

HP Operations Manager for UNIX Smart Plug-in for Remedy Action Request System

Administrator's Reference

Software Version 4.01

For UNIX operating systems



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Support

Please visit the HP Operations Manager for UNIX web site at:

<http://www.hp.com/managementsoftware/support/>

This web site provides contact information and details about the products, services, and support that HP Operations Manager for UNIX offers.

HP Operations Manager for UNIX online software support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valuable support customer, you can benefit by using the support site to:

- Search for knowledge documents of interest
- Submit enhancement requests online
- Download software patches
- Submit and track progress on support cases
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- Enter discussions with other software customers
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Most of the support areas require that you register as an HP Passport user and log in. To find more information about access levels, go to the following URL:

http://h20230.www2.hp.com/new_access_levels.jsp

To register for an HP Passport ID, go to the following URL:

<http://h20229.www2.hp.com/passport-registration.html>

1 SPI for Remedy ARS Online Help

This section describes what you can find in the online help for the Smart Plug-in for Remedy Action Request System.

In this Section

The on-line help for the Smart Plug-in for Remedy Action Request System provides all the information you need to install and use the SPI for Remedy ARS to manage and monitor your Remedy ARS environment from a central location. In the on-line Help, you will find information about the following topics:

- [“Introducing the SPI for Remedy ARS”](#)

This section introduces the SPI for Remedy ARS software and helps you to understand the basic concepts and functionality of both HPOM and Remedy ARS.

- [“Installing the SPI for Remedy ARS”](#)

This section describes how to install and, if necessary, upgrade the SPI for Remedy ARS.

- [“Getting Started”](#)

This section describes how to configure the SPI for Remedy ARS.

- [“Using the SPI for Remedy ARS”](#)

This section describes the SPI for Remedy ARS interface that you will use in the performance of your every-day tasks.

- [“Customizing the SPI for Remedy ARS”](#)

This section describes how to customize the SPI for Remedy ARS to suit the demands of your environment.

- [“Troubleshooting the SPI for Remedy ARS”](#)

This section describes how to go about troubleshooting the SPI for Remedy ARS.

- [“De-installing the SPI for Remedy ARS”](#)

This section describes how to de-install the SPI for Remedy ARS software from the systems on which you have installed it.

In this Section

This section introduces the HP Operations Manager for UNIX Smart Plug-in for Remedy Action Request System software. The section covers the following areas:

- “Overview of the SPI for Remedy ARS”
- “Understanding HP Operations Manager for UNIX”
- “Understanding the Action-Request System”
- “The Functionality of the SPI for Remedy ARS”
- “The SPI for Remedy ARS Architecture”

Overview of the SPI for Remedy ARS

The Smart Plug-in for Remedy Action Request System (SPI for Remedy ARS) enables you to integrate HP Operations Manager for UNIX (HPOM) with the Remedy Action Request System (ARS).

Figure 2-1 Integration between HPOM and an Action-Request System

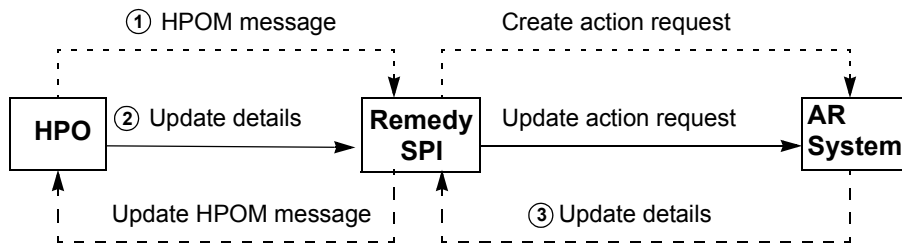


Figure 2-1 gives an overview of how the SPI for Remedy ARS integrates HPOM and an action-request system. It shows that:

1. The SPI for Remedy ARS accepts messages from HPOM, then forwards the HPOM message to the action-request system. This creates a new action request which corresponds to the HPOM message.
2. If an HPOM message is modified, the SPI for Remedy ARS updates the action request.
3. If an action request is modified, the SPI for Remedy ARS updates the HPOM message details.

For example, if HPOM receives a message about a printer failure, the SPI for Remedy ARS uses this message to create a new action request in the action-request system. A help desk user sees the new action request and assigns it to an engineer. The engineer adds information to the action request, and the SPI for Remedy ARS changes the HPOM message as appropriate. After the engineer repairs the printer, they update the status of the action request. The SPI for Remedy ARS then changes the status of the message in HPOM.

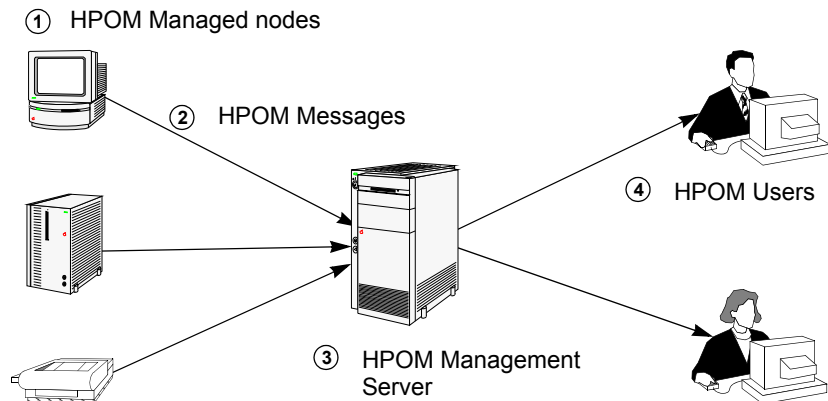
The rest of this chapter describes the SPI for Remedy ARS's functionality and architecture in more detail.

Understanding HP Operations Manager for UNIX

This section gives a brief overview of the HP Operations Manager for UNIX (HPOM) features that are important for the SPI for Remedy ARS. For more detailed information about HPOM, see the *HP Operations Concepts Guide*. This section contains information on the following topics:

- “Messages”
- “Message Management”
- “Actions”

Figure 2-2 Overview of HPOM



Messages

Figure 2-2 gives an overview of HPOM. It shows the following:

1. HPOM can monitor and control remote systems, known as managed nodes.
2. If a particular status or event occurs on a managed node, the HPOM agent sends a message to a management server. The messages contain structured information about the managed node and the problem that has been identified.

3. The management server receives messages from managed nodes.
4. Users can see messages for message groups and managed nodes that they are responsible for.

For example, an automatic backup fails because of a disk error. This generates an error message for the message group “Backup”. The HPOM agent on the managed node sends to the management server. The management server receives the message. Users with access to the both the Backup message group and the managed node can then see details of the backup failure.

Message Management

When users receive a message, HPOM enables them to work on it in the following different ways:

- Take *ownership* of a message:
Taking ownership of a message prevents other users working on the message and shows that the new owner is aware of the message and intends to deal with it personally.
- Add *annotations* to a message:
The user can attach notes to a message; the notes provide helpful information. For example, a message annotation could describe how a user fixed the problem to which the message related so that identical or similar messages may be dealt with more efficiently in the future.
- *Acknowledge* a message.
The user can move a message to the history database. This usually happens when work on this message is complete.

Actions

Figure 2-2 shows how messages enable HPOM to monitor managed nodes. At each stage, an action can be started in response to the information in the message. An action can be started on:

- the managed node where the message originated as soon as the problem is discovered (automatic action)
- the management server when a message arrives (automatic action)

- the user when they see the message (operator-initiated action)

An action can be a command, a program, a shell script, or any other appropriate response to the problem to which the message relates. The action usually attempts to solve the problem to which the message relates or provide more details about it.

For example, when the management server receives a message about a backup failure, the management server may start an automatic action that performs the backup on a different disk. Additionally, when the user sees the message, they may identify the cause of the failure and start an operator-initiated action to correct it.

Understanding the Action-Request System

This section gives a brief overview of the main features of the Remedy Action-Request System (ARS) that are important in the context of the SPI for Remedy ARS. The sections describe the following areas:

- “The ARS Work Flow”
- “The Action-Request Form”

The ARS Work Flow

The Remedy Action Request System allows users to work on a database containing so-called **Action Requests—Trouble Tickets** in HPOM terminology. Typically, these action requests (AR) are created either by users who encounter a problem during the performance of their every-day work or by first-line support people, who receive reports of problems by means of other channels such as phone or e-mail.

An actionrequest is essentially a description of a problem. The problem description contains all available information such as; problem category, affected components, the type of problem, a serial number, the people the problem affects, the person who submitted the action request, and so on. One of the major features of ARS is the flexibility the user is allowed in the design of the structure of the AR. The structure of an action request is defined in so-called **form (schema in previous versions)**. A form consists of a set of fields, which hold the individual pieces of information which, brought together, provide a comprehensive description of a problem. Clearly, each action request created from the same form contains the same set of fields. However, a user can adapt a form to suit the demands of a particular environment by defining the set of fields needed to hold all the necessary information.

After an action request has been created, it resides in the action-request system’s database as a **problem report**. As soon as the problem itself has been solved, for example by an external action, the corresponding problem report can be deleted. However, you can choose to keep for future reference all the additional notes and general information which were added by the support people who worked on the problem—in case the same, or a similar, problem occurs again.

The Action-Request Form

The action-request system enables users to work on a database of action requests. Each action request usually contains details of a problem that needs attention. For example, an action request may contain details of a printer failure. This section also explains the following related concepts:

- “Action-Request Filters” on page 23
- “AR Active Links” on page 23

Figure 2-3 shows a simple action-request system form. A form consists of fields that can contain single items of information. Together, the fields in a form define the structure of one type of action request.

Figure 2-3 A Simple Action-Request Schema

The screenshot shows a web-based form titled "Problem Report System" within a window titled "Submit Window -- Problem Report (sdwin95)". The form is organized into several sections:

- Case Information:** Includes text input fields for "Case ID", "Created By", and "Created On".
- Status:** A group box containing five radio buttons: "New" (selected), "Assigned", "Fixed", "Rejected", and "Closed".
- Assigned To:** A text input field.
- Impact:** A dropdown menu currently showing "Unknown" with a downward arrow.
- Modification History:** Includes text input fields for "Last Modified By" and "Modified On".
- Machine/Device Information:** Includes text input fields for "Machine Name" and "Application/Device", each with a small icon to its right.
- Description:** Includes text input fields for "Short Description" and "Description", each with a small icon to its right.
- Work Log:** A large text area for "Work Log" with a small icon to its right.

The action-request system enables an organization to design forms that meet its own needs. The organization is responsible for deciding what forms they need and what fields the forms have. Important for this SPI for Remedy ARS is that:

- each form has a unique name.
- each field within a form has a unique identifier.
- each field within a form has a distinct data type, for example:
 - character
 - diary
 - date/time

If forms exist, they enable users to create, view, and modify action requests. For example, if an organization’s help desk uses the action-request system and someone calls the help desk to report a problem, the user can enter details into the appropriate form. The act of entering the details creates a new action request. After someone solves the problem, the form may be used to update the status of the action request, for example: to add details of the cause of the problem and any helpful hints about how the problem was solved.

Action-Request Filters

A **filter** is defined in ARS as any action or group of actions carried out by ARS on the action-request server system. As requests are made to the database, filters are applied, for example, to check values in the fields of forms that have been completed and submitted. You can configure the automatic trigger of actions depending on the result of the filter.

The SPI for Remedy ARS uses the action-request filter mechanism to trigger communication between the ARS and HP Operations Manager for UNIX. The SPI for Remedy ARS client, which resides on the action-request server is registered as a filter and configured to react to events such as *modify* and *delete*. In this way, changes to action-request forms that are of interest to HPOM can trigger automatic updates in the HPOM database via the SPI for Remedy ARS. The SPI for Remedy ARS keeps a constant watch on these changes and ensures that the two databases are kept in constant synchronization. For more information on filters, see [“ARS Filters and Active Links” on page 148](#).

AR Active Links

An **active link** is defined in ARS as any action or group of actions carried out by ARS on the action-request client—in simple terms, the user interface. Active links are typically triggered by user actions, for example the click of a mouse button in the GUI.

The SPI for Remedy ARS uses this feature to provide buttons in action-request forms which allow the user to launch operator-initiated actions in HPOM from within ARS or even escalate HPOM messages so that the necessary expertise can be obtained quickly to fix a problem. For more information on active links, see [“ARS Filters and Active Links”](#) on page 148.

The Functionality of the SPI for Remedy ARS

The SPI for Remedy ARS enables you to integrate HPOM's monitoring and control capabilities with Remedy's action-request system. When HPOM detects problems in the environment, the SPI for Remedy ARS can immediately and automatically create an action request even before the first human notices the situation. In addition, the SPI for Remedy ARS maintains consistency between action requests and HPOM messages until the problem is solved. This section also provides information about the following topics:

- [“Key Features” on page 25](#)
- [“Example Scenarios” on page 26](#)

Key Features

The SPI for Remedy ARS provides the following features:

- Adapt to fit an organization's individual needs
- Create new action requests by automatically sending a HPOM message to an action-request system
- Create new action requests when an HPOM user decides to send one or more HPOM messages to an action-request system
- Use external data and actions to add supplementary details to an action request
- Update action requests when the corresponding HPOM message changes
- Update action requests by adding further HPOM messages
- Update HPOM messages from the action-request system. This includes:
 - change ownership of the HPOM message
 - add annotations to the HPOM message
 - escalate an HPOM message
 - acknowledge an HPOM message to reflect the status of the action request
 - start an action in HPOM

The SPI for Remedy ARS also provides the following functionality:

- Complete integration with the HPOM GUI
- The capacity to monitor action-request system availability with HPOM
- The capacity to monitor SPI for Remedy ARS availability with HPOM

Example Scenarios

The following two scenarios are examples which describe how you could use the SPI for Remedy ARS in your HPOM environment. Naturally, you can use the SPI for Remedy ARS in many other ways, too, depending on the needs of you organization.

Figure 2-4 An Action Request that Provides Information

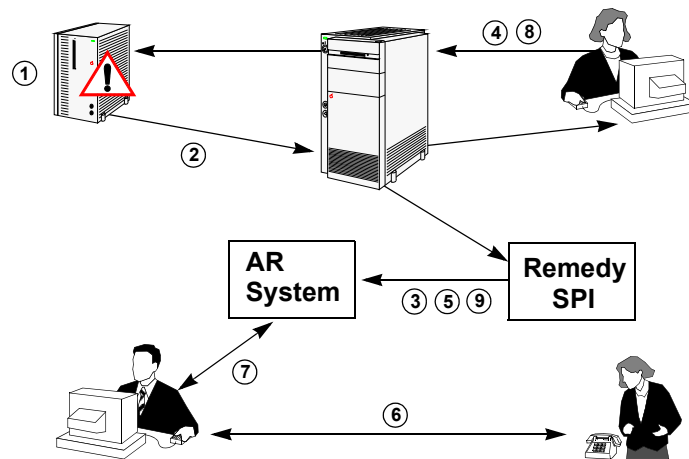


Figure 2-4 shows an example of how the SPI for Remedy ARS can create and update an action request to provide information.

1. A backup procedure fails because the disk is full.
2. The HPOM agent on the managed node sends a message to the HPOM management server.

3. The HPOM management server automatically tells the SPI for Remedy ARS to create a new action request via the HPOM Trouble-Ticket interface.
4. The HPOM user sees the message and decides to start the backup on a different disk. The user explains what he is doing in the annotation he adds to the HPOM message.
5. The SPI for Remedy ARS automatically updates the action request.
6. An end-user calls the help desk because he cannot find the backup of an important file.
7. The help desk staff see that an action request already exists for this problem. They read the information in the `Diary` field and tell the caller that the backup is on a different disk.
8. Meanwhile, the HPOM user solves the problem of the full disk and acknowledges the HPOM message.
9. The SPI for Remedy ARS automatically updates the information associated with the action request and the action request's status.

Figure 2-5 An Action Request that Needs Attention

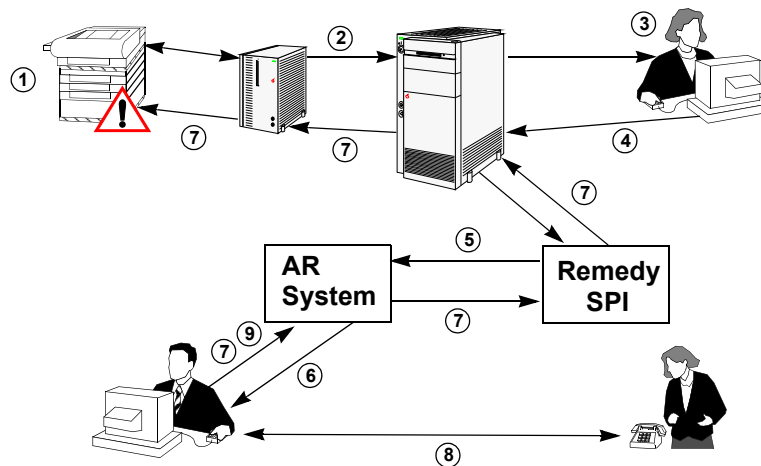


Figure 2-5 shows an example of how the SPI for Remedy ARS can create an action request that needs attention, then update the HPOM message when the action request changes.

1. A large printer in the print room fails because of a paper jam.

The Functionality of the SPI for Remedy ARS

2. The HPOM agent on the managed node sends a message to the HPOM management server at a different site.
3. The HPOM operator sees the message and diagnoses the problem. The HPOM operator adds an annotation to the HPOM message explaining that someone needs to remove the jammed paper and then reset the printer.
4. Since the HPOM operator cannot remove the jammed paper from a printer in a remote site, he decides to forward the HPOM message to the action-request system.
5. The SPI for Remedy ARS receives the HPOM message and creates a new action request.
6. The help desk staff see that an action request exists for a printer problem and that there is a suggested solution. They call a technician and ask them to remove the jammed paper from the printer.

As soon as the Help Desk starts to deal with the action request, the HPOM operator `Remedy SPI User` automatically takes ownership of the HPOM message linked to the Action Request. Ownership of an HPOM message indicates to other HPOM operators that the problem is being solved.

7. The help desk staff start an action in HPOM that resets the failed printer.
8. The technician reports that the printer is working, so the help desk staff close the action request.
9. The SPI for Remedy ARS automatically acknowledges the corresponding HPOM message.

The SPI for Remedy ARS Architecture

This section gives a brief overview of the architecture of the SPI for Remedy ARS and some of the underlying technical concepts. The section covers:

- “Process and Network Components”
- “Data Components”
- “SPI for Remedy ARS Components Integrated with HPOM”

Process and Network Components

To use the SPI for Remedy ARS, the components shown in [Figure 2-6](#) at the very least must be present, namely:

- one HPOM management server with a SPI for Remedy ARS server
- one action-request system server with a SPI for Remedy ARS client (if you want changes to the action requests to update pro-actively any associated HPOM messages)

Figure 2-6

Server and Network Architecture

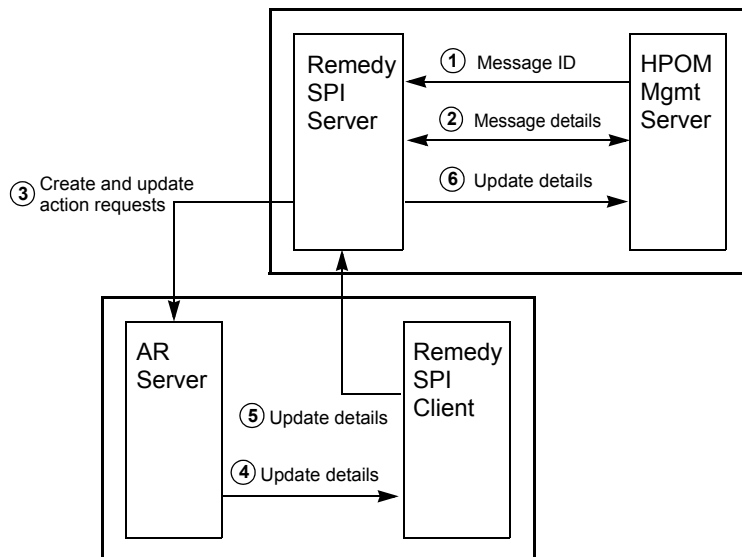
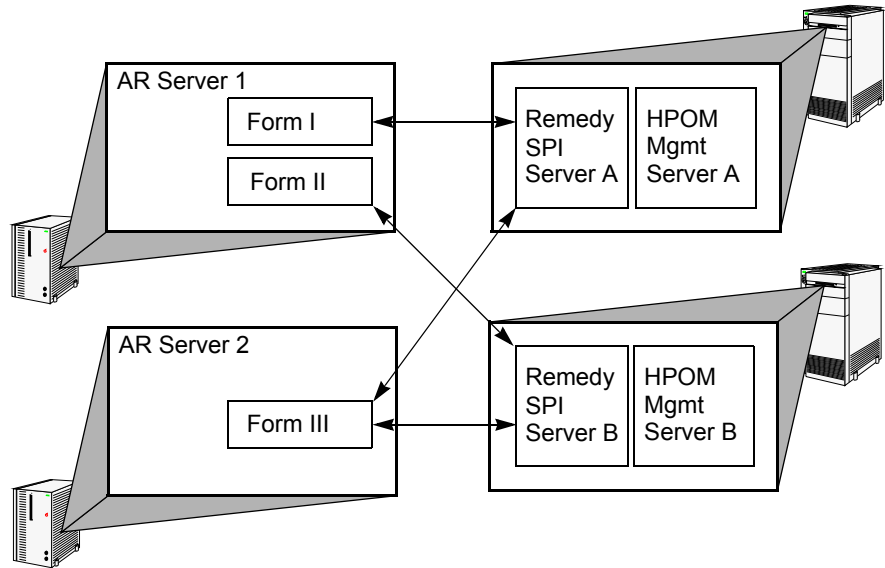


Figure 2-6 on page 29 shows that the SPI for Remedy ARS server runs on the same machine as the HPOM management server. The action-request server can run on the same or a different machine. The SPI for Remedy ARS client must be on the same machine as the action-request server. Figure 2-6 also shows:

1. The SPI for Remedy ARS server receives the ID of an HPOM message from the HPOM management server via a submission program.
2. The SPI for Remedy ARS server retrieves details of the HPOM message from the HPOM management server via an application programmer interface (API).
3. The SPI for Remedy ARS server creates and updates action requests using the ARS API.
4. When an action request changes, the action-request system calls the SPI for Remedy ARS client and passes on the details of the update via the ARS filter mechanism.
5. The SPI for Remedy ARS client sends the update details to the SPI for Remedy ARS server.
6. The SPI for Remedy ARS server updates the HPOM message on the HPOM management server using HPOM's API.
7. When an HPOM message is modified, the SPI for Remedy ARS server receives a message-change event via the HPOM API.
8. HPOM sends the details of the message-change event to the SPI for Remedy ARS server via the HPOM API.

