HP OpenView Operations Smart Plug-in for SAP

Administrator's Reference

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HP-UX/Sun Solaris

Manufacturing Part Number: None

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Support

Please visit the HP OpenView web site at:

`http://openview.hp.com/`

There you will find contact information and details about the products, services, and support that HP OpenView offers.

The support area of the HP OpenView web site includes:

- Downloadable documentation
- Troubleshooting information
- Patches and updates
- Problem reporting
- Training information
- Support program information

1 Introduction

This section describes what information you can find in the book and where you can find it.

Overview

The *HP OpenView Smart Plug-in for SAP Administrator's Reference* provides information designed to help the administrators of both OVO and SAP R/3 to configure the SPI for SAP to suit the needs and requirements of the SAP R/3 landscape which they plan to manage with OVO. This book also explains how to install and configure the various, additional sub-agents that come with the SPI for SAP. Finally, the *HP OpenView Smart Plug-in for SAP Administrator's Reference* describes how to integrate the SPI for SAP with performance-related products that are available as part of HP OpenView.

The *HP OpenView Smart Plug-in for SAP Administrator's Reference* comprises the following sections:

- "Customizing the SPI for SAP Monitors" on page 21

  A general introduction to the SPI for SAP monitors, including configuration-file locations, environment variables, and information about default configurations.

- "The SPI for SAP Alert Monitors" on page 55

  Reference and configuration information for the CCMS alert monitors `r3monsap`, `r3monal`, `r3monxmi`, `r3monpro` and `r3mondev`.

- "The SPI for SAP Alert-Collector Monitors" on page 107

  Reference and configuration information for `r3moncol` and the alert-collector monitors `r3monale`, `r3mondmp`, `r3monwpa` and so on.

- "Understanding Message Flow" on page 215

  This section describes how to use both OVO functionality and CCMS to control the flow of messages between SAP R/3 and OVO.

- "The SPI for SAP Performance Monitors" on page 245

  This section describes how to install, configure, and use the SPI for SAP performance monitors.

- "The ITS Monitor" on page 305

  This section describes how to install and configure the ITS Monitor. The **Internet Transaction Server** (ITS) provides the SAP R/3 user with an SAP R/3 transaction interface in a web browser.

- “Service Views” on page 341

  This section introduces the concept of service views and explains how to use service views to improve the management of your SAP R/3 landscape.

- “Service Reports” on page 357

  This section describes how to install the SPI for SAP service reports, configure the OpenView Reporter to generate the reports, and use the reports to monitor and manage your SAP R/3 landscape.

- “Troubleshooting the SPI for SAP” on page 383

  This section provides information that is designed to help troubleshoot the problems you encounter when working with the SPI for SAP.com.

2 Customizing the SPI for SAP Monitors

This section describes how to set up the SPI for SAP monitors and distribute them to the SAP R/3 servers in your SAP R/3 landscape.

Introduction to the SPI for SAP Monitors

The SPI for SAP includes a set of monitors, which you configure to run at regular intervals to collect information regarding various aspects of your SAP environment's health.

The OVO administrators, working from the OVO desktop, distribute the appropriate SPI for SAP message-source templates to the SAP R/3 servers which they want to manage and monitor with OVO. Monitor distribution is usually completed as part of the SPI for SAP installation and configuration process.

If you have never configured the SPI for SAP monitors, you will want to read the detailed description of each alert monitor and alert-monitor configuration file. The alert-monitor configuration files include information about default configurations as well as a list of changes you need to make to ensure that the monitor works correctly in your SAP environment.

This section contains information about the following topics:

- "Before Using the SPI for SAP Monitors" on page 23
- "The SPI for SAP Monitors" on page 24
- "Important Monitor-configuration Concepts" on page 27
- "The SPI for SAP Monitor Configuration File" on page 33
- "Distributing Alert-Monitor Configuration Files" on page 49
- "Local and Global Configurations" on page 51

Before Using the SPI for SAP Monitors

Before using any of these monitors, be sure to complete the following tasks:

- set up the required SAP R/3 users and their associated logons as described in the *HP OpenView Smart Plug-in for SAP Installation Guide*
- specify in the `r3itosap.cfg` file details of all SAP systems to be monitored. You can define entries in `r3itosap.cfg`:

  — as part of the installation procedure (see the *HP OpenView Smart Plug-in for SAP Installation Guide*)

  or,

  — at any time, using the `Config SAP R/3 GUI` function in the `SAP R/3 Admin` application group

NOTE

If the SAP instance you want to monitor is configured in a high-availability cluster, such as MC/ServiceGuard, you need to add an extra entry to the “cluster host mapping” section of the `r3itosap.cfg` file in order to tell the SPI for SAP about the nodes configured in the cluster. If the host-mapping entry is not present in the `r3itosap.cfg` file, the SPI for SAP might encounter problems monitoring the nodes in the cluster, for example; resolving the hostname of the cluster nodes, starting the monitors at the correct time, and associating messages with the appropriate managed nodes.

For more information about configuring the SPI for SAP to monitor SAP in a high-availability environment, see the section “Specifying SAP R/3 Systems to Monitor” in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

The SPI for SAP Monitors

Table 2-1 provides an overview of SPI for SAP alert-monitors.

Table 2-1 The CCMS Alert Monitors

CCMS Alert Monitor	Monitor Function
r3monaco	Although this is not strictly speaking an alert monitor, you must assign r3monaco to the managed nodes.
r3monal	Monitors SAP R/3 system log events and alerts from the internal SAP R/3 CCMS 4.x alert monitor
r3mondev	Monitors errors in SAP R/3 trace and log files
r3monpro	Monitors SAP R/3 work processes and database processes
r3monsap	Monitors SAP R/3 system-log events and alerts from the internal SAP R/3 CCMS 3.x alert monitor
r3status	Monitors the status of the SAP R/3 instances configured in the r3itosap.cfg file
r3monxmi	Monitors SAP R/3 system-log events

Table 2-2 provides an overview of the alert-collectors used by r3moncol, the SPI for SAP Alert Collector.

Table 2-2 The r3moncol Alert-Collector Monitors

Alert-Collector Monitor	Monitor Function
r3monale	Monitors the status of iDOCs in the SAP R/3 System
r3monchg	Monitors the SAP R/3 system change options.

Table 2-2 The r3moncol Alert-Collector Monitors (Continued)

Alert-Collector Monitor	Monitor Function
r3moncts	Monitors the correction-and-transport system.
r3mondmp	Monitors ABAP/4 Dumps.
r3monjob	Monitors SAP R/3 batch jobs.
r3monlck	Monitors the Enqueue process, which manages logical locks for SAP R/3 transactions and reports on obsolete locks.
r3monoms	Monitors the operation mode switch to determine whether a scheduled operation mode has been activated after the specified time.
r3monrfc	Checks the status of RFC destinations in an SAP environment
r3monspl	Monitors spooler entries, spooler errors, and print errors.
r3montra	Monitors the transport system.
r3monupd	Monitors the update process for active status and errors
r3monusr	Monitors the number of users logged-in to SAP R/3.
r3monwpa	Monitors the status of the work processes. It reports any processes that are running in debug, private, or no restart modes, compares the number of configured work processes with the actual number running, and checks the number of expected work processes waiting and the number running

NOTE

The SPI for SAP allows you to check the consistency of the Temporary Sequential (TEMSE) File. You do this by setting up a report in SAP R/3 instead of configuring an alert monitor. For more information, see "Monitoring the TEMSE file" on page 214.

Important Monitor-configuration Concepts

This section describes the concepts underpinning the CCMS alert-monitors and, in addition, explains how to configure the monitors. The section covers the following areas:

- "Monitor Configuration Files" on page 27
- "Monitor Configuration File: Global vs. Local" on page 28
- "Monitor Configuration Modes" on page 28
- "Alert Monitor Order of Precedence" on page 29
- "Remote Monitoring with the Alert Monitors" on page 30

Monitor Configuration Files

Each alert or alert-collector monitor has an associated configuration file, which you can edit to define your own rules for how you want CCMS alerts to be monitored. However, the monitors all have usable default configurations, which you can use without modification. For more information about the contents of the SPI for SAP's monitor-configuration files, see:

- "The SPI for SAP Monitor Configuration File" on page 33

  General information which applies to the configuration of *all* the SPI for SAP monitors

- "The Alert-Monitor Configuration Files" on page 58

  Information, which applies to the configuration of the Alert Monitors `r3monal`, `r3mondev`, `r3monpro`, `r3monsap`, and `r3monxmi`.

- "The r3status Configuration File" on page 103
- "The Alert-collector Monitor Configuration Files" on page 122

  Information which applies to the configuration of the Alert-collector Monitor `r3moncol` and the alert collectors it uses, for example; `r3monale`, `r3mondmp`, `r3monjob`, and so on.

Monitor Configuration File: Global vs. Local

Configuration files can be distributed to the managed nodes either globally or locally, as follows:

- **Globally**

  Globally using the `Install Config` function in the `SAP R/3 Admin` application group, which distributes copies of each configuration file to all selected managed nodes.

- **Locally**

  Locally using the `Distribute Local Config` function in the `SAP R/3 Admin Local` application group.

For more information about when to use each of these distribution methods and for instructions on editing the configuration files, see "The SPI for SAP Monitor Configuration File" on page 33.

Monitor Configuration Modes

The SPI for SAP supports the following configuration modes:

- **Global**

  You define in a single configuration file the monitoring conditions for all managed nodes. If you specifify a *global* configuration, the monitoring conditions you define must cover the monitoring needs of all managed nodes.

- **Local**

  You define the monitoring conditions for a particular node in a configuration file associated only with that single, managed node. If a *local* configuration is used, each node can have its own configuration file, which defines only the monitoring conditions for that particular node.

You can deploy a mixture of global and local configurations. For an explanation of the relationship between local and global configuration as well as instructions on the use of each configuration mode, see "Distributing Alert-Monitor Configuration Files" on page 49.

Alert Monitor Order of Precedence

Each time an alert monitor runs, its behavior is determined by information defined in an alert-monitor-specific configuration file. An alert monitor chooses which configuration file to use according to a defined “order of precedence”, as follows:

1. The monitor first checks for the presence of the SAPOPC_<*R3monitor_name*>_CONFIGFILE variable and determines the location of the configuration files from this. For more information about the SAPOPC_<*R3monitor_name*>_CONFIGFILE variable, see “Alert-collector Monitor Environment Variables” on page 118.
2. If the SAPOPC_<*R3monitor_name*>_CONFIGFILE variable is not set, the monitor checks the $PATH variable and uses the configuration file it specifies.

   If the $PATH variable is set, alert monitors assume that all alert-monitor configuration files (for all alert types) are stored in the directory defined in $PATH. If any of the alert monitor types is missing a configuration file, the monitor will not run. Consequently, if you are using the $PATH variable, you must ensure that configuration files for *all* alert monitors are copied to the directory specified in $PATH.

IMPORTANT

Neither the SPI for SAP nor OVO is able to distribute configuration files to the $PATH variable. The $PATH variable can only be modified manually and should be modified for test purposes only. If you *do* copy configuration files into the user path, you will no longer be able to manage the configuration files from the OVO Message Browser. In addition, manual modification on the managed systems will be required to correct this situation.

3. If no $PATH variable is found, the monitor checks the path for the OVO for UNIX local configuration file. If found, the monitor uses the OVO for UNIX local configuration file.

4. If the monitor does not find an OVO for UNIX local configuration file and there is no configuration file specified in the system path variable, the monitor checks for the OVO for UNIX global configuration file. If found, the monitor uses the OVO for UNIX global configuration file.
5. If the monitor does not find an OVO for UNIX local or global configuration file and there is no configuration file specified in the system path variable, the monitor checks the path for the OVO for Windows local configuration file. If found, the monitor uses the OVO for Windows local configuration file.
6. Lastly, the monitor checks the path for the OVO for Windows global configuration file. If found, the monitor uses the OVO for Windows global configuration file. If not found, an error message is displayed.

In Example 2-1, the first line relates only to instance 01 on SAP system LPO. Therefore, if instance 01 is being monitored, the monitor applies the rules as defined on this line *only*. The second line of the example refers to all other instances on LPO. The final line refers to all instances on all systems except for LPO

Example 2-1 Order of Precedence for Configuration Files

```
Order of        SAP         SAP
Precedence      System      Number
1               =LPO        =01       =<monitor-spec conf>
2               =LPO        =ALL      =<monitor-spec conf>
3               =ALL        =ALL      =<monitor-spec conf>
```

Remote Monitoring with the Alert Monitors

The current version of the SPI for SAP includes a feature which allows you to extend the scope of all the Alert, Alert-collector, and Performance Monitors to monitor the status of SAP on remote SAP servers, which are *not* OVO managed nodes and where the SPI for SAP is *not* installed. You set up and perform the remote monitoring from an OVO managed node, where the SPI for SAP software is installed, correctly configured, and running.

NOTE Although the SAP Server defined in the RemoteHost parameter is not an OVO managed node, it must still be present in the OVO Node Bank. If you do not add the SAP Server defined in RemoteHost to the OVO Node

Bank, OVO cannot resolve the host name associated with the remote host and, as a consequence, will not be able to display any messages from the remote host in the `Message Browser`.

To make use of the remote-monitoring feature provided by the SPI for SAP, for example; to monitor an SAP System running in an environment that is not supported by the SPI for SAP, you need to perform the following actions. Example 2-2 on page 32 shows how a new line is required for each *additional* SAP server, which you want to monitor remotely.

- Activate the new **RemoteMonitoring** keyword by removing the leading hash symbol "#" in each monitor's configuration file
- Define the name of the *local* host, which you want to perform the monitoring. Note that you need a new line for each *local* host that you want to associate with a remote host
- Define the name of the *remote* SAP server (*RemoteHost*), which you want to monitor.
- Make sure that the remote host is added to the OVO Node Bank

The RemoteMonitoring keyword accepts the following parameters:

- **LocalHost**

  This is the name of the local OVO managed node where the SPI for SAP software is installed and running and whose performance agent will be used to remotely monitor the SAP server defined in the parameter "RemoteHost".

- **RemoteHost**

  This is the name of the *remote* SAP server you want to monitor from the host defined in the parameter "LocalHost". Although the remote host does not have the SPI for SAP software installed and is *not usually* an OVO managed node, it must be present in the OVO Node Bank in order for messages to be handled correctly.

- **SAP System/Number** (`r3monal` and `r3monxmi` *only*)

  The CCMS Alert Monitor `r3monal` and the syslog monitor `r3monxmi` need to know both the ID and the Number of the SAP System running on the SAP server defined in the parameter "RemoteHost".

For more information about any additional requirements when defining remote monitoring with the Alert Monitors, and in particular `r3monal` (the CCMS Alert Monitor) and `r3monxmi` (the syslog monitor), see "The SPI for SAP Monitor Configuration File" on page 33 and "The Alert-Monitor Configuration Files" on page 58.

Example 2-2 Specifying Individual Remote Servers to Monitor

```
#------------------------------------------------------------
# Remote                Local       Remote
# Monitoring            Host        Host
RemoteMonitoring        =sap1       =sdsap1
RemoteMonitoring        =sap1       =sdsap2
RemoteMonitoring        =sap2       =sdsap3
#------------------------------------------------------------
```

Note that you can use the Alert-classes section at the end of the monitor-configuration file to associate an instance of a monitor with a specific host, SAP instance, or processes on the remote server in the same way as you can with a normal (local) managed node. For more information about configuration-file keywords, see "The SPI for SAP Monitor Configuration File" on page 33.

The SPI for SAP Monitor Configuration File

During SPI for SAP installation and configuration, the SAP specialist must set up initial configuration values for the SPI for SAP monitors by alert type and distribute the modified configuration files to the managed nodes.

Each configuration file provided with the SPI for SAP defines particular default settings by means of keywords. This section indicates which keywords you can use with which monitors and, where appropriate, shows permitted values for keyword parameters. This section provides detailed information about the following keywords:

- "Agent Hostname" on page 34
- "Alert Classes" on page 34
- "AlerMonSyslog" on page 38

  Configure filtering of CCMS alerts or system logs
- "CCMS Acknowledge Message" on page 38
- "CCMS Interface" on page 39
- "CCMS Monitor Set" on page 39
- "History Path" on page 40
- "Local Auto Ack" on page 40

  Enable or disable the CCMS local auto-acknowledge feature
- "Monitoring Conditions" on page 40
- "Remote Monitoring" on page 41
- "RFCTimeOut" on page 42
- "Severity Levels" on page 43
- "SAP SHM Check" on page 43

  Perform a check of the SAP Shared-memory
- "Trace File" on page 44
- "Trace Level" on page 45

Agent Hostname

The AgentHostname keyword is currently disabled in the monitor-configuration file.

Alert Classes

You use the Alert Classes section at the end of the monitor-configuration file to define conditions for the alert classes in order to generate messages. The Alert Classes section only needs to be configured if you are using the shared-memory interface to monitor SAP alerts, and changes according to the parameters that are allowed for a given monitor. For example, the parameters `SAP Hostname`, `SAP system`, and `SAP number` tend to be present in all the monitor-configuration files: the parameter `SyslogId`, on the other hand, appears only in the `r3monxmi` monitor's configuration file. For more information about which Alert Types and parameters are allowed with which monitor-specific Alert Classes, see the information in this section and, in addition, the section which corresponds to the individual monitor you are interested in, for example; the `=CHANGE_OPT` alert type can only be used with `r3monchg`, the System Change Monitor.

NOTE

The SPI for SAP monitors are configured by default to manage *all* SAP Systems, which are discovered on the host systems where the SPI for SAP software is installed. The monitor-configuration files should not be edited by anyone who does not have a detailed knowledge of SAP R/3 and, in addition, the local SAP R/3 Landscape, which the SPI for SAP is being configured to manage.

The following list shows *all* the parameters in the Alert Class section of *all* the SPI for SAP monitor configuration files. Where appropriate, restrictions are indicated in brackets (), for example; (`r3mondev` only).

- **Alerttype**:

  `=<`*`Alerttype`*`>` For more information about the values an alert-collector monitor accepts, see the Alert Types section for a given monitor, for example; "r3monale: The iDOC-Status Monitor" on page 127 refers to the alert type "IDOC_CURRENT_STATUS".

- **AlertMonitor**:

  =*<Monitor_Name>*

  where *<Monitor_Name>* is the short form of the alert monitor you are configuring, for example; =ALE for `r3monale`, =CTS for the `r3moncts`, and so on.

- **Enable/Disable**:

  =0 *Disable* the monitor

  =1 *Enable* the monitor. This is the default setting.

- **Filemask** (`r3mondev` only):

  =*<File_Name>*

  where *<File_Name>* is the name of the trace file you want `r3mondev` to monitor. You can use the wildcard "*" (asterisk) to monitor multiple file names, for example; **`=dev_*`**

- **Mode** (`r3monpro` only):

  =*<mode_value>* where *<mode_value>* is the way you want ProcessNumber to be evaluated, for example; Maximum, Minimum, Exact, and Delta. For more detailed information about the possible values, see "r3monpro: The Process Monitor" on page 84.

- **OPC MsgGroup**:

  =*<OVO_Msg_Group>*

  where *<OVO_Msg_Group>* is the name of the OVO Message Group to which the generated message belongs, for example: R3_CTS, or R3_DMP. The default names all start with "R3_" and reflect the names of the alert monitors to which they correspond, for example; `r3moncts` or `r3mondmp`. Note that if you change the names of the OVO Message Groups in the monitor-configuration files, remember to ensure that the changes are reflected in the message conditions in order to avoid the generation of unmatched messages.

- **OPC Object**:

  =*<OpC_Object>* where *<OpC_Object>* is the OVO object associated with the generated message. The object names tend to reflect the names of the alert types associated with the alert-collector monitor, for example; REQUEST or TASK for `r3moncts`.

  If you change the names of the OVO objects in the monitor-configuration files (or add new ones), you must ensure that these changes are reflected in the message conditions in order to avoid the generation of unmatched messages.

  The =SyslogId string in the OPC Object field has nothing to do with the SyslogId Alert Class described below.

- **OPC Severity**:

  =*<OVO_Msg_Severity>*

  where *<OVO_Msg_Severity>* is the severity level of the OVO message you want to map the CCMS alert to, for example: Normal, Warning, Major, Critical.

- **ProcessName** (`r3monpro` only):

  =*<NameSID>* where *<NameSID>* is the name of the SAP process you want `r3monpro` to monitor.

- **ProcessNumber** (`r3monpro` only):

  =*<nn>* where *<nn>* is the number of instances of the SAP process defined in ProcessName. You can qualify the number with Max, Min, Exact, and Delta. For more information see "r3monpro: The Process Monitor" on page 84.

- **RFC Parameter** (`r3moncol` only):

  =*<RFC_Param>* where *RFC_Param* is the name of the parameter followed by any required Query Conditions, each with the prefix "=", for example; =CP (for "Contains Pattern") or EQ for ("Equals"). For more information about Query Conditions, see "Alert-collector Monitor Query Conditions" on

page 114. For more information about monitor-specific, alert-type parameters, see the appropriate monitor description, for example: Table 4-8, "Configuration Parameters," on page 129 for the `r3monale` monitor.

- **SAP Client**:

  =ALL — All SAP clients being monitored by the SPI for SAP. This is the default setting.

  =<*SAP_host*> — the specific SAP client for which performance monitoring is to be enabled, for example; 099. Use a new line for each individual host.

- **SAP Hostname**:

  =ALL — All SAP hosts will be monitored by the SPI for SAP. This is the default setting.

  =<*SAP_host*> — the host name of a specific SAP server where performance monitoring is to be enabled. Use a new line for each individual host.

- **SAP Number**:

  =ALL — All SAP numbers will be monitored by the SPI for SAP. This is the default setting.

  =<*SAP_host*> — the specific SAP number for which performance monitoring is to be enabled, for example; 00, 99. Use a new line for each individual host.

- **SAP System**:

  =ALL — All SAP Systems will be monitored by the SPI for SAP. This is the default setting.

  =<*SAP_host*> — the SAP SID for which performance monitoring is to be enabled, for example; DEV. Use a new line for each individual host.

- **SyslogId** (`r3monal` and `r3monxmi` only):

  =A00 — The *lower* end of the range of SAP SIDs, whose CCMS Alerts or syslogs you want to monitor.

  =ZZZ — The *upper* end of the range of SAP SIDs, whose CCMS Alerts or syslogs you want to monitor.

AlerMonSyslog

Syslog filtering can be used *only* with the `r3monal` and `r3monxmi` alert monitors. You use it to configure filtering in combination with either the SAP shared-memory (SHM) or the XMI/XAL interface. The AlerMonSyslog keyword requires a value for the following parameters:

- **SAP System**

  The SAP System ID whose CCMS alerts or system logs you want to monitor

- **SAP Number**

  This SAP number associated with the SAP System whose CCMS alerts or system logs you want to monitor

- **SyslogId**:

=A00	The *lower* end of the range of SAP SIDs, whose CCMS alerts or syslogs you want to monitor.
=ZZZ	The *upper* end of the range of SAP SIDs, whose CCMS alerts or syslogs you want to monitor.

- **Enable/Disable**:

=0	*Disable* the monitor
=1	*Enable* the monitor. This is the default setting.

CCMS Acknowledge Message

Only with `r3monal` with SAP 4.6 (and later) and the XMI/XAL interface

The `r3monal` monitor uses the CCMSAcknowledgeMessage keyword to switch the CCMS auto-acknowledge feature on or off in SAP. This keyword can only be used if you have configured `r3monal` to use the XMI/XAL interface and requires a value for the following parameters:

- **SAP System** (`r3monal` with SAP 4.6 and later *only*)

  The SAP System ID whose CCMS Alerts you want to acknowledge (or **complete**) in SAP.

- **Ack. Filtered Messages**

  This feature determines whether or not CCMS Alerts which match the defined conditions are acknowledged (or completed) in CCMS or not.

=0	*Do not* acknowledge (complete) the CCMS Alerts in SAP. This is the default setting.

=1 *Acknowledge* the CCMS Alerts in SAP. This is the same as clicking the `[Complete Alert]` button in SAP CCMS.

- **Enable/Disable**

  =0 *Disable* the monitor. Note that this also disables the setting for **Ack. Filtered Messages**. This is the default setting.

  =1 *Enable* the monitor.

CCMS Interface

Only with `r3monal` with SAP 4.6 (and later) and the XMI/XAL interface

Configure the `r3monal` monitor to use either the old shared-memory interface or the new, enhanced XMI/XAL interface (BAPI). The CCMSInterface keyword requires *one* of the following values;

=SHM enable the old shared-memory interface

=XAL enable the new, enhanced XMI/XAL interface (BAPI)

CCMS Monitor Set

Only with `r3monal` with SAP 4.6 (and later) and the XMI/XAL interface

Define a CCMS monitor set to use with the new, enhanced XMI/XAL interface (BAPI). The CCMSMonitorSet keyword can only be used if you have configured `r3monal` to use the XMI/XAL interface and requires a value for the following parameters, for example;

- **SAP System**

  The SAP System ID whose CCMS Alerts are defined in the parameter Monitor Set

- **SAP Number**

  This SAP number of the SAP System whose CCMS Alerts are defined in the parameter Monitor Set

- **Monitor Set**:

  =SAP CCMS Technical Expert Monitors

  The name of the monitor set as it appears in the CCMS Alert-Monitor tree.

- **Monitor**:

  =System / All Monitoring Segments / All Monitoring Context

The names of the monitors belonging to the monitor set defined in the parameter “Monitor Set” separated by a forward slash (/).

History Path

The HistoryPath[Unix | AIX | WinNT] keyword in the monitor-configuration file accepts the following parameters:

- **Hostname**:

=ALL	All hosts being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a SAP server, where you want to specify the path to the monitor history file. Use a new line for each individual host.

- **Path**:

UNIX:	`=/var/opt/OV/tmp`
AIX:	`=/var/lpp/OV/tmp`
MS Windows:	`=default`

Local Auto Ack

`r3monsap` *only*

The `r3monsap` monitor uses the `LocalAutoAck` keyword to switch the local CCMS auto-acknowledge feature on (=1) or off (=0). This feature determines whether or not CCMS Alerts appear as messages in the OVO Message Browser. Disabling CCMS auto-acknowledge produces messages in the OVO Message Browser: if CCMS alerts are automatically acknowledged in CCMS, no messages appears in the OVO Message Browser.

Monitoring Conditions

The monitoring conditions you specify in the monitor-configuration file determine which alert collection functions are called when the monitor runs, as well as any limiting parameters for these functions. The conditions also define rules for any messages that may be generated when the alert collectors run. You can define default conditions that apply to all SAP systems and instances and exceptions that apply only to specific systems and instances.

Note that the keywords you use to define the conditions associated with a particular monitor differ according to the scope of the monitor and the specific area of SAP, which the monitor is designed to manage. For example, the `AlertDevMon` keyword can only used in the configuration file for the `r3mondev` monitor. Similarly, the `AlertMonPro` and `AlertInstMonPro` keywords only appear in the r3mondev monitor’s

configuration file. For more information about which keywords may be used with a particular monitor, see the section that describes the monitor you are configuring, for example; `r3mondmp`, the ABAP dump monitor.

Ambiguous definitions should be avoided if at all possible. For example, in the configuration below, the final two lines cause a logical clash because both `msg4` and `msg5` are defined as OVO objects for roll paging messages from the same SAP instance of the same SAP system.

```
AlertClassRollpag  =ALL  =ALL  =1  =RollPag  =R3_Roll-Paging
AlertClassRollpag  =ALL  =01   =1  =msg2     =R3_Roll-Paging
AlertClassRollpag  =LPO  =ALL  =1  =cwmsg3   =R3_Roll-Paging
AlertClassRollpag  =LPO  =01   =1  =msg4     =R3_Roll-Paging
AlertClassRollpag  =LPO  =01   =1  =msg5     =R3_Roll-Paging
```

Remote Monitoring

The RemoteMonitoring keyword in the monitor-configuration file can be used with all the SPI for SAP monitors *except* `r3mondev` and `r3monpro`. RemoteMonitoring accepts the following parameters:

- **LocalHost**

  the name of the OVO managed node where the SPI for SAP is installed and running and whose performance agent will be used to do the monitoring on the host defined in “RemoteHost”.

- **RemoteHost**

  the name of the *remote* SAP system to be monitored by the host defined in “LocalHost”. The RemoteHost does not have the SPI for SAP installed and is not usually (but could theoretically be) an OVO managed node.

- **SAP System** (`r3monal` and `r3monxmi` *only*)

  This is the ID of the SAP System running on the SAP server defined in the parameter “RemoteHost” which you want to remotely monitor with the SPI for SAP running on “LocalHost”.

- **SAP Number** (`r3monal` and `r3monxmi` *only*)

  This is the specific Number of the SAP System running on the SAP server defined in the parameter “RemoteHost” which you want to remotely monitor with the SPI for SAP running on “LocalHost”.

Note that the remote-monitoring feature does not work with all the alert monitors, for example; you cannot configure `r3mondev` or `r3monpro` to monitor SAP instances running on a remote server. For more information, see the appropriate section on the individual alert monitor.

Example 2-3 Setting up Remote Monitoring for r3monal and r3monxmi

```
#-------------------------------------------------------------
# Remote              Local     Remote     SAP        SAP
# Monitoring          Host      Host       System     Number
RemoteMonitoring      =sap1     =sdsap1    =SP6       =00
RemoteMonitoring      =sap1     =sdsap2    =SP6       =00
RemoteMonitoring      =sap2     =sdsap3    =WA1       =33
#-------------------------------------------------------------
```

For more information about using the RemoteMonitoring keyword, see the individual alert monitors and, in addition:

- “Remote Monitoring with the Alert Monitors” on page 30
- “Remote Monitoring with the r3status Monitor” on page 105
- “Remote Monitoring with the Alert-collector Monitors” on page 119
- “Remote Performance Monitoring” on page 265

RFCTimeOut `r3monal` and `r3monxmi` *only* and SAP 4.6 (XAL/XMI) and later only

RFCTimeout defines the maximum amount of time, in seconds, before an RFC XMI/XAL function call is canceled, for example; =120. If the RFC call takes longer than expected to complete, that is; to receive a reply to the initial request, the System is probably down or has a serious performance problem. Note that after the call has completed and a free Dialog process has been allocated, the time limit no longer applies.

The RFCTimeout keyword can only be used if you have configured `r3monal` to use the XMI/XAL interface in the `r3monal.cfg` configuration file. For more information, see the CCMSInterface keyword “CCMS Interface” on page 39. For more information about configuring the `r3monal` monitor to use the XMI/XAL interface with SAP R/3, see “r3monal: CCMS 4.x Alert Monitor with XMI/XAL” on page 71.

Severity Levels

The SeverityValue keyword enables the `r3monal`, `r3monsap`, and `r3monxmi` monitors to map the severity of CCMS alerts (for example; SeverityCritical) in the SAP subsystem to messages in OVO (for example; CRITICAL) and accepts the following values:

Table 2-3 Mapping Severity Levels

CCMS Alert Severity	Message Severity
SeverityNull	=UNKNOWN
SeverityNormal (green)	=NORMAL
SeverityWarning (yellow)	=WARNING
SeverityCritical (red)	=CRITICAL

NOTE

The alert-collector monitors (`r3moncol`) have two additional severity levels; Minor and Major. The severity hierarchy in ascending order is; Normal, Warning, Minor, Major, Critical.

You can customize these severity levels to suit the severity conditions you wish to define. For example, for the alert type OLD_LOCKS for the alert monitor LOCK_CHECK you could specify that if the lock is older than 12 hours you receive a WARNING message and if it is older than 24 hours you receive a CRITICAL message.

SAP SHM Check

Alert Monitors `r3monal`, `r3mondev`, `r3monpro`, and `r3monxmi` *only*.

The `SAPSHMCheck` keyword enables or disables the automatic SAP shared-memory check which the Alert Monitors use at run time to determine the status of the SAP Systems defined in the `r3itosap.cfg` file. The shared-memory check compares the results of the current run with the results of the previous run to determine whether or not any change in status has occurred in the SAP Systems to be monitored. The `SAPSHMCheck` keyword requires a value for the following parameters:

- **Hostname**:

  =ALL — Enable/disable the SAP shared-memory check on all SAP servers being monitored by the SPI for SAP. This is the default setting.

=<*SAP_host*>	the name of a specific SAP server, where you want to enable/disable the SAP Shared-memory check. Use a new line for each individual host.

- **Enable/Disable**:

=0	*Disable* the shared-memory check. This is the default setting for all monitors *except* `r3monpro` , which the SPI for SAP uses to monitor SAP processes. The default setting for SAPSHMCheck in the `r3monpro` Alert Monitor's configuration file, `r3monpro.cfg`, is `=1(enabled)`.
=1	*Enable* the shared-memory check.

If the SAP shared-memory check is neither enabled nor disabled in the monitor-configuration file, for example; because you are using an old version of the configuration file where the `SAPSHMCheck` keyword does not appear, the Alert Monitors assume the default state (disabled) is true.

Example 2-4 Enabling and Disabling the SAP Shared-memory Check

```
#-----------------------------------------------------------
# SAPSHMCheck    hostname    Enable  =1
#                            Disable =0
SAPSHMCheck      =ALL        =0

#-----------------------------------------------------------
```

Trace File

The TraceFile keyword in the monitor-configuration file accepts the following parameters:

- **Hostname**:

=ALL	All SAP servers being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a specific host where tracing is enabled and you want to specify a trace level. Use a new line for each individual host.

- **Filename**:

  =r3mon<*alert_monitor_name*>.log, for example; `r3mondev.log`, or `r3mondmp.log`, etc. This is the default setting. Alternatively, you can specify the name of the file to which you want to write the trace log. By default, monitor trace files are located in the following directories:

— **UNIX**: `/var/opt/OV/bin/OpC/monitor`

— **AIX**: `/var/lpp/OV/bin/OpC/monitor`

— **MS Windows:** `\usr\OV\bin\OpC\intel\monitor`

For more information about changing the path, see the environment variable SAPOPC_TRACEPATH in "Alert-collector Monitor Environment Variables" on page 118.

Trace Level

The TraceLevel keyword in the monitor-configuration file accepts the following parameters:

- **Hostname**:

=ALL	All hosts being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a SAP server, where you want to specify a trace level. Use a new line for each individual host.

- **Trace level**:

=0	Disable. This is the default setting.
=1	Log only error messages
=2	Log all messages
=3	Log only debug messages

NOTE

Trace levels 2 and 3 are *only* available for `r3moncol`.

To Configure the SPI for SAP Alert Monitors

1. In the Application Desktop, double click the appropriate application group icon. There are two application groups that include monitor configuration icons:

`SAP R/3 Admin`	For global configurations
`SAP R/3 Admin Local`	For local configurations

2. In the Application Group window, double click the icon that corresponds to the alert monitor to be changed. The selected alert monitor's configuration file opens.
3. Edit or enter lines to define *trace levels*. For example, You can set a default for ALL hosts (hostname = ALL), then add lines for any hostname exceptions. For example:

```
TraceLevel     =ALL        =0
TraceLevel     =hpbbx10    =1
```

   In this example, tracing is turned off for all hosts except for host `hpbbx10`. For more information about trace levels, see "Trace Level" on page 45.
4. Specify the name of the *trace file* in which trace information is to be recorded. For example:

```
TraceFile      =ALL         =r3monpro.log
```

   Default trace file names for each monitor are given in Table 2-4

Table 2-4 Default Trace File Names

Tracefile Name	Monitor Alert Type
r3monaco.log	Alert Calls
r3monal.log	Alerts (SAP R/3 4.x)
r3monale.log	iDOC alerts
r3monchg.log	System Change
r3moncts.log	Correction and Transport System
r3mondev.log	Trace and Log Files
r3mondmp.log	ABAP/4 Dumps
r3monjob.log	Job
r3monlck.log	Lock_Check
r3monoms.log	OM Switch
r3monpro.log	Work and Database Processes
r3monsap.log	Alerts

Table 2-4 Default Trace File Names (Continued)

Tracefile Name	Monitor Alert Type
r3monspl.log	Spooling
r3montra.log	Transport
r3monupd.log	Update
r3monusr.log	User
r3monwpa.log	WorkProcess Availability
r3monxmi.log	Syslog

5. Specify the *history path*, which is the directory path by which you can locate an alert monitor's history file. Alert monitors include the following default paths for UNIX, AIX and NT servers:

```
HistoryPathUnix     =ALL       =/var/opt/OV/tmp
HistoryPathAIX      =ALL       =/var/lpp/OV/tmp
HistoryPathWinNT     =ALL       =default
```

NOTE

You can tell the alert monitors to use a specific, default history path on NT managed nodes rather than the hard-coded: `C:\Temp`, for example: `%OVAGENTDIR%\Tmp`. For more information, see the SAPOPC_HISTORYPATH environment variable and the alert-monitor configuration-file keyword HistoryPath[Unix | Aix | WinNT].

Each alert monitor writes its own history file. Each time an alert monitor completes a run, it adds a new section to its history file. This feature enables the alert monitor to check for changes since the previous run.

IMPORTANT

Do *not* edit any of the monitor history (`*.his`) files. Editing the monitor history file could compromise the accuracy and consistency of your records. The monitor uses its history file to determine which, if any, events have occurred since the last run and whether or not to send any messages.

6. Define the monitoring conditions. Monitoring conditions are rules that control the checks which the alert monitor makes each time it runs. The monitoring conditions you enter are different for each alert monitor. See "Monitoring Conditions" on page 40 and "Alert Classes" on page 34 for general information about the keywords and parameters that are allowed with each monitor.

NOTE

For specific information on the Monitoring Conditions for each alert monitor, see the appropriate section on the particular alert monitor.

Distributing Alert-Monitor Configuration Files

You can distribute the Alert-Monitor configuration files to the managed nodes in any one of the following ways:

1. The `Install/Update Software & Config` menu option

   Use the following menu option to distribute the monitors to the managed nodes.

   `Actions > Agents > Install/Update Software & Config`

   Configuration files are installed together with the monitor executables as part of the initial installation of the SPI for SAP. For any subsequent distributions, this method is typically only used if the monitors have been changed or updated. This method can only be used by the OVO administrator.

NOTE

If you have updated any of the SPI for SAP monitors' configuration files, we recommend you run the `.Activate R/3 Config` application in the `SAP R/3 Admin` application group *before* you run the `Install/Update Software & Config` command. The `.Activate R/3 Config` application moves the updated configuration files to the distribution directory sourced by the standard template-distribution mechanism.

2. The `.Install Config` application

   Use the `.Install Config` application located in the `SAP R/3 Admin` application group. The `.Install Config` application distributes copies of each configuration file to all selected managed nodes. This method can be used by any OVO user with the necessary access permissions.

3. The `Distribute Local Config` application

   Use the `Distribute Local Config` application located in the `SAP R/3 Admin Local` application group. The `Distribute Local Config` application distributes a copy of the monitor configuration file to the selected managed node *only*. This method can be used by any OVO user with the necessary access permissions.

It is possible to have configuration files in both the global and local directories on a managed node. When a monitor executable runs, it uses an order of precedence to determine which configuration file should be used. For more information, see "Alert Monitor Order of Precedence" on page 29.

Global configuration files are installed in the following directories on the OVO managed node:

- **UNIX**: `/var/opt/OV/bin/OpC/monitor`
- **AIX**: `/var/lpp/OV/bin/OpC/monitor`
- **MS Windows:** `\usr\OV\bin\OpC\intel\monitor`

Local configuration files are installed in the following directories on the managed node:

- **UNIX:** `/var/opt/OV/conf/hpitosap/local_config`
- **AIX:** `/var/lpp/OV/conf/hpitosap/local_config`
- **MS Windows:** `\usr\OV\conf\hpitosap\local_config`

Local and Global Configurations

This section explains briefly how to apply either a local or a global Alert-Monitor configuration and, in addition, how to delete configurations, which have already been applied and distributed. This section provides instructions for the following tasks:

- "To Apply a Global Configuration" on page 51
- "To Apply a Local Configuration" on page 52
- "To Delete All Local Configurations on a Node" on page 53
- "To Delete Selected Local Configurations on a Node" on page 53

It is possible to configure both global and local directories on the same machine. When a monitor executable runs, it uses an order of precedence to determine which configuration file should be used. For more information, see "Alert Monitor Order of Precedence" on page 29.

To Apply a Global Configuration

1. In the application group `SAP R/3 Admin`, double-click the icon associated with the alert monitor to be configured.
2. Edit the configuration file of the alert monitor as required. For a detailed description of file parameters, see "To Configure the SPI for SAP Alert Monitors" on page 45.
3. Double-click the icon `Install Config` to include the monitor configurations in the SPI for SAP R/3 database.
4. Repeat steps 1 through 3 for each alert type you wish to monitor, making sure to make all required changes in each corresponding alert monitor configuration file.
5. In the `Node Bank` window, select the managed nodes to which you want to distribute updated configurations.
6. Double-click the icon `Distribute R/3 Config`

   The *global* configuration files are copied to one of the following directories on each of the selected managed nodes:

   - **UNIX**: `/var/opt/OV/bin/OpC/monitor`

- **AIX**: `/var/lpp/OV/bin/OpC/monitor`
- **MS Windows:** `\usr\OV\bin\OpC\intel\monitor`

To Apply a Local Configuration

1. In the `Node Bank` window, select the managed node(s) on which you want to create or update a local configuration.
2. On the Management Server in the application group `SAP R/3 Admin Local`, double-click the icon associated with the alert monitor you want to configure.
3. Edit the configuration file of the alert monitor as required. For more information, see "To Configure the SPI for SAP Alert Monitors" on page 45

IMPORTANT

If this is the first local configuration for the selected alert monitor and node, opening the configuration file automatically places a copy of the dedicated global-configuration file in the local-configuration directory on the managed node.

If you do not want to have a local configuration for this alert monitor, you must delete this file from the directory before the next distribution of local-configuration files.

4. Repeat steps 1 through 3 for each alert type you wish to monitor locally, ensuring you make all required changes in *each* corresponding Alert-monitor configuration file.
5. In the `Node Bank` window, select the managed nodes to which you want to distribute updated local configurations.
6. In the application group `SAP R/3 Admin Local`, double-click the `Distribute Local Config` icon.

   The configuration files are copied to one of the following directories on each of the selected managed nodes:

   - **UNIX:** `/var/opt/OV/conf/hpitosap/local_config`
   - **AIX:** `/var/lpp/OV/conf/hpitosap/local_config`
   - **MS Windows:** `\usr\OV\conf\hpitosap\local_config`

To Delete All Local Configurations on a Node

1. In the Node Bank window, select the managed node(s) for which you want to delete the local configuration.
2. On the Management Server in the application group SAP R/3 Admin Local, double-click the icon Delete Local Config.

   On the Management Server, the local-configuration directories for the selected managed nodes are deleted and the updated configurations are distributed to the managed nodes.

To Delete Selected Local Configurations on a Node

1. On the Management Server, change to the local-configuration directory for the node:

   cd /opt/hpitosap/local_config/<*node_name*>/configfile

2. Remove the configuration file that is no longer required:

   rm <*filename*>.cfg

3. In the Node Bank window, select the managed node whose local configuration you want to delete.
4. In the application group SAP R/3 Admin Local, double-click the icon Distribute Local Config.

   The existing local configuration is removed and replaced by the new configuration, which does not include the configuration file you have removed.

IMPORTANT

Even if it is empty, do not manually remove the directory /opt/hpitosap/local_config/<node name>/configfile on the Management Server.

If you accidentally remove this directory, or this directory is otherwise not present, the Distribute Local Config function is not able to redistribute the configuration, which means that the local configuration on the managed node cannot be updated.

3 The SPI for SAP Alert Monitors

This section describes the CCMS alert monitors `r3monsap`, `r3monal`, `r3monxmi`, `r3monpro` and `r3mondev` and explains how to use them.

Introducing the SPI for SAP Monitors

The SPI for SAP includes a set of monitors, which you configure to be run at regular intervals to collect information regarding various aspects of your SAP environment.

Monitors must be deployed on the SAP R/3 servers which you want to manage and monitor with OVO. Monitor distribution is usually completed as part of the SPI for SAP installation and configuration process. To distribute a monitor, the OVO administrator, working from the OVO desktop, first assigns and distributes the appropriate SPI for SAP message-source templates.

If you are new to configuring the monitors, you will want to read the detailed description of each Alert Monitor and Alert-monitor configuration file. Each Alert-monitor configuration file includes information about default configurations as well as a list of changes you must make to the configuration file.

This section describes the CCMS alert monitors (`r3monsap`, `r3monal`, `r3monxmi`) and the monitors `r3monpro` and `r3mondev` and explains how to use them. The section covers the following areas:

- "Using the CCMS Alert Monitors" on page 57
- "The Alert-Monitor Configuration Files" on page 58
- "r3monal: Introducing the CCMS 4.x Alert Monitor" on page 60
- "r3monal: CCMS 4.x Alert Monitor with Shared Memory" on page 66
- "r3monal: CCMS 4.x Alert Monitor with XMI/XAL" on page 71
- "r3mondev: The Trace-file Monitor" on page 81
- "r3monpro: The Process Monitor" on page 84
- "r3monsap: CCMS 3.x Alert Monitor" on page 88
- "r3monxmi: The System-log Monitor (via XMI)" on page 93
- "r3status: The SAP R/3 Status Monitor" on page 100

Using the CCMS Alert Monitors

The alert monitors you use for your CCMS monitoring requirements can vary according to the SAP R/3 version of your system as illustrated in Table 3-1.

Table 3-1 CCMS Alert Monitors with Different Versions of SAP R/3

SAP R/3 Version	r3monsap	r3monal	r3monxmi
SAP R/3 3.1I	✓		✓
SAP R/3 4.0B	✓	(✓)	✓
SAP R/3 4.5B	(✓) [a]	✓	✓
SAP R/3 4.6		✓	✓
SAP R/3 6.10		✓	✓
SAP R/3 6.20		✓	✓

a. Configurations marked with (✓) are not recommended

NOTE Starting with version A.08.10, the SPI for SAP addresses the problem of particular CCMS alert monitors only working with specific SAP R/3 versions by providing specific template groups for specific versions of SAP R/3.

The Alert-Monitor Configuration Files

Each SPI for SAP Alert Monitor is specified in an OVO message-source template and in several files, including an executable file and a configuration file.

The message-source template defines the rules for generating messages to appear in the OVO Message Browser. The message-source template also controls the frequency with which the associated executable file runs. If you want to customize a message-source template, follow the instructions given in the online help for OVO Administrators.

The monitor executable file runs at the regular interval defined in the message-source template. It checks for and reports conditions according to monitoring conditions defined in the individual monitor's associated configuration file. You can define these monitoring conditions to suit the needs of your environment.

The SPI for SAP monitor's configuration file allows you to use keywords to set up the monitor to meet the requirements of your particular environment. Note that although most of the keywords appear in *all* the configuration files, some of the keywords can only be used in conjunction with specific monitors.

For more information about the keywords which you can use in the SPI for SAP alert-monitor configuration files, see "Monitor Configuration Files" on page 27. Note too, that the contents of `r3status.cfg`, the `r3status` monitor configuration file, are explained in greater detail in "The r3status Configuration File" on page 103:

Example 3-1 on page 58 shows what a complete configuration file looks like for the `r3mondev` monitor, which scans the trace and log files of the SAP system for the string "`ERROR`".

Example 3-1 Excerpt from the r3mondev.cfg File

```
#-------------------------------------------------------------------------
# TraceLevel  hostname  only error messages=1  info messages=2  debug messages=3
#                       Disable=0
TraceLevel     =ALL        =0
#-------------------------------------------------------------------------
# TraceFile  hostname    filename
#
TraceFile    =ALL        =r3moncts.log
```

```
#------------------------------------------------------------
# History    hostname    path
# Path
#
HistoryPathUnix   =ALL   =/var/opt/OV/tmp
HistoryPathAIX    =ALL   =/var/lpp/OV/tmp
HistoryPathWinNT  =ALL   =default
#------------------------------------------------------------
# AgentHostname   hostname   aliasname
#
AgentHostname     =ALL       =default
#------------------------------------------------------------

# SAPSHMCheck hostname    Enable = 1
#                         Disable = 0
SAPSHMCheck   =ALL        =0
#------------------------------------------------------------
# AlertDevMon  SAP  SAP     Enable =1  Filemask   Severity  Opc        OpC
#              Sys  Number  Disable=0                       Object     MsgGroup
#AlertDevMon   =ALL  =ALL    =1        =dev_*     =WARNING  =r3mondev  =R3_Trace
#AlertDevMon   =ALL  =ALL    =1        =std*      =CRITICAL =r3mondev  =R3_Trace
#Dispatcher trace file
AlertDevMon    =ALL  =ALL    =1        =dev_disp  =WARNING  =r3mondev  =R3_Trace
#Workprocess trace file for workprocess with number 0
AlertDevMon    =ALL  =ALL    =1        =dev_w0    =WARNING  =r3mondev  =R3_Trace
#message server trace file
AlertDevMon    =ALL  =ALL    =1        =dev_ms    =WARNING  =r3mondev  =R3_Trace
#screen processor trace file
AlertDevMon    =ALL  =ALL    =1        =dev_dy0   =WARNING  =r3mondev  =R3_Trace
#tp process trace file
AlertDevMon    =ALL  =ALL    =1        =dev_tp    =WARNING  =r3mondev  =R3_Trace
-------------------------------------------------------------------------------
```

r3monal: Introducing the CCMS 4.x Alert Monitor

The `r3monal` monitor uses the SAP R/3 CCMS monitoring architecture introduced at SAP version 4.0 and enables you to monitor the output of SAP's own internal monitor, the CCMS alert monitor. The `r3monal` monitor maps the alerts identified by the CCMS monitor to OVO messages, which you can view in the OVO Message Browser.

How you configure the `r3monal` monitor depends on the version of SAP R/3 you want to monitor with the SPI for SAP, as follows:

- **SAP R/3 4.0 and 4.5**

  If the SAP Servers you want to monitor with the SPI for SAP are running SAP R/3 4.0 and 4.5, then you need to configure the `r3monal` CCMS Alert Monitor to use the SAP shared memory as described in the section "r3monal: CCMS 4.x Alert Monitor with Shared Memory" on page 66. Remember to pay particular attention to the Alert Classes section at the end of the configuration file.

- **SAP R/3 4.6(6.x)**

  If the SAP Servers you want to monitor with the SPI for SAP are running SAP R/3 4.6 (6.10, 6.20 etc.), then you can configure the CCMS Alert Monitor to use either:

  — the SAP shared memory as described in "r3monal: CCMS 4.x Alert Monitor with Shared Memory" on page 66.

  — the new XMI/XAL interface as described in "r3monal: CCMS 4.x Alert Monitor with XMI/XAL" on page 71.

NOTE Since SAP has indicated that it intends to phase out support for the shared-memory interface, future releases of the SPI for SAP will only support the XMI/XAL interface.

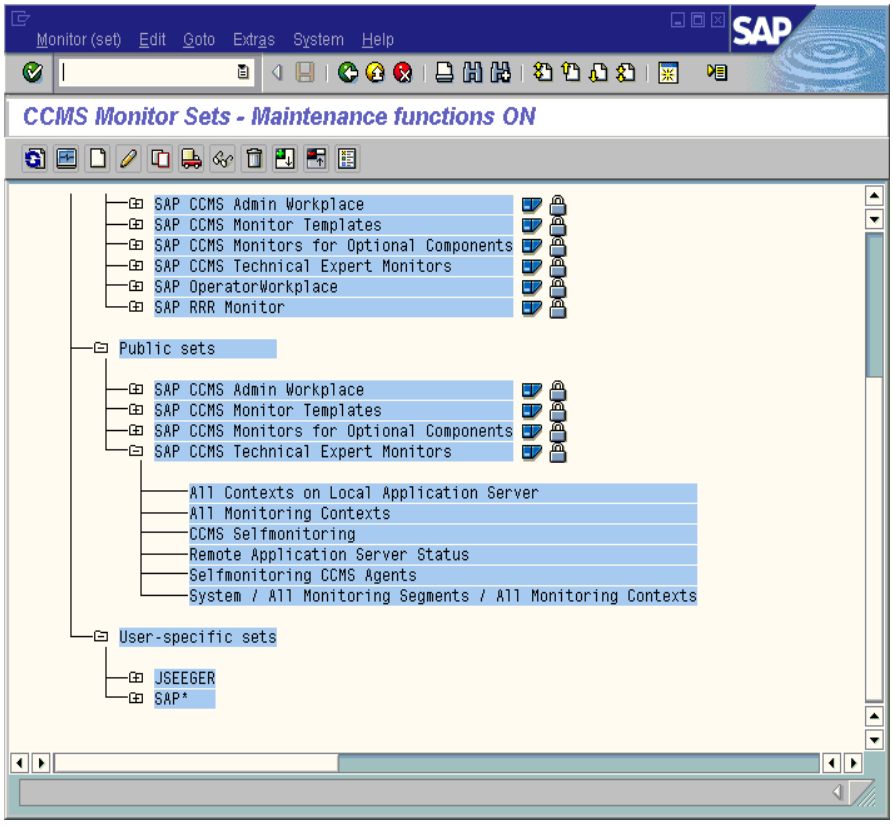
The rest of the information in this section applies to both configurations of the `r3monal` CCMS Alert Monitor and includes information about the following topics:

- "CCMS Alert Monitors" on page 61
- "r3monal: Trace Levels" on page 63
- "r3monal: File Locations" on page 63
- "r3monal: Environment Variables" on page 64
- "r3monal: Severity Levels" on page 64

CCMS Alert Monitors

Alerts are the most basic element of the strategy that the SAP uses to monitor the health of the SAP Landscape. Alerts are associated with objects such as disks and CPUs, and objects have attributes such as response times and usage statistics. The status of the object as well as its performance and availability over time are important to the SAP System administrator. The SAP R/3 CCMS Alert Monitor displays the configured alerts (along with any associated objects and attributes) as CCMS **Monitors** in a **Monitor Tree**, which you can browse, as illustrated in Figure 3-1. Note that *public* Monitor sets are visible to (and usable by) all SAP users.

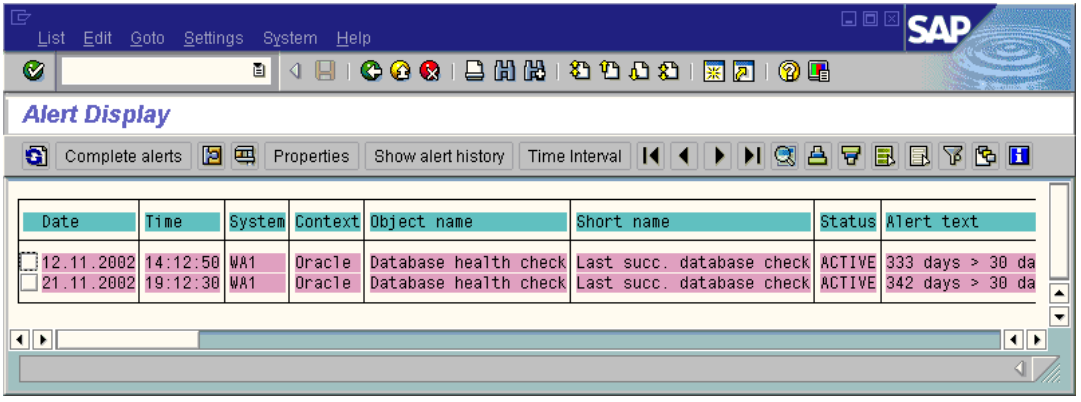
Figure 3-1 **CCMS Monitor Sets**



For ease of navigation, the CCMS monitors are grouped into pre-defined **Monitor Sets**, for example; `SAP CCMS Technical Expert Monitors` or `SAP CCMS Admin Workplace`. The pre-defined monitor sets contain a large number of sub sets and monitors, which can generate thousands of alerts, some of which you really do not need. If you switch *on* the maintenance function for the CCMS Monitor Sets, you can create your own CCMS Monitor Sets, which contain only the monitors for the alerts you want to know about on a regular basis. When you have created your own Monitor Sets, you can add them to the Monitor-set tree and

configure the SPI for SAP to monitor them. In this way, you can reduce the alerts you hear about and the information you receive so that it is easier to manage.

Figure 3-2 CCMS Alert Properties



When a condition is reported in the SAP R/3 CCMS monitor, the monitoring object and its attributes are included in the resulting alert as shown in Figure 3-2.

r3monal: Trace Levels

For more information about the trace levels the Alert Monitors use and, in particular, the trace levels available to the `r3monal` monitor, see Trace Level in the section "Monitor Configuration Files" on page 27.

r3monal: File Locations

The `r3monal` monitor uses the default files listed in Table 3-2.

Table 3-2 r3monal Files

File Name	Description
`r3monal(.exe)`	Executable for the SAP R/3 CCMS alert monitor
`r3monal.cfg`	Configuration file for the CCMS alert monitor
`r3monal.his`	History file for storing data after each monitor run
`r3monal.msg`	SAP R/3 syslog message mapping table

r3monal: Environment Variables

Table 3-3 lists the environment variables, which you can use to configure the `r3monal` monitor.

