodes in the MC/ServiceGuard cluster. For more information, see [Removing the SPI for SAP from HPOM Managed Nodes](#) on page 94.

7 Using the Smart Plug-in for SAP

This section introduces the SPI for SAP integration with HPOM and describes a typical SPI for SAP session.

Introduction

After you have installed and configured the SPI for SAP you can begin to use it to monitor your SAP NetWeaver system environment.

When you log on to HPOM using the user name and password of an operator with SAP responsibilities, you will see additional SAP-specific components in the HPOM Node Bank, Message Group, and Application Bank windows. You will also see SAP related messages in the HPOM message browser.

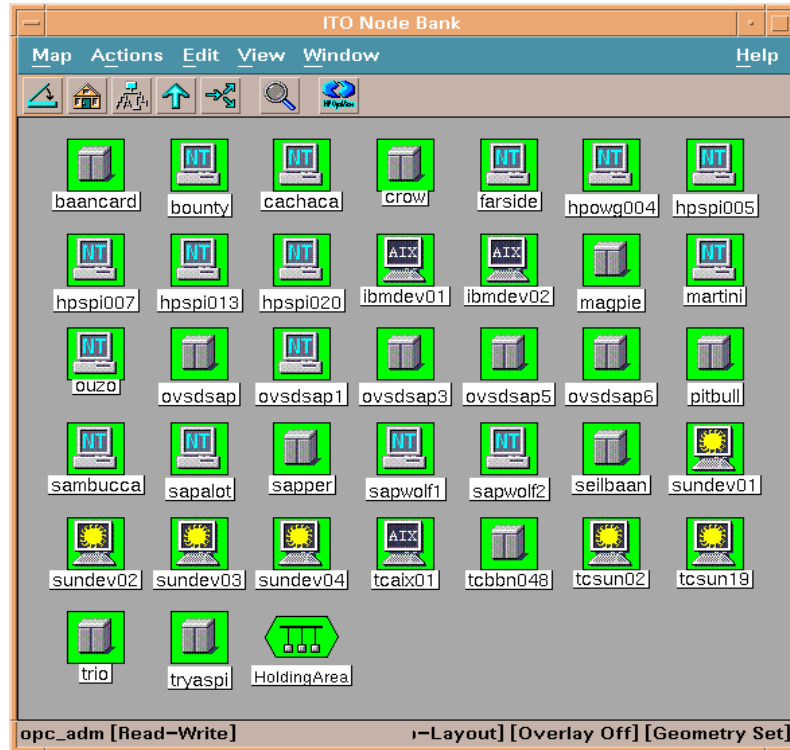
This chapter provides an overview of the SAP components that are integrated into HPOM and describes the following steps and procedures with which you will need to become familiar in order to run a typical SPI for SAP session:

- [The HPOM Managed Nodes Window](#) on page 75
- [The HPOM Message Groups Window](#) on page 76
- [The HPOM Message Browser Window](#) on page 79
- [The HPOM Application Bank Window](#) on page 81
- [Working with SAP Messages in HPOM](#) on page 91

The HPOM Managed Nodes Window

The Managed Nodes window contains a symbol for each node for which the operator is responsible. Node symbols are displayed in colors which correspond to the highest severity of any message received from that node. For example, if the status propagation option is set to “most critical”, a node symbol will turn red when that node has at least one unacknowledged critical message. After all critical messages have been acknowledged, the node symbol changes color to indicate the highest severity level of the remaining active (or unacknowledged) messages.

Figure 11 HPOM Managed Nodes Window

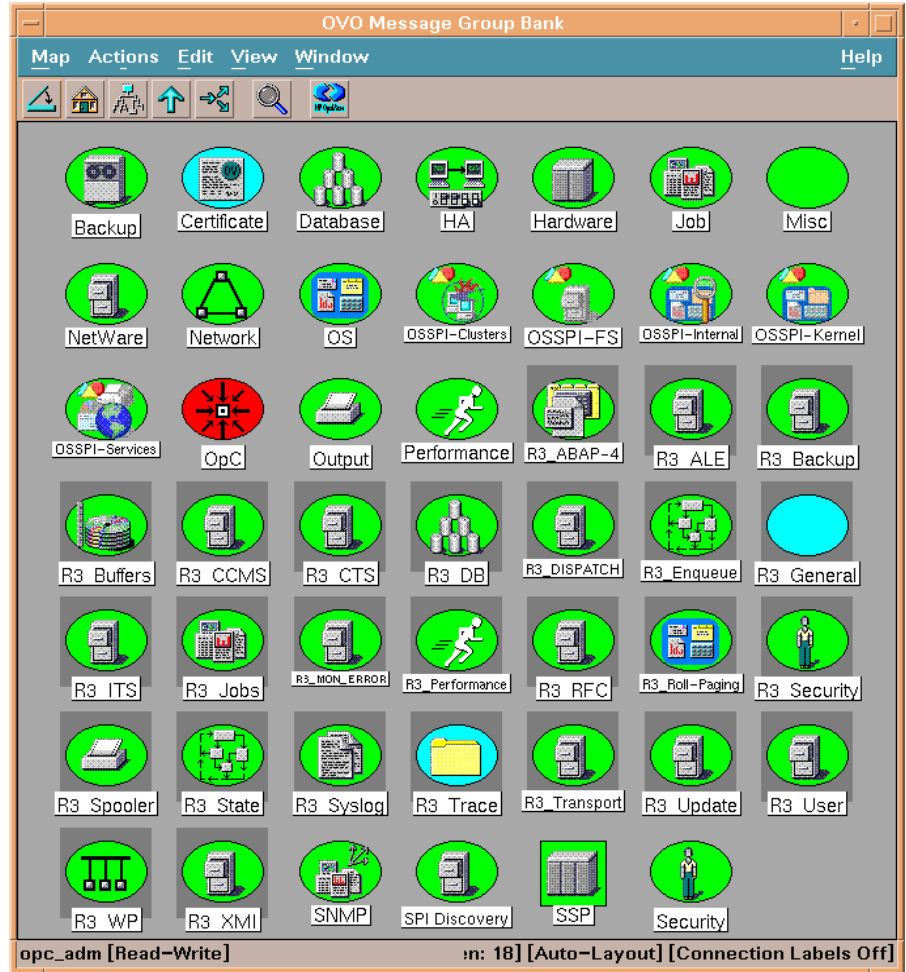


Before you can use any of the application desktop functions with a particular managed node, you need to select the node by clicking its icon in the Managed Nodes window.

The HPOM Message Groups Window

The Message Groups window contains symbols for the message groups for which a particular operator is responsible. In this window you can review the status of each group and select specific groups for message review. HPOM uses message groups to combine management information about similar or related managed objects under a chosen name and provide status information on a group level.