9. The SPI for Remedy ARS server updates the action request by means of the Remedy-ARS application-programming interface (API).

Figure 2-7 Multiple Servers



The SPI for Remedy ARS also supports multiple HPOM management servers and multiple action-request servers. [Figure 2-7](#) shows that each management server has one SPI for Remedy ARS server. Each SPI for Remedy ARS server can create and update action requests on any of the action-request servers. In addition, each action-request server has a SPI for Remedy ARS client that can update HPOM messages on any of the HPOM management servers.

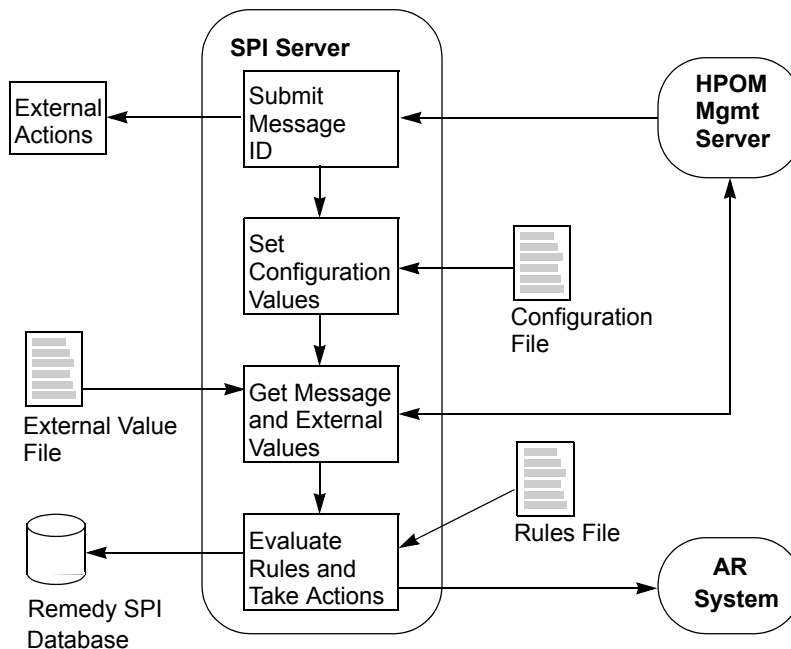
Data Components

This section describes what data components are enabled and used when data flow between HP Operations Manager for UNIX and the SPI for Remedy ARS. The section covers the following areas:

- [“External Actions and Data”](#)
- [“Configuration File”](#)
- [“Rules File”](#)
- [“The SPI for Remedy ARS Database”](#)

Figure 2-8 shows how data flows in and out of the SPI for Remedy ARS server when an HPOM message is submitted to the action-request system.

Figure 2-8 Data Flow in the SPI for Remedy ARS



External Actions and Data

To submit an HPOM message to the SPI for Remedy ARS, HPOM passes the message's ID to a script called `remspisub_auto.sh` (via the Trouble Ticket Interface) and `remspisub_man.sh` (via a HPOM tool). These scripts have a special user-code section where you can add commands, for example: to start any external actions that are necessary. This could include actions to update or retrieve data in an external database.

The user code section could also include actions that generate external value files. External value files contain additional information that the HPOM message does not provide. The SPI for Remedy ARS can add this extra information when it creates a new action request.

After the user code section, the message ID is submitted to the SPI for Remedy ARS server.

For more details about using external actions and external value files, see [“Using External Actions and Data” on page 170](#).

Configuration File

The configuration file `remspi.cfg` defines the user name and passwords that the SPI for Remedy ARS uses to log in to HPOM. The passwords are encrypted. For more details about creating and modifying the configuration file, see [“Configuring Communication Between HPOM and ARS” on page 54](#).

Rules File

The rules file uses HPOM message attributes and additional external values to determine answers to the following questions:

- On which action-request system should an action request be created?
- Which action-request form (schema) should be used?
- Which HPOM message attributes match which action-request form fields?

The `rules` file defines *targets* and *conditions*. A target defines the *name* of a form on an action-request server. The target also defines how the SPI for Remedy ARS should update an HPOM message if one of this schema’s action requests changes.

The rules file also has a set of conditions. Conditions define criteria that filter HPOM messages and determine what actions need to be taken to address the problems described in the message. If an HPOM message meets a condition, the SPI for Remedy ARS can, for example, create a new action request on the targets which are tied to that condition.

A condition also defines the fields in the schema that the SPI for Remedy ARS completes to create an action request. The SPI for Remedy ARS can complete fields in a schema using data from the original HPOM message and also from an external value file.

You create your own rules file to define targets and conditions that meet your organization’s needs. For more details, see [“Customizing the Rules File” on page 82](#).

The SPI for Remedy ARS Database

The SPI for Remedy ARS maintains information in the databases relating to the associations between action requests and HPOM messages. Every time the SPI for Remedy ARS creates a new action request, it adds a new record containing the HPOM message ID and the action request ID. There is one database for each target in the rules file, because one HPOM message may have associations with several targets.

When a HPOM message changes, the SPI for Remedy ARS uses the database to find the ID or IDs of associated action requests.

SPI for Remedy ARS Components Integrated with HPOM

The SPI for Remedy ARS also provides components that integrate with HPOM and the HPOM GUI, including the following elements:

- Node groups for:
 - AR Servers UX
 - AR Servers AIX
 - AR Servers NT
 - Remedy SPI Servers
- Message groups for:
 - AR-System
 - Remedy-SPI
- Default policies to monitor:
 - AR server processes
 - AR System log files
 - Remedy SPI server processes
 - Remedy SPI log files
 - Communication queue between HPOM and the Remedy SPI
- Operator and administrator users
- Applications or tools to:

- submit an HPOM message
- attach HPO messages to an existing action request
- start a SPI for Remedy ARS server
- stop a SPI for Remedy ARS server
- display the SPI for Remedy ARS server status
- test the SPI for Remedy ARS
- start an action-request server
- stop an action-request server

3

Installing the SPI for Remedy ARS

This section describes how to install and upgrade the Smart Plug-in for Remedy Action Request System.

In this Section

This section describes how to install and upgrade the Smart Plug-in for Remedy Action Request System. The section covers the following areas:

- [“Installation Prerequisites” on page 39](#)
- [“Installing the SPI for Remedy ARS” on page 42](#)

NOTE

The SPI for Remedy ARS is available on the HP Operations Smart Plug-ins DVD.

Installation Prerequisites

The SPI for Remedy ARS consists of client and server components and integrates with existing HPOM and action-request servers. The SPI for Remedy ARS client runs on the same machine as the action-request server. The SPI for Remedy ARS server runs on the same machine as the HPOM server. This section also provides information about the following topics:

- “Disk-Space Requirements” on page 41
- “Memory (RAM) Requirements” on page 41

Table 3-1 shows the software prerequisites for the HPOM for Unix servers on HP technical workstations and business servers, as well as on Sun SPARC systems.

Table 3-1 Supported HPOM for Unix Servers

Product Version	Operating System			
	HP-UX	Sun Solaris		Linux
	11i	9	10	2.6
HPOM 9.0x	X	-	-	X
HPOM 9.1x	-	X	X	-

NOTE

The SPI for Remedy ARS is linked with Remedy ARS libraries 7.1.0 (API version 13) on HP-UX and Solaris HPOM management-server platforms and with Remedy ARS libraries 7.5.0 (API version 14) on Linux HPOM management-server platforms. For a client program using the 7.1.0/7.5.0 libraries, the list of possible target action-request server versions is 6.3 to 7.5, but other restrictions may apply. Please consult the support matrix for the Remedy ARS server for details.

Table 3-2 shows software prerequisites for the action-request servers on the various supported hardware platforms.

Table 3-2 Prerequisites for the Remedy Action-Request Server

Hardware Platform	Operating System	AR System Version			
		6.3	7.0	7.1	7.5
HP	HP-UX 11i ^a	X	X	X	X
Intel	Windows 2k,2k3,2k8 ^b	X	X	X	X
Sun SPARC	Solaris 8,9,10	X	X	X	X
IBM RS6000	AIX 5L 5.1,5.2,5.3	X	X	X	X
Intel	SuSE SLES 9,10 ^c	X	X	X	X
	RedHat RHEL 4, 5.1-5.3 ^d	X	X	X	X

a. PA-RISC and IA64.

b. 32/64 Bit, on 64 Bit HTTPS only

c. 32/64 Bit, on 64 Bit HTTPS only

d. 32/64 Bit, on 64 Bit HTTPS only

NOTE

To take full advantage of the SPI for Remedy ARS, your action-request servers should be HPOM managed nodes. The prerequisites listed above do not invalidate the prerequisites for the action-request server mentioned by the manufacturer (BMC/Remedy Corp.).

Disk-Space Requirements

Table 3-3 lists the disk space requirements for the SPI for Remedy ARS software on both the HPOM management server and the action-request server, which is the SPI for Remedy ARS client.

Table 3-3 Disk-Space Requirements

Machine	HPOM Version	OS	Install (MB)	Runtime Files (MB)	Total (MB)
HPOM Server	all	UNIX	200	10 + X ^a	200 + X
	all	Windows	15	5 + Y ^b	15 + Y
ARS Server ^c	n/a	n/a	n/a	5	5

- a. Approx. 100 bytes per message forwarded to the ARS server and not yet acknowledged in HPOM. If the global option `FORGET_ACKED_MSGS` is not turned on, this applies for each message forwarded to (but not yet deleted on) the ARS server.
- b. Approx. 50 bytes per message (in one file) forwarded to the ARS server and not yet acknowledged in HPOM. If the global option `FORGET_ACKED_MSGS` is not turned on, this applies for each message which forwarded to (but not yet deleted on) the ARS server.
- c. SPI for Remedy ARS client

Memory (RAM) Requirements

There are no specific requirements concerning the amount of RAM installed on either the HPOM or the action-request server.

Installing the SPI for Remedy ARS

The installation steps differ very slightly depending on whether or not you want your action-request server to be an HPOM managed node. The instructions in this section assume that you *do* want your action-request server to be a managed node. In fact, we strongly recommend it in order for you to be able to make use of the SPI for Remedy ARS's powerful monitoring capabilities, for example; to monitor the health and status of the action-request server processes. If you do *not* want your action-request servers to be HPOM managed nodes, please pay special attention to the steps described in [“Installation Overview” on page 42](#).

The information in this section covers the following topics:

- [“Installation Overview” on page 42](#)
- [“Installing the SPI for Remedy ARS Software on HPOM for Unix” on page 43](#)
- [“Verifying Installation of the SPI for Remedy ARS Software” on page 44](#)
- [“Assigning the SPI for Remedy ARS Policies” on page 45](#)
- [“Distributing the SPI for Remedy ARS Policies in HPOM for Unix” on page 46](#)
- [“Installed File Locations” on page 46](#)

Installation Overview

To install the SPI for Remedy ARS, you need to complete the steps indicated in the list below and described in more detail in the sections that follow:

1. Carry out some brief pre-installation checks
2. Install the SPI for Remedy ARS software on the HPOM management server
3. Verify that the installation of SPI for Remedy ARS software bundle completed successfully on the HPOM management server
4. Assign and distribute the appropriate SPI for Remedy ARS policies to the HPOM management server

5. Either:

- a. Assign and distribute the appropriate SPI for Remedy ARS policies, along with all the rest of the SPI for Remedy ARS software, to the action-request server (the HPOM managed node)

or:

- b. If you do *not* want your action-request server to be an HPOM managed node, copy the `itoupdate` program (`itoupdate.exe` for Windows) file from the HPOM management server to the action-request server manually.

Ideally, the file should be copied to the location indicated in [Table 3-6, “File Locations for the Installed SPI for Remedy ARS Client,” on page 47](#). However, as long as you tell ARS where to find it, the file can be placed in the location of your choice.

After you complete the installation, you need to configure the ARS filters to use the `itoupdate` file to communicate with HP Operations Manager for UNIX. For more information, see [“ARS Filters and Active Links” on page 148](#).

Installing the SPI for Remedy ARS Software on HPOM for Unix

The Smart Plug-in for Remedy Action Request System is available on the HP Operations Smart Plug-ins DVD.

To install the Smart Plug-in for Remedy Action Request System software bundle on the HPOM management server, carry out the following steps:

1. Login to the HPOM management server as **root** user.
2. Mount the HP Operations Smart Plug-ins DVD
3. The command to install the software depends on the platform of the management server (and the mountpoint of the DVD).

- For a HP-UX management server, enter:

```
swinstall -s  
/dvdrom/HPUX/HP_Operations_Smart_Plug-ins_HPUX.depot  
SPI-Remedy
```

- For a Solaris management server, enter:

```
pkgadd -d  
/dvdrom/SOLARIS/HP_Operations_Smart_Plug-ins_SOLARIS.  
sparc SPI-Remedy
```

- For a Linux management server, enter:

```
rpm -i  
/dvdrom/SOLARIS/HP_Operations_Smart_Plug-LINUX.rpm  
SPI-Remedy
```

These commands install the SPI-Remedy software from the depot and perform basic configuration. The software bundle contains all the SPI for Remedy ARS software, configuration files, and documentation.

Verifying Installation of the SPI for Remedy ARS Software

To verify that the installation of the Smart Plug-in for Remedy Action Request System completed successfully on the HPOM management server, carry out the steps in the following list:

1. On the command line, enter: **swlist SPI-Remedy** on HP-UX, **pkginfo SPI-Remedy** on Solaris and **rpm -qa | grep Remedy** on Linux.

Look for output containing the product name:

- SPI-Remedy 4.01
2. In the HPOM GUI, check that the following elements have been added:
 - Node Groups:
 - Remedy SPI Servers
 - AR Servers NT
 - AR Servers UX
 - AR Servers AIX
 - Message Groups:
 - Remedy-SPI
 - AR System

- Application/Tool Groups:
 - Remedy SPI Admin
 - Remedy SPI
- Users:
 - remspi_adm
 - remspi_op
- Policy Groups:
 - Remedy SPI - AR Server NT
 - Remedy SPI - AR Server UX
 - Remedy SPI - AR Server AIX
 - Remedy SPI - ITO

3. If either of these steps fails to produce the desired results, check the following data for more specific information relating to installation problems:

- a. Check the following log files for more specific information relating to installation problems:
 - /var/adm/sw/swagent.log
 - /var/adm/sw/swinstall.log
- b. Check your installation with the details in [Table 3-5, “File Locations on the HPOM Management Server,”](#) on page 46.

Assigning the SPI for Remedy ARS Policies

To facilitate the assignment of the SPI for Remedy ARS policies to the various HPOM and action-request servers in your environment, you first need to add the servers to HPOM and then copy the nodes to the appropriate SPI node groups, which are created during the installation of the SPI for Remedy ARS software.

Most of the following steps depend on the platform of the HPOM management server. For details on how to configure HPOM please consult the products manual.

1. Start the HPOM GUI.

2. Add the node for the action-request servers - if they are not already defined in HPOM.
3. Copy the action-request servers to the appropriate SPI node group, according to their platforms.
4. Copy the HPOM management server to the appropriate SPI node group.

The installation of the SPI for Remedy ARS software automatically assigns the appropriate policy groups to the corresponding node group as illustrated in [Table 3-4](#). Consequently, any managed node that you copy to the node groups listed has the correct policies assigned automatically.

Table 3-4 Automatic SPI for Remedy ARS - Policy Group Assignment

Node Group	Policy Group
AR Servers NT	SPI for Remedy ARS - AR Server NT
AR Servers UX	SPI for Remedy ARS - AR Server UX
AR Servers AIX	SPI for Remedy ARS - AR Server AIX
Remedy SPI Servers	SPI for Remedy ARS - ITO

Distributing the SPI for Remedy ARS Policies in HPOM for Unix

To distribute the SPI for Remedy ARS policies to the HPOM for Unix management server and, assuming it is to be an HPOM managed node, the action-request server, too, use the Deploy menu in the HPOM GUI.

Installed File Locations

The installation process copies the necessary files to the HPOM management server. [Table 3-5](#) shows the directories that the installation process creates on the HPOM management server for the SPI for Remedy ARS.

Table 3-5 File Locations on the HPOM Management Server

File Type	Directory
Binaries	/opt/OV/bin/remspi

Table 3-5 File Locations on the HPOM Management Server (Continued)

File Type	Directory
Libraries	/opt/OV/bin/remspi/lib
Temporary / runtime	/var/opt/OV/share/tmp/remspi
Log files	/var/opt/OV/log/remspi
Installation Log files	/var/opt/OV/share/log/remspi
Configuration	/etc/opt/OV/share/conf/remspi
HPOM integration	/var/opt/OV/share/tmp/OpC_appl/remspi
Documentation	/opt/OV/doc
Message Catalogs	/opt/OV/lib/nls/C/remspi.cat /opt/OV/lib/nls/C/remspii.cat

Table 3-6 shows the directories for SPI for Remedy ARS clients that you install on a HPOM managed node. These are the standard locations for HPOM commands.

Table 3-6 File Locations for the Installed SPI for Remedy ARS Client

Operating System	Directory
UNIX	DCE agent: /var/opt/OV/bin/OpC/cmds HTTPS agent: /var/opt/OV/bin/instrumentation
AIX	DCE agent: /var/lpp/OV/bin/OpC/cmds HTTPS agent: /var/opt/OV/bin/instrumentation
Windows	DCE agent: %OvInstallDir%\bin\instrumentation HTTPS agent: %OvDataDir%\bin\instrumentation

Operating the SPI for Remedy ARS in a “non-root agent” environment

The SPI for Remedy ARS is able to run on a managed node where the HPOM agent is started under a non-root account (Unix agents only). See the according HPOM documentation for more information about how to configure the HPOM agent for such an environment.

After you switch the HPOM agent to support a non root environment, you have to configure the SPI for Remedy ARS, too, as follows:

1. Switch the HPOM agent to non root
2. Execute the following script on the managed node as user “root”:

```
/var/opt/OV/bin/instrumentation/remspi_root.sh
```

It is essential that you perform the last step *after* the HPOM agent has been switched to non root. This is because the HPOM step changes permissions and ownerships of the deployed instrumentation. The SPI for Remedy ARS needs this information to perform its own switch.

4 **Getting Started**

This section describes how to configure the Smart Plug-in for Remedy Action Request System.

In this Section

This section describes how to install and upgrade the HP Operations Manager for UNIX Smart Plug-in for Remedy Action Request System. The information in this section covers the following areas:

- [“Configuration Overview”](#)
- [“Uploading the Example Form to ARS”](#)
- [“Configuring Communication Between HPOM and ARS”](#)
- [“Configuring Communication between ARS and HPOM”](#)

Configuration Overview

The information in this section describes a simple scenario that takes you through the steps required to set up communication between HP Operations Manager for UNIX and the Remedy Action Request System by means of the SPI for Remedy ARS. The instructions in this section assume that you have already successfully installed the SPI for Remedy ARS software on the HPOM management server and assigned and distributed the SPI for Remedy ARS templates to both the HPOM management server and the action-request server. For more information about the installation of the software and the assignment and distribution of the SPI for Remedy ARS templates, see [“Installing the SPI for Remedy ARS” on page 42](#).

The configuration of the SPI for Remedy ARS involves two simple steps which establish and configure communication channels between HPOM and ARS by means of the SPI for Remedy ARS. When HPOM and ARS can communicate with each other, you can use HPOM messages to create Action Requests in ARS, and configure ARS to update the original HPOM message in the event of any change to the status of an Action Request created by an HPOM message.