Table 3-3 r3monal Environment Variables

Environment Variable	Description
SAPOPC_DRIVE	The Windows drive where the OVO agent is installed, for example; `E:\usr\...`
SAPOPC_HISTORYPATH	History path
SAPOPC_R3MONAL_CONFIGFILE	Name of the configuration file
SAPOPC_SAPDIR	The Windows drive where SAP R/3 is installed, for example; `E:\usr\sap`
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_TRACEPATH	Trace path

r3monal: Severity Levels

Table 3-4 on page 64 shows how the “Severity Levels” section of the `r3monal.cfg` file allows you to define how the severity level associated with a CCMS Alert corresponds to the severity level assigned to the OVO messages, which are generated by the CCMS Alerts.

Table 3-4 Mapping CCMS Alert Severity Levels to OVO Messages

CCMS Alert	OVO Message
SeverityNull	=UNKNOWN
SeverityNormal (green)	=NORMAL
SeverityWarning (yellow)	=WARNING

Table 3-4 Mapping CCMS Alert Severity Levels to OVO Messages

CCMS Alert	OVO Message
SeverityCritical (red)	=CRITICAL

r3monal: Remote Monitoring

The RemoteMonitoring keyword in the monitor-configuration file can be used *only* with the SPI for SAP Alert Monitors `r3monal` and `r3monxmi` (the System-log Monitor). For more information about the parameters you can use with the RemoteMonitoring keyword, see the list of keywords in "Remote Monitoring with the Alert Monitors" on page 30. Note that SAP System and SAP Number are only required by `r3monal` and `r3monxmi`.

Example 3-2 Enabling Remote Monitoring in the r3monal.cfg File

```
#------------------------------------------------------------
# Remote Host     Localhost   Remotehost    SAP      SAP
#                                           System   Number
RemoteMonitoring  =hpspi003   =ovsdsap6     =SP6     =00
#------------------------------------------------------------
```

r3monal: CCMS 4.x Alert Monitor with Shared Memory

The CCMS Alert Monitor (`r3monal`) provided with version A.07.10 (and newer) of the SPI for SAP can use either the old SAP shared-memory (SHM) interface or the new XMI/XAL interface to monitor CCMS alerts. Note that the new XMI/XAL interface is only available with SAP R/3 4.6 and higher. If you want to use the SPI for SAP to monitor older 4.x versions of SAP R/3 such as 4.0 or 4.5, you will have to configure the SPI for SAP to use the SAP shared-memory interface, as described in this section.

NOTE Since SAP has indicated that it intends to phase out support for the shared-memory interface, future releases of the SPI for SAP will only support the XMI/XAL interface.

For information about using the XMI/XAL interface to monitor CCMS alerts in SAP R/3 4.6, see "r3monal: CCMS 4.x Alert Monitor with XMI/XAL" on page 71: for information about monitoring CCMS alerts in SAP R/3 3.x, see "r3monsap: CCMS 3.x Alert Monitor" on page 88.

This section contains information about the following topics:

- "r3monal: Monitoring Conditions" on page 67
- "r3monal: Severity Levels" on page 67
- "r3monal: Alert Classes" on page 68

Table 3-5 shows how the CCMS Alert components are mapped to the corresponding components in OVO.

Table 3-5 Mapping CCMS Alert Components to OVO Messages

CCMS Alert	OVO Message
Monitoring Object	OVO Message Object
Attribute	OVO Message Prefix
Alert Text	Message Text

r3monal: Monitoring Conditions

The entries that are required in the `r3monal` monitor configuration file depend on which SAP interface you are using to collect the alerts, namely; SAP shared memory or the new XMI/XAL interface, which is only available from SAP R/3 version 4.6. When `r3monal` is configured to use the SAP shared memory, you define any monitoring conditions in the following two sections, which are described in greater detail later in this section:

- Severity Levels
- Alert Classes

For more information about the contents of the `r3monal.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

r3monal: Severity Levels

The "Severity Levels" section of the `r3monal.cfg` file maps severity levels for CCMS Alerts to the desired OVO severity levels for the corresponding OVO messages. By adding a new line for each individual SAP system ID/SAP number combination, you can tie the severity mapping to a specific SAP System ID and SAP Number. Example 3-3 on page 67 shows the default severity-level settings in the `r3monal.cfg` file.

Example 3-3 Default Severity Levels in the r3monal Configuration File

```
#-----------------------------------------------------------
#Severity         SAP      SAP     Enabled=1    OpCSeverity
#Values           System   Number  Disabled=0
SeverityWarning  =ALL     =ALL    =1           =WARNING
SeverityCritical =ALL     =ALL    =1           =CRITICAL
#-----------------------------------------------------------
```

You can edit the severity levels in `r3monal.cfg` in the following ways:

1. **Enable or disable severity levels**

   If you want to disable (=0) messages for normal conditions, add a new (or change the existing) SeverityNormal line as follows:

   ```
   SeverityNormal    =ALL    =ALL    =0    =NORMAL
   ```

2. **Change how CCMS severity levels are mapped to OVO severity levels.**

   If you want all SeverityNull events to be reported as WARNINGS, add a new (or change the existing) SeverityNull definition, as follows:

```
SeverityNull      =ALL    =ALL    =1    =WARNING
```

3. **Define SID-Specific exceptions**

   If you want SeverityWarning events that occur on SAP system LP2 to be reported as critical, leave the default settings for ALL systems, and add the following line:

```
SeverityWarning   =LP2    =ALL    =1    =CRITICAL
```

r3monal: Alert Classes

In the alert classes section of the `r3monal.cfg` file, you can define how OVO alert classes are mapped to a specified part of the monitoring tree. You can define a configuration which applies to *all* SAP systems and instance numbers, or for each individual SAP system and instance number. Each definition associates the mapped alerts with an OVO Message Group.

NOTE

The SPI for SAP uses a combination of the `r3monsap` and `r3monal` monitors to monitor CCMS alerts in SAP R/3 versions 4.0 and 4.5. To avoid duplication, alert conditions that are identified by the `r3monal` monitor should be disabled in the `r3monsap` configuration file.

The `r3monal.cfg` file includes the following defaults in the Alert Classes section.

```
Alert       SAP     SAP     Monitoring                 Enabled=1    VPO MsgGroup
Classes     System  Number  Tree                       Disabled=0
AlertMonObj =ALL    =ALL    =\*\OperatingSystem\CPU    =1          =R3_
AlertMonObj =ALL    =ALL    =\*\OperatingSystem\Paging =1          =R3_Roll-Paging
AlertMonObj =ALL    =ALL    =\*\OperatingSystem        =1          =OS
AlertMonObj =ALL    =ALL    =\*\DatabaseClient         =1          =R3_DB
AlertMonObj =ALL    =ALL    =\*\R3Services             =1          =R3_
AlertMonObj =ALL    =ALL    =\*\R3BasisSystem\TraceSwitches =1     =R3_Trace
AlertMonObj =ALL    =ALL    =\*\R3BasisSystem          =1          =R3_
AlertMonObj =ALL    =ALL    =\*\R3Syslog               =1          =R3_Syslog
```

```
AlertMonObj =ALL    =ALL   =\*                          =1          =R3_General
#-------------------------------------------------------------------------------
# Alert         SAP      SAP      SyslogId      Enabled=1     VPO MsgGroup
# Classes       System   Number   From   To     Disabled=0
AlerMonSyslog   =ALL     =ALL     =A00   =ZZZ   =1            =R3
-------------------------------------------------------------------------------
```

When you customize the `r3monal.cfg` file's alert classes section, keep in mind the following information:

- **OVO Message Group:**

  Each object to be monitored by `r3monal` is identified in the alert classes section by a reference to its location in the CCMS monitoring tree. For example, in the second line of the default `r3monal.cfg` file, which is `\*\*\OperatingSystem\Paging`, you can see that for all SAP systems and instances, Paging events for all operating systems are reported in the Message Group, `R3_Roll_Paging`.

- **Order of definitions:**

  The order of the definitions in the configuration file is important. Conditions are considered from top to bottom of the list. Consequently, more specific definitions must precede general ones. For example, if the order of the first three default lines were changed to:

  ```
  AlertMonObj  =ALL  =ALL  =\*\OperatingSystem      =1  =OS
  AlertMonObj  =ALL  =ALL  =\*\OperatingSystem\CPU  =1  =OS
  AlertMonObj  =ALL  =ALL  =\*\OperatingSystem\Paging =1 \
  =R3_Roll-Paging
  ```

  All operating system alerts would be assigned to the `OS` Message Group and the conditions that assign CPU and Paging alerts to the `CPU` and `R3_Roll-Paging` groups would never be considered.

- **Syslog alert formats:**

  The settings for syslog alerts can have different formats. The default setting:

  ```
  AlerMonSyslog   =ALL   =ALL   =A00   =ZZZ   =1
  ```

  enables global reporting of all syslog alerts. You can change this by enabling and disabling ranges of syslog IDs either globally or for specified SAP systems and instances. For example:

```
AlerMonSyslog    =ALL    =ALL    =A00    =MZZ    =1
AlerMonSyslog    =ALL    =ALL    =N00    =ZZZ    =0
AlerMonSyslog    =LPO    =01     =A00    =ZZZ    =1
```

You can also monitor syslog messages using the `r3monxmi` monitor, which monitors the SAP R/3 system log rather than syslog alerts in the CCMS alerts monitor.

NOTE

If you are using the `r3monxmi` monitor, make sure that you disable syslog alerts in the `r3monal` monitor.

r3monal: CCMS 4.x Alert Monitor with XMI/XAL

The `r3monal` monitor provided with version A.07.10 (and newer) of the SPI for SAP uses the SAP R/3 CCMS monitoring architecture introduced at SAP version 4.6 and enables you to monitor the output of SAP's own internal monitor. You can configure the new `r3monal` CCMS Alert Monitor to use either the old SAP shared-memory interface or the new XMI/XAL interface to monitor CCMS alerts. Note that the new XMI/XAL (BAPI) interface is only available with SAP R/3 4.6 and higher.

NOTE Since SAP has indicated that it intends to phase out support for the shared-memory interface, future releases of the SPI for SAP will only support the XMI/XAL interface.

For information about monitoring CCMS alerts in SAP R/3 4.x, see "r3monal: CCMS 4.x Alert Monitor with Shared Memory" on page 66: for information about monitoring CCMS alerts in SAP R/3 3.x, see "r3monsap: CCMS 3.x Alert Monitor" on page 88.

This section contains information about the following topics:

- "r3monal: Monitoring Conditions" on page 71
- "r3monal: RFCTimeOut" on page 72
- "r3monal: CCMS Interface" on page 72
- "r3monal: CCMS Monitor Sets" on page 73
- "r3monal: CCMS Acknowledge Message" on page 77
- "r3monal: Severity Levels" on page 78

r3monal: Monitoring Conditions

The conditions which you have to define in the `r3monal` monitor configuration file depend on which SAP interface you are using to collect the alerts, namely; SAP shared memory or the new XMI/XAL interface, which is only available from SAP R/3 version 4.6.

- **Shared-memory Interface:**

  You must set the CCMS Interface keyword as described in "r3monal: CCMS Interface" on page 72 and, in addition, define and enable the Severity-levels, and Alert-classes keywords as described in "r3monal: CCMS 4.x Alert Monitor with Shared Memory" on page 66.

- **XMI/XAL Interface:**

  You must set the CCMSInterface keyword as described in "r3monal: CCMS Interface" on page 72 and, in addition, define and enable the keywords; Severity levels, RFCTimeOut, CCMS Monitor Set, and CCMSAcknowledgeMessage. If you are using the XMI/XAL interface, you do not need to define or enable the Alert Classes keyword.

r3monal: RFCTimeOut

You use the RFCTimeout keyword to define the maximum amount of time in seconds before an RFC XMI/XAL function call is canceled, for example; =120. You need to set a time-out which takes into account the the environment in which SAP is running. For example, if the RFC call takes longer than expected to complete, that is; to receive a reply to the initial request, the SAP System is probably down or has a serious performance problem. Note that after the RFC call has completed and a free Dialog process has been allocated, the time limit no longer applies.

The RFCTimeout keyword can only be used if you have configured `r3monal` to use the XMI/XAL interface in the `r3monal.cfg` configuration file, as described in "r3monal: CCMS Interface" on page 72.

Example 3-4 Setting the Time-out period for XMI/XAL Function Calls

```
#------------------------------------------------------------
# Max. time in sec. before a RFC XMI/XAL 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
#------------------------------------------------------------
```

r3monal: CCMS Interface

To select the interface you want the `r3monal` monitor to use with SAP 4.6/6.x, you use the **CCMSInterface** keyword in the `r3monal.cfg` configuration file. "The Alert-Monitor Configuration Files" on page 58

lists all the keywords you can use in the SPI for SAP monitors' configuration file as well as any allowed parameters. Note that we recommend configuring the `r3monal` monitor to use the XAL interface in order to take advantage of the greater functionality. The XAL interface is enabled by default in the example configuration file provided for the `r3monal` monitor

Example 3-5 Selecting the CCMS Interface

```
# The XAL interface can be only used with SAP 4.6 and higher.
#-------------------------------------------------------------
# SHM => for the shared-memory interface (old interface)
# XAL => for the new enhanced XMI/XAL interface (BAPI)
CCMSInterface = XAL
#-------------------------------------------------------------
```

Note that if you select the new XAL interface, you have to apply and distribute the `r3monal` monitor *only* to the SAP Central Instance. This is because the SAP Application Servers are already known to the Central Instance. If on the other hand you select the old, shared-memory interface, you have to apply and distribute the `r3monal` monitor to both the SAP Central Instance and *all* the Application Servers, too. In addition, if you select the XAL interface, you do *not* have to configure the Application Servers as OVO managed nodes. However, the Application Servers must be added to the node list in the Node Bank window and, in addition, appear in an Node Group so that messages are matched and appear in the OVO Message Browser.

r3monal: CCMS Monitor Sets

The new XMI/XAL interface allows the SPI for SAP to read, write, and reset CCMS alerts directly in the CCMS alert-monitor tree. The most obvious advantage of this feature is that you can use existing CCMS Monitor Sets as templates to define your own Monitor Sets, which contain only those CCMS alerts you want to monitor with the SPI for SAP.

Remember to login to SAP and define the new CCMS Monitor Sets which you want the SPI for SAP to use to generate messages *before* you start the configuration of the `r3monal` monitor in OVO . Figure 3-3 on page 75 shows how the application servers `bounty` and `hpspi003` appear in the Monitor-tree when you select and expand the Central Instance item `WA1`.

NOTE

In order to create or modify items in the CCMS Monitor tree, you need to make sure that the `Maintenance Function` for the CCMS Monitor Sets is switched on. You can find the `Maintenance function` option in the `Extras` menu, as follows:

```
Extras > Activate Maintenance Function
```

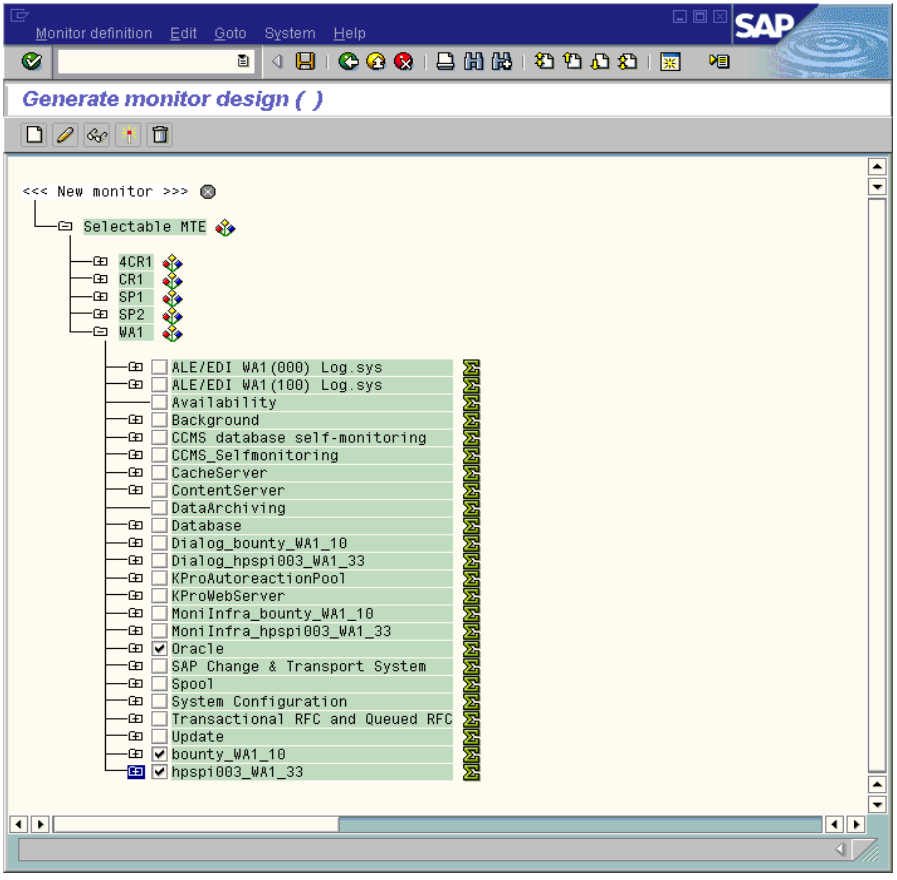
If you are not interested in receiving messages concerning *all* the alerts present in the default Monitor Set, for example; `OperatingSystem`, `DatabaseClient`, and so on, you can expand the individual Application Server item and select only the alerts which you want to use to generate messages that will be sent to OVO. In the example configuration shown in Figure 3-3, we have also selected the `Oracle` item so that we hear about problems with the database, too.

Make sure that the new Monitor Sets you define for the SPI for SAP are visible to and usable by the OVO user, which you have defined for the SPI for SAP. If you are logged into SAP as the defined OVO user, then you can see only the CCMS Monitor Sets defined for the defined OVO user and those marked “Public”. If you are logged into SAP as the administrator, you can see *all* available Monitor Sets, in which case you have to remember to ensure that you make the *new* Monitor Sets you define for the SPI for SAP visible either to the defined OVO user for the SPI for SAP or everyone by using the option “Public”.

One SAP System/SID can have multiple Monitor Sets. If you need to define multiple Monitor Sets for a SAP System/SID, remember to include each new Monitor Set on a new line in the Monitor Set section of the `r3monal.cfg` monitor configuration file, as illustrated in Example 3-6. The name you define in the Monitor parameter must match the name of

the Monitor Set as it appears in the CCMS Alert-monitor tree. The names of monitor groups and subgroups must be separated by a forward slash (/) in the `r3monal.cfg` configuration file, as shown in Example 3-6.

Figure 3-3 Defining a Monitor Set



Note that the combination of traditional long SAP names and the line break in the example configuration file shown in Example 3-6 disguises the name of the Monitor. The complete name of the last Monitor is: `=System / All Monitoring Segments / All Monitoring Contexts`. Note that the names you use do not have to be this long. In addition, if you want to associate multiple Monitors with one, single Monitor Set, you have to specify each individual Monitor on a new line as shown by the first two entries in Example 3-6, where the **SPISAP** monitor set has two Monitors; **System** and **DB_ALERT**.

Example 3-6 Configuring Multiple Monitor Sets

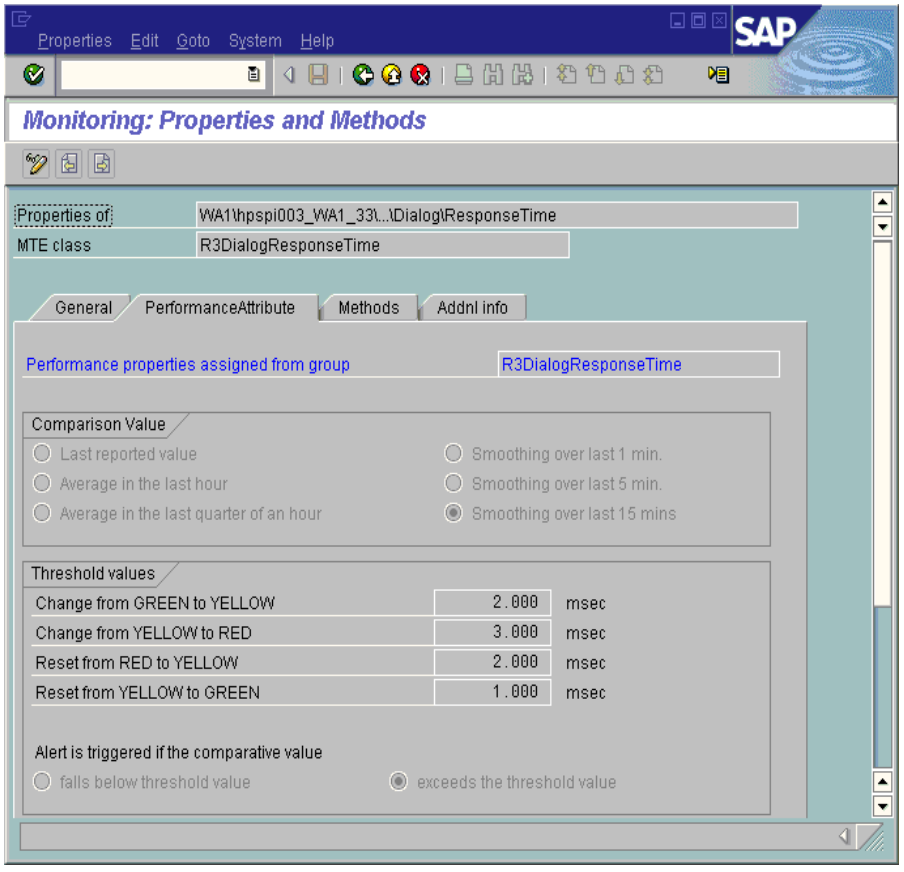
```
#-------------------------------------------------------------------------
# Monitor Set    SAP     SAP     Monitor Set                          Monitor
#                System  Number
CCMSMonitorSet   =WA1    =33     =SPISAP                              =System
CCMSMonitorSet   =WA1    =33     =SPISAP                              =DB_ALERT
CCMSMonitorSet   =SP6    =00     =SAP CCMS Technical Expert Monitors  =System /
                              All Monitoring Segments / All Monitoring Contexts
#-------------------------------------------------------------------------
```

The default configuration of individual CCMS Alert Monitors does not always meet the demands of your environment and, in some instances, will need to be changed. You can check and, if necessary, modify a Monitor's properties in the `Performance Attribute` tab of the `Monitor: Properties and Methods` window, as illustrated in Figure 3-4. You need to:

- ensure that the severity level of the CCMS Alerts matches the severity level of the OVO messages, which are generated by the CCMS Alerts.
- ensure that severity-level thresholds configured for a given CCMS Alert Monitor are appropriate for your needs.

To open the `Monitor: Properties and Methods` window for a specific CCMS Monitor, browse to the desired Monitor in the Monitor-set tree and either click the `Properties` button or double-click the Monitor you want to view.

Figure 3-4 **Checking and Modifying CCMS Alert-Monitor Thresholds**



r3monal: CCMS Acknowledge Message

This feature determines whether or not CCMS Alerts which match the defined conditions are acknowledged (or completed) in CCMS or not. Enabling the CCMSAutoAcknowledge feature in the `r3monal.cfg` configuration file is the same as selecting the alert and clicking the `[Complete Alert]` button in SAP CCMS.

You can only use the r3monal monitor to automatically acknowledge CCMS Alerts in SAP if you have configured the r3monal monitor to use the XMI/XAL interface. If you have configured the r3monal monitor to use the old SAP shared-memory interface, any settings you make in the AutoAcknowledge section of the r3monal.cfg configuration file are ignored.

Example 3-7 Automatically Acknowledging CCMS Alerts

```
# AutoAcknowledge of CCMS alerts will only work if you use the
# XMI/XAL interface. If you use the SHM interface, the XAL
# settings are ignored.
#-------------------------------------------------------------
# CCMSAcknowledgeMessage  SAP     Ack. filtered   Enable=1
#                         System  Messages        Disable=0
CCMSAcknowledgeMessage    =ALL    =0              =0
CCMSAcknowledgeMessage    =SP6    =0              =0

#-------------------------------------------------------------
```

You can enable or disable the r3monal monitor for specific SAP Systems defined on individual lines in the r3monal.cfg configuration file. Note, however, that if you *disable* the r3monal monitor (=0) for a specific SAP System, r3monal ignores the setting for **Ack. Filtered Messages** defined on the same line.

r3monal: Severity Levels

The "Severity Levels" section of the r3monal.cfg file maps severity levels for CCMS Alerts to the desired OVO severity levels for the corresponding OVO messages. By adding a new line for each individual SAP system ID/SAP number combination, you can tie the severity mapping between CCMS Alerts and OVO messages to a specific SAP System ID and SAP Number. Example 3-8 shows the default settings for severity levels in the r3monal.cfg file.

Example 3-8 Default Settings for Severity Levels in r3monal.cfg

```
#-----------------------------------------------------------
#Severity         SAP      SAP     Enabled=1   OpCSeverity
#Values           System   Number  Disabled=0
SeverityWarning   =ALL     =ALL    =1          =WARNING
SeverityCritical  =ALL     =ALL    =1          =CRITICAL
#-----------------------------------------------------------
```

You can edit the severity levels in `r3monal.cfg` in any one of the following ways:

1. **Enable or disable severity levels**

   For example, if you want to disable messages for normal conditions, change the SeverityNormal line as follows:

   ```
   SeverityNormal     =ALL    =ALL    =0    =NORMAL
   ```

2. **Change how CCMS severity levels map to OVO severity levels.**

   For example, if you want all SeverityNull events to be reported as WARNINGS, change the SeverityNull definition, as follows:

   ```
   SeverityNull       =ALL    =ALL    =1    =WARNING
   ```

3. **Define SID-Specific exceptions**

   For example, if you want SeverityWarning events that occur on SAP system LP2 to be reported as critical, leave the default settings for ALL systems, and add the following line:

   ```
   SeverityWarning    =LP2    =ALL    =1    =CRITICAL
   ```

Example 3-9 Excerpt from a Default r3monal Configuration File

```
#-----------------------------------------------------------
# Max. time in sec. before a RFC XMI/XAL 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

# The XAL interface can be only used with SAP 4.6 and higher.
#-----------------------------------------------------------
# SHM => for the shared memory interface (old interface)
# XAL => for the new enhanced XMI/XAL interface (BAPI)
CCMSInterface = XAL

# A Monitor Set defines the messages you want to forward to
# the OVO console. The Monitor Set can be only used with the
# XMI/XAL interface. You can build up your own Monitor Set
# (recommended).
#-----------------------------------------------------------
# Monitor Set      SAP    SAP     Monitor Set  Monitor
#                  System Number
#CCMSMonitorSet    =WA1   =33     =SPISAP      =System
```

```
#CCMSMonitorSet    =WA1    =33      =SPISAP       =DB_ALERT
#CCMSMonitorSet     =SP6     =00       =SAP CCMS Technical Expert Monitors =System
/ All Monitoring Segments / All Monitoring Contexts

#-------------------------------------------------------------
# Remote Host       Localhost    Remotehost   SAP      SAP
#                                             System   Number
#RemoteMonitoring   =hpspi003    =ovsdsap6    =SP6     =00

# AutoAcknowledge of CCMS alerts will only work if you use the
# XMI/XAL interface. If you use the SHM interface, the XAL settings
# are ignored.
#-------------------------------------------------------------
# CCMSAcknowledgeMessage  SAP       Ack. filtered      Enable=1
#                         System    Messages           Disable=0
CCMSAcknowledgeMessage    =ALL      =0                 =0
CCMSAcknowledgeMessage    =SP6      =0                 =0

#-------------------------------------------------------------------
```

r3mondev: The Trace-file Monitor

The r3mondev monitor scans the trace files and log files of the SAP system for the string "ERROR". Because it monitors only what has occurred since its previous run, any error within a trace file generates only a single alert. The file monitor scans the following directories:

- **UNIX**: /usr/sap/<*SID*>/<*InstanceNumber*>/work/
- **AIX:** /usr/sap/<*SID*>/<*InstanceNumber*>/work/
- **Win**: <*drive*:>\usr\sap\<SID>\<*InstanceNumber*>\work

where <*SID*> stands for the SAP system ID and <*InstanceNumber*> stands for the SAP instance number.

Messages generated by this monitor include an operated-initiated action, which calls the vi editor. vi then displays a list of all trace files and log files and prompts you to select a file from the list and display its contents.

This section contains information about the following topics:

- "r3mondev: File Locations" on page 81
- "r3mondev: Environment Variables" on page 82
- "r3mondev: Monitoring Conditions" on page 82
- "Editing the r3mondev.cfg File" on page 83

r3mondev: File Locations

The file monitor, r3mondev, includes the files listed in Table 3-6.

Table 3-6 r3mondev Files

File	Description
r3mondev(.exe)	Executable for the file monitor
r3mondev.cfg	Configuration file for monitored files
r3mondev.his	History file for storing data after each monitor run

r3mondev: Environment Variables

The file monitor uses environment variables listed in Table 3-7.

Table 3-7 r3mondev Environment Variables

Environment Variable	Description
SAPOPC_DRIVE	The Windows drive where the agent is installed, for example; `E:\usr\...`
SAPOPC_HISTORYPATH	History path
SAPOPC_R3MONDEV_CONFIGFILE	Name of the configuration file
SAPOPC_SAPDIR	The Windows drive where SAP R/3 is installed, e.g.; `E:\usr\sap`
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_TRACEPATH	Trace path

r3mondev: Monitoring Conditions

This section of the `r3mondev.cfg` file enables you to specify the device monitoring details for the SPI for SAP R/3.

For more information about the entries in the `r3mondev.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

The monitoring conditions section of the `r3mondev.cfg` file includes the following default settings:

```
# AlertDevMon   SAP    SAP    Enable=1   File     Severity  Opc        OpC
#               System Number Disable=0  Mask               Object     MsgGroup
AlertDevMon     =ALL   =ALL      =1      =dev_*   =WARNING  =r3mondev  =R3_Trace
AlertDevMon     =ALL   =ALL      =1      =std*    =CRITICAL =r3mondev  =R3_Trace
```

Editing the r3mondev.cfg File

You can edit `r3mondev.cfg` in the following ways:

- **Disable messages**

  Disable messages. For example, if you don't want to receive any messages relating to `dev_*` files for any SAP system, change the first line as follows:

  ```
  AlertDevMon    =ALL    =ALL      =0      =dev_* =WARNING =
  r3mondev =R3_Trace
  ```

- **Change a message's severity level**

  Change the severity level of the message. For example, if you want to demote messages relating to `std*` files from critical to warning, change the second line as follows:

  ```
  AlertDevMon    =ALL    =ALL      =1      =std* =WARNING
  =r3mondev  =R3_Trace
  ```

- **Define exceptions**

  Define an exception to the general rule. For example, if you want to promote messages relating to `dev_*` files on SAP system LP2 from warning to critical, leave the default settings as they are and add the following line.

  ```
  AlertDevMon =LP2 =ALL =1 =dev_* =CRITICAL =r3mondev =R3_Tr
  ace
  ```

NOTE Wildcards are only allowed at the end of the string. Only SAP trace files (located in the work directory) are relevant and these files must begin with `dev` or `std`.

r3monpro: The Process Monitor

The `r3monpro` monitor scans all processes associated with a given instance, such as dialog, enqueue, update, batch, dispatch, message, gateway, and spool work processes. It is also used for monitoring database processes.

This section contains information about the following topics:

- "r3monpro: File Locations" on page 84
- "r3monpro: Environment Variables" on page 85
- "r3monpro: Monitoring Conditions" on page 85
- "r3monpro: Example Configuration" on page 86

r3monpro: File Locations

The process monitor `r3monpro` contains the files listed in Table 3-8.

Table 3-8 r3monpro Files

File	Description
`r3monpro(.exe)`	Executable for the process monitor
`r3monpro.cfg`	Configuration file for the process monitor
`r3monpro.his`	History file for storing data after each monitor run

r3monpro: Environment Variables

The process monitor `r3monpro` uses the environment variables listed in Table 3-9.

Table 3-9 r3monpro Environment Variables

Environment Variable	Description
SAPOPC_DRIVE	The Windows drive where the agent is installed, for example; `E:\usr\...`
SAPOPC_HISTORYPATH	History path
SAPOPC_R3MONPRO_CONFIGFILE	Name of the configuration file
SAPOPC_SAPDIR	The Windows drive where SAP R/3 is installed, e.g.; `E:\usr\sap`
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_TRACEPATH	Trace path

r3monpro: Monitoring Conditions

Monitoring conditions for `r3monpro` are specified in the `r3monpro.cfg` file. Individual rows define monitoring conditions for specific processes. You use the `r3monpro.cfg` file to set the rules which define how the number of processes running should be measured and what severity level should be assigned to the alert that is generated if the number of processes exceeds the limits you define.

You can set monitoring conditions for a specific process to any of the following modes:

- **Exact**

  The number of process running on a managed node must be equal to the specified number.

- **Min**

  The number of processes running on a managed node must not be less than the specified number.

- **Max**

  The number of processes running on a managed node must not be more than the specified number.

- **Delta**

  An alert is triggered if there is any change in the number of processes running on a managed node or if the specific amount of allowed change in the number of instances of the same process exceeds the defined limit. This mode enables you to recognize changes without having to define an absolute number of processes for a managed node.

  For example, if Delta =2, then a difference of 2 or more between the number of processes (n) found in the previous and current monitor run on a managed node triggers an alert. Note that, if an alarm is triggered, n is reset to the number of processes discovered in the most recent monitor run, and any new Delta is calculated on the basis of the new number of processes found to be running.

Messages generated when one of these conditions is identified include an operated-initiated action. This action calls an SPI for SAP module which lists all the current processes for the affected SAP instance.

For more information about the entries in the `r3monpro.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

r3monpro: Example Configuration

In the first row of the following example, the `saposcol` process is monitored on all hosts. Exactly one such process should run at any given time. Any violation of this number is critical. It affects the OVO object `saposcol`. The associated OVO Message Group is `R3_State`.

The last row of the same example specifies that eight or fewer instances of the `dw.sapSID` process should run on all hosts. If the number is larger than eight, a warning message associated with OVO object `dw.sap` and OVO Message Group `R3_State` is issued.

The string `SID` has special meaning in this context. `SID` will be replaced by the SAP System name on the managed node. This enables global definitions for different SAP Systems.

```
AlertInstMonPro  =ALL =T11 =saposcol  =1 =Exact=1 =CRITICAL =saposcol =R3_State
AlertInstMonPro  =C01 =00  =explorer  =1 =Max  =1 =CRITICAL =explorer =R3_State
AlertInstMonPro  =T11 =00  =dw.sapSID =1 =Min  =8 =WARNING  =dw.sap   =R3_State
```

It is also possible to ensure that a process is not running. To do so, use the mode `Exact` and enter 0 as the number.

NOTE

On HP-UX servers, `r3monpro` can identify processes at the instance level. On MS Windows servers, you need to define on a single line the total number of work processes on the node. For example, if there are two instances, each with four (4) work processes, the total number of processes is eight (8).

r3monsap: CCMS 3.x Alert Monitor

The `r3monsap` alert monitor enables you to monitor the output of SAP's own internal monitor, the CCMS alert monitor. It maps CCMS alerts to OVO messages, which you can view in the OVO Message Browser.

NOTE

If you are using SAP R/3 version 4.x, use the `r3monal` CCMS alert monitor for the majority of your CCMS monitoring requirements.

At SAP R/3 version 4.0B you must use `r3monsap` for database alerts.

This section contains information about the following topics:

- "r3monsap: File Locations" on page 88
- "r3monsap: Environment Variables" on page 89
- "r3monsap: Monitoring Conditions" on page 89
- "r3monsap: Alert Classes" on page 91

r3monsap: File Locations

Table 3-10 lists the files used to monitor `r3monsap` alerts.

Table 3-10 r3monsap Files

File	Description
`r3monsap(.exe)`	Executable for the SAP R/3 CCMS alert monitor
`r3monsap.cfg`	Configuration file for the monitoring of R/3 CCMS alerts
`r3monsap.his`	History file for storing data after each monitor run
`r3monsap.msg`	SAP R/3 syslog message mapping table
`r3monsap.log`	Trace file for storing trace data.

r3monsap: Environment Variables

Table 3-11 lists the environment variables used in monitoring `r3monsap` alerts.

Table 3-11 r3monsap Environment Variables

Environment Variable	Description
SAPOPC_DRIVE	The Windows drive where the OVO agent is installed, for example; `E:\usr\...`
SAPOPC_HISTORYPATH	History path
SAPOPC_R3MONSAP_CONFIGFILE	Name of the configuration file
SAPOPC_R3MONSAP_SAPMSGFILE	SAP R/3 syslog message ID to message text mapping table
SAPOPC_SAPDIR	The Windows drive where SAP R/3 is installed, e.g.; `E:\usr\sap`
SAPOPC_TRACEMODE	Trace mode: a = append, w = create (default)
SAPOPC_TRACEPATH	Trace path

r3monsap: Monitoring Conditions

The monitoring conditions for `r3monsap` are defined in three sections:

- CCMS syslog auto-acknowledge on or off
- Severity values
- Alert classes

To ensure that all CCMS alert messages are viewable in the OVO Message Browser you have to enable the auto-acknowledge function by setting this value to 1 in the `r3monsap.cfg` file. For more detailed

information about the individual entries in the `r3monpro.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

The "Severity Levels" section of the `r3monsap.cfg` file maps CCMS severity levels to OVO severity levels by SAP system ID and SAP number. as shown in Table 3-12

Table 3-12 Mapping CCMS Severity Levels to OVO

CCMS	OVO
SeverityNull	=UNKNOWN
SeverityNormal (green)	=NORMAL
SeverityWarning (yellow)	=WARNING
SeverityCritical (red)	=CRITICAL

The defaults severity-level mapping in the `r3monsap.cfg` file are:

```
Severity          SAP     SAP    Enabled=1   OpCSeverity
Values            System  Number Disabled=0
SeverityNull      =ALL    =ALL     =1        =UNKNOWN
SeverityNormal    =ALL    =ALL     =1        =NORMAL
SeverityWarning   =ALL    =ALL     =1        =WARNING
SeverityCritical  =ALL    =ALL     =1        =CRITICAL
```

You can edit the severity levels in `r3monsap` in the following ways:

- **Enable or disable severity levels**

  Enable or disable severity levels. For example, if you want to disable messages for normal conditions, change the SeverityNormal line as follows:

  ```
  SeverityNormal   =ALL   =ALL     =0         =NORMAL
  ```

- **Re-map severity levels**

  Change how CCMS severity levels map to OVO severity levels. For example, if you want all SeverityNull events to be reported as warnings, change the SeverityNull definition, as follows:

  ```
  SeverityNull    =ALL   =ALL     =1         =WARNING
  ```

- **Define mapping exceptions**

  Define mapping exceptions, where specified SAP system/instances are mapped in a way that is an exception to the general rule. For example, if you want SeverityWarning events that occur on SAP system LP2 to be reported as critical, leave the default settings for ALL systems, and add the following line:

```
SeverityWarning   =LP2    =ALL     =1          =CRITICAL
```

r3monsap: Alert Classes

The alert classes section of the `r3monsap.cfg` file controls the handling of CCMS Collector alert classes by the following values:

- SAP system
- SAP number
- OVO object
- OVO Message Group

When defining custom settings for alert classes, be aware of the fact that OVO objects can be added arbitrarily. OVO objects specified in this file are displayed in the associated Message Browser column. However, be sure to specify only *defined* OVO Message Groups in this file, namely; Message Groups known to OVO.

The alert classes defined by default in the `r3monsap.cfg` file shown in Example 3-10 provide standard monitoring for all SAP systems and instances. You can use this default alert classes configuration for situations where only `r3monsap` is being used to monitor the CCMS alerts monitor.

For more detailed information about the individual entries in the `r3monpro.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

IMPORTANT

The SPI for SAP uses a combination of the `r3monsap` and `r3monal` monitors to monitor CCMS alerts in SAP R/3 versions 4.0 and 4.5. To avoid duplication, alert conditions that are identified by the `r3monal` monitor should be disabled in the `r3monsap` configuration file.

You can edit the alert classes in `r3monsap` and define exceptions for a particular SAP system or instance by adding a line to the `r3monsap.cfg` file which specifies the system ID and instance number. For example, you can disable all `AlertClassRollpag` messages from SAP instance number 01 of SAP system LPO, by adding the following line to the `Alert Classes` section:

```
AlertClassRollpag  =LPO  =01  =0  =RollPage    =R3_Roll-Paging
```

Example 3-10 Default Settings in the r3monsap.cfg File

```
#Alert                SAP    SAP    Enabled=1    VPO           VPO
#Classes              Sys    Num    Disabled=0   Object        MsgGroup

AlertClassNull        =ALL   =ALL       =1       =Null         =R3_General
AlertClassStateChange =ALL   =ALL       =1       =StateChange  =R3_State
AlertClassSAPsysUp    =ALL   =ALL       =1       =SAPsysUp     =R3_State
AlertClassSAPsysDown  =ALL   =ALL       =1       =SAPsysDown   =R3_State
AlertClassSlogId      =ALL   =ALL       =1       =SyslogId     =R3_Syslog
AlertClassSlogFreq    =ALL   =ALL       =1       =SyslogFreq   =R3_Syslog
AlertClassBuf         =ALL   =ALL       =1       =Buffers      =R3_Buffers
AlertClassEnqueue     =ALL   =ALL       =1       =Enqueue      =R3_Enqueue
AlertClassRollpag     =ALL   =ALL       =1       =RollPage     =R3_Roll-Paging
AlertClassTrace       =ALL   =ALL       =1       =Trace        =R3_Trace
AlertClassDpQueue     =ALL   =ALL       =1       =DpQueue      =R3_General
AlertClassPerfDia     =ALL   =ALL       =1       =Dialog       =R3_
AlertClassPerfUpd     =ALL   =ALL       =1       =Update       =R3_
AlertClassPerfBtc     =ALL   =ALL       =1       =Batch        =R3_
AlertClassPerfSpo     =ALL   =ALL       =1       =Spool        =R3_
AlertClassAbapUpd     =ALL   =ALL       =1       =Update       =R3_ABAP-4
AlertClassAbapErr     =ALL   =ALL       =1       =Error        =R3_ABAP-4
AlertClassAbapSql     =ALL   =ALL       =1       =SQL          =R3_ABAP-4
AlertClassDbIndcs     =ALL   =ALL       =1       =Indices      =R3_DB
AlertClassDbFreSp     =ALL   =ALL       =1       =FreeSpace    =R3_DB
AlertClassDbArcSt     =ALL   =ALL       =1       =Archive      =R3_DB
AlertClassDbBckup     =ALL   =ALL       =1       =Backup       =R3_DB
AlertClassSpo         =ALL   =ALL       =1       =Spooler      =R3_General
AlertClassArch        =ALL   =ALL       =1       =Archive      =R3_General
AlertClassOsLoad      =ALL   =ALL       =1       =Load         =OS
AlertClassOsPage      =ALL   =ALL       =1       =Paging       =OS
AlertClassOsSwap      =ALL   =ALL       =1       =Swap         =OS
AlertClassOsFile      =ALL   =ALL       =1       =Filesys      =OS
AlertClassGenP3       =ALL   =ALL       =1       =GenP3        =R3_General
AlertClassGenP4       =ALL   =ALL       =1       =GenP4        =R3_General
AlertClassGenP5       =ALL   =ALL       =1       =GenP5        =R3_General
```

r3monxmi: The System-log Monitor (via XMI)

The `r3monxmi` monitor reads the SAP R/3 system log (via the SAP transaction `SM21`) and passes the messages to the OVO Message Browser. Unlike the CCMS Alerts monitors (`r3monsap` and `r3monal`), `r3monxmi` does not require the generation of a syslog alert in the internal SAP R/3 CCMS monitor.

Messages generated by `r3monxmi` include an operator-initiated action which opens the SAP System Log (transaction SM21).

To avoid duplication of messages in the OVO Message Browser, make sure you disable all syslog alerts to the internal SAP R/3 CCMS monitor, not just those in `r3monsap` and `r3monal`. This is particularly important for MS Windows platforms where syslog alerts are also passed to the MS Windows application log, which is monitored by OVO.

NOTE

If you use the `r3monxmi` monitor, make sure that any SAP user you set up for the SPI for SAP (see the *HP OpenView Smart Plug-in for SAP Installation Guide*) must include the authorization profile `SAP_XMI_ALL` (SAP 3.x) or `S_XMI_ALL` (SAP 4.x). Without the correct authorization profile, the monitor is not able to access the SAP syslog directly.

This section contains information about the following topics:

- "r3monxmi: File Locations" on page 94
- "r3monxmi: Monitoring Conditions" on page 95
- "r3monxmi: Environment Variables" on page 94
- "r3monxmi: Severity Levels" on page 95
- "r3monxmi: Syslog Message Components" on page 96
- "r3monxmi: Alert Classes" on page 98
- "r3monxmi: Syslog Message Components" on page 96

r3monxmi: File Locations

Table 3-13 lists the files used by the `r3monxmi` monitor.

Table 3-13 r3monxmi Files

File	Description
`r3monxmi(.exe)`	Executable for the syslog monitor
`r3monxmi.cfg`	Configuration file for the monitoring of syslog alerts
`r3monxmi.his`	History file for storing data after each monitor run
`r3monxmi.msg`	Categories for syslog messages.

r3monxmi: Environment Variables

Table 3-14 lists the environment variables used by the `r3monxmi` monitor.

Table 3-14 r3monxmi Environment Variables

Environment Variable	Description
SAPOPC_DRIVE	The Windows drive where the OVO agent is installed.
SAPOPC_HISTORYPATH	History path
SAPOPC_R3MONXMI_CONFIGFILE	Name of the configuration file
SAPOPC_SAPDIR	The Windows drive where SAP R/3 is installed, for example; `E:\usr\sap`
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_TRACEPATH	Trace path

r3monxmi: Monitoring Conditions

In the `r3monxmi` monitor, the monitoring conditions are defined in two sections:

- Severity values
- Alert classes

For more detailed information about the individual entries in the `r3monpro.cfg` file including keywords and their possible values along with a description of each editable parameter, see "The Alert-Monitor Configuration Files" on page 58.

r3monxmi: Severity Levels

The "Severity Values" section of the `r3monxmi.cfg` file maps syslog severity levels to OVO severity levels by SAP system ID and SAP number, as shown in Table 3-15.

Table 3-15 Mapping syslog Severity Levels to OVO

Syslog	OVO
SeverityNull	=UNKNOWN
SeverityNormal (green)	=NORMAL
SeverityWarning (yellow)	=WARNING
SeverityCritical (red)	=CRITICAL

The "Severity Values" section of the `r3monxmi.cfg` file contains the following default values:

```
Severity            SAP      SAP      Enabled=1    OpCSeverity
Values              System   Number   Disabled=0

SeverityNull       =ALL     =ALL       =1          =UNKNOWN
SeverityNormal     =ALL     =ALL       =0*         =NORMAL
SeverityWarning    =ALL     =ALL       =1          =WARNING
SeverityCritical   =ALL     =ALL       =1          =CRITICAL
```

NOTE The default for `SeverityNormal` marked with an asterisk (*) above is changed to 0 as shown, after installation.

You can edit the severity levels in `r3monxmi` in the following ways:

- **Enable or disable severity levels**

  For example, if you want to disable messages for normal conditions, change the SeverityNormal line as follows:

  ```
  SeverityNormal =ALL   =ALL =0 =NORMAL
  ```

- **Change severity-level mapping**

  Change how CCMS severity levels map to OVO severity levels. For example, if you want all SeverityNull events to be reported as warnings, change the SeverityNull definition, as follows:

  ```
  SeverityNull   =ALL   =ALL =1 =WARNING
  ```

- **Define mapping exceptions**

  Specified SAP system/instances can be mapped in a way that is an exception to the general rule. For example, if you want SeverityWarning events that occur on SAP system LP2 to be reported as critical, leave the default settings for ALL systems, and add the following line:

  ```
  SeverityWarning =LP2 =ALL =1  =CRITICAL
  ```

r3monxmi: Syslog Message Components

The following components of a syslog message are used by the `r3monxmi` monitor:

- **MNo**

  A three-character ID that indicates the purpose of the syslog entry. In the `r3monxmi.cfg` file, you can specify the ranges of IDs to be monitored.

  SAP versions 4.0 and later use 'MNo' to look up messages in `r3monxmi.msg`. Note that the first two characters of MNo must match the AREA column in the `r3monxmi.msg` file: the third character of MNo must match the SUBID column. In the matching

line the first character of the MONBEW column is then used to calculate the severity of the message. The following mapping rules apply:

- **R**: SeverityCritical
- **Y**: SeverityWarning
- **G**: SeverityNormal
- **W**: SeverityNormal
- **others**: SeverityNull

- **C**

  A single-character code, which indicates the type and severity of the logged event and identifies syslog severity values that are used in the `r3monxmi.cfg` file to map to OVO severity levels. Possible values are:

  - **K**: SeverityCritical caused by an SAP basis problem
  - **S**: SeverityNormal caused by an operation trace
  - **T**: SeverityCritical caused by a transaction problem
  - **W**: SeverityWarning
  - **X**: SeverityNull

NOTE

SAP versions 4.0 and later do *not* use the character code 'C' to lookup messages in `r3monxmi.msg`: instead, they use the character code 'MNo'.

- **Text**

  The text of the syslog entry, which is passed to the OVO Message Browser by the `r3monxmi` monitor.

For SAP versions earlier than 4.5a, a patch is required to enable the display of the full message text. To apply this patch, add the line "`with tr_term eq '*'` to the function module SXMI_XMB_SYSLOG_READ so that it reads as follows:

```
submit rslg0000 line-size 255
with tr_term eq '*'
with tr_date eq from_date
with tr_time eq from_time
```

```
with tr_edate eq to_date
with tr_etime eq to_time
with tr_cpu eq server_name
with tr_pages eq '003'
with nocodevc eq 'X'
with nocotask eq 'X'
with nocomand eq 'X'
with nocotran eq 'X'
with nocoterm eq 'X'
exporting list to memory
and return
```

IMPORTANT In order to make the required modifications to the SXMI_XMB_SYSLOG_READ module, you must have an SAP R/3 developer license. See your SAP representative for details.

r3monxmi: Alert Classes

In the alert classes section of the `r3monxmi.cfg` file, you can define the syslog events that you want to monitor by specifying ranges of message numbers (syslog IDs). Each line of the `r3monxmi.cfg` file is set up in a particular way. Each entry defines monitoring for a specified range of syslog events. You can specify which syslog events to monitor by enabling and/or disabling ranges of syslog IDs either globally or for specified SAP systems and instances.

In Example 3-11, the syslog events are to be monitored on all SAP Systems and numbers for syslog IDs A00 through MZZ: the syslog events (IDs N00 through ZZZ) are *not* to be monitored on all SAP Systems and numbers. Syslog event monitoring is enabled on SAP System LPO for IDs A00 through ZZZ.

Example 3-11 r3monxmi.cfg File - Configuring Alert Classes

```
#------------------------------------------------------------
# Alert Classes  SAP      SAP        SyslogId      Enabled=1
#                System   Number    From    To     Disabled=0
AlerMonSyslog    =ALL     =ALL      =A00    =MZZ   =1
AlerMonSyslog    =ALL     =ALL      =N00    =ZZZ   =0
AlerMonSyslog    =LPO     =01       =A00    =ZZZ   =1
```

NOTE You must delete all *critical* CCMS alerts in R/3 before you can use this alert monitor with SAP R/3 versions later than version 3.0. The transaction **`/nrz08`** displays the CCMS alert monitor.

r3status: The SAP R/3 Status Monitor

The `r3status` monitor checks the current status of SAP R/3 and compares it with the last recorded status to determine whether any change in status occurred since the last time the monitor ran. Using the SAP R/3 function module RFC_SYSTEM_INFO, the `r3status` monitor provides the following features:

- Reports about local SAP R/3 system-availability
- Recognition and monitoring of each individual SAP R/3 instance
- SAP R/3 availability status reported may be: up, down, hanging (RFC time out).

The `r3status` monitor is of type *timeframe*. It runs every two minutes and compares the current value with the previous value stored in the history file and generates a message if it finds a difference, which it needs to report. For more information about reporting types, see "Report Types for the Alert-collector Monitors" on page 111.

This section contains information about the following topics:

- "r3status: File Locations" on page 100
- "r3status: Environment Variables" on page 101
- "r3status: History File" on page 102
- "The r3status Configuration File" on page 103
- "Remote Monitoring with the r3status Monitor" on page 105

r3status: File Locations

Table 3-16 lists the files used by the `r3status` monitor.

Table 3-16 r3status Files

File	Description
`r3status(.exe)`	Executable for the `r3status` monitor

Table 3-16 r3status Files (Continued)

File	Description
`r3status.log`	The `r3status` monitor creates a log/trace file after each run of the monitor. The trace file is stored in the default monitor directory of the OVO agent: • **UNIX**: `/usr/OV/bin/OpC/monitor` • **MS Windows**: `\usr\ov\bin\opc\monitor`
`r3itosap.cfg`	The `r3status` monitor uses information in the `r3itosap.cfg` file to determine which SAP instances it is supposed to monitor.
`r3status.cfg`	The `r3status` monitor uses information in the `r3status.cfg` file to determine which, if any, SAP instances it is supposed to monitor on remote SAP servers.
`r3monup.his`	History file for storing data after each run of the `r3status` monitor. The `r3status` monitor uses information in this file to determine whether or not a change of status has occurred. For more information, see "r3status: History File" on page 102.

r3status: Environment Variables

Table 3-17 lists the environment variables used by the `r3status` monitor.

Table 3-17 r3status Environment Variables

Environment Variable	Description
SAPOPC_RFC_TIMEOUT	set time out value for RFC connections - default is 20 seconds
SAPOPC_HISTORYPATH	History path to the `r3monup.his` file [a]

Table 3-17 r3status Environment Variables (Continued)

Environment Variable	Description
SAPOPC_R3STATUS_CONFIGFILE	Name of the configuration file, which the `r3status` monitor uses
SAPOPC_R3ITOSAP_CONFIGFILE	Name of the general configuration file, which contains SAP login information used by the SPI for SAP monitors
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_TRACEPATH	Trace path

a. Default is: `<ovagentdir>/tmp`

r3status: History File

The first time the `r3status` monitor runs, it writes its findings to the history file, `r3monup.his`. The next time the `r3status` monitor runs, it uses the information in the `r3monup.his` file to determine whether or not a change of status has occurred since the last time the monitor ran and, as a consequence, which if any message needs to be sent to the OVO Management Server.

Note that the `r3status` monitor does not add entries to the `r3monup.his` history file each time it runs: it only writes to the file if it discovers that a change of status has taken place. In addition, if a change of status has occurred, `r3status` overwrites the existing information in the file with the latest available status information, which includes a timestamp indicating when the change of status was discovered.

The information in the `r3monup.his` history file reflects the last *change* in status of the SAP instances, which you are managing with the SPI for SAP. If the most recent run of the `r3status` monitor discovers that no change in status has occurred since the last time it ran, it does not update the information in the `r3monup.his` file. Example 3-12 shows the format and contents of the `r3monup.his` file.

Example 3-12 Excerpt from the r3monup.his file

```
021028-11:18:29 #-------------------------------------------------------------
021028-11:18:29 #Keyword               SAP     SAP     SAP          State
021028-11:18:29 #                      System  Number  Instance
021028-11:18:29 #
021028-11:18:29 ConfiguredInstance     =DEV    =00     =DVEBMGS00   =UP
021028-11:18:29 ConfiguredInstance     =PKR    =99     =DVEBMGS99   =DOWN
-------------------------------------------------------------------------------
```

The r3status Configuration File

The r3status monitor's configuration file allows you to use the keywords listed below to change the configuration from the default settings to meet the requirements of your particular environment. Where appropriate, possible values for a given keyword are also specified. Example 3-13 on page 106 shows what a complete configuration file looks like for the `r3status` monitor, which monitors the status of both local and remote SAP Systems. You can use the following keywords in an SPI for SAP `r3status` configuration file:

- **TraceLevel**

  The TraceLevel keyword accepts the following parameters:

  — **Hostname**:

=ALL	All hosts being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a SAP server, where you want to specify a trace level. Use a new line for each individual host.

  — **Trace level**:

=0	Disable. This is the default setting.
=1	Log only error messages
=2	Log all messages
=3	Log only debug messages

- **TraceFile**

  The TraceFile keyword accepts the following parameters:

— **Hostname**:

=ALL	All SAP servers being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a specific host where tracing is enabled and you want to specify a trace level. Use a new line for each individual host

— **Filename**:

=r3mon<*alert_monitor_name*>.log, for example; r3monale.log, or r3mondmp.log, etc. This is the default setting. Alternatively, you can specify the name of the file to which you want to write the trace log. For more information about changing the path, see the environment variable SAPOPC_TRACEPATH in Table 3-17 on page 101.