Figure 12 HPOM Message Groups



As in the Managed Nodes window, the color of a symbol represents the symbol's current status. A change in the color of a symbol in the Message Groups window indicates a change in status of a managed node within an operator's environment. If a message with the severity level critical arrives in your browser, the Message Groups window automatically opens and moves to the front of your display to notify you of the event. You can, however, configure HPOM in such a way that this window remains in its original position when a critical message arrives.

When you are logged on as an operator with SAP responsibilities, your Message Groups window contains some or all of the SAP-specific message groups listed in Table 11 depending on the responsibilities assigned to you by the HPOM administrator.

Table 11 SPI for SAP Message Groups

Message Group	Contents/Purpose
R3_ABAP-4	ABAP/4 database events
R3_ALE	Events concerning the status of iDOCs in the NetWeaver System
R3_Buffers	SAP NetWeaver instance buffer problems
R3_Backup	SAP NetWeaver backup messages

Table 11 SPI for SAP Message Groups (cont'd)

Message Group	Contents/Purpose
R3_CCMS	CMMS alert messages from r3monal when it is configured to use the XMI/XAL interface
R3_CTS	Correction and transport-system alert messages
R3_DB	Internal SAP NetWeaver database events
R3_Dispatch	ABAP dispatcher events
R3_Enqueue	Enqueue server messages
R3_General	General and SAP NetWeaver collector messages
R3_ITS	Messages relating to status of the ITS server
R3_Jobs	SAP NetWeaver jobs
R3_MON_ERROR	SPI for SAP monitor-specific error messages
R3_Performance	SAP NetWeaver performance messages
R3_RFC	Messages from r3monrfc, the RFC-destination monitor.
R3_Roll-Paging	Rolling and paging activities
R3_Security	Events relating to the security of SAP NetWeaver systems
R3_Spooler	Spooler events
R3_State	Configuration status information
R3_Syslog	SAP NetWeaver entries in the syslog log files
R3_Trace	Tracing information if trace is switched on
R3_Transport	Transport related messages
R3_Update	Update error messages
R3_User	User and usage messages
R3_WP	Work process events
R3_XMI	Special syslog XMI messages

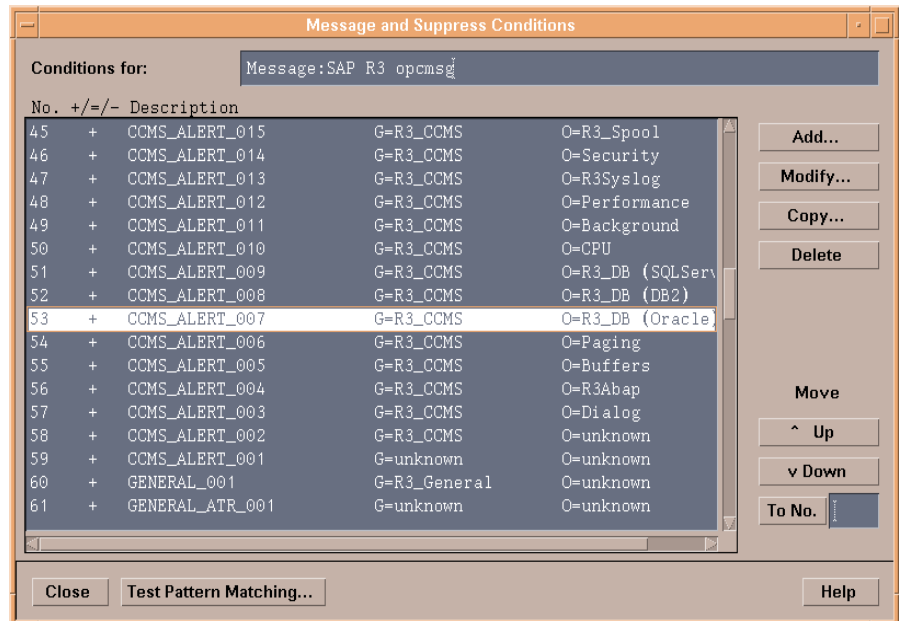
Changing Default Message-Group Settings

For the sake of convenience, the SPI for SAP automatically assigns messages generated by its monitors to particular message groups. For example, messages relating to the database are assigned to the R3_DB message group. This makes it easier to understand the general theme of a problem when browsing through messages in the HPOM message browser. However, you can change these default settings to suit the demands of your environment.

For example, if you configure `r3monal`, the SPI for SAP's CCMS Alert monitor, to use the XMI/XAL interface in SAP, the SPI for SAP automatically assigns any messages generated by `r3monal` to the `R3_CCMS` message group. However, there are a large number of messages from this source, and it can be helpful to re-assign the messages to sub-groups, which more accurately reflect the nature of the problem that the message describes.

If you want to change the message group to which individual messages are assigned, you can change the attributes of the message condition which generates the message in the first place. Note that messages generated by SAP's database are originally assigned to the message group `R3_CCMS` but are then re-assigned to the message group `R3_DB` if a defined condition matches which shows that the message originates from a problem in an Oracle, DB2, or SQLServer database.

Figure 13 Default Message Group Settings



To change a message condition's attributes, select the message as illustrated in [Figure 13](#), click the **Modify...** button. In the Set Attributes section of the Condition No. # window that appears, change the value in the Message Group field to match the name of the new message group, to which you want the generated messages to belong.

The HPOM Message Browser Window

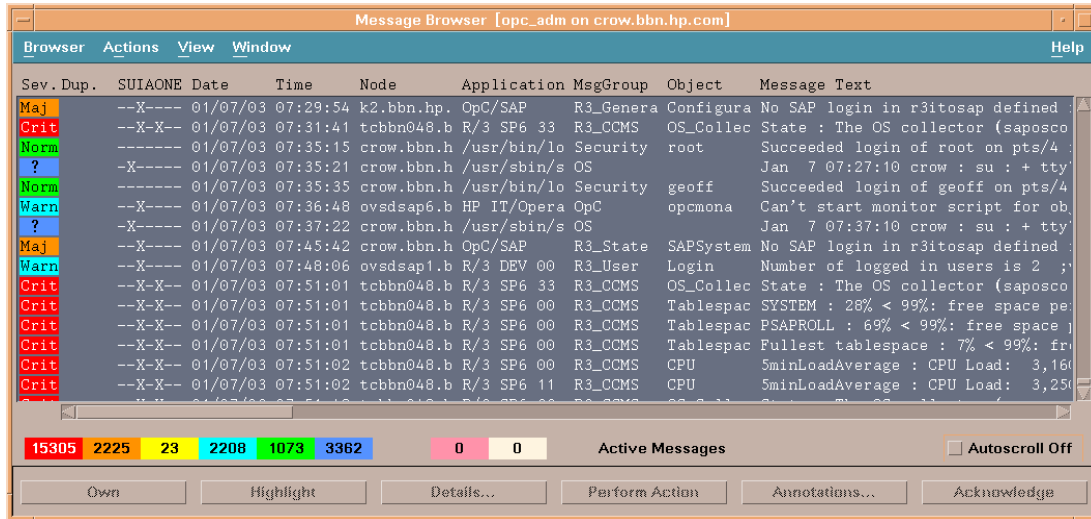
The Message Browser window is your unique view of all active messages received at your display station from the managed nodes of the message groups assigned to you.