To configure communication between HPOM and ARS, you need to carry out the following high-level steps in the order specified:

1. Configure the HPOM management server to use the SPI for Remedy ARS server to communicate with your ARS server(s).
2. Configure the ARS server(s) to use the SPI for Remedy ARS client to communicate with the HPOM management server.

To help you understand how the configuration process works and allow you to verify whether or not the configuration has completed successfully, the SPI for Remedy ARS provides a very simple example action-request form, which you can upload to the action-request server and quickly configure. For ease of use, the same form appears elsewhere in the book, for example; in [“Customizing the SPI for Remedy ARS” on page 75](#)

Uploading the Example Form to ARS

In this step, you upload a simple form, provided as part of the SPI for Remedy ARS package, from the HPOM management server to the action-request server. When the form is uploaded to ARS, you can use it to help you understand how the communication channels between HPOM and ARS work. In the process, you see how HPOM and ARS use the SPI for Remedy ARS to communicate with each other and what has to be done to set up the any other forms you have already created or intend to create.

To upload the example form to ARS:

1. Depending on the operating system installed on the action-request server, use the `ftp` command to transfer the appropriate file from the HPOM management server to the action-request server. You can find the files on the management server in the following location:

```
/etc/opt/OV/share/conf/remspi/gui
```

The file to use depends on the platform and type of the HPO agent:

- *DCE* agent:
 - Windows: `ProblemReport-NT.def`
 - AIX: `ProblemReport-AIX.def`
 - Other UNIX: `ProblemReport-UX.def`
- *HTTPS* agent:
 - Windows: `ProblemReport-NT-HTTPS.def`
 - UNIX: `ProblemReport-UX-HTTPS.def`

2. In the ARS administrator's GUI on the action-request server, select the action-request server into which you want to import new definitions and import the form using the following menu sequence:

```
Tools:Import Definitions
```

3. Select the definitions file to import, in this case, e.g.:

```
ProblemReport-UX.def
```

4. In the `Import Files` window, choose the `Select All` option and click the `OK` button.

5. Open the `Forms` property sheet to verify that the form was successfully imported.

Configuring Communication Between HPOM and ARS

In this step, you set up and configure the connection between HPOM and the Remedy ARS. This involves the following high-level steps, each of which is described in detail in the sections that follow:

- [“Create a Login to HPOM for the SPI for Remedy ARS” on page 54](#)

Create a SPI for Remedy ARS login to HPOM so that HPOM can use the SPI to forward messages to the ARS. This involves:

- Adding a new HPOM user (for the SPI for Remedy ARS) to the `User Bank` in the HPOM GUI
- Set up the same user in the SPI for Remedy ARS-server configuration scripts

- [“Configure the SPI for Remedy ARS in HPOM” on page 56](#)

Configure the SPI for Remedy ARS so that it knows to which action-request servers to send the messages it receives from HPOM, what conditions apply, and what schemas exist in ARS

- [“Verifying the Configuration” on page 58](#)

Test the connection you have set up between HPOM and ARS

For more information on adding and modifying users in HPOM, see [“SPI for Remedy ARS Users” on page 69](#). For information on how to set up the Trouble-Ticket (TT) interface in HPOM so that HPOM messages can be automatically submitted to the ARS via the SPI for Remedy ARS, see [“Setting up the Trouble-Ticket Interface on HPOM” on page 81](#).

Create a Login to HPOM for the SPI for Remedy ARS

To create an ARS login to HPOM, you need to create a new HPOM user with the appropriate permissions in HPOM and copy the details of the new HPOM user, including an encrypted version of the new user’s password, into the `remspi.cfg` file, which you have to put in the following location on the HPOM management server:

```
/etc/opt/OV/share/conf/remspi/remspi.cfg.
```

You may use the file `remspi.cfg.new` in this directory as a starting point.

If you want to use the `FORCE OWN` or the `DISOWN` keywords in the rules file, you will have to configure the encrypted password of the HPOM administrator in this file, too.

NOTE

The new HPOM user you create in this step is the user the SPI for Remedy ARS server will use to access the HPOM database to fetch the message attributes or to modify messages. Consequently, the user you create must have the necessary permissions to see *all* the messages that you want the SPI for Remedy ARS to forward from HPOM to ARS. For more information on user privileges in HPOM, see the section on the responsibility matrix in “[SPI for Remedy ARS Users](#)” on page 69 and the *HP Operations Concepts Guide*.

To create a new HPOM user login for the SPI for Remedy ARS server:

1. Use the HPOM GUI to create a HPOM user with access to the SPI for Remedy ARS applications, node groups and, in addition, the messages in the HPOM database. Specify a password for the new user.
2. Encrypt the password you have just assigned to the HPOM user by executing the `remspipasswd` command. For example, on the command line in a separate shell, enter:

```
remspipasswd <new-user_password>
```

3. Open the `/etc/opt/OV/share/conf/remspi/remspi.cfg` file and enter (by typing or cutting and pasting) the appropriate values for:

- `REMSPI_ITO_USER`

The name of the new user you created in HPOM in step 1

- `REMSPI_ITO_PASSWD`

The encrypted password you received in step 2 using the `remspipasswd` command

- `REMSPI_ITO_ADMIN_PASSWD`

The encrypted password for the `opc_adm` HPOM user you received using the `remspipasswd` command with the password of the HPOM administrator (note that this line is optional and only needed if you want to make use of the FORCE OWN/DISOWN features).

Example 4-1 Example Configuration File

```
# File:          remspi.cfg
# Description:   Configuration file for Remedy(tm) SPI
# Package:      HP Operations SMART Plug-In for
#               Remedy(tm) Action Request System(r)
# Note: Value must be on same line as keyword

REMSPI_ITO_USER      remspi_server
REMSPI_ITO_PASSWD   C338D5F21219E076C2000C45AA0475925A1
REMSPI_ITO_ADMIN_PASSWD C338D5F21219F076C2000C4VAA0475925A1
```

4. Save the modifications to the `remspi.cfg` file

NOTE

Note that the `remspi.cfg.new` file which is delivered with the SPI for Remedy ARS contains the encoded default password of the `opc_adm` user of an HPOM for UNIX 7.* system. This entry has to be changed for a production system.

Configure the SPI for Remedy ARS in HPOM

In this section, you tell the SPI for Remedy ARS about the action-request servers to which it has to send messages, what (if any) conditions apply, and what forms exist in ARS that need to be modified by HPOM via the SPI for Remedy ARS. You define these details in the `rules` file, which you have to create in the following place on the HPOM management server:

```
/etc/opt/OV/share/conf/remspi
```

In this directory, you'll find a template named `rules.PR` which you may use as a starting point.

For more information about the structure of the `rules` file and the syntax you are expected to use, see [“Customizing the Rules File” on page 82](#).

NOTE

If you simply want to understand how the example schema works, you do not need to change or modify values in the specified in the `MSGCONDITIONS` section of the `rules` file and described in step 3 below. However, this information is vital when you need to set up your own conditions at a later date.

To configure the SPI for Remedy ARS in HPOM:

1. Open the `rules` file with a text editor

2. Enter or modify the following values in the `TARGET` section:

SERVER Name of the action-request server where `SCHEMA` is defined. This value is *mandatory*: no default value is possible.

SCHEMA Name of the form (schema) to be modified by the HPOM message

USER User name to log in to the action-request server where `SCHEMA` is defined. This is the account the SPI for Remedy ARS server uses to log in to the action-request server. Note that you should use different account names for the SPI for Remedy ARS server and for interactive action-request users to distinguish SPI for Remedy ARS server triggered transactions from normal action-request user transactions.

PASSWORD Password of `USER`

3. Modify the following values in the `MSGCONDITIONS` section:

DESCRIPTION of the condition

CONDITION <empty>

SET TARGET Name of the form to be linked to the HPOM message generated by the condition match

4. Save the modifications to the `rules` file.

5. On the HPOM management server, restart the SPI for Remedy ARS server process to enable the new configuration.

`/opt/OV/bin/remspi/remspi.sh stop`

```
/opt/OV/bin/remspi/remspi.sh start
```

NOTE

If an action-request server which is configured in the `rules` file is not available during the startup of the SPI for Remedy ARS, a warning is written to the SPIs log file, but the SPI is nevertheless started.

The verification of the AR-related configuration which is necessary for proper operation of the SPI, is retried later at regular intervals.

As soon as an action-request server is reachable, the verification is performed and an entry is written to the SPI for Remedy ARS's log file.

Verifying the Configuration

To verify that your configuration has indeed established the recommended means of communication between HPOM and the ARS via the SPI for Remedy ARS, you can use the SPI for Remedy ARS to send a HPOM message to the ARS and check whether or not an Action Request has been created.

1. In the HPOM GUI, start the tool `Remedy SPI Admin:SPI Test`
2. Verify that the HPOM message you send creates an Action Request in the Remedy-ARS GUI:
 - a. Start the Remedy-ARS User GUI
 - b. Find the example schema using the following menu sequence:
`File:Search For-> Problem Report System`
 - c. Click the `Search` button
 - d. Select the message you sent from HPOM from the list at the top of the window
 - e. Verify the values in the action-request schema that is displayed at the bottom of the window

Configuring Communication between ARS and HPOM

In this step, you set up and configure the connection between the Remedy ARS server and HPOM. When this connection is up and running, ARS can use the SPI for Remedy ARS to inform HPOM about any changes to Action Requests that have been linked to or perhaps even created by HPOM messages. Setting up the connection between ARS and HPOM involves the following high-level steps:

- [“Configuring the itoupdate Command” on page 60](#)

Configure the `itoupdate` command in such a way that HPOM message flags such as `own/disown`, `acknowledge`, `escalate`, and so on, can be set automatically as a result of specific changes to the status of action-request fields.

- [“Registering the Remedy-ARS Filters” on page 61](#)

Register Remedy action-request filters so that they can use the `itoupdate` command to update HPOM messages.

- [“Communicating with the Action-Request Server through a Firewall” on page 62](#)

Configure the SPI for Remedy ARS server to use a special, fixed port to communicate with the action-request server.

- [“Using Private Queues on the Action-Request Server” on page 62](#)

Define a private queue for the SPI server communication with the action-request server.

- [“Verifying the Configuration” on page 63](#)

Verify that you have successfully configured the `itoupdate` command to update HPOM messages automatically as a result of changes to the status of action requests.

Note that the `itoupdate` command is installed on the action-request server either when you install the SPI for Remedy ARS software on the action-request server (the HPOM managed node) or when you copy the `itoupdate` file from the HPOM management server to the action-request server manually.

Configuring the itoupdate Command

This step describes how to use the `rules` file on the HPOM management server to configure the way in which the `itoupdate` command reacts to ARS filters on the action-request server.

NOTE

For the purposes of understanding how the example schema works, you do not need to change or modify values in the `rules` file other than other than the details concerning login and server. However, this information is vital when you need to modify the `itoupdate` command to suit the requirements of your own environment.

To configure the `itoupdate` command:

1. Open the `rules` file on the HPOM management server:

```
/etc/opt/OV/share/conf/remspi/rules
```
2. In the `TARGET` section, find the `ITO_UPDATE` sub-section
3. In the `ITO_UPDATE` section, add entries as appropriate for the following values:
 - `OWN/DISOWN`
 - `ACKNOWLEDGE/UNACKNOWLEDGE`
 - `ANNOTATE`
 - `CMA`
 - `SEVERITY`
 - `MSGTXT`
 - `ESCALATE`

[“An Example of a Rules File” on page 137](#) shows you a working rules file. This is the rules file that is shipped with the SPI for Remedy ARS software and which you installed in [“Uploading the Example Form to ARS” on page 52](#). For more detailed information about linking changes to Action Request fields with changes to the status of HPOM messages, see [“Defining Update Rules” on page 93](#).

Registering the Remedy-ARS Filters

This step describes how to register action-request-system filters on the HPOM management server so that they can use the `itoupdate` command to update HPOM messages with information relating to any change of status of action requests. For more information about the `remspifilter` command and the options it accepts, see [“The remspifilter Command” on page 151](#)

To register a Remedy-ARS filter:

1. On the HPOM management server, stop the SPI for Remedy ARS server process.

```
/opt/OV/bin/remspi/remspi.sh stop
```

2. Use the command `remspifilter` to register the Remedy-ARS filters on the HPOM management server.

```
/opt/OV/bin/remspi/remspifilter \  
-target <target_name> -create
```

Where for the example schema you have uploaded; `target_name = ProbSys`. For more information about targets and how to define them, see [“Defining Targets” on page 89](#).

3. Confirm the activation of the filter. Enter:

```
Confirm Creation (y/n) [y]: y
```

4. On the HPOM management server, restart the SPI for Remedy ARS server process to enable the new configuration.

```
/opt/OV/bin/remspi/remspi.sh start
```

NOTE

Note that the automatic generation of action-request filters is only available for filters not using the `IF_MODIFIED` tag. Filters using the `IF_MODIFIED` tag have to be created manually using the Remedy-ARS administrator's GUI.

Communicating with the Action-Request Server through a Firewall

If there is a firewall between the action-request server and the HPOM management server or the communication port of the action-request server has been restricted in some other way, the SPI for Remedy ARS server can use a special, fixed port to communicate with the action-request server.

In the file `/etc/opt/OV/share/conf/remspi/rules`, locate the `TARGET` section for the action-request server and insert a line “`ARTCPPORT portnum`”, where `<portnum>` is the number of the port the action-request server listens for requests.

A global default for this communication port may be defined in the file `/etc/opt/OV/share/conf/remspi/remspi.cfg`. If there is no global default and no specific definition in the `rules` file, the communication port is set to 0 and thus the portmapper is used to determine the actual port number. The global default may be defined by inserting a line “`REMSPI_ARTCPPORT portnum`” in the file `remspi.cfg`.

NOTE

Note that this situation requires configuration on the action-request server, too. For details, see the *Remedy Action Request System Administrator's Reference*.

Using Private Queues on the Action-Request Server

If a private queue should be used for the SPI server communicating with the action-request server, you can specify the number of this `rpc` queue.

In the file `/etc/opt/OV/share/conf/remspi/rules`, locate the `TARGET` section for the action-request server and insert a line “`ARRPC rpcnum`”, where `rpcnum` is the number of the `rpc` port used by the action-request server.

A global default for this private queue number may be defined in the file `/etc/opt/OV/share/conf/remspi/remspi.cfg`. This default may be defined by inserting the line “`REMSPI_ARRPC rpcnum`” in the file `remspi.cfg`.

NOTE

Note that this situation requires configuration on the action-request server, too. For details, see the *Remedy Action Request System Administrator's Reference*.

Verifying the Configuration

To verify that you have successfully configured the `itoupdate` command to update HPOM messages automatically as a result of changes to the status of action requests, you can use the Remedy Action Request System (ARS) to modify the action request you created when you send a HPOM message in “Verifying the Configuration” on page 58. To verify that the addition or update of comments to an Action Request are reflected in the annotations attached to the original HPOM message:

1. Submit a HPOM message to ARS as described in “Verifying the Configuration” on page 58
2. Login to the action-request server and open the Problem Report Schema
3. In ARS, select the action request created by the HPOM message you have just submitted and open the Action Request for modification
4. Enter some text in the `Work Log` field and save the changes
5. In HPOM, open the `Message Browser` window, select the message you originally submitted to ARS, and click the `[Annotations]` button.

The `Message Annotations` window opens allowing you to check for the presence in the list of annotations of the text you entered in the `Work Log` field in step 4 above.

To verify that changes to the status of action requests in ARS are automatically reflected in a corresponding change of status to the appropriate messages in HPOM:

1. In ARS, select the action request created by the HPOM message you have just submitted and open the action request for modification
2. Change the status of the action request to `Assigned`

3. In HPOM, open the `Message Browser` window, select the message you originally submitted to ARS and ensure that the message is now owned by the appropriate SPI for Remedy ARS user.
4. In ARS, change the status of the same action request to `Closed`
5. In HPOM, open the `History Message Browser` window, select the message you originally submitted to ARS and ensure that the message is now acknowledged by the appropriate SPI for Remedy ARS user.

5 Using the SPI for Remedy ARS

This section describes the SPI for Remedy ARS interface that you will use in the performance of your every-day tasks.

In this Section

This section describes the SPI for Remedy ARS interface that you will use in the performance of your every-day tasks and provides advice and information concerning how to go about setting up and modifying the main aspects. The section covers the following areas:

- “SPI for Remedy ARS Node Groups”
- “SPI for Remedy ARS Message Groups”
- “SPI for Remedy ARS Users”
- “SPI for Remedy ARS Tool Groups”
- “SPI for Remedy ARS Administrator Tools”
- “SPI for Remedy ARS Operator Tools”

SPI for Remedy ARS Node Groups

New node groups are installed with the Smart Plug-in for Remedy Action Request System on an HPOM management server. These node groups are:

- AR Servers NT
- AR Servers UX
- AR Servers AIX
- Remedy SPI Servers

You should add the action-request servers in your ARS environment to the AR Servers NT, AR Servers UX and AR Servers AIX node group as appropriate.

The system running the SPI for Remedy ARS server, normally the HPOM management server, should be added to the node group `Remedy SPI Servers` in the same way.

The installation of the SPI for Remedy ARS software automatically assigns the appropriate policy group to the corresponding node group as illustrated in [Table 3-4 on page 46](#). Consequently, the managed nodes that you copy to the node groups listed have the correct policies assigned automatically.

For more information about which platforms, operating systems, and Remedy ARS versions that are supported by the Smart Plug-in for Remedy Action Request System, see [“Installation Prerequisites” on page 39](#).

You can then assign the message groups `AR System` and `Remedy-SPI` to the SPI for Remedy ARS users you add and make them responsible for your action-request systems and the SPI for Remedy ARS in general. In this way, the messages generated by SPI for Remedy ARS systems are sent automatically to the SPI for Remedy ARS users whom you make directly responsible for these systems. For more information about SPI for Remedy ARS users, see [“SPI for Remedy ARS Users” on page 69](#). For more information about SPI for Remedy ARS message groups, see [“SPI for Remedy ARS Message Groups” on page 68](#).

SPI for Remedy ARS Message Groups

This section describes the message groups that are installed by default with the Smart Plug-in for Remedy Action Request System. The message groups are:

- AR System
- Remedy-SPI

You assign the message groups; AR System and Remedy-SPI to the SPI for Remedy ARS users whom you add and make responsible for your action-request systems and the SPI for Remedy ARS in general.

For more information about SPI for Remedy ARS users, see [“SPI for Remedy ARS Users” on page 69](#). For more information about SPI for Remedy ARS node groups, see [“SPI for Remedy ARS Node Groups” on page 67](#).

SPI for Remedy ARS Users

This section describes the default SPI for Remedy ARS users that appear in the `User Bank` window after you have installed the SPI. The items are:

- `remspi_adm`
- `remspi_op`

The default HPOM user accounts for the SPI for Remedy ARS, `remspi_adm` and `remspi_op` are intended as examples: they can be used as a basis for the creation of “real” HPOM user accounts, which are added by the HPOM administrator. The default SPI for Remedy ARS user accounts have access to the default SPI for Remedy ARS applications to allow them to manage the SPI for Remedy ARS (starting and stopping action-request servers, for example) and to work with the SPI for Remedy ARS (submitting and attaching messages). In addition, the default SPI for Remedy ARS users can “see” the default SPI for Remedy ARS node groups so that they can select the managed nodes on which the application will run.

The HPOM account you set up for the SPI for Remedy ARS server in [“Configuring Communication Between HPOM and ARS” on page 54](#) and which is defined in the configuration file `remspi.cfg` is used by the SPI for Remedy ARS server to access messages in the HPOM database. Clearly, this account must be granted access to all the messages which should be forwarded to the action-request system.

You need to pay particular attention to which node groups are assigned to which message groups. For more information about node and message groups in the SPI for Remedy ARS, see [“SPI for Remedy ARS Node Groups” on page 67](#) and [“SPI for Remedy ARS Message Groups” on page 68](#).

SPI for Remedy ARS Tool Groups

To assist the SPI for Remedy ARS user in the performance of every-day tasks, the installation process of the Smart Plug-in for Remedy Action Request System creates two new tool groups specifically for the SPI for Remedy ARS. The new tool groups are:

- Remedy SPI
contains tools for operating the SPI for Remedy ARS
- Remedy SPI Admin
contains tools for the administration of the SPI for Remedy ARS

NOTE

Your organization may restrict access to the application groups, or create different ones.

For more information about the contents of the Remedy SPI and Remedy SPI Admin tool group, see [“SPI for Remedy ARS Operator Tools” on page 73](#) and [“SPI for Remedy ARS Administrator Tools” on page 71](#), respectively.

SPI for Remedy ARS Administrator Tools

The tool group `Remedy SPI Admin` contains tools that enable the SPI for Remedy ARS administrator to manage the SPI for Remedy ARS from within HPOM. The `Remedy SPI Admin` tool group by default contains the following tools:

- [“The SPI for Remedy ARS Server’s Status” on page 71](#)
- [“Starting and Stopping the SPI for Remedy ARS Server” on page 71](#)
- [“Testing the SPI for Remedy ARS” on page 72](#)
- [“Starting and Stopping the Action-Request Server” on page 72](#)

NOTE

`Remedy SPI Admin` is the default tool group that the installation procedure creates for a SPI for Remedy ARS administrator. You may add, modify, or group the tools according to the requirements of your organization.