- **HistoryPath[Unix | AIX | WinNT]**

  The HistoryPathUnix keyword accepts the following parameters:

  — **Hostname**:

=ALL	All hosts being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the name of a SAP server, where you want to specify the path to the monitor history file Use a new line for each individual host

  — **Path**:

UNIX:	=/var/opt/OV/tmp
AIX:	=/var/lpp/OV/tmp
WinNT:	=default

- **RemoteMonitoring**

  The RemoteMonitoring keyword accepts the following parameters:

  — **LocalHost**

  This is the name of the local OVO managed node where the SPI for SAP software is installed and running and whose performance agent will be used to remotely monitor the SAP server defined in the parameter “RemoteHost”.

— **RemoteHost**

This is the name of the *remote* SAP server you want to monitor from the host defined in the parameter “LocalHost”. Although the remote host does not have the SPI for SAP software installed and is *not usually* an OVO managed node, it must appear in the Node Bank.

For more information, see “Remote Monitoring with the r3status Monitor” on page 105.

Remote Monitoring with the r3status Monitor

The current version of the SPI for SAP includes a feature which allows you to extend the scope of the monitors to remotely monitor the status of SAP on SAP servers (which are *not* OVO managed nodes) from a host, which *is* already configured as an OVO managed node and where the SPI for SAP is installed, configured, and running.

To make use of the remote-monitoring feature provided by the SPI for SAP, for example; to monitor a SAP server running on an operating system that is not supported by the SPI for SAP, you need to activate the new **RemoteMonitoring** keyword (by removing the leading hash symbol “#”) in the `r3status.cfg` file. Next, on the same line, you define the name of the local host, which you want to perform the monitoring. Finally, you have to define the name of the remote SAP server, which you want to monitor. Example 3-13 on page 106 shows how a new line is required for each *additional* SAP server, which you want to monitor remotely.

NOTE

You can associate multiple remote SAP servers with one, single local host or you can associate single remote hosts with individual, different local hosts. Example 3-13 on page 106 shows a mixed approach where one *local* host “sap1” is used to monitor two *remote* hosts; “sdsap” and “sapwolf”. A third local host “sap2” remotely monitors the remote host “triosap”.

For more information about the contents of the `r3status` monitor’s configuration file including the keywords and parameters you use to define local and remote server names, see the entry concerning “Remote Monitoring” in “The r3status Configuration File” on page 103.

Example 3-13 Default r3status Configuration File

```
#------------------------------------------------------------
# TraceLevel   hostname   Disable=0  only error messages=1
#                         info messages=2  debug messages=3
#
TraceLevel     =ALL       =2
#------------------------------------------------------------
# TraceFile  hostname    filename
#
TraceFile    =ALL        =r3status.log
#------------------------------------------------------------
# History    hostname    path
# Path
#
HistoryPathUnix    =ALL        =/var/opt/OV/tmp
HistoryPathAIX     =ALL        =/var/lpp/OV/tmp
HistoryPathWinNT   =ALL        =default
#------------------------------------------------------------
# Remote             Local       Remote
# Monitoring         Host        Host
RemoteMonitoring     =sap1       =sdsap
RemoteMonitoring     =sap1       =sapwolf
RemoteMonitoring     =sap2       =triosap
#------------------------------------------------------------
```

4 The SPI for SAP Alert-Collector Monitors

This section describes the alert-collector monitors controlled by `r3moncol` and explains how to configure and use them.

Introducing r3moncol and the Alert-collector Monitors

The SPI for SAP uses the one, single alert collector `r3moncol` to collect alerts from a number of additional SAP R/3 alert monitors. Each of the alert monitors listed in this section takes its name from the nature of the alerts it is designed to monitor. For example, the `r3mondmp` alert-collector monitors ABAP dumps. The tasks that each monitor performs are grouped according to *alert types*. For example, the alert type IDOC_CURRENT_STATUS helps the `r3monale` monitor determine the current status of iDOCs in an SAP System. Monitoring parameters are specified at the alert-*type* (rather than alert-*monitor*) level. For example, you could use the parameter =CHECK_INBOUND to limit the range of the alert type IDOC_CURRENT_STATUS so that it checks the status of inbound iDOCs only.

The following list shows which alert-collectors are available to `r3moncol` and gives a short description of each monitor's scope. For more detailed information about the alert types associated with each alert monitor as well as the parameters you can use to configure them, see the appropriate sections and tables later in this chapter:

- `r3monaco` - "Monitoring the TEMSE file" on page 214

  To save runtime costs, the Temporary Sequential File (TEMSE) monitor has been replaced by a report. See "Monitoring the TEMSE file" on page 214 for more details.

- "r3monale: The iDOC-Status Monitor" on page 127

  The IDOC Status monitor checks the status of the iDOCs present in the SAP R/3 Systems configured in your SAP Landscape. `r3monale` generates an alert when a defined threshold for the number of iDOCs with a given status is exceeded

- "r3monchg: The SYSTEM CHANGE OPTION Monitor" on page 137

  The SYSTEM CHANGE OPTION monitor checks for the occurrence of SAP System Change options. This monitor has version-specific configurations for:

  — SAP R/3.1X

  — SAP R/3 4.0X, 4.5X SAP

— SAP R/3 4.6X, 6.10, 6.20

- "r3moncts: The CORRECTION & TRANSPORT SYSTEM Monitor" on page 147

  The CORRECTION and TRANSPORT SYSTEM monitor checks the correction and transport system for important transport requests, tasks and objects. It generates an alert according to the specifications you define.

- "r3mondmp: The ABAP Dump Monitor" on page 159

  The ABAP Dump monitor detects ABAP dumps which occur in the SAP System. The cause of the dump can be identified from the details which the message gives and used to determine any corrective action taken.

- "r3monjob: The JOBREPORT Monitor" on page 162

  The JOBREPORT monitor checks for jobs that:

  — exceed a specified run time

  — do not run as long as they are expected to run

  — do not start within a specified time frame

  — are aborted

- "r3monlck: The LOCK_CHECK Monitor" on page 172

  The LOCK_CHECK monitor references the SAP R/3 Enqueue process which manages logical locks for SAP R/3 transactions and reports on obsolete locks. An obsolete lock is a lock which is older than the time period you specify.

- "r3monoms: The OPERATION MODE Monitor" on page 175

  The OPERATION MODE monitor detects when:

  — a scheduled operation mode switch has occurred later than the time specified

  — a scheduled operation mode switch has not occurred at all

- "r3monrfc: The RFC-destination Monitor" on page 179

  The SAP-RFC monitor checks RFC destinations in an SAP environment:

  — the status of connections

  - — the availability of connections

- "r3monspl: The SPOOLER Monitor" on page 182

  The SPOOLER monitor checks:

  - — the number of spool entries
  - — the number of erroneous spool requests in a specified range
  - — spool entries with state ERROR for specified printers

- "r3montra: The TRANSPORT Monitor" on page 187

  The TRANSPORT monitor checks the following parts of the transport system:

  - — the status of exports and imports
  - — confirmed and unconfirmed repairs
  - — performs a ping of the specified system
  - — checks the TP interface

- "r3monupd: The UPDATE Monitor" on page 195

  The UPDATE-alert monitor detects

  - — if an update was deactivated
  - — if update errors have occurred

- "r3monusr: The USER Monitor" on page 198

  The USER monitor specifies the number of users which would trigger an alert, using SAP transaction `SM04` as reference

- "r3monwpa: The WORKPROCESS Monitor" on page 201

  The WORKPROCESS monitor performs the following checks on work processes:

  - — monitors their status and reports any processes that are running in *debug*, *private* or *no-restart* modes
  - — compares the number of configured work processes with the number of work process actually running
  - — checks the number of expected work processes waiting and the number of expected work processes running *for each work process type*

Configuring the SPI for SAP Alert-collector Monitors

You can use the alert-collector monitors to define a series of monitoring tasks within SAP R/3, for example; checks on SAP R/3 processing modes, SAP R/3 dumps, or the availability of SAP R/3 work processes. The alert-collector monitors ensure that each defined alert-collector configuration is executed on a regular basis and reports any messages that come back from the called function. This section covers the following topics:

- "Report Types for the Alert-collector Monitors" on page 111
- "Polling Rates and Run Locations for the Alert-collector Monitors" on page 112
- "Alert-collector Monitor Query Conditions" on page 114
- "Alert-collector Monitor Environment Variables" on page 118
- "Alert-collector Monitor Command-Line Parameters" on page 118
- "Remote Monitoring with the Alert-collector Monitors" on page 119

For more information about the contents of the individual Alert-collector Monitor configuration files, see "The Alert-collector Monitor Configuration Files" on page 122.

Report Types for the Alert-collector Monitors

Each of the alert monitors uses one of two reporting types.

- **Time Frame**

  Time-frame monitors use a defined time range as their measurement base. For example, the `r3monjob` alert monitor uses a time frame which compares the time from the last monitor run with the configured start date and time of a batch job.

- **Snapshot**

  Snapshot monitors use one moment of time as their measurement base. For example, the `r3monlck` (LOCK_CHECK) monitor uses the moment the monitor runs to generate an alert that a lock is "old",

whenever a defined time span has been exceeded. The snapshot type is dynamic and can be run continuously because the alerts can be generated without being confined to a specific time frame.

Polling Rates and Run Locations for the Alert-collector Monitors

The alert monitors have different polling rates and run locations. See Table 4-1 for the polling rate for each alert monitor and See Table 4-2 for the run locations for each alert monitor.

Table 4-1 Polling Rates of Alert Monitors

Alert Monitor Name	Polling Rate		
	Days	Hours	Mins
r3monale			10
r3monchg		4	
r3moncts	1		
r3mondmp			2
r3monjob			5
r3monlck		1	
r3monoms			10
r3monspl			30
r3montra	1		
r3monupd		1	
r3monusr			5
r3monwpa			2
r3monaco [a]			15

a. r3monaco is not a genuine alert collector monitor but has to be assigned to the managed node before setting up the TEMSE report. See "Monitoring the TEMSE file" on page 214

Table 4-2 shows the run locations by SAP version and server type (central instance and/or application server)

Table 4-2 Run Location(s) for Alert Monitors

Alert Collector Monitor Name	App Server 3.1I	Central Inst 3.1I	App Server 4.x	Central Inst 4.x
r3monale		✓		✓
r3monchg		✓		✓
r3moncts		✓		✓
r3mondmp		✓		✓
r3monjob		✓		✓
r3monlck		✓		✓
r3monoms		✓		✓
r3monspl		✓		✓
r3montra		✓		✓
r3monupd		✓		✓
r3monusr		✓		✓
r3monwpa		✓		✓
r3monaco [a]		✓		✓

a. r3monaco is not a genuine alert collector monitor. However, it has to be assigned to the managed node in order for data to be passed to a report which monitors the temporary sequential (TEMSE) file consistency.

Alert-collector Monitor History

Unlike the SPI for SAP monitors `r3monal`, `r3mondev`, or `r3monxmi`, the alert-collector monitors controlled by `r3moncol` (such as `r3monale` or `r3mondmp`, etc.) do *not* write history information to a monitor-specific history file. Instead, any information relating to SAP alerts which come to the notice of the SPI for SAP alert-collector monitors is written directly to the SAP database, where it can be found by the alert collector `r3moncol`. At the start of each monitor run, `r3moncol` reads the relevant tables and uses the information to determine which if any events the OVO Management Server has already been notified about and whether or not to generate further messages.

Note that in versions up to and including SPI for SAP A.08.x, the alert collector `r3moncol` used shared memory to determine the status of any given SAP instances and wrote the information to the history file, `r3monup.his`. In later versions of the product, the `r3status` monitor is used to provide a more convenient and, by means of a wider range of statuses, a more accurate way to determine the status of the SAP instances being monitored by the SPI for SAP.

Alert-collector Monitor Query Conditions

The data for each alert monitor is split into a number of alert types. For example, the JOBREPORT Monitor has four alert types: JOB_MAX_RUN-TIME, JOB_MIN_RUN_TIME, START_PASSED and JOB_ABORTED. For each of a given alert monitor's defined alert types you have to:

- specify which SAP R/3 Systems should be checked
- enter selection criteria which defines under what circumstances an alert will be raised. This is described in more detail below.

Parameter Data Types

The conditions which cause an alert to be generated are defined by parameters in the monitoring-conditions section of the configuration files associated with each alert type. There are two general types of parameter data:

- **name**

  The parameter *name* describes the attributes of the SAP R/3 System for which you define the monitoring conditions. For example: MAX_RUNTIME and JOBNAME are the names of parameters for the alert type JOB_MAX_RUN_TIME, which is associated with the JOBREPORT Monitor, `r3monjob`.

- **delimiters**

  Parameter *delimiters* are used to specify the "select" options for each parameter. The parameter delimiters define the circumstances under which an alert should be generated. An OVO message will be sent for each event that matches your specified conditions. There are four types of Parameter Delimiters: SIGN, OPT(ION), LOW and HIGH. (See Table 4-3)

Specifying Query Conditions

The following points apply generally when using parameter delimiters to specify query conditions:

- All possible and reasonable conditions can be used to configure the query condition, within the limitations given below.
- Messages which are excluded by your defined conditions will not appear in the OVO Message Browser.
- Detailed descriptions of the alert-type configurations for each monitor follow this introductory section.

For each of their alert types, the alert monitors have as a default an example configuration of the parameters. However, this example configuration should not be treated as a default, which is ready to use. As a general rule, you must customize the alert type by editing its parameters. You can find information about when it is possible to use these unedited default values (and when editing is mandatory) in the detailed descriptions of each alert monitor's alert types which follows this introduction.

Table 4-3 Description of Parameter Delimiters

Parameter Delimiters	Description
SIGN	**I**: Inclusive **E**: Exclusive

Table 4-3 Description of Parameter Delimiters (Continued) (Continued)

Parameter Delimiters	Description
LOW	Contains a comparison value and can also be used to specify the lower value of a range in conjunction with the operator BT.
HIGH	Contains a numeric comparison value to specify the higher value of a range. This parameter delimiter should only be used when specifying a range in conjunction with the operator BT
OPT	The standard SAP operators NE (Not Equal to), NB (Not Between... and...), and NP (does Not contain Pattern) cannot be used to configure the alert types described in this section. You should only use the following operators: • **EQ**: equal to • **BT**: between... and • **CP:** contains pattern • **LE**: less than or equal to • **GE**: greater than or equal to • **GT**: greater than • **LT**: less than

Parameter Values

The *include* and *exclude* parameter values for an alert type entry are interpreted as described below. Parameter values in *different* parameters are always compared using ‘and’: parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using ‘or’
- **Exclude**: parameters are compared using ‘and’

Note that the *include* values are evaluated before the *exclude* values, as shown in the Table 4-4.

Table 4-4 AND/OR Comparisons using Include and Exclude Conditions for the Same Parameter

Select Options	Example Configuration of Select Options for JOB_MAX_RUN_TIME	Comparison
1	=JOBNAME =I =CP =ZREP* = =MAX_RUNTIME =I =GT =10 =	OR
2	=JOBNAME =I =CP =SAP* = =MAX_RUNTIME =I =GT =20 =	OR
3	=JOBNAME =E =CP =SAP_ZREP* =	AND

Query Conditions

The following rules apply to the use of blocks and line breaks when configuring the alert types for the alert collector monitors:

- Each parameter is configured as a separate block. For example for JOB_MAX_RUN_TIME
  1. =JOBNAME =I =CP =SAP* = is the block for the parameter JOBNAME
  2. =MAX_RUNTIME =I =GT =20 = is the block for the parameter MAX_RUNTIME.
- The symbol '\' is used to indicate a line continuation.
- Line breaks should be made in the following locations:
  1. Within each specified configuration between:
     a. the general alert class configuration (SAP hostname, system, number and client)
     b. the OVO configurations (severity level, object and Message Group)
     c. the monitoring query conditions (parameter name and the SIGN, OPT, LOW and HIGH parameter delimiters).
  2. Between each separate specified condition for AND comparisons.

Alert-collector Monitor Environment Variables

This section describes the environment variables for all the alert-collector monitors managed by `r3moncol`. The configuration is identical for all alert collectors except that the name of the alert-collector configuration file is monitor specific e.g. `r3monjob`, `r3mondmp`, `r3monlck`, `r3monoms`.

Table 4-5 Environment Variables for r3moncol.exe

Environment Variable	Description
SAPOPC_TRACEMODE	Trace mode: a = append w = create (default)
SAPOPC_ <*R3MONNAME*>_CONFIGFILE	Configuration-file name [a]
SAPOPC_R3ITOSAP_CONFIGFILE	General SAP R/3 login config. file
SAPOPC_TRACEPATH	Trace path config. file

a. Where <*R3MONNAME*> is the name of the monitor whose configuration file location you want to change. For example; SAPOPC_*R3MONDMP*_CONFIGFILE

Alert-collector Monitor Command-Line Parameters

The command line parameters for all the alertcollector monitors controlled by the `r3moncol` are described in this section. In the same way as for the environment variables, the configuration is identical for all

alert-collector monitors except that the name of the alert-collector configuration file is monitor specific e.g. `r3monjob.cfg`, `r3mondmp.cfg`, `r3monlck.cfg`, `r3monoms.cfg`.

Table 4-6 r3moncol Command Line Parameters

Parameter	Description [a]
`-cfgfile`	Name of the monitor's configuration file. For example, `-cfgfile <R3MONNAME>.cfg`
`-trace`	The monitor writes an initial trace file `writetrace.log`, which contains information about the configuration file `r3itosap` and the monitor-specific config file `<R3MONNAME>.cfg`.

a. Where <*R3MONNAME*> is the name of the monitor whose configuration-file location you want to read. For example; `r3mondmp`

In the following example, the alert-collector monitor writes an initial trace file `writetrace.log`, which contains information about the general configuration file `r3itosap` and the monitor-specific configuration file `r3monjob.cfg`.

```
r3moncol -cfgfile r3monjob.cfg -trace
```

Remote Monitoring with the Alert-collector Monitors

The current version of the SPI for SAP includes a feature which allows you to extend the scope of the alert-collector monitor to remotely monitor the health of SAP processes on additional SAP servers (which are *not* OVO managed nodes) from an SAP server, which *is* already configured as an OVO managed node.

To make use of the remote-monitoring feature provided by the SPI for SAP, for example; to monitor an SAP System running an operating system that is not supported by the SPI for SAP, you need to activate the new **RemoteMonitoring** keyword (by removing the leading hash symbol "#") in the `r3mon<alert_monitor_name>.cfg` file (for example; `r3mondmp.cfg`) and then, on the same line, tell the SPI for SAP alert-collector monitor the name of the local server which you want to perform the monitoring and, finally, the name of the remote server,

which you want to monitor. Example 4-2 on page 125 shows how a new line is required for each *additional* SAP server, which you want to monitor remotely. You use the following keyword parameters to define local and remote server names:

- **LocalHost**

  the name of the OVO managed node where the SPI for SAP is installed and running and whose alert-collector monitor will be used to do the monitoring on the remote host defined in “RemoteHost”

- **RemoteHost**

  the name of the *remote* system to be monitored by the system defined in “LocalHost”. The RemoteHost does not have the SPI for SAP installed and is not usually (but could theoretically be) an OVO managed node.

For more information about the contents of the alert-collector monitor configuration file, see “The Alert-collector Monitor Configuration Files” on page 122.

Example 4-1 on page 121 shows a hypothetical example of how to configure the SPI for SAP on two different OVO managed nodes (`sap1` and `sap2`) to remotely manage three different SAP servers (`ovsdsap1`, `ovsdsap2`, and `ovsdsap3`) and, in addition, specify different monitoring rules to suit the different roles of the individual SAP servers, for example; production, development, or even test/unused:

- **Production System**

  The remote server `ovsdsap1` in Example 4-1 is the *production* system, it has the monitor enabled (=1) and is configured to associate the OVO message severity CRITICAL with alerts generated by the =REQUEST_CREATED alert type.

- **Development System**

  The remote server `ovsdsap2` in Example 4-1 is the *development* system, it has the monitor enabled (=1) and is configured to associate the OVO message severity MAJOR with alerts generated by the =REQUEST_CREATED alert type.

- **Test System**

  The remote server `ovsdsap3` in Example 4-1 is the test system whose configuration is unchanged from the default which has the monitor disabled (=0) and associates the OVO message severity WARNING with alerts generated by the =REQUEST_CREATED alert type.

Example 4-1 Specifying Monitoring Rules for Individual Remote Servers

```
#--------------------------------------------------------------------------
# Remote          LocalHost   RemoteHost
# Monitoring
RemoteMonitoring  =sap1       =ovsdsap1
RemoteMonitoring  =sap1       =ovsdsap2
RemoteMonitoring  =sap2       =ovsdsap3
#--------------------------------------------------------------------------
# AlertMonFun  SAP       SAP      SAP      SAP     Alertmonitor   Enable =1/  \
#              Hostname  System   Number   Client                  Disable=0   \
#
#   OpC          OpC           OpC        \
# Severity     Object        MsgGroup     \
#
# Alerttype     RFC Parameter
#             =Parameter     =Sign   =Opt    =Low    =High
#            [=Param        =Sign   =Opt    =Low    =High] ...
# Example:
#
AlertMonFun  =ovsdsap1  =ALL  =ALL  =ALL  =CTS  =1\
=CRITICAL =Request     =R3_CTS\
=REQUEST_CREATED   =USERNAME   =I    =CP      =*    =

AlertMonFun  =ovsdsap2  =ALL  =ALL  =ALL  =CTS  =1\
=MAJOR =Request     =R3_CTS\
=REQUEST_CREATED   =USERNAME   =I    =CP      =*    =

AlertMonFun  =ovsdsap3  =ALL  =ALL  =ALL  =CTS  =0\
=WARNING =Request     =R3_CTS\
=REQUEST_CREATED   =USERNAME   =I    =CP      =*    =
--------------------------------------------------------------------------
```

The Alert-collector Monitor Configuration Files

The keywords listed in this section appear in the Alert-collector Monitors configuration files and can be used to set up the individual monitor to meet the requirements of your particular environment. Where appropriate, possible values for a given keyword are also specified. Example 4-2 on page 125 shows what a complete configuration file looks like for the `r3moncts` monitor, which monitors the correction and transport system for important transport requests, tasks and objects. You can use the following keywords in all SPI for SAP alert-collector monitor configuration file:

- **TraceLevel**

  For more information, see "The SPI for SAP Monitor Configuration File" on page 33.

- **TraceFile**

  For more information, see "The SPI for SAP Monitor Configuration File" on page 33.

- **HistoryPath[Unix | AIX | WinNT]**

  For more information, see "The SPI for SAP Monitor Configuration File" on page 33.

- **AgentHostname**

  The AgentHostname keyword is not currently used

- **RemoteMonitoring**

  For more information, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

- **AlertMonFun**

  The AlertMonFun keyword *requires* a value for the following parameters:

— **Alerttype**:

=<*Alerttype*> For more information about the values an alert-collector monitor accepts, see the Alert Types section for a given monitor, for example; "r3monale: The iDOC-Status Monitor" on page 127 refers to the alert type "IDOC_CURRENT_STATUS".

— **AlertMonitor**:

=<*Monitor_Name*>

where <*Monitor_Name*> is the short form of the alert monitor you are configuring, for example; ALE for `r3monale`, CTS for the `r3moncts`, and so on

— **Enable/Disable**:

=0 *Disable* the monitor

=1 *Enable* the monitor. This is the default setting.

— **OPC Severity**:

=<*OVO_Msg_Severity*>

where <*OVO_Msg_Severity*> is the severity level of the OVO message you want to map the CCMS alert to, for example: Normal, Warning, Major, Critical.

— **OPC Object**:

=<*OpC_Object*> where <*OpC_Object*> is the OVO object associated with the generated message. These tend to reflect the names of the alert types associated with the alert-collector monitor, for example; Request, task or object for `r3moncts`. Note that if you change the names of the OVO objects in the monitor-configuration files (or add new ones), you must ensure that these changes are reflected in the message conditions in order to avoid the generation of unmatched messages.

— **OPC MsgGroup**:

=*<OVO_Msg_Group>*

where *<OVO_Msg_Group>* is the name of the OVO Message Group to which the generated message belongs, for example: R3_CTS, or R3_ABAP-4. The default names all start with "R3_" and reflect the names of the alert monitors to which they correspond, for example; `r3moncts` or `r3mondmp`. Note that if you change the names of the OVO Message Groups in the monitor-configuration files, remember to ensure that the changes are reflected in the message conditions in order to avoid the generation of unmatched messages.

— **RFC Parameter**:

=*<RFC_Param>* where *RFC_Param* is the name of the parameter followed by any required Query Conditions, each with the prefix "=", for example; =CP (for "Contains Pattern") or EQ for ("Equals"). For more information about Query Conditions, see "Alert-collector Monitor Query Conditions" on page 114. For more information about monitor-specific alert-type parameters, see the appropriate monitor description, for example: Table 4-21, "Configuration Parameters," on page 150.

— **SAP Client**:

=ALL — All SAP clients being monitored by the SPI for SAP. This is the default setting.

=*<SAP_host>* — the specific SAP client for which performance monitoring is to be enabled, for example; 099. Use a new line for each individual entry.

— **SAP Hostname**:

=ALL — All SAP hosts will be monitored by the SPI for SAP. This is the default setting.

=<*SAP_host*>	the host name of a specific SAP server where performance monitoring is to be enabled.Use a new line for each individual entry.

— **SAP Number**:

=ALL	All SAP numbers will be monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the specific SAP number for which performance monitoring is to be enabled, for example; 00, 99. Use a new line for each individual entry.

— **SAP System**:

=ALL	All SAP Systems will be monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	the SAP SID for which performance monitoring is to be enabled, for example; DEV. Use a new line for each individual entry.

Example 4-2 Example Default Configuration for the CTS Monitor (r3moncts)

```
#------------------------------------------------------------
# TraceLevel  hostname  Disable=0  only error messages=1  info messages=2  \
#                       debug messages=3
TraceLevel     =ALL        =0
#------------------------------------------------------------
# TraceFile  hostname    filename
#
TraceFile    =ALL        =r3moncts.log
#------------------------------------------------------------
# History    hostname    path
# Path
#
HistoryPathUnix    =ALL        =/var/opt/OV/tmp
HistoryPathAIX     =ALL        =/var/lpp/OV/tmp
HistoryPathWinNT   =ALL        =default
#------------------------------------------------------------
# AgentHostname   hostname   aliasname
#
AgentHostname     =ALL       =default
#------------------------------------------------------------
# Remote          Server      Remotely
# Monitoring      Node        monitored Node
RemoteMonitoring  =rum        =ovsdsap1
```

```
RemoteMonitoring  =whisky     =ovsdsap2
RemoteMonitoring  =bacardi    =ovsdsap3
#-------------------------------------------------------------------------------
# AlertMonFun  SAP       SAP      SAP      SAP     Alertmonitor   Enable =1/  \
#              Hostname  System   Number   Client                  Disable=0   \
#
#   OpC          OpC         OpC        \
#   Severity     Object      MsgGroup     \
#
# Alerttype     RFC Parameter
#               =Parameter     =Sign   =Opt    =Low    =High
#              [=Param         =Sign   =Opt    =Low    =High] ...
# Example:
#
AlertMonFun  =ALL  =ALL  =ALL  =ALL  =CTS  =1  \
=WARNING    =Request     =R3_CTS   \
=REQUEST_CREATED   =USERNAME   =I    =CP      =*    =
-------------------------------------------------------------------------------
```

r3monale: The iDOC-Status Monitor

The iDOC-status alert monitor, `r3monale`, is *time-frame* based and checks the status of existing iDOCs for errors using the transaction **`/WE02`** as the data source. The monitor is application-server independent and available for global (SAP R/3 System-wide) use.

Type

The monitor is of type *timeframe*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The iDOC-Status Monitor has the following alert types:

- "IDOC_CURRENT_STATUS"

  defines when an alert will be generated for the actual state of the iDOCs - see page 129

File Locations

The `r3monale` alert monitor uses the files listed in Table 4-7.

Table 4-7 r3monale Files

File	Description
`r3moncol(.exe)`	Collector executable for the iDOC-status monitor
`r3monale.cfg`	Configuration file for iDOC-status monitor
`r3monale.log`	Trace file for storing trace data

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monale` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert-collector monitors share the same format, the only difference being that the name of the configuration file varies to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monale` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert-collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for the `r3monale` alert monitor. "Alert-collector Monitor Query Conditions" on page 114 describes general configuration query rules which apply to all alert collector monitors.

Configuring iDOC-Monitor Alert Types

When configuring the IDOC_CURRENT_STATUS alert type for `r3monale`, the iDOC status monitor, remember that at least one of the parameters listed in Table 4-8 *must* be defined. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

IDOC_CURRENT_STATUS

Table 4-8 on page 129 lists the parameters that you can use with IDOC_CURRENT_STATUS. Note that ‘ ‘ in the `Default Value` column signifies an empty string.

Table 4-8 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
DOCNUM	IDOC number	= Sign: I, E	‘ ‘
		= Opt: GE, GT, LE, LT, BT	‘ ‘
		= Low	‘ ‘
		= High:	‘ ‘
DOCTYP	IDOC type	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
MESCOD	Logical message *code*	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
MESFCT	Logical message *function*	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘

Table 4-8 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
MESTYP [a]	Logical message *type*	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
RCVPFC	Partner *function* of receiver	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
RCVPRN	Partner *number* of receiver	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
RCVPRT	Partner *type* of receiver	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘
SNDPFC	Partner *function* of sender	= Sign I	‘ ‘
		= Opt: CP, EQ	‘ ‘
		= Low	‘ ‘
		= High	‘ ‘

Table 4-8 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
SNDPRN	Partner *number* of sender	= Sign I	‘‘
		= Opt: CP, EQ	‘‘
		= Low	‘‘
		= High	‘‘
SNDPRT	Partner *type* of sender	= Sign I	‘‘
		= Opt: CP, EQ	‘‘
		= Low	‘‘
		= High	‘‘
STATUS [b]	Status of IDOC	= Sign I, E	‘‘
		= Opt: GE, GT, LE, LT, BT	‘‘
		= Low	‘‘
		= High	‘‘

a. Possible values; ABSENT, MAX_ENTRIES, TIME_LIMIT
b. Possible values: CHECK_INBOUND, CHECK_OUTBOUND, MAX_ENTRIES

In Example 4-3, the `r3monale` alert is configured to check the status of inbound iDOCs. An event generating an alert occurs if the number of in-bound iDOCS specified in IDOC_CURRENT_STATUS is greater than (GT) the value 4 (four) defined in MAX_ENTRIES. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Example 4-3 Example IDOC_CURRENT_STATUS Configuration

```
AlertMonFun  =ALL  =ALL  =ALL  =ALL  =ALL   =1  \
  =WARNING   =ALE =R3_IDOC_STATUS  \
  =IDOC_CURRENT_STATUS =STATUS =I =EQ =CHECK_INBOUND \
                       =MAX_ENTRIES =I =GT =4
```

Checking the iDOC Status

Using the IDOC_CURRENT_STATUS alert type in conjunction with the STATUS parameter allows you to check any one of the different iDOC statuses that are registered in SAP R/3 or a range of statuses defined in a group. Table 4-9 lists all the statuses that the SPI for SAP recognizes.

In addition, the SPI for SAP provides two pre-defined groups that you can use to check for a range of errors relating to incoming or outgoing iDOCs. For example, you can use the values `CHECK_INBOUND` and `CHECK_OUTBOUND` to monitor a range of values:

- `CHECK_OUTBOUND`

  monitors iDOCs with status: 02, 04, 05, 25, 26, 29, 30, 32

- `CHECK_INBOUND`

  monitors iDOCs with status: 51, 56, 60, 61, 62, 63, 64, 65, 66, 69

If you want to use the `r3monale` alert monitor to check for a specific iDOC status, replace the value `=CHECK_INBOUND` shown in Example 4-3 with the iDOC status number listed in Table 4-9 that corresponds to the iDOC status you want to monitor. For example, to monitor the number of existing iDOCS, use `=01`. Note that it is not currently possible to define your own ranges similar to the pre-defined ranges `CHECK_INDOUND` and `CHECK_OUTBOUND`. Instead, you have to define a separate `AlertMonFun` entry for *each* additional value, which you want to monitor.

Table 4-9 Possible iDOC Status

iDOC Status	Description	Check Inbound	Check Outbound
00	Not used, only for R/2		
01	IDoc created		
02	Error passing data to port		✓
03	Data passed to port OK		
04	Error within control information of EDI subsystem		✓
05	Error during translation		✓
06	Translation OK		

Table 4-9 Possible iDOC Status (Continued)

iDOC Status	Description	Check Inbound	Check Outbound
07	Error during syntax check		
08	Syntax check OK		
09	Error during interchange handling		
10	Interchange handling OK		
11	Error during dispatch		
12	Dispatch OK		
13	Retransmission OK		
14	Interchange Acknowledgement positive		
15	Interchange Acknowledgement negative		
16	Functional Acknowledgement positive		
17	Functional Acknowledgement negative		
18	Triggering EDI subsystem OK		
19	Data transfer for test OK		
20	Error triggering EDI subsystem		
21	Error passing data for test		
22	Dispatch OK, acknowledgement still due		
23	Error during retransmission		
24	Control information of EDI subsystem OK		

Table 4-9 Possible iDOC Status (Continued)

iDOC Status	Description	Check Inbound	Check Outbound
25	Processing despite syntax error (outbound)		✓
26	Error during syntax check of IDoc (outbound)		✓
27	Error in dispatch level (ALE service)		
28	Not used		
29	Error in ALE service		✓
30	IDoc ready for dispatch (ALE service)		✓
31	Error - no further processing		
32	IDoc was edited		✓
33	Original of an IDoc which was edited		
34	Error in control record of IDoc		
35	IDoc reloaded from archive		
36	Electronic signature not performed (time-out)		
37	IDoc added incorrectly		
38	IDoc archived		
39	IDoc is in the receiving system (ALE service)		
40	Application document not created in receiving system		
41	Application document created in receiving system		

Table 4-9 Possible iDOC Status (Continued)

iDOC Status	Description	Check Inbound	Check Outbound
42	IDoc was created by test transaction		
50	IDoc added		
51	Error: Application document not posted	✓	
52	Application document not fully posted		
53	Application document posted		
54	Error during formal application check		
55	Formal application check OK		
56	IDoc with errors added	✓	
57	Test IDoc: Error during application check		
58	IDoc-Copy from an R/2 connection		
59	Not used		
60	Error during syntax check of IDoc (Inbound)	✓	
61	Processing despite syntax error (Inbound)	✓	
62	IDoc passed to application	✓	
63	Error passing IDoc to application	✓	
64	IDoc ready to be transferred to application	✓	
65	Error in ALE service		

Table 4-9 Possible iDOC Status (Continued)

iDOC Status	Description	Check Inbound	Check Outbound
66	IDoc is waiting for predecessor IDoc (serialization)		
67	Not used		
68	Error - no further processing		
69	IDoc was edited	✓	
70	Original of an IDoc which was edited		
71	IDoc reloaded from archive		
72	Not used, only for R/2		
73	IDoc archived		
74	IDoc was created by test transaction		

r3monchg: The SYSTEM CHANGE OPTION Monitor

The SYSTEM CHANGE OPTION alert monitor `r3monchg` double-checks the SAP system change options. The alert monitor `r3monchg` references the SAP R/3 transactions **`/SE06`**.

The `r3monchg` monitor is SAP-version dependent and has three different configurations for:

- SAP R/3 3.X
- SAP R/3 4.0X, 4.5X
- SAP R/3 4.6X.

Type

The `r3monchg` monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The SYSTEM CHANGE OPTION alert monitor has only one alert type:

- **CHANGE_OPT**

  monitors and double-checks the SAP System change options and sends out an alert if the option matches the configuration. For more information, see:

  — "CHANGE_OPT (SAP R/3 3.x)" on page 139

  — "CHANGE_OPT (SAP R/3 4.0x/4.5x)" on page 140

  — "CHANGE_OPT (SAP R/3 4.6x)" on page 143

File Locations

The `r3monchg` alert monitor has the files listed in Table 4-10.

Table 4-10 r3monchg Files

File	Description
`r3moncol(.exe)`	Collector executable for the system change option monitor

Table 4-10 r3monchg Files (Continued)

File	Description
`r3monchg.cfg`	Configuration file for system change option monitor.
`r3monchg.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monchg` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command Line Parameters

The `r3monchg` monitor uses the command line parameters described in Table 4-6 on page 119. The command line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring SYSTEM CHANGE OPTION Monitor Alert Types

The System Change Monitor, `r3monchg`, is SAP version dependent. There are three possible configurations shown in separate tables. Please refer to the table that matches your SAP version.

Note, too, the general rules repeated below concerning the use of exclude and include parameter values: the rules are particularly important for these alert types.

Parameter Values

The *include* and *exclude* parameter values for an alert type entry are interpreted as described below. Parameter values in *different* parameters are always compared using 'and': parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using 'or'
- **Exclude**: parameters are compared using 'and'

Note that the *include* values are evaluated before the *exclude* values, as shown in Table 4-11.

Table 4-11 AND/OR Comparisons using Include and Exclude Conditions for the Same Parameter

Select Options	Alert Type: CHANGE_OPT (SAP R/3 4.5x) Example Configuration of Select Options	Comparison
1	=SYSTEM_CHANGE_OPTION =1 =WARNING =SystemChange =R3_Security = NSP_EDTFLAG =I = CP= /0* =	OR
2	=SYSTEM_CHANGE_OPTION =1 =WARNING =SystemChange = =R3_Security = NSP_EDTFLAG =I =EQ =/SAPQUERY/ =	OR
3	=SYSTEM_CHANGE_OPTION =1 =WARNING =SystemChange =R3_Security = NSP_EDTFLAG =E =EQ =/0LOCAL/ =	AND

CHANGE_OPT (SAP R/3 3.x)

An alert is generated when the `EDTFLAG` parameter is set to allow the editing that you are trying to perform.

Example 4-4 Example Default Configuration

```
AlertMonFun =ALL =ALL =ALL =ALL   =SYSTEM_CHANGE_OPTION  =1   \
  =WARNING   =SystemChange  =R3_Security  \
   =CHANGE_OPT  =EDTFLAG   =I    =EQ  =   =
```

Note that configuration of the parameter (described in Table 4-12 on page 140) is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-12 Configuration Parameters (SAP R/3 3.x)

Parameter Name	Description	Query Conditions	Default Value
EDTFLAG	Flag indicating if an object can be edited.	= Sign: I	I
		= Opt: EQ	EQ
		= Low: N, C, R, ‘ ‘ N = no change, C = all customer objects R = all objects ‘ ‘ = only original object‘	‘ ‘
		= High:	

CHANGE_OPT (SAP R/3 4.0x/4.5x)

An alert is generated when the flag parameters are set to allow the editing you are trying to perform. The configuration of the parameter `EDTFLAG` is optional. The configuration of the `NSP_EDTLAG` is mandatory.

Table 4-13 Configuration Parameters (SAP R/3 4.0x/4.5x)

Parameter Name	Description	Query Conditions	Default Value
EDTFLAG	Flag indicating if an object can be edited for global system changes.	= Sign: I	I
		= Opt: EQ	EQ
		= Low: ON, OFF, PATCH [a]	PATCH
		= High:	

Table 4-13 Configuration Parameters (SAP R/3 4.0x/4.5x) (Continued)

Parameter Name	Description	Query Conditions	Default Value
NSP_EDTFLAG	Flag indicating which specified name space(s) are to be set to ON.	= Sign: I	I
		= Opt: EQ: CP	CP
		= Low [b]	*
		= High:	

a. PATCH=set to patch system.
b. See the list of name space change options for SAP R/3 4.0X and SAP R/3 R 4.5X in Table 4-14 on page 142 and Table 4-15 on page 142.

In Example 4-5, an event generating an alert occurs when the global system change option is ON or the specified name space is ABAP/4 Query/SAP (/SAPQUERY/). For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Example 4-5 The Default CHANGE_OPT Configuration (SAP R/3 4.0x/4.5x)

```
AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION =1 \
=WARNING =SystemChange =R3_Security \
=CHANGE_OPT =NSP_EDTFLAG =I =EQ =/SAPQUERY/ =

AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION =1 \
=WARNING =SystemChange =R3_Security \
=CHANGE_OPT =EDTFLAG =I =EQ =ON =
```

In Example 4-6, an event generating an alert occurs when the global system change option is ON or the system space names are set to ON for Customer Name Range (/0CUST/) or ABAP/4 Query/SAP (/SAPQUERY/).

Example 4-6 Customized CHANGE_OPT Configuration (SAP R/3 4.0x)

```
AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION =1 \
=WARNING =SystemChange =R3_Security \
=CHANGE_OPT =NSP_EDTFLAG =I =EQ =/0CUST/ =

AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION =1 \
=WARNING =SystemChange =R3_Security \
=CHANGE_OPT =NSP_EDTFLAG =I =EQ =/SAPQUERY/ =
```

```
AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION =1 \
=WARNING =SystemChange =R3_Security \
=CHANGE_OPT =EDTFLAG =I =EQ =ON =
```

Table 4-14 Name Space System Change Options: SAP R/3 4.0x

ID	Description
/0CUST/	Customer name range
/0LOCAL/	Local objects
/0SAPAPPL/	SAP R/3 application components
/0SAPBAS/	SAP R/3 Basis System
/1BCABA/	ABAP+GUI tools
/1BCDWB/	Development Workbench
/1BCDWBEN/	Enqueue function groups
/SAPQUERY/	ABAP/4 Query/SAP

Table 4-15 Name-Space System Change Options: SAP R/3 4.5x

ID	Description
/0CUST/	Customer name range
/0LOCAL/	Local objects
/0SAPAPPL/	SAP R/3 application components
/0SAPBAS/	SAP R/3 Basis System
/1BCABA/	ABAP+GUI tools
/1BCDWB/	Development Workbench
/1BCDWBEN/	Enqueue function groups
/1PAPA/	Personnel administration
/1PAPAXX/	Personnel administration, general

Table 4-15 Name-Space System Change Options: SAP R/3 4.5x (Continued)

ID	Description
/1PSIS/	Project Information System - Logical database PSJ
/1SAP1/	General SAP generation namespace
/BI0/	Business Information Warehouse: SAP namespace
/BIC/	Business Information Warehouse: 1 - Customer namespace
/SAPQUERY	ABAP/4 Query/SAP
/SAPTRAIN/	SAP training

CHANGE_OPT (SAP R/3 4.6x)

An alert is generated when the flag parameters are set to allow the editing you are trying to perform.

The configuration of all parameters is mandatory. Multiple parameter entries on a single line are *not* allowed. Rather, the different configurations should be separated on to different lines. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-16 Configuration Parameters (SAP R/3 4.6X)

Parameter Name	Description	Query Conditions	Default Value
EDTFLAG	Flag indicating if an object can be edited.	= Sign: I	I
		= Opt: EQ	EQ
		= Low: ON, OFF, PATCH [a]	PATCH
		= High:	

Table 4-16 Configuration Parameters (SAP R/3 4.6X) (Continued)

Parameter Name	Description	Query Conditions	Default Value
NSP_EDTFLAG	Flag indicating which specified name space(s) are to be set to ON.	= Sign: I	I
		= Opt: EQ:CP	CP
		= Low [b]	*
		= High:	
SWC_EDTFLAG	Flag indicating which specified software components are to be set to ON.	= Sign: I	I
		= Opt: EQ, CP	CP
		= Low: <specified software component> [b]	*
		= High:	

a. PATCH=set to patch system
b. See list of name space change options for SAP R/3 4.6. X in Table 4-18

In Example 4-7, an event generating an alert occurs when the global system change is OFF or the specified name space is Local Objects (/0LOCAL/), or the specified software component is Local Developments (no automatic transport).

Example 4-7 The Default CHANGE_OPT (SAP R/3 4.6x) Configuration

```
AlertMonFun =ALL =ALL =ALL =ALL   =SYSTEM_CHANGE_OPTION  =1\
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT   =NSP_EDTFLAG  =I =EQ  =/0LOCAL/  =

AlertMonFun  =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION  =1\
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT          =SWC_EDTFLAG  =I    =EQ  = LOCAL    =

AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION  =1\
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT            =EDTFLAG      =I    =EQ  =OFF  =
```

Example 4-8 The Customized CHANGE_OPT (SAP R/3 4.6x) Configuration

```
AlertMonFun =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION  =1\
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT  =NSP_EDTFLAG  =I    =EQ  =/SAPQUERY/    =

AlertMonFun =ALL =ALL =ALL  =ALL =SYSTEM_CHANGE_OPTION  =1\
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT         =SWC_EDTFLAG  =I    =EQ  = SAP_HR =

AlertMonFun =ALL =ALL =ALL =ALL =SYSTEM_CHANGE_OPTION  =1 \
=WARNING    =SystemChange  =R3_Security \
=CHANGE_OPT  =EDTFLAG  =I    =EQ  =OFF  =
```

In Example 4-8, an event generating an alert occurs when the global change option is OFF or the system space change option ABAP query/SAP is ON, or the software component change option for Human Resources is ON. For more information about the change options for Name System and software components, see Table 4-17 and Table 4-18.

Table 4-17 Software Components Change Options for SAP R/3 4.6x

Technical ID	Description
HOME	Customer developments
LOCAL	Local developments (no automatic transport)
SAP_ABA	Cross-Application Component
SAP_APPL	Logistics and Accounting
SAP_BASIS	SAP Basis Component
SAP_HR	Human Resources

Table 4-18 Name System Change Options for SAP R/3 4.6x

Technical ID	Description
/0CUST/	Customer name range
/0SAP/	General SAP name range
/1BCABA/	ABAP & GUI tools
/1BCDWB/	Development Workbench

Table 4-18 Name System Change Options for SAP R/3 4.6x (Continued)

Technical ID	Description
/1BCDWBEN/	Enqueue function groups
/1COPA/	Generated objects in CO-PA
/1ISRWP/	IS-R merchandise and assortment controlling
/1ISU/	Generation namespace for CIC (Customer Interaction Center)
/1PAPA/	Personnel administration
/1PAPAXX/	Personnel administration - general
/1PSIS/	Project Information System - Logical database PSJ
/1PYXXFO/	PY-XX Form tool: Generated objects
/1SAP1/	General SAP generation namespace
/1SDBF12L/	Generation of pricing report
/BI0/	Business Information Warehouse: SAP namespace
/BIC/	Business Information Warehouse: Customer namespace
/SAPQUERY/	ABAP query/SAP
/SAPRRR/	Ready-to-Run R/3
/SAPSMOSS/	Interface: R/3 messages to the SAP Online Service Sy
/SAPTRAIN/	SAP training

r3moncts: The CORRECTION & TRANSPORT SYSTEM Monitor

The CTS alert monitor `r3moncts` identifies and monitors the Correction and Transport System for important transport requests, tasks and objects. Data collection is application-server independent.

The alert monitor r3moncts references:

- transport requests and object lists created using SAP R/3 transaction **`/SE01`**
- tasks created using SAP R/3 transaction **`/SE09`**

Type

The monitor is of type *timeframe*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The CTS monitor has the following alert types:

- "REQUEST_CREATED"

  Defines when an alert will be generated for a new request.
- "REQUEST_RELEASED"

  Defines when an alert will be generated for a new request which has been released.
- "TASK_CREATED"

  Defines the when an alert will be generated for a new task.
- "TASK_RELEASED"

  Defines when an alert will be generated for a new task which has been released.
- "OBJECT_USED"

  Defines which objects when used by a task or a request will generate an alert.
- "OBJECT_RELEASED"

  Defines when an alert will be generated when the request or task which holds this object is released.

File Locations

The `r3moncts` monitor has the files listed in Table 4-19.

Table 4-19 r3moncts Files

File	Description
`r3moncol(.exe)`	Collector executable for the CTS monitor
`r3moncts.cfg`	Configuration file for the CTS monitor.
`r3moncts.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3moncts` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command Line Parameters

The `r3moncts` monitor uses the command line parameters described in Table 4-6 on page 119. The command line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert-collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring CTS Monitor Alert Types

You should bear in mind the following the rules when configuring the alert-type parameters for the CTS monitor, `r3moncts`:

- By default, *all* data is selected for each parameter.
- Data can be restricted by specifying some or all of the parameters for the alert type.
- If any parameter values are specified only the named parameters are taken into account i.e the default value ALL is overridden for the unspecified parameters.

The parameter TRFUNCTION is used to configure the REQUEST_CREATED, REQUEST_RELEASED, TASK CREATED and TASK RELEASED alert types. TRFUNCTION has request functions which can be specified using the letter codes specified in Table 4-20.

Table 4-20 TRFUNCTION Request Functions

Letter Code	Function Description
A	Request: Unclassified request becomes K, L or W with first object
C	Transport with change authorization
D	Patch
K	Request: Change request with destination consolidation layer
L	Request: Local request without transport
R	Task: Repair
S	Task: Development/correction
T	Request: Transport without originals
U	Dummy
W	Request: Customizing request with cons. layer destination
X	Task: Unclassified task becomes S or R with first object

Table 4-20 TRFUNCTION Request Functions (Continued)

Letter Code	Function Description
Z	(task without request) SE09 memory usage

NOTE In the descriptions of the use of this parameter for each of the CTS alert types, only the letter code is shown. If you do not know what these letter codes represent, please consult Table 4-20.

REQUEST_CREATED

An alert is generated if a new request was created within the last specified time frame The configuration of any of these parameters is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-21 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
TRFUNCTION	The request function.	= Sign: I, E	I
		= Opt: CP, EQ	CP
		= Low: A, K,L,W,C,T, U, D [a]	*
		= High:	
TARGET	The target system for which this request was created. Note: this must be a SID	= Sign I, E	
		= Opt: EQ, CP	
		= Low: <*name of system*>	
		= High	

Table 4-21 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
USERNAME	The login name of the SAP R/3 user who created the request.	= Sign I	
		= Opt: EQ, CP	
		= Low: <*username who created this request*>	
		= High	

a. Only the listed functions can be specified (* means all).

In Example 4-9, an event generating an alert occurs if a new request was created within the last time frame

Example 4-9 The Default REQUEST_CREATED Configuration

```
AlertMonFun  =ALL  =ALL  =ALL  =ALL  =CTS  =1\
=WARNING    =Request     =R3_CTS\
=REQUEST_CREATED   =USERNAME   =I    =CP      =*    =
```

REQUEST_RELEASED

An alert is generated if a new request is released within in the last time frame. The configuration of the parameters below is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-22 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
TRKORR	Request ID	= Sign: I, E	
		= Opt: EQ	
		= Low: <Request ID>	
		= High:	

Table 4-22 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
TRFUNCTION	The request function.	= Sign: I, E	
		= Opt: EQ	
		= Low: K,L, W,C,T, U, D. [a]	
		= High:	
TARGET	The target system for which this request was created. This must be a SID	= Sign I, E	I
		= Opt: EQ, CP	CP
		= Low: <name of system>	*
		= High	
USERNAME	The login name of the SAP R/3 user who created the request.	= Sign I	
		= Opt: EQ,CP	
		= Low: <username who created this request>	
		= High	
CUSTOMIZING	Customizing Requests	= Sign I,E	
		= Opt: EQ	
		= Low [b]	
		= High	
WORKBENCH	Workbench Requests	= Sign I, E	
		= Opt: EQ	
		= Low [b]	
		= High	

a. Only the listed functions can be specified (* means all).
b. Any entry other than 'X' will be treated as space.

In Example 4-10, an event generating an alert occurs if any *customizing* request was released in the last time frame.

Example 4-10 The Default REQUEST_RELEASED Configuration

```
AlertMonFun     =ALL    =ALL =ALL =ALL =CTS    =1\
  =WARNING     =Request      =R3_CTS\
  =REQUEST_RELEASED  =CUSTOMIZING  =I =EQ   =X
```

TASK_CREATED

An alert is generated if a new task was *created* within the last specified time frame. The configuration of any of these parameters is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-23 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
TRFUNCTION	The request function.	= Sign: I, E	I
		= Opt: CP, EQ	CP
		= Low: X, S, R, Z [a]	*
		= High:	
USERNAME	The login name of the SAP R/3 user who created the request.	= Sign: I	
		= Opt: EQ, CP	
		= Low:<username who created this request>	
		= High:	

a. Only the listed functions can be specified (* means all).

In Example 4-11, an event generating an alert occurs if a new task was *created* within the last specified time frame.

Example 4-11 The Default TASK_CREATED Configuration

```
AlertMonFun     =ALL    =ALL =ALL   =ALL   =CTS          =1      \
  =WARNING     =Task   =R3_CTS        \
  =TASK_CREATED         =TRFUNCTION    =I    =CP      =*          =
```

TASK_RELEASED

An alert is generated if a new task was released within the last time frame. The configuration of the parameters below is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-24 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
TRKORR	Request ID	= Sign: I, E	
		= Opt: EQ	
		= Low: <Request ID>	
		= High:	
TRFUNCTION	The request function.	= Sign: I, E	I
		= Opt: CP, EQ	CP
		= Low: R, S, Z [a]	*
		= High:	
USERNAME	The login name of the SAP R/3 user who created the request.	= Sign: I	
		= Opt: EQ, CP	
		= Low: <username who created this request>	
		= High	

a. Only the listed functions can be specified (* means all).

In Example 4-12, an event generating an alert occurs if any new task was *released* in the last time frame

Example 4-12 The Default TASK_RELEASED Configuration

```
AlertMonFun =ALL =ALL =ALL  =ALL  =CTS  =1\
  =WARNING  =Task =R3_CTS\
  =TASK_RELEASED =TRFUNCTION  =I =CP =* =
```

OBJECT_USED

An alert is generated if the object matching the defined configuration is used by a task or by a request within the last time frame.

The configuration of the parameters below is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-25 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
PGMID	Program ID	= Sign: I, E	
		= Opt: EQ, CP	
		= Low: <Program ID>	
		= High:	
OBJECT	Object type of element	= Sign I, E	
		= Opt: EQ, CP	
		= Low: <Object type>	
		= High	
OBJ_NAME	Object Name in object directory	= Sign I, E	I
		= Opt: EQ, CP	CP
		= Low: <Object name>	*
		= High	

Table 4-25 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
OBJ_FUNC	Special function for an object entry, e.g. D = Delete or M = delete+ recreate.	= Sign I, E	
		= Opt: EQ, CP	
		= Low	
		= High	
IN_REQUEST	Alert generated if object container is a request	= Sign I,E	
		= Opt: EQ	
		= Low	
		= High	
IN_TASK	Alert generated if object container is a task.	= Sign I, E	
		= Opt: EQ	
		= Low	
		= High	

In Example 4-13, an event generating an alert occurs if any object with Object Type "LIMU" is used by a task or a request.

Example 4-13 The Default OBJECT_USED Configuration

```
AlertMonFun  =ALL  =SD1 =ALL  =ALL   =CTS    =1\
  =WARNING   =Object =R3_CTS\
  =OBJECT_USED =PGMID  =I    =EQ  =LIMU  =
```

OBJECT_RELEASED

An alert is generated if a request or task is released which holds the specified object. The configuration of the parameters below is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-26 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
TRKORR	Request ID	= Sign: I, E	
		= Opt: EQ, CP	
		= Low:<Request ID>	
		= High:	
PGMID	Program ID	= Sign: I, E	
		= Opt: EQ, CP	
		= Low: <Program ID>	
		= High:	
OBJECT	Object type of element	= Sign I, E	
		= Opt: EQ, CP	
		= Low: <Object type>	
		= High	
OBJECT_NAME	Object Name in object directory	= Sign I	I
		= Opt: EQ, CP	CP
		= Low: <Object name>	*
		= High	

Table 4-26 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
IN_REQUEST	Alert generated if object container is a request	= Sign I,E	
		= Opt: EQ	
		= Low [a]	
		= High	
IN_TASK	Alert generated if object container is a task.	= Sign I, E	
		= Opt: EQ	
		= Low [a]	
		= High	

a. Any entry other than 'X' will be treated as space.

In Example 4-14, an event generating an alert occurs if any object is released by a task.

Example 4-14 The Default OBJECT_RELEASED Configuration

```
AlertMonFun =ALL   =ALL      =AL =ALL   =CTS   =1\
  =WARNING  =Object =R3_CTS\
  =IN_TASK    =I =EQ       =X   =
```

r3mondmp: The ABAP Dump Monitor

The ABAP DUMP alert monitor, `r3mondmp`, reports ABAP dumps in the SAP R/3 system which have occurred within the last, defined, time frame. The check is performed once per monitor run for all application servers.

Dumps are usually runtime errors and so they cannot always be detected by a static syntax check. They can occur for many reasons and may indicate serious problems. No dumps should occur on a production system.

Here are two examples of actions which cause dumps to occur:

- division by zero
- a called function model is not activated

User action by the system administrator is generally required after a dump has occurred in order to resolve the problem. Consequently, the messages generated by this alert monitor include an operator-initiated action that calls an ABAP program to display details of the dump.

The alert monitor `r3mondmp` references the SAP R/3 transaction **`/ST22`**.

Type

The monitor is of type *timeframe*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The ABAP DUMP monitor has the following alert types:

- "ABAP4_ERROR_EXIST"

  One alert is generated for each ABAP dump.