You can use this window to review and manage messages and to guide problem resolution. Incoming messages are displayed with pre-configured attributes and status information. You can:

- Look at all the details about a single message and, to resolve the message-triggering event:
 - execute an operator-initiated action, or
 - have HPOM perform an automatic action for you.

- Restart actions at any time or even stop the execution of an action
- Print messages and prepare message reports.
- Document your actions and read through previously performed actions using HPOM's annotation facility
- Acknowledge messages in the Message Browser window after actions are completed

Figure 14 HPOM Message Browser



Understanding SAP-related Messages

Incoming messages are displayed with pre-configured attributes and status information, which can be particularly useful in identifying and understanding SAP-related messages. [Table 12](#) summarizes the message attributes you can use to identify a message in your browser as an SAP NetWeaver-related message.

Table 12 SAP-related Message Attributes

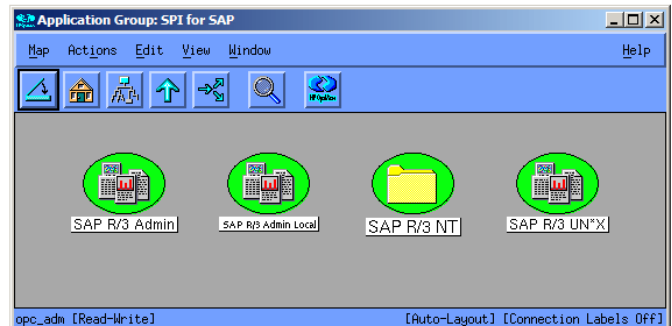
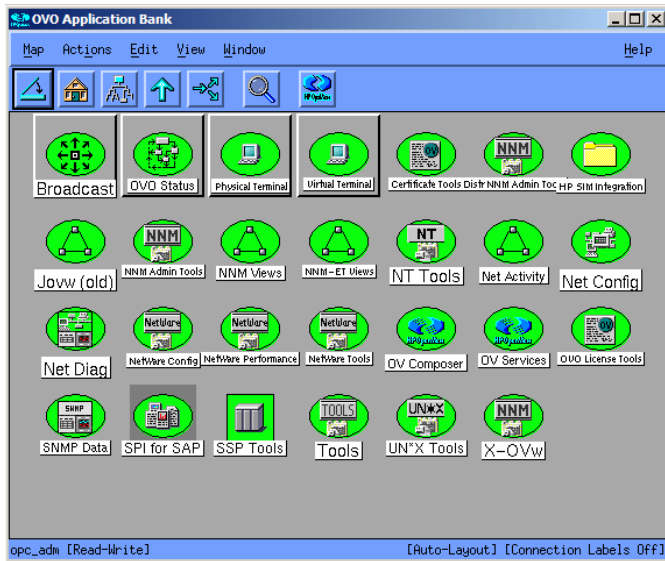
Message Attribute	Description
Application	Identifies the application which was affected or detected the message cause. For the SPI for SAP, the application is always R/3, followed by a SAP system name and number.
Message Group	Identifies the message group to which the message belongs. For SPI message groups see Table 11 on page 77.
Object	Identifies the object which was affected by, detected, or caused the message.

The HPOM Application Bank Window

The Application Bank window displays the applications, console sessions, and command broadcast which you can use to manage your SAP NetWeaver environment. In this window, or in the Managed Nodes window, you can:

- Start applications
- Open console sessions
- Broadcast commands on selected nodes

Figure 15 The HPOM Application Desktop



SPI for SAP Application Groups

A group symbol represents a group of applications. Double-clicking a group symbol opens a second-level desktop containing the applications of the group. The following application groups are added to the Application Bank under the SPI for SAP group when the SPI for SAP is installed:

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

The SAP R/3 Admin Application Group

The SAP R/3 Admin application group includes applications 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.

Figure 16 SAP R/3 Admin Application Group

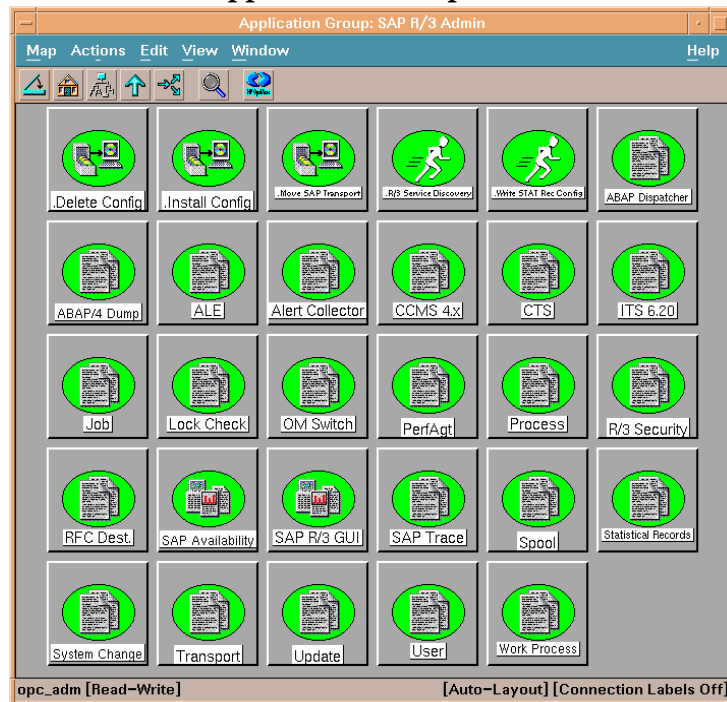


Table 13 lists the applications which appear in the SAP R/3 Admin application group and describes briefly what each of the applications does.