The SPI for Remedy ARS Server’s Status

You can check the status of the SPI for Remedy ARS server by starting the `SPI Server Status` tool. The status information appears in an `Output of Application` window.

Starting and Stopping the SPI for Remedy ARS Server

You can start or stop the SPI for Remedy ARS server by starting the `Start SPI Server` or `Stop SPI Server` tools. The tool confirms the new status of the SPI for Remedy ARS server in an `Output of Application` window.

NOTE

You need to stop and restart the SPI for Remedy ARS server if you change rules file. For more details, see [“Customizing the Rules File”](#) on page 82.

Testing the SPI for Remedy ARS

As an administrator you can test the status of the SPI for Remedy ARS using the SPI Test tool . A message appears in the HPOM Message Browser window indicating the result of the test.

Starting and Stopping the Action-Request Server

For maintenance purposes, you can start or stop an action-request server that runs on an HPOM managed node. To do this:

1. Select the managed node in the HPOM GUI.
2. Start the Start AR Server or Stop AR Server tool.

SPI for Remedy ARS Operator Tools

The tool group `Remedy SPI` contains tools that enable the SPI for Remedy ARS operate to carry out actions from within HPOM. This tool group contains the following tools :

- [“Manually Submitting Messages to an Action-Request System” on page 73](#)
- [“Attaching Messages to Existing Action Requests” on page 74](#)

`Remedy SPI` is the default application group that the installation procedure creates for a SPI for Remedy ARS operator. The administrator may add, modify, or group the applications differently according to requirements.

Manually Submitting Messages to an Action-Request System

You can use HPOM messages in the `Message Browser` window to create action requests in the ARS. The situations in which you submit messages manually depend on how your organization uses HPOM, ARS, and the SPI for Remedy ARS.

To manually submit HPOM messages to a Remedy Action-Request System:

1. In the `Message Browser` window, select one or more messages that you want to submit.
2. In the `Application Bank` window, double-click the `Remedy SPI` application group, and execute the `Submit Message(s)` application.

The application confirms success or failure of your action in an `Output of Application` window. Message submission to ARS fails if:

- The HPOM message does not match any of the conditions in the rules file. For more details, see [“Defining Conditions” on page 112](#).
- HPOM or an HPOM user has already submitted the same HPOM message. You cannot resubmit HPOM messages. The SPI for Remedy ARS updates them automatically according to the update rules in the rules file. For more details, see [“Defining Update Rules” on page 93](#).

NOTE

If you submit several messages at the same time, the SPI for Remedy ARS evaluates conditions for the message with the highest severity first. If more than one message has the same severity, the SPI for Remedy ARS takes the first message it finds with this severity.

If message submission is successful, a new action request appears in the appropriate action-request schema.

Attaching Messages to Existing Action Requests

You can attach one or more new HPOM messages to an existing action request. You might want to attach several messages to a single action request if one problem causes (or has already caused) several other problems in different, but related, areas.

To attach HPOM messages to an existing action request:

1. In the `Message Browser` window, select the original message for which an action request already exists.
2. Select one or more messages that you want to attach to the action request.
3. Double click the `Attach Message(s)` application.

NOTE

The SPI for Remedy ARS treats messages attached to an action request as an update to the action request. For more details, see [“Defining Update Rules” on page 93](#).

If you want to configure the SPI for Remedy ARS to be able to perform attachments to existing action request automatically, see [“Configuring automatic attachments” on page 136](#). Attaching automatically is available on HPOM for Windows, too.

6

Customizing the SPI for Remedy ARS

This section describes how to customize the SPI for Remedy ARS to suit the demands of your environment.

In this Section

This section describes how to customize the Smart Plug-in for Remedy Action Request System to suit the demands of your environment and to take full advantage of the functionality of the SPI for Remedy ARS in your environment. The section covers the following high-level areas:

- [“Customizing HP Operations Manager for UNIX”](#)
- [“Customizing the Rules File”](#)
- [“ARS Filters and Active Links”](#)
- [“Customizing the SPI for Remedy ARS for Multiple Servers”](#)
- [“Using Backup Action-Request-System Servers”](#)
- [“Maintaining a backup copy of the SPI database”](#)
- [“Using the SPI for Remedy ARS on Cluster Nodes”](#)
- [“Using External Actions and Data”](#)
- [“Miscellaneous Configurations Tasks”](#)
- [“Utilities installed with the SPI”](#)

Customizing HP Operations Manager for UNIX

The SPI for Remedy ARS's installation process creates a default configuration within HPOM. You may need to change these, depending on your organization's needs. In this section, you can find out how to perform the following actions:

- [“Customizing HPOM GUI Elements” on page 78](#)
- [“Modifying the SPI for Remedy ARS Policies” on page 79](#)
- [“Setting up the Trouble-Ticket Interface on HPOM” on page 81](#)

Customizing HPOM GUI Elements

After you install the SPI for Remedy ARS, new elements appear in the HP Operations Manager for UNIX GUI that enable you to work with the SPI for Remedy ARS. [Table 6-1](#) shows a list of these objects.

Table 6-1 SPI for Remedy ARS Objects in the HPOM GUI

Object Type	Name	Description
Node Group	SPI for Remedy ARS Servers	Nodes on which a SPI for Remedy ARS server runs. By default, this contains the current SPI for Remedy ARS server node.
	AR Servers NT	Windows NT nodes on which an action-request server runs. By default, this window is empty to allow you to add nodes as appropriate.
	AR Servers UX	UNIX (non AIX) nodes on which an action-request server runs. By default, this window is empty to allow you to add nodes as appropriate.
	AR Servers AIX	AIX nodes on which an action-request server runs. By default, this window is empty to allow you to add nodes as appropriate.
Message Group	Remedy-SPI	HPOM messages that result from monitoring the SPI for Remedy ARS server
	AR-System	HPOM messages that result from monitoring an action-request server.

Table 6-1 SPI for Remedy ARS **Objects in the HPOM GUI (Continued)**

Object Type	Name	Description
Application/Tool Group	Remedy SPI Admin	Applications that the SPI for Remedy ARS administrator uses to manage the SPI for Remedy ARS and action-request servers.
	Remedy SPI	Applications that SPI for Remedy ARS operators and administrators use to work with the SPI for Remedy ARS.
User	remspi_adm	The SPI for Remedy ARS administrator has access to all SPI for Remedy ARS node, message, and application groups. After installation, the default password is RemspI_adm.
	remspi_op	The SPI for Remedy ARS operator has access to all SPI for Remedy ARS node and message groups, but only to the SPI for Remedy ARS application group. After installation, the default password is RemspI_op.

Modifying the SPI for Remedy ARS Policies

You can modify the policies supplied with the SPI for Remedy ARS in the HPOM GUI. For example, you might want to modify the configuration of a policy to change the polling interval or set up the Trouble-Ticket interface for individual message conditions.

The following tables describe the SPI for Remedy ARS policies.

Table 6-2 Policy Group “Remedy SPI - AR Server AIX”

Policy Name	Description
RemSPI ARS Server errors (UX)	Monitors the AR system server error log file (UNIX version)
RemSPI itouupdate messages (AIX)	Monitors the log file of itouupdate (AIX version)
RemSPI_ARC_server_UX	Check whether Remedy ARS processes are down (UNIX version)
RemSPI_ARC_server_UX_Up	Check whether Remedy ARS processes are up (UNIX version)

Table 6-3 Policy Group “Remedy SPI - AR Server NT”

Policy Name	Description
RemSPI ARS Server errors (NT)	Monitors the AR system server error log file (Windows version)
RemSPI itouupdate messages (NT)	Monitors the log file of itouupdate (Windows version)
RemSPI_ARC_server_NT	Check whether Remedy ARS processes are down (Windows version)
RemSPI_ARC_server_NT_Up	Check whether Remedy ARS processes are up (Windows version)

Table 6-4 Policy Group “Remedy SPI - AR Server UX”

Policy Name	Description
RemSPI ARS Server errors (UX)	Monitors the AR system server error log file (UNIX version)

Table 6-4 Policy Group “Remedy SPI - AR Server UX” (Continued)

Policy Name	Description
RemSPI itoupdate messages (UX)	Monitors the log file of itoupdate (UNIX version)
RemSPI_ARS_server_UX	Check Remedy ARS processes

Table 6-5 Policy Group “Remedy SPI - ITO”

Policy Name	Description
RemSPI SPI Server	Monitors the error log file of the SPI server process
RemSPI Internal Messages	Catches internal messages of the SPI
RemSPI Test	Catches test messages of the SPI
RemSPI_Server	Monitors the existence of the SPI server.
RemSPI_QSize	Monitors the size of the communication queue between HPOM and the SPI.

Setting up the Trouble-Ticket Interface on HPOM

This section describes how to set up the Trouble-Ticket (TT) interface in HPOM so that messages generated by HPOM can be submitted automatically to the action-request server via SPI for Remedy ARS. In addition, you can also choose to enable the Trouble-Ticket interface for individual message conditions - so that HPOM messages generated as a result of matching specific policy conditions are copied to the TT interface.

1. Set up the Trouble-Ticket interface on the HPOM management server using the HPOM GUI.
2. Enable the Trouble-Ticket interface for the individual message conditions that will generate messages for ARS.

Customizing the Rules File

This section describes how to customize the rules file, which determines how the SPI for Remedy ARS handles HPOM messages and Action Requests. This section covers the following high-level areas:

- “The Structure of the Rules File”
- “Defining Global Options”
- “Defining Targets”
- “Defining Buffer Rules”
- “Defining Update Rules”
- “Defining Submit and Attach Rules”
- “Defining Move-From and Move-To Rules”
- “Defining Conditions”
- “Defining Actions”
- “An Example of a Rules File”

NOTE

After making changes to the `rules` file, you need to apply the changes by saving the file and stopping and restarting the SPI for Remedy ARS server process, which runs on the HPOM management server.

The Structure of the Rules File

The `rules` file is a plain text file, which resides in the directory `/etc/opt/OV/share/conf/remspi`. By default, the `rules.PR` file contains some example rules, which you must edit to meet the needs and requirements of your organization. The rules file defines:

- global options which rule the overall behavior of the SPI for Remedy ARS
- targets that describe action-request servers and schemas

- update rules that determine how the SPI for Remedy ARS updates an HPOM message if the corresponding action request changes
- submit/attach rules that determine how the SPI for Remedy ARS updates an HPOM message if the message is submitted as/attached to an action-request ticket
- move from/to rules that determine how the SPI for Remedy ARS updates an HPOM message if the action-request ticket is moved away/to a target by means of an action-request transfer (DSO)
- conditions that filter the HPOM messages submitted to the SPI for Remedy ARS
- actions that determine how to create or update action requests when an HPOM message satisfies a defined condition

Figure 6-1 **The Structure of the Rules File**

```
File Description
Global Options

Target 1
  Buffer Rules
  Update Rules
  ...

Target n
  Buffer Rules
  Update Rules

Condition 1
  Action
Condition 2
  Action
...
Condition n
  Action
```

The main body of the `rules` file, as illustrated in [Figure 6-1](#), starts with an optional global options sections, followed by one or more target definitions, each with its own update rules. You follow these with one or more condition definitions, each with its own action.

The file description consists of:

- the syntax version identifier: `SYNTAX VERSION 2.3`
- the rules file name that you define as: `SPI_RULES "string"`
- a description that you define as: `DESCRIPTION "string"`

A rules file definition should look similar to the following:

```
SYNTAX VERSION 2.3
SPI_RULES      "rules"
DESCRIPTION    "Rules file for the AR Problem System"
```

You should note the following important points about the rules file syntax:

- You can insert a comment in the rules file, by preceding it with the hash (#) character. The SPI for Remedy ARS server ignores everything between the # character and the end of the line.
- Text strings can contain standard characters including carriage returns and tabs. You can insert print characters within a text string by preceding the print character with two back-slash characters (\\). The same rule applies for if you want to include quotation marks or tab characters. For example:

```
\\n           represents a new line
\\"           represents a quotation mark
\\t           represents a tab character
```

- Text strings, which are not keywords, are always enclosed in quotation marks, e.g. "MyTargetName". This rule applies even if the string does not contain embedded white space.
- You can also use special variables within the rules file. To do this, always enclose the variable with dollar (\$) signs. For example `$$MSG_TEXT$`. For more information, see [Table 6-18 on page 139](#).

Defining Global Options

A *global option* controls the overall behavior of the SPI for Remedy ARS. [Table 6-6](#) shows the option names that you can define globally.

Table 6-6 Global Options

Option	Description
NO_AR_UPDATE	The SPI for Remedy ARS does not process changes to HPOM messages. Changing an HPOM message does not result in a change to the associated action-request ticket.
ANNO_FAILED_MSG_UPD	<p>If an HPOM message could not be updated as a consequence of a change of the associated action-request ticket, an annotation is added to this HPOM message.</p> <p>Note that this added annotation does not trigger an update of the associated action-request ticket.</p> <p>This option is valid for message updates specified in the ITO_UPDATE and ON_SUBMIT sections of the rules file</p>
BUFFER_TT	This option controls whether the ticket creation and update requests should be buffered if the action-request server is down or not available.

Table 6-6 Global Options (Continued)

Option	Description
FORGET_ACKED_MSGS	The SPI for Remedy ARS maintains its own database containing the IDs of messages and tickets. If an HPOM message is acknowledged, the entries in the SPI database are deleted if this option is set. This helps to clean up the database and speeds up the processing of the SPI for Remedy ARS. However, if the HPOM message is unacknowledged later, it cannot be updated by the SPI for Remedy ARS.

Table 6-6 Global Options (Continued)

Option	Description
FLEXIBLE_TICKET_UPDATES	<p>If this option is <i>not</i> set, an existing AR ticket is updated - if the corresponding HPOM message is modified - via the <i>same</i> SPI rules file condition which was used to <i>create</i> the ticket.</p> <p>If this option <i>is</i> set and an HPOM message is modified, the rules file condition used to update the corresponding AR ticket is determined by checking all rules file conditions from the beginning until a match is found - similar to the process used when creating the ticket. New condition terms which may be used in such update conditions are MESSAGE_STATUS (the status of the modified HPOM message) and CREATE_CONDITION (the name of the condition which was used to create the corresponding ticket). Note that for conditions used solely for updating, only fields marked as UPDATEable make sense. If this option is set and no matching rules file condition is found for a modified HPOM message, the AR ticket is not updated.</p>
ANNO_SEPARATOR “string”	<p>This option defines the separator string in case multiple OM message annotations are concatenated for a ticket field by using the action variable \$MSG_ANNO\$. The string may consist of multiple lines and thus may include line breaks.</p>

The following example defines all global options.

```
OPTION NO_AR_UPDATE
OPTION ANNO_FAILED_MSG_UPD
OPTION BUFFER_TT
OPTION FORGET_ACKED_MSGS
OPTION FLEXIBLE_TICKET_UPDATES
OPTION ANNO_SEPARATOR "..."
```

If buffering is turned on (OPTION BUFFER_TT), then the requests for creating and updating action-request tickets are buffered until the action-request server is available again.

If the action-request server is back, the buffered requests are processed in the order they were buffered.

Internal SPI for Remedy ARS messages are generated when buffering starts and ends.

Change events for buffered HPOM messages are not buffered.

If you need more detailed messages regarding the buffering status, use the variable REMSPI_QUEUE_CHECK in file remspi.cfg. The value of this variable is treated as a time delay after which the number of buffered requests is checked. If the number of buffered requests is greater than zero, an internal warning message is written to the SPI's log file - and forwarded to the HPOM message browser. Note that this check is performed and a message is generated on each check cycle - if a buffered request exists. The number of requests existing in the buffer queues is added to the message. If the variable is not specified or set to 0, no check is performed.

See [“Defining Buffer Rules” on page 92](#) for details regarding the definition of rules for buffering.

Defining Targets

A *target* defines the name, location of a form (schema) on an action-request server and any login details that are required for the SPI for Remedy ARS. This information enables the SPI for Remedy ARS server to connect to the action-request server and create or change action requests that belong to a particular schema.

Table 6-7 Target Attributes

Attribute	Description
TARGET	An alias that you use to reference the target schema within the rules file. See the example below.
SERVER	The name of the machine where the (primary) action-request server runs. For example, <i>ars1.yourcompany.com</i> . This value is <i>mandatory</i>
BACKUP_SERVER	The name of the machine where the backup action-request server runs. For example, <i>ars1.yourcompany.com</i> . This value is <i>optional</i> . If the primary server is not reachable, the ticket is created on the backup server - if configured
SCHEMA	The name of the form (schema). <i>This attribute is mandatory.</i>
USER	<p>The user name with which the SPI for Remedy ARS server logs in to the action-request server. <i>This attribute is mandatory.</i></p> <p>Note that you should use different account names for the SPI for Remedy ARS server logging in to the action-request server and for interactive users to be able to distinguish between transactions triggered by the SPI for Remedy ARS and transactions triggered by interactive users.</p>

Table 6-7 Target Attributes (Continued)

Attribute	Description
PASSWORD	<p>The encrypted password for USER.</p> <p>Note that this password must be encrypted with the command <code>remspipasswd</code>.</p> <p>If this attribute is not specified, it defaults to the blank (empty) password.</p>
ARTCPPOINT	<p>The TCP port on which the action-request server is running. Note that this is only necessary if you configured the action-request server to run on a fixed port and not using the portmapper. If this optional attribute is missing or specified with a value of 0, then the portmapper is used from the SPI for Remedy ARS server. See “Communicating with the Action-Request Server through a Firewall” on page 62 for more details.</p>
ARRPC	<p>The number of the dedicated server queue the SPI for Remedy ARS server should use for communication with the action-request server. If this optional attribute is missing or a value of 0 is specified, then the fast server queue is used. See “Using Private Queues on the Action-Request Server” on page 62 for more details.</p>
AR_SESS_TIMEOUT_NORMAL	<p>An integer value for the timeout in seconds used in fast AR server operations. If this optional attribute is not defined, then the global default value defined in the <code>remspi.cfg</code> is used.</p>

Table 6-7 Target Attributes (Continued)

Attribute	Description
AR_SESS_TIMEO UT_LONG	An integer value for the timeout in seconds used in list AR server operations. If this optional attribute is not defined, then the global default value defined in the <code>remspi.cfg</code> is used.
AR_SESS_TIMEO UT_XLONG	An integer value for the timeout in seconds used in definition updating and import/export operations on the AR server. If this optional attribute is not defined, then the global default value defined in the <code>remspi.cfg</code> is used.

Table 6-7 shows the attributes that you can define for a target. Each attribute must appear once per target definition (ARTCPPORT and ARRPC are optional). You use these attributes to define a target for each of the forms that the SPI for Remedy ARS must use.

The following example defines a target for the form Problem Report illustrated in Figure 2-3 on page 22, on a server called `ars1.bbn.hp.com`. If this primary server is not available, the backup server `ars2.bbn.hp.com` is contacted. If the backup server is not available either, the request is queued (if the `OPTION BUFFER_TT` is set). The default communication is explicitly specified.

```
TARGET "ProbSys"
  SERVER "ars1.bbn.hp.com"
  BACKUP_SERVER "ars2.bbn.hp.com"
  SCHEMA "Problem Report"
  USER "spi_user"
  PASSWORD "c8D5F22121E076C200F6E6B4E94B2C679B2DA"
  ARTCPPORT 0
  ARRPC 0
```

NOTE To display the encrypted version of a password, use the command:
`remspipasswd <password>`

Defining Buffer Rules

Each target has a set of buffer rules. The buffer rules define which priority should be attached to buffered requests for HPOM messages. These rules only apply if the global `OPTION BUFFER_TT` is turned on.

Three priorities are available: `HIGH`, `MEDIUM` and `LOW`. If a request has to be buffered, the SPI for Remedy ARS checks the severity of the relevant HPOM message and stores the request in the appropriate priority queue.

```
BUFFER
  PRIO HIGH      severity ...
  PRIO MEDIUM   severity ...
  PRIO LOW       severity ...
  PRIO DISCARD  severity ...
```

The severity of a message is specified using the keywords:

- Critical
- Major
- Minor
- Warning
- Normal
- Unknown

Multiple severities may be specified for a priority queue. If a severity is not specified, the priority of the queue defaults to `LOW`, that is: the message is stored in the `LOW` priority queue. If the complete `BUFFER` section is omitted, all requests are stored in the `LOW` priority queue. The special priority `DISCARD` may be used to skip buffering requests with specific severities.

The retry intervals for the priority queues may be adjusted in the `remspi.cfg` file using the following syntax:

```
REMSPI_QUEUE_READ_HIGH interval
REMSPI_QUEUE_READ_MEDIUM interval
REMSPI_QUEUE_READ_LOW interval
```

The *interval* is the delay in seconds between two checks of the relevant queue. The default values are as follows:

- `REMSPI_QUEUE_READ_HIGH 300`

- REMSPI_QUEUE_READ_MEDIUM 600
- REMSPI_QUEUE_READ_LOW 900

NOTE

Realtime events arriving during queue checks are processed immediately.