File Locations

The `r3mondmp` monitor has the files listed in Table 4-27.

Table 4-27 r3mondmp Files

File	Description
`r3moncol(.exe)`	Collector executable for ABAP DUMP monitor
`r3mondmp.cfg`	Configuration file for monitored application servers.

Table 4-27 r3mondmp Files (Continued)

File	Description
`r3mondmp.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3mondmp` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command Line Parameters

The `r3mondmp` monitor uses the command line parameters described in Table 4-6 on page 119. The command line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring ABAP DUMP Monitor Alert Types

No parameters are used in the configuration of `r3mondmp`, the ABAP DUMP monitor: you do not need to edit the configuration file.

ABAP4_ERROR_EXIST

An alert is generated for each dump that occurred in the last time frame. Example 4-15 shows how you can use =MAX_ENTRIES to count the number of dumps that have to occur before the SPI for SAP generates a message. In addition, you can specify a period of time in hours (=TIME_LIMIT) within which the defined number of dumps must occur. In this example, the SPI for SAP generates a message if ten dumps occur within twenty four hours.

Example 4-15 The Default ABAP4_ERROR_EXIST Configuration

```
AlertMonFun     =ALL  =ALL  =ALL   =ALL =ABAP4 =1\
=WARNING    =ABAP_Dump   =R3_ABAP-4\
=ABAP4_ERROR_EXIST

# New feature in SPI for SAP version 8.0
#AlertMonFun    =ALL   =ALL  =ALL  =ALL  =ABAP4  =1  \
      =WARNING  =ABAP_Dump  =R3_ABAP-4  =ABAP4_ERROR_EXIST\
                =MAX_ENTRIES  =I    =GT   =10   =    \
                =TIME_LIMIT   =I    =GT   =24   =
```

r3monjob: The JOBREPORT Monitor

The `r3monjob` alert monitor identifies and reports on batch jobs for the following conditions:

- A batch job's run time is either less than or has exceeded a specified limit.
- A specified period of time passes between a batch job's scheduled and actual start time (and date).
- A batch job has aborted.

The alert monitor `r3monjob` references:

- Reports created using SAP R/3 transaction **`/SM36`** or **`/SM38`**
- Job details including ID number using SAP R/3 transaction **`/SM37`**

Messages generated by this alert monitor include an operator-initiated action that displays the list of current SAP batch jobs.

Type

The monitor is of type *timeframe*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The JOBREPORT monitor has the following alert types. Note that if you want to use the `r3monjob` monitor, you *must* configure the alert types listed below:

- "JOB_MAX_RUN_TIME"

  defines the maximum allowed run time. Alerts are triggered for jobs which exceed the maximum time, specified in minutes.

- "JOB_MIN_RUN_TIME"

  defines the minimum allowed run time. Alerts are triggered for jobs which did not run for at least as long as the time, specified in minutes.

- "START_PASSED"

  is the maximum allowed delay between scheduled and actual start time. Alerts are triggered for jobs which have not started within the time, specified in minutes.

- "JOB_ABORTED"

  An alert is triggered whenever the jobs specified in its configuration fail to complete successfully.

First Time Monitoring

When monitoring batch job alerts for a particular alert type for the first time, the JOBREPORT Monitor, r3monjob checks for:

- jobs which are not yet scheduled to run
- jobs which ended within the previous two days
- jobs which are still running

Performance Aspects

On a production system the table `tbtco` is usually very big. In order to speed up the database selection you should specify the job names in as much detail as possible. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

The runtime cost of a job selection grows in the order shown in theTable 4-28.

Table 4-28 Order of Runtime Cost of Job Selection Criteria

Specified Jobname	Sign	Option	Selection
JOBNAME	I	EQ	Z5_CRITICAL_JOB_1> select via index
JOBNAME	I	CP	Z5_CRITICAL_JOB*> select via index
JOBNAME	E	CP	Z5_CRITICAL_JOB*> sequential scan

File Locations

The `r3monjob` monitor has the files listed in Table 4-29

Table 4-29 r3monjob Files

File	Description
`r3moncol(.exe)`	Collector executable for the batch job monitor

Table 4-29 r3monjob Files (Continued)

File	Description
`r3monjob.cfg`	Configuration file for monitored jobs and job conditions.
`r3monjob.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monjob` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monjob` monitor uses the command-line parameters described in Table 4-6 on page 119. The command line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors refer to "Alert-collector Monitor Query Conditions." in the introduction to this chapter.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

Configuring JOBREPORT Monitor Alert Types

You can configure `r3monjob`, the JOBREPORT monitor, for each of the listed alert types for a specific job, a combination of jobs, or for *all* jobs. You can also define exceptions for jobs that need different monitoring conditions. For more detailed information, see the alert-type tables which give the parameters and configuration for each alert type. Also, please

note the general rules repeated below for using exclude and include parameter values which are of particular importance for these alert types.

IMPORTANT

Try to avoid using select option CP with the JOBNAME parameter: CP slows down the selection process. If you do use CP, try to limit its scope, for example; instead of specifying CP *, specify CP SAP*.

Parameter Values

The *include* and *exclude* parameter values for an alert type entry are interpreted as described below. Parameter values in *different* parameters are always compared using 'and': parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using 'or'
- **Exclude**: parameters are compared using 'and'

First the *include* values are evaluated; then the *exclude* values are evaluated, as shown in Table 4-30.

Table 4-30 AND/OR Comparisons using Include and Exclude Conditions for the Same Parameter

Select Options	AlertType:JOB_MAX_RUN_TIME Example Configuration of Select Options	Comparison
1	=JOBNAME =I =CP =ZREP* = =MAX_RUNTIME =I =GT =10 =	OR
2	=JOBNAME =I =CP =SAP* = =MAX_RUNTIME =I =GT =20 =	OR
3	=JOBNAME =E =CP =SAP_ZREP* = =	AND

JOB_MAX_RUN_TIME

An alert is generated when the configured parameter MAX_RUNTIME is exceeded.

The configuration of any of the parameters below is optional. If both parameters are omitted, all jobs running in the specified time frame are reported. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-31 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
JOBNAME	Name of the jobs to be monitored	= Sign: I, E	I
		= Opt: EQ, CP, BT	CP
		= Low <Name of job>	*
		= High [a]	
MAX_RUNTIME	Job run time in minutes which, if exceeded, generates an alert.	= Sign I, E	I
		= Opt: EQ, GE, GT, BT	GT
		= Low [b]	5
		= High [a]	

a. Only for use with a range
b. This parameter must be specified as a number. Otherwise the monitor ends with a dump.

The following examples illustrates both the default and a customized configuration for the JOB_MAX_RUN_TIME alert type.

In Example 4-16, an event generating an alert occurs if any report named <*jobname*>* has a runtime exceeding five minutes

Example 4-16 The Default JOB_MAX_RUN_TIME Configuration

```
AlertMonFun  =ALL =ALL =ALL =ALL =JOBREPORT =1  \
=WARNING    =MaxRunTime   =R3_Jobs\
=JOB_MAX_RUN_TIME =JOBNAME  =I  =CP  =<jobname>*  =\
=MAX_RUNTIME   =I  =GT  =5  =
```

In Example 4-17, an event generating an alert occurs if all reports named SAP*, except reports SAPZ*, have a runtime exceeding ten minutes

Example 4-17 A Customized JOB_MAX_RUN_TIME Configuration

```
AlertMonFun =ALL  =ALL =ALL =ALL =JOBREPORT =1\
=WARNING    =MaxRunTime   =R3_Jobs  \
=JOB_MAX_RUN_TIME =JOBNAME =I =CP =SAP*  = \
=MAX_RUNTIME   =I  =GT  =10  =

AlertMonFun =ALL  =ALL =ALL =ALL =JOBREPORT =1\
=WARNING  =MaxRunTime   =R3_Jobs  \
=JOB_MAX_RUN_TIME =JOBNAME  =E =CP =SAPZ*  = \
=MAX_RUNTIME   =I  =GT  =10  =
```

JOB_MIN_RUN_TIME

An alert is generated when jobs are not running for as long as the time specified in the parameter MIN_RUNTIME. The configuration of any of the parameters below is optional. If both parameters are omitted, all jobs running in the specified time frame are reported. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-32 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
JOBNAME	Name of the jobs to be monitored	= Sign: I, E	I
		= Opt: EQ, CP, BT	CP
		= Low <Name of job>	*
		= High: [a]	

Table 4-32 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
MIN_RUNTIME	This defines the minimum allowed run time Alerts are triggered for jobs which did not run for at least as long as the time specified (in minutes).	= Sign I, E	I
		= Opt: EQ,LE, LT, BT	LT
		=Low <Min. value in minutes> [b]	1
		= High	

a. Only for use with a range
b. This parameter must be specified as a number, otherwise the monitor ends with a dump.

The following examples illustrates both the default and a customized configuration for the JOB_MIN_RUN_TIME alert type.

In Example 4-18, an event generating an alert occurs if any report named <*jobname*>* has a runtime of less than one minute.

Example 4-18 The Default JOB_MIN_RUN_TIME Configuration

```
AlertMonFun =ALL =ALL =ALL  =ALL =JOBREPORT  =1  \
=WARNING      =MinRunTime  =R3_Jobs\
=JOB_MIN_RUN_TIME =JOBNAME   =I  =CP  =<jobname>*  = \
=MIN_RUNTIME =I  =LT  =1   =
```

In Example 4-19, an event generating an alert occurs if all reports named SAP*, except reports SAPZ*, have a runtime of less than two minutes

Example 4-19 Customized JOB_MIN_RUN_TIME Configuration

```
AlertMonFun  =ALL =ALL   =ALL  =ALL  =JOBREPORT =1  \
=WARNING    =MinRunTime   =R3_Jobs  \
=JOB_MIN_RUN_TIME =JOBNAME       =I    =CP     =SAP*  = \
=MIN_RUNTIME  =I =LT =2 =
```

```
AlertMonFun  =ALL =ALL =ALL  =ALL =JOBREPORT =1  \
=WARNING    =MinRunTime   =R3_Jobs  \
=JOB_MIN_RUN_TIME =JOBNAME       =E     =CP     =SAPZ*  = \
=MIN_RUNTIME   =I  =LT  =2  =
```

START_PASSED

An alert is generated if the specified jobs are not started within the configured TIME_SPAN after the scheduled start time. If a job is scheduled but does not have a start time, it cannot be monitored until and unless a start time has been assigned and is visible in the SAP database. SAP associates a start time with a job only when the job assumes a particular status. The following SAP job statuses have a start time and, consequently, can be monitored by `r3monjob`: Released, Ready, Active, Finished, and Canceled.

The configuration of any of the parameters below is optional. If both parameters are omitted all jobs running in the specified time frame are reported. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-33 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
JOBNAME	Name of the jobs to be monitored	= Sign: I, E	I
		= Opt: EQ, CP, BT	CP
		= Low <Name of job>	*
		= High:[a]	
TIME_SPAN	The job run time in minutes that specifies when an alert should be raised. Note that it is not necessary to use a time range. You can specify a particular time instead.	= Sign I, E	I
		= Opt: EQ, LT, LE, BT	LT
		=Low <*low_value_of_range_in_minutes_past_scheduled_start_time*>[b]	1
		=High <*high_value_of_range_in_minutes_past_scheduled_start_time*>	

a. Only for use with a range
b. This parameter must be specified as a number. Otherwise the monitor ends with a dump

In Example 4-20, an event generating an alert occurs if any report named <*jobname*>* is not started more than one minute after the scheduled start time.

Example 4-20 The Default START_PASSED Configuration

```
AlertMonFun =ALL  =ALL =ALL   =ALL =JOBREPORT  =1\
=WARNING    =StartPassed  =R3_Jobs  \
=START_PASSED     =JOBNAME    =I  =CP   =<jobname>* =\
 =TIME_SPAN =I =GT  =1    =
```

JOB_ABORTED

An alert is generated when a job is aborted. The configuration of the parameter below is optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-34 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
JOBNAME	Name of the jobs to be monitored	= Sign: I, E	I
		= Opt: EQ, CP, BT	CP
		= Low <Name of job>	*
		= High [a]	

a. Only for use when specifying a range

In Example 4-21, an event generating an alert occurs if any report named <*jobname*>* is aborted

Example 4-21 The Default JOB_ABORTED Configuration

```
AlertMonFun   =ALL =ALL =ALL  =ALL  =JOBREPORT =1\
=WARNING   =Aborted      =R3_Jobs \
=JOB_ABORTED  =JOBNAME  =I  =CP= <jobname>*
```

In Example 4-22, an event generating an alert occurs if jobs named SAP_REORG_ABAPDUMPS or ITOTEST are aborted.

Example 4-22 A Customized JOB_ABORTED Configuration

```
AlertMonFun  =ALL  =ALL  =ALL  =ALL =JOBREPORT =1\
=WARNING   =Aborted =R3_Jobs \
=JOB_ABORTED  =JOBNAME  =I =EQ =SAP_REORG_ABAPDUMPS =

AlertMonFun  =ALL  =ALL =ALL  =ALL  =JOBREPORT        =1  \
=WARNING   =Aborted  =R3_Jobs\
=JOB_ABORTED =JOBNAME   =I   =EQ  =ITOTEST =
```

r3monlck: The LOCK_CHECK Monitor

The LOCK_CHECK alert-collector monitor references the Enqueue process which manages logical locks for SAP R/3 transactions and reports on obsolete locks. Obsolete locks are defined as locks which are older than the time period you specify. The check is performed once per monitor run for all application servers.

An object which is locked cannot be changed by anyone other than the user associated with it and can cause severe problems. The operator can check the locks set for a specific instance in **/SM12**. Here are two examples of actions which cause locks to occur

- Users switching off their computers without first logging off the R/3 system, (this is the most common cause).
- As a result of entire instances failing.

The alert monitor `r3monlck` references the SAP R/3 transaction **/SM12**.

Messages generated by this alert monitor include an operator-initiated action that calls the **/SM12** Locks Overview module. The operator can then check the locks set for a specific instance in **/SM12**.

Type

The `r3monlck` monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The LOCK_CHECK monitor has only one alert type:

- "OLD_LOCKS"

  Specifies when the lock is to be defined as "old", using the time period you specify in the parameter LOCK_TIME.

File Locations

The `r3monlck` monitor has the files listed in Table 4-35.

Table 4-35 r3monlck Files

File	Description
`r3moncol(.exe)`	Collector executable for the lock_check monitor

Table 4-35 r3monlck Files (Continued)

File	Description
`r3monlck.cfg`	Configuration file for the lock_check monitor.
`r3monlck.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monlck` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monlck` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

OLD_LOCKS

An alert is generated if the time span for the parameter LOCK_TIME is exceeded, i.e the lock is defined as "old".

The configuration of the parameter below is mandatory. Note that you can have more than one configuration in the `.cfg` file. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-36 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
LOCK_TIME	The time span (in hours) after which a lock is considered old	= Sign: I,E	I
		= Opt: EQ, GT, GE, LE, LT, BT	GT
		= Low: <time in hours> [a]	
		= High:[b]	

a. This parameter must be specified, otherwise the monitor ends with a dump.
b. Only for use when specifying a range

In Example 4-23, an event generating an alert occurs if any lock exceeds a time span of 24 hours.

Example 4-23 The Default OLD_LOCKS Configuration

```
AlertMonFun  =ALL =ALL =ALL   =ALL =LOCK_CHECK =1\
=WARNING    =Enqueue  =R3_Enqueue\
=OLD_LOCKS  =LOCK_TIME =I    =GT  =24   =
```

r3monoms: The OPERATION MODE Monitor

The OPERATION MODE alert monitor `r3monoms` checks each application server for the following conditions:

- A scheduled operation mode occurs later than the time specified
- A scheduled operation mode switch has not occurred at all

The alert monitor `r3monoms` references:

- scheduled operation modes in SAP R/3 transaction **`/SM63`**
- configuration modes in SAP R/3 transaction **`/RZ04`**

Operation-mode switch failures influence the performance of the SAP R/3 system and can cause problems. Operation-mode switches might occur for a number of reasons, for example; work processes that must be switched are still occupied in a process while the operation-mode switch is running. The system administrator usually needs to intervene to fix the problem, for example; by forcing and testing the operation mode's state.

NOTE If an operations-mode switch generated an alarm because it was not activated in time, but then successfully occurred later without any intervention, a message is sent stating that the switch, although late, has now gone ahead as planned.

Type The `r3monoms` monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types The alert monitor OPERATION MODE has only one alert type:

- "OM_SWITCH_OVERDUE"

  This defines when an operation mode switch is overdue.

File Locations

The `r3monoms` monitor has the files listed in Table 4-37

Table 4-37 r3monoms Files

File	Description
`r3moncol(.exe)`	Collector executable for the operation mode monitor
`r3monoms.cfg`	Configuration file for the operation mode monitor.
`r3monoms.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monoms` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monoms` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

OM_SWITCH_OVERDUE

An alert is generated when the operation mode switch is not triggered within the defined period of time.

The configuration of the parameters in Table 4-38 on page 177 is optional. By default, an alert is triggered if an Operation-Mode switch is more than three minutes late.

The APSERVER parameter allows you to set the application-server-dependent monitors, `r3monwpa`, `r3monusr`, and `r3monoms` to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction `SM51`:

```
=APSERVER  =I =CP =<hostname>_<SID>_<Instance_Number>
```

It is also recommended that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-24.

Example 4-24 Specifying an Application Server

```
AlertMonFun  =<Centr_Instance_hostname> =ALL =ALL =ALL =OM =1 \
=WARNING   =OperationMode  =R3_WP   \
=OM_SWITCH_OVERDUE =OVERDUE_TIME   =I  =GT  =15   = \
                   =APSERVER  =I =CP =hpdev01_MP3_00
```

For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-38 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low	
		= High	

Table 4-38 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
OVERDUE_TIME	The time in minutes, after which a scheduled mode switch is considered overdue.	= Sign: I, E	I
		= Opt: GT, GE, LE, LT, BT	GT
		= Low <*time in minutes*> [a]	3
		= High [b]	

a. This query condition must be specified, otherwise no check is performed.
b. Only for use when specifying a range.

In Example 4-25, an event generating an alert occurs if a scheduled operation mode switch is more than three minutes late.

Example 4-25 The Default OM_SWITCH_OVERDUE Configuration

```
AlertMonFun  =ALL =ALL =ALL  =ALL=OM  =1\
=WARNING   =OperationMode  =R3_WP\
=OM_SWITCH_OVERDUE   =OVERDUE_TIME  =I   =GT  =3  =
```

r3monrfc: The RFC-destination Monitor

The RFC-destination monitor `r3monrfc` is application-server independent and checks RFC destinations in an SAP environment. SAP uses RFC destinations to remotely execute function modules, which reside on other SAP Systems. The alert-collector monitor, `r3monrfc`, references the RFC destinations, which you can display, create, and maintain by means of the SAP R/3 transaction **`/NSM59`**.

Type

The `r3monrfc` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The RFC-destination alert monitor has the following alert type, which uses a snapshot report type:

- "CHECK"

  Defines alert conditions for failed SAP-RFC connections

File Locations

The `r3monrfc` monitor has the files listed in Table 4-45.

Table 4-39 r3monrfc Files

File	Description
`r3moncol(.exe)`	Collector executable for the SAP-RFC monitor
`r3monrfc.cfg`	Configuration file for the SAP-RFC monitor.
`r3monrfc.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monrfc` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monrfc` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring RFC-destination Alert Types

The parameters CONNECTION_TYPE and NAME must be configured for all alert types for `r3monrfc`, the RFC-destination monitor. Note the general rules below on exclude and include parameters for `r3monrfc`.

Parameter Values

The *include* and *exclude* parameter values for an alert-type entry are interpreted in the manner described below. Parameter values in *different* parameters are always compared using 'and': parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using 'or'
- **Exclude**: parameters are compared using 'and'

First the include, then the exclude values are evaluated.

CHECK

CHECK is a snapshot alert type for `r3monrfc`, the SPI for SAP's RFC-destination monitor. Snapshot alert types take a picture of the SAP System at the moment the monitor runs. An alert is generated if the specified Alert Threshold is exceeded for the number of reconnect errors to the target system.

The parameter CHECK must be configured. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-40 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
CONNECTION_TYPE	Type of SAP RFC connection to be monitored. Type 1= App. Server, Type 3= R/3 System, Type M= CMC, Type T =TCP/IP, etc.	= Sign I, E	I
		= Opt: EQ	EQ
		= Low [a]	4
		= High	
NAME	Name you assigned to the SAP-RFC connection as shown in the transaction /NSM59.	= Sign: I, E	I
		= Opt: EQ, CP	EQ
		= Low: <SID>	’ ’
		= High:	

a. The parameter must be specified as a number, otherwise the monitor ends with a dump.

Example 4-26 The Default Check-RFC_DESTINATION Configuration

```
AlertMonFun  =ALL  =ALL  =ALL  =ALL  =RFC_DESTINATION  =1 \
             =WARNING  =RFC_Destinations  =R3_RFC  \
              =CHECK  =CONNECTION_TYPE  =I  =EQ  =3  =
```

In Example 4-26, an event generating an alert occurs whenever the RFC_DESTINATION test fails for any *one* of the type 3 SAP-RFC destinations.

Example 4-27 An Example Check-RFC_DESTINATION Configuration

```
AlertMonFun  =ALL  =ALL  =ALL  =ALL  =RFC_DESTINATION  =1 \
             =WARNING  =RFC_Destinations  =R3_RFC  \
              =CHECK  =NAME  =I  =CP  =OV_C01_099  =
```

In Example 4-27, an event generating an alert occurs whenever RFC_DESTINATION test fails for the single SAP-RFC destination named OV_C01_099.

r3monspl: The SPOOLER Monitor

The SPOOLER alert monitor `r3monspl` is application-server independent and monitors spooler entries for the following conditions:

- The number of spool requests which would generate an alert
- The number of error-generating spool requests that would generate an alert.
- If a specified printer has received erroneous spool requests.

The alert monitor `r3monspl` references output tasks in SAP R/3 transaction **`/SP01`** and report sources in SAP R/3 transaction **`/SE38`**.

Type

The `r3monspl` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The SPOOLER alert monitor has the following alert types:

- "SPOOL_ENTRIES_RANGE"

  This defines the number of spool requests which, if exceeded, would cause an alert.

- "SPOOL_ERROR_RANGE"

  This defines the number of error-generating spool requests which, if exceeded, would cause an alert.

- "PRINT_ERROR_EXISTS"

  This specifies the name(s) of printers for which an alert would be generated if a spool error exists.

File Locations

The `r3monspl` monitor uses the files listed in Table 4-41.

Table 4-41 r3monspl Files

File	Description
`r3moncol(.exe)`	Collector executable for the spooler monitor
`r3monspl.cfg`	Configuration file for the spooler monitor.

Table 4-41 r3monspl Files (Continued)

File	Description
r3monspl.log	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The r3monspl monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command Line Parameters

The r3monspl monitor uses the command line parameters described in Table 4-6 on page 119. The command line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the -cfgfile and -trace parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring SPOOLER Monitor Alert Types

You can configure r3monspl, the SPOOLER monitor, for each of the alert types and then define exceptions for different monitoring conditions. For more detailed information, see the alert-type tables which give the parameters and configuration for each alert type.

SPOOL_ENTRIES_RANGE

An alert is generated if the number of spool entries exceeds the range specified. The configuration of the RANGE parameter is mandatory. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-42 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
RANGE	The number of spool entries outside of which an alert will be generated. Note that, despite its name, this parameter does not need to be specified as a select- option range.	= Sign: I, E	I
		= Opt: EQ, GT, GE, LE, LT, BT	GT
		= Low [a]	50
		= High	

a. This parameter must be specified as a number, otherwise the monitor ends with a dump.

In Example 4-28, an event generating an alert occurs if there are more than 50 spooler entries.

Example 4-28 The Default SPOOL_ENTRIES_RANGE Configuration

```
AlertMonFun  =ALL   =ALL =ALL =ALL =SPOOLER  =1\
=CRITICAL     =Spool   =R3_Spooler \
=SPOOL_ENTRIES_RANGE    =RANGE  =I  =GT  =50   =
```

SPOOL_ERROR_RANGE

An alert is generated if the number of erroneous spool requests exceeds the range specified. The configuration of the RANGE parameter is mandatory. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-43 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
RANGE	The number of erroneous spool requests outside of which an alert will be generated. Note that, despite its name, this parameter does not need to be specified as a select option range.	= Sign: I, E	I
		= Opt: EQ, GT, GE,LE, LT, BT	GT
		= Low [a]	50
		= High	

a. This parameter must be specified as a number, otherwise the monitor ends with a dump.

In Example 4-29, an event generating an alert occurs if there are more than 50 erroneous spool requests.

Example 4-29 The Default SPOOL_ERROR_RANGE Configuration

```
AlertMonFun  =ALL =ALL =ALL =ALL  =SPOOLER  =1\
=CRITICAL =Spool  =R3_Spooler \
=SPOOL_ERROR_RANGE  =RANGE  =I  =GT  =50    =
```

PRINT_ERROR_EXISTS

An alert is generated if a spool error exists for a specified printer. The configuration of the PRINTER parameters is mandatory. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-44 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
PRINTER	The printer(s) which should be checked for spool entries of state error.	= Sign: I, E	I
		= Opt:	CP
		= Low	*
		= High:	

In Example 4-30, an alert is generated when any printer has a spool entry-state error.

Example 4-30 The Default PRINT_ERROR_EXISTS Configuration

```
AlertMonFun  =ALL  =ALL =ALL  =ALL  =SPOOLER  =1\
=WARNING  =Spool  =R3_Spooler \
=PRINT_ERROR_EXISTS =PRINTER   =I  =CP      =*   =
```

r3montra: The TRANSPORT Monitor

The TRANSPORT monitor `r3montra` is application-server independent and is used to check the following parts of the transport system:

- successful and failed exports and imports for the monitored system
- confirmed and unconfirmed repairs in the monitored system.
- connections using a connection test (PING) to the configured systems
- TP-Tests of the configured systems.

The alert monitor `r3montra` references transport routes in SAP R/3 transactions **`/STMS`** and **`/SE01`**.

Type

The `r3montra` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The TRANSPORT alert monitor has the following alert types, which use a mixture of snapshot and time-frame report types:

- "TRANS"

  defines alert conditions for successful and failed transport exports and imports.

- "REPAIR"

  defines alert conditions for confirmed and unconfirmed repairs.

- "RFCONNECT"

  defines alert conditions for the RFC connections between the systems.

- "TPTEST"

  defines alert conditions concerning the TP interface with the database. It includes a connection test (PING), a TP call to the connected database, a check of the TP interface (version, transport directory, TPPARAM path, a file check and a TPLOG check).

File Locations

The `r3montra` monitor has the files listed in Table 4-45.

Table 4-45 r3montra Files

File	Description
`r3moncol(.exe)`	Collector executable for the transport monitor
`r3montra.cfg`	Configuration file for the transport monitor.
`r3montra.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3montra` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3montra` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring TRANSPORT Alert Types

The parameter ALERT_THRESHOLD must be configured for all alert types for `r3montra`, the Transport monitor. All other parameters are optional. Note the general rules below on exclude and include parameters for `r3montra`.

Parameter Values

The *include* and *exclude* parameter values for an alert-type entry are interpreted in the manner described below. Parameter values in *different* parameters are always compared using 'and': parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using 'or'
- **Exclude**: parameters are compared using 'and'

First the include, then the exclude values are evaluated.

TRANS

`TRANS` is a time-frame based alert type for `r3montra`, the SPI for SAP's Transport Monitor. An alert is generated if the specified threshold is exceeded for failed or successful transport imports and exports. Note that the parameter ALERT_THRESHOLD *must* be configured. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-46 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
ALERT_THRESHOLD	Number of allowed transport states above which an alert is generated	= Sign I, E	I
		= Opt: GT, GE, LT, LE	GT
		= Low [a]	4
		= High	

Table 4-46 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
E_SUCCESS	Filtering option to include all *successfully* exported transports	= Sign: I, E	I
		= Opt: EQ	EQ
		= Low [b]	X
		= High:	
E_FAILURE	Filtering option to include all failed *exported* transports	= Sign: I, E	I
		= Opt: EQ	EQ
		= Low [b]	X
		= High:	
I_SUCCESS	Filtering option to include all *successfully* imported transports	= Sign: I, E	I
		= Opt: EQ	EQ
		= Low [b]	X
		= High:	
I_FAILURE	Filtering option to include all *failed* imported transports	= Sign: I, E	I
		= Opt: EQ	EQ
		= Low [b]	X
		= High:	
USERNAME	The login name of the SAP R/3 user [c]	= Sign I, E	I
		= Opt: EQ,CP	EQ
		= Low: <username>	’ ’
		= High	

a. Specify as a number, otherwise the monitor ends with a dump
b. Any entry other than the default is treated as space.
c. Since requests/tasks are user dependent, you can use it to restrict data.

Example 4-31 The Default TRANS Configuration

```
AlertMonFun =ALL =ALL =ALL =ALL =TRANSPORT =1\
=WARNING =Trans =R3_Transport\
=TRANS =I_FAILURE =I =EQ =X =\
=ALERT_THRESHOLD =I =GT =4 =

AlertMonFun =ALL =ALL =ALL =ALL =TRANSPORT =1\
=WARNING =Trans =R3_Transport\
=TRANS =I_SUCCESS =I =EQ =X =\
=ALERT_THRESHOLD =I =GT =4 =

AlertMonFun =ALL =ALL =ALL =ALL =TRANSPORT =1\
=WARNING =Trans =R3_Transport\
=TRANS =E_FAILURE =I =EQ =X =\
=ALERT_THRESHOLD =I =GT =4

AlertMonFun =ALL =ALL =ALL =ALL =TRANSPORT =1\
=WARNING =Trans =R3_Transport\
=TRANS =E_SUCCESS =I =EQ =X =\
= ALERT_THRESHOLD = I = GT = 4 =
```

In Example 4-31, an event generating an alert occurs if users exceed the alert threshold of four (4) for successful or unsuccessful imported or exported transports.

REPAIR

`REPAIR` is a time-frame based alert type for `r3montra`, the SPI for SAP's Transport Monitor. An alert is generated if the specified alert threshold is exceeded for confirmed and/or unconfirmed repairs. Note that the parameter ALERT_THRESHOLD *must* be configured. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-47 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
R_CONFIRM	Filtering option to include all confirmed repairs.	= Sign: I, E	I
		= Opt: EQ	EQ
		= Low [a]	X
		= High	

Table 4-47 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
R_UNCONFIR	Filtering option to include all unconfirmed repairs.	= Sign: I, E	I
		= Opt:	EQ
		= Low [a]	X
		= High	
USERNAME	The login name of the SAP R/3 user [b]	= Sign I, E	I
		= Opt: EQ,CP	EQ
		= Low: <username>	’ ’
		= High	
ALERT_THRESHOLD	Number of allowed repair states above which an alert is generated	= Sign I, E	I
		= Opt: GT, GE, LT, LE	GT
		= Low [c]	4
		= High	

a. Any entry other than the default is treated as space
b. Since requests/tasks are user dependent, you can use it to restrict the data.
c. Specify the parameter as a number or the monitor ends with a dump

RFCONNECT

`RFCONNECT` is a snapshot alert type for `r3montra`, the SPI for SAP’s Transport Monitor. Snapshot alert types take a picture of the System at the moment the monitor runs. An alert is generated if the specified Alert Threshold is exceeded for the number of reconnect errors to the target system.

The parameter ALERT_THRESHOLD must be configured. All other parameters are optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-48 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
ALERT_THRESHOLD	Number of repair states above which an alert is generated	= Sign I, E	I
		= Opt: GT, GE, LT, LE	GT
		= Low [a]	4
		= High	
CHECKSYSTEM	System ID of the systems which have to be tested and/or monitored.	= Sign: I, E	I
		= Opt: EQ, CP	EQ
		= Low: <SID>	’ ’
		= High:	

a. The parameter must be specified as a number, otherwise the monitor ends with a dump.

Example 4-32 The Default RFCONNECT Configuration

```
AlertMonFun =ALL =ALL  =ALL =ALL =TRANSPORT =1\
=WARNING    =RfcConnect  =R3_Transport\
=RFCCONNECT  =CHECKSYSTEM =I =CP =* =\
=ALERT_THRESHOLD  =I =GT =4 =
```

In Example 4-32, an event generating an alert occurs if the alert threshold of four reconnect errors is exceeded for the specified target system.

TPTEST

`TPTEST` is a snapshot alert type for `r3montra`, the SPI for SAP’s Transport Monitor. Snapshot alert types take a picture of the System at the moment the monitor runs. An alert is generated if the specified Alert

Threshold is exceeded for the number of TPTEST errors to the target system. Note that the parameter ALERT_THRESHOLD *must* be configured. All other parameters are optional. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-49 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
ALERT_THRESHOLD	Number of TPTEST errors above which an alert is generated	= Sign I, E	I
		= Opt: GT, GE, LT, LE	GT
		= Low [a]	4
		= High	
CHECKSYSTEM	System ID of the systems which have to be tested and/or monitored.	= Sign: I, E	I
		= Opt: EQ, CP	EQ
		= Low: <SID>	' '
		= High:	

a. The parameter must be specified as a number, otherwise the monitor ends with a dump.

Example 4-33 The Default TPTEST Configuration

```
AlertMonFun  =ALL  =ALL  =ALL =ALL =TRANSPORT =1\
=WARNING    =TpTest      =R3_Transport\
=TPTEST    =CHECKSYSTEM    =I  =EQ =<SID> =\
=ALERT_THRESHOLD=I =GT =4  =
```

In Example 4-33, an event generating an alert occurs if exceed the alert threshold of four TPTEST errors is exceeded for the specified target system.

r3monupd: The UPDATE Monitor

The UPDATE alert monitor identifies and reports the following update conditions:

- the update process is *in*active
- update-process errors

Active updates can be deactivated by the user or by the system. This is a critical problem and the system log **/SM13** must be checked for problems. Update errors discovered are returned as an annotation and a check must be made of the system log.

The alert monitor `r3monupd` references update errors and update status in SAP R/3 transaction **/SM13**.

Type

The `r3monupd` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The UPDATE monitor has the following alert types.

- "UPDATE_ACTIVE"

  This is used to get information about the status of update processes and sends an alert if a process is not active.

- "UPDATE_ERRORS_EXIST"

  This is used to get information on update processes which have errors.

File Locations

The `r3monupd` monitor has the files listed in Table 4-50.

Table 4-50 r3monupd Files

File	Description
`r3moncol(.exe)`	Collector executable for the update monitor
`r3monupd.cfg`	Configuration file for the update monitor.
`r3monupd.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monupd` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monupd` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format: the only difference is that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring UPDATE Monitor Alert Types

No parameters are used to configure alert types for `r3monupd`, the SPI for SAP's UPDATE Monitor. You do not need to edit or customize the configuration file.

UPDATE_ACTIVE

UPDATE_ACTIVE is an alert type for `r3monupd`, the SPI for SAP's Update Monitor. If the UPDATE task is inactive, an alert is generated. The following example illustrates the default configuration for the UPDATE_ACTIVE alert type.

Example 4-34 The Default UPDATE_ACTIVE Configuration

```
AlertMonFun    =ALL =ALL =ALL =ALL =UPDATE   =1\
=CRITICAL    =UpdActive      =R3_Update  =UPDATE_ACTIVE
```

In Example 4-34, an event generating an alert occurs if any update is deactivated.

UPDATE_ERRORS_EXIST

UPDATE_ERRORS_EXIST is an alert type for `r3monupd`, the SPI for SAP's Update Monitor. An alert is generated if any update errors exist. The following example illustrates the default configuration for the UPDATE_ERRORS_EXIST alert type.

Example 4-35 The Default UPDATE_ERRORS_EXIST Configuration

```
AlertMonFun    =ALL =ALL =ALL  =ALL =UPDATE =1\
=CRITICAL  =UpdError  =R3_Update  =UPDATE_ERRORS_EXIST
```

In Example 4-35, an event generating an alert occurs if any update error occurs.

r3monusr: The USER Monitor

The USER alert monitor `r3monusr` identifies and reports the number of logged-in users. The check is performed for each application server. A very high number of users could indicate that performance problems might occur. The alert can then be used to decide whether it is necessary to ask or even force users to log out.

The alert monitor `r3monusr` references the SAP R/3 transaction **`/SM04`**.

Type

The `r3monusr` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The USER monitor has only one alert type:

- "USER_LOGGEDIN_MAX"

  This is used to define the maximum number of logged in users.

File Locations

The `r3monusr` monitor has the files listed in Table 4-51.

Table 4-51 r3monusr Files

File	Description
`r3moncol(.exe)`	Collector executable for the user monitor
`r3monusr.cfg`	Configuration file for the user monitor.
`r3monusr.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monusr` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format, the only difference being that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The r3monusr monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format: the only difference is that the name of the configuration file must vary to match each specific monitor for both the -cfgfile and -trace parameters as indicated in Table 4-6 on page 119.

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

USER_LOGGEDIN_MAX

USER_LOGGEDIN_MAX is an alert type for r3monusr, the SPI for SAP's User Monitor. An alert is generated if the maximum number of users specified is exceeded. The configuration of the parameter MAX is mandatory.

The APSERVER parameter allows you to set the application-server-dependent monitors, r3monwpa, r3monusr, and r3monoms to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction SM51:

```
=APSERVER  =I =CP =<hostname>_<SID>_<Instance_Number>
```

We also recommend that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-36.

Example 4-36 Specifying an Application Server

```
AlertMonFun =<Central_Inst_Hostname> =ALL =ALL =ALL =USER =1 \
=WARNING   =Login  =R3_WP   \
=USER_LOGGEDIN_MAX =MAX   =I  =GT  =30   = \
                   =APSERVER  =I =CP =hpdev01_MP3_00
```

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see

"Alert-collector Monitor Query Conditions" on page 114. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-52 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low	
		= High	
MAX	The number of logged in users before an alert is generated. [a]	= Sign: I, E	I
		= Opt: GT, GE	GT
		= Low	5
		= High:	

a. The parameter value must be specified as a number, otherwise the monitor ends with a dump.

Example 4-37 The Default USER_LOGGEDIN_MAX Configuration

```
AlertMonFun  =ALL =ALL =ALL =ALL =USER =1\
=WARNING    =Login   =R3_User\
=USER_LOGGEDIN_MAX =MAX =I   =GT  =30  =
```

In Example 4-37, an event generating an alert occurs if the number of users logged in exceeds thirty.

r3monwpa: The WORKPROCESS Monitor

The WORKPROCESS alert monitor `r3monwpa` reports the following conditions for each application server:

- checks the number of *running* work processes for each work-process type
- checks the number of *waiting* work processes for each work-process type
- compares the number of *active* work processes with the number of *configured* work processes (of the same work process type) in the profile of the current operation mode.
- checks the status of the work processes, as follows:
  - **D (Debug)**

    No processes run on live systems
  - **P (Private)**

    Processes run using maximum available system resources.
  - **R (No Restart)**

    Failed processes do not restart, which means that dependent jobs also fail.

The alert monitor `r3monwpa` references the SAP R/3 transaction **`/SM50`**.

Type

The `r3monwpa` monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Alert Types

The WORKPROCESS alert monitor has the following alert types.

- "WP_AVAILABLE"

  This defines alert conditions for the number of expected work processes running.
- "WP_IDLE"

  This defines alert conditions for the number of idle work processes waiting.

- "WP_CHECK_CONFIGURED"

  This defines alert conditions for comparing the actual number of running work processes with the number of configured work processes in the profile of the current operation mode. Comparison is only made between two WPs of the same WP type.

- "WP_STATUS"

  This defines alert conditions for WPs in a problematic state, such as DEBUG, PRIVATE or RESTARTNO.

File Locations

The `r3monwpa` monitor has the files listed in Table 4-53.

Table 4-53 r3monwpa Files

File	Description
`r3moncol(.exe)`	Collector executable for the WorkProcess monitor
`r3monwpa.cfg`	Configuration file for the WorkProcess monitor.
`r3monwpa.log`	Trace file for storing trace data.

The alert-collector monitors do not write history information to a specific history file. For more information, see "Alert-collector Monitor History" on page 114.

Environment Variables

The `r3monwpa` monitor uses the environment variables described in Table 4-5 on page 118. The environment variables for all the alert collector monitors share the same format: the only difference is that the name of the configuration file must vary to match each specific monitor as indicated in Table 4-5 on page 118.

Command-Line Parameters

The `r3monwpa` monitor uses the command-line parameters described in Table 4-6 on page 119. The command-line parameters for all the alert collector monitors share the same format, the only differences being that the name of the configuration file must vary to match each specific monitor for both the `-cfgfile` and `-trace` parameters as indicated in Table 4-6 on page 119

Remote Monitoring

For more information about configuring the alert-collector monitors to monitor another SAP System remotely, see "Remote Monitoring with the Alert-collector Monitors" on page 119.

NOTE The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114.

Configuring WORKPROCESS Alert Types

This section helps you to configure Alert Types for `r3monwpa`, the SPI for SAP's Work-process Monitor. Please note the general rules repeated below on using *exclude* and *include* parameter values which are of particular importance for these alert types.

Parameter Values

The *include* and *exclude* parameter values for an alert type entry are interpreted as described below. Parameter values in *different* parameters are always compared using 'and': parameter values in the *same* parameter are compared as follows.

- **Include**: parameters are compared using 'or'
- **Exclude**: parameters are compared using 'and'

First the include values are evaluated; then the exclude values are evaluated, as shown in the Table 4-54.

Table 4-54 AND/OR Comparisons using Include and Exclude Conditions for the Same Parameter

Select Options	AlertType:WP_AVAILABLE Example Configuration of Select Options	Comparison
1	= DIA =I =BT =50 =100 =OPMODE =I =CP =DAY	OR
2	= DIA =I =GT =5 =OPMODE =I =CP =NIGHT	OR
3	= DIA = E =LT =60	AND

WP_AVAILABLE

WP_AVAILABLE is an Alert Type for `r3monwpa`, the SPI for SAP's Work-process Monitor. An alert is generated when the number of running work processes for each, selected work-process type is outside the specified maximum (or minimum) threshold.

The configuration of the parameters listed for the WP_AVAILABLE Alert Type is mandatory. All threshold parameters must be specified as a number otherwise the monitor ends with a dump.

The APSERVER parameter allows you to set the application-server-dependent monitors, `r3monwpa`, `r3monusr`, and `r3monoms` to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction `SM51`:

```
=APSERVER  =I =CP =<hostname>_<SID>_<Instance_Number>
```

We also recommend that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-38.

Example 4-38 Specifying an Application Server

```
AlertMonFun =<Centr_Instance_Hostname> =ALL =ALL =ALL =WP =1 \
=WARNING   =Availability  =R3_WP   \
=WP_AVAILABLE =DIA   =I  =GT  =50   = \
              =APSERVER  =I =CP =hpdev01_MP3_00
```

The remainder of this section describes the specific configuration requirements for this alert monitor. If you are unsure about the general configuration query rules which apply to all alert collector monitors, see

"Alert-collector Monitor Query Conditions" on page 114. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-55 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low <*time in minutes*>	
		= High	
BTC	Threshold for BTC WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low: <number>.	
		= High:	
DIA	Threshold for DIALOG WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low: <number>.	
		= High:	
ENQ	Threshold for ENQ WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low: <number>.	
		= High:	

Table 4-55 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
OPMODE	Defines the operation mode for this parameter [a]	= Sign I, E	I
		= Opt: CP, EQ	EQ
		= Low: <operation_ mode>	*current*
		= High	
SPO	Threshold for SPO WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low: <number>.	
		= High:	
UPD	Threshold for UPD WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High	
UP2	Threshold for UP2 WPs	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High	

a. A critical alert is generated if a non-existent mode is specified.

In Example 4-39, an event generating an alert occurs if the number of available Dialog work processes is less than fifty.

Example 4-39 The Default WP_AVAILABLE Configuration

```
AlertMonFun    =ALL    =ALL   =ALL   =ALL =WP   =1\
=WARNING    =Availability   =R3_WP\
=WP_AVAILABLE     =DIA    =I     =LT   =50    =
```

WP_IDLE

WP_IDLE is an Alert Type for `r3monwpa`, the SPI for SAP's Work-process Monitor. An alert is generated when the number of waiting work processes for each, selected work-process type is outside of the specified max (or min) threshold.

The configuration of the parameters for the WP_IDLE Alert Type is mandatory. All threshold parameters must be specified as a number otherwise the monitor ends with a dump.

The APSERVER parameter allows you to set the application-server-dependent monitors, `r3monwpa`, `r3monusr`, and `r3monoms` to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction `SM51`:

```
=APSERVER   =I =CP =<hostname>_<SID>_<Instance_Number>
```

We also recommend that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-40.

Example 4-40 Specifying an Application Server

```
AlertMonFun =<Centr_Instance_Hostname> =ALL =ALL =ALL =WP =1 \
=WARNING    =Idle   =R3_WP    \
=WP_IDLE    =BTC    =I   =GT   =20    = \
           =APSERVER   =I =CP =hpdev01_MP3_00
```

If you are unsure about the general configuration query rules which apply to all alert collector monitors, see “Alert-collector Monitor Query Conditions” on page 114. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-56 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low	
		= High	
BTC	Threshold for BTC work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High	
DIA	Threshold for DIALOG work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High:	
ENQ	Threshold for ENQ work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low	
		= High	

Table 4-56 Configuration Parameters (Continued)

Parameter Name	Description	Query Conditions	Default Value
OPMODE	Defines the operation mode for this parameter.[a]	= Sign I, E	I
		= Opt: CP, EQ	EQ
		= Low: <operation mode>	<current>
		= High	
SPO	Threshold for SPO work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High	
UPD	Threshold for UPD work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low <number>	
		= High	
UP2	Threshold for UP2 work processes	= Sign: I, E	
		= Opt: GT, GE, LT, LE	
		= Low<number>	
		= High	

a. If a non-existent mode is specified, a critical alert is generated.

In Example 4-41, an event generating an alert occurs if the number of idle Dialog work processes is less than ten.

Example 4-41 The Default WP_IDLE Configuration

```
AlertMonFun   =ALL =ALL =ALL  =ALL =WP =1\
=WARNING   =Idle  =R3_WP\
=WP_IDLE  =DIA =I  =LT =10 =
```

WP_CHECK_CONFIGURED

WP_CHECK_CONFIGURED is an Alert Type for `r3monwpa`, the SPI for SAP's Work-process Monitor. The WP_CHECK_CONFIGURED Alert Type makes a comparison between the actual number of running work processes and the number of configured work processes in the profile of the current operation mode. Note that comparison is only made between two WPs of the same type (DIA, BTC etc.).

The APSERVER parameter allows you to set the application-server-dependent monitors, `r3monwpa`, `r3monusr`, and `r3monoms` to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction `SM51`:

```
=APSERVER  =I =CP =<hostname>_<SID>_<Instance_Number>
```

We also recommend that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-42.

Example 4-42 Specifying an Application Server

```
AlertMonFun =<Centr_Instance_Hostname> =ALL =ALL =ALL =WP =1 \
=WARNING   =Check  =R3_WP   \
=WP_CHECK_CONFIGURED \
               =APSERVER  =I =CP =hpdev01_MP3_00
```

If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-57 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low	
		= High	

In Example 4-43, an alert is generated when the number of running work processes does not match the number of configured work processes for a given workprocess type.

Example 4-43 Default WP_CHECK_CONFIGURED Configuration

```
AlertMonFun =ALL   =ALL =ALL =ALL =WP =1\
=WARNING  =Check  =R3_WP\
=WP_CHECK_CONFIGURED  \
               =APSERVER  =I =CP =ALL
```

WP_STATUS

WP_STATUS is an Alert Type for `r3monwpa`, the SPI for SAP's Work-process Monitor. An alert is generated when the comparison between the number of running work processes and the number of configured work processes does not match the conditions defined in the parameters below. The configuration of the parameter below is optional.

The APSERVER parameter allows you to set the application-server-dependent monitors, `r3monwpa`, `r3monusr`, and `r3monoms` to monitor a specific application server. You need to configure APSERVER in the following manner, where *<hostname>* is the name of the application server to be monitored as it appears in the list of application servers displayed in transaction `SM51`:

```
=APSERVER  =I =CP =<hostname>_<SID>_<Instance_Number>
```

We also recommend that you explicitly define the host name of the SAP R/3 Central Instance whose application server(s) you want to specify with APSERVER, as illustrated in the Example 4-44.

Example 4-44 Specifying an Application Server

```
AlertMonFun =<Centr_Instance_Hostname> =ALL =ALL =ALL =WP =1 \
=WARNING   =WP_Status  =R3_WP   \
=WP_STATUS =STATUS   =I  =GT  =30   = \
           =APSERVER  =I =CP =hpdev01_MP3_00
```

If you are unsure about the general configuration query rules which apply to all alert collector monitors, see "Alert-collector Monitor Query Conditions" on page 114. For more information about the meaning of the Query Conditions in the alert-collector monitor configuration files, see Table 4-3 on page 115.

Table 4-58 Configuration Parameters

Parameter Name	Description	Query Conditions	Default Value
APSERVER	specifies an application server to be monitored	= Sign: I, E	
		= Opt: CP	
		= Low	
		= High	
STATUS [a]	The status which is monitored.	= Sign: I, E	
		= Opt:	
		= Low D =Debug, P = Private, R= Restart no alert.	
		= High	

a. Possible additional values; MAX_ENTRIES

In Example 4-45, an event generating an alert occurs if the status of a running workprocess is *critical*. Example 4-45 also shows how you can use =MAX_ENTRIES to define the number of work processes with a defined status that have to exist before the SPI for SAP generates a message.

Example 4-45 The Default WP_STATUS Configuration

```
AlertMonFun     =ALL =ALL =ALL  =ALL =WP    =1\
                =CRITICAL    =WP_Status  =R3_WP\
                =WP_STATUS      =STATUS =I  =CP  =*    =
# New feature in SPI for SAP Version 8.0
```

Monitoring the TEMSE file

To save runtime costs, the consistency of SAP's Temporary Sequential file (TEMSE) is monitored not by means of one of the SPI for SAP alert monitors, but rather by means of a report you set up in SAP. However, you still need to assign the SPI for SAP `r3monaco` monitor to the managed nodes.

Type

The TEMSE monitor is of type *snapshot*. One monitor run gathers only one value set. For more information, see "Report Types for the Alert-collector Monitors" on page 111.

Report Description

The TEMSE report references the SAP R/3 transaction **`/SP12`**. Any inconsistency found in the TEMSE database is serious, and the cause of the inconsistency, for example a disk failure, must be corrected using the system log in **`/SP12`**.

Running the TemSe Monitor

To run the TemSe monitor, you need to set up a job in SAP R/3 with the report named `ZHPSPIT1`, as follows:

1. Login to SAP R/3
2. Set up a job using the following transaction: **`/sm36`**
3. Specify:
   - the date on which the report should start
   - the frequency with which the report should run

5 Understanding Message Flow

This section describes how to use OVO functionality and CCMS to control the flow of messages between SAP R/3 and OVO.

In this Section

The information in this section describes how to control message flow between SAP R/3 and OVO and includes the following topics:

- "OVO Message Customization" on page 217

  Customizing OVO message template conditions.

- "Customizing CCMS Message Flow by Central OVO Configuration" on page 220

  Changing the conditions for alert generation in the SAP R/3 CCMS alert monitor.

- "Customizing CCMS Message Flow in SAP R/3" on page 229

  Using SAP R/3 features to control whether or not CCMS alert monitors generate specific messages.

- "SAP Solution-Manager Integration" on page 236

  Use the `r3ovo2ccms` command to write OVO messages directly into the CCMS tree, where they can be viewed and used by the SAP Solution Manager in the same way as any other SAP message alert. You can also use `r3monal` to forward messages from directly from CCMS to OVO.

NOTE

The methods for setting thresholds in the CCMS monitor do not apply if you are using the new CCMS monitoring architecture, where thresholds can be set globally within SAP R/3.

For details on the procedures outlined in these sections, refer to your SAP R/3 documentation and to the manuals supplied with OVO.

OVO Message Customization

With the aid of standard OVO functionality, you can:

- **Set up message filters**

  use the View Message Browser to set up views that show you only messages which fit specified criteria, for example, only critical messages. For more information, see "Setting Up the Message Views" on page 217.

- **Change severity levels**

  change the severity level of messages. For more information, see "Changing the Message Severity" on page 219.

- **Suppress messages**

  suppress specific messages by setting a suppress condition in the `opcmsg` template. For more information, see *HP OpenView Smart Plug-in for SAP Installation Guide*.

NOTE

The SPI for SAP provides its own `opcmsg` template in addition to the standard `opcmsg` template. In order to avoid message duplication, you need to suppress *all* messages from the SAP application in the standard `opcmsg` template. For more information, see the *HP OpenView Smart Plug-in for SAP Installation Guide*.

Setting Up the Message Views

The `View Message Browser` window is your own customized presentation of a selection of the messages displayed in your `Message Browser` window. The `Message Browser` window displays every message belonging to the managed nodes and Message Groups assigned to you: the `View Message Browser` window displays only the messages you actually want to see.

In this way, you can configure the view so that only the most important messages are displayed and, as a consequence, concentrate on messages needing immediate attention.

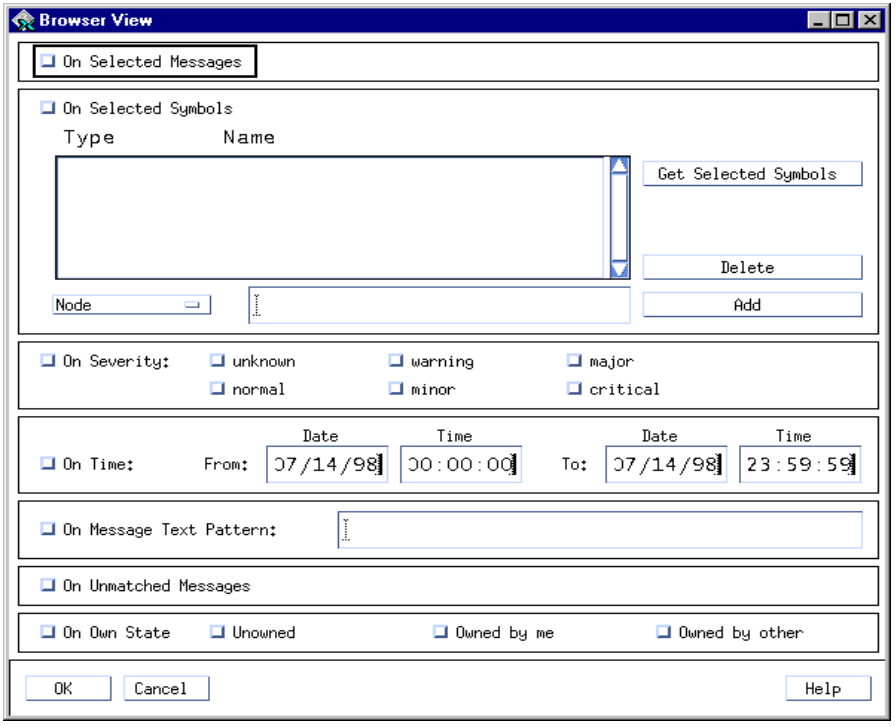
Use the Browser View window to specify which messages are displayed in the View Message Browser. You can set up simple or complex views, select specific messages to be displayed, or define a filter to display only a subset of the incoming messages. For example, if you want to display messages with a severity level of critical, you can specify that messages of all other severity levels are not displayed.

To view all messages belonging to a node and a particular group, first use the View Message Browser to view all of the messages on the specified node. Then use the View Message Browser again to narrow the view down to only the messages from the specified group.

To define your customized message-browser view:

1. On the menu bar at the top of the Message Browser window, click View to display the View pull-down menu.
2. From the View pull-down menu, select Some to display the Browser View window.

Figure 5-1 Browser View Window



3. Define the filtering patterns to be used.

   For example, if you click the `Critical` button, all messages other than those marked `Critical` are not displayed in the `Message Browser` window.

4. Click `[OK]` to implement your filtering pattern(s).

NOTE

If a critical event occurs on one of your managed nodes after you have defined a new Message Browser view, the `Message Groups` window is immediately moved into the foreground.

Changing the Message Severity

To change the severity of specific SAP R/3-generated messages in the Message Browser:

1. Log on to OVO as user `opc_adm`.
2. Select the following menu items from the menu bar of the `Node Bank` window:

   `Actions > Configure Messages > Logfiles, Console, Trap...`

3. OVO displays a list of message-source templates. From this list, select `SAP R/3 opcmsg`.
4. Display the message conditions window to change the severity level of a specific message. See your OVO documentation for details.
5. Distribute the changed message configuration to the applicable SAP nodes. See your OVO documentation for details.

Customizing CCMS Message Flow by Central OVO Configuration

NOTE The information in this section applies only to SAP R/3 3.1x. Do not use this method of threshold setting if you are using CCMS version 4.x and later.