Table 13 SAP R/3 Admin Applications

Application	Description
ABAP/4 Dump	Opens the global <code>r3mondmp.cfg</code> configuration file for the ABAP-dump monitor
ABAP Dispatcher	Opens the global <code>r3mondisp.cfg</code> configuration file for the Dispatcher monitor
Alert Collector	Opens the global <code>r3monaco.cfg</code> configuration file
ALE	Opens the global <code>r3monale.cfg</code> configuration file for the iDOC-status monitor
CCMS 4.x	Opens the global <code>r3monal.cfg</code> configuration file of the central SAP R/3 CCMS alert monitor
CTS	Opens the global <code>r3moncts.cfg</code> configuration file
Delete Config	Removes global configuration files from selected managed nodes. This should only be used when de-installing the product
Install Config	Installs global configurations on selected managed nodes. This is the recommended way to distribute monitor-configuration files to the managed nodes.
ITS 6.20	Opens <code>r3monits.cfg</code> , the configuration file of the SAP ITS 6.20 monitor
Job	Opens the global <code>r3monjob.cfg</code> configuration file of the job monitor
Lock Check	Opens the global <code>r3monlck.cfg</code> configuration file for the lock-check monitor
Move SAP Transport	Moves the RFC Transport to the directory: <code>/usr/sap/trans</code> . The OS user starting the application must have write access to the directory
OM Switch	Opens the global <code>r3monoms.cfg</code> configuration file for the operation-mode switch monitor
PerfAgt	Opens the performance agent's global configuration file <code>r3perfact.cfg</code>
Process	Opens the process monitor's global configuration file <code>r3monpro.cfg</code>
RFC Dest.	Opens the RFC monitor's global configuration file <code>r3monrfc</code>
R/3 Security	Opens the SAP security monitor's global configuration file <code>r3monsec.cfg</code>

Table 13 SAP R/3 Admin Applications (cont'd)

Application	Description
R/3 Service Discovery	Automatically creates a service-configuration file that defines a service view of the SAP NetWeaver services on the selected managed node(s)
SAP Availability	Opens the SAP status monitor's global configuration file, <code>r3status.cfg</code>
SAP R/3 GUI	Opens the SPI for SAP's central configuration file <code>r3itosap.cfg</code>
SAP Trace	Opens the SAP trace monitor's global configuration file <code>r3mondev.cfg</code>
Self Healing Info	Collects data for troubleshooting on selected managed nodes or node groups
Spool	Opens the SAP spooler monitor's global configuration file <code>r3monspl.cfg</code>
Statistical Records	Opens the performance monitor's configuration file <code>r3perfstat.cfg</code>
System Change	Opens the change-system monitor's global configuration file <code>r3monchg.cfg</code>
Transport	Opens the Transport monitor's global configuration file <code>r3montra.cfg</code>
Update	Opens the update monitor's global configuration file <code>r3monupd.cfg</code>
User	Opens the SAP user monitor's global configuration file <code>r3monusr.cfg</code>
Work Process	Opens the work-process monitor's global configuration file <code>r3monwpa.cfg</code>
Write STAT Rec Config	Write statistical records in SAP
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)

If you use a SPI for SAP application to check or modify a configuration file, `r3conf` uses the text editor defined by the environment variable `$EDITOR`. If the variable `$EDITOR` is *not* set, `r3conf` uses `vi` to edit the SPI for SAP configuration files. For more information about editing and distributing monitor configurations, see the *HP Operations Smart Plug-in for SAP Administrator's Reference*.

The SAP R/3 Admin Local Application Group

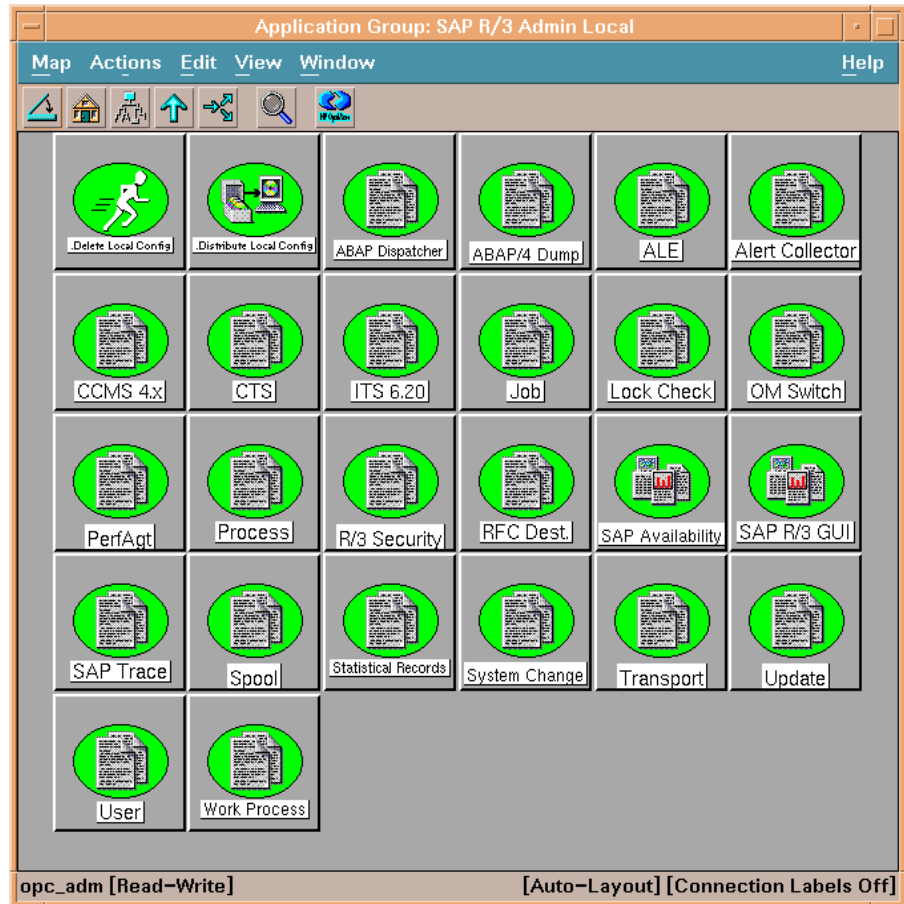
The SAP R/3 Admin Local group includes applications for editing and distributing files for local configuration.

Table 14 SAP R/3 Admin Local Applications

Application	Description
Delete Local Config	Deletes the <i>local</i> SPI for SAP configuration files on the selected managed nodes and, in addition, any files related to the selected managed nodes, which reside on the HPOM management server.
Distribute Local Config	Distributes and installs the local SPI for SAP configurations on the selected managed node(s)

The contents of the SAP R/3 Admin and SAP R/3 Admin Local application groups are very similar. Table 14 lists *only* those applications in the SAP R/3 Admin Local application group that have not already been described in Table 13 on page 83 and indicates what each applications does. [Application Desktop for SAP R/3 Admin Local](#) on page 85 shows the applications available in the SAP R/3 Admin Local application group.