Defining Update Rules

Each target has a set of update rules. The update rules define how the SPI for Remedy ARS server updates the associated HPOM messages when it receives details of modifications to an action request.

NOTE

The update rules are also evaluated if the action-request ticket is moved between action-request servers or forms (DSO).

You define the update rules by adding the `ITO_UPDATE` attribute to the target definition. You then assign keywords with parameters to the `ITO_UPDATE` attribute. [Table 6-8 on page 94](#) shows the keywords you use to define for a target. All of the keywords are described in the sections that follow:

- [“Acknowledging Messages”](#)
- [“Unacknowledging Messages”](#)
- [“Adding Annotations to a Message”](#)
- [“Escalating a Message”](#)
- [“Starting an Operator-Initiated Action”](#)
- [“Taking Ownership of a Message”](#) (disowning first on request)
- [“Removing Ownership from a Message”](#)
- [“Modifying the text of a Message”](#)
- [“Modifying the severity of a Message”](#)
- [“Modifying or Adding a Custom Message Attribute”](#)

NOTE

Optional keywords and parameters are listed in brackets, e.g.
[IF_MODIFIED *field ID*]

The special manually constructed action-request filter mentioned in [Table 6-8 on page 94](#) is described in “[Configuring a Special IF_MODIFIED ARS Filter Manually](#)” on page 154.

If the keyword IF_MODIFIED is used, the action-request filter which notifies the SPI for Remedy ARS server must be constructed in a special way. This must be done manually using the action-request administrator’s GUI, since the program `remspifilter` is not able to generate those filters. To learn about these special action-request filters, see [Configuring a Special IF_MODIFIED ARS Filter Manually](#) on page 154.

Table 6-8 **Update Keywords**

Keyword	Parameters	Description
ACKNOWLEDGE	[IF_MODIFIED] <i>field ID</i> <i>value</i>	Use this keyword to acknowledge the HPOM message if the <i>field ID</i> has the given <i>value</i> . This also removes the association between the action request and the HPOM message from the SPI for Remedy ARS database. If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.

Table 6-8 Update Keywords (Continued)

Keyword	Parameters	Description
UNACKNOWLEDGE	[IF_MODIFIED] <i>field ID</i> <i>value</i>	<p>Use this keyword to unacknowledge the HPOM message if the <i>field ID</i> has the given <i>value</i>. This action is valid only if the message was locally acknowledged using the HPOM GUI.</p> <p>If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.</p>
ANNOTATE	[IF_MODIFIED <i>field ID</i>] <i>format</i>	<p>Use this keyword to add an annotation to the HPOM message. The <i>format</i> describes the annotation to the HPOM message and can consist of text and variables.</p> <p>If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.</p>

Table 6-8 Update Keywords (Continued)

Keyword	Parameters	Description
ANNOTATE	[IF_MODIFIED] < <i>field ID</i> <i>value</i> > <i>format</i>	Use this keyword to add an annotation to the HPOM message if the <i>field ID</i> has a special <i>value</i> . The <i>format</i> describes the annotation to the HPOM message and can consist of text and variables. If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.
ESCALATE	<i>command name</i>	Use this keyword to escalate the HPOM message if the SPI for Remedy ARS client passes the given <i>command name</i> . Not supported on OMU 9.
OP_ACTION	<i>command name</i>	Use this keyword to start an operator-initiated action if the SPI for Remedy ARS client passes the given <i>command name</i> .

Table 6-8 Update Keywords (Continued)

Keyword	Parameters	Description
OWN	[IF_MODIFIED] <i>field ID</i> <i>value</i>	<p>Use this keyword to take ownership of the HPOM message if the <i>field ID</i> has the given <i>value</i>.</p> <p>If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.</p>
FORCE OWN	[IF_MODIFIED] <i>field ID</i> <i>value</i>	<p>Use this keyword to remove the ownership of the message and then to take ownership of the HPOM message if the <i>field ID</i> has the given <i>value</i> (regardless which user currently owns the message).</p> <p>Note that the REMSPI_ITO_ADMIN_PASSWD keyword is necessary in the <i>remspi.cfg</i> file for this to work.</p> <p>If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.</p>

Table 6-8 Update Keywords (Continued)

Keyword	Parameters	Description
DISOWN	[IF_MODIFIED] <i>field ID</i> <i>value</i>	<p>Use this keyword to remove ownership of the HPOM message if the <i>field ID</i> has the given <i>value</i> (regardless which user currently owns the message).</p> <p>Note that to use this keyword, the password for the HPOM administrator has to be configured with the REMSPI_ITO_ADMIN_PASSWD keyword in the <code>remspi.cfg</code> file.</p> <p>If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an action-request user transaction and the action-request filter was constructed in a special way.</p>
MSGTXT	[IF_MODIFIED] <i>field ID</i> <i>value</i> <i>format</i>	<p>Use this keyword to modify the text of the HPOM message if the <i>field ID</i> has a special <i>value</i>. The format describes the new message text of the HPOM message and can consist of text and variables. If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the field ID was modified in an AR user transaction and the AR filter was constructed in a special way.</p>

Table 6-8 Update Keywords (Continued)

Keyword	Parameters	Description
SEVERITY	[IF_MODIFIED] <i>field ID</i> <i>value</i> <i>severity</i>	Use this keyword to modify the severity of the HPOM message if the <i>field ID</i> has a special value. The <i>severity</i> describes the new message severity of the HPOM message (Critical, Major, Minor, Warning, Normal). If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an AR user transaction and the AR filter was constructed in a special way.
CMA	[IF_MODIFIED] <i>field ID</i> <i>value</i> <i>cma-name</i> <i>format</i>	Use this keyword to add or modify the contents of a custom message attribute with name <i>cma-name</i> of the HPOM message if the <i>field ID</i> has a special <i>value</i> . The <i>format</i> describes the new contents of the CMA and can consist of text and variables. If the optional keyword IF_MODIFIED is used, this update rule is triggered only if the <i>field ID</i> was modified in an AR user transaction and the AR filter was constructed in a special way.

Acknowledging Messages

The following example shows an update rule that acknowledges the HPOM message if the modified action request has the value Closed in field 7.

```
ITO_UPDATE
  ACKNOWLEDGE 7 "Closed"
```

The next example shows an update rule that acknowledges the HPOM message if the modified action request has the value `Closed` in field 7 and this field was modified in the current action-request transaction.

```
ITO_UPDATE
  ACKNOWLEDGE IF_MODIFIED 7 "Closed"
```

NOTE

Note that if the `IF_MODIFIED` tag is used in the update rules, the action-request filters which trigger the notification of the SPI for Remedy ARS server must be constructed manually in a special way. The program `remspifilter` is not able to generate these filters on the action-request server. To learn about these special action-request filters, see [Configuring a Special IF_MODIFIED ARS Filter Manually](#) on page [page 154](#).

For information on the problems that can occur when acknowledging a large number of messages at the same time, see [“Troubleshooting SPI for Remedy ARS Usage”](#) on page [191](#)

Unacknowledging Messages

The following example shows an update rule that unacknowledges the HPOM message if the modified action request has the value `Open` in field 7.

```
ITO_UPDATE
  UNACKNOWLEDGE 7 "Open"
```

Adding Annotations to a Message

The following example adds the `ITO_UPDATE` attribute to the existing target definition and defines an update rule using the `ANNOTATE` keyword. The `ANNOTATE` keyword uses text, variables, and control characters. The variables `5` and `1000000001` refer to field identifiers for values in the action request. The control character `\\n` starts a new line in the annotation.

```
TARGET "ProbSys"
  SERVER "ars1.hp.com"
  SCHEMA "Problem Report"
  USER "spi_user"
```

```
PASSWORD "C338D5F22121E076C200F6E6B4E94B2C679B2DA"
ITO_UPDATE
  ANNOTATE "$5$ has modified the action request.\n He or she
made the following work log entry: \n\n$1000000001$"
```

The following example shows the different annotations which the SPI for Remedy ARS adds depending on whether field 7 has the value Rejected or Closed.

```
ITO_UPDATE
  ANNOTATE 7 "Rejected" "$5$ rejected the action request."
  ANNOTATE 7 "Closed" "$5$ closed the action request."
```

The next example shows the same annotations, but now these annotations are added to the HPOM message only if the field 7 was modified in the current action-request transaction by an interactive action-request user. For this example to execute properly, the action-request filters which trigger the notification of the SPI for Remedy ARS server and thus the evaluation of the update rules, must be constructed manually in a special way. The program `remspifilter` is not able to create these filters.

```
ITO_UPDATE
  ANNOTATE IF_MODIFIED 7 "Rejected" "$5$ rejected the action
request."
  ANNOTATE IF_MODIFIED 7 "Closed" "$5$ closed the action
request."
```

You can also use annotation variables in the format that follows an ANNOTATE keyword. [Table 6-9](#) shows the annotation variables that you can use. These variables must be embedded in dollar signs. In addition to the variables listed, you may also refer to the contents of AR ticket fields by embedding the field number in dollar signs. More, all attributes of the current HPOM message may be used ([Table 6-13 on page 122](#)).

Table 6-9 **Annotation Variables**

Variable	Description
ARS_ID	The unique identifier of the modified action request.
ARS_SCHEMA	The schema name that the modified action request belongs to.
ARS_SERVER	The host name of the server where the schema exists.

Table 6-9 **Annotation Variables (Continued)**

Variable	Description
ARS_USER	The name of the user in the action-request System who modified the action request.

The following example shows the ANNOTATE keyword with a format that includes annotation variables.

```
ITO_UPDATE
ANNOTATE "An action request exists for this message in the
schema $ARS_SCHEMA$ on the server $ARS_SERVER$. The action
request has the ID $ARS_ID$.
```

Escalating a Message

The next example shows an update rule that escalates an HPOM for Unix message if an appropriate HPOM escalation manager exists. The command name (here `escalate`) must match the command parameter in the active link that calls the SPI for Remedy ARS client. For more details about setting up an active link, see [“Configuring an Active Link” on page 156](#).

```
ITO_UPDATE
  ESCALATE "escalate"
```

Starting an Operator-Initiated Action

The next example shows an update rule that starts the HPOM message’s operator-initiated action, if one exists. The command name (here `start-action`) must match the command parameter in the active link that calls the SPI for Remedy ARS client. For more details about setting up an active link, see [“Configuring an Active Link” on page 156](#).

```
ITO_UPDATE
  OP_ACTION "start-action"
```

Taking Ownership of a Message

The following example shows two update rules that use the `OWN` keyword. The first rule instructs the SPI for Remedy ARS to take ownership of the corresponding HPOM message if the modified action request has the value `Open` in field 7. Note that taking ownership here is possible only if the message is not owned by another user yet.

The second rule instructs the SPI for Remedy ARS to take ownership of the HPOM message (regardless which user owns the message currently) if the modified action request has the value `Solved` in field 7.

```
ITO_UPDATE
    OWN 7 "Open"
FORCE OWN 7 "Solved"
```

NOTE

The HPOM user that you specify in the configuration file `remspi.cfg` becomes the owner of the HPO messages.

For information on the problems that can occur when taking ownership of a large number of messages at the same time, see [“Troubleshooting SPI for Remedy ARS Usage” on page 191](#)

Removing Ownership from a Message

The following example shows an update rule that use the `DISOWN` keyword. The rule instructs the SPI for Remedy ARS to remove ownership from the corresponding HPOM message if the modified action request has the value `New` in field 7.

```
ITO_UPDATE
    DISOWN 7 "New"
```

Modifying the text of a Message

The following example shows an update rule that use the `MSGTXT` keyword. The rule instructs the SPI for Remedy ARS to modify the text of the corresponding HPOM message if the modified action request has the value `Rejected` in field 7. The new text of the message contains information about the ticket ID, the rejecting user and the original message text.

You can also use annotation variables in the format that follows a `MSGTXT` keyword. [Table 6-9 on page 101](#) shows the annotation variables that you can use. These variables must be embedded in dollar signs. In addition to the variables listed, you may also refer to the contents of AT ticket fields by embedding the field number in dollar signs. You can use all the attributes of the current HPOM message as described in [Table 6-13 on page 122](#).

```
ITO_UPDATE
MSGTXT 7 "Rejected" "Ticket $ARS_ID$ rejected by $5$
($MSG_TEXT_ORIG$) "
```

Modifying the severity of a Message

The following example shows an update rule that uses the `SEVERITY` keyword. The rule instructs the SPI for Remedy ARS to set the severity of the corresponding HPOM message to `Minor` (keyword, i.e. no quotes) if the modified action request has the value `Minor` in field `10000002` (string, i.e. with quotes). More than one `SEVERITY` rule may be specified, with different conditional values.

```
ITO_UPDATE
SEVERITY 10000002 "Minor" Minor
```

Modifying or Adding a Custom Message Attribute

The following example shows an update rule that use the `CMA` keyword. The rule instructs the SPI for Remedy ARS to add or to modify the `CMA` with name `CMA-1` of the corresponding HPOM message if the modified action request has the value `Rejected` in field `7`. The text of the `CMA` contains information about the ticket ID, the rejecting user and the message text.

You can also use annotation variables in the format that follows a `MSGTXT` keyword. [Table 6-9 on page 101](#) shows the annotation variables that you can use. These variables must be embedded in dollar signs. In addition to the variables listed, you may also refer to the contents of action-request ticket fields by embedded the field number in dollar signs. More, all attributes of the current HPOM message may be used ([Table 6-13 on page 122](#)).

```
ITO_UPDATE
CMA 7 "Rejected" "CMA-1" "Ticket $ARS_ID$ rejected by $5$
($MSG_TEXT_ORIG$) "
```

Defining Submit and Attach Rules

Each target has a set of submit and attach rules. The submit rules define how the SPI for Remedy ARS server updates the HPOM messages when it submits these messages as an action-request ticket. The attach rules

define how the SPI for Remedy ARS server updates the HPOM messages when it attaches messages to an existing action-request ticket. You define the submit rules by adding the ON_SUBMIT attribute to the target definition. The attach rules are defined by adding the ON_ATTACH attribute to the target definition

All of the keywords are described in the sections that follow:

- “Acknowledging Messages”
- “Taking Ownership of a Message” (disowning first on request)
- “Removing Ownership from a Message”
- “Modifying the text of a Message”
- “Setting or Modifying a Custom Message Attribute (CMA) of a Message”
- “Generating an HPOM message”
- “Adding an annotation”

You then assign keywords with parameters to the ON_SUBMIT resp. ON_ATTACH attribute. [Table 6-10 on page 105](#) shows the keywords you use to define for a target.

Table 6-10

Submit and Attach Keywords

Keyword	Parameters	Description
ACKNOWLEDGE	-	Use this keyword to acknowledge the HPOM message right after the message is submitted as an action-request ticket. This also removes the association between the action request and the HPOM message from the SPI for Remedy ARS database.
OWN	-	Use this keyword to take ownership of the HPOM message right after the message is submitted as an action-request ticket.

Table 6-10 **Submit and Attach Keywords (Continued)**

Keyword	Parameters	Description
FORCE OWN	-	<p>Use this keyword to remove the ownership of the message and then to take ownership of the HPOM message right after the message is submitted as an action-request ticket.</p> <p>Note that the REMSPI_ITO_ADMIN_PASSWD keyword is necessary in the remspi.cfg file for this to work.</p>
DISOWN	-	<p>Use this keyword to remove ownership of the HPOM message right after the message is submitted as an action-request ticket.</p> <p>Note that to use this keyword, the password for the HPOM administrator has to be configured with the REMSPI_ITO_ADMIN_PASSWD keyword in the remspi.cfg file.</p> <p>Note further that this operation is carried out after the modification if the HPOM message text (if specified).</p>

Table 6-10 Submit and Attach Keywords (Continued)

Keyword	Parameters	Description
MSGTXT_PREFIX	A string which will be prepended to the original message text. See “Modifying the text of a Message” on page 103 for details.	Use this keyword to modify the text of the HPOM message right after the message is submitted as an action-request ticket. Note that after modification, the message is automatically owned by the HPOM core system. You can disown the message immediately after the modification by using the DISOWN submit keyword. An annotation documenting the modification is automatically added by the HPOM core system.
CMA	First string parameter is the name of the CMA to be set, second string parameter the value of the CMA. See “Setting or Modifying a Custom Message Attribute (CMA) of a Message” on page 111 for details.	Use this keyword to set or modify a custom message attribute of the HPOM message right after the message is submitted as an AR ticket. Note that after modification, the message is automatically owned by the HPOM core system. You can disown the message immediately after the modification by using the DISOWN submit keyword. An annotation documenting the modification is automatically added by the HPOM core system.

Table 6-10 Submit and Attach Keywords (Continued)

Keyword	Parameters	Description
MSG_IF_MANUAL	<p>A string which is used as the message text.</p> <p>See “Generating an HPOM message” on page 111 for details.</p>	<p>Use this keyword to specify the text of the HPOM message which is generated right after the current message is successfully and manually submitted as an action-request ticket (\$ITO_SUBMITTER\$ is not "OpC").</p> <p>The new HPOM message has the following attributes:</p> <ul style="list-style-type: none"> • Application "Remedy SPI" • Object "RemSPI" • Message Group "Remedy-SPI" • Severity "Normal"
ANNO_IF_MANUAL	<p>A string which is used as the annotation text.</p> <p>See “Adding an annotation” on page 111 for details.</p>	<p>Use this keyword to specify the text of the annotation which is attached to the HPOM message right after the message is submitted as an action-request ticket.</p> <p>The annotation is added only for successfully and manually submitted messages. If multiple messages are submitted, the annotation is added to all messages.</p>

Acknowledging Messages

The following example shows a submit rule that acknowledges the HPOM message after the message is submitted as an action-request ticket.

```
ON_SUBMIT
  ACKNOWLEDGE
```

For information on the problems that can occur when acknowledging a large number of messages at the same time, see [“Troubleshooting SPI for Remedy ARS Usage” on page 191](#).

Taking Ownership of a Message

The following example shows a submit rule that uses the `FORCE OWN` keyword.

The rule instructs the SPI for Remedy ARS to take ownership of the HPOM message (regardless which user owns the message currently) if the message is submitted as an action-request ticket. If you omit the `FORCE` keyword, the message will be owned only there is no other user currently owning it.

```
ON_SUBMIT
  FORCE OWN
```

NOTE

The HPOM user that you specify in the configuration file `remspi.cfg` becomes the owner of the HPOM messages.

NOTE

If you use the `FORCE` keyword, you have to configure the password of the HPOM administrator in the `remspi.cfg` configuration file using the `REMSPI_ITO_ADMIN_PASSWD` keyword.

For information on the problems that can occur when taking ownership of a large number of messages at the same time, see [“Troubleshooting SPI for Remedy ARS Usage” on page 191](#).

Removing Ownership from a Message

The following example shows a submit rule that uses the `DISOWN` keyword. The rule instructs the SPI for Remedy ARS to remove ownership from the corresponding HPOM message if the message is submitted as an action-request ticket.

```
ON_SUBMIT
DISOWN
```

NOTE

If you use the `FORCE` keyword, you have to configure the password of the HPOM administrator in the `remspi.cfg` configuration file using the `REMSPI_I_TO_ADMIN_PASSWD` keyword.

Modifying the text of a Message

The following example shows a submit rule that uses the `MSGTXT_PREFIX` keyword. The rule instructs the SPI for Remedy ARS to prepend the ticket of the constructed action-request ticket to the text of the corresponding HPOM message if the message is submitted as an action-request ticket.

The formatted text may contain the special variables `ARS_ID`, `$TICKET_SERVER$`, `$BACKUP_USED$`, references to the current message attributes listed in [Table 6-13 on page 122](#), as well as references to fields of the constructed action-request ticket (use `$<fieldno>$`).

```
ON_SUBMIT
MSGTXT_PREFIX "ID: $ARS_ID$, Ticket-ID: $100002$ - "
```

NOTE

If you use the `MSGTXT_PREFIX` keyword, the message will be automatically get an annotation and will be automatically owned. You may decide to disown the message using the submit keyword `DISOWN` additionally.

Setting or Modifying a Custom Message Attribute (CMA) of a Message

The following example shows a submit and an attach rule that uses the CMA keyword. The rule instructs the SPI for Remedy ARS to set the CMAs *ARServer* and *ARTicket* of the corresponding action-request ticket if the message is submitted as an action-request ticket or attached to an existing action-request ticket.

The formatted text may contain the special variables `ARS_ID`, `$TICKET_SERVER$`, `$BACKUP_USED$` and references to the current message attributes listed in [Table 6-13 on page 122](#), as well as references to fields of the constructed action-request ticket (use `<fieldno>$`).

```
ON_SUBMIT
  CMA "ARServer" "$TICKET_SERVER$
  CMA "AR-ID" "$ARS_ID$"
  CMA "Ticket-ID" "$100002$"

ON_ATTACH
  CMA "ARServer" "$TICKET_SERVER$
  CMA "AR-ID" "$ARS_ID$"
  CMA "Ticket-ID" "$100002$"
```

Generating an HPOM message

The following example shows a submit rule that uses the `MSG_IF_MANUAL` keyword. The rule instructs the SPI for Remedy ARS to generate an HPOM message if a message is successfully and manually submitted as an action-request ticket. The submitter must not be "OpC".