To configure the SAP CCMS thresholds:

1. From the `Application Bank` window, open the `SAP R/3 Admin` group.
2. Click `Config SAP Thresholds` to display the `r3itothr.cfg` configuration file. This file enables you to set:
   - "Thresholds for Performance Alerts" on page 221
   - "Thresholds for Syslog Alerts" on page 222
   - "Thresholds for Buffer Alerts" on page 224
   - "Thresholds for Other Alerts" on page 225
   - "Thresholds for Oracle Databases" on page 225
   - "Thresholds for Informix Databases" on page 227

NOTE Network thresholds and operating system thresholds are not supported by the SPI for SAP.com.

3. Set the thresholds as required for your environment.
4. To apply these thresholds on a specific SAP R/3 system:
   a. Select the node in the `Node Bank` window
   b. Start the `Write SAP threshold` action

Thresholds for Performance Alerts

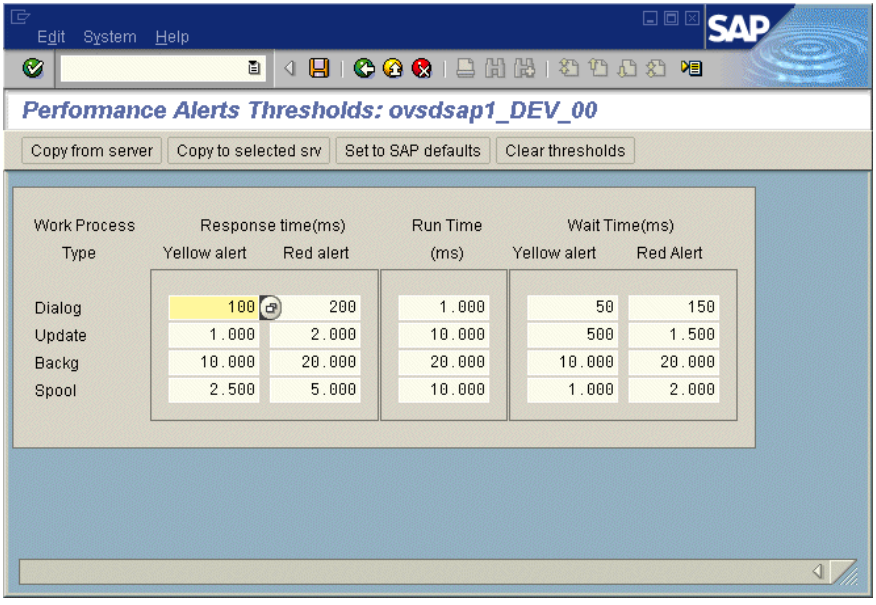
You can set thresholds for performance alerts in the following section of the `r3itothr.cfg` file:

```
#=============================================================================
# Performance Alert Thresholds
#=============================================================================
#                    SAP      Resp[ms]   Resp[ms]   RunTime    Wait[ms]    Wait[ms]
#                  Server     Yellow     Red        [ms]       Yellow      Red
AlertThrPerfDia    =ALL       =1000      =2000      =10000     =500        =1500
AlertThrPerfUpd    =ALL       =1000      =2000      =10000     =500        =1500
AlertThrPerfBtc    =ALL       =10000     =20000     =20000     =10000      =20000
AlertThrPerfSpo    =ALL       =2500      =5000      =10000     =1000       =2000

#=============================================================================
```

In CCMS, the sample settings of the configuration file section shown above would result in the settings shown in Figure 5-2.

Figure 5-2 **Performance Alert Threshold for a Specific Server**



Thresholds for Syslog Alerts

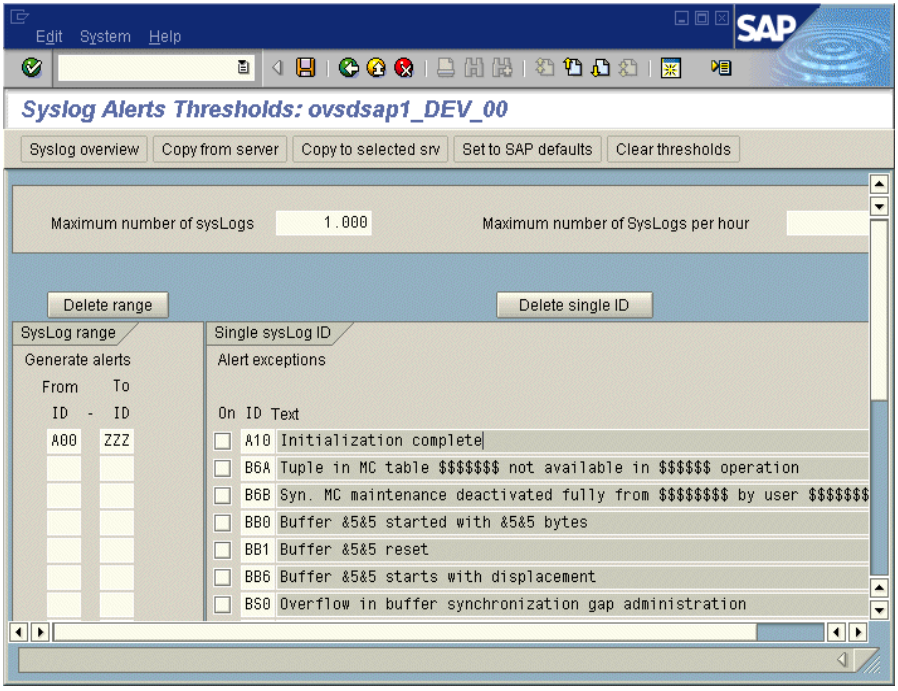
You can set the frequency for syslog alerts in the following section of the `r3itothr.cfg` file:

```
#============================================================================
# Syslog Alert Thresholds
#============================================================================

#
# Frequency           SAP         Max number    Max number
#                    Server       of syslogs    of syslogs per hour
AlertThrSlogFreq     =ALL           =1000       =100
============================================================================
```

In CCMS, the sample settings of the configuration file section shown above would result in the SAP settings shown in Figure 5-3.

Figure 5-3 **Syslog Alert Frequency Threshold for a Specific Server**



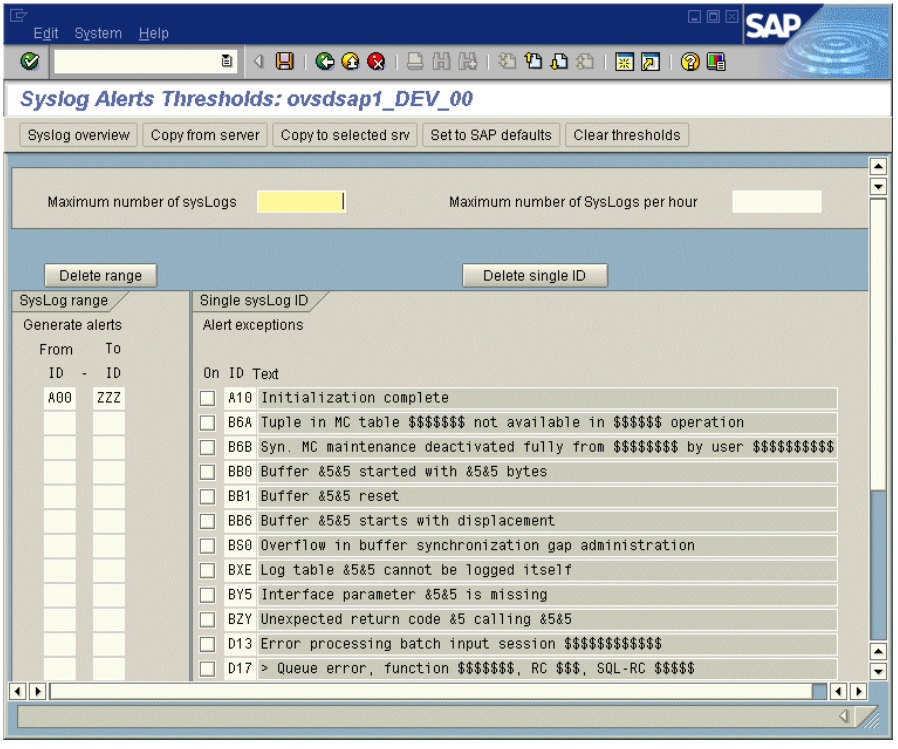
Ranges for Syslog Alerts

You can set ranges for syslog alerts in the following section of the `r3itothr.cfg` file:

```
#=============================================================================
# Delete Ranges       SAP          From          To          Mode
#                       Server         Syslog ID      Syslog ID    Add/Del
AlertThrSlogRange       =ALL           =A00           =ZZZ         =ADD
#=============================================================================
# Single ID             SAP             Syslog ID      Mode
#                       Server                         Add/Del
AlertThrSlogId          =ALL            =A00           =ADD
=============================================================================
```

In CCMS, the sample settings of the configuration file section shown above would result in the SAP settings shown in Figure 5-4.

Figure 5-4 Syslog Alert Threshold Ranges for a Specific Server



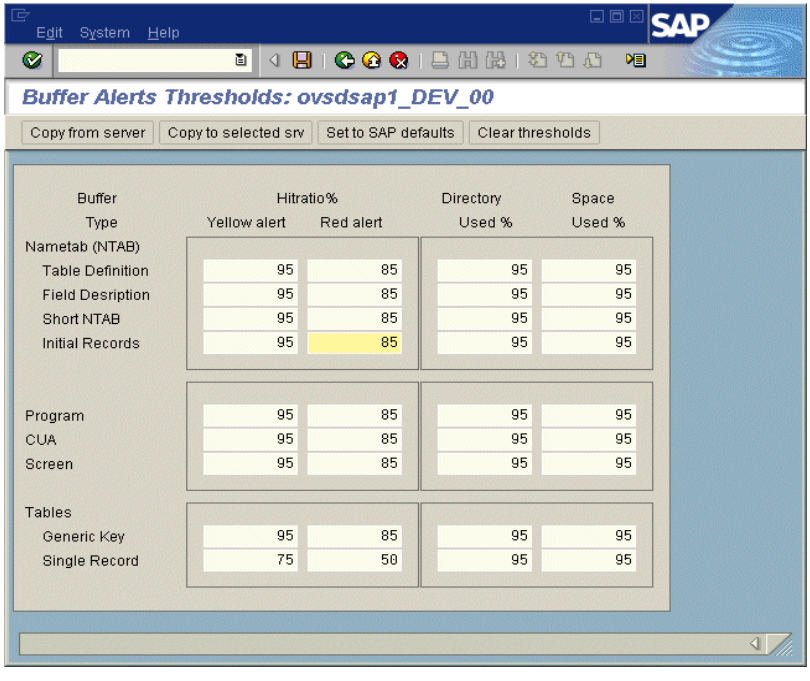
Thresholds for Buffer Alerts

You can set thresholds for buffer alerts in the following section of the `r3itothr.cfg` file:

```
#=========================================================================
# Buffers Alert Thresholds
#=========================================================================
#                      SAP          Hitratio% Hitratio% Directory Space
#                     Server        Yellow    Red       Used %    Used %
AlertThrBufNTABTable =ALL          =95       =85       =95       =95
AlertThrBufNTABField =ALL          =95       =85       =95       =95
AlertThrBufNTABShort =ALL          =95       =85       =95       =95
AlertThrBufNTABInit  =ALL          =95       =85       =95       =95
AlertThrBufProgram   =ALL          =95       =85       =95       =95
AlertThrBufCUA       =ALL          =95       =85       =95       =95
AlertThrBufScreen    =ALL          =95       =85       =95       =95
AlertThrBufTablesGen =ALL          =95       =85       =95       =95
```

In CCMS, the sample settings of the configuration file section shown above would result in the SAP settings shown in Figure 5-5.

Figure 5-5 Buffer Alert Threshold for a Specific Server



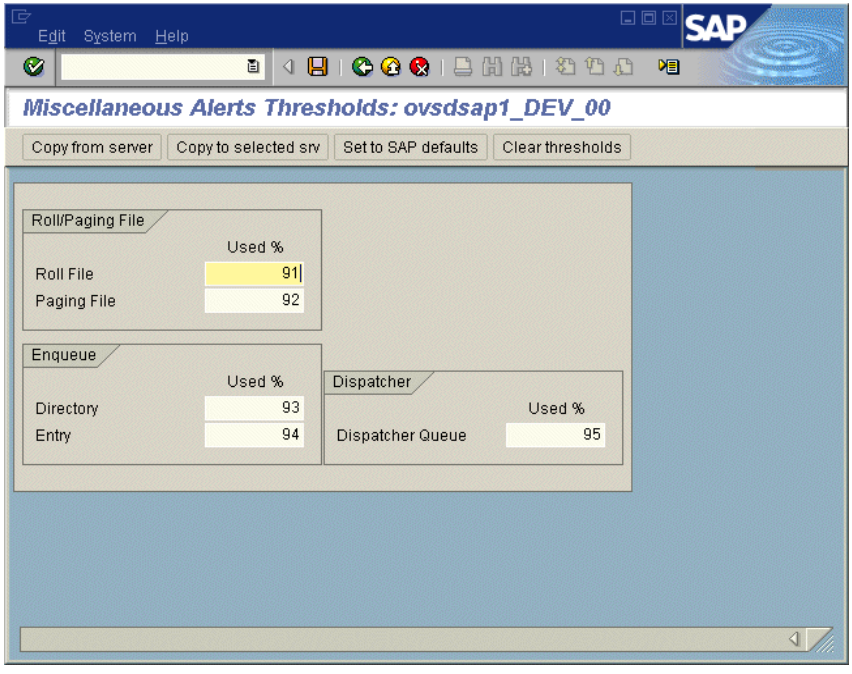
Thresholds for Other Alerts

You can set thresholds for other alerts in the following section of the `r3itothr.cfg` file:

```
#===========================================================================
# Others Alert Thresholds
#===========================================================================
#                  SAP       Rollfile  Pagefile  EnqDir  EnqEntry DispQueue
#                  Server    Used %    Used %    Used %  Used %   Used %
AlertThrOthers     =ALL      =91       =92       =93     =94      =95
===========================================================================
```

In CCMS, the sample settings of the configuration file section shown above would result in the SAP settings shown in Figure 5-6.

Figure 5-6 Other Alert Threshold for a Specific Server



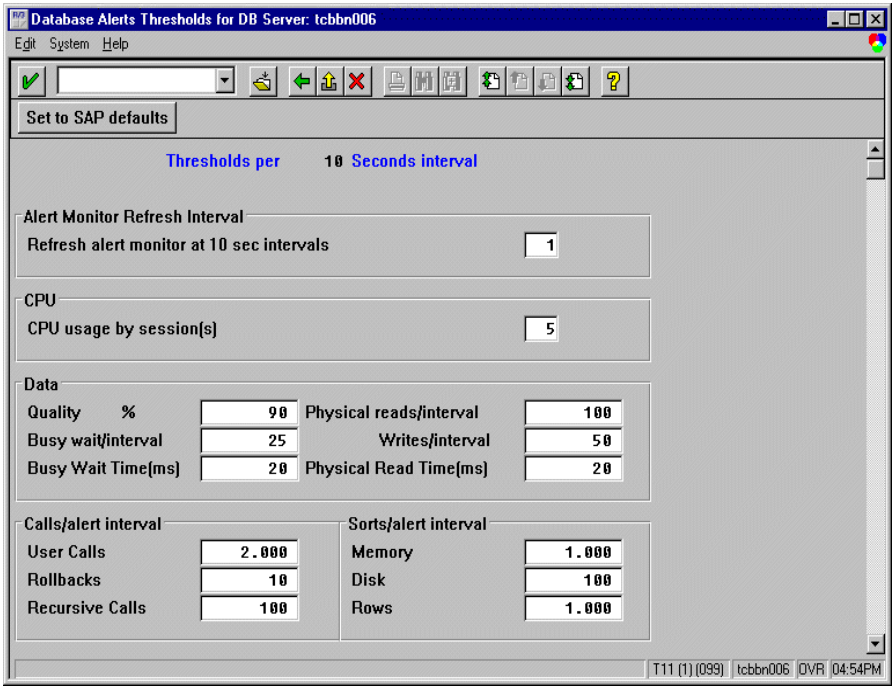
Thresholds for Oracle Databases

You can set thresholds for Oracle database alerts in the following section of the `r3itothr.cfg` file:

```
#===============================================================================
# ORACLE Database Alert Thresholds
#===============================================================================
# General          SAP              SAP Database
#                 Server            Server
AlertThrOraDB     =hpbbcpo5_LPO_00  =hpbbcpo5
#-
# General          SAP              Alert Monitor         CPU Usage
#                 Server            Interval [10secs]     by session
AlertThrOraGen    =hpbbcpo5_LPO_00  =1                    =5
#-
# Data            SAP            Quality  Busy   Busy    Physical Phys.  Phys.Read
#                Server             %     Wait   Wait[ms] Reads    Writes Time[ms]
AlertThrOraData   =hpbbcpo5_LPO_00  =80     =350   =350     =350     =350   =350
#-
# Calls            SAP              User     User       Recursive
#                 Server            Calls    Rollbacks  Calls
AlertThrOraCall   =hpbbcpo5_LPO_00  =350     =350       =350
#-
# Calls            SAP              Long     Rows
#                 Server            Tables   Gotten
AlertThrOraScan   =hpbbcpo5_LPO_00  =350     =350
#-
# Sorts           SAP               Sort     Sort    Sort
#                 Server            Memory   Disk    Rows
AlertThrOraSort   =hpbbcpo5_LPO_00  =1000    =100    =1000
#-
# Calls            SAP              Remaining  Using     Backup Age    Auto log
#                 Server            Space[kb]  BrBackup  allowd[days]  save [kb]
AlertThrOraArch   =hpbbcpo5_LPO_00  =350       =1        =10           =5000
================================================================================
```

In CCMS, the sample settings of the configuration file section shown above would result in the SAP settings shown in Figure 5-7.

Figure 5-7 **Alerts for an Oracle Database**



Thresholds for Informix Databases

You can set thresholds for Informix database alerts in the following section of the `r3itothr.cfg` file:

```
#*******************************************************************************
# INFORMIX Database Alert Thresholds
#*******************************************************************************
# DB                SAP               SAP Database
#                  Server             Server
AlertThrInfDB     =hpbbcpo5_LPO_00   =hpbbcpo5
#-
# Data              SAP              AlertMon   Read        Reads    Write       Writes
#                  Server            Interval   Quality[%]           Quality[%]
AlertThrInfData   =hpbbcpo5_LPO_00 =0        =95         =1000    =85         =2000
#-
# Calls             SAP              Disk     Seq.    Roll-   Long       Locks[%]   Locks[%]
#                  Server            Reads    Scans   backs   Waits[ms]  Yellow     Red
AlertThrInfActiv  =hpbbcpo5_LPO_00 =350     =350    =10     =1000      =50        =60
#-
```

```
# Calls            SAP             Locked[s]  Locked[s]  Lockwait[s]  Lockwait[s]
================================================================================
```

Customizing CCMS Message Flow in SAP R/3

SAP R/3 CCMS provides a range of features enabling you to allow or prevent the inclusion of specific messages in its alert monitor. This section includes information about the following topics:

- "Disabling Messages" on page 229
- "Setting Thresholds for SAP R/3 CCMS Alert Monitor Messages" on page 231
- "Setting Up Messages for Inclusion in the SAP R/3 System Log File" on page 232
- "Obtaining a Message ID from the SAP R/3 Syslog File" on page 233
- "Configuring the System Log Filter for Alert Generation" on page 233

Disabling Messages

To disable messages in SAP R/3:

1. Select the following items from the SAP R/3 menu bar:

   ```
   Tools > Administration > Computing Center >
   Management System > Control > Control Panel
   ```

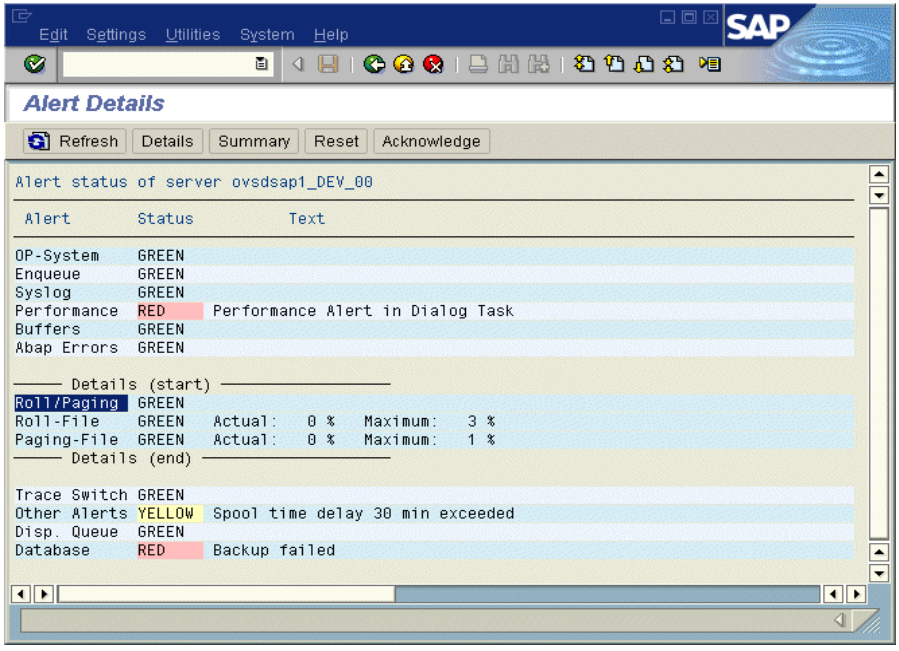
NOTE Alternatively, you can enter the following transaction code into the SAP R/3 command field: `/nrz03`

2. Select your SAP R/3 instance.
3. Select the following menu items from the SAP R/3 menu bar:

   ```
   Monitoring > Alert-Details
   ```

4. Click `Roll/Paging` in the `Type` column.

Figure 5-8 Alert State window



5. Proceed as follows to disable, for example, Roll/Paging alerts:
   a. Click `Roll/Paging`
   b. From the R/3 menu bar, select the following menu items:

      `Settings > Disable`

      The selected item and the suppressed message type are now marked disabled in the Message Browser window..
6. Return to the `CCMS Control Station` window and save your settings.
7. Check the OVO `Message Browser`. You should not receive any more Roll/Paging messages.

NOTE Since disabling messages will result in inconsistencies with the settings previously defined in the SPI for SAP configuration file, you must only perform this operation if you do *not* want to have a central configuration.

Setting Thresholds for SAP R/3 CCMS Alert Monitor Messages

To set thresholds for SAP R/3 CCMS alert monitor messages:

1. Select the following items from the SAP R/3 menu bar:

   `Tools > Administration > Computing Center > Management System > Control > Control Panel`

2. Select the SAP R/3 instance (under `Server name`) for which you want to define a performance limit value.
3. Click `Alert details`
4. From the SAP R/3 menu bar, select the following menu items:

   `Settings > Threshold values`

   The Alert Thresholds window is displayed.

5. Click `Performance` to display the Performance Alerts Thresholds window
6. Edit the time threshold values as appropriate
7. To save your new thresholds, select the following items from the SAP R/3 menu bar:

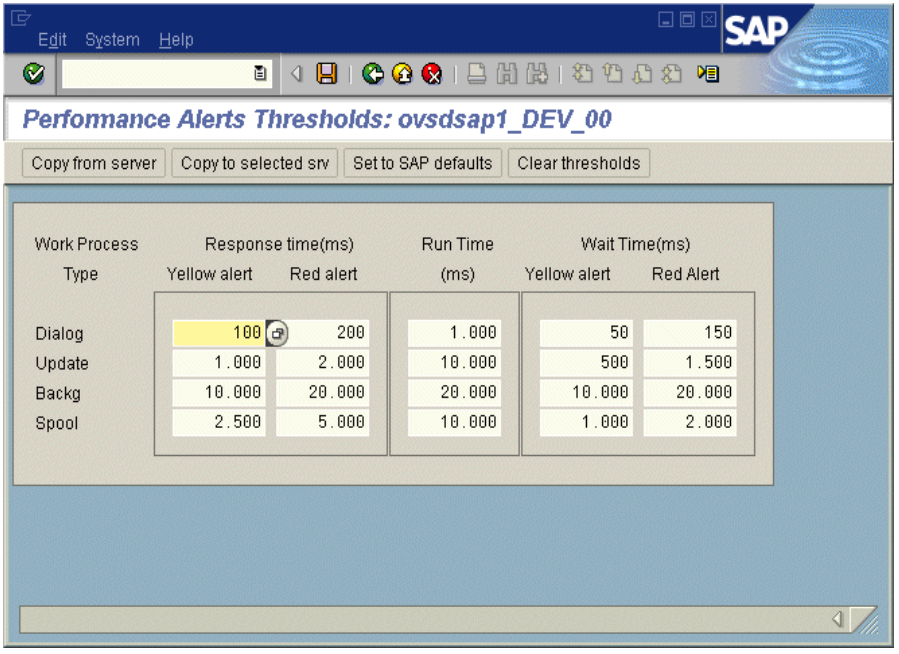
   `Edit > Save`

   When the limit you just defined is reached, you will receive a warning or a critical `Dialog performance` message (similar to Figure 5-9).

NOTE This example assumes that you want to set a specific performance limit that will trigger a related dialog-performance message.

To initialize your SAP R/3 CCMS before you have empirical data for thresholds, it may be a good idea to apply the SAP defaults by clicking `Set to SAP defaults` in the `Alert Thresholds` window.

Figure 5-9 **Performance Alert Thresholds**



Setting Up Messages for Inclusion in the SAP R/3 System Log File

Any messages recorded in the SAP R/3 system log file can be defined to trigger an alert in CCMS. This alert can be picked up by the R/3 collector from the shared-memory segment and used to display an associated message in the OVO Message Browser with instructions for any appropriate actions, which are required.

To set up messages for inclusion in the SAP R/3 system log file, perform each of the following procedures in sequence:

- "Obtaining a Message ID from the SAP R/3 Syslog File" on page 233

- "Configuring the System Log Filter for Alert Generation" on page 233

Obtaining a Message ID from the SAP R/3 Syslog File

To obtain the message ID of a critical message:

1. Select the following menu items from the SAP R/3 menu bar to read the system log file:

   `Tools > Administration > Monitoring > System Log`

NOTE

Alternatively, you can enter the following transaction code into the SAP R/3 command field: `/nsm21`

   SAP R/3 displays the Local Analysis window.

   It may be a good idea to select appropriate time restrictions in order to limit the contents of the `syslog` file to the currently relevant entries.

2. Click `Refresh SysLog` to display the system log file of your SAP R/3 system.
3. Double-click the message that you want to use to hi trigger an alert. The system displays a `Message Details` window.
4. Look for and make note of the message ID.

   To display the ID numbers of all SAP R/3 syslog messages, enter the transaction code `/nse92` into the SAP R/3 command field and click `List all numbers`.

Configuring the System Log Filter for Alert Generation

1. Select the following menu items from the SAP R/3 menu bar:

   `Tools > Administration > Computing Center > Management System > Control > Control panel`

   The system displays the CCMS control station panel.

2. Select your SAP R/3 instance.

3. Click `Alert details`.
4. Select the following menu items from the SAP R/3 menu bar:

   `Settings > Threshold values`

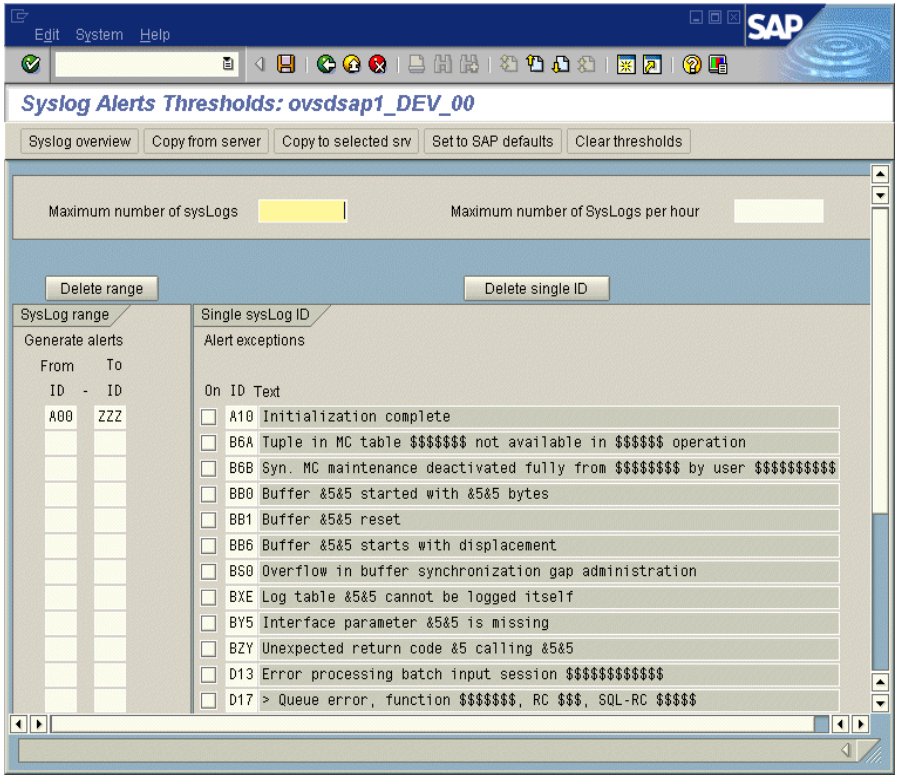
5. Click `Syslog`. The SAP system displays the `Syslog Alert Thresholds` window.

   In the `Syslog Alerts` window shown, you can see that all messages—ranging from A00 through ZZZ—are *enabled*. This implies that these messages are able to generate an alert if they occur in the Syslog. All `Single Syslog ID` messages (shown on the right) are *disabled*. If you want to enable any of these currently disabled messages, simply click `[OK]` to the left of the message ID field (for instance, BB1).

6. To save your new settings, select the following items from the SAP R/3 menu bar:

   `Edit > Save`

Figure 5-10 **Syslog Alert Thresholds**



SAP Solution-Manager Integration

The information in this section explains how the you can set up the SPI for SAP's to enable bi-directional communication between the SAP Solution Manager and OVO. With the SPI for SAP's Solution-Manager integration, you can configure the SPI for SAP to inform OVO when a Solution Manager business process fails: you can also set up the SPI for SAP in such a way as to enable it to populate the CCMS tree with OpenView managed objects, for example; by means of an automatic or operator-initiated action attached to a message condition in a template. The information in this section is split into the following topics:

- "Pre-requisites" on page 236
- "Integration Overview" on page 237
- "Sending Messages from SAP to OVO" on page 238
- "Sending Messages from OVO to SAP" on page 239
- "The r3ovo2ccms Command" on page 243

Pre-requisites

If you want to take advantage of the SPI for SAP's Solution-manager integration, please note that the target system, that is; the SAP server to which the SPI for SAP writes the CCMS alerts, must meet the following pre-requisites:

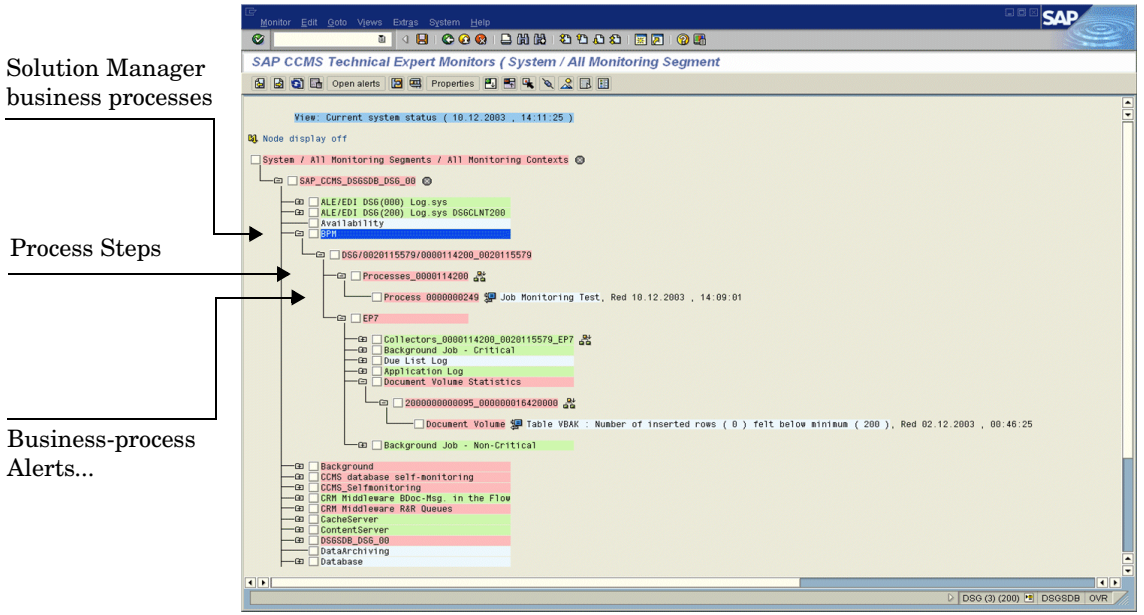
- Satellite Systems that are monitored by the Solution Manager must have SAP Version 4.6 or higher
- The BC-XMW interface is supported for Releases 6.10 and 6.20 of the SAP_BASIS package.
  - — Release 6.20: support package 29 is required for full support of the BC-XMW interface. According to SAP, earlier SP levels will work, but the XMW interface designation will not be recognized. SAP recommends using the XAL interface instead.
  - — For Release 6.10, support package 38 is required for full support of the interface. According to SAP, earlier support package levels will work, but the XMW interface designation will not be recognized. SAP recommends using the XAL interface instead.

- Have a look at SAP notes 645353 and 608384, too.

Integration Overview

The SPI for SAP's Solution-manager integration uses the CCMS XMW and XAL interfaces to improve communication between SAP and OVO. Using the CCMS interfaces, the SPI for SAP ensures that the power of both SAP and OVO can be used to enhance and improve the information available to system administrators in both areas.

Figure 5-11 **Choosing CCMS Alerts to Monitor**



For example, you can now configure the SPI for SAP to write directly to CCMS and populate the CCMS tree with messages and alerts, which are discovered by OVO and relate to problems not normally of particular interest to SAP, such as hardware and network performance. Conversely, Figure 5-11 on page 237 shows how you can use the Solution-manager integration to monitor specific CCMS alerts and, by linking the generated OVO messages to a defined service ID, watch the impact on specific services. In this way, you can not only ensure that OVO knows as soon as a Solution-manager business process fails but also that the

status of the service associated with the business process you are monitoring is immediately reflected in the service map in the OpenView Navigator.

To summarize how the SPI for SAP's Solution-manager integration enhances communication in both directions between SAP and OVO:

- **SAP -> OVO**

  By defining message conditions for `r3monal`, the SPI for SAP's CCMS Alert Monitor, you can keep an eye on specific CCMS alerts, for example; the alerts you have assigned to Business Processes. For more information about setting up `r3monal`, the CCMS Alert Monitor, see "Sending Messages from SAP to OVO" on page 238.

- **OVO -> SAP**

  You can attach an action to an OVO message condition, which calls the `r3ovo2ccms` command and uses it to populate the CCMS tree with messages and objects monitored by OVO. For more information about using the `r3ovo2ccms` command, see "The r3ovo2ccms Command" on page 243.

Sending Messages from SAP to OVO

By defining message conditions for `r3monal`, the SPI for SAP's CCMS Alert Monitor, you can keep an eye on specific alerts in the CCMS tree. When the message condition for the specified CCMS alert matches, you can associate the OVOmessage that is generated with a known Service ID and, in this way, link the message directly to a service in the OVO service tree. For more information about setting up `r3monal`, the CCMS Alert Monitor, see "r3monal: Introducing the CCMS 4.x Alert Monitor" on page 60.

To set up communication between the SAP Solution Manager and OVO

1. In SAP, open up the CCMS alert tree for the Solution-manager business process which you want to monitor.
2. Expand the CCMS alert tree and browse to the alerts associated with individual steps in the selected business process.

NOTE If CCMS alerts are not already assigned to individual steps in the business process you want to monitor, you will have to use SAP to locate the CCMS monitor which generates the alerts you require (transaction RZ20) and then assign the alert(s) to the business-process step.

3. Assign the desired CCMS alert(s) to the step in the business process, which you want to link to service objects in OVO.
4. Set up a message condition for the SPI for SAP's CCMS alert monitor, `r3monal`: the message condition should monitor the alerts you have assigned to the individual steps in the Solution-manager business-process. If you want to link the OVO messages to services in OVO, you will need to assign a service ID at this point, too. The service ID must match the service name defined in the service-configuration file and take the following form:

   `SAP_SPI:<SID>:<service_instance_name>`
5. Remember to (re)distribute the `r3monal` template with the new (or modified) conditions.

Sending Messages from OVO to SAP

The first and most important thing you need to do is to inform OVO which of the incoming OVO messages it should forward to SAP and write into the CCMS tree. The message-forwarding task is triggered by means of an action attached to the condition in the SPI for SAP template, which generates the original message. The action you configure can be either automatic or operator-initiated. For more information about the command you use and the parameters and options that are allowed, see"The r3ovo2ccms Command" on page 243.

To set up an automatic action in an OVO template, follow the instructions below. Note that the names and titles of the windows can sometimes vary according to the type of template you select. The example described here uses a performance-threshold policy.

1. Open the `Message-source Templates` window, using the following menu option:

   `Window > Message Source Templates`

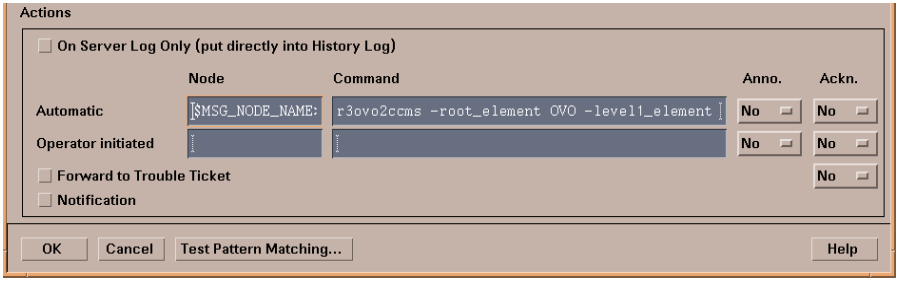
2. Locate and double click the template which generates the OVO message you want to forward to SAP and write into the CCMS tree. For example, you might choose a message from a performance monitor, which is configured to monitor CPU load on the SAP server.
3. In the `Message and Suppress Conditions` window, locate and double click the condition, which generates the message you want to forward to SAP. Note that not all messages need to be forwarded. For example, the rules which generate a critical message are probably of more interest than the rules which generate messages with severity level “warning” or “normal”.
4. In the `Actions` field of the `Condition No.` window which appears, enter the `r3ovo2ccms` command in the command box along with the parameters and options you need to perform the desired action, including the location in the CCMS tree, where you want the message to appear. If the location you specify in the CCMS tree does not already exist, it is created for you when the message is forwarded to SAP. Note that the default name of the root element for OpenView in the CCMS monitor tree is ZSAPSPI.

   Note too that, providing you have not modified the default settings, you do not need to supply an absolute path with the command. On MS Windows nodes, you do not need the `.exe` file extension, either. For more information about the r3ovo2ccms command, see “The r3ovo2ccms Command” on page 243.

   The `Node` field defines the name of the node where the template you are modifying is assigned and the `r3ovo2ccms` command runs. If you use the $MSG_NODE_NAME variable in conjunction with the -host option in the Command field, the SPI for SAP assumes the name of

the node associated with the original message. Assuming the RemoteMonitoring feature is enabled, this is true even for nodes, which the SPI for SAP is monitoring remotely.

Figure 5-12 Configuring an Automatic Action



5. The CCMS alert (Monitor-Tree Element or MTE) that `r3ovo2ccms` writes to the CCMS monitor tree must be assigned to a specific step in the business process, for example; “Create Invoice”, which you have defined in SAP Solution Manager.

   a. In SAP, browse to the following transaction:

      `Change Mode: Setup Business Process Monitoring`

   b. Select the process step to which you want to assign the CCMS alert for OpenView

   c. Manually enter the name of the OpenView CCMS monitor element, which you want to assign to the business-process step.

NOTE

The name of the monitor that you enter must match the entry created by the `r3ovo2ccms` command as it appears in the CCMS tree. You do *not* need to include either the monitor context (ZSAPSPI) or the name of the CCMS Monitor *Set*, to which the monitor belongs, for example; OpenView.

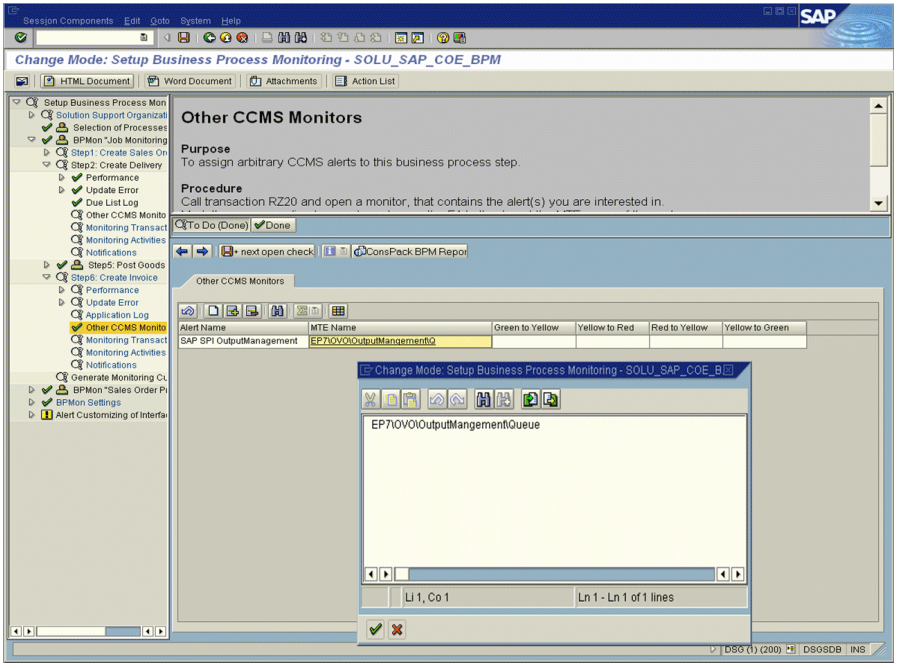
6. Next, you need to create a CCMS monitor set, for example; OpenView, and generate a CCMS monitor, for example; SAPSPI, to host the OpenView alerts sent by the `r3ovo2ccms` command.

Then you can select the new monitor and, using the Change button, display a list of the CCMS alerts and alert groups, which you want to associate with the new monitor (SAPSPI) in order to make them visible to the Solution Manager. Scroll down the list of contexts displayed and select “ZSAPSPI”.

NOTE

The context ZSAPSPI is only visible for selection in the list of contexts displayed *after* the first OVO message sent by the `r3ovo2ccms` command appears in the CCMS tree. You can use the `r3ovo2ccms` command to send a dummy message to CCMS, which creates the ZSAPSPI context. For more information see “The r3ovo2ccms Command” on page 243.

Figure 5-13 Assigning CCMS MTEs to Business Process Steps



The r3ovo2ccms Command

The mechanism which the SPI for SAP uses to forward OVO messages to SAP and write them directly into the CCMS tree is the `r3ovo2ccms` command, which is installed into the default OVO actions directory on the OVO managed node.

You can use the `r3ovo2ccms` command directly on the command line or start it either automatically (as an automatic action) or manually (as an operator-initiated action). If you want to use the `r3ovo2ccms` command in a configured action, you need to modify each template lthat generates an OVO message, which you want to forward to CCMS. The SPI for SAP uses the configured action to forward the OVO message to SAP, where it will appear in the CCMS tree in the location defined by the parameters and options you specify.

The `r3ovo2ccms` command accepts the following parameters and parameter options, which are displayed in the command shell if no parameters are specified:

```
r3ovo2ccms  -level1_element <level1_element>
-level2_element <level2_element> -text <text> -host
<SAP_hostname> [-root_element <root element>]  [-sid
<SID>] [-number <SAP_instance_number>] [-severity
<NORMAL|WARNING|CRITICAL>]
```

Command Parameters

The `r3ovo2ccms` command accepts the following command parameters:

`-level1_element <level1_element>`

This parameter identifies first-level branch in the CCMS tree structure

`-level2_element <level2_element>`

This parameter identifies the second-level branch in the CCMS tree structure

`-text <text>`

Descriptive text explaining the event/problem in more details.

`-host <SAP_hostname>`

The name of the SAP System on which the event/problem was originally detected by OVO.

Parameter Options The following options can be used with the `r3ovo2ccms` command parameters:

`-root_element <root_element>`

The name of the root element of the branch of the CCMS tree into which you want to insert the message. The default value is "ZSAPSPI".

`-sid <SID>`

The System ID (SID) of the SAP System, where the original event/problem was detected when found by OVO.

`-number <SAP_instance_number>`

The instance number of the SAP System, where the original event/problem was detected by OVO.

`-severity <NORMAL|WARNING|CRITICAL>`

The severity of the CCMS alert message. The default value is "CRITICAL"

Examples The following example shows how you can use the `r3ovo2ccms` command to forward to SAP an OVO message relating to a problem with CPU load on the SAP server “mezcal” and write it directly into a defined location in the CCMS tree. You can configure the OVO template which generates the message to execute the command either automatically by means of an automatic action or manually by means of an operator-initiated action.

Example 5-1 Writing OVO Messages into the CCMS Tree

```
r3ovo2ccms -root_element OVO -level1_element Performance
-level2_element CPU -text "CPU load: bottleneck situation
90%" -host mezcal
```

In the example above, the OVO message will appear in the `OVO > Performance > CPU` branch of the SAP CCMS tree when a critical problem with the CPU load occurs and is reported by the SPI for SAP. The problem to which the message relates was originally reported on the SAP server, “mezcal”.

6 The SPI for SAP Performance Monitors

This section describes in detail how to install, set up, and use the SPI for SAP performance-monitor and its features.

In this Section

The information in this section describes how to install and configure the SPI for SAP performance subagent (SAP/Performance subagent). It also provides information about how to put the performance monitors included in the SAP/Performance subagent to best use and supplement the information collected by the SPI for SAP performance monitors with information supplied by the OpenView Performance Agent (formerly MeasureWare). The section includes the following topics:

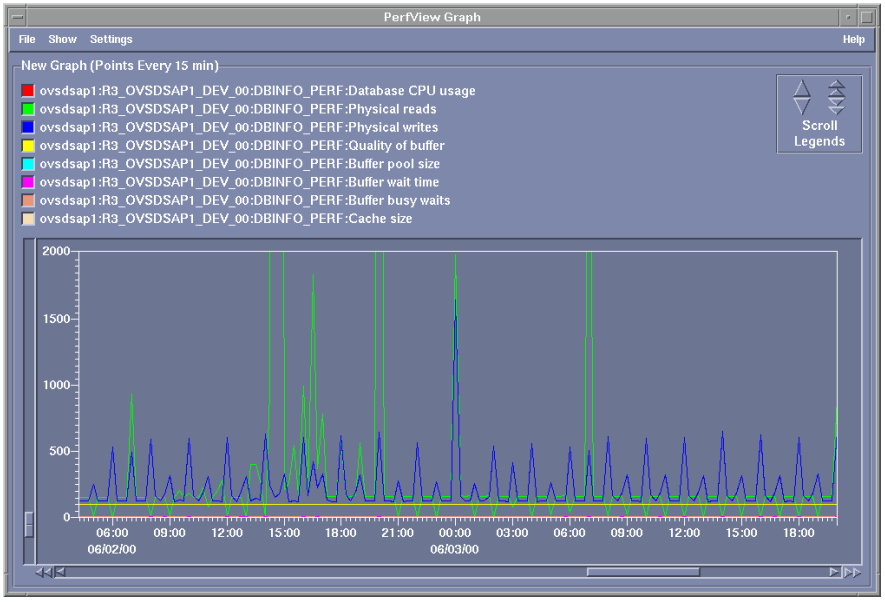
- "Performance Monitors Overview" on page 247
- "Upgrading the SAP/Performance Subagent" on page 249
- "Installing the SAP/Performance Subagent" on page 255
- "Locating the SAP/Performance Subagent Files" on page 257
- "Configuring the SAP/Performance Subagent" on page 260
- "The r3perfagent.cfg Configuration File" on page 269
- "Managing the SAP/Performance Subagent" on page 274
- "The SPI for SAP Performance Monitors" on page 277
- "De-installing the SAP/Performance Subagent" on page 304

Performance Monitors Overview

The SPI for SAP performance subagent (SAP/Performance subagent) uses a selection of performance monitors to collect SAP R/3 performance data and store them either in the OVO Embedded Performance Component (CODA) or the Performance Agent (Unix/NT). Performance Manager can then be used to centrally monitor, manage and correlate these data, together with data collected by any other application, database, system and network Performance Agent. The data can then be used to compare trends between SAP business transactions and other system metrics. This section provides information about the following topics:

- Performance Monitoring with the SPI for SAP
- How to use OVO to install the SAP/Performance subagent
- The Performance Monitors and how to configure them

Figure 6-1 **Performance Data displayed in the Performance Manager**



Implemented ABAP-function modules inside SAP R/3 are accessed via an RFC-call. The Performance Monitors gather a snapshot of SAP runtime performance data.

The SPI for SAP SAP/Performance subagent can collect more than 70 metrics in *addition* to those collected by the R/3 Performance Alert Monitor (`/rz03`), which is part of the SAP R/3 CCMS subsystem.

The new Performance Agent can be configured to specify which SAP/Performance subagent monitors should be run on specified SAP R/3 instances and how frequently. For more information, see "Configuring the SAP/Performance Subagent" on page 260.

The Performance Agent runs under MS Windows as a service and under UN*X as a daemon (background) process that runs independently of the OVO agent processes. To start or stop the SAP/Performance subagent processes, use the appropriate OVO application in the `OVO Application Bank` window. For more information, see "Managing the SAP/Performance Subagent" on page 274.

Upgrading the SAP/Performance Subagent

You cannot use the data sources you defined in the previous version of the SAP/Performance subagent with the latest version of the SPI for SAP SAP/Performance subagent. However, the *data* already collected by the old Performance Agents can still be used in the generation of Service Reports.

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

1. **Remove the existing SAP/Performance subagent**

   For more information about de-installing the SAP/Performance subagent, see "De-installing the SAP/Performance Subagent" on page 304.

2. **Remove existing SAP/Performance subagent data and data sources**

   For more information, see "Migrating the SAP/Performance subagent with the OpenView Performance Agent" on page 250 or "Upgrading the SAP/Performance subagent with CODA" on page 252

3. **Upgrade the SPI for SAP**

   For more information, see the *HP OpenView Smart Plug-in for SAP Installation Guide*.

4. **Install the new SAP/Performance subagent**

   For more information about installing the SAP/Performance subagent, see "Installing the SAP/Performance Subagent" on page 255.

5. **Configure the new SAP/Performance subagent**

   For more information about installing the SAP/Performance subagent, see "Configuring the SAP/Performance Subagent" on page 260.

6. **Upgrade the SPI for SAP/OV Reporter Integration**

   For more information about upgrading the SPI for SAP Reporter integration, see "Upgrading the SPI for SAP Reports" on page 361.

Migrating the SAP/Performance subagent with the OpenView Performance Agent

If you are using the OpenView Performance Agent (MWA) as your performance data source and want to upgrade the SAP/Performance subagent from the previous to the most recent version, it is extremely important that you remove cleanly and completely the data and data sources associated with the old version of the SAP/Performance subagent before you start the installation of the new version, as follows:

1. **Stop the Performance Agent**

   On the node where the upgrade is to be done, stop the Performance Agent:

   - AIX: **`/usr/lpp/perf/bin/mwa stop`**
   - HP-UX/Solaris: **`/opt/perf/bin/mwa stop`**
   - MS Windows: **`mwacmd stop`**

2. **Remove the old SAP/Performance subagent**

   Remove the old version of the SPI for SAP SAP/Performance subagent from the managed node as described in "De-installing the SAP/Performance Subagent" on page 304.

3. **Clean up datasources**

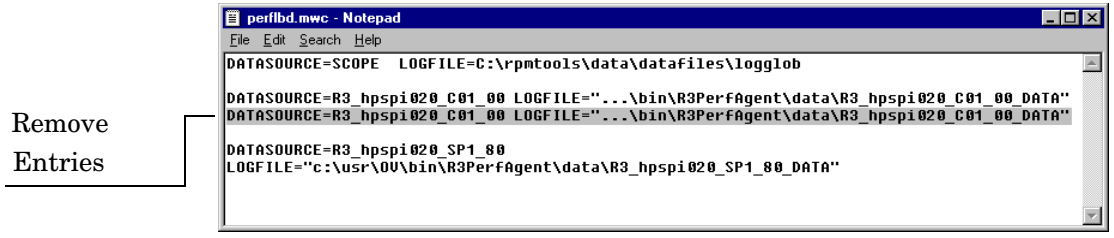
   Remove all existing SAP/Performance subagent performance data sources from the managed nodes as follows:

   a. On the OVO managed node, locate and, using your favorite text editor, open the following file, whose location differs according to operating system:

      - AIX: `/usr/lpp/perf/data/perflbd.rc`
      - HP-UX & Solaris : `/var/opt/perf/data/perflbd.rc`
      - MS Windows: `C:\rpmtools\data\perflbd.mwc`

b. Remove by hand any entries relating to the SAP/Performance subagent present in the `perflbd` file, as illustrated in Figure 6-2 on page 251. Entries in the `perflbd` file relating to the SAP/Performance subagent typically start with the string: `DATASOURCE=R3_*`.

Figure 6-2 Cleaning up the perflbd file



c. Remove by hand the data-source files from the following directories:

- AIX: `/var/lpp/OV/bin/R3PerfAgent/data`
- HP-UX/Solaris: `/usr/OV/bin/r3perfagent/data`
- MS Windows: `C:\...\bin\r3perfagent\data`

4. **Remove the old version of the SPI for SAP**

   If you have not already done so, remove the old version of the SPI for SAP from the Management Server. For more information see the section “Deinstalling the SPI for SAP” in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

5. **Install the new version of the SPI for SAP**

   Install the new version of the SPI for SAP on the OVO Management Server. From more information, see the section “Installing the SPI for SAP” in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

6. **Install the new SAP/Performance subagent**

   Install the new version of the SPI for SAP SAP/Performance subagent as described in “Installing the SAP/Performance Subagent” on page 255.

7. **Configure the new SAP/Performance subagent**

   Configure the SPI for SAP SAP/Performance subagent. For more information, see "Configuring the SAP/Performance Subagent" on page 260.

   Note that after finishing the migration described here, you do not need to execute steps 1 and 2 specified in "Configuring the SAP/Performance Subagent" on page 260. You can proceed directly to step 3 and adapt the configuration file before starting the SAP/Performance subagent in steps 4 and 5.

Upgrading the SAP/Performance subagent with CODA

If you are using the OVO Embedded Performance Component (CODA) as your performance data source and want to upgrade the SAP/Performance subagent from the previous to the most recent version, it is extremely important that you remove cleanly and completely the data and data sources associated with the old version of the SAP/Performance subagent before you start the installation of the new version, as follows:

1. **Remove the old SPI for SAP SAP/Performance subagent**

   Remove the old version of the SPI for SAP SAP/Performance subagent from the managed node as described in "De-installing the SAP/Performance Subagent" on page 304.

2. **Clean up SAP/Performance subagent datasources**

   Check for (and delete) entries relating to the old SAP/Performance subagent present in the `ddflbd` file. Note that the location of the `ddflbd` file and the file extension differ according to platform, namely:

   - AIX: `/var/lpp/OV/conf/dsi2ddf/ddflbd.rc`
   - HP-UX/Solaris: `/var/opt/OV/conf/dsi2ddf/ddflbd.rc`
   - MS Windows: `%OvAgentDir%\conf\dsi2ddf\ddflbd.mwc`

   Entries in the `ddflbd` file relating to the SAP/Performance subagent typically start with the following string: `DATASOURCE=R3_*` as illustrated in Figure 6-3 on page 254. The value of `LOGFILE=` defined for the SAP/Performance subagent entries is important: you use it

(including the complete path) as an argument with the command-line utility `ddfutil -rm all` to remove the entries one by one, as follows:

```
# ddfutil \
c:\usr\ov\bin\r3perfagent\data\R3_MARTI_WA4_00_DATA \
-rm all
```

Once you have removed from the `ddflbd` file all the entries you can find relating to the SAP/Performance subagent, you can check that the entries have been successfully removed by closing the `ddflbd` file and opening it again.