Figure 17 Application Desktop for SAP R/3 Admin Local



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

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

These two groups include applications 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 UNIX group includes a number of applications that involve interactive actions with terminal output, for example: Check R/3 Database, Status R/3 Config, or Version Verify. These applications are not supported on the Microsoft Windows platform.

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

Table 15 lists the applications, available in both application groups, that open a SAP GUI session.

Table 15 SPI for SAP Applications that Call SAP Transactions

Application	Description	SAP Transaction 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
Syslog Msg	System log message maintenance	SE92
Users	User overview	AL08

The Version Verify tool allows you to compare the installed base version of the SPI for SAP with the version of any SPI for SAP components that have been added subsequently.

Accessing Data on a Managed Node

The following applications allow quick access to SAP NetWeaver related information from the selected managed node.

Table 16 SAP Information and Platform Availability

SPI for SAP Application Name	SAP R/3 UN*X	SAP R/3 NT
Check R/3 database	✓	
R/3 Info	✓	✓
R/3 Process Logs	✓	
Java R/3 Frontend	✓	
Status R/3 Config	✓	

Checking the SAP NetWeaver Database

The Check R/3 Database application establishes a connection to the database server and thus provides a rapid way of checking the database connection.

SAP NetWeaver Information

The R/3 Info application provides the following information for SAP NetWeaver instances that are installed on a selected node:

- Hostname
- SAP system name
- Instance name
- Instance number
- SAP release number
- List of processes for the selected instance

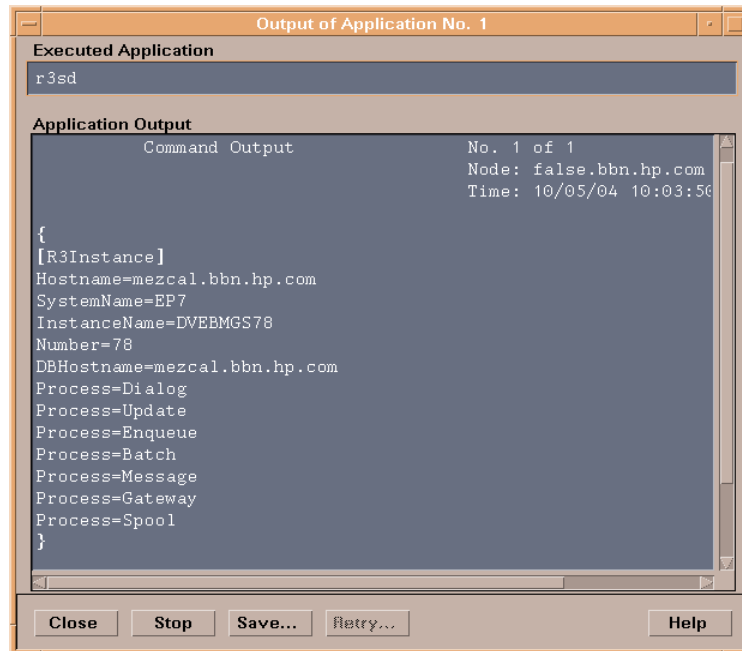


The R/3 Info application is available for both UNIX and Windows nodes and present in both the SAP R/3 UNIX and SAP R/3 NT application groups.

To display information for a selected managed node:

- 1 In the Node Bank window, select the UNIX or Microsoft Windows node for which you want to display a information about SAP NetWeaver.
- 2 In the SAP R/3 UNIX or SAP R/3 NT application group window, double-click the R/3 Info icon. The requested information is displayed, as shown in [Figure 18](#).

Figure 18 Output from the R/3 Info Application



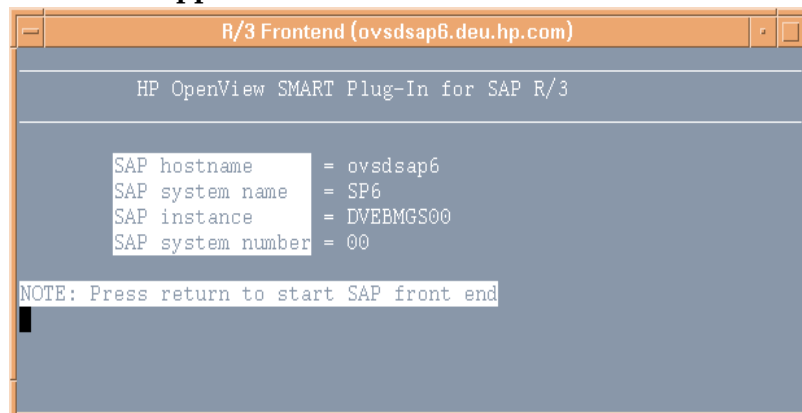
Starting the SAP NetWeaver Front-End

The Java R/3 Frontend application makes full use of the distributed architecture of SAP NetWeaver. It uses the local `sapgui` utility (running on the HPOM management server) and profile to connect to the desired SAP system. Because multiple SAP systems may be installed on a selected managed node, you are prompted with a list of installed SAP systems and functional modules.

To start the SAP NetWeaver front-end:

- 1 In the `Node Bank` window, select the UNIX node on which you want to start an SAP session.
- 2 In the `SAP R/3 UNIX application group` window, double-click the `Java R/3 Frontend` icon. A window similar to [Figure 19](#) is displayed. The local `sapgui` starts, connects to the selected SAP component, and displays the SAP NetWeaver login screen.

Figure 19 The R/3 Front-end Application



Using the SAP NetWeaver front-end locally improves application performance by decreasing the data flow across the network.

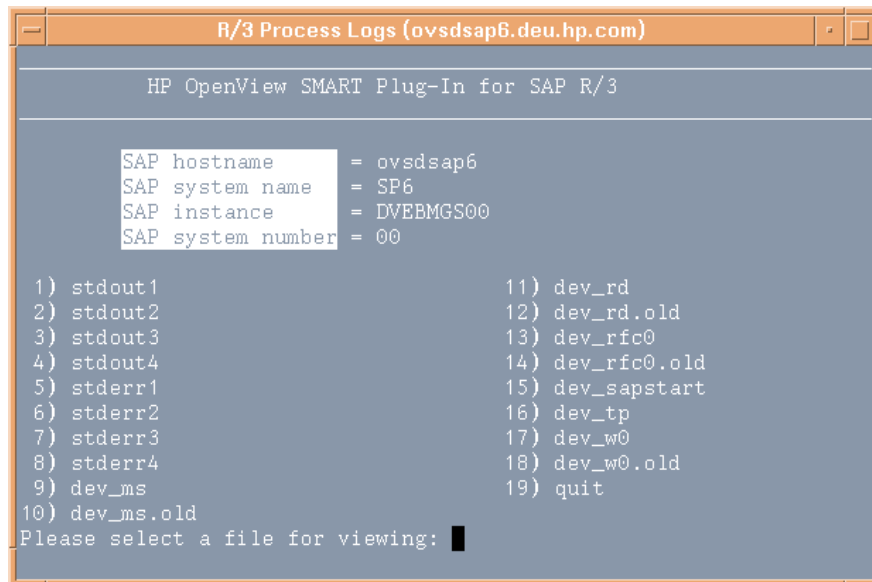
R/3 Process Logs

The R/3 Process Logs application reports all error conditions in a specific file structure. Also, all SAP NetWeaver standard output and standard error information is stored on disk. The log analyzer extracts relevant ERROR information for all functional modules of each SAP system and displays this information for the selected managed node.