The formatted text may contain the special variables `ARS_ID`, `$TICKET_SERVER$`, `$BACKUP_USED$` and references to the current message attributes listed in [Table 6-13 on page 122](#), as well as references to fields of the constructed action-request ticket (use `<fieldno>$`).

```
ON_SUBMIT
  MSG_IF_MANUAL "AR ticket created with ID $100002$"
```

Adding an annotation

The following example shows a submit rule that uses the `ANNO_IF_MANUAL` keyword. The rule instructs the SPI for Remedy ARS to add an annotation to the HPOM message which is submitted as an

action-request ticket. The annotation is sent only if the ticket was successfully and manually submitted. If multiple messages are submitted, the annotation is added to all of them.

The formatted text may contain the special variables \$ARS_ID\$, \$TICKET_SERVER\$, \$BACKUP_USED\$ and references to the current message attributes listed in [Table 6-13 on page 122](#), as well as references to fields of the constructed action-request ticket (use \$<fieldno>\$).

```
ON_SUBMIT
  ANNO_IF_MANUAL "AR ticket created with ID $100002$"
```

Defining Move-From and Move-To Rules

In order to support the modification of HPOM messages in case an action-request ticket is moved between action-request servers or between forms, each target may have a set of move-from and move-to rules. The move-from rules define how the SPI for Remedy ARS server updates the HPOM messages when a ticket is moved away from the current target. The move-to rules define how the SPI for Remedy ARS server updates the HPOM messages when an action-request ticket is moved to the current target. You define the move-from rules by adding the ON_MOVE_FROM_ME attribute to the target definition. The move-to rules are defined by adding the ON_MOVE_TO_ME attribute to the target definition.

You may use the same keywords as in submit and attach rules.

If ticket fields are referenced in move-to rules, they refer to the ticket after the move has been processed by the action-request server.

NOTE

It's not possible to reference fields of an action-request ticket which is moved away from the current target. This is because at the time the SPI for Remedy ARS server learns about the move, the ticket move has already been processed by the action-request server and is thus not available anymore using the old data.

Defining Conditions

Conditions filter the messages that HPOM sends to the SPI for Remedy ARS to determine whether to start an action or suppress the message.

- Message conditions determine whether to start an action and begin under `MSGCONDITIONS`.
- Suppress conditions determine whether to ignore an HPOM message and begin under `SUPPRESSCONDITIONS`.

The rules file can contain multiple sets of message and suppress conditions in any order. You create each condition in a set by assigning a `DESCRIPTION` followed by `CONDITION`.

NOTE

The SPI for Remedy ARS evaluates conditions in the order that they appear in the rules file. If an HPOM message satisfies a condition, the SPI for Remedy ARS does not evaluate any subsequent conditions. Consequently, you must consider the order of conditions in the rules file carefully.

NOTE

Condition descriptions must be unique throughout file. The description of a condition serves as a key reference.

Optional keywords and parameters are listed in brackets, e.g. `[NOT]` `[LIKE]`. The keyword `NOT` negates the specified check, the keyword `LIKE` switches from lexical comparison to pattern matching.

You define the condition using keywords and parameters that refer to values in the HPOM message. The keyword `EXTERNAL` in the test part of a condition refers to an external value file, not to a message attribute.

Table 6-11 Condition Keywords

Keyword	Description
<code>AA_STATUS</code>	The status of the automatic action of the HPOM message. Syntax: <code>AA_STATUS [NOT] status</code> where <i>status</i> one of <code>UNDEFINED</code> , <code>AVAILABLE</code> , <code>STARTED</code> , <code>FINISHED</code> , <code>FAILED</code>

Table 6-11 Condition Keywords (Continued)

Keyword	Description
APPLICATION	<p>The application string attached to the HPOM message.</p> <p>Syntax: APPLICATION [NOT] [LIKE] <i>string</i></p>
APPLICATION IN	<p>A file is specified as the parameter. The current HPOM message application attribute is checked for existence in this file and the condition is satisfied if the value is found. The file holds only strings without blanks, one per line, and is plain text.</p> <p>Syntax: APPLICATION [NOT] IN <i>file-string</i></p>
CMA	<p>This keyword needs two strings as parameters. The first parameter is the name of an HPOM Custom Message Attribute, the second parameter the expected value of this CMA.</p> <p>This condition term is true if the HPOM message has a Custom Message Attribute with that name and value.</p> <p>Syntax: CMA <i>key-string</i> [NOT] [LIKE] <i>val-string</i></p>
CMA IN	<p>A CMA name and a file are specified as the parameters. The named custom message attribute of the current HPOM message is checked for existence in this file and the condition is satisfied if the value is found. The file holds only strings without blanks, one per line, and is plain text.</p> <p>Syntax: CMA <i>key-string</i> [NOT] IN <i>file-string</i></p>

Table 6-11 Condition Keywords (Continued)

Keyword	Description
CREATE_CONDITION	<p>The name of the <code>rules</code> file condition which was used to create the AR ticket.</p> <p>This keyword is used in update conditions which should be triggered if an already submitted HPOM message is modified, and the AR ticket should be updated using a different condition than was used to create it.</p> <p>Valid only if the global option <code>FLEXIBLE_TICKET_UPDATES</code> is set in the rules file.</p> <p>Syntax: <code>CREATE_CONDITION [NOT] name-string</code></p>
DUPLICATES	<p>The number of duplicates of the HPOM message.</p> <p>Syntax: <code>DUPLICATES op number</code></p> <p>where <code>op</code> is one of: <code>==, !=, >=, <=, >, <</code></p>
EXTERNAL	<p>A value in an external value file. For more details, see “Referencing External Values” on page 174.</p> <p>Note that this keyword behaves different than others in this list. This keyword does not refer to an attribute of the HPOM message, but to a value in an external file.</p> <p>Syntax: <code>EXTERNAL key-str [NOT] [LIKE] val-str</code></p>
ITO_SUBMITTER	<p>The name of the HPOM user who submitted the message.</p> <p>Syntax: <code>ITO_SUBMITTER [NOT] [LIKE] string</code></p>

Table 6-11 Condition Keywords (Continued)

Keyword	Description
MESSAGE_STATUS	<p>The type of the modification (<i>Message Change Event</i>) of an already submitted HPOM message. Valid only if the global option FLEXIBLE_TICKET_UPDATES is set in the rules file.</p> <p>Syntax: MESSAGE_STATUS [NOT] <i>status</i> ...</p> <p>where <i>status</i> is one of the following:</p> <ul style="list-style-type: none"> • MSG_EVT_CREATE for new messages • MSG_EVT_ANNO if annotations were added • MSG_EVT_ACK if acknowledged • MSG_EVT_UNACK if unacknowledged • MSG_EVT_OWN if owned • MSG_EVT_DISOWN if disowned • MSG_EVT_AA_START if auto action started • MSG_EVT_AA_END if auto action finished • MSG_EVT_OA_START if oper action started • MSG_EVT_OA_END if oper action finished • MSG_EVT_ESC_TO if escalated to other • MSG_EVT_ESC_FROM if escalated from other • MSG_EVT_MODIFY if modified <p>Multiple <i>status</i> names may be used, separated by blanks.</p>
MSGGRP	<p>The message's message group.</p> <p>Syntax: MSGGRP [NOT] [LIKE] <i>string</i></p>
NODE	<p>The name of the machine that sent the message. (or for which the message was sent).</p>

Table 6-11 Condition Keywords (Continued)

Keyword	Description
NODE_GROUP	<p>One of the HPOM node groups the message node is a member of. Only one node group can be listed here. Note that there is no corresponding action variable \$NODE_GROUP\$.</p> <p>Virtual nodes which are defined using regular expressions in HPOM are supported, too.</p> <p>Syntax: NODE_GROUP [NOT] <i>string</i></p>
NODE_IP	<p>The IP address of the machine that sent the message (or for which the message was sent).</p> <p>Syntax: NODE_IP [NOT] [LIKE] <i>string</i></p>
NODE IN	<p>A file is specified as the parameter. The current HPOM message node is checked for existence in this file and the condition is satisfied if the node is a member of the file. The file holds only names or IP addresses in decimal form (a.b.c.d), one per line, and is plain text.</p> <p>Syntax: NODE [NOT] IN <i>string</i></p>
OA_STATUS	<p>The status of the operator initiated action linked to the HPOM message.</p> <p>Syntax: OA_STATUS [NOT] <i>status</i></p> <p>where <i>status</i> one of UNDEFINED, AVAILABLE, STARTED, FINISHED, FAILED</p>
OBJECT	<p>The name of the object that generated the message.</p> <p>Syntax: OBJECT [NOT] [LIKE] <i>string</i></p>

Table 6-11 Condition Keywords (Continued)

Keyword	Description
OBJECT IN	<p>A file is specified as the parameter. The current HPOM message object attribute is checked for existence in this file and the condition is satisfied if the value is found. The file holds only strings without blanks, one per line, and is plain text.</p> <p>Syntax: OBJECT [NOT] IN <i>file-string</i></p>
OWN_USER	<p>The name of the HPOM user who owns the HPOM message.</p> <p>Syntax: OWN_USER [NOT] [LIKE] <i>string</i> OWN_USER [NOT] NOBODY</p>
SERVICE_NAME	<p>The name of the service attached to the HPOM message.</p> <p>Syntax: SERVICE_NAME [NOT] [LIKE] <i>string</i></p>
SEVERITY	<p>The message's severity. This keyword can take one or more of the parameters unknown, normal, warning, minor, major, or critical. A list is treated as a logical OR.</p> <p>Syntax: SEVERITY [NOT] <i>severity</i></p> <p>where <i>severity</i> is a blank separated list of Unknown, Normal, Warning, Minor, Major, Critical</p>
TEXT	<p>The text that explains the message's cause, i.e. the message text.</p> <p>Syntax: TEXT [NOT] [LIKE] <i>string</i></p>

Table 6-11 shows the keywords that you can assign to a condition. All of the keywords are optional.

You must give a value for each keyword. If the values in the HPOM message match the values you give for the keywords, the HPOM message satisfies the condition, and the action starts.

NOTE

The exception is the keyword `EXTERNAL`. This keyword does refer to the values in the external file, it does not refer to the attributes of the HPOM message.

The next example shows a suppress condition that filters out all HPOM messages that have the severity `Normal`. From the HPOM messages that remain, a message condition selects those that:

- belong to the message group `Printers`
- have the message text `Paper Jam`
- have the severity `Critical`, `Major`, or `Minor`

```
SUPPRESSCONDITIONS
  DESCRIPTION "Suppress Normal"
  CONDITION
    SEVERITY Normal

MSGCONDITIONS
  DESCRIPTION "ProbSys Condition 1"
  CONDITION
    MSGGRP "Printers"
    TEXT "Paper Jam"
    SEVERITY Critical Major Minor
```

NOTE

If you change the `DESCRIPTION` for a message condition that the SPI for Remedy ARS has already used to create an action-request ticket, the SPI for Remedy ARS cannot update the tickets which were created with this condition.

Using Regular Expressions

This sections describes how regular expressions may be used as parameters to the condition keywords.

If the keyword LIKE is specified in a condition, the message attribute (or the external value) is not compared character by character with the string parameter following the LIKE keyword, but this string parameter is then treated as a regular expression pattern.

The SPI supports *Extended Regular Expressions*, like well known commands as grep, vi or awk.

For a detailed discussion of *Extended Regular Expressions*, see the appropriate on-line operating system documentation on your HPOM management server (HP-UX: man 5 regexp, Solaris: man 5 regex).

CAUTION

If you have to use the backslash symbol "\" in you regular expression pattern, you will have to quote this symbol itself by prepending an additional "\" symbol. This is a difference to the operating system documentation.

[Table 6-12 on page 120](#) lists some examples for using regular expressions in conditions.

Table 6-12 Regular Expressions in Message Conditions

Syntax	Description
OBJECT LIKE "^oracle-[0-9]+\$"	Matches if the HPOM message object attribute starts with the string oracle- and ends with a non empty sequence of digits.
TEXT LIKE "ERROR WARNING"	Matches if the HPOM message text contains the words ERROR or WARNING (or both).
NODE_IP LIKE "10\\.1\\.2\\.25[0-4]"	Matches if the message node's IP address is in the range from 10.1.2.250 to 10.1.2.254. Note that you have to quote the period, since a period matches any single character. Note too that, for the SPI for Remedy ARS, it is necessary to quote the quote character.

Defining Actions

This section describes how to define actions within the SPI for Remedy ARS. The section covers the following areas:

- [“Using Action Variables”](#)
- [“Defining Values using Composite Formats”](#)
- [“Setting Default Values”](#)
- [“Setting Enumerated Field Values”](#)
- [“Handling Multiple HPOM Messages”](#)
- [“Setting Update Policies”](#)
- [“Setting a Target’s Default Actions”](#)
- [“Configuring automatic attachments”](#)

Each condition under MSGCONDITIONS has one or more actions. An action determines how the SPI for Remedy ARS creates or updates an action request when an HPOM message satisfies the condition. To define an action, you specify the target and state how the SPI for Remedy ARS must create or update fields.

To specify a target, use `SET TARGET target name`. To specify a field, use `FIELD field ID value`. To specify further actions, repeat `SET TARGET` further.

The next example adds two actions to an existing condition definition. The first action places the text `Created by SPI` into field `1000000005` in the schema that the target `ProbSys1` defines. The second action places text into a field in a schema that the target `ProbSys2` defines.

```
MSGCONDITIONS
  DESCRIPTION "ProbSys Condition 1"
  CONDITION
    MSGGRP"Printers"
    TEXT"Paper Jam"
    SEVERITY Critical Major Minor

  SET TARGET "ProbSys1"
    FIELD 1000000005 "Created by SPI."

  SET TARGET "ProbSys2"
    FIELD 1000000005 "Copy of AR on ProbSys1. Created by SPI."
```

NOTE

Remember to ensure that the value you *assign* to a field is of the appropriate *type* for the field. For example, if the schema defines a field as an integer field, you should assign integers to it.

Even if you do *not* do this, the SPI for Remedy ARS nonetheless attempts to convert in the appropriate manner. The SPI for Remedy ARS truncates string values if necessary.

Using Action Variables

You can also define values in the action request using information derived from the HPOM message.

[Table 6-13](#) shows the action variables that you can use. Each time you use an action variable, place \$ before and after the variable name.

Table 6-13

Action Variables

Variable	Description	Can Be Empty ?
<i>AA_ACK_FLAG</i>	Whether this message's automatic action acknowledges the message.	No
<i>AA_ANNO_FLAG</i>	Whether the output of this message's automatic action becomes a new annotation.	No
<i>AA_CMD</i>	The command for this message's automatic action.	Yes
<i>AA_NODE</i>	The node which this message's automatic action runs on.	Yes
<i>AA_STATUS</i>	The status of this message's automatic action.	No
<i>ACK_TIME</i>	The time that the message became acknowledged.	Yes
<i>ACK_USER</i>	The name of the HPOM user who acknowledged the message.	Yes

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>ANNO_CNT</i>	The number of annotations to this message.	No
<i>ANNO_USER</i>	The name of the HPOM user who added an annotation last.	Yes
<i>ARS_SERVER</i>	The name of the primary ARS server configured for the target used to submit the ticket.	No
<i>BACKUP_SERVER</i>	The name of the backup ARS server configured for the target used to submit the ticket.	Yes
<i>BACKUP_USED</i>	The numeric index of the server on which the ticket is created, with “0” meaning the primary server. The index follows the order of specification in the rules file.	No
<i>CMA</i>	<p>This action variable needs the name of a custom message attribute as a parameter. This pair is then replaced by the value of the customer message attribute in the current HPOM message.</p> <p>The following example will insert into action-request field 9 the value of the CMA Orga of the current HPOM message:</p> <p>Field 9 "Org = \$CMA Orga\$"</p>	Yes
<i>DUPLICATES</i>	The number of duplicates of this HPOM message.	No
<i>ESCAL_SRV</i>	The name of the server from or to which the message is escalated.	Yes

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>ESCAL_STAT</i>	Whether the message is escalated to or from another management server, or not at all.	No
<i>EXTERNAL</i>	<p>This action variable needs the name of a key in the external file as a parameter. This pair is then replaced by the value assigned to the key in the external value file.</p> <p>The following example will insert into action-request field 8 the value of the key Phone Number in the external value file:</p> <pre>FIELD 8 "Phone = \$EXTERNAL PhoneNumber\$"</pre>	Yes
<i>HLP_TEXT</i>	<p>The instructions associated with the message.</p> <p>If HPOM has an external instruction interface for this message, the SPI for Remedy ARS uses the resolved instruction <i>only</i> if the message was submitted automatically (via the Trouble Ticket Interface), otherwise the interface name and command is used as the value of this keyword.</p> <p>Note that to be able to fetch the resolved instruction text, the Instruction Text Interface must be configured accordingly (Resolved text for Trouble Ticket Interface)</p>	Yes

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>HOST_NAME</i>	The host name of the machine where the HPOM management server and SPI for Remedy ARS server run.	No
<i>INSTR_IF</i>	The name of any instruction interface for this message.	Yes
<i>INSTR_PAR</i>	Details of any instruction interface parameters.	Yes
<i>INSTR_TYPE</i>	Whether an instruction for this message is internal or uses an interface.	Yes
<i>ITO_MSI</i>	Whether HPOM passed the message to the message-stream interface.	No
<i>ITO_NOTIFY</i>	Whether HPOM passed the message to a notification interface.	No
<i>ITO_SUBMITTER</i>	The name of the HPOM user who submitted the messages. If the messages was submitted automatically (trouble-ticket interface), this value is "OpC".	No
<i>ITO_TT</i>	Whether HPOM passed the message to the trouble ticket-interface.	No
<i>ITO_TT_ACK</i>	Whether HPOM acknowledges this message automatically after it passes it to the trouble-ticket interface.	No
<i>ITO_UNMATCHED</i>	Whether the message did not match a condition on the HPOM agent.	No

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>ITO_USER</i>	The HPOM user name which the SPI for Remedy ARS used to log in to HPOM.	No
<i>LOG_ONLY</i>	Whether HPOM immediately moves the message to the history database.	No
<i>MSG_ANNO</i>	The annotations added to the message. When the SPI for Remedy ARS creates an action request, it combines all the existing annotations. When the SPI for Remedy ARS updates an action request, it uses only the last annotation.	Yes
<i>MSG_ANNO_ALL</i>	All annotations which are attached to the message.	Yes
<i>MSG_ANNO_FIRST</i>	The first annotation which is attached to the message.	Yes
<i>MSG_ANNO_LAST</i>	The last annotation which is attached to the message.	Yes
<i>MSG_GRP</i>	The message's message group.	No
<i>MSG_ID</i>	The messages ID.	No
<i>MSG_OBJ</i>	The name of the object that generated the message.	No
<i>MSG_SEVERITY</i>	The message's severity.	No
<i>MSG_SRC</i>	The message's source.	No
<i>MSG_SRC_TYPE</i>	The message's source type.	No
<i>MSG_STATUS</i>	Whether the message is active or in the history database.	No

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>MSG_TEXT</i>	The text that explains the message's cause.	No
<i>MSG_TEXT_ORIG</i>	The message's original text before any changes.	No
<i>MSG_TYPE</i>	The message's type.	Yes
<i>NODE_APPL</i>	The application that generated the message.	No
<i>NODE_DATE</i>	The date on which the HPOM managed node generated the message.	No
<i>NODE_NAME</i>	The name of the machine that sent the message.	No
<i>NODE_IP</i>	The IP address of the machine that sent the message (in decimal string format, e.g. 192.168.0.12)	No
<i>NODE_TIME</i>	The time at which the HPOM managed node generated the message.	No
<i>OA_ACK_FLAG</i>	Whether this message's operator-initiated action acknowledges the message.	No
<i>OA_ANNO_FLAG</i>	Whether the output of this message's operator-initiated action becomes a new annotation.	No
<i>OA_CMD</i>	The command for this message's operator-initiated action.	Yes
<i>OA_NODE</i>	The node which this message's operator-initiated action runs on.	Yes

Table 6-13 Action Variables (Continued)

Variable	Description	Can Be Empty ?
<i>OA_STATUS</i>	The status of this message's operator-initiated action.	No
<i>OWN_TIME</i>	The time at which a user took ownership of this message.	Yes
<i>OWN_USER</i>	The name of the HPOM user who owns the message.	Yes
<i>SERVICE_NAME</i>	The name of the service attached to the HPOM message.	Yes
<i>SRV_DATE</i>	The date on which the HPOM management server received the message.	No
<i>SRV_TIME</i>	The time at which the HPOM management server received the message.	No
<i>TICKET_SERVER</i>	The name of the action-request server on which the ticket has been created.	No
<i>MANAGEMENT_SERVER</i>	The name of the current HPOM management server system or HPOM package (in a cluster environment).	No

Table 6-13 shows the action variables that you can use.

NOTE

Each time you use an action variable, place \$ before and after the variable name.