3. **Remove the old version of the SPI for SAP**

   If you have not already done so, remove the old version of the SPI for SAP from the Management Server. For more information see the section “De installing the SPI for SAP” in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

4. **Install the new version of the SPI for SAP**

   Install the new version of the SPI for SAP on the OVO Management Server. From more information, see the section “Installing the SPI for SAP” in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

5. **Install the new SPI for SAP SAP/Performance subagent**

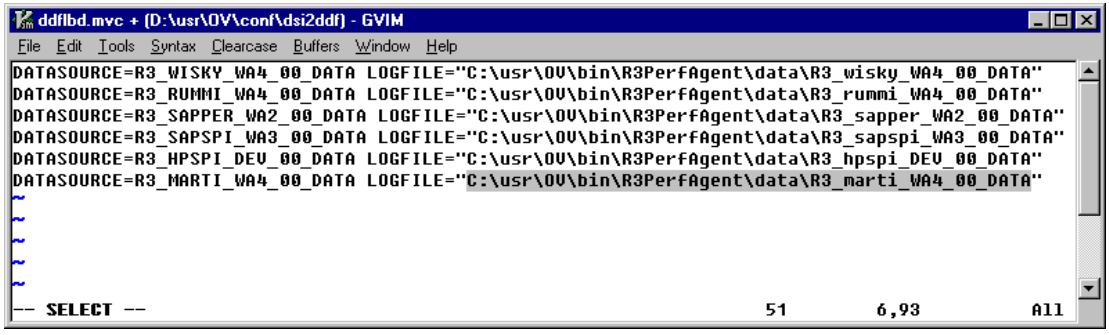
   Install the new version of the SAP/Performance subagent as described in “Installing the SAP/Performance Subagent” on page 255.

6. **Configure the new SPI for SAP SAP/Performance subagent**

   Configure the SAP/Performance subagent. For more information, see “Configuring the SAP/Performance Subagent” on page 260.

   Note that after finishing the migration described here, you do not need to execute steps 1 and 2 specified in “Configuring the SAP/Performance Subagent” on page 260. You can proceed directly to step 3 and adapt the configuration file before starting the SAP/Performance subagent in steps 4 and 5.

Figure 6-3 Cleaning up the ddflbd.mvc File



Installing the SAP/Performance Subagent

This section describes how to use the OVO GUI to install the SPI for SAP functionality for the performance sub-agent on the SAP servers you want to manage with OVO and the SPI for SAP. Note that the instructions in this section assume that:

- the OVO agent is already installed and running on the selected SAP servers
- the `dsi2ddf` wrapper is present on the OVO Management Server and, in addition, you have selected the source you want the Performance Monitor Subagent to use for performance data.

  For more information about installation pre-requisites and selecting the performance-data source, see the *HP OpenView Smart Plug-in for SAP Installation Guide*.
- either the OpenView Performance Agent or the OVO Embedded Performance Component (CODA) is installed and running on the selected SAP servers.

  For information about which versions of the Performance Agent are compatible with the SPI for SAP A.08.71, see the *HP OpenView Smart Plug-in for SAP Software Release Notes*.

To install the SPI for SAP functionality for either the Performance Agent or the OVO Embedded Performance Component on the SAP servers (OVO managed nodes), follow the instructions below.

To install the SAP/Performance Agent package:

1. **Stop the Performance Agent**

   On the node where the SAP/Performance Agent is to be installed, stop the Performance Agent by entering the following command in a shell:

   - AIX: **`/usr/lpp/perf/bin/mwa stop`**
   - HP-UX/Solaris: **`/opt/perf/bin/mwa stop`**
   - MS Windows: **`mwacmd stop`**

2. **Select the Managed Nodes for subagent installation**

   In the `Node Bank` window, select the managed node(s) where the SAP/Performance Agent is to be installed.

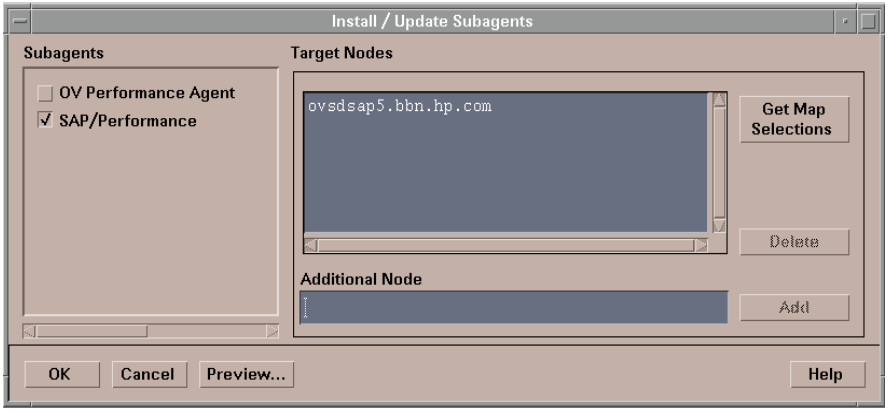
3. **Open the subagent-installation window**

   From the `Actions...` menu, select:

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

   The `Install / Update Subagent` selection window is displayed.

Figure 6-4 Subagent Selection Window



4. **Select the subagent package to install**

   Select the `SAP/Performance` subagent and ensure the target nodes for installation are correct.

5. **Install the SAP/Performance subagent package**

   Click `[OK]` to start the installation of the subagent package. The `swinstall` command installs the subagent software on the SAP managed nodes you have selected and writes general information and errors to `stdout`. Further information can be found in the following log files on the OVO Management Server:

   - `/tmp/swinstall_r3perf.log`
   - `/var/opt/OV/log/OpC/mgmt_sv/product_inst.log`
   - `/var/opt/OV/log/OpC/mgmt_sv/product_inst_err.log`
   - `/var/opt/OV/log/OpC/mgmt_sv/product_inst_sum.log`

Locating the SAP/Performance Subagent Files

This section lists the files installed as part of the SAP/Performance subagent package for the following platforms:

- "SAP/Performance Subagent Files: AIX"
- "SAP/Performance Subagent Files: HP-UX/Solaris"
- "SAP/Performance Subagent Files: MS Windows"

SAP/Performance Subagent Files: AIX

This section lists the files installed as part of the SAP/Performance subagent package for AIX:

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

    Performance-Monitor configuration tool
  - `r3perfagent`

    Performance-Monitor Agent
- Configuration files: `/var/lpp/OV/conf/SAP_SPI/[global| local]`
  - `r3perfagent.cfg`

    Configuration file for the various performance monitors
- Dsilogfiles: `/var/lpp/OV/bin/R3PerfAgent/data`
  - `R3_<HOSTNAME>_<SID>_...`

    On installation, this directory is empty. It is used by the Performance Agent to store the dsilogfiles compiled by `r3perfconfig/compdsifile.sh`
- Templates: `/var/lpp/OV/bin/R3PerfAgent/template`
  - `R3statistics.<PERF-MONITOR>`

    Files used to compile the `dsilog` files
  - `Parm.UX`

    Parameter-file template.

SAP/Performance Subagent Files: HP-UX/Solaris

This section lists the files installed as part of the SAP/Performance subagent package for HP-UX and Solaris:

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

    Performance-Monitor configuration tool
  - `r3perfagent`

    Performance-Monitor Agent
- Configuration files: `/var/opt/OV/conf/SAP_SPI/[global |local]`
  - `r3perfagent.cfg`

    Configuration file for the performance monitors if you use the `Distribute Local Config` application in the `SAP R/3 Admin Local` Application group.

    If you use the `Actions: Agents > Install/Update S/W & Config...`

    `/var/opt/OV/bin/OpC/monitor`
- `dsilog` files: `/var/opt/OV/bin/R3PerfAgent/data`
  - `R3_<`*`HOSTNAME`*`>_<`*`SID`*`>_...`

    On installation, this directory is empty. It is used by the Performance Agent to store the dsilogfiles compiled by `r3perfconfig`.
- Templates: `/var/opt/OV/bin/R3PerfAgent/template`
  - `R3statistics.<`*`PERF-MONITOR`*`>`

    Files used to compile the dsilogfiles
  - `parm.UX`

    Parameter-file template.

SAP/Performance Subagent Files: MS Windows

This section lists the files installed as part of the SAP/Performance subagent package for MS Windows:

- Binaries: `\usr\ov\bin\r3perfagent\bin`
  - `r3perfconfig`

    Performance-Monitor configuration tool
  - `r3perfagent`

    Performance-Monitor Agent
  - `r3perfagent_service`

    Starts the Performance-Monitor Agent as a service under MS Windows
- Configuration files: `\usr\ov\conf\hpitosap\localconfig`
  - `r3perfagent.cfg`

    Configuration file for the various performance monitors.
- Dsilogfiles: `\usr\ov\bin\r3perfagent\data`
  - `R3_<`*`HOSTNAME`*`>_<`*`SID`*`>_...`

    On installation, this directory is empty. It is used by the Performance Agent to store the `dsilog` files compiled by `r3perfconfig.bat` and `compdsifile.bat`
- Templates: `\usr\ov\bin\r3perfagent\template`
  - `R3statistics.<`*`PERF-MONITOR`*`>`

    Files used to compile the dsilogfiles
  - `parm.UX`

    Parameter-file template.

Configuring the SAP/Performance Subagent

The information in this section takes you through the process of setting up and configuring the SAP/Performance Agent, and covers the following topics:

- "Selecting the Performance-data Source" on page 260
- "To Configure the SAP/Performance Subagent" on page 262
- "Remote Performance Monitoring" on page 265
- "The Performance-Monitor Scheduler" on page 267

Selecting the Performance-data Source

By default, OVO for UNIX deploys the OpenView Performance Agent (previously MeasureWare) with all OVO A.07.x agents. OVO Smart Plug-ins use the OpenView Performance Agent as the default source for the performance data required for graphing in HP OpenView Performance Manager and OpenView Reporter. Previously installed OpenView products that use the OpenView 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 OVO Embedded Performance Component as the data source on the managed node and wish to switch to the Performance Agent. You can override the use of the OVO 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. The location of the `nocoda.opt` file on the managed node varies

according to the operating system running on the OVO Management Server and managed node. Table 6-1 shows the location of the `nocoda.opt` file on nodes managed by an OVO Management Server.

Table 6-1 OVO 7.0 for UNIX Management Servers

Managed Node Operating System	Location of the nocoda.opt File
AIX	`/var/lpp/OV/conf/dsi2ddf/nocoda.opt`
HP-UX / Solaris	`/var/opt/OV/conf/dsi2ddf/nocoda.opt`
Windows	`\usr\OV\conf\dsi2ddf\nocoda.opt`

To change the default setting for the data source, open the `nocoda.opt` file in a text editor and manually enter the appropriate information using the format and syntax illustrated in Example 6-1.

To change the performance-data source:

1. **Open the nocoda.opt file**

   Open the (or create a new) nocoda.opt file in a text editor and manually enter the appropriate information using the format and syntax illustrated in Example 6-1.

2. **Specify a generic data source**

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

3. **Specify individual data sources**

   To designate Performance Agent as the agent for a data source tied to a specific SAP R/3 (or SAP R/3 ITS) instance, include a reference to each instance on a separate line of the `nocoda.opt` file, as shown in Example 6-1 and using the following format:

   `R3_<`*`Virtual_SAPITS_Instance_Name`*`>_<`*`SAPITS_Hostname`*`>_DATA`

4. **Save the changes to the nocoda.opt file**

   Save the changes to the `nocoda.opt` file

5. **Restart the OVO agent**

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

Example 6-1 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_ovsdsap_DEV_00_DATA
# SAP R/3 ITS hosts/instances:
R3ITS_SP6_00_ovspi_DATA
```

To Configure the SAP/Performance Subagent

You need to complete the following steps to configure the SAP/Performance subagent:

1. **Start the SAP/Performance subagent configuration**

   On the node where you installed the SAP/Performance subagent, switch to the appropriate directory and enter the following command to run the SAP/Performance Subagent configuration scripts:

   - MS Windows: **`r3perfconfig`**
   - UN*X: **`./r3perfconfig`**

   Follow the instructions which appear on screen. The script lists the SIDs that it finds together with an associated number and prompts you to choose one of the associated numbers to indicate which SAP R/3 instance you want to configure. For example:

```
Installed SAP Instances:

       SID   SapNr    HostName
       -------------------------------------

(0)    AST    0       sapper
(1)    DEV    1       ovsdsap1
```

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

Enter the appropriate identification number, for example; **0** for AST. If you choose **888** to configure a SAP SID from scratch, you are required to answer a series of questions concerning the SAP SID you want to configure. When you are finished, the `dsilog` files are then compiled and the data source is added to the file:

- MS Windows: `perflbd.mwc`
- UN*X: `perflbd.rc`

On completion, the script prompts you to restart the Performance Agent. However, it makes sense to update the `parm.mwc` file as described in step 2 before you start the Performance Agent.

2. **Update the Performance-agent parameter file**

IMPORTANT

This step does not apply to the OVO Embedded Performance Component.

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

- UN*X: **`cat parm.UX >> parm`**

  In UN*X, the `parm` file is located in: `/var/opt/perf/parm`

- MS Windows: **`type parm.NT >> parm.mwc`**

  The `parm` file is located in the following directory in MS Windows:

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

NOTE

You can represent several SAP R/3 instances in the `parm` file by using the asterisk (*) wild card.

3. **Configure the performance monitors**

   Configure the monitors in the `r3perfagent.cfg` file. If you do not do this, all monitors will run with the default settings as illustrated in the following example. There are two possible configurations:

   - **Global:** `/var/opt/OV/bin/OpC/monitor/`

     Global SAP/Performance subagent settings for *all* SAP R/3 managed nodes

   - **Local:** `/opt/hpitosap/local_config/<hostname>`

     Local SAP/Performance subagent settings for *individual* SAP R/3 managed nodes, where <*hostname*> is the name of the SAP R/3 server, to which the local configuration pertains.

   To open the `r3perfagent.cfg` file double-click the `PerfAgt` icon in the `SAP R/3 Admin` application group.

NOTE

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

The default configuration is:

- All performance monitors are enabled for all SAP host names, systems, numbers and clients.
- The default polling intervals are set for each performance monitor in minutes.
- `Hold Connections` is disabled.

Change any values as required and save the file. You will have to restart the Performance Agents to upload the latest configurations.

4. **Start the Performance Agent**

   Start the Performance Agent on the managed node by entering the following command in a shell:

   - UN*X: **`mwa start`**
   - MS Windows: **`mwacmd start`**

5. **Start the SAP/Performance subagent**

On the managed node, switch to the directory in which the `r3perfagent` command resides and start the SAP/Performance subagent by entering the following command in a shell:

- UN*X: **`./r3perfagent [stop | start]`**
- MS Windows: **`r3perfagent_service [-e | -s]`**

Or, alternatively, in the OVO GUI, use the following SPI for SAP application

- UN*X: `SAP R/3 UN*X > PerfAgt Start`
- MS Windows: `SAP R/3 NT > PerfAgt Start`

Figure 6-5 r3perfagent.cfg File Example

Configure Performance Agent Monitoring (r3perfagent.cfg)

```
#RemoteMonitoring  =sapwolf2     =ovsdsap1

#-------------------------------------------------------------
# PerfMon    SAP         SAP     SAP       SAP       RFC FUNCTION     Enable =1/       Polling Interval   Hold Connection
#          hostname    System   Number    Client                      Disable=0          (minutes)       Enable =1/Disable =0

#

# SAP SID ------------------------------------------------
# These Performance Monitors collect SID related Metrics and should therefore
# run only once per SID (either on the Central Instance, or on ONE AppServer)

PerfMon     =ALL        =ALL     =ALL       =ALL     =DBINFO_PERF          =1              =15              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =JOBREP_PERF          =1              =60              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =UPDATE_PERF          =1              =1               =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =SPOOL_PERF           =1              =20              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =DOCSTAT_PERF         =1              =60              =0

# SAP AppServer ------------------------------------------
# These Performance Monitors collect AppServer related Metrics and should
# therefore run on each AppServer of interest.

PerfMon     =ALL        =ALL     =ALL       =ALL     =WP_PERF              =1              =15              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =STATRECS_PERF        =1              =1               =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =WLSUM_PERF           =1              =60              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =USER_PERF            =1              =5               =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =SAPBUFFER_PERF       =1              =15              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =SAPMEMORY_PERF       =1              =15              =0
PerfMon     =ALL        =ALL     =ALL       =ALL     =ICMSTAT_PERF         =1              =15              =0
```

Remote Performance Monitoring

The current version of the SPI for SAP includes a feature which allows you to extend the scope of the performance monitor to remotely monitor the health of an additional SAP server (which is *not* a managed node) from an SAP server, which *is* already configured as an OVO managed node.

NOTE Although the remote host is not an OVO managed node, it must nonetheless be present in the OVO Node Bank. If you do not add the remote host to the OVO Node Bank, OVO cannot resolve the host name associated with the remote host and, as a consequence, any messages from the remote host will not appear in the Message Browser.

To make use of the remote-monitoring feature provided by the SPI for SAP, for example; to collect SAP performance metrics from a SAP System running an operating system that is not supported by the SPI for SAP, you need to manually add (with `r3perfconfig`) an additional datasource for the system you plan to monitor remotely and then activate the new RemoteMonitoring keyword (by removing the leading hash symbol "#") in the `r3perfagent.cfg` file. On the same line in the `r3perfagent.cfg` file, tell the SPI for SAP performance agent the name of the local server which you want to perform the monitoring and, in addition, the name of the remote server, which you want to monitor. As illustrated in Example 6-2 on page 266, a new line is required for each *additional* server that you want to monitor remotely.

Note that the performance-monitoring conditions defined in the *Perfmon* section at the end of the `r3perfagent.cfg` file apply by default to all SAP instances running on all the servers listed in the configuration file, that is; all SAP instances running on both the local and remote servers defined in the RemoteMonitoring section. For more information about the keywords and parameters used to define remote monitoring in the `r3perfagent.cfg` file, see "The r3perfagent.cfg Configuration File" on page 269.

Example 6-2 Specifying Remotely Monitored Hosts in the r3perfagent.cfg File

```
#-------------------------------------------------------------------
# TraceLevel   hostname  only error messages=1 info messages=2
# debug messages=3 Disable=0
TraceLevel     =ALL        =0
#-------------------------------------------------------------------
# TraceFile          hostname     filename
#
TraceFile            =ALL         =r3perfmon.log
#-------------------------------------------------------------------
# AgentHostname      hostname     aliasname
#
AgentHostname        =ALL         =default
#-------------------------------------------------------------------
```

```
# Remote            LocalHost    RemoteHost
# Monitoring

RemoteMonitoring    =sapwolf2    =sapprod1
RemoteMonitoring    =sapwolf3    =sapprod2
RemoteMonitoring    =sapper      =sapprod3
#-------------------------------------------------------------------------------------
#PerfMon  SAP     SAP     SAP     SAP     RFC FUNCTION   Enable=1   Polling     Hold
#         Host    System  Number  Client                 Disable=0  Interval    Connection
#                                                                               En/Disable
# SAP SID ------------------------------------------------------------------------------
# These Performance Monitors collect SID related Metrics and should therefore
# run only once per SID (either on the Central Instance, or on ONE AppServer)
PerfMon   =ALL    =ALL    =ALL    =ALL    =DBINFO_PERF     =1         =15        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =JOBREP_PERF     =1         =60        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =UPDATE_PERF     =1         =1         =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =SPOOL_PERF      =1         =20        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =DOCSTAT_PERF    =1         =60        =0
# SAP AppServer ------------------------------------------------------------------------
# These Performance Monitors collect AppServer related Metrics and should
# therefore run on each AppServer of interest.
PerfMon   =ALL    =ALL    =ALL    =ALL    =WP_PERF         =1         =15        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =STATRECS_PERF   =1         =1         =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =WLSUM_PERF      =1         =60        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =USER_PERF       =1         =5         =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =SAPBUFFER_PERF  =1         =15        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =SAPMEMORY_PERF  =1         =15        =0
PerfMon   =ALL    =ALL    =ALL    =ALL    =ICMSTAT_PERF    =1         =15        =0
-------------------------------------------------------------------------------------
```

The Performance-Monitor Scheduler

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

If the Performance Agent encounters any problems during its run and cannot complete its task before the start of the next scheduled run, it does not stop and leave tasks incomplete: the Performance Agent continues to run until it has completed its task. However, the scheduler tracks the progress of the Performance Agent and tries to synchronize the run schedules so that the time lost can be regained without affecting the collection of the performance data.

If the Performance-agent Scheduler falls ten minutes behind schedule, it sends a message to the OVO Management Server with the warning that the Scheduler is out of synchronization. If the Performance- agent Scheduler falls thirteen minutes behind schedule, it resets ignoring all outstanding jobs. For more information about the keywords you can use to control the Performance-agent Scheduler and the messages it generates, see "The r3perfagent.cfg Configuration File" on page 269.

The performance monitor has problems with synchronization if it is not able to complete all its scheduled tasks in the allowed time between each monitor run. To troubleshoot scheduler-synchronization problems:

1. **Check the Polling Interval**

   Check that the polling interval for the individual `r3perfagent` monitors has not been changed in the `r3perfagent.cfg` file to a value that is too small. You can define the polling interval for individual monitors in the "Polling Interval" column of the `r3perfagent.cfg` file, as shown in Example 6-2 on page 266. The default polling intervals for the performance monitors are, with one or two exceptions, between 15 and 60 minutes.

   For example, if the polling interval of *all* the performance monitors has been reduced to one (1) minute, the Performance Monitor scheduler tries to start *all* the performance monitors *each* time it runs. If there are ten monitors and each monitor takes ten seconds to respond, then the scheduler will already be out of synchronization by the time the scheduler starts its second run. You will have to increase the polling interval for the various performance monitors accordingly.

2. **Disable Remote Monitoring**

   If you have enabled remote monitoring for the `r3perfagent` Performance Monitor, network problems could mean that requests for information from the remote server are not being answered in a timely fashion. Try disabling remote monitoring for a short while to test whether or not this is the reason the `r3perfagent` Performance Monitor is having problems. You can do this for one individual remote host, or all remote hosts (if there are more than one). For more information about remote monitoring with the SPI for SAP Performance Monitor, see "Remote Performance Monitoring" on page 265.

The r3perfagent.cfg Configuration File

The SPI for SAP provides a default configuration for the `r3perfagent` monitor, which is designed to work without modification immediately after installation. However, if you want to set up the `r3perfagent` monitor for your particular SAP environment, you can modify the `r3perfagent.cfg` file by enabling or disabling the keywords in the following list and, where necessary, setting or modifying the appropriate parameters:

- **TraceLevel**

  The TraceLevel keyword accepts the following parameters:

  — **Hostname**:

=ALL	All hosts being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The name of a SAP server, where you want to specify a trace level. Use a new line for each individual host.

  — **Trace level**:

=0	Disable. This is the default setting.
=1	Log only error messages
=2	Log all messages
=3	Log only debug messages

- **TraceFile**

  The TraceFile keyword accepts the following parameters:

  — **Hostname**:

=ALL	All SAP servers being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The name of a specific host where tracing is enabled and you want to specify a trace level

— **Filename**:

=`r3perfmon.log` - which is the default setting or, alternatively, the name of the file to which you want to write the trace log and, if necessary, the path. The path can be either absolute or relative to the working directory, which is the location where the SPI for SAP performance agent executable resides, for example: `/var/opt/OV/bin/R3PerfAgent/bin`. For more information about the location of the `r3perfagent` binaries, see "Locating the SAP/Performance Subagent Files" on page 257.

- **AgentHostname**

  The AgentHostname keyword is not currently used

- **SyncBack**

  The SyncBack keyword accepts the following parameters:

  — **SyncBack Threshold**

=<*n*> mins	The difference in minutes between defined and actual schedules. If the SyncBack threshold is reached, for example; when the scheduler is "n" minutes behind schedule, the scheduler restarts in order to return to the defined schedule. The SnycBack Threshold should be *higher* than the `Message Threshold` value set in association with the `BehindSyncMessage` keyword so that you receive a message warning about schedule problems *before* the scheduler restarts.

  — **Enable/Disable**

=0	Disable the scheduler synchronization
=1	Enable the scheduler synchronization. This is the default setting.

- **BehindSyncMessage**

  The BehindSyncMessage keyword accepts the following parameters:

  — **Enable/Disable**

=0	Disable the sending of a behind-schedule message

=1 Enable the sending of a behind-schedule message. This is the default setting.

— **OpC Severity**

=WARNING The severity of the behind-schedule message sent. This is the default value.

— **OpC Object**

=r3perfagent The OVO object to associate with the behind-schedule message. This is the default value.

— **OpC MsgGroup**

=R3_General The OVO Message Group to which the behind-schedule message belongs. This is the default value.

— **Message Threshold**

=<*n*> mins The elapsed time in minutes before a behind-schedule message is sent to the OVO managment server. The `Message-Threshold` value should be *less* than the `SyncBack Threshold` value set in association with the `SyncBack` keyword so that you receive a message warning about schedule problems *before* the scheduler restarts.

- **RemoteMonitoring**

  The RemoteMonitoring keyword accepts the following parameters:

  — **LocalHost**

  This is the name of the host where the SPI for SAP software is installed and running and whose performance agent will be used to remotely monitor the SAP server defined in “Remotely Monitored Node”.

  — **RemoteHost**

  This is the name of the *remote* SAP server you want to monitor from the SAP server defined in “Server Node”. Although the remote host does not have the SPI for SAP software installed and is *not usually* an OVO managed node, it must appear in the OVO Node Bank.

For more information, see "Remote Performance Monitoring" on page 265.

- **Perfmon**

  The Perfmon keyword *requires* a value for the following parameters:

  — **SAP Hostname**:

=ALL	All SAP hosts will be monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The host name of a specific SAP server where performance monitoring is to be enabled. Use a new line for each individual host

  — **SAP System**:

=ALL	All SAP Systems will be monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The SAP SID for which performance monitoring is to be enabled, for example; DEV. Use a new line for each individual SID.

  — **SAP Number**:

=ALL	All SAP numbers will be monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The specific SAP number for which performance monitoring is to be enabled, for example; 00, 99. Use a new line for each new SAP number.

  — **SAP Client**:

=ALL	All SAP clients being monitored by the SPI for SAP. This is the default setting.
=<*SAP_host*>	The specific SAP client for which performance monitoring is to be enabled, for example; 099 . Use a new line for each new SAP client.

— **RFC FUNCTION**:

=<*metricname*>_PERF, where *metricname* refers to the specific metric list you want the performance monitor to use, for example; DBINFO_PERF or SAPMEMORY_PERF. For more information about the possible values you can use, see "The SPI for SAP Performance Monitors" on page 277.

— **Enable/Disable**

=0	Disable the performance monitor
=1	Enable the performance monitor. This is the default setting.

— **Polling Interval**

=*nn*	*nn* is the time in minutes between each run of the performance monitor

— **Hold Connection**

=0	*Disable*: close the RFC connection after the call has completed. This is the default setting.
=1	*Enable*: keep the RFC connection open after the call has completed

Managing the SAP/Performance Subagent

The SPI for SAP SAP/Performance subagent can be controlled using command-line options, which differ according to the platform and operating system. The SPI for SAP SAP/Performance subagent can be managed either by using command-line options or the tools that are installed by the SPI for SAP. For more information, see:

- "SAP/Performance agent Command Line Syntax" on page 274
- "SAP Logins for the SAP/Performance agent" on page 275
- "SAP/Performance agent Applications" on page 276

SAP/Performance agent Command Line Syntax

The following options can be used with the `r3perfagent` command on UNIX managed nodes to control the SPI for SAP SAP/Performance subagent from the command line:

- **`r3perfagent start`**
- **`r3perfagent stop`**
- **`r3perfagent status`**

The following syntax can be used with the `r3perfagent` command on MS Windows managed nodes to control the SPI for SAP SAP/Performance subagent from the command line:

- **`r3perfagent_service -i`**

  registers the service
- **`r3perfagent_service -u`**

  *de*registers the service
- **`r3perfagent_service -s`**

  starts the service
- **`r3perfagent_service -e`**

  stops the service

The services can also be controlled from the `Services` option in the MS Windows Control Panel.

SAP Logins for the SAP/Performance agent

The SPI for SAP SAP/Performance subagent require access to SAP in order to be able to collect SAP-related metrics, which are then used to generate reports and graphs. You define the SAP login for the SAP/Performance subagent during the installation and configuration of the SPI for SAP and the combination of SAP user-name and password must be copied to the central SPI for SAP configuration file, `r3itosap.cfg`, where it is referenced by the SPI for SAP monitors and agents.

This is particularly important for the SPI for SAP's SAP/Performance subagent, which reads the SAP log-in information in the `r3itosap.cfg` *once only*, on startup, and will not start if it cannot log in to SAP. The SPI for SAP SAP/Performance subagent attempts to log in to SAP and, if it fails, sends a message to OVO indicating that it was unable to start as a result of authorization problems.

NOTE

Note that SAP has a security mechanism which blocks further logins from a user who has tried (and failed) to login to SAP a given number of times. This number of failed logins could quickly be reached by the SAP/Performance subagent if the SAP username/password for the SPI for SAP is changed in SAP but the changes to the SAP log-in details are not updated in the `r3itosap.cfg` file.

If you change the SAP user name/password which the SPI for SAP uses to log in to SAP, you need to make sure that the changes are reflected in the `r3itosap.cfg` and, in addition, that the SPI for SAP components which use the information in the `r3itosap.cfg` are restarted in order to make them aware of the changes.

Best of all, stop the SPI for SAP SAP/Performance agent *before* you change the SAP user/password which the SPI for SAP needs for access to SAP, as follows:

1. **Stop the SAP/Performance agent**

   Stop the SAP/Performance agent on all OVO managed nodes where it is installed and running. On each managed node, enter:

   ```
   r3perfagent stop
   ```

2. **Login to SAP**

   Login to SAP as the administrator and change the user/password which SPI for SAP uses to log in to SAP, as required.

   Note that SAP requires the password for DIALOG users to be changed more frequently than other types of SAP users.

3. **Update the configuration file**

   Update the SPI for SAP configuration file, `r3itosap.cfg`, with the changes you have made to the SAP user and password.

4. **Restart the SAP/Performance agent**

   Restart the SPI for SAP SAP/Performance agent on each of the OVO managed nodes where the SAP/Performance agent is running. On each managed node, enter:

   ```
   r3perfagent start
   ```

NOTE The SPI for SAP cannot collect performance metrics during the period when the SAP/Performance agent is not running.

SAP/Performance agent Applications

Table 6-2 shows which applications are available for the SAP/Performance Agent in the appropriate SPI for SAP application group—`SAP R/3 NT` or `SAP R/3 UN*X`.

Table 6-2 Performance Agent Applications

Application Name	SAP R/3 NT	SAP R/3 UN*X
`PerfAgt Start`	✓	✓
`PerfAgt Stop`	✓	✓
`PerfAgt Status`		✓

The SPI for SAP Performance Monitors

The SPI for SAP performance monitors can be one of two types: **snapshot** or **time-frame**. A snapshot monitor runs once and gathers only one set of values. This means that snapshot monitors must be scheduled to run on a regular basis in order to create a comprehensive picture of the performance of the SAP R/3 environment. Time-frame monitors run, as the name suggests, over a period of time. Most SPI for SAP performance monitors do not make use of alert types or parameters.

The following SPI for SAP performance monitors are available with the SPI for SAP and are explained in greater detail in the individual sections that follow:

- "DBINFO_PERF"

  monitors database-performance analysis values

- "DOCSTAT_PERF"

  collects the document volume statistics for the last full hour

- "ICMSTAT_PERF"

  monitors the status and performance of the SAP Internet Communication Manager

- "JOBREP_PERF"

  counts the number of jobs per state (scheduled, running, etc.)

- "SAPBUFFER_PERF"

  returns values for the use of SAP *buffers* for an SAP instance

- "SAPMEMORY_PERF"

  monitors SAP memory use by SAP users for an SAP instance

- "SPOOL_PERF"

  counts the number of spool requests in its different states

- "STATRECS_PERF"

  returns the response/net times of defined transactions

- "SYSUP_PERF"

  monitors the status of the SAP R/3 instances

- "UPDATE_PERF"

  monitors the number of update processes

- "USER_PERF"

  monitors the number of users and user sessions per SAP client

- "WLSUM_PERF"

  collects the performance-workload statistics hourly

- "WP_PERF"

  monitors the number of users/sessions per SAP client for an SAP application server

DBINFO_PERF

The DBINFO_PERF performance monitor returns a set of values as they are displayed in the SAP database-performance analysis page. This information can be used to detect database performance problems and assess whether database tuning could improve database performance.

NOTE The DBINFO_PERF performance monitor works *only* with Oracle database data structures. It does *not* work with data structures from other database products.

Type The DBINFO_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency It is recommended to run the monitor once every 15 minutes.

Datasource The SAP R/3 transaction `ST04` (DB Performance Overview)

Metrics Table 6-3 shows the values in the performance table returned by the monitor.

Table 6-3 DBINFO_PERF Performance Monitor Metrics

Order	Metric Name	Description	% Value	Cum
1	CPUUSAGE	Database CPU usage		No
2	BUFPREADS	Physical reads		Yes
3	BUFPWRITES	Physical writes		Yes
4	BUFQUAL	Quality of data base buffer pool	%	No
5	BUFSIZE	Data base buffer pool size		Static
6	BUFWAITS	Buffer busy waits		Yes
7	BUFWTIME	Buffer busy wait time		Yes

Table 6-3 DBINFO_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description	% Value	Cum
8	DICTSIZE	Dictionary cache size		Static
9	DDQUAL	Quality of Data Dictionary cache	%	No
10	LOGBLOCKS	Redo log blocks written		Yes
11	LOGENTRIES	Redo log buffer entries		Yes
12	LOGSIZE	Redo log buffer size		Static
13	LOGFAULT	Allocation error rate of redo log buffer	%	No
14	LOGALLOC	Redo log buffer allocation retries		Yes
15	ROLLBACKS	Rollbacks		Yes
16	SCANLONG	Long table scans		Yes
17	SORTDISK	Sort disk		Yes
18	SORTMEM	Sort memory		Yes
19	SORTROWS	Sort rows		Yes

Figure 6-6 and Figure 7-7 show the values in the performance table returned by the monitor pointing to a specified field in the transaction screen of ST04. The call-out numbers present in Figure 6-6 and Figure 6-7 correspond to the numbers in the Order column of Table 6-3 and indicate the sequence of the values in the performance string:

Figure 6-6 Performance Table Values: Part 1

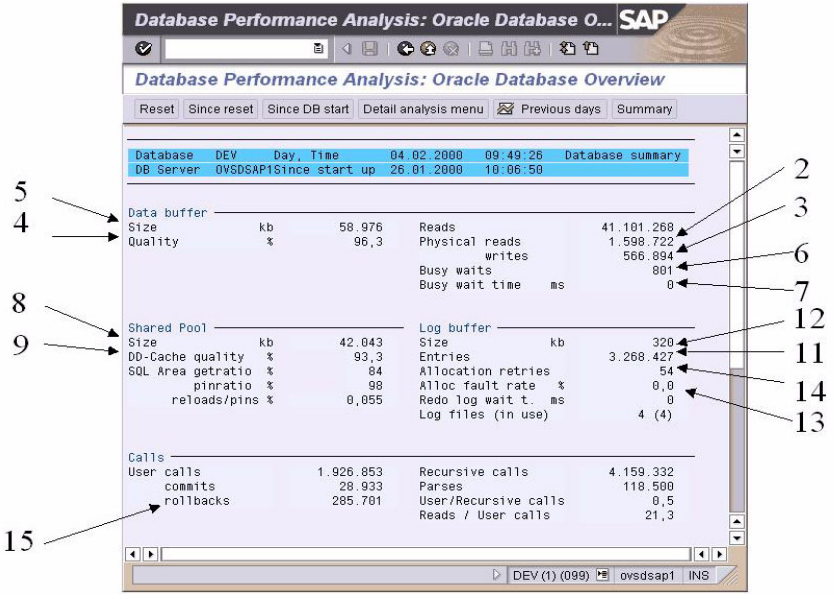
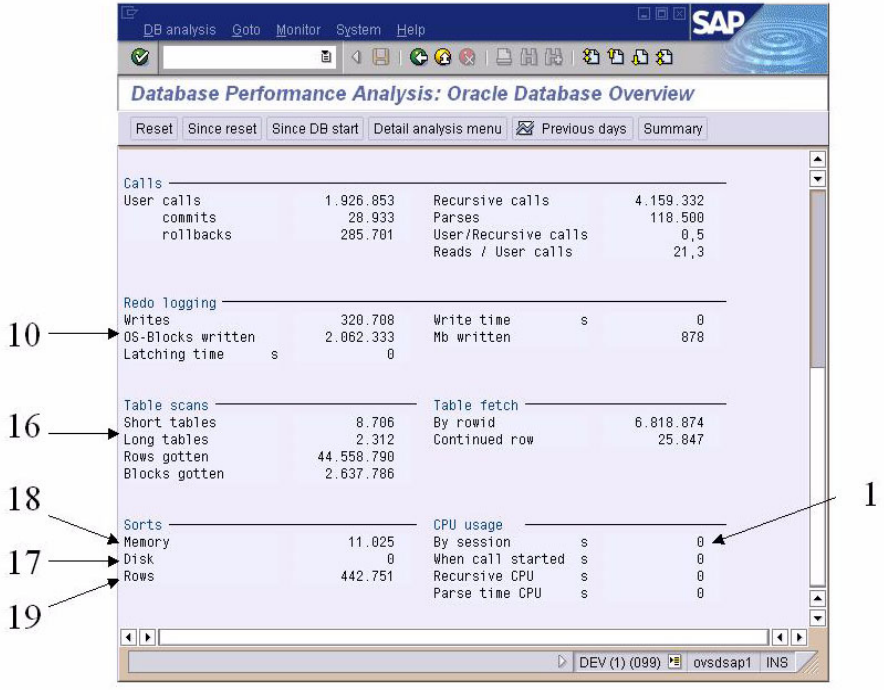


Figure 6-7 Performance Table Values: Part 2



DOCSTAT_PERF

The performance monitor, DOCSTAT_PERF, collects the quantity-structure statistics relating to the volume of documents generated and processed for the last full hour. This monitor must be configured only once for every SAP R/3 System that you want to monitor.

Type

The DOCSTAT_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended to run the monitor hourly.

Data Source

The SAP R/3 transaction `ST07` (quantity structure) is used as the data source for this monitor.

Metrics

Table 6-4 shows the values in the performance table returned by the DOCSTAT_PERF monitor.

Table 6-4 DOCSTAT_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	SID	The SAP System ID
2	DESCRIPTION	Description of an application-monitor object
3	CNTHEADER	Document headers
4	CNTITEM	Document items
5	CNTDIV	Document Division
6	CNTTOTAL	Total number of records
7	CNTLINE	Number of line items
8	CNTCHGDOC	The number of changed documents
9	CNTTEXT	Text

ICMSTAT_PERF

The performance monitor, ICMSTAT_PERF, monitors the status and performance of the SAP Internet Communication Manager (ICM).

Type

The ICMSTAT_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended to run the monitor approximately once every fifteen minutes or so.

Datasource

The SAP R/3 transaction `SMICM` (ICM Monitor) is used as the data source for this monitor.

Metrics

Table 6-5 shows the values in the performance table returned by the ICMSTAT_PERF monitor.

Table 6-5 ICMSTAT_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	ICM_Status	The status of the Internet Communication Manager
2	Max_Threads	The defined max. number of open threads allowed by the ICM
3	Peak_Threads	Peak number of open threads in the ICM in a given period
4	Cur_Threads	Number of currently open threads in the ICM
5	Max_Connections	The defined max. number of open connections allowed by the ICM
6	Peak_Connections	Peak number of connections in the ICM in a given period
7	Cur_Connections	Number of current connections in the ICM

Table 6-5 ICMSTAT_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
8	Max_QueueEntries	The max. number of queued requests allowed by the ICM defined `in: icm/req_queue_len`
9	Peak_QueueEntries	Peak number of queued requests in the ICM in a given period
10	Cur_QueueEntries	Number of currently queued requests in the ICM
11	Running_Threads	Number of work threads waiting for a request (*idle*)
12	Dead_Threads	Number of work threads in a problematic state, for example; dead or hanging
13	Processed_Threads	Number of work threads currently processing a request

JOBREP_PERF

The JOBREF_PERF performance monitor counts the jobs per state in the time period between the end date and time of the last monitor run and the start date and time of the actual monitor run.

Type

The JOBREF_PERF monitor is of type *time-frame* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended to run the monitor between once an hour and once a day.

Datasource

The SAP R/3 transaction `SM37` (Background Job Overview) is used as the data source for this monitor.

Metrics

Table 6-6 shows the values in the performance table returned by the JOBREF_PERF monitor.

Table 6-6 JOBREF_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	RUNNING	The number of jobs with status *running* since the last monitor run
2	READY	The number of jobs with status *ready* since the last monitor run
3	SCHEDULED	The number of jobs with status *scheduled* since the last monitor run
4	RELEASED	The number of jobs with status *released* since the last monitor run
5	ABORTED	The number of jobs with status *aborted* since the last monitor run
6	FINISHED	The number of jobs with status *finished* since the last monitor run

Table 6-6 JOBREF_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
7	PUT_ACTIVE	The number of jobs with status *put_active* since the last monitor run
8	UNKNOWN_STATE	The number of jobs with status *unknown* since the last monitor run

SAPBUFFER_PERF

The SAPBUFFER_PERF performance monitor returns values for the use of SAP memory *buffers* by SAP users for a given instance, for example; hit ratios, buffer quality, free space available and so on in the R/3 repository, programs, and database tables.

NOTE Use the SAPBUFFER_PERF and SAPMEMORY_PERF performance monitors to collect data previously collected by the SYSBUF_PERF Monitor.

Type The SAPBUFFER_PERF monitor is of type *timeframe*.

Frequency It is recommended to run the monitor every fifteen minutes.

Data Source The SAPBUFFER_PERF monitor reads information from the SAP buffers transaction `ST02`.

Metrics Table 6-8 shows the values in the performance table returned by the SAPBUFFER_PERF monitor.

Table 6-7 SAPBUFFER_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	BUFFER_NAME	The name of the buffer
2	HITRATIO	Buffer object reads / logical requests. The buffer hit ratio is displayed as a percentage.
3	ALLOCATED_SIZE	The amount of space allocated to the buffers [a]
4	FREE_SPACE	The amount of free space (KB) available in the buffer
5	FREE_SPACE_PERCENT	Available free buffer space as a percentage of total

Table 6-7 SAPBUFFER_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
6	MAXDIR_ENTR	The number of directories available for the buffer [b]
7	FREEDIR_ENTR	Number of free directories available for the buffer
8	FDIR_ENTR_PERCENT	Free directories available for the buffer as a percentage
9	BUFFER_SWAPS	Swap activity both inwards and outwards since System start [c]
10	BUFFER_SWAPS_DELTA	Difference between the number of buffer swaps measured in the current and previous monitor runs
11	DB_ACCESSES	The number of database accesses since System start [d]
12	DB_ACCESSES_DELTA	Difference between the number of database accesses measured in the current and previous monitor runs

a. Buffer size and “available buffer size” differ because part of the buffer space is used for buffer management.
b. The buffer directories point to the location of the objects stored in the buffer.
c. Buffers swap objects *out* of the buffer in order to load a new object *in*, if insufficient free space or free directories exist.
d. Database access occurs when an object cannot be read from the buffer.

SAPMEMORY_PERF

The SAPMEMORY_PERF performance monitor returns values for SAP memory use by SAP users for a given instance, for example; roll and paging areas, and extended memory.

NOTE Use the SAPBUFFER_PERF and SAPMEMORY_PERF performance monitors to collect data previously collected by the SYSBUF_PERF Monitor.

Type The SAPMEMORY_PERF monitor is of type *snapshot*: one monitor run gathers one value set.

Frequency It is recommended to run the monitor every fifteen minutes.

Data source The SAPMEMORY_PERF monitor reads information from the SAP buffers transaction `ST02`.

Metrics Table 6-8 shows the values in the performance table returned by the SAPMEMORY_PERF monitor.

Table 6-8 SAPMEMORY_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	MEMORY_AREA	The type of memory buffer
2	CURRENT_USE_PERCENT	The amount of space currently used expressed as a percentage of the total available
3	CURRENT_USE	The amount of space currently used in KB
4	MAX_USE	The maximum value (max. use) since system startup

Table 6-8 SAPMEMORY_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
5	IN_MEMORY	The amount of space used in shared memory
6	ON_DISK	The amount of space used on the disk

SPOOL_PERF

The SPOOL_PERF performance monitor counts the number of spool requests present in their different states.

Type

The SPOOL_PERF monitor is of type *time frame* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended to run the monitor once every 10 to 30 minutes.

Data Source

The SAP R/3 transaction `SP01` (Output Controller) is used to get the data part of this monitor.

Metrics

Table 6-9 shows the values in the performance table returned by the monitor.

Table 6-9 SPOOL_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	ALL_SJ	Total number of spool jobs
2	SJ_ARCHIVE	Number of spool jobs in status archive
3	PRINT_REQ	Total number of print requests
4	OPEN_PR	Number of open print requests
5	SUCCESS_PR	Number of successfully processed print requests
6	ERROR_PR	Number of Print requests with errors
7	FAILED_PR	Number of failed print requests

STATRECS_PERF

The STATRECS_PERF performance monitor reads the statistical records and returns the average response time per transaction.

NOTE The implementation of the statistical records file in R/3 is not the same for the versions 3.1x, 4.0x and 4.6x, hence, there is a dedicated STATRECS_PERF monitor for each SAP R/3 version.

The STATRECS_PERF performance monitors uses the alert types RESPONSE_TIME and the parameter TRANSACTION to restrict the data selected. The transactions monitored are specified in the parameter TRANSACTION. If this parameter is not specified, the average response time is reported for each transaction in the local statistics file for the specified time frame.

Type The STATRECS_PERF monitor is *time-frame* based. Each run gathers only one value set. To collect a set of values, the monitor must be scheduled on a regular basis. The interval must be specified for each monitor individually, as the various monitors have different requirements. This monitor is based on the time frame between the last start and the current start of this monitor. A transaction must have ended within the time-frame a monitor checks in order to be taken into account.

Frequency It is recommended you set this monitor to run once a minute.

Data Source SAP R/3 transaction `STAT` (Local transaction statistics).

Metrics Table 6-10 shows the values in the performance table returned by the monitor.

Table 6-10 STATRECS_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	TCODE	Transaction Code of the measured Transaction

Table 6-10 STATRECS_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
2	RESPONSE_TIME	Response Time
3	NET_TIME	Net Time

Configuring and Uploading STATRECS_PERF

To activate the STATRECS_PERF monitor, the `r3perfstat.cfg` file must be configured and the results uploaded into SAP R/3. There are two possible configurations:

- Global from `SAP R/3 Admin`
- Local from `SAP R/3 Admin Local`

To set and upload the STATRECS_PERF configurations:

1. **Open and edit the r3perfstat.cfg configuration file**

   Open the `r3perfstat.cfg` file by double-clicking the `Statistical Records` icon from the `Application Bank`. If you select the global configuration file, the settings will be used for all nodes except for those with local configurations.

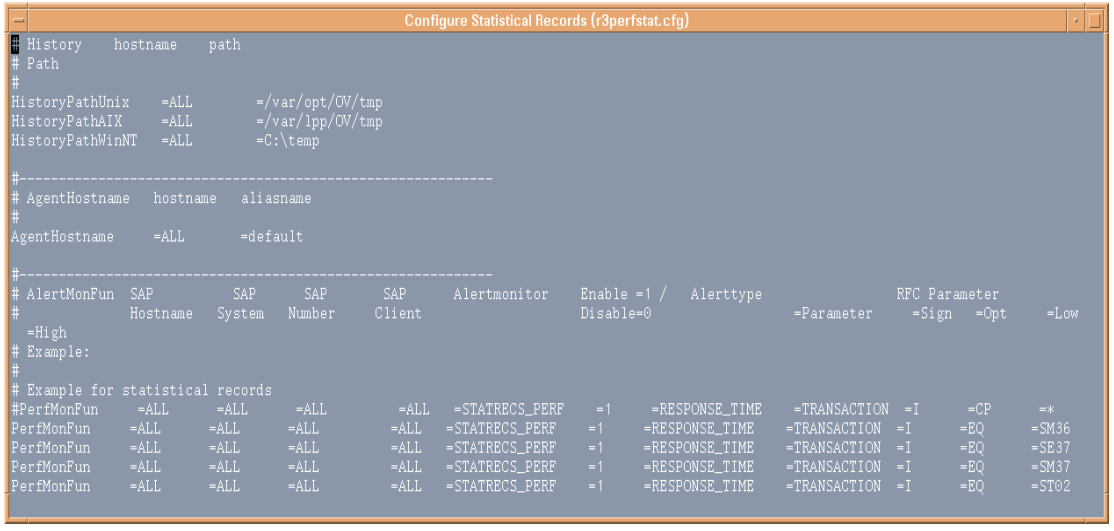
2. **Modify and save the r3perfstat.cfg configuration file**

   Change any values as required and save the file. This file is stored on the OVO Management-Server system. It must be uploaded into SAP R/3.

3. **Upload the new configuration to SAP R/3**

   To upload the configurations into SAP R/3, double-click the `.write STAT Rec Config` application, which you can find in the `SAP R/3 Admin` application group in the `Application Bank`.

Figure 6-8 Configuring Statistical Records



SYSUP_PERF

The SYSUP_PERF performance monitor is used to determine whether the SAP R/3 system is available or not.

Type

The SYSBUF_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended you set this monitor to run once a minute.

Data Source

Internal SAP RFC calls.

Metrics

Table 6-11 shows the values in the performance table returned by the monitor.

Table 6-11 SYSUP_PERF Performance Monitor Metrics

Metric Name	Description
SYSTEM_STATUS	Status of the System (UP/DOWN) on the basis of the following values: • SAP System available • SAP System logon failure • SAP System communication problems • SAP System unknown Indicates that the performance agent was not running and could not collect any data.

UPDATE_PERF

The UPDATE_PERF performance monitor is used to determine whether update errors are occurring.

When the SAP R/3 system is behaving well, no update errors should occur. However, an update error can occur, if an update is performed on a database table record that has previously been deleted. A normal update process should not have to wait in status INIT for more than 5 minutes for an update task. If a greater number of work processes exist with the status INIT the reason could be that a table space is full.

Type

The UPDATE_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended you set this monitor to run once a minute.

Data Source

The UPDATE_PERF monitor uses the SAP R/3 transaction `SM13` (Update Records) as its data source.

Metrics

Table 6-12 shows the values in the performance table returned by the monitor.

Table 6-12 UPDATE_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	ALL	Number of all VB-update tasks
2	INITIAL	Number of initial VB-update tasks
3	ERRONEOUS	Number of erroneous VB-update tasks
4	VB1	Number of update tasks having V1 executed
5	VB2	Number of update tasks having V2 executed

USER_PERF

The USER_PERF performance monitor provides important information about the number of users and user sessions per SAP client for a given SAP application server.

Type

The USER_PERF monitor is of type *snapshot*: one monitor run gathers one value set.

Frequency

It is recommended to run the monitor every five minutes.

Data source

The USER_PERF monitor reads information from the SAP transaction `SM04` (Overview of Users).

Metrics

Table 6-13 shows the values in the performance table returned by the USER_PERF monitor.

Table 6-13 USER_PERF Performance-Monitor Metrics

Order	Metric Name	Description
1	USER_CLIENT	The SAP client number associated with the users
2	USER_CNT	The number of users logged in per client
3	SESSION_CNT	The total number of user sessions per client

WLSUM_PERF

The performance monitor, WLSUM_PERF, collects the performance workload statistics for the last full hour. You can display the workload statistics for all task types, for example; dialog, background, RFC, ALE, or update. The WLSUM_PERF monitor is required and must be configured for every application server that you want to monitor.

NOTE You can use the WLSUM_PERF performance monitor to collect data previously collected by the MIB_PERF Monitor.

Type The WLSUM_PERF monitor is of type *time-frame* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency It is recommended to run the monitor hourly.

Data source The SAP R/3 transaction `ST03` (workload analysis) is used as the data source for this monitor.

Metrics Table 6-4 shows the values in the performance table returned by the WLSUM_PERF monitor.

Table 6-14 WLSUM_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	Hostname	The SAP System hostname
2	SID	The SAP System ID
3	INSTANCE	The SAP instance number, if SAP version < 4.6x
4	TASKTYPE	Type of SAP R/3 task (RFC, Dialog, etc.)
5	CNT	The number of Dialog steps
6	DBACTIVCNT	Counter for database-active dialog steps

Table 6-14 WLSUM_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
7	RESPTI	Time that elapses between a dialog sending a request to the dispatcher and receiving a response
8	CPUTI	CPU time used in the work process
9	QUEUETI	The time an unprocessed dialog step waits in the dispatcher queue for a free work process
10	LOADGENTI	Time taken loading and generating objects such as ABAP source code and screen information from the database
11	COMMITTI	Time required for commit to complete
12	DDICTI	Time required for Data Dictionary
13	QUETI	Time required for batch-input queue
14	CPICTI	Time required for RFC and CPI-C
15	ROLLINCNT	Number of roll-ins (rolled-in user contexts)
16	ROLLINTI	Processing time for roll-ins
17	ROLLOUTCNT	Number of roll-outs (rolled-out user contexts)
18	ROLLOUTTI	Processing time for roll-outs
19	READDIRCNT	Number of direct read accesses
20	READDIRTI	Time for direct read access
21	READSEQCNT	Number of sequential read attempts
22	READSEQTI	Time for sequential read accesses
23	CHNGCNT	Number of modified database accesses
24	CHNGTI	Time for modified database accesses

Table 6-14 WLSUM_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
25	BYTES	Number of bytes
26	GUITIME	Total time taken for a GUI request to be executed by the Dispatcher
27	GUICNT	Count of GUI steps
28	GUINETTIME	Time taken for the application server to respond to a request from the SAP GUI

WP_PERF

The SPI for SAP performance agent uses the WP_PERF monitor to detect performance problems when, for example:

- processes need to wait for semaphores
- processes are in *private* mode
- a dialog work-process does not return to idle after use/release

Type

The WP_PERF monitor is of type *snapshot* and does not make use of alert types or parameters. One monitor run gathers only one value set.

Frequency

It is recommended you set this monitor to run once every 15 minutes.

Data Source

The SAP R/3 transaction `SM50` (Work Process Overview) is used as the data source for this monitor.

Metrics

Table 6-15 shows the values in the performance table returned by the monitor.

Table 6-15 WP_PERF Performance Monitor Metrics

Order	Metric Name	Description
1	ALL_WP	Number of all work processes
2	SEMAPHORE_WP	Number of work processes waiting on a semaphore
3	DEBUG_WP	Number of work processes in debug mode
4	LONG_RUNNING	Number of long running dialog wp
5	PRIVAT_WP	Number of dialog `wp` in private mode
6	NOSTART_WP	Number of dialog `wp` with no restart capability
7	DIA_IDLE	Number of idle dialog work processes
8	DIA_ALL	Number of dialog work processes

Table 6-15 WP_PERF Performance Monitor Metrics (Continued)

Order	Metric Name	Description
9	DIA_RUNNING	Number of running dialog wp
10	BTC_IDLE	Number of idle batch work processes
11	BT_ALL	Number of batch work processes
12	BTC_RUNNING	Number of running batch wp
13	SPO_IDLE	Number of idle spool work processes
14	SPO_ALL	Number of spool work processes
15	SPO_RUNNING	Number of running spool wp
16	ENQ_IDLE	Number of idle enqueue work processes
17	ENQ_ALL	Number of enqueue work processes
18	ENQ_RUNNING	Number of running enqueue wp
19	UPD_IDLE	Number of idle update work processes
20	UPD_ALL	Number of update work processes
21	UPD_RUNNING	Number of running update wp
22	UPD2_IDLE	Number of idle update2 work processes
23	UPD2_ALL	Number of update2 work processes
24	UPD2_RUNNING	Number of running update2 work processes

De-installing the SAP/Performance Subagent

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

1. In the `Node Bank` window, select the managed node(s) from which the SAP/Performance agent is to be de-installed.
2. From the `Actions...` menu, select:

   `Subagents` > `Deinstall...`

   The `Deinstall Subagent` window is displayed.
3. Select the `SAP/Performance` subagent and the target nodes for de-installation.
4. Click `[OK]` to start the de-installation of the subagent package. The `swremove` command removes the subagent software from the SAP managed nodes you have selected.
5. You can find information concerning the success or the failure of the de-install operation in the following files:

   - `/var/adm/sw/swagent.log`
   - `/var/adm/sw/swremove.log`

7 The ITS Monitor

This section describes how to install, configure, and remove the ITS Monitor.

In this Section

The information in this section introduces you to the ITS Monitor sub-agent for SPI for SAP and explains how to use it to expand the performance-monitoring capability of the SPI for SAP. In this section, you will find information about he following topics:

- "What is ITS?"
- "ITS Installations"
- "The ITS Monitor"
- "Installing the ITS Monitor"
- "Verifying the ITS Monitor Installation"
- "Configuring the ITS Monitor"
- "ITS Performance Metrics"
- "ITS Service Reports"
- "ITS Performance Graphs"
- "ITS Status and Availability"
- "Removing the ITS Monitor"

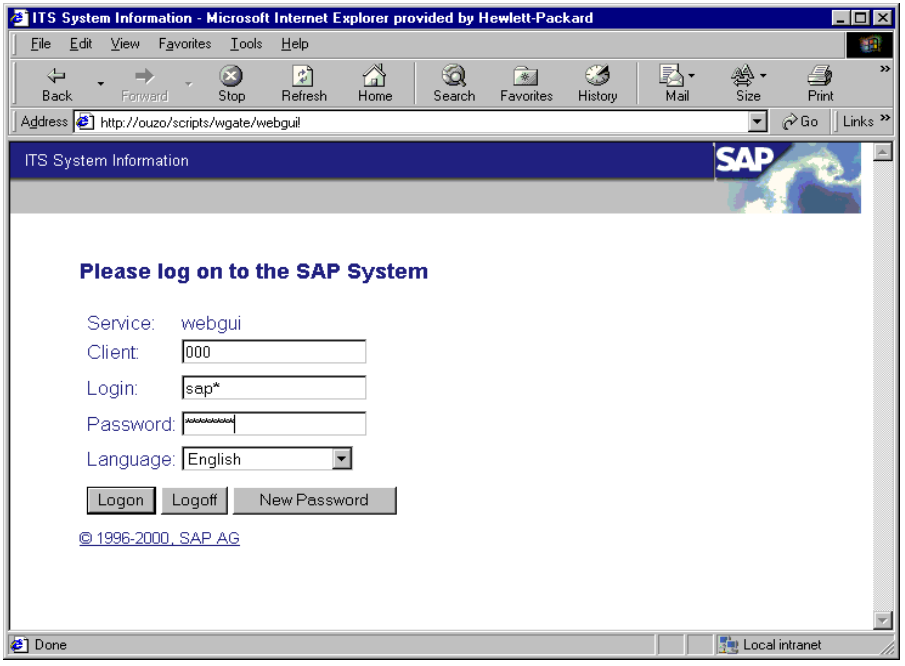
What is ITS?

The **Internet Transaction Server** (ITS) provides the SAP R/3 user with an SAP R/3 transaction interface in a web browser. With this transaction interface, the SAP R/3 user can:

- log on to the SAP R/3 System via the internet
- make requests for information by entering transactions directly in the SAP R/3 system
- immediately see the results of the transaction request in a web browser via the transaction interface provided by ITS

NOTE The SAP R/3 ITS is only available for MS Windows platforms.

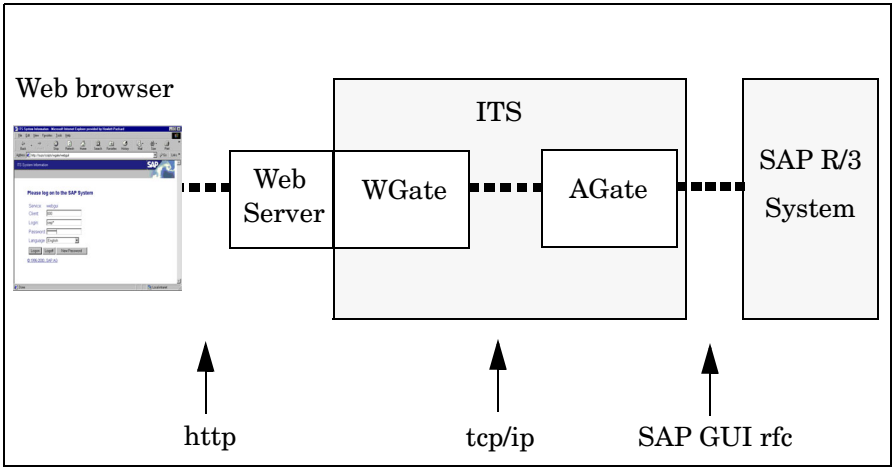
Figure 7-1 Logging in to SAP R/3 with ITS



ITS Installations

The ITS server comprises two main components, the **Application Gateway** (Agate) and the **Web Gateway** (Wgate). Both these components can be monitored by the ITS performance monitor, which is installed as part of the SPI for SAP.

Figure 7-2 **ITS Architecture**



Application Gateway

The Application Gateway links the ITS server to the SAP R/3 application server. The AGate is the core processing component of the ITS: it receives Web browser requests from the WGate and communicates with the SAP R/3 application server via either the DIAG or the RFC protocol.

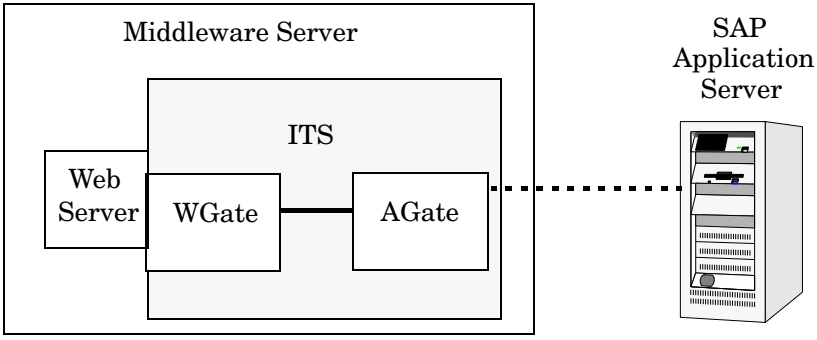
Web Gateway

The Web Gateway connects the ITS server to the Web server. The WGate component is always located on the same host as the Web server. The WGate receives requests from the Web server and then establishes a connection *with* and forwards the requests *to* the AGate.

You can either install both components of the ITS, the AGate and the WGate, on a **single-host** or on two *separate* hosts (**dual-host** installation). The single-host installation illustrated in Figure 7-3 is appropriate for test or development purposes, where small loads are

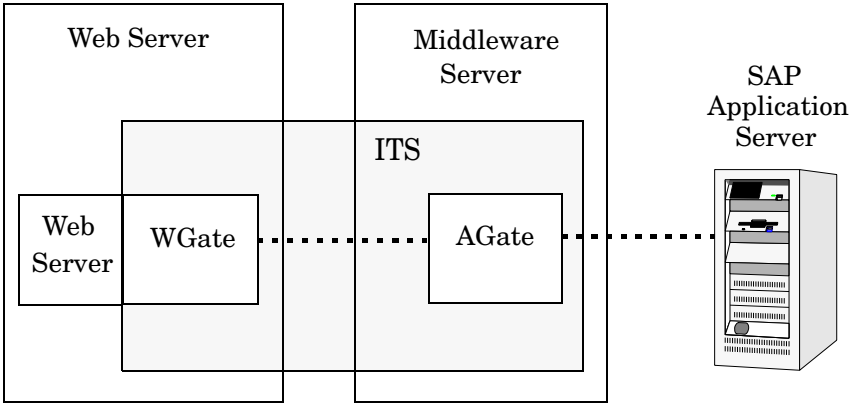
present: the dual-host configuration shown in Figure 7-4 tends to work better in a production environment, where higher loads are to be expected.

Figure 7-3 ITS Single-Host Configuration



In a dual-host installation, the Web server and the WGate run on one host, which must be connected to the client-access network (Internet or intranet) and the AGate runs on the second host, which is connected to the WGate through the TCP/IP network and handles all communication with the SAP System by means of SAP remote function calls.

Figure 7-4 ITS Dual-Host Configuration



ITS also allows the configuration of multiple AGate and WGate instances, which can share the increased load generated by large numbers of remote users logging on. The scalability feature allows individual AGate instances to communicate with multiple WGate

instances and multiple application servers, too. Similarly, to balance overall load, individual WGate instances can communicate with multiple AGate instances.

The ITS Monitor

The SPI for SAP includes a dedicated SAP ITS (Internet Transaction Server) monitor which allows you to perform the following actions:

- **check ITS availability**

  You can check the availability of the various components of the ITS server, including; AGate, WGate, and Web Server

- **pinpoint communication problems**

  You can now pinpoint communication problems between the ITS components even in an environment with multiple ITS instances and complex load sharing

- **collect important SAP ITS performance metrics**

  SAP R/3 performance metrics can be used in conjunction with other system or application performance data to identify bottlenecks and long term performance trends

- **use Agate hostname routing**

  A new entry in the `r3itsperfmon.cfg` file allows the SAP ITS monitor to handle Agate hostname routing, so that you can use an "Alias" for an AGATE hostname in order to route requests to a given ITS server instance using a machine-name alias.

- **SAP message-server support**

  The SPI for SAP ITS monitor supports the SAP message-server functionality, which is often used in a load-balancing environment, where one Agate instance can be associated with several SAP Application Servers.

The ITS Monitor collects data by parsing ITS log files and regularly sending `http` requests for specific information from the ITS server instances.

The ITS Monitor saves the data it collects along with the data collected by OpenView Performance Agent (formerly MWA) or the OVO Embedded Performance Component (CODA), or both. OpenView performance tools such as the OpenView Reporter or Performance Manager can then use

the correlated data to generate reports and graphs, which can be used to investigate problems, performance issues, and general trends relating to ITS.

The ITS Monitor allows you to monitor the following aspects of the ITS Application Gateway:

- the status of both local *and* remote AGate instances in one AGate cluster
- the status of each AGate process and AGate-process work thread
- accumulated performance data since AGate startup
- the number of user sessions
- current work-thread activity
- performance monitor

Together with OpenView Internet Services (OVIS), the `r3itsperfmon` performance monitor allows you to monitor the ITS Web Gateway, too. However, since the ITS Web Gateway's main tasks involve passing requests to and from the internet, whose performance is outside your control, the information you glean from such monitoring is probably not very useful.

Installing the ITS Monitor

The instructions in this section assume that either the OVO Embedded Performance Component (CODA) or the OpenView Performance Agent agent is already installed on all OVO managed nodes, where the ITS Monitor is required. To install the ITS Monitor on an OVO managed node, you need to perform the steps indicated below, each of which is described in more detail in the appropriate subsections that follow:

- "ITS-Monitor: Installation Pre-requisites" on page 313
- "Assigning the ITS Monitor Template" on page 314
- "Distributing the ITS Monitor Template" on page 315

ITS-Monitor: Installation Pre-requisites

Before you start the installation of the ITS Monitor, make sure that the MS Windows SAP R/3 servers on which you have chosen to install the SPI for SAP ITS Monitor meet the following requirements:

- Operating system: Windows NT 4.0, Windows 2000
- OVO agent installed and running
- either the Performance Agent agent for MS Windows or the OVO Embedded Performance Component
- SAP ITS 4.6 - 6.10
- OpenView Performance Manager (but not necessarily on the ITS server machine)
- HP OpenView Reporter (but not necessarily on the ITS server machine)
- the `dsi2ddf` wrapper utilities must be installed on the OVO Management Server

NOTE The ITS Monitor is designed to monitor the ITS Agate server. If your environment has the Agate and Wgate servers running on separate hosts, make sure the ITS Monitor is installed on the host where the Agate instance is running.

If you do not want to use the default settings for the SPI for SAP ITS Monitor, you need to select the source you want the SAP R/3 ITS to use for performance data. For more information about installation pre-requisites and selecting the performance-data source, see the *HP OpenView Smart Plug-in for SAP Installation Guide*.

Assigning the ITS Monitor Template

To assign the ITS Monitor templates to the appropriate ITS server:

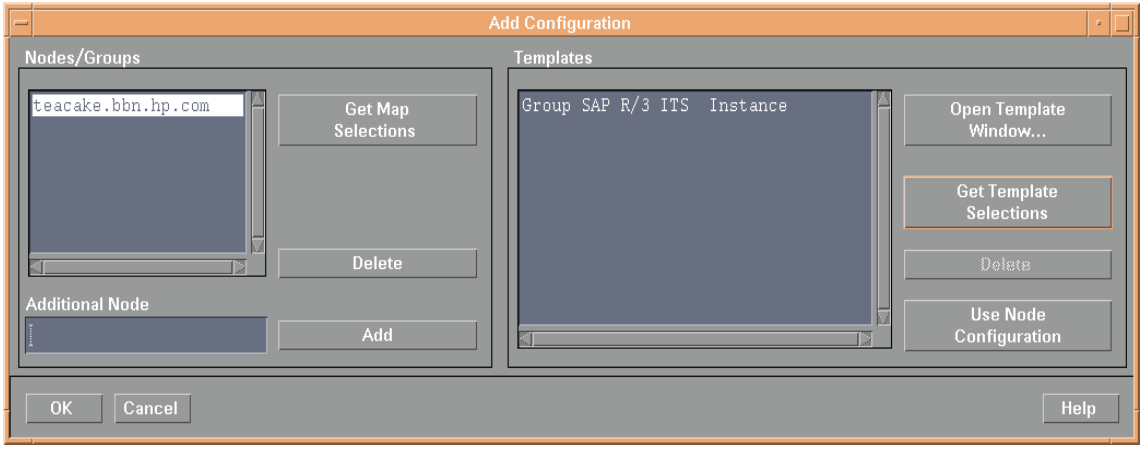
1. In the `Node Bank` window, select the SAP nodes to which you want to assign templates. Nodes selected together must:
   - all run the same SAP version—either 3.x or 4.x, and
   - have the same usage—application server or central instance.
2. From the menu bar, select the following menu option:

   `Actions:Agents -> Assign Templates...`

   The `Define Configuration` window opens.

3. Click [Add...]. The Add Configuration window opens.

Figure 7-5 Add Configuration Window



4. Click [Open Template Window]. The Message Source Templates window appears.
5. In the left pane, expand the SAP R/3 SPI template group and select the template group or groups you want to assign to the ITS server.
6. Return to the Add Configuration window illustrated in Figure 7-5 on page 315 and click [Get Template Selections].

   The newly assigned template is displayed in the Templates list.
7. Click [OK] to finish assigning the templates

Distributing the ITS Monitor Template

To distribute the ITS Monitor templates, carry out the steps in the following list:

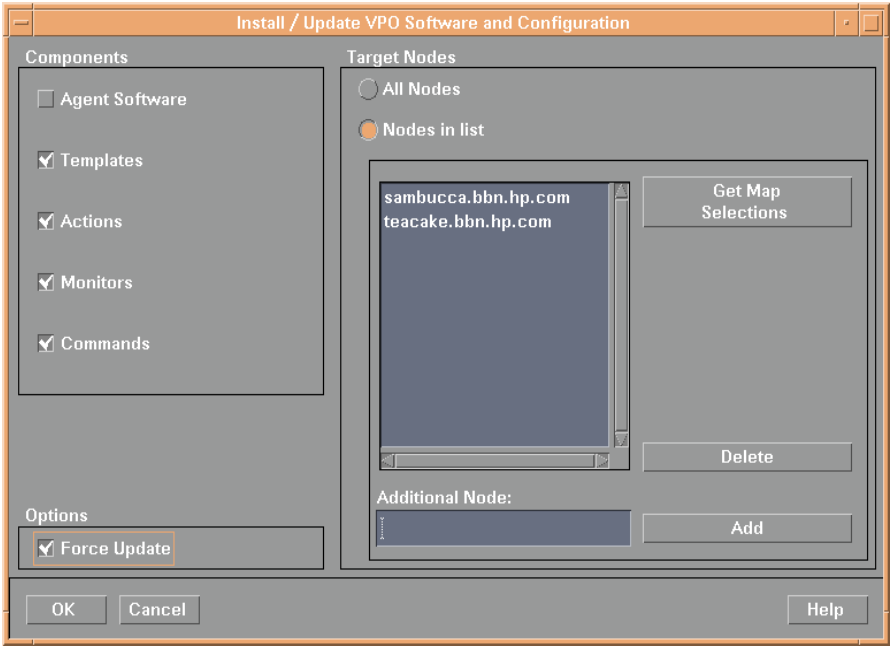
1. Select the managed nodes (the ITS servers) to which you want to distribute ITS Monitor components.
2. From the menu bar of the Node Group window, select the following menu option:

   Actions:Agents -> Install/Update SW & Config

   The Install/Update ITO Software and Configuration window appears as shown in Figure 7-6.

3. Select the components you want to distribute.
4. Select `Force Update`.
5. Click `[OK]` to finish the distribution.

Figure 7-6 Install/Update ITO Software and Configuration



Verifying the ITS Monitor Installation

This section describes how to verify that the installation of the ITS Monitor completed successfully:

1. As a first step, you can generate a report which lists template assignments for a given managed node, as follows:

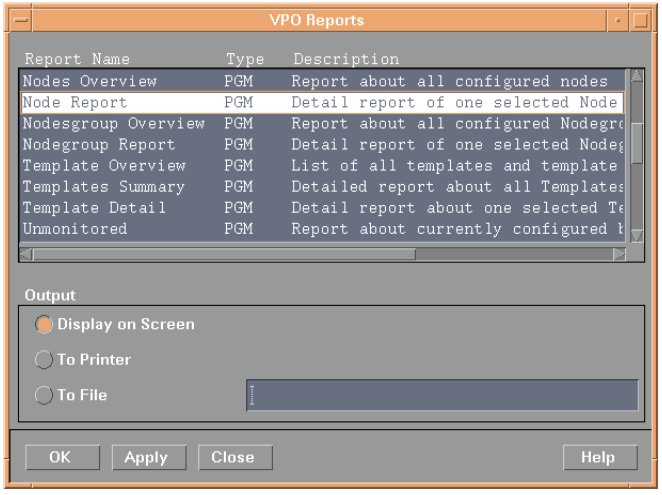
   a. In the `Node Bank` window, select the managed node(s) on which you have installed the ITS Monitor.

   b. Click the following menu option:

      `Actions -> Utilities > Reports`

   c. Select `Node Report` as illustrated in Figure 7-7.

Figure 7-7 Generating an OVO Node Report



In this case the following ITS-specific templates should be present in the list of templates which the node-specific report generates:

- `r3itsperfmon`

  monitors the performance of ITS using a wide range of pre-defined metrics

- `SAP R3 opcmsg`

  periodically polls the Web server and the SAP R/3 application servers to confirm availability

2. Next you can log in to the managed node and check that the installation of the ITS Monitor has copied the appropriate components to the correct locations. For more information about what information is copied where during the installation of the ITS Monitor, see "ITS-Monitor: File Locations" on page 324.

Configuring the ITS Monitor

This section describes how to configure the ITS Monitor. To carry out the tasks described in this section, you must have installed the ITS Monitor and, in addition, verified that the installation completed successfully as described in "Installing the ITS Monitor" on page 313 and "Verifying the ITS Monitor Installation" on page 317, respectively.

The ITS Monitor collects performance, status, and availability data from ITS by parsing the ITS instance-specific log files and using `http` requests to collect specific information from the ITS instances. For more information about the data sources which the ITS Monitor uses to collect performance information, see "ITS Performance Metrics" on page 328. This section covers the following topics:

- "ITS Monitor: Selecting the Performance-Data Source" on page 319
- "ITS-Monitor: Configuration Tasks" on page 321
- "ITS-Monitor: Default Configuration" on page 323
- "ITS-Monitor: File Locations" on page 324
- "ITS-Monitor: Configuration-File Key Words" on page 324
- "ITS-Monitor: the Command-line Interface" on page 327

ITS Monitor: Selecting the Performance-Data Source

By default, OVO for UNIX deploys the OpenView Performance Agent (previously MeasureWare) with all OVO A.07.x agents. OVO Smart Plug-ins use the OpenView Performance Agent as the default source for the performance data required for graphing in OpenView Performance Manager and OpenView Reporter. Previously installed OpenView products that use the OpenView 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 OVO Embedded Performance Component as the data source on the managed node and wish to switch to the Performance Agent. You can override the use of the OVO 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. The location of the `nocoda.opt` file on the managed node varies according to the operating system running on the OVO Management Server and managed node. Table 7-1 shows the location of the `nocoda.opt` file on nodes managed by an OVO Management Server.

Table 7-1 OVO 7.0 for UNIX Management Servers

Managed Node Operating System	Location of the nocoda.opt File
AIX	`/var/lpp/OV/conf/dsi2ddf/nocoda.opt`
HP-UX / Solaris	`/var/opt/OV/conf/dsi2ddf/nocoda.opt`
Windows	`\usr\OV\conf\dsi2ddf\nocoda.opt`

To change the default setting for the data source, open the `nocoda.opt` file in a text editor and manually enter the appropriate information using the format and syntax illustrated in Example 7-1.

To change the performance-data source:

1. **Open the nocoda.opt file**

   Open the (or create a new) nocoda.opt file in a text editor and manually enter the appropriate information using the format and syntax illustrated in Example 7-1.

2. **Specify a generic data source**

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

3. **Specify individual data sources**

   To designate Performance Agent as the agent for a data source tied to a specific SAP R/3 (or SAP R/3 ITS) instance, include a reference to each instance on a separate line of the `nocoda.opt` file, as shown in Example 7-1 and using the following format:

   `R3ITS_<Virtual_SAPITS_Instance_Name>_<SAPITS_Hostname>_DATA`

4. **Save the changes to the nocoda.opt file**

   Save the changes to the `nocoda.opt` file

5. **Restart the OVO agent**

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

Example 7-1 Example 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_ovsdsap_DEV_00_DATA
# SAP R/3 ITS hosts/instances:
R3ITS_SP6_00_ovspi_DATA
```