To display the SAP NetWeaver process log for a selected managed node:

- 1 In the Node Bank window, select the UNIX node for which you want to display a process log.
- 2 In the SAP R/3 UN*X application group window, double-click the R/3 Process Logs icon.
- 3 Press **Enter**. The system displays an output file selection window (see [Figure 20](#)).

Figure 20 Logfile-Output Selection Window



- 4 Enter the number associated with the output log file you want to view. For example, if you enter 17 for the `dev_w0` file, the system displays a log file such as that shown in [Figure 21](#).

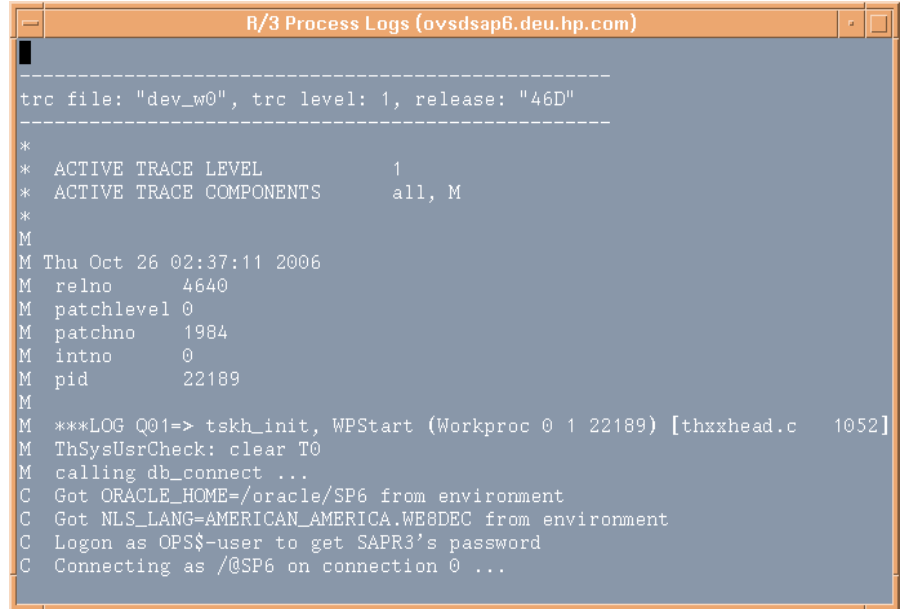
▶ `stdout1-5` and `stderr1-5` are always displayed, even if the associated files do not contain an error message.

- 5 To access additional process logs, return to the process logs selection window by entering the command:

q!

In order to use commands related to the `vi` editor your editor environment variable must be set to `vi`.

Figure 21 Sample Log File



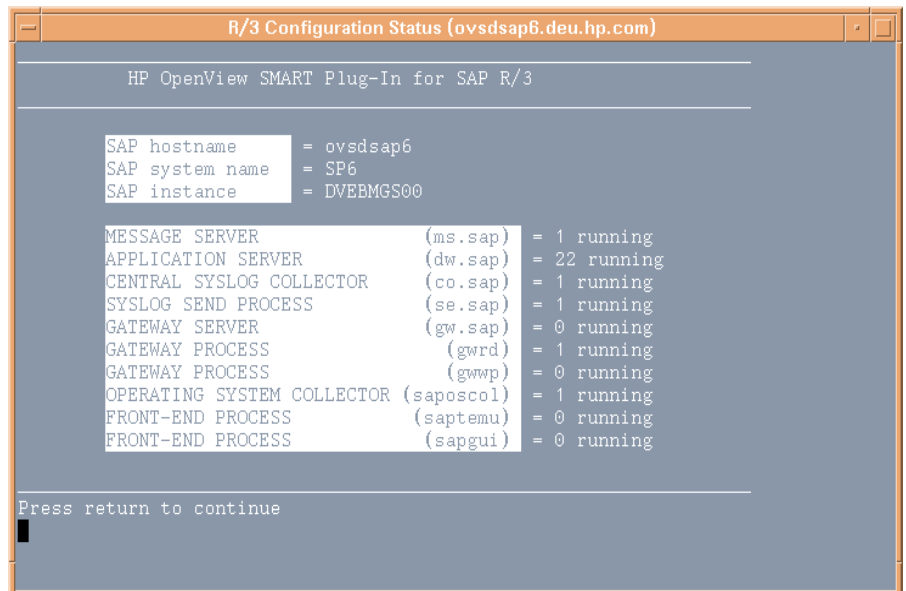
```
R/3 Process Logs (ovdsap6.deu.hp.com)
-----
trc file: "dev_w0", trc level: 1, release: "46D"
-----
*
* ACTIVE TRACE LEVEL          1
* ACTIVE TRACE COMPONENTS    all, M
*
M
M Thu Oct 26 02:37:11 2006
M relno      4640
M patchlevel 0
M patchno    1984
M intno      0
M pid        22189
M
M ***LOG Q01=> tskh_init, WPStart (Workproc 0 1 22189) [thxhead.c 1052]
M ThSysUsrCheck: clear T0
M calling db_connect ...
C Got ORACLE_HOME=/oracle/SP6 from environment
C Got NLS_LANG=AMERICAN_AMERICA.WE8DEC from environment
C Logon as OPS$-user to get SAPR3's password
C Connecting as /@SP6 on connection 0 ...
```

The Status R/3 Config Application

The Status R/3 Config application runs on the selected managed node and provides an ASCII representation of the current local SAP NetWeaver configuration. Status R/3 Config lists all SAP systems installed on the selected managed node and, in addition, the functional modules per system. The SAP NetWeaver process status also provides a list of all established SAP NetWeaver processes and their current status.

Select a managed node, then click the Status R/3 Config icon to display the R/3 Configuration Status window.