The next example shows an action definition that uses variables to define the values in an action request.


```
SET TARGET "ProbSys"  
FIELD 1000000003 "$NODE_NAME$"  
FIELD 1000000004 "$NODE_APPL$"  
FIELD 1000000005 "Message created at $NODE_TIME$ on  
$NODE_DATE$\nMessage received at $SRV_TIME$ on $SRV_DATE$"
```

The action puts:

- the name of the managed node that created the HPOM message into field 1000000003
- the name of the application that generated the HPOM message into field 1000000004
- a message that contains times and dates of creation and receipt into field 1000000005

NOTE

Some of the action variables can be empty if there is no appropriate value for them. You may need to define defaults when using these variables. For more details, see [“Setting Default Values” on page 131](#).

Defining Values using Composite Formats

You can use composite formats to define values in the action request using pre-formatted information from the HPOM message. [Table 6-14](#) shows the composite formats available. The composite format `MSG_EVENT` varies automatically, depending on how the HPOM message changed. [Table 6-15](#) shows the formats that can apply for `MSG_EVENT`.

Table 6-14

Composite Formats

Format Name	Description
MSG_EVENT	A format that varies automatically, depending on the type of change made to the HPO message. Table 6-15 shows a list of possible formats.

Table 6-14 Composite Formats (Continued)

Format Name	Description
MSG_PARMS	A format that shows common message parameters as follows: “Message: \$MSG_TEXT\$ Message ID: \$MSG_ID\$ Severity: \$MSG_SEVERITY\$ Instructions: \$HLP_TEXT\$”

Table 6-15 MSG_EVENT Formats

Event	Format
MSG_EVT_AA_END	“Automatic action of HPOM message \$MSG_ID\$ finished.”
MSG_EVT_AA_START	“Automatic action of HPOM message \$MSG_ID\$ has been started.”
MSG_EVT_ACK	“HPOM message \$MSG_ID\$ has been acknowledged by \$ACK_USER\$.”
MSG_EVT_ANNNO	“HPOM message \$MSG_ID\$ has been annotated by \$ANNO_USER\$.”
MSG_EVT_CREATE	“HPOM message \$MSG_ID\$ has been submitted to the Trouble Ticket IF.”
MSG_EVT_DISOWN	“HPOM message \$MSG_ID\$ has been disowned.”
MSG_EVT_ESC_FROM	“HPOM message \$MSG_ID\$ has been escalated from \$ESCAL_SRV\$.”
MSG_EVT_ESC_TO	“HPOM message \$MSG_ID\$ has been escalated to \$ESCAL_SRV\$.”
MSG_EVT_OA_END	“Operator-initiated action of HPOM message \$MSG_ID\$ finished.”
MSG_EVT_OA_START	“Operator-initiated action of HPOM message \$MSG_ID\$ has been started.”

Table 6-15 **MSG_EVENT Formats (Continued)**

Event	Format
MSG_EVT_OWN	“HPOM message \$MSG_ID\$ has been owned by \$OWN_USER\$.”
MSG_EVT_UNACK	“HPOM message \$MSG_ID\$ has been unacknowledged.”

Setting Default Values

Some of the action variables in [Table 6-13](#) may contain no value, depending on the HPOM message. For example, if no user owns the message the variable `OWN_USER` is empty. Submission of an action request fails if your action tries to place an empty variable into a mandatory schema field.

To avoid this problem, you can specify a default value for a field. The following example shows an example of a default value. If the variable `OWN_USER` is empty, the action puts the text `Not owned` into field `1000000005` instead.

```
FIELD 1000000005 "Owned by $OWN_USER$." "Not owned."
```

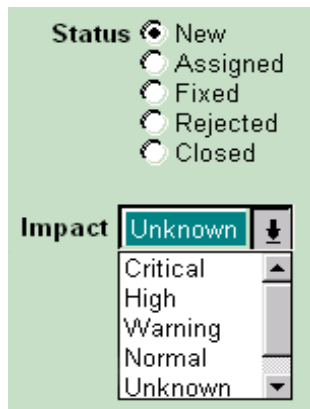
NOTE

The default value for an enumerated field is the first value. You cannot specify a different default value for an enumerated field. For more details, see [“Setting Enumerated Field Values”](#) on page 132.

Setting Enumerated Field Values

Enumerated fields are fields that can have one of a restricted number of values. In a schema, an enumerated field is either a drop-down list or a radio button field. [Figure 6-2](#) shows example enumerated fields in a schema.

Figure 6-2 Enumerated Fields



To set values for enumerated fields in a schema, you use text or a variable that matches one of the available values.

You can also use a variable whose values from the HPOM message do not match the available values in the schema. To do this, you map the index numbers of the HPOM message values to the index numbers of the schema values.

The variable *MSG_SEVERITY* can have the value unknown, normal, warning, minor, major, or critical. These have index values from 0 to 5 respectively. The field *Impact* in [Figure 6-2](#) can have the value critical, high, warning, normal, or unknown. These have index values from 0 to 4 respectively.

The following example shows how to map the variable *MSG_SEVERITY* to the field *Impact* by listing the field's index numbers in the order they should be used.

```
FIELD 1000000002 "$MSG_SEVERITY$" "4, 3, 2, 1, 1, 0"
```

The example maps:

- unknown in HPOM (0) to unknown (4)
- normal in HPOM (1) to normal (3)

- warning in HPOM (2) to warning (2)
- minor in HPOM (3) to high (1)
- major in HPOM (4) to high (1)
- critical in HPOM (5) to critical (0)

Handling Multiple HPOM Messages

You can submit multiple HPOM messages to create just one action request. When you do this, the SPI for Remedy ARS has a number of values available for every variable you use in the action definition. To specify which value the SPI for Remedy ARS uses, insert a multiple message keyword before the FIELD keyword.

Table 6-16 Multiple Message Keywords

Keyword	Description
ALL	For numeric fields, the SPI for Remedy ARS uses the highest value from all the HPOM messages. For text fields creates a numbered list that includes values from all the HPOM messages. <i>This is the default for text fields.</i>
FIRST	The SPI for Remedy ARS uses the value from the first HPOM message in order of severity. <i>This is the default for numeric and enumerated fields.</i>

Table 6-16 shows the multiple message keywords that you can use. The example below shows multiple message policies where:

- field 1000000002 contains the severity of the first message in a group (which is the severest)
- field 1000000001 contains a numbered list of annotations from all the messages in a group

```
FIRST FIELD 1000000002 "$MSG_SEVERITY$"
ALL FIELD 1000000001 "$MSG_ANNO"
```

Setting Update Policies

By default, the SPI for Remedy ARS does not update any fields in the action request if the HPOM message changes. To specify that the SPI for Remedy ARS should update a field when necessary, insert the `UPDATE` keyword before the `FIELD` keyword. You can extend this with more specific update keywords.

Table 6-17 Update Keywords

Keyword	Description
ATTACHED	<p>Optional keyword which controls the handling of the original HPOM message in case of attaching more HPOM messages to an existing action-request ticket. May be used with any of the following keywords: <code>APPEND</code>, <code>OVERWRITE</code>. This keyword is ignored for automatic attachments and submit requests.</p> <p>If <code>ATTACHED</code> is specified for a field, the SPI ignores the value of the original HPOM message when determining the new value of the field and only considers the attached HPOM messages.</p>
APPEND	<p>For numeric fields, the SPI for Remedy ARS replaces the existing value only if the new value is higher.</p> <p>For text fields, the SPI for Remedy ARS adds the new value after the existing value.</p> <p><i>This is the default for text fields.</i></p>
OVERWRITE	<p>The SPI for Remedy ARS always replaces the existing value with the new value.</p> <p><i>This is the default for numeric fields.</i></p>

Table 6-17 shows the different update keywords you can use. The example below shows examples of update policies where the SPI for Remedy ARS:

- appends annotations into field 1000000001; if new HPOM messages are attached to an existing ticket, the annotation of the original HPOM message (which created the ticket) is ignored.
- overwrites field 1000000007 with details of the latest event

```
UPDATE ATTACHED FIELD 1000000001 "$MSG_ANNO$"
UPDATE OVERWRITE FIELD 1000000007 "$MSG_EVENT$"
```

NOTE

The SPI for Remedy ARS always appends values to diary fields in a schema.

Setting a Target's Default Actions

You can set the default actions for a target by adding them to the target definition. The SPI for Remedy ARS uses the default actions every time the SET TARGET keywords reference that target.

You can override the default actions when you define an action that belongs to a specific condition.

The following example shows a target definition with default actions at the end. In this example, every time an action specifies the target ProbSys, the SPI for Remedy ARS enters:

- HPOM Smart Plug-In in field 2
- New in field 7
- the message text in field 8

```
TARGET "ProbSys"
  SERVER "ars1.bbn.hp.com"
  SCHEMA "Problem Report"
  USER "spi_user"
  PASSWORD "C338D5F22121E076C200F6E6B4E94B2C679B2DA"
  ITO_UPDATE
    ANNOTATE "Work log entry:\n$1000000001$"

  FIELD 2 `HPOM Smart Plug-In`
  FIELD 7 "New"
  FIELD 8 "$MSG_TEXT$"
```

NOTE

You can also include action keywords within the default actions defined for a target. This includes action variables, composite formats, default field values, enumerated fields, multiple message policies, and update policies.

Configuring automatic attachments

With the `ATTACH_TO` keyword, it is possible to define a list of *search fields* which are then used to locate an action-request ticket, to which the *submitted* HPOM messages should be attached.

If the condition matches, all action-request servers listed as a `SET TARGET` of this condition are searched for tickets for which the fields contained in the search list have the specified values.

- If such tickets are found on a target, the submitted HPOM messages are attached to the oldest ticket.
- If no tickets are found on a target, a new ticket is created as if the HPOM messages were submitted without the search fields.

The search fields are specified after the last sub condition and before the `SET TARGET`'s are defined.

The following example shows a condition definition with search fields. In this example, every time an HPOM message is *submitted* (not attached) and matches this condition (severity is `Critical`, object matches `"ora.*"`), all tickets on target `"ProbSys"` are located which have their field 9 set to the actual object attribute of the submitted HPOM message.

If such tickets are found, the currently submitted HPOM messages are attached to the oldest of these tickets using the specified set actions (the message text is appended to field 10). If no such tickets are found, then a new ticket is created with field 9 set to the message object and field 10 set to the message text.

```
DESCRIPTION "Attach-1"  
CONDITION  
  SEVERITY Critical  
  OBJECT LIKE "ora.*"  
  ATTACH_TO  
    FIELD 9 "$MSG_OBJ$"  
  SET TARGET "ProbSys"  
    FIELD 9 "$MSG_OBJ$"  
    UPDATE APPEND FIELD 10 "$MSG_TEXT$"
```

NOTE

You can also include action keywords within the search fields defined for a condition. This includes action variables and enumerated fields.

It's possible to use multiple search fields and multiple SET TARGET's:

```
ATTACH_TO
  FIELD 9 "$MSG_OBJ$"
  FIELD 7 "Key for field 7"
SET TARGET "ProbSys"
  FIELD 9 "$MSG_OBJ$"
  UPDATE APPEND FIELD 10 "$MSG_TEXT$"
SET TARGET "OtherTarget"
  FIELD 11 "Something"
  FIELD 9 "$MSG_OBJ"
```

NOTE

If multiple HPOM messages are submitted and action variables are used in the search field definition, then only the FIRST (according to the rules described earlier) HPOM message is evaluated.

The search fields are only evaluated for message submittals, not for message attachments, i.e. the operation has to be a SUBMIT (regardless whether it has been started manually or automatically).

An Example of a Rules File

This section uses the rules file supplied with the SPI for Remedy ARS and displayed in [Example 6-1](#) to demonstrate how the field names of an ARS schema shown in [Figure 6-3 on page 138](#), are associated with unique identifiers, shown in [Table 6-18 on page 139](#). This section covers the following topics:

- [“Submitting HPOM Messages”](#)
- [“Updating an Action Request”](#)
- [“Updating an HPOM Message”](#)

Example 6-1 illustrates how any changes to the fields you identify may then be linked to actions that need to be carried out in HPOM. The action-request schema shown in Figure 6-3 enables help desk users to create and update details of reported problems.

Figure 6-3 Example Schema

The screenshot shows a web-based form titled "Problem Report System" within a window titled "Submit Window -- Problem Report (sdwin95)". The form contains several input fields and a status selection area. The fields are: "Case ID", "Created By", "Created On", "Assigned To", "Last Modified By", "Modified On", "Machine Name", "Application/Device", "Short Description", "Description", and "Work Log". The "Status" field has radio buttons for "New", "Assigned", "Fixed", "Rejected", and "Closed", with "New" selected. The "Impact" field is a dropdown menu currently set to "Unknown". At the bottom of the form are two buttons: "Start Action" and "Escalate".

Table 6-18 shows the unique identifiers for each of the fields in the Problem Report System schema. The rules file uses the identifiers to reference the fields and their values.

Table 6-18 Example Schema Field Identifiers

Field Name	Identifier
Case ID	1
Created By	2
Created On	3
Assigned To	4
Last Modified By	5
Modified On	6
Status	7
Short Description	8
Work Log	1000000001
Impact	1000000002
Machine Name	1000000003
Application/Device	1000000004
Description	1000000005

Example 6-1 shows a simple rules file that defines how the SPI for Remedy ARS handles HPOM messages and action requests in the Problem Report System.

Example 6-1 Example Rules File

```

*** File Definition ***

SYNTAX_VERSION 2.2
SPI_RULES "rules"
DESCRIPTION "Example rules for the Problem System"

*** Target Definition ***

```

Customizing the SPI for Remedy ARS

Customizing the Rules File

```
TARGET "ProbSys"
  SERVER "ars1.hp.com"
  SCHEMA "Problem Report"
  USER "spi-user"
  PASSWORD "C338D5F21219E076C200F6E6B4E946B2C679B2DA"

  *** Update Rules ***

  ITO_UPDATE
  ANNOTATE
  "Action request modified.
  Schema: $ARS_SCHEMA$
  Server: $ARS_SERVER$
  Latest work log entry: $1000000001$"
  ANNOTATE IF_MODIFIED 1000000001
  "Work log modified: $1000000001$"
  ANNOTATE IF_MODIFIED 7 "Closed"
  "Action request closed by $5$ on $6$"

  OWN          IF_MODIFIED 7 "Assigned"
  OWN          IF_MODIFIED 7 "Fixed"
  ACKNOWLEDGE IF_MODIFIED 7 "Closed"
  OP_ACTION   "operator-action"
  ESCALATE    "escalate"

  *** Submit Rules ***

  OWN_SUBMIT
  DISOWN
  MSGTXT_PREFIX "AR-ID: $ARS_ID$"

  *** Default Actions ***

  FIELD 2 "ITO Smart Plug-In"
  FIELD 7 "New"
  FIRST FIELD 8 "$MSG_TEXT$"
  FIRST FIELD 1000000002 "$MSG_SEVERITY$" "4, 3, 2, 1, 1, 0"
  FIELD 1000000003 "$NODE_NAME$"

  *** Suppress Conditions ***

  SUPPRESSCONDITIONS

  DESCRIPTION "Suppress Normal"
```

```
CONDITION
  SEVERITY Normal

*** Message Conditions ***

MSGCONDITIONS

  DESCRIPTION "Condition1"
  CONDITION
    MSGGRP "Printers"
    SEVERITY Warning

  SET TARGET "ProbSys"
    FIELD 1000000004 "$MSG_OBJ$"
    FIELD 7 "Closed"
    ALL FIELD 1000000005
  "Printing Error - INFORMATION ONLY - TAKE NO ACTION.
  * This action request is linked to ITO message: $MSG_ID$
  * ITO message text: $MSG_TEXT$
  * ITO message generated at $NODE_TIME$ on $NODE_DATE$"

  DESCRIPTION "Condition2"
  CONDITION
    MSGGRP "Printers"
    SEVERITY Minor Major Critical

  SET TARGET "ProbSys"
    UPDATE ALL FIELD 1000000001 "$MSG_EVENT$"
    ALL FIELD 1000000004 "$MSG_OBJ$"
    ALL FIELD 1000000005
  "Printing Error.
  * This action request is linked to ITO message: $MSG_ID$
  * ITO message text: $MSG_TEXT$
  * ITO message generated at $NODE_TIME$ on $NODE_DATE$
  * Instructions: $HLP_TEXT$"

*** More Suppress Conditions ***

SUPPRESSCONDITIONS

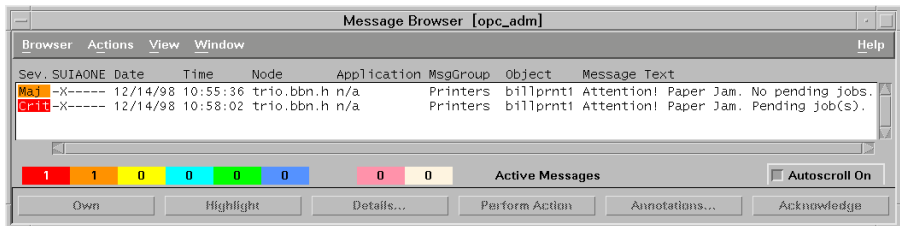
  DESCRIPTION "Suppress Performance"
  CONDITION
    MSGGRP "Performance"
```

```
*** More Message Conditions ***  
  
MSGCONDITIONS  
  
DESCRIPTION "Condition3"  
CONDITION  
SEVERITY Critical  
  
SET TARGET "ProbSys"  
UPDATE ALL FIELD 1000000001 "$MSG_EVENT$"  
FIELD 1000000004 "$NODE_APPL$"  
ALL FIELD 1000000005  
"Critical Error. Submitted from ITO.  
$MSG_PARM$"  
Annotation: $MSG_ANNOS"
```

Submitting HPOM Messages

Figure 6-4 shows two HPOM messages that appear when a large printer fails.

Figure 6-4 HPOM Messages for Submission



When the HPOM user decides to submit these messages to the action-request system, the following process occurs:

1. The SPI for Remedy ARS begins checking for a matching condition. It evaluates the second message against conditions, because this has the highest priority.
2. Suppress Normal in the rules file does not match, so the SPI for Remedy ARS continues checking.
3. Condition1 in the rules file does not match, so the SPI for Remedy ARS continues checking.

4. Condition2 in the rules file matches, so the SPI for Remedy ARS checks no further.
5. The SPI for Remedy ARS completes the default actions for the target ProbSys.
6. The SPI for Remedy ARS completes the actions for Condition2.
7. The SPI for Remedy ARS completes the actions listed in the ON_SUBMITsection.

Figure 6-5 Created Action Request

The screenshot shows a 'Problem Report' window with a 'Matching Problem Report' section at the top. Below this is a 'Modify Problem Report 000000000000001' form. The form contains the following fields and controls:

- Case ID:** 000000000000001
- Created By:** opc_adm
- Create On:** 06.03.00 14:29:52
- Status:** Radio buttons for New (selected), Assigned, Fixed, Rejected, and Closed.
- Impact:** Unknown (dropdown menu)
- Assigned To:** (empty text field)
- Last Modified By:** Demo
- Modified On:** 06.03.00 14:32:57
- Machine Name:** cholera.nice.de
- Application/Device:** billprt1
- Short Description:** Attention: Paper Jam. Pending Job(s)
- Description:** Printing Error.
* This action request is linked to ITO message:
- Work Log:** (empty text area)

At the bottom of the form are two buttons: 'Start Action' and 'Escalate'.

Figure 6-5 shows the action request that the SPI for Remedy ARS creates as a result of the HPOM message. Notice that:

- the Impact field has the severity Critical
- the fields Machine Name, Application/Device, Description, and Work Log each contain two entries. The multiple message policy specifies one entry per HPOM message.

NOTE

The first condition in Example 6-1 creates a different action request if the HPOM message is within the Printers message group, but is only a warning. This involves overriding the target's default action for field 7.

The third condition in Example 6-1 creates an action request for all critical HPOM messages that do not meet the first or second conditions.

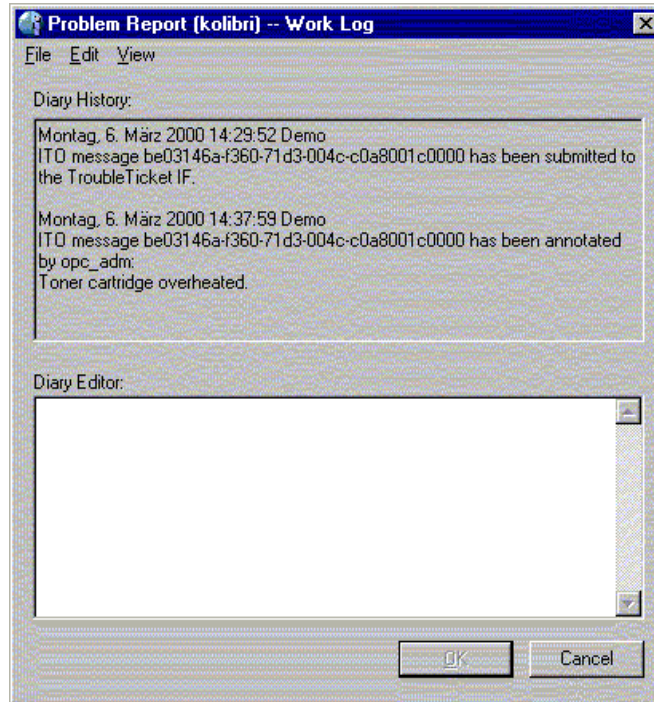
Updating an Action Request

A HPOM user has experience with this type of large printer, and notices the HPOM message in the message browser. She adds an annotation to the HPOM message explaining that paper jams sometimes occur when a certain part wears out.