ITS-Monitor: Configuration Tasks

The ITS Monitor uses information in the ITS `global.srvc` configuration file to provide a default configuration automatically. However, to set up the ITS Monitor to collect performance information, you need to perform the following configuration tasks:

1. Make sure that the ITS Monitor has access to (and the necessary permissions for) the directories containing the following log files:

   `<`*`DRIVE`*`>:\Program Files\SAP\ITS\2.0\<`*`ITS_Instance_Name`*`>\logs`

2. Activate performance monitoring by means of `http` requests by setting the following keys to the value one (1) in the Registry on the ITS managed node for *each* ITS instance:

   a. Enable the command interface under:

      `HKEY_LOCAL_MACHINE\Software\SAP\ITS\2.0\<`*`ITS_instance`*`>\ \Programs\AGate\AdminEnabled`

   b. Configure performance monitoring under:

HKEY_LOCAL_MACHINE\Software\SAP\ITS\2.0\<*ITS_instance*>\CCMS\PerfMonitoring

This allows you to set a trace level (by default off=0) and view performance-monitoring data in a Web browser.

c. Restart the AGate instance(s) to activate the changes made to the registry.

Figure 7-8 Setting Registry Keys with the ITS Administrator GUI

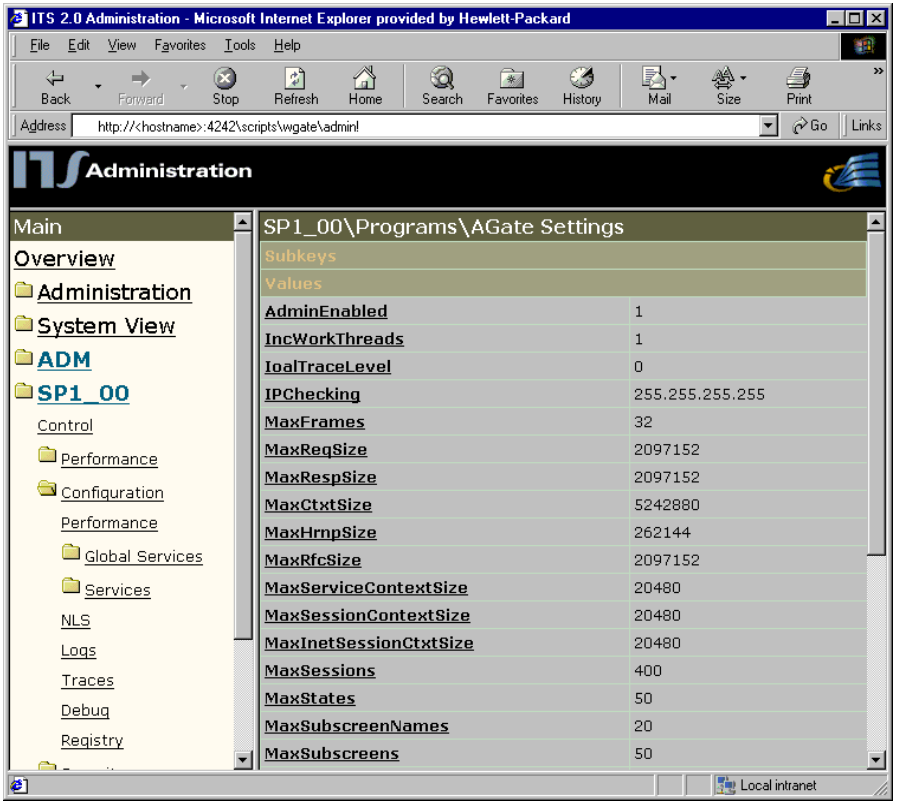


Figure 7-8 shows you how to set the appropriate SAP ITS registry keys using the ITS administrator GUI. Enter:

http://<*hostname*>:4242\scripts\wgate\admin!

ITS-Monitor: Default Configuration

The ITS Monitor stores configuration details in the file, `r3itsperfmon.cfg`. After installation, the ITS Monitor uses the default version of the configuration file shown in Example 7-2. For more information about where to find the configuration file for the ITS Monitor, see "ITS-Monitor: File Locations" on page 324.

Example 7-2 The ITS Monitor Configuration File

```
# The r3itsperfmon.cfg file
#-------------------------------------------------------------------------------
# TraceLevel hostname    Disable=0, only error messages=1
#                        info messages=2, debug messages=3
#
TraceLevel     =ALL        =0

#-------------------------------------------------------------------------------
# TraceFile  hostname    filename
#
TraceFile    =ALL        =r3itsperfmon.log

#-------------------------------------------------------------------------------
# History    hostname     path
# Path
#
HistoryPathWinNT   =ALL   =c:\usr\OV\tmp

#-------------------------------------------------------------------------------
# Datafiles location
DatafilesLocation     =ALL    =c:\rpmtools\data\datafiles

#-------------------------------------------------------------------------------
# Remote            LocalHost    RemoteHost
# Monitoring
RemoteMonitoring    =sapits2     =sapweb11
RemoteMonitoring    =sapits3     =sapweb12
RemoteMonitoring    =sapperits   =sapperweb
#-------------------------------------------------------------------------------
# PerfMon  ITS      ITS        Enable/  Webserver  Portnumber  Agate
#          hostname System ID  Disable                         Hostname
#
ITSPerfMon =ALL     =ALL       =1       =default   =default    =default

#-------------------------------------------------------------------------------
```

ITS-Monitor: File Locations

The ITS Monitor installs the configuration files it reads and the trace and log files it writes in the following location on the OVO managed node (ITS server):

`<DRIVE>:\usr\OV\bin\OpC\monitor`

Table 7-2 lists the files the `r3itsperfmon` performance monitor uses.

Table 7-2 r3itsperfmon Files

File	Description
`r3itsperfmon.exe`	Executable for the SAP R/3 ITS performance monitor
`r3itsperfmon.cfg`	Configuration file for the SAP R/3 ITS performance monitor. See Example 7-2.
`r3itsperfmon.his`	History file for storing data after each monitor run
`r3itsperfmon.log`	Log file used to store trace information when tracing is enabled

ITS-Monitor: Configuration-File Key Words

The SPI for SAP provides a default configuration for the ITS performance monitor, which is designed to work without modification immediately after installation. However, if you want to set up the ITS performance monitor for the particular demands of your SAP environment, you can modify the `r3itsperfmon.cfg` file by enabling or disabling the keywords in the following list and, where necessary, setting the appropriate parameters:

- **TraceLevel**

  The TraceLevel keyword accepts the following parameters:

  — **Hostname**:

=ALL	All SAP ITS servers being monitored by the SPI for SAP ITS Performance Monitor. This is the default setting.

=<*ITS_host*> The name of the SAP ITS server, where you want to specify a trace level. Use a new line for each individual SAP ITS Server.

— **Trace level**:

=0 Disable. This is the default setting.

=1 Log only error messages

=2 Log all messages

=3 Log only debug messages

- **TraceFile**

  The TraceFile keyword accepts the following parameters:

  — **Hostname**:

  =ALL All SAP ITS servers being monitored by the SPI for SAP ITS Performance Monitor. This is the default setting.

  =<*ITS_host*> The name of a specific SAP ITS server where tracing is enabled and where you want to specify a trace level. Use a new line for each individual SAP ITS Server.

  — **Filename**:

  `=r3itsperfmon.log` - which is the default setting or, alternatively, the name of the file to which you want to write the trace log and, if necessary, the path. For more information about the location of the `r3itsperfmon` binaries, see "ITS-Monitor: File Locations" on page 324.

- **HistoryPathWinNT**

  The HistoryPathWinNT keyword accepts the following parameters:

  — **Hostname**:

  =ALL All SAP ITS hosts monitored by the SPI for SAP. This is the default setting.

  =<*ITS_host*> The name of the SAP ITS server, where you want to specify the path to the monitor history file. Use a new line for each individual SAP ITS Server.

— **Path**:

Windows: `=default`

- **DatafilesLocation**

  The default location of the files which contain the data used by Performance Manager and OpenView Reporter:

  `c:\rpmtools\data\datafiles`

  The DatafilesLocation keyword is intended for use by the SPI for SAP Performance Agent (and not the ITS Performance Monitor) but *must* be enabled in the `r3itsperfmon.cfg` file, too.

- **ITSPerfMon**

  The the ITSPerfMon keyword appears in the ITS Performance Monitor's configuration file and *requires* a value for the following parameters:

  — **ITS Hostname**:

=ALL	All SAP ITS servers will be monitored by the SPI for SAP. This is the default setting.
=<*ITS_host*>	The host name of a specific SAP ITS server where performance monitoring is to be enabled. Use a new line for each individual SAP ITS Server.

  — **ITS System ID**:

=ALL	All SAP ITS Systems will be monitored by the SPI for SAP. This is the default setting.
=<*ITS_SID*>	The SAP ITS System ID (SID) for which performance monitoring is to be enabled, for example; "DEV". Use a new line for each individual SAP ITS SID.

  — **Enable/Disable**

=0	Disable the ITS Performance Monitor
=1	Enable the ITS Performance Monitor. This is the default setting.

— **Webserver**

=default	The name of the default ITS web server defined in ITS `global.srvc` configuration file. Used for load balancing.
=<*webserver*>	<*webserver*> is the host name of a web server other than the default defined in the ITS `global.srvc` configuration file

— **Portnumber**

=default	The *default* port number (defined in the ITS `global.srvc` configuration file) on which the SAP ITS Wgate web server is listening.
=<*nn*>	Use this option to change the port number parameter from the default defined in the ITS `global.srvc` configuration file to a specific port number <*nn*>, for example; **`6100`**.

— **Agate Hostname**

=default	The AGATE Hostname defined in the ITS configuration file `global.srvc` . This option allows you to use an “Alias” for an AGATE hostname in order to route requests to a given ITS server instance using a machine-name alias.
=<*hostname*>	<*hostname*> is the name of a machine (other than the default defined in the ITS configuration file `global.srvc`) where an AGATE instance is running. Use this option if you want to change the AGATE Hostname “Alias” from the default to a specific machine-name of your choice.

ITS-Monitor: the Command-line Interface

You can use the `\bin\r3itsperfmon` command to overwrite the default configuration for the ITS monitor. The `r3itsperfmon` command recognizes the following command-line parameters:

`r3itsperfmon -config`

ITS Performance Metrics

Table 7-3 lists the performance metrics which the SAP R/3 ITS Performance Monitor collects and uses to monitor ITS AGate instances, indicates which data source is used to collect the information required, and describes briefly what the metric information relates to.

Table 7-3 Collected Performance Metrics

Metric Name	Data Source	Description
AVBLOCKLENGTH	agateperf	Average length of a block (in bytes)
AVBLOCKSPERTRANSAC	agateperf	Average number of blocks per transaction.
AVTAT	loadstat.log	Average turn-around time for this instance (not including WGate and WWW-Server)
AVAGATETIME	agateperf	Average time taken (in millisecs) within Agate
AVAGATETIMEPERCENT	agateperf	Average time taken within Agate in milliseconds as a percentage of total AGate time
AVWEIGHT	loadstat.log	Average Weight of the Instance.The weight is an aggregate measure (from 0 to 1) that specifies how suitable a certain AGate instance is to handle further requests.
AVBROWSETIME	agateperf	Time taken to send results to Web browser via WGate and Web server / percentage of total time.

Table 7-3 Collected Performance Metrics (Continued)

Metric Name	Data Source	Description
AVBROWSETIMEPERCENT	agateperf	Time taken to send results to Web browser (via WGate and Web server) as a percentage of total browse time
AVDESTROYEDTHREADS	agateperf	Number of times a work thread has been dynamically created and destroyed during peak loads of the AGate
AVHITSPERSECOND	loadstat.log	Average number of hits per second
AVKERNELTIME	agateperf	Kernel CPU time usage in millisecs
AVR3TIME	agateperf	Time taken in milliseconds to send a request to R/3 and receive a response
AVR3TIMEPERCENT	agateperf	Time taken in milliseconds to send a request to R/3 and receive a response as a percentage of the total R/3 time
AVTOTALTIME	agateperf	Sum of: Agate time + Wait time + R3 time + Browse time
AVUSERTIME	agateperf	User CPU time usage in milliseconds
AVWAITTIME	agateperf	Average time taken by dispatcher to assign request to a work thread

Table 7-3 Collected Performance Metrics (Continued)

Metric Name	Data Source	Description
AVWAITTIMEPERCENT	agateperf	Time taken by dispatcher to assign request to a work thread as a percentage of total wait time
HOSTNAME_ITS	System Environment	Name of the ITS host
R3_APPSERVER	System environment (global.srvc config. file)	Name of the SAP R/3 application server(s) connected to the ITS host
ITS_INSTANCE_NAME	Registry	Name of the ITS instance
RUNAGATEPROCESSES	loadstat.log	Total number of running AGATE processes
TOTREADBLOCKS	agateperf	Total number of blocks sent from R/3 for all transactions.
R3_SID	System environment (global.srvc config. file)	System ID of the SAP R/3 application server(s) connected to the ITS host
TOTSESSIONSAVAIL	loadstat.log	Number of currently available sessions in the ITS instance
TOTSESSIONSMAX	loadstat.log	Maximum number of sessions an ITS instance can handle.
TOTLOGGEDINUSERS	agateusers	Total number of active users who are logged in to SAP via ITS (user sessions)

Table 7-3 Collected Performance Metrics (Continued)

Metric Name	Data Source	Description
TOTWEBTRANSAC	agateperf	Number of Web transactions executed
TOTWORKTHREADSAVAIL	loadstat.log	Total number of available (idle) work threads in the instance
TOTWORKTHREADSMAX	loadstat.log	Total maximum number of work threads of this ITS instance
WEBSERVER_ITS	System environment (global.srvc config. file)	Name of the Web server that is used for the http requests: <*hostname*>:<*portnumber*>
WORKTHRINITIAL	agatestatus	Total number of work threads in status “initial”
WORKTHREADSNOTUSED	agatestatus	Total number of work threads in status “not used”

ITS Service Reports

This section describes how to use the OpenView Reporter to examine the data collected by the ITS Monitor. For a complete list of the ITS reports available with the SPI for SAP, see Table 9-3 on page 372. This section covers the following topics:

- "ITS Service Reports: Installation Pre-requisites" on page 332
- "ITS Service Reports: Configuring the OpenView Reporter" on page 332
- "Viewing ITS Service Reports" on page 333

ITS Service Reports: Installation Pre-requisites

You will need to ensure that the following products are installed and configured before you can use the OpenView Reporter to generate and view reports relating to information collected by the ITS Monitor:

- HP OpenView Reporter
- SPI for SAP ITS Monitor Reports Snap-In

ITS Service Reports: Configuring the OpenView Reporter

The installation of the SPI for SAP service reports described in "Installing the SPI for SAP Reports" on page 362 automatically completes most of the installation and configuration of the SAP R/3 ITS service reports. However, you should:

1. **Add managed nodes to the OV Reporter**

   Check that the individual SAP ITS systems you want to monitor with the SAP R/3 ITS monitor have been added to (and discovered by) the OpenView Reporter. The OV Reporter automatically attempts to discover all the new systems you add to it. If it cannot find a node, OV Reporter will not be able to generate any reports for that node.

2. **Schedule the report generation**

   Remember to schedule a job to generate reports for the SAP R/3 ITS systems

Viewing ITS Service Reports

To view the complete list of the ITS Monitor reports, you can use one of several options:

- click the `[View Reports]` button in the OV Reporter window
- browse to the following file/directory on the OV Reporter machine, *`host.name.com`*:

  `\\<`*`host.name.com`*`>\rpmtools\Data\Webpages\reports.htm`

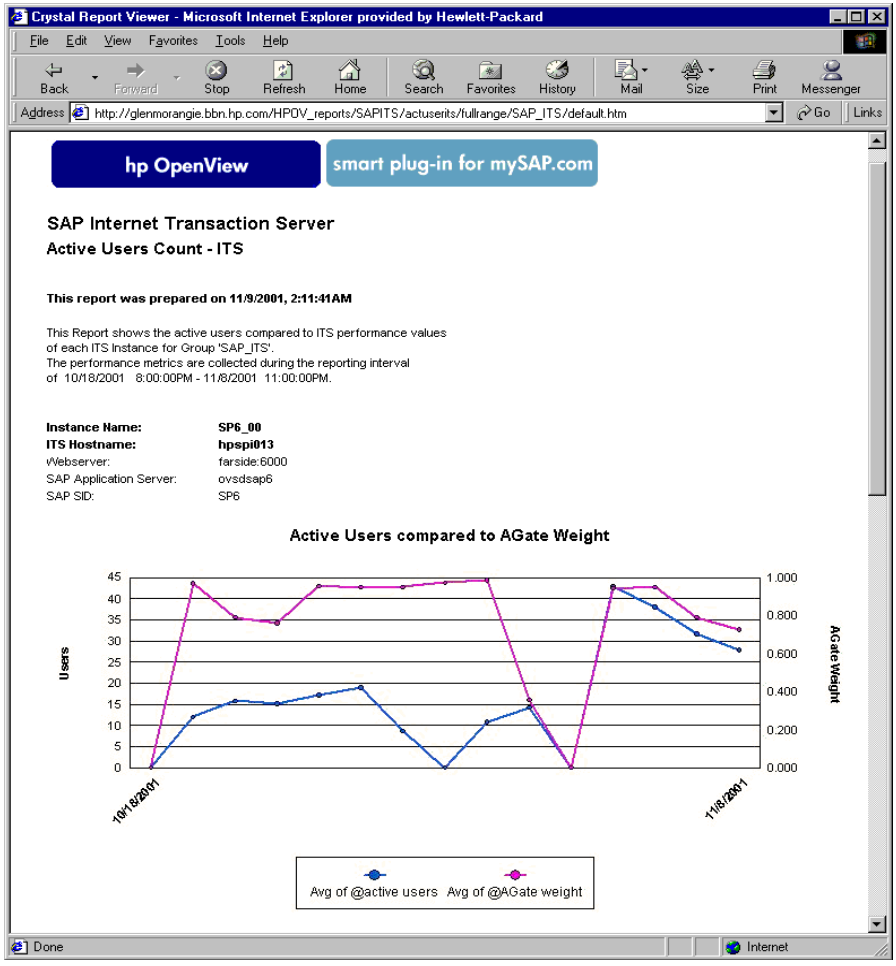
- open a (remote) Web-browser window and enter the following URL:

  `http://<`*`host.name.com`*`>/HPOV_reports/reports.htm`

  Note that this assumes that a Web server is configured on the OV Reporter machine *`host.name.com`*.

In the page that appears, browse to the group of reports that you want to examine, for example: `SAP R/3 Last Full Week`. Next, you can select an individual report from the list of reports that is displayed. Figure 7-9 shows a report about the number of active ITS users and the affect the number of users is having on the CPU load.

Figure 7-9 SAP R/3 ITS Reports



ITS Performance Graphs

This section describes how to use the OpenView Performance Manager to examine the data collected by the ITS Monitor. Note that Performance Manager can only use the OpenView Performance Agent as a data source. This section covers the following topics:

- "ITS Performance Graphs: Installation Pre-requisites" on page 335
- "ITS Performance Graphs: Configuring OpenView Performance Manager" on page 335
- "Viewing ITS Performance Graphs" on page 336

ITS Performance Graphs: Installation Pre-requisites

You will need to ensure that the following products are installed and configured before you can use the OpenView Performance Manager to view graphs using information collected by the ITS Monitor:

- OpenView Performance Manager
- OpenView Performance Agent

ITS Performance Graphs: Configuring OpenView Performance Manager

Make sure that the ITS servers and ITS instances which you want to monitor with the ITS Monitor are known to Performance Manager. If an ITS server/instance is not already configured in Performance Manager, you can add it as follows:

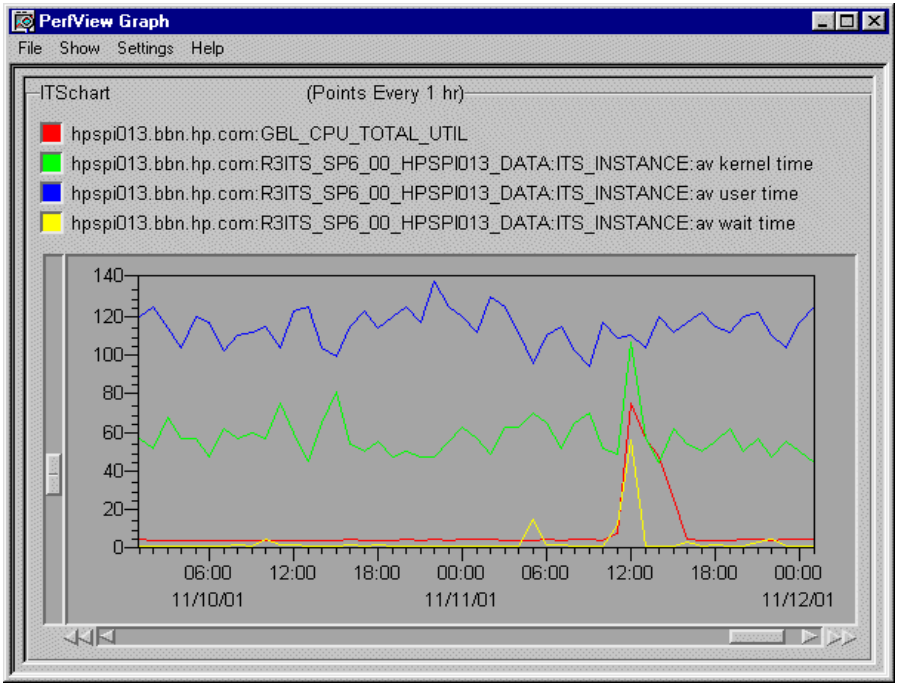
1. Open the Performance Manager window
2. Click the `[Add...]` button
3. Enter the details of the ITS server or instance and save the newly configured node

NOTE Performance Manager automatically recognizes the presence of multiple ITS instances on a given ITS server.

Viewing ITS Performance Graphs

Performance Manager is a powerful tool that allows a great deal of scope for defining customized graphs that meet the requirements of your particular environment. For example, not only can you select the ITS instance you want to examine in closer detail, and choose from a list of various metrics, you can also change many aspects of the graph, which Performance Manager draws. Figure 7-10 shows a graph that Performance Manager has drawn for the given ITS instance using the global GBL_CPU_TOTAL_UTIL metric.

Figure 7-10 ITS Metrics in Performance Manager



To use ITS data to draw a graph with Performance Manager:

1. In the list of data sources, choose the ITS instance which you want to examine in greater detail, for example:

   `R3ITS_<SID>_...`

2. Click `[Connect Sources]`

3. Choose a metric from the list of metrics displayed, for example; `AGate Processes` or `av. agate time`, and click `[OK]`.
4. In the `Metrics to be Drawn` window, click `[Draw]`.
5. You can use the `Select Metrics` window to remove unwanted metrics from the graph.

ITS Status and Availability

The ITS Monitor checks the availability of the various critical components of the ITS server, including; the Application Gateway, the Web Gateway, and the Web Server itself. The ITS Monitor also monitors the connections between the critical components in order to pinpoint potential and existing communication problems between them. This capability is particularly important in an environment which has multiple ITS instances and complex load sharing.

This section describes the messages which the ITS Monitor sends to OVO if it discovers a problem when checking the availability of SAP ITS on the managed nodes you have asked it to monitor:

- **The connection to the WGATE is down**

  The connection between the ITS Instance: <*Instance Name*> on host: <*Hostname*> and the Web server: <*Webserver-Hostname*>:<*Portnumber*> is down.

- **The connection to the SAP AppServer is down**

  The Internet Transaction Server: <*instance_name*> on host: <*Hostname*> could not connect to the SAP R/3 System <*SAP_SID*> on host <*Hostname*>

- **No ITS instance was found on the node**

  No ITS instance was found on the node.

- **The web server extension (WGate) cannot connect to the AGate process.**

  The WGate: <*Hostname:portnumber*> cannot connect to the AGAte process: <*process_number*> from the instance: <*Instance Name*> on host: <*Hostname*>.

- **Create session failed**

  The ITS instance <*Instance Name*> on host: <*Hostname*> is currently experiencing a very high load.

Removing the ITS Monitor

To remove the ITS Monitor components from the OVO managed node, you should carry out the following steps in the order specified

1. **Reassign and re*distribute* the SPI for SAP templates**

   You need to reassign and *distribute* the SPI for SAP templates to the managed node (ITS server) *without* the ITS-Monitor templates. This de-activates and removes any remaining ITS Monitor-template definitions from the managed nodes you select in the node-assignment list.

2. **Remove any ITS Monitor configuration data**

   Remove any ITS Monitor configuration data from the managed nodes, including:

   - configuration files

3. **Clean up the ITS Node Group**

   Remove the managed nodes manually from the ITS Node Group using the following menu option:

   ```
   Actions -> Agent -> Remove from this group
   ```

8 Service Views

This section describes how to install, set up, and use the service views provided with the SPI for SAP.

In this Section

The information in this section introduces you to the concept of Service Views and explains how they are used by both the SPI for SAP and OVO to provide you with information that is specifically designed to help you manage your SAP R/3 landscape in a more efficient and more convenient way. You can find detailed information about the following topics:

- "What are Service Views?" on page 343
- "Service Views in the SPI for SAP" on page 345
- "Configuring Service Views for SAP R/3" on page 350
- "Troubleshooting Service Discovery" on page 354

What are Service Views?

Service views provide you with a way of viewing the objects that make up your environment so that you can better determine the impact of current problems or predict potential problems. You can view the Service Views using the OVO 5.0 (or later) Java-based operator GUI.

NOTE You cannot use Service Views with versions of OVO earlier than 5.0.

Use the capabilities of OVO and Navigator to:

- Map messages to the services that they directly affect
- Generate a service model of your environment, which includes all relationships and dependencies between component objects
- Identify and select actions available for each object
- Define propagation rules, which can identify potential or present problems on objects and on related services

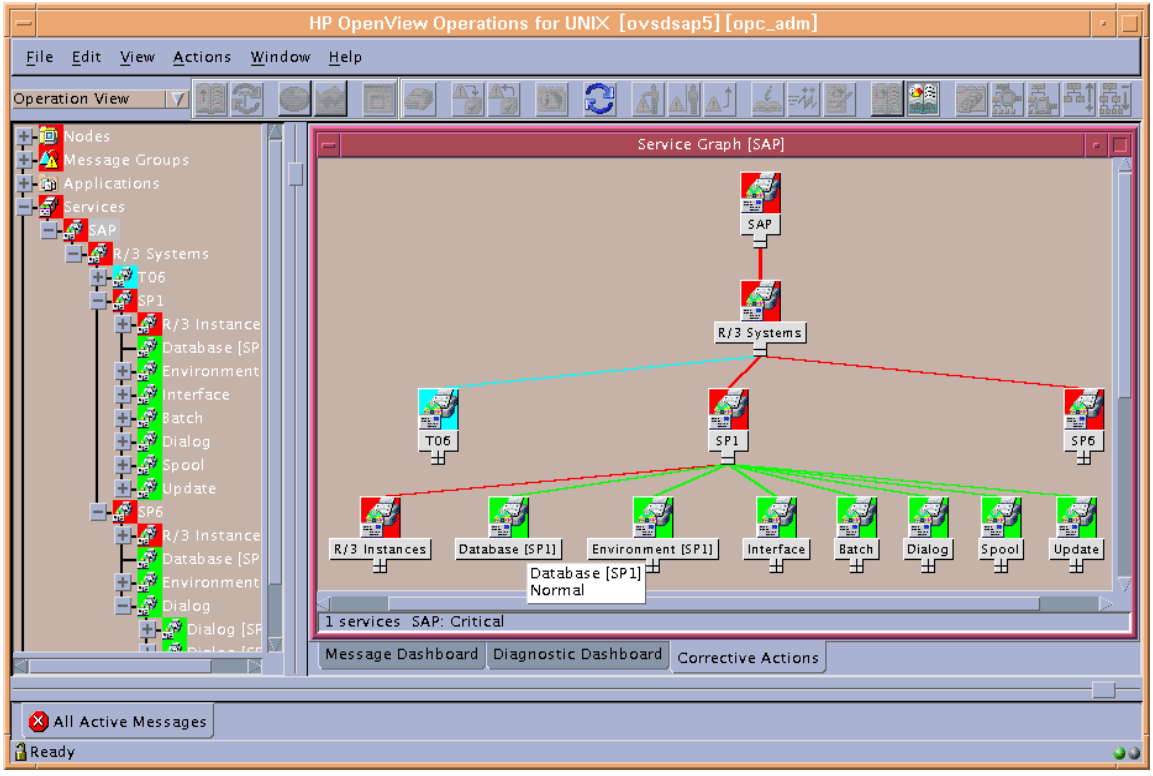
Define message-to-object mapping in the OVO message-source template by specifying a service ID. The environment model, message calculation and propagation rules, and available actions for each object are defined in the service-configuration file.

The scoping pane of the main window in the Java GUI shows discovered services in addition to the usual OVO managed nodes, Message Groups, and applications. Clicking a service expands the service's navigation tree in the scoping pane. From the tree, you can select any service or sub-service and display a service graph.

In both the navigation tree and service graph, the component services are color-coded according to status. This color-coding matches the color-coding of messages in your Message Browser, which is determined by message severity level.

For instance, a service displayed in red indicates that a condition exists that has a critical impact on that service or on a related service. The action `Get Root Cause` traces the origin of a condition that has affected the status of a selected service.

Figure 8-1 The Navigator GUI



For a detailed explanation of the concepts and implementation of Navigator, see the *HP OpenView Navigator Concepts and Configuration Guide*.

Service Views in the SPI for SAP

The SPI for SAP provides a `Service Discovery` application, which you can execute on each managed node to analyze the SAP R/3 environment and generate a service-configuration file. The service-configuration file represents all existing ownership and dependency relationships between objects on the nodes, message-propagation rules, and any actions that are available for objects. This file must be uploaded to the Navigator.

The service view reflects your individual setup. Each service view is a unique representation of the environment from which it is taken. In general, the SAP service view consists of several levels.

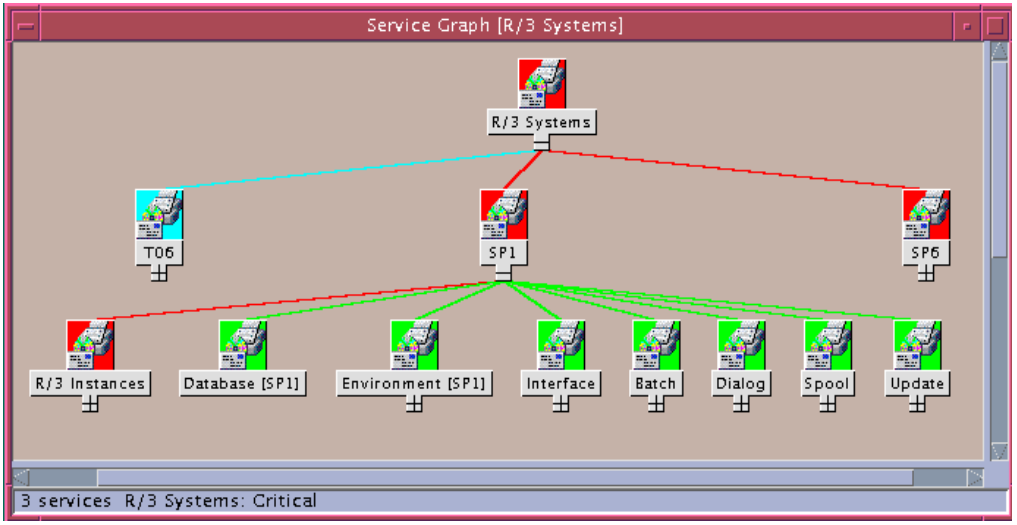
The first level is an accumulation object including all SAP R/3 systems. When you expand a first-level object, you see an object for each SAP R/3 system in your environment. The SAP R/3 Systems object changes status in response to a change of status in any of the objects that make up the instances that it contains.

The second level includes logical objects within each SAP R/3 system. Notice that none of the objects shown at this level have any messages mapped directly to them. They are logical objects, used to give a general overview of the status of the services provided by the SAP R/3 system. Expand an SAP R/3 system object to display the following logical objects:

- R/3 Instances
- Database (<*SID*>)
- Environment (<*SID*>)
- Interface
- Batch
- Dialog
- Spool
- Update

Figure 8-2 shows an example SAP R/3 service view expanded to the logical object level.

Figure 8-2 Service View of R/3 Systems

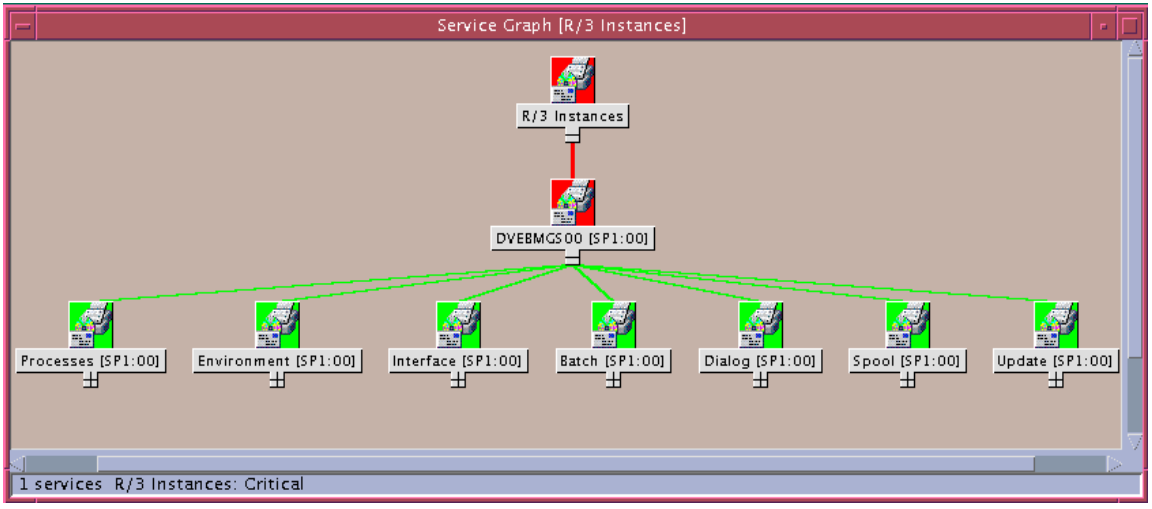


When you expand the SAP R/3 Instance object, each R/3 instance is displayed as an object in the tree. When you expand the environment object, you will see displayed three further objects:

- Operating System
- Network
- Memory Management

These objects have messages mapped to them which would then be propagated to the environment object. The other objects have **use** relationships with objects contained within the processes object; an event that affects a related process would cause a change in status in these objects.

Figure 8-3 Service View of an R/3 Instance



The processes object can be expanded to show the following objects:

- Gateway
- Message
- Dialog work process
- Batch work process
- Spool work process
- Update work process

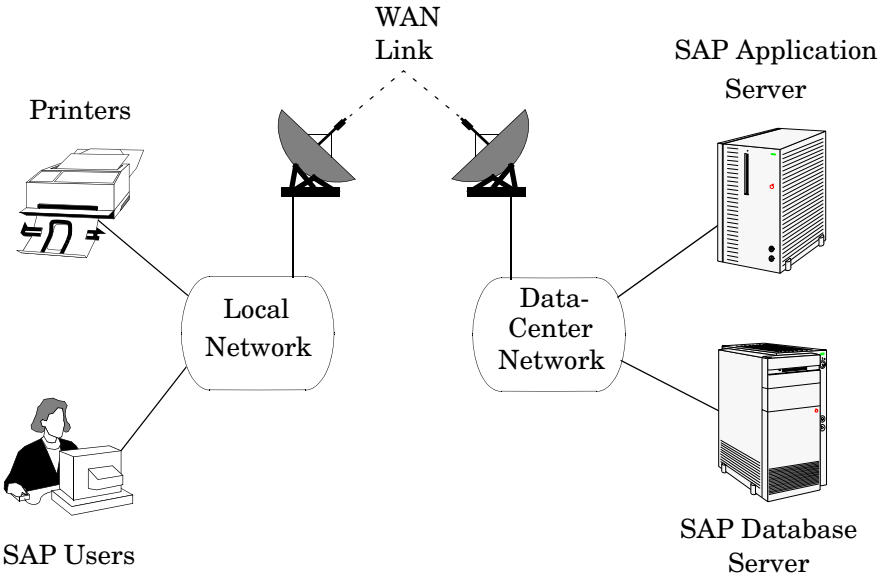
Line of Business Views

The SAP R/3 service view and the other service views available with OVO provide graphical representations of the individual areas being monitored, for example SAP R/3, a WAN or a LAN, or printer services.