Figure 22 R/3 Configuration Status Window



```
R/3 Configuration Status (ovdsap6.deu.hp.com)
HP OpenView SMART Plug-In for SAP R/3
-----
SAP hostname      = ovdsap6
SAP system name   = SP6
SAP instance      = DVEBMGS00
-----
MESSAGE SERVER      (ms.sap) = 1 running
APPLICATION SERVER  (dw.sap) = 22 running
CENTRAL SYSLOG COLLECTOR (co.sap) = 1 running
SYSLOG SEND PROCESS (se.sap) = 1 running
GATEWAY SERVER      (gw.sap) = 0 running
GATEWAY PROCESS     (gwr)  = 1 running
GATEWAY PROCESS     (gwwp) = 0 running
OPERATING SYSTEM COLLECTOR (saposcol) = 1 running
FRONT-END PROCESS   (saptemu) = 0 running
FRONT-END PROCESS   (sapgui) = 0 running
-----
Press return to continue
```

Working with SAP Messages in HPOM

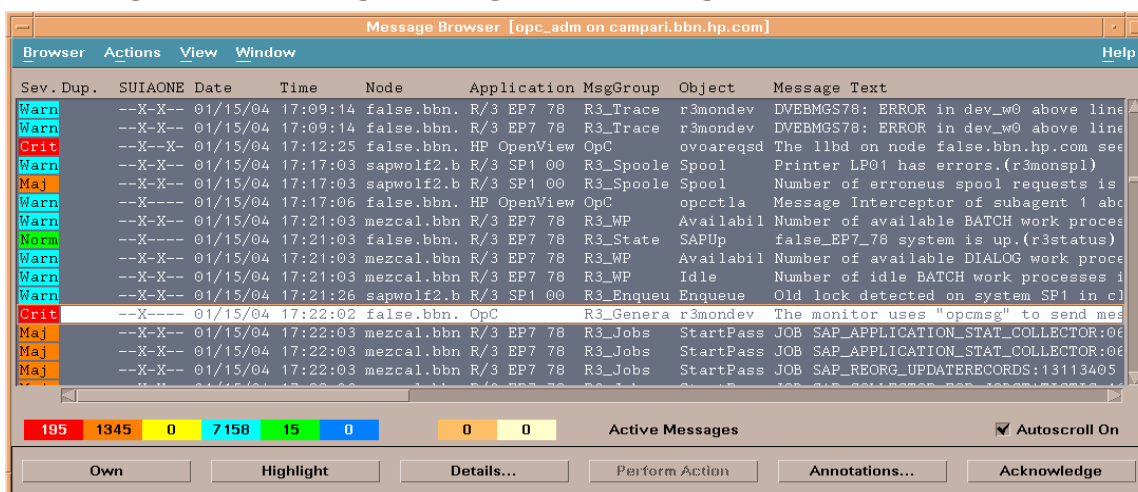
The Message Browser window is your most important source of information about the status of the managed nodes for which you are responsible. If you are logged on to HPOM as a user with SAP responsibilities, your Message Browser window will include messages from SAP NetWeaver managed nodes.

When you select a message in the Message Browser window you can:

- view a detailed description of a problem.
- view instructions of how to deal with the problem.
- initiate a pre-defined action.
- add an annotation to document your actions.
- acknowledge the message so that it is moved to the History Message Browser window.

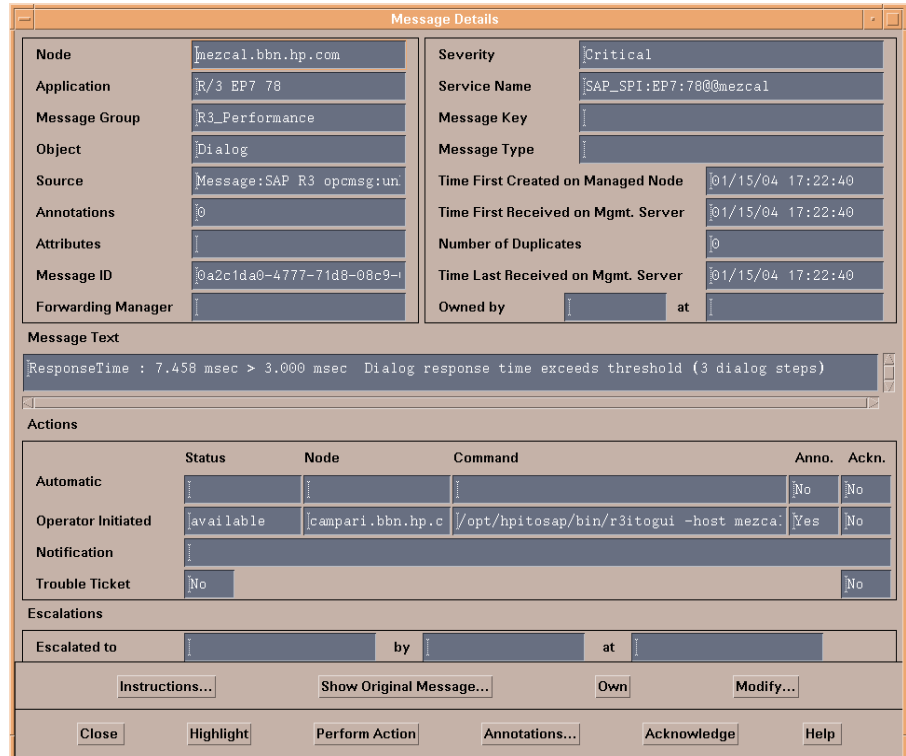
The example that follows shows a typical sequence of events when a critical message appears in the message browser.

Figure 23 Selecting a Message in the Message Browser



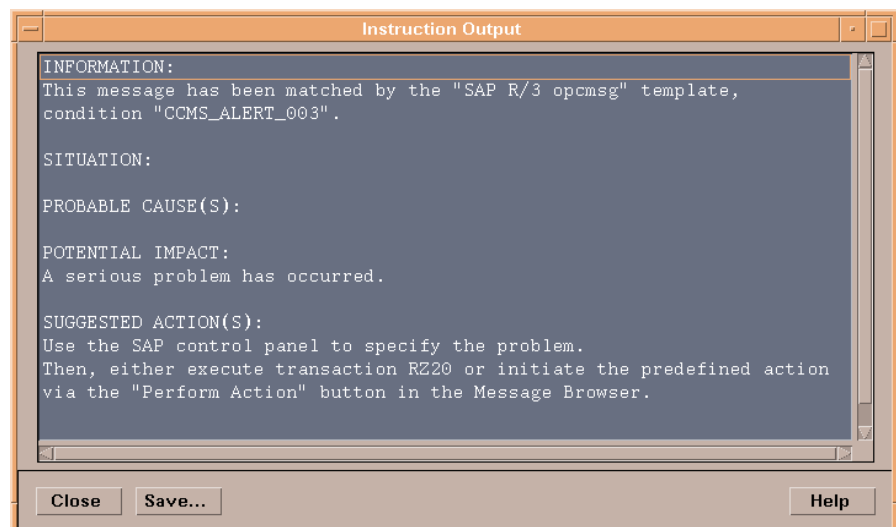
- 1 Select the message in the Message Browser window.
- 2 Click the Details... button in the Message Browser window. The system returns detailed information for the selected message.

Figure 24 Message Details



- 3 Click the Instructions... button to read the instructions provided by the system.
- 4 Once you have read and understood the instructions displayed in Figure 25 on page 92, click the Perform Actions button. The SPI for SAP automatically provides context-dependent access to the associated transaction.
- 5 In this window, Use standard SAP methods to fix the problem.
- 6 Return to the Message Details window shown in Figure 25 on page 92.
- 7 Click the Acknowledge button to confirm your awareness of the message to which you just responded. Once you have acknowledged the message, the message is moved from the Message Browser window to the History Message Browser window.

Figure 25 Message Instructions



8 Deinstalling the SPI for SAP

This section provides information concerning the removal of SPI for SAP software and any corresponding components.

Removing the SPI for SAP

This section describes how to remove the SPI for SAP software quickly and cleanly. You will need to perform the following tasks, as appropriate, on either the UNIX or Microsoft Windows managed nodes as well as the HPOM managements server(s) on which you installed the SPI for SAP software.



The information in this section describes how to perform a complete de-installation of the SPI for SAP software from the HPOM management server and the managed nodes by removing *all* the files created during the installation, configuration, and use of the SPI for SAP. You should *not* use the instructions in this section if you want to remove the SPI for SAP software as the first step in an upgrade of the SPI for SAP. For more information about upgrading the SPI for SAP, see [Upgrading the SPI for SAP](#) on page 32.

To remove the SPI for SAP software, carry out the following high-level steps which are described in greater detail in the corresponding sections that follow:

- [Removing SAP/Performance Subagents from SAP Managed Nodes](#) on page 93
- [Removing the SPI for SAP Objects from Managed Nodes](#) on page 94
- [Removing the SPI for SAP from HPOM Managed Nodes](#) on page 94
- [Removing the SPI for SAP Software from the HPOM Management Server](#) on page 95

Removing SAP/Performance Subagents from SAP Managed Nodes

To remove the SAP/Performance subagent from the managed node, you need to perform the following steps in the order indicated:

- 1 Before starting the process of removing the SPI for SAP performance agent from the managed node, make sure that you *stop* the SPI for SAP performance agent, for example;
 - Use the SPI for SAP application, **PerfAgt Stop**, which resides in the **SPI for SAP > SAP R/3 UN*X** or **SPI for SAP > SAP R/3 NT** application group.
 - Use the following command as user root on the command line:

```
r3perfagent stop
```

- 2 From the `Application Bank` window, go to the SPI for SAP group, and then run the following applications:
 - Run the `Remove Performance Package (UNIX)` application on UNIX nodes
 - Run the `Remove Performance Package (Windows)` application on Windows nodes

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 the [Applying the SAP Transport](#) on page 35 section for information on applying an SAP transport.

Removing the SPI for SAP from HPOM Managed Nodes

To de-assign and remove SPI for SAP management functionality from HPOM managed nodes:

- 1 As user `opc_adm`, open the `Node Bank` window, select all the managed nodes on which you installed the SAP/Performance sub-agent package, and run the following menu option:

Actions > Agents > Assign Templates...

- 2 Check the `Sort by templates` option and select *all* SAP-related assignments. These are any pre-defined template groups, but also any *individual* SAP-related monitors that you have assigned to particular managed nodes.

In addition, make sure that you also select any assignments based on any copies of the original SAP related templates, as suggested in the installation chapter.

- 3 Run the following menu option: **Remove selected.**
- 4 Distribute the modified template assignments to all *appropriate* managed nodes (those managed nodes from which you are de-installing the SPI for SAP software) by selecting the managed nodes in the `Node Bank` window and executing the following menu option:

Actions -> Agents -> Install/Update SW & Config...

- 5 Check [] the `Templates` and the `Force Updates` check boxes.
- 6 Click **OK** to confirm.
- 7 Use the `Delete Local Config` application to remove any local- configuration files that exist for any SPI for SAP managed nodes, for example; by selecting in the `Node Bank` window all the managed nodes from which you want to remove the SPI for SAP, dragging them over to the `SAP R/3 Admin Local` application group, and dropping them onto the `Delete Local Config` application icon.
- 8 Use the `Delete Config` application to remove any global- configuration files that exist for any SPI for SAP managed nodes, for example; by selecting in the `Node Bank` window all the managed nodes from which you want to remove the SPI for SAP, dragging them over to the `SAP R/3 Admin` application group, and dropping them onto the `Delete Config` application icon.

Removing the SPI for SAP Software from the HPOM Management Server

This section describes how to perform a complete de-install of the SPI for SAP from the HPOM management server. You should not use the instructions in this section as the first step in an upgrade of the SPI for SAP software.

To remove the SPI for SAP software from the HPOM management server:

- 1 Open the `Message Group Bank` window, select all message groups starting with `R3_...`, and delete them. Note that you might have to delete the message groups individually.
- 2 Open the `Message Source Templates` window, select the template group `SPI for SAP`, and choose the option: `Delete From All...`

If the templates in the deleted template groups still appear in the list of templates, you will have to delete the templates individually.

If you made copies of or modifications to the original SAP related templates, as suggested in the installation chapter, select and remove those as well.

- 3 Open the `User Profile Bank` window, select the SAP related user profiles, and delete them.
- 4 If you created HPOM users used exclusively for dealing with the SPI for SAP software, you can remove those from the `User Bank` window as well.
- 5 Open the `Application Bank` window, select the four SAP related application groups and delete them.
- 6 Remove the SPI for SAP related binaries from the HPOM database tree. As user root, enter:

```
/opt/OV/1bin/sapspi/r3itoin -u
```

- 7 Distribute the monitors, and commands to all managed nodes using the following menu option:

```
Actions > Agents > Install/Update SW & Config...
```

- 8 As user root, remove the SPI for SAP software package from the HPOM management server with one of the following commands:

- For HP-UX servers:

```
/usr/sbin/swremove SPI-SAP-ITO
```

- For Solaris servers:

```
/usr/sbin/pkgrm HPOvSpiSap
```

- 9 Remove any existing copies of the SPI for SAP configuration files. Enter:

```
rm -r /var/opt/OV/share/conf/sapspi/*
```


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 HPOM while adding the SAP node to the management server. If you use the 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.
- 2 Change the default agent user (Local System) to a non-privileged user.



Refer to the *HTTPS Agent Concepts and Configuration Guide* for more information on changing the default agent user.

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 applications:** You must provide these tools with the rights to be able to start or stop the OV R3 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 OV R3 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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