Business processes are not typically confined to any one of these areas and each business process depends on the services of several areas and is specific to the customer's defined processes.

For example, for an operator to enter orders and print acknowledgments, the printer, the network, and SAP R/3 Dialog Spool Service must all be available. To monitor order entry and printing at a particular location, you could set up a view that includes the WAN, the LAN at that location, the printer being used for the order acknowledgments, and the SAP R/3 dispatch, dialog, and spooling processes for the specific SAP R/3 instance.

Figure 8-4 Service Areas Affecting Order Entry



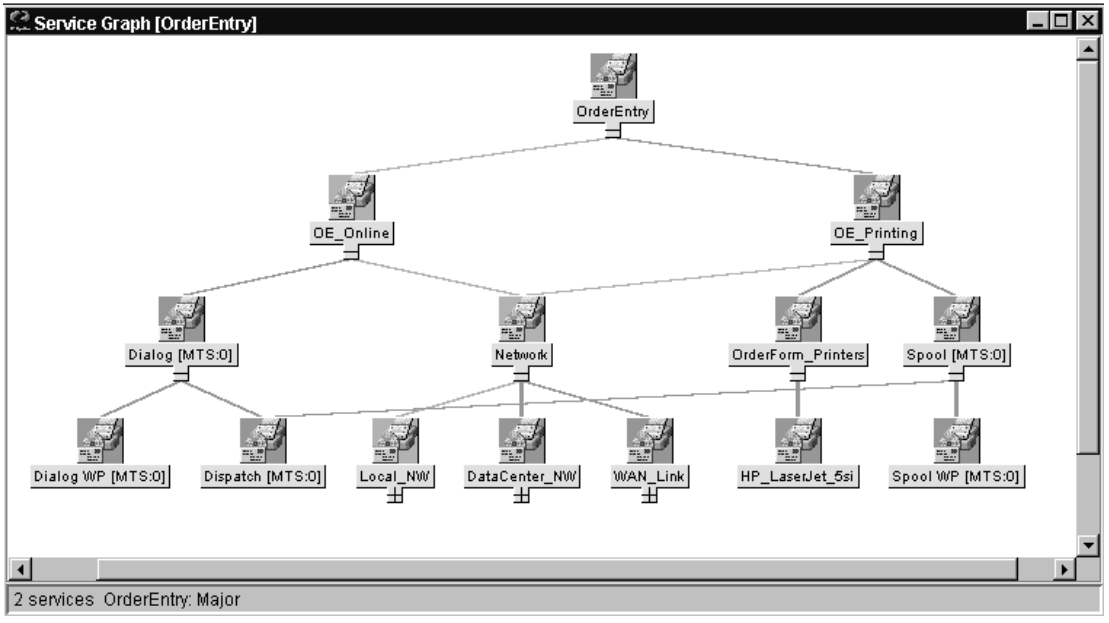
To create a line-of-business service view, you must first define the structure you want to see by generating a custom service-configuration file, in which you must define one or more logical objects (for example, Order Entry) to which messages will be propagated by the objects you include in the view.

Using the service-configuration files for the service areas you are interested in (for example, the SAP R/3 file), obtain the service names of the objects you want to include and add use references to them to your

Service Configuration file. See the *HP OpenView Service Navigator Concepts and Configuration Guide* for information on creating Service Configuration files.

Be aware that the services should only be built on top of logical (not physical) service objects. For example, use the SAP R/3 Spool-Service object in a reference but not the underlying physical objects such as `Spool Work Process`. This ensures that your customization and Business Service Views remain working, even if new releases of SAP or the SPI for SAP change the dependencies between physical components, for example as a result of architectural changes.

Figure 8-5 Line of Business View for Order Entry



Configuring Service Views for SAP R/3

In order to use the service-views feature of the SPI for SAP, you need to find out which services are running on the SAP servers you are monitoring and upload the discovered information to the OVO database, as follows:

1. **Discover the SAP services**

   Discover which SAP services need to be monitored by the SPI for SAP on each of the SAP R/3 servers.

NOTE

On OVO 6.x managed nodes, make sure that Perl 5.6 or later is installed in the default location, for example in UNIX environments; `/usr/bin/perl`. If Perl is not installed in the default location, make sure it is accessible by means of the PATH environment variable. In a Microsoft Windows environment, the Perl 5.6 interpreter is accessible through the PATH variable. Note that the Perl installation sometimes has an option to automatically add Perl to the PATH.

2. **Create a service-configuration file**

   Use the information about the discovered services to create a service-configuration file. The service-configuration file contains definitions for the services present on each SAP R/3 instance on each of the SAP R/3 servers that you want to monitor with OVO and the SPI for SAP.

   For more information, see “To create the Service Configuration file” on page 351.

3. **Upload the service-configuration file to OVO**.

   Once the discovered SAP services are known to OVO, you can use the OpenView Navigator tool (or, from OVO 5.0 onwards, the Java GUI) to display a graphical overview of the services.

   For more information, see “To Upload the Service Configuration File to OVO” on page 352.

4. **Assign SAP R/3 services to SPI for SAP operators**

   Assign the SAP R/3 services to the SPI for SAP operators who are responsible for them. In this way, the operators receive messages concerning only those services for which they are responsible.

   For more information, see "Assign the SAP Services to an OVO Operator" on page 352.

5. **Troubleshoot Service-discovery Problems** (optional)

   There are a number of ways in which you can attempt to troubleshoot problems that arise during the Service-discovery process.

   For more information, see "Troubleshooting Service Discovery" on page 354.

To create the Service Configuration file

1. Log in to OVO as `opc_adm`
2. Open the `Managed Nodes` window and the `SAP R/3 Admin` application group window
3. Select the node, nodes, or node group for which you want to generate a service configuration and drag it (or them) over the `SAP R/3 Admin` application group window and drop it (or them) onto the R/3 `Service Discovery` icon.
4. The `R/3 Service Discovery` application writes entries in the file `/var/opt/OV/tmp/SapSpiServices` for each SAP R/3 instance it discovers on each of the managed nodes selected in the previous step.

   Note that tracing is enabled by default and writes information and error messages relating to the SPI for SAP service-discovery process to the following file: `/var/opt/OV/tmp/r3sm.trace`

5. You can watch the progress of the `R/3 Service Discovery` application as it writes progress to `stdout`. Once the `R/3 Service Discovery` application completes its tasks, you can examine the contents of the `/var/opt/OV/tmp/SapSpiServiceDiscovery` file to verify that the managed nodes have all been successfully discovered. If this is not the case, and managed nodes are missing from the list of discovered nodes, see "Common SPI for SAP Problems" on page 395.

To Upload the Service Configuration File to OVO

This section describes how to upload the service-configuration file to OVO:

NOTE You do *not* need to stop the OV services to complete this task.

1. Upload the service-configuration file to OVO. On the command line, enter:

   `#/usr/bin/opcservice -add /var/opt/OV/tmp/SapSpiServices`

   ```
   Converting service file to XML ...
   Successfully added service file file:/tmp/SapSpiServices
   ```

   Note that `/usr/bin/opcservice` takes care of the conversion to XML where appropriate.

NOTE If a Navigator GUI is open, it will not immediately reflect the changes made by the `.R/3 Service Discovery` application. You must refresh the Navigator GUI to load the new configuration. To refresh the Navigator GUI, open the `View` menu and select `Reload Configuration`.

Assign the SAP Services to an OVO Operator

This section describes how to assign the configured and uploaded SAP services to the SPI for SAP operators:

NOTE You do *not* need to stop the OV services to complete this task.

1. Assign the service to an operator. Enter:

   `#/usr/bin/opcservice -assign <Operator> SAP_SPI:SAP`

   ```
   Successfully assigned services to operator <Operator>
   ```

NOTE If a Navigator GUI is open, it will not immediately reflect the changes made by the `.R/3 Service Discovery` application. You must refresh the Navigator GUI to load the new configuration. To refresh the Navigator GUI, open the `View` menu and select `Reload Configuration`.

Troubleshooting Service Discovery

In normal circumstances, the SPI for SAP discovers SAP services automatically and without any problem. However, if for any reason the information the SPI for SAP is looking for is not present in the default locations, then the service-discovery process will fail.

For example, the SPI for SAP needs to know the names of the hosts on which SAP instances are running and, in addition, the location of the SAP profile directory, which contains the SAP **default**, **instance**, and **startup** profiles. The SAP default and instance profiles are of particular interest as they contain SAP System- and Instance-specific information, which the SPI for SAP uses to determine the SAP System IDs (SID) and SAP Instance names as well as the SAP Instance numbers whose services it will attempt to discover.

In the event that the Service Discovery fails, you can use the environment variables in Table 8-1 on the managed node to help the SPI for SAP find the information it needs to discover SAP services successfully. The SPI for SAP Service discovery tool looks for the SAP profiles in the following locations:

- **UNIX** (SAP application servers)

  `/sapmnt/<SID>/profile/`

- **Microsoft Windows**

  `\\<central_instance_host>\sapmnt\<SID>\SYS\profile\`

  The `<central_instance_host>` is the name of the host on which the SAP central instance is installed. You can use the long or short hostname, the IP address of the hostname, or the UNC notation.

Table 8-1 Service-discovery Environment Variables

Environment Variable	Description
SAPOPC_SAPPROFILEDIR	the path to the location of the SAP profiles. Like the PATH environment variable, it may contain a list of directories where the profiles could reside

Table 8-1 Service-discovery Environment Variables (Continued)

Environment Variable	Description
SAPOPC_HOSTNAMES	used on managed nodes in a high-availability cluster to define the list of physical and virtual hostnames (each separated by a space) to be processed by service-discovery

9 Service Reports

This section describes how to install, set up, and use the service reports provided with the SPI for SAP.

In this Section

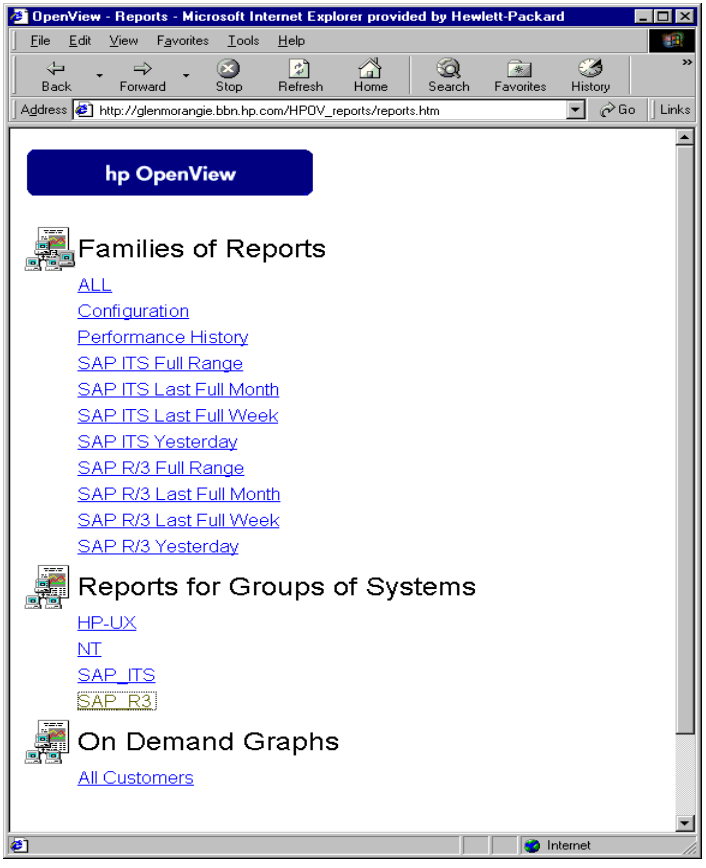
The information in this section introduces you to the concept of Service Reports and explains how you can use them in conjunction with both the SPI for SAP and OVO to provide you with information that is specifically designed to help you manage your SAP R/3 landscape in a more efficient and more convenient way. You can find detailed information about the following topics:

- "What Are Service Reports?" on page 359
- "Upgrading the SPI for SAP Reports" on page 361
- "Installing the SPI for SAP Reports" on page 362
- "Service Reports in the SPI for SAP" on page 366
- "SPI for SAP Report Metrics" on page 377
- "Removing the SPI for SAP Reports" on page 380

What Are Service Reports?

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

Figure 9-1 Service Reports Viewed on Internet Explorer



SPI for SAP service reports corollate the data extracted from either the OVO Embedded Performance Component (CODA) or the OpenView Performance Agent agent (formerly MWA). You can use the correlated data to generate reports which display short-, medium-, or long-term

views of your IT environment and supplement the detailed, real-time graphs available with Performance Manager. The combination of reports and graphs is a powerful tool for trend analysis. For example, you can:

- identify potential bottlenecks in your IT system, so that you can take action before problems become acute.
- use the information to help you to make accurate predictions for future upgrades.
- collect accurate information to be used in measuring service levels.

Upgrading the SPI for SAP Reports

This section describes what you have to do if you upgrade the SPI for SAP software and the SAP/Performance subagent and want to continue using the service-reporter functionality. For more information about upgrading the SAP/Performance subagent, which gathers performance data for the Service Reports, see "Upgrading the SAP/Performance Subagent" on page 249. For more information about upgrading the SPI for SAP itself, see the section "Upgrading the SPI for SAP" in the *HP OpenView Smart Plug-in for SAP Installation Guide*.

NOTE

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

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

   ```
   Start: Settings > Control Panel > Add/Remove Software
   ```

2. Install the new SPI for SAP reporter integration as described in "Installing the SPI for SAP Reports" on page 362.

Installing the SPI for SAP Reports

This section explains how to install the SAP R/3 service reports which come with the SPI for SAP and, in addition, provides information designed to help you prepare for the installation. The section covers the following topics:

- "Before You Begin" on page 362
- "To Install SAP R/3 Service Reports" on page 362

Before You Begin

Before you install and set-up for the SAP R/3 Service Reports, you must ensure that the following tasks have been completed:

1. **Performance Agent**

   Either the OVO Embedded Performance Component or the OpenView Performance Agent agent must be installed on all SAP R/3 managed nodes for which you want to produce service reports.

   The OpenView Performance Agent agent must also have been configured according to the instructions given in "The SPI for SAP Performance Monitors" on page 245.

2. **Service Reports**

   OV Reporter must be installed on an MS Windows NT/2000 host.

   To edit existing or create new Service Reports for the SPI for SAP, Seagate's Crystal Reports version 8.5 needs to be installed and running on the machine hosting the OpenView Reporter version A.03.50 (or later) .

To Install SAP R/3 Service Reports

The service reports for SAP R/3 are installed into the OV Reporter product as a snap-in using InstallShield on the OpenView Reporter system. During set-up you will be asked to select the common application path of OV Reporter. This is the folder into which OV Reporter is installed. The set-up routine will attempt to discover this path automatically and indicate to you what it finds. In most circumstances you should avoid changing it and accept the default settings.

The set-up copies components to the directories as summarized in Table 9-1. All directory paths are relative to the OV Reporter common application path.

Table 9-1 Locations of SAP Service Report Components

Component	Directory
Configuration files	`\newconfig\`
Installation script	`\newconfig\`
Report template files	`\data\reports\Sap\`
Executables	`\bin\`

To install the SPI for SAP Service Reports:

1. Insert the product CD and browse to the following directory:

   `\OV_REPORTER\SAPSPI_A.08.71`

   Double-click the `setup.exe` file, and select the `Complete Installation` option.

2. Follow the installation-wizard's instructions. During set-up of the SPI for SAP service reports you will be asked to confirm or specify the common application path for the OpenView Reporter. Accept the default to ensure that all automatic configuration steps are correctly executed without the need for manual re-configuration.

NOTE If you change the common application path, set-up will not be able to find its executables and will generate warning messages.

3. Set-up automatically performs the following tasks:

   - assigns two SAP-specific report groups: `SAP_R3` and `SAP_ITS`
   - assigns metric lists to the `SAP_R3` and `SAP_ITS` report groups
   - assigns group reports to the `SAP_R3` and `SAP_ITS` report groups
   - assigns system reports to the `SAP_R3` and `SAP_ITS` report groups

4. Verify that the installation of the SPI for SAP service reports completed successfully by confirming that setup created the report and metrics groups mentioned in the previous step and listed in full in "SPI for SAP Report Metrics" on page 377. The installation should look similar to the example illustrated in Figure 9-2.

5. If you choose to add your SAP R/3 and SAP ITS systems to OpenView Reporter manually, you can use the following values in the `Add System` window:

   - System: **`host.name.com`**
   - Network: **`SAP`**
   - Domain: either **`SAP`** or **`ITS`** as appropriate

   Check that your SAP R/3 and SAP ITS hosts have been added to the appropriate OpenView Reporter group, namely; SAP_R3 or SAP_ITS. Hosts are automatically assigned to a report group according to the kind of data source (SAP R/3 or SAP ITS) discovered on the monitored host.

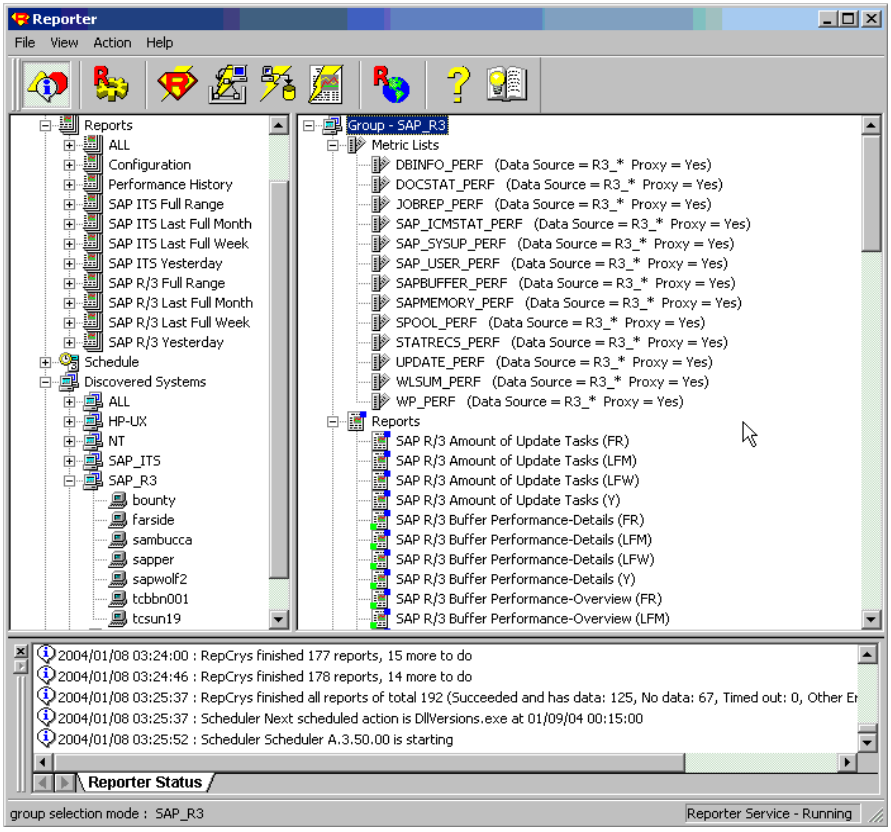
   Click `[OK]` to display the newly added systems in the OV Reporter's Details Pane.

6. Use the OV Reporter GUI to schedule the generation of the SPI for SAP reports or generate them now using the following option:

   `Actions > Run > Generate Reports`

7. After you have successfully generated the SPI for SAP reports, you can view them with any standard web browser. For more information about how to view the SPI for SAP reports, see "Viewing SPI for SAP Reports" on page 375.

Figure 9-2 SPI for SAP Reports and Metrics



Service Reports in the SPI for SAP

The Smart Plug-in for SAP includes a package of service reports that use the data collected by the OVO Embedded Performance Component (CODA) and OpenView Performance Agent (formerly MWA) to generate reports, which display vital information about the health and availability of the Systems in your SAP R/3 landscape. The reports provided in the Smart Plug-in for SAP report package cover a wide variety of system- and business-critical areas.

The information in this section describes in detail the service reports, which are supplied with the SPI for SAP. You can find information about the following topics:

- "SAP R/3 Reports" on page 367

  A complete list of all the SAP R/3-related reports provided with the SPI for SAP including the metrics used

- "SAP-ITS Service Reports" on page 372

  A complete list of all the reports for the SAP Internet Transaction Server provided with the SPI for SAP including the metrics used

- "Defining the Scope of SAP R/3 Service Reports" on page 374

  Hints to help you target more accurately the information you want to display in a report

- "Generating SPI for SAP Reports" on page 375

  Instructions for starting the generation of the SPI for SAP reports

- "Viewing SPI for SAP Reports" on page 375

  Instructions for viewing the SPI for SAP reports you have generated

The SPI for SAP service-report integration supports the remote-monitoring functionality, where SAP servers which are *not* OVO managed nodes and do *not* have the SPI for SAP software installed, are monitored remotely from an OVO managed node, where the SPI for SAP monitors are installed, configured, and running. You can generate service reports for SAP servers, which are managed remotely. For more information about remote monitoring feature, see "Remote Monitoring with the Alert Monitors" on page 30, and "Remote Performance Monitoring" on page 265.

SAP R/3 Reports

Table 9-2 lists the SAP R/3 reports available with the Smart Plug-in for SAP. You can also find in the table details about the information displayed in the reports and the individual metrics used to generate the reports. For more information about the SPI for SAP performance monitors, see "The SPI for SAP Performance Monitors" on page 277.

Table 9-2 SAP R/3 Performance Reports

Report	Purpose	Metrics
Database Performance	shows the important database performance metrics correlated together	• Physical reads/writes • Disk Physical IO • Long Table Scans • Sort Rows • Sort in Memory • Sort on Disk • Redo block Written • Redo Buffer Size
Database Quality	show important metrics, which taken together give a detailed picture of the quality of the database configuration	• Quality of data base buffer pool • Quality of Data Dictionary cache • Redo-Log faults • Buffer Pool Size • Dictionary Cache Size • Redo log buffer size • Buffer busy waits • Buffer busy wait time
E2E Time	shows the E2E Transaction Time of the configured transactions, divided into Response and Network Time	• Response Time • Network Time

Table 9-2 SAP R/3 Performance Reports (Continued)

Report	Purpose	Metrics
ICM Statistics - Overview	overview of the status of the Internet Communication Manager plus general information about queues, threads, and connections	• ICM Status • Max. number of threads • Peak number of threads • Current number of threads • Max. number of connections • Peak number of connections • Current number of connections • Max. number of queue entries • Peak number of queue entries • Current number of queue entries • Number of running work threads • Number of dead work threads • Number of processed work threads
ICM Statistics - Details	shows a much more detailed view of the status of the Internet Communication Manager including up-time and down-time periods, plus statistics for request queues, work threads, and open connections	
Job Overview	shows the number of jobs for the SAP R/3 instances in the different, specified states (running, ready, released, etc.)	Number of Jobs in the status: • Running • Ready • Scheduled • Released • Aborted • Finished

Table 9-2 SAP R/3 Performance Reports (Continued)

Report	Purpose	Metrics
Number of Spool Jobs	shows the number of Spool Jobs and Print Requests in different status	• Total Number of Spool Jobs • Number of Spool Jobs in status Archive • Number of open print Requests • Number of print Requests with errors • Number of failed print requests
Amount of Update Tasks	shows the Amount of Update Tasks	• total VB-update tasks • initial VB-update tasks • erroneous VB-update tasks • update tasks having V1 executed • update tasks having V2 executed
Work Process Overview	compares the total number of the different Work Processes with the number of in use processes	• Dialog processes/processes in Use • Batch processes/processes in Use • Spool processes/processes in Use • Update processes/processes in Use • Update2 processes/processes in Use
Document Volume	shows the total document volumes per module (BW, FA, QA, etc.) correlated with business-transaction metrics	• GUI net time • Response time • CPU time • DB Request time
Document & Lines	shows the number of documents and the lines created per document, sorted by SAP R/3 application module	• Head - generic doc. information • Detail - the average number of lines in the document. The larger the file, the longer it takes to commit to the database.

Table 9-2 SAP R/3 Performance Reports (Continued)

Report	Purpose	Metrics
Document Volume by Module	shows the volume of documents per application module	Number of documents
Workload Overview Count	shows the number of steps for all Task Types in an SAP R/3 System (Batch, Dialog, Spool, Update)	• GUI net time • Response time • CPU time • DB Request time
Workload Overview Response Time	shows the average number of steps and response time (in seconds) for each SAP R/3 instance	• CPU Time • Load Time • Queue Time • DB Read Time • DB Update Time
Workload Overview Task Type	shows the average number of steps and response time (in seconds) for each task type (e.g. AUTOABA, BCKGRD)	
Workload Overview DB Overview	shows the work-load metrics based on database activity for a defined SAP R/3 system	• Change Count • Change Time • DB Calls • DB Requests • DB Time per Req. • Read-Dir Count • Read-Dir Time • Read-Seq. Count • Read-Seq. Time • Requested Bytes
Workload Overview DB Task Type	shows the work-load metrics per task type and based on database activity for a defined SAP R/3 system	

Table 9-2 SAP R/3 Performance Reports (Continued)

Report	Purpose	Metrics
SAP R/3 Memory	SAP R/3 Memory use for the defined System	• Extended Memory • Paging Area • Roll Area
SAP R/3 Users - Overview	the number of users and user sessions per SAP client for a given SAP application server	• Average Users • Average Sessions
SAP R/3 Users - Workload	shows the load for named SAP R/3 work process of users and user sessions (per SAP client/Application Server)	• Average Users • Average Sessions • Average Response Time • CPU Time • Dialog, Update, Spool, Batch steps
SAP R/3 Users - Document Statistics	shows the document statistics per SAP R/3 module for users and user sessions (per SAP client/Application Server)	• Average Sessions • Average Users • SAP R/3 Module (FA, MM, SD, etc.)

Table 9-2 SAP R/3 Performance Reports (Continued)

Report	Purpose	Metrics
SAP R/3 Buffer Performance - Overview SAP R/3 Buffer Performance - Detailed Analysis	Shows general and detailed analyses of the use of SAP memory buffers by SAP users for a given instance and client.	• Buffer Name • Hit Ration • Allocated Size • Free Space • Free Space Percent • Max. Dir Entry • Free Dir Entry • Free Dir Entry (Percent) • Buffer Swaps • Buffer Swaps (Delta) • Database Accesses • Database Accesses (Delta)

SAP-ITS Service Reports

Table 9-3 lists the Internet-Transaction-Server (ITS) reports available with the Smart Plug-in for SAP. You can also find in the table details about the information displayed in the reports and the individual metrics used to generate the reports. For more information about the SPI for SAP performance monitors, see "The SPI for SAP Performance Monitors" on page 277.

Table 9-3 Internet Transaction Server Reports

Report	Purpose	Metrics
Availability	shows the overall availability of the ITS systems	• Up • Down • Unknown

Table 9-3 Internet Transaction Server Reports (Continued)

Report	Purpose	Metrics
Session Overview	the overall number of sessions for *all* the ITS instances (for machines in the SAP ITS reporter group)	• Max/Active/Available sessions • Hit Count • Max./Available Threads • Restarts • TAT
Sessions by Instance	shows the number of sessions for a selected ITS instance	
Active Users Overview	the overall number of users for *all* the ITS instances (for machines in the SAP ITS reporter group)	Total number of active (logged-in) users
Active Users - OS	shows the number of active users correlated with operating-system metrics	• Active (logged-in) users • CPU Load • Memory Page Rate
Active Users - ITS	the number of active users correlated with performance metrics for each ITS instance	• Active ITS users • Agate weight • Turn-around time (TAT)
Response Time Overview	shows the ITS response times	• Agate time • R3 time • Browse time • Wait time

Table 9-3 Internet Transaction Server Reports (Continued)

Report	Purpose	Metrics
Response Time by Instance	shows the response times for each selected ITS instance	• Agate time • R3 time • Browse time • Wait time • Kernel time • User time
Agate Processes	shows the total number of Agate processes running	Number of Agate processes
Transaction Data	shows the transaction information for each ITS instance	• Max. available work threads • Available Work threads • Initial Work threads • Not used Work threads
Agate Weight	Average weight of the ITS Instance.	Average AGate Weight [a]
Work thread Overview	shows the number of Work threads each ITS Instance	• Max. avail. Work threads • Available Work threads • Initial Work threads • Not used Work threads
Work thread by Instance	shows the number of Work threads each ITS instance can handle	

a. The weight is an aggregate measure (from 0 to 1) that specifies how suitable an AGate instance is to handle further requests.

Defining the Scope of SAP R/3 Service Reports

You can limit the scope of any service report by:

- specifying which systems to include. Possible values are:

  - — *all* systems
  - — a selected *group* of systems
  - — a selected *system*
- specifying the period for which report data is to be included. Possible values are:
  - — a full *range* (up to the last 180 days)
  - — last full *month*
  - — last full *week*
  - — *yesterday*

Generating SPI for SAP Reports

Use the OV Reporter GUI either to schedule the generation of the SPI for SAP reports or generate them immediately as described in this section. You should consider using the schedule option, if there are a lot of reports to be generated and the reports involve collecting and processing data from muliple SAP Systems.

If you want to generate a single report or multiple reports immediately, follow the steps described below:

1. Make sure you have completed installation and configuration steps described in "To Install SAP R/3 Service Reports" on page 362
2. Open the OV Reporter GUI
3. Use the OV Reporter GUI to start the generation of the SPI for SAP reports using the following option:

   ```
   Actions > Run > Generate Reports
   ```

Viewing SPI for SAP Reports

To view the SPI for SAP reports:

1. First, ensure that the reports have been successfully generated. For more information about generating reports, see "To Install SAP R/3 Service Reports" on page 362.
2. Open a web browser
3. Enter the following string in the location bar:

`http://<machine.name.com>/HPOV_reports/reports.htm`

4. Navigate through the displayed reports to the report, which you want to examine more closely.

SPI for SAP Report Metrics

This section lists the metrics used by the reports for SAP R/3 and SAP R/3 ITS, which are installed as part of the SPI for SAP reporter package. For more information about the metrics listed in the section below, see "The SPI for SAP Performance Monitors" on page 277. For more information about the SPI for SAP reports, see "Service Reports in the SPI for SAP" on page 366.

In this section, you can find information about the following topics:

- "SAP R/3 Report Metrics" on page 377
- "SAP ITS Report Metrics" on page 378

SAP R/3 Report Metrics

The following list shows which performance metrics are used to gather the data that is used in the preparation of the performance-related reports for the SPI for SAP.

- "DBINFO_PERF"

  This metric monitors database-performance analysis values

- "DOCSTAT_PERF"

  This metric collects the quantity-structure statistics (the document volume) for the last full hour

- "ICMSTAT_PERF"

  Monitors the status and performance of the SAP Internet Communication Manager

- "JOBREP_PERF"

  Counts the number of jobs per state (scheduled, running, etc.)

- "SAPBUFFER_PERF"

  Returns values for the use of SAP memory *buffers* for an SAP instance

- "SAPMEMORY_PERF"

  SAP memory use by SAP users for an SAP instance

- "SPOOL_PERF"

  Counts the number of spool requests in different states

- "STATRECS_PERF"

  Returns the response/net times of defined transactions

- "SYSUP_PERF"

  The status of the SAP R/3 instances

- "UPDATE_PERF"

  The number of update processes

- "USER_PERF"

  Monitors the number of users and user sessions per SAP client for a given SAP application server

- "WLSUM_PERF"

  Collects the performance-workload statistics hourly

- "WP_PERF"

  Number of users/sessions per SAP client for an SAP application server

SAP ITS Report Metrics

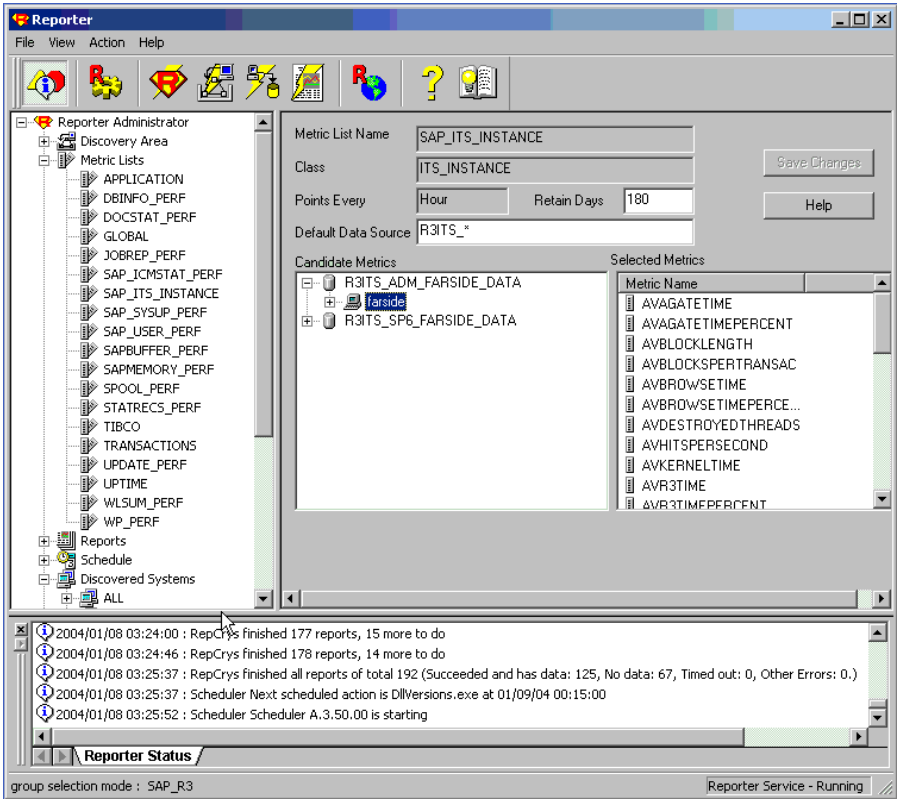
The following list shows which performance metrics are used to gather the data that is used in the preparation of the performance-related reports for the SPI for SAP's ITS Monitor:

- `SAP_ITS_INSTANCE`

  Uses the data source "R3ITS_ <*SAPITS_Instance_Name*>_ <*SAPITS_Hostname*>_DATA" to gather data relating to the named ITS instances.

For more information about the individual metrics contained in the metric list, `SAP_ITS_INSTANCE`, see "ITS Performance Metrics" on page 328.

Figure 9-3 **SAP R/3 ITS Reports Metrics**



Removing the SPI for SAP Reports

In order to completely remove the SPI for SAP reports and the integration with the OpenView Reporter, you need to perform the following steps described in this section in the order specified. This section covers the following topics:

- "To Remove OpenView Reporter Snap-in Packages" on page 380
- "To Remove the SPI for SAP from the OV Reporter System" on page 380

To Remove OpenView Reporter Snap-in Packages

Use the following instructions to help you remove the SPI for SAP snap-in package for the OpenView Reporter quickly and easily from the OpenView Reporter system:

1. In OV Reporter, browse to:

   `File > Configure > Reporter Packages`

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

   - SPI for ITS_SAP
   - SPI for SAP

3. Double-click the left arrow button `[<-]` in the `Available Packages` window located in the left pane of the `Configure Report Packages` window.

4. Click `[OK]` to finish

To Remove the SPI for SAP from the OV Reporter System

To remove the SPI for SAP binaries from the OpenView Reporter system, you need to carry out the following steps on the OpenView Reporter system as the system Administrator:

1. In the MS-Windows Start menu, browse to the following item:

`Start:Settings > Control Panel > Add/Remove Programs`

2. Select: `HP OpenView Operations Performance for Windows`
3. Highlight: `Reports for hp OpenView smart plug-in for SAP`
4. Select: `Remove`

   Follow the on-screen instructions to complete the removal process.

10 Troubleshooting the SPI for SAP

This section provides information that is designed to help troubleshoot the problems you encounter when working with the SPI for SAP.

In this Section

The information in this section helps you through the process of troubleshooting the problems you encounter in the every-day use of the SPI for SAP. You will find information about the following topics:

- "Characterizing Problems" on page 385
- "Problem Identification Procedures" on page 386
- "Common SPI for SAP Problems" on page 395

Characterizing Problems

When you encounter a problem, make a note of all associated information. This information may be useful when you proceed to the next stage of problem analysis or if external support is required and you are requested to explain the problem to service personnel:

- **Context**

  What has changed? Determine if anything has changed on your network or with the product configuration:

  — Hardware?

  — Software (including OS, OVO, and SAP R/3 patches)?

  — Files?

  — Security (file permissions)?

  — Name services?

  — Utilization?

  — In what situation does (or did) the problem occur?

- **Duration**

  How long and how often? Is the problem consistent (fails every time) or inconsistent (fails only sometimes)?

Problem Identification Procedures

This section includes descriptions of procedures that you can use to identify the root of the problem that is causing the symptoms you have noted. You will not need all these procedures for every problem you encounter, as some problems can be easily localized to a particular component of the system. However, for most problems, you will need to check one or more of the following:

- The OVO agent and OVO Management-Server installation (including patches).
- SPI for SAP installation.
- The message-source templates that are distributed to managed nodes.
- The operation of the SPI for SAP monitors on managed nodes.
- SPI for SAP access to the SAP R/3 front end.

Checking the OVO Agent Installation

You must check the following:

- the OVO agent is installed on both the managed node and the Management Server.
- which version of the OVO agent is installed

To check whether the OVO agent is installed on a managed node or the OVO Management Server, go to the command line and enter the following command:

```
swlist
```

This provides information about the installed version of the OVO agent on the managed node or the OVO Management Server where you executed the command.

You can obtain more information by stopping the OVO agent, enabling tracing, and starting the OVO agent again, as follows:

1. Enable tracing of the OVO agent.

   To enable tracing of the OVO agent, open the following file and add the entry: **`OPC_TRACE TRUE`**:

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

2. Stop the OVO agent.

   To stop the OVO agent, enter the following command:

   ```
   opcagt -stop
   ```

3. Restart the OVO agent.

   To restart the OVO agent, enter the following command:

   ```
   opcagt -start
   ```

4. Verify the information in the OVO trace file.

   To monitor the contents of the OVO trace file, enter the following command:

   ```
   tail -f /var/opt/OV/tmp/OpC/trace
   ```

Checking the OVO Server Installation

To check whether the server component is installed on the OVO Management Server, go to the command line and enter the following command:

```
swlist
```

This provides information about the installed version of theOVO server component that is installed on the Management Server.

You can obtain more information by stopping and starting the OVO agent with trace enable, as follows:

1. Enable tracing of the OVO Management Server.

   Open the following file `/opt/OV/bin/OpC/install/opcinfo` and add the entry: **`OPC_TRACE TRUE`**

2. Stop the OVO Management Server.

   Enter the following command:

   ```
   opcsv -stop
   ```

3. Restart the OVO Management Server.

   Enter the following command:

   ```
   opcsv -start
   ```

4. Verify the information in the OVO trace file.

   Enter the following command:

   ```
   tail -f /var/opt/OV/tmp/OpC/mgmt_sv/trace
   ```

Checking Installed Patches

To check whether you have the latest OVO patches installed, go to the command line and execute the following command:

```
swlist
```

The information displayed includes the patch number. To ensure that the patch has been distributed to managed nodes, you should check:

- to see which version of OVO the patch relates to, as well as
- note which version of OVO executable is on the managed node.

To check the version of an executable on a UN*X node, execute the `what` command, for example:

```
what opcgt
```

The output includes the version number.

To check the version of an executable on an MS Windows node, select and right click the executable file in Windows Explorer, choose `Properties` from the context menu, then click the `Version` tab.

Testing the SPI for SAP Installation

You can check which version of the SPI for SAP is installed on the OVO Management Server or on a UNIX managed node by checking the versions of the `r3itogui` and the SPI for SAP monitors. To find out which versions of the `r3itogui` and the SPI for SAP monitors are installed on a particular system, enter the following commands:

```
what /opt/hpitosap/bin/r3itogui
```

```
what /var/opt/OV/bin/OpC/monitor/r3mon*
```

The information displayed when you execute either of these commands includes the SPI for SAP version. For example:

```
/opt/hpitosap/bin/r3itogui:
abcglob %u.%u
HP Open View SMART Plug-In for SAP R/3 Mon Jun 7 12:30:21 METDST 1999
HP Open View SMART Plug-In for SAP R/3 Rev. 6.0 Serie 700/800 HP-UX 10.X
alxxsnmp.c 20.7 SAP 97/03/06
```

Checking the Distributed Templates

You can check which message source templates are distributed to a managed node as well as any parameters (such as polling rate) that have been set for them. To obtain this information, enter the command:

```
/opt/OV/bin/OpC/utils/opcdcode /var/opt/OV/conf/OpC/monitor
```

The following is an example of the information that is displayed for each template that is found on the node:

```
Monitor "r3monjob"
DESCRIPTION "Monitoring of SAP R/3 batch jobs
INTERVAL "15m"
MONPROG "r3monpro
MAXTHRESHOLD
GEN_BELOW_RESET
THRESHOLD 0750000
RESET 0.250000
```

Checking the Execution of Monitors on HP-UX Nodes

To check that a monitor is running correctly, you can enable tracing, start the monitor from the command line, and then view the resulting trace file.

To start a monitor with tracing enabled, enter the following command:

/var/opt/OV/bin/OpC/monitor/<*monitor*> -trace 1

where <*monitor*> is the monitor name, for example, `r3moncol`.

When the monitor has started, you can view the trace file by entering the following command:

more /var/opt/OV/bin/OpC/monitor/<*monitor*>.log

Additional trace information can be obtained for monitors that use Remote Function Calls (RFCs), by entering the following command:

more dev_rfc

This command displays the `rfc_dev` file, where you can see trace information regarding the establishment of the RFC connection, RFC-get and RFC-send data, and any RFC exceptions.

The monitors that use RFCs are:

- The batch job monitor, `r3monjob`
- The syslog monitor, `r3monxmi`

For the following monitors, there is an additional facility that allows you to validate the monitoring conditions that have been defined in the monitor configuration files:

- The CCMS alert monitor, `r3monsap`
- The process monitor, `r3monpro`
- The batch job monitor, `r3monjob`

For these monitors, you can add the switch, `-parser`, to the start monitor command, as follows:

```
/var/opt/OV/bin/OpC/monitor/<monitor> -trace 1 -parser
```

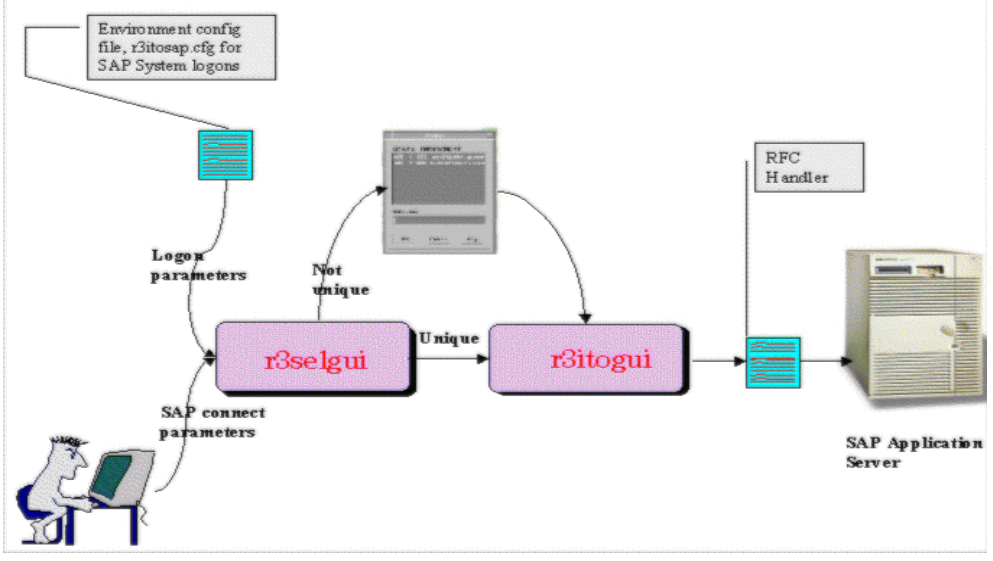
If the configuration is found to be invalid, a critical message is sent to the Message Browser. Otherwise, there is no message.

For information about configuration of SPI for SAP monitors, see "Customizing the SPI for SAP Monitors" on page 21.

Checking SPI for SAP Access to the SAP R/3 Front End

The SPI for SAP includes a number of applications and operator-initiated actions that open a SAP R/3 online session. Figure 10-1 illustrates how the connection to the SAP front end is made from the OVO desktop.

Figure 10-1 SPI for SAP Connection to the SAP R/3 Front End



You can test the connection to the SAP R/3 front end for a particular instance by starting the sapgui and the `r3selgui` executables, each with trace enabled. To do this, go to the command line on the Management Server and enter:

```
export DISPLAY =<hostname>:0.0
/opt/hpitosap/sapgui/sapgui -host<hostname> -nr \
<SAP_instance_number>
/opt/hpitosap/bin/r3selgui -exefile
/opthpitosap/bin/r3itogui -host <hostname> -trace 1
```

To view the result of the trace, enter:

```
more dev_rfc
```

This command displays the `rfc_dev` file, where you can see trace information regarding the establishment of the RFC connection, RFC get and send data, and any RFC exceptions.

Figure 10-2 illustrates the different stages in the process of communication between OVO and SAP R/3

Figure 10-2 Message Flow between OVO and SAP R/3

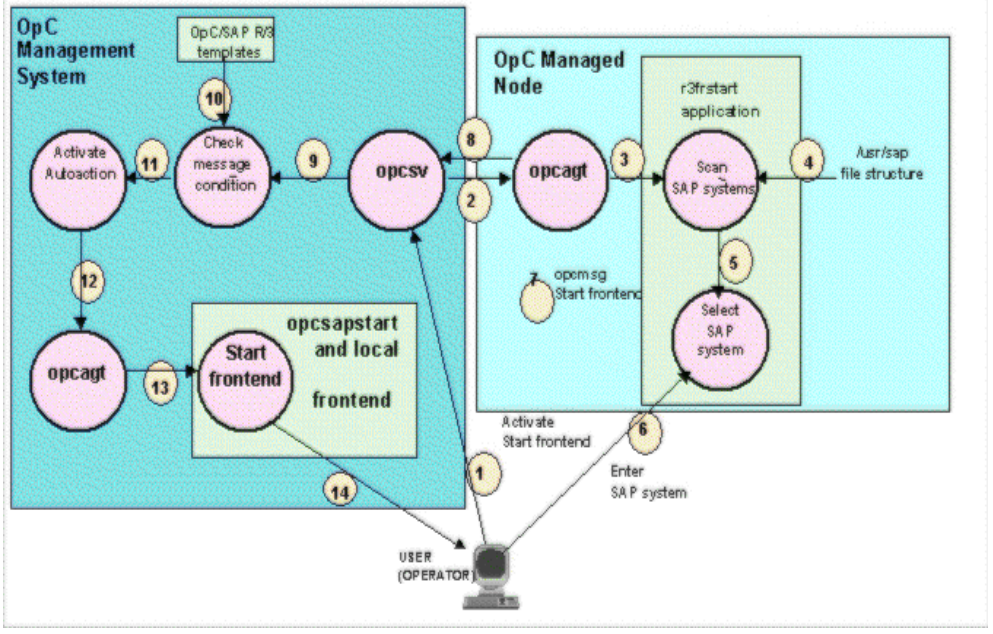


Table 10-1 summarizes the problems that can occur at different stages in this communication process, and the checks that you can make to discover the cause.

Table 10-1 Checking Communication Problems

Stages	Problem	Check
1, 2, 3	Permission problems on the managed node The action agent `opcacta` is not running on the managed node.	`rlogin` to the managed node as user `opc_op`, and try to start the `SAP R/3 Front End` application manually. Execute the command: **`opcagt -status`**
4, 5, 6	No read permissions in directory structure: `/usr/sap`	Log on to managed node: **`su opc_op`** execute: **`find /usr/sap -print`** If it is a problem with read permissions, the message "`Cannot Open`" will appear.
7, 8, 9	OVO agent or server is not running Problems with communication	On the Management Server and managed node, execute: **`opcagt -status`** On the Management Server, execute: **`opcsv -status`** Enable OVO trace mode on the managed node and the Management Server.
10, 11, 12	The message sent via `opcmsg` does not match the `r3frstart` message condition.	Check for the existence and order of the r3frstart condition in the `opcmsg` template. Check whether the message appears in the Message Browser after confirmation of the selected SAP system. In the message details, check the status of the automatic action.

Table 10-1 Checking Communication Problems (Continued)

Stages	Problem	Check
13, 14	OVO agent is not running on the Management Server. The shell script `opcsapstart` cannot be started.	On the Management Server, execute: **`opcagt -status`** On the Management Server, execute: **`/opt/hpitosap/sapgui/opcsapstart <hostname> <instance_number> <SID>`**

Common SPI for SAP Problems

SPI for SAP related problems could fall into one of the following areas:

- "SPI Product Cannot be Installed" on page 395
- "Distributing SPI for SAP Software to an MS Windows Node Aborts" on page 396
- "Configuration Files Cannot be Edited" on page 396
- "R/3 Service Discovery Fails on some Managed Nodes" on page 396
- "SAP System Up/Down Not Reported Correctly" on page 397
- "Duplicate OVO Messages in the Message Browser" on page 398
- "Duplicate CCMS Alert Messages in the Message Browser" on page 398
- "Duplicate Syslog Messages in the Message Browser" on page 398
- "Syslog Messages are not Forwarded to the Message Browser" on page 399
- "Syslog Messages are not Forwarded to the Message Browser" on page 399
- "SAP Status is not Reported" on page 399
- "Performance Monitor out of Synchronization" on page 399
- "Performance Monitor does not Work" on page 400

SPI Product Cannot be Installed

- Check which Management Server components or managed node components cannot be installed.
- Check whether installation prerequisites have been met (both for the Management Server and managed nodes). See the *HP OpenView Smart Plug-in for SAP Installation Guide*.
- Verify if the installation steps have been correctly executed. See the *HP OpenView Smart Plug-in for SAP Installation Guide*.
- Verify that the product has already been installed (either on console or managed node).

Distributing SPI for SAP Software to an MS Windows Node Aborts

This is caused by a sharing violation in the following directory:

`\usr\OV\bin\OpC\intel\monitor\cmds`

You must ensure that no other process is using this directory on the node. To do this, close the MS Windows Explorer and the command shell on the managed node to which you want to distribute the SPI for SAP software.

Configuration Files Cannot be Edited

If you get an error message when you try to edit a configuration file using one of the applications in the `SAP R/3 Admin` or `SAP R/3 Admin Local` groups, this is probably because you have not distributed the SPI for SAP software components to the Management Server and nodes. See the *HP OpenView Smart Plug-in for SAP Installation Guide*.

R/3 Service Discovery Fails on some Managed Nodes

If the `R/3 Service Discovery` application fails to collect the information it needs for a given host, the host will not appear in the SPI for SAP service tree. However, you add the missing information by hand and create the `SapSpiServices` file as follows:

1. For each managed SAP node whose service-discovery information is missing from the `SapSpiServiceDiscovery` file, log into the managed node and execute the following command. Enter:

   `/var/opt/OV/bin/OpC/cmds/r3sd`

   The `r3sd` command writes the information you need to `stdout`. The result should be similar to the example shown in Example 10-1.

Example 10-1 Example Output of the r3sd Command

```
{
[R3Instance]
Hostname=sapper
HostnameGUID=
SystemName=AST
InstanceName=DVEBMGS00
Number=0
```

```
Release=40B
DBName=AST
DBHostname=sapper
Process=Dialog
Process=Update
Process=Enqueue
Process=Batch
Process=Message
Process=Gateway
Process=Spool
}
```

2. For *each* managed node not *automatically* discovered by the `R3 Service Discovery` command, copy the output of the `r3sd` command (including opening and closing curly brackets {}) into the following file on the OVO Management Server:

   `var/opt/OV/tmp/SapSpiServiceDiscovery`

3. On the OVO Management Server, execute the following command. Enter:

   `/opt/hpitosap/bin/r3sm -file \`
   `/var/opt/OV/tmp/SapSpiServiceDiscovery`

   If the program completes successfully, `r3sm` creates the following file, containing the SPI for SAP service tree, which you then upload to OVO, as described in "To Upload the Service Configuration File to OVO" on page 352:

   `/var/opt/OV/tmp/SapSpiServices`

SAP System Up/Down Not Reported Correctly

The symptom of this problem is that a message, reporting that the `r3monup.his` file cannot be accessed, appears in the Message Browser after each run of the `r3monsap` monitor. It is normal for this message to appear on the first run of the monitor, as the file is created by the `r3moncol` alert-collector monitor on its first run.

If the message continues to appear, this is probably because the monitor is failing to log on to the SAP R/3 system. You should check the environment configuration file (`r3itosap.cfg`) and ensure that the log-on information has been correctly set up.

Note that the SPI for SAP now uses the `r3status` monitor to check the status of SAP R/3. The `r3status` monitor is able to distinguish between the following states:

- a host that is *un*reachable
- a host that is reachable but whose SAP Systems are not available
- a host that is reachable and the SAP Systems are available, but where the specified SAP user could not log in

Duplicate OVO Messages in the Message Browser

You have not suppressed SAP-related messages in the standard OVO `opcmsg` template. The SPI for SAP has its own `opcmsg` template which is installed on managed nodes in parallel with the standard opcmsg template. If SAP-related messages are not suppressed in the standard template, some conditions will be reported by both templates. See the *HP OpenView Smart Plug-in for SAP Installation Guide*.

Duplicate CCMS Alert Messages in the Message Browser

CCMS alert monitoring of SAP R/3 versions 4.0 and later is covered by a combination of the `r3monsap` and `r3monal` monitors. To avoid duplication, alert conditions that are being identified by the `r3monal` monitor must be disabled in the `r3monsap` monitor. Currently, only database alerts are not covered by the `r3monal` monitor, so all alerts other than database alerts should be disabled in the `r3monsap` configuration file.

Duplicate Syslog Messages in the Message Browser

There are three monitors than can forward syslog messages to the Message Browser. These are:

- `r3monxmi`
- `r3monal`
- `r3monsap`

The r3monxmi monitor obtains syslog messages directly from the SAP R/3 syslog, not via syslog alerts in the CCMS alert monitor. If you are using this monitor, disable syslog messages in the SAP R/3 CCMS alert monitor and in the SPI for SAP r3monal and r3monsap configuration files.

Syslog Messages are not Forwarded to the Message Browser

If you are using the r3monsap monitor to forward syslog messages, there can be only one unacknowledged syslog message in the Message Browser. Syslog messages generated in the time between the arrival of a syslog message and its acknowledgement are lost.

To avoid losing syslog messages you can either

- use the r3monxmi syslog monitor which allows multiple unacknowledged syslog messages.

  or

- set the option in the r3monsap.cfg configuration file to automatically acknowledge all syslog messages before they are sent.

SAP Status is not Reported

When attempting to determine the status of SAP instances running on Unix systems the RFC call can occasionally hang and fail to return any information. This is due to a bug in an SAP library. In addition, if the SAP GUI cannot connect to the SAP System whose status the r3status monitor is attempting to check, then it could be that the RFC call is simply hanging.

Performance Monitor out of Synchronization

The performance monitor has problems with synchronization if it is not able to complete all its scheduled tasks in the allowed time between each monitor run. To troubleshoot scheduler-synchronization problems:

1. **Check the Polling Interval**

   Check that the polling interval for the individual r3perfagent monitors has not been changed in the r3perfagent.cfg file to a value that is too small. You can define the polling interval for

individual monitors in the “Polling Interval” column of the `r3perfagent.cfg` file. For more information, see “The Performance-Monitor Scheduler” on page 267.

2. **Disable Remote Monitoring**

   If you have enabled remote monitoring for the `r3perfagent` Performance Monitor, network problems could mean that requests for information from the remote server are not being answered in a timely fashion. Try disabling remote monitoring for a short while to test whether or not this is the reason the `r3perfagent` Performance Monitor is having. You can do this for one individual remote host, or all (if there are more than one). For more information about remote monitoring with the SPI for SAP Performance Monitor, see “Remote Performance Monitoring” on page 265.

Performance Monitor does not Work

If you change the SAP user name/password which the SPI for SAP uses to log in to SAP, you need to make sure that the changes are reflected in the `r3itosap.cfg` and, in addition, that the SPI for SAP components which use the information in the `r3itosap.cfg` are restarted in order to make them aware of the changes.

This is particularly important for the SPI for SAP’s SAP/Performance subagent, which reads the SAP log-in information in the `r3itosap.cfg` *once only*, on startup, and will not start if it cannot log in to SAP. In addition, SAP itself has a security mechanism which prevents further logins from a user who has already tried and failed to login a given number of times. For more information, see “Managing the SAP/Performance Subagent” on page 274.

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