Because the SPI for Remedy ARS applied the second condition in [Example 6-1](#) when creating the action request, it also applies the second condition when updating it.

Figure 6-6

Updated Action Request



In the second condition, the SPI for Remedy ARS can update the `Work Log` field with details of a message event. Therefore, when the HPOM user adds the annotation, the SPI for Remedy ARS appends details of this event to the action request's work log. [Figure 6-6](#) shows the how the annotation in HPOM has updated the work log entry in the action request.

NOTE

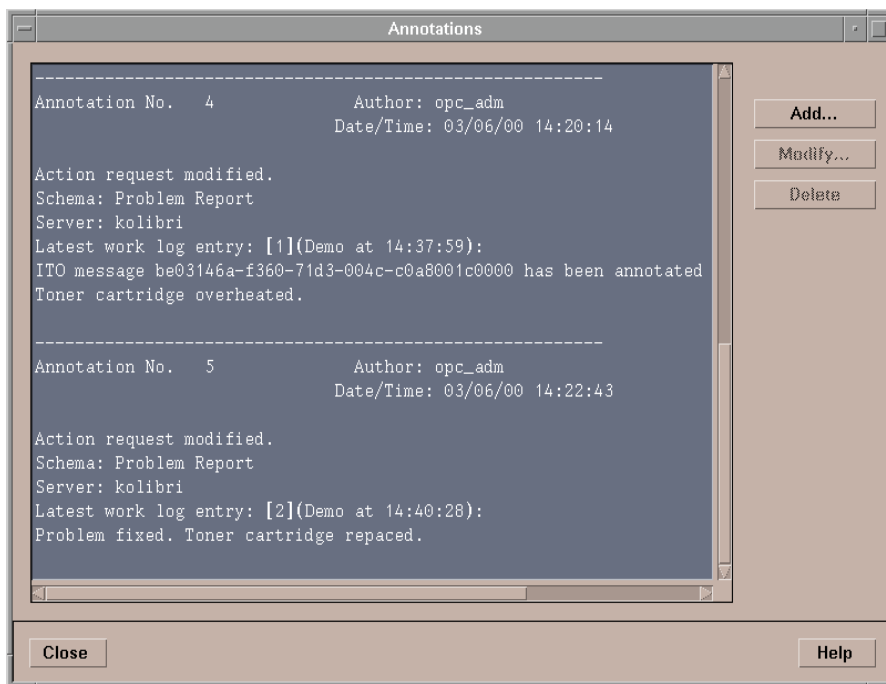
When the SPI for Remedy ARS applies the first condition in [Example 6-1](#), it cannot update any of the action request's fields.

When the SPI for Remedy ARS applies the third condition in [Example 6-1](#), it can only update the `Work Log` field.

Updating an HPOM Message

Figure 6-7 shows how amendments to the Status and Work Log of the action request cause an annotation to be added automatically to the corresponding HPOM message—the same HPOM message, which created the original action request being amended here. When the user saves the amendments, a filter calls the SPI for Remedy ARS client, which sends details of the action request and any modifications to the SPI for Remedy ARS server.

Figure 6-7 Changed Action Request



This target's update rules specify that the SPI for Remedy ARS must then:

- add an annotation to the HPOM message that includes the Work Log entry
- take ownership of the HPOM message because the Status is now Assigned

NOTE

The update rules apply for all action requests that belong to a schema, provided that the SPI for Remedy ARS created them.

ARS Filters and Active Links

To enable ARS to communicate with HPOM via the SPI for Remedy ARS you need to complete the following steps.

1. Configure one or more ARS filters that run when somebody modifies or deletes an action request
2. Configure active links in ARS which enable users to start actions or escalate messages in HPOM directly from the action-request schema

This section describes the following topics:

- [“The itoupdate Command”](#)
- [“The remspifilter Command”](#)
- [“Configuring the ARS Filter Automatically”](#)
- [“Configuring the ARS Filter Manually”](#)
- [“Configuring an Active Link”](#)

NOTE

You should consider creating the action-request filters manually if you want to notify the SPI for Remedy ARS server only if an interactive action request user has changed the ticket. The filters constructed automatically by `remspifilter` execute on any modification of the ticket, regardless whether it was an interactive action-request user or the SPI for Remedy ARS server itself. This can lead to multiple annotations to the HPOM message.

The itoupdate Command

The action-request filters and active links call the SPI for Remedy ARS client. The SPI for Remedy ARS client is the `itoupdate` utility, which is copied to the action-request server either during the distribution of the SPI for Remedy ARS templates or manually with the `ftp` command. For more information about template assignment and distribution, see [“Installing the SPI for Remedy ARS” on page 42](#).

The `itoupdate` utility is installed on the action-request server system in either one of the following locations, depending on the operating system:

- UNIX operating systems:
 - DCE agent: `/var/opt/OV/bin/OpC/cmds/itouupdate`
 - HTTPS agent: `/var/opt/OV/bin/instrumentation/itouupdate`
- AIX operating systems:
 - DCE agent: `/var/lpp/OV/bin/OpC/cmds/itouupdate`
 - HTTPS agent: `/var/opt/OV/bin/instrumentation/itouupdate`
- MS Windows operating systems:
 - DCE agent: `%OVOAGT_INSTRUMENTDIR%\itouupdate.exe`
 - HTTPS agent: `%OVOAGT_INSTRUMENTDIR%\itouupdate.exe`

The `itouupdate` command informs the SPI for Remedy ARS server process about changes made to the action-request ticket. In addition, `itouupdate` is used by the ARS User Tool to trigger actions attached to HPOM messages, for example; the execution of operator-initiated actions, escalating a message, and so on.

The options `-retries` and `-timeout` may be used to implement a kind of buffering for AR ticket changes. If the `itouupdate` command is not able to connect to the SPI server and to transmit the request, it may retry the attempt after a certain delay.

The `itouupdate` command may be used manually and accepts the following options and parameters:

```
itouupdate [opts] <Remedy SPI server hostname> <params> ...
```

The allowed options (*opts*) are as follows:

```
-debug          enable the debug mode
-retries num   set number of connection retries (Default: 10)
-timeout num  set connection retry delay in seconds (Default: 3)
```

The allowed parameters (*params*) are:

```
ENTRY_ID       the ARS ticket id
SERVER         the name of the ARS server
SCHEMA        the name of the ARS schema
CMD           a command name as defined in the remspi.cfg file
OP            the operation you wish to perform on an ARS ticket
```

MODIFIED the ID of the field which was modified in the current transaction

Examples of usage:

1. To use the `itoupdate` command to trigger an action on a HPOM message:

```
itoupdate <Remedy SPI server> \  
        ENTRY_ID=<AR ticket id> \  
        SERVER=<AR server name> \  
        SCHEMA=<AR schema name>\  
        CMD=<command name as defined in rules>
```

2. To use the `itoupdate` command to inform HPOM about changes to an action-request ticket:

```
itoupdate <Remedy SPI server> \  
        ENTRY_ID=<AR ticket id> \  
        SERVER=<AR server name> \  
        SCHEMA=<AR schema name> \  
        OP=<operation on AR ticket>
```

Note that the value of the `OP=` parameter may be taken directly from the action-request system by using the action-request variable `$OPERATION$`.

3. To use the `itoupdate` command to inform HPOM about a changed field in an action-request ticket:

```
itoupdate <Remedy SPI server> \  
        ENTRY_ID=<AR ticket id> \  
        SERVER=<AR server name> \  
        SCHEMA=<AR schema name> \  
        OP=<operation on AR ticket> \  
        MODIFIED=<ID of modified field>
```

Note that the value of the OP= parameter may be taken directly from the action-request system by using the action-request variable `$_OPERATION$`. The value of the MODIFIED= parameter is the numeric ID of the field.

4. To use the `itupdate` command move an action-request ticket from one (source) action-request server to another (destination) action-request server:

```
itupdate <RemedySPI server> ENTRY_ID=<AR source ticket id>\
SERVER=<AR source server name> SCHEMA=<AR source schema \
name> CMD=DSO-TRANSFER ENTRY_ID=<AR destination ticket id>\
SERVER=<AR destination server name>\
SCHEMA=<AR_destination_schema name>
```

See “Moving a Ticket Between Action-Request Servers” on page 160 for details.

The `remspifilter` Command

The `remspifilter` command registers the filters you create in ARS and want to use to perform actions in HPOM. The `remspifilter` command accepts the following options:

```
remspifilter [ -help | -version ]
              [ -create | -delete ]
              [ -target <target> | \
                -server <server> -schema <schema> \
                -user <user> [ -passwd <password> ] ]
              [ -ar_nt | -ar_ux | -ar_aix ] [ -https ]
              [ -cmd <filter command> ]
              [ <filter name> ]
```

Where:

- create creates a new filter. To retrieve an existing filter, neither specify `-create` nor `-delete`.
- delete deletes the filter you specify in `filter name`
- target creates a filter for a `target` defined in the rules file. Note that differences between target definitions and filter declarations are resolved on the SPI for Remedy ARS server.

<code>-server</code>	defines the name of the action-request server. Note that inconsistencies between the use of short and long hostnames here and elsewhere can lead to problems.
<code>-schema</code>	defines the name of the schema
<code>-user</code>	defines the user name with which to log in to the action-request server
<code>-passwd</code>	defines a password to be associated with the name defined in <code>-user</code>
<code>-ar_nt</code>	indicates an action-request server running on MS Windows operating systems
<code>-ar_aix</code>	indicates an action-request server running on AIX operating systems
<code>-ar_ux</code>	indicates an action-request server running on UNIX (not AIX) operating systems
<code>-ar_nt</code>	indicates an action-request server running on MS Windows operating systems
<code>-https</code>	indicates an HTTPS agent
<code>-cmd</code>	<i>path of itoupdate</i> enables the created filter to find the SPI for Remedy ARS client. Enter the path to the location where you installed the SPI for Remedy ARS client. If you omit this option, the command uses the default HP-UX 11.x path; <code>/var/opt/OV/bin/OpC/cmds/</code>
<i>filtername</i>	defines the name of the filter to create, delete, or retrieve. The default <i>filter name</i> is: <code><Schema Name>: ITO-Update</code>

NOTE

The `remspifilter` command is not able to create the special filters needed if the `IF_MODIFIED` tag is used in the rules file. These filters must be created manually, see [pConfiguring a Special IF_MODIFIED ARS Filter Manually on page 154](#).

Configuring the ARS Filter Automatically

To automatically configure a filter for the action-request system, use the command `remspifilter`. For example, you could enter the following command:

```
remspifilter -create -cmd \  
/Program_Files/OpenView/Remspi/itoupdate -server ars1 \  
-schema HD:HelpDesk -user admin
```

If you want to create filters for all the targets defined in the rules file, use only the `-create` option and the `-cmd` option if necessary. For example, you could enter the following command:

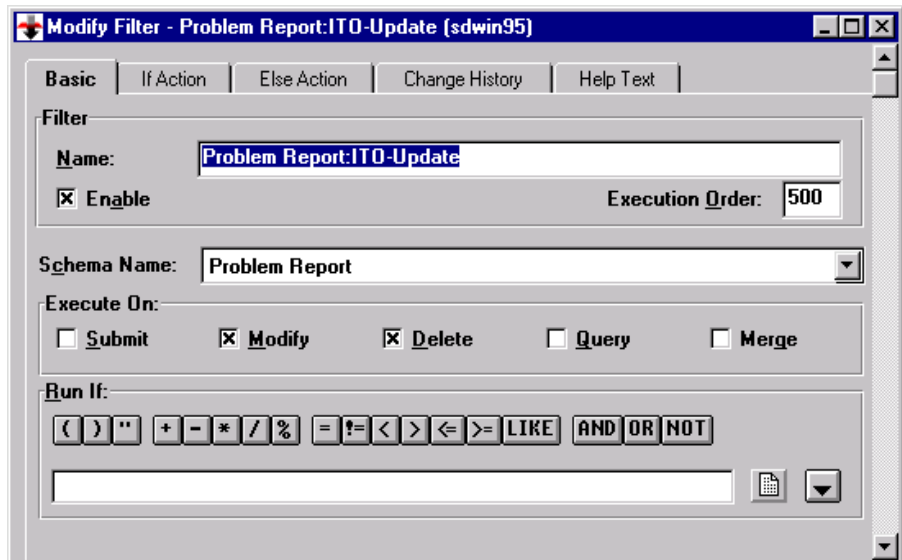
```
remspifilter -create -cmd \  
/Program_Files/OpenView/Remspi/itoupdate
```

Configuring the ARS Filter Manually

You can configure the filter manually in the same way that you create other filters in an action-request system. To do this:

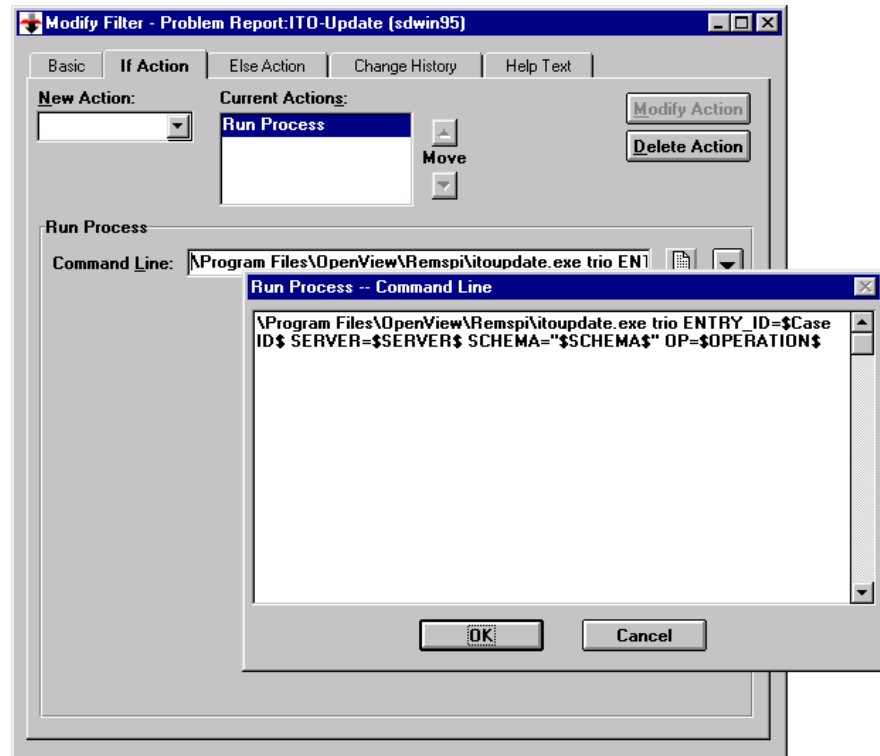
1. Create a new filter that executes when someone modifies or deletes an action request as shown in [Figure 6-8](#).

Figure 6-8 Creating a New Filter



2. Add a run-process action that calls the SPI for Remedy ARS client as shown in [Figure 6-9](#).

Figure 6-9 Defining a Filter's Run Process



Configuring a Special IF_MODIFIED ARS Filter Manually

This special filter is used to notify the SPI for Remedy ARS server that a certain field in an action-request ticket has been changed by an interactive user. This special notification then triggers the evaluation of update rules which have the IF_MODIFIED tag set for this field in the rules file.

NOTE

Note that you have to configure one of these filters for every field which is used with the `IF_MODIFIED` tag in the rules file.

You can configure the filter manually in the same way that you create other filters in an action-request system. To do this:

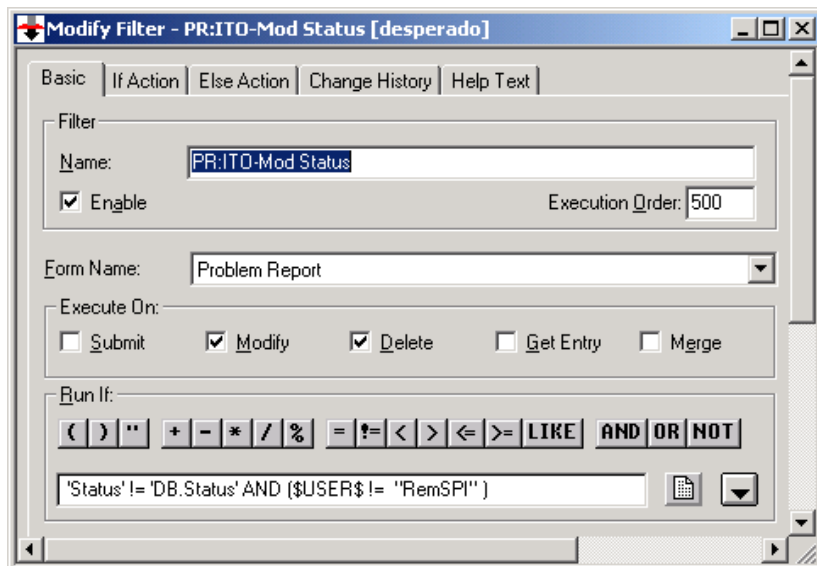
1. Create a new filter that executes when someone modifies or deletes an action request as shown in [Figure 6-10](#).

NOTE

Note the qualification specification which runs the filter only if the field (Status in our example) was modified in the current transaction and the modification was not made by the account which is used by the SPI for Remedy ARS server (RemSPI in our example). For this filter to be usable, you have to use different accounts than RemSPI for the interactive action-request users.

The qualification expression for our example is ('Status' != 'DB.Status') AND (\$USER\$!= "RemSPI")

Figure 6-10 Using Special Filters to modify the Status field



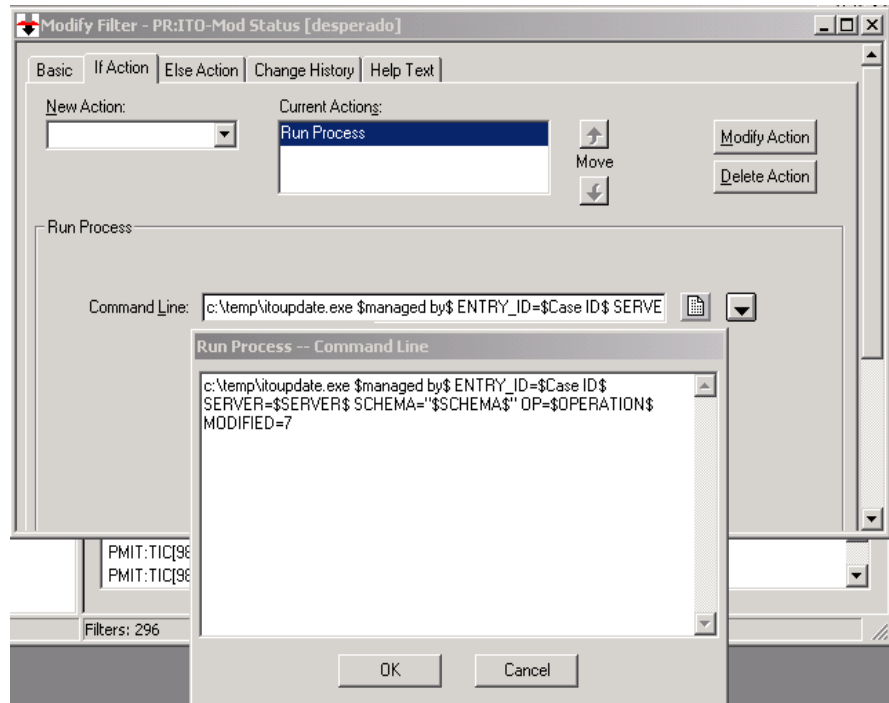
2. Add a run-process action that calls the SPI for Remedy ARS client as shown in [Figure 6-11](#).

NOTE

Note the keyword `IF_MODIFIED` and the ID of the modified field in the command line of the Run Process.

The command line for our example is `C:\temp\itoupdate.exe $managed by$ ENTRY_ID=$Case ID$ SERVER=$SERVER$ SCHEMA=" $SCHEMA$" OP=$OPERATION$ MODIFIED=7`

Figure 6-11 The special filter's Run Process

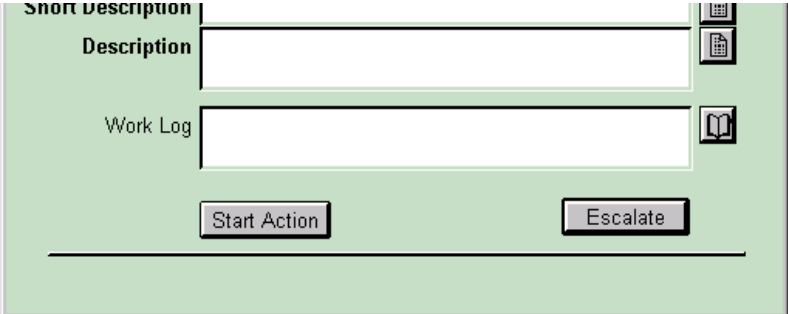


Configuring an Active Link

To configure an active link that enables users to start actions or escalate messages in HPOM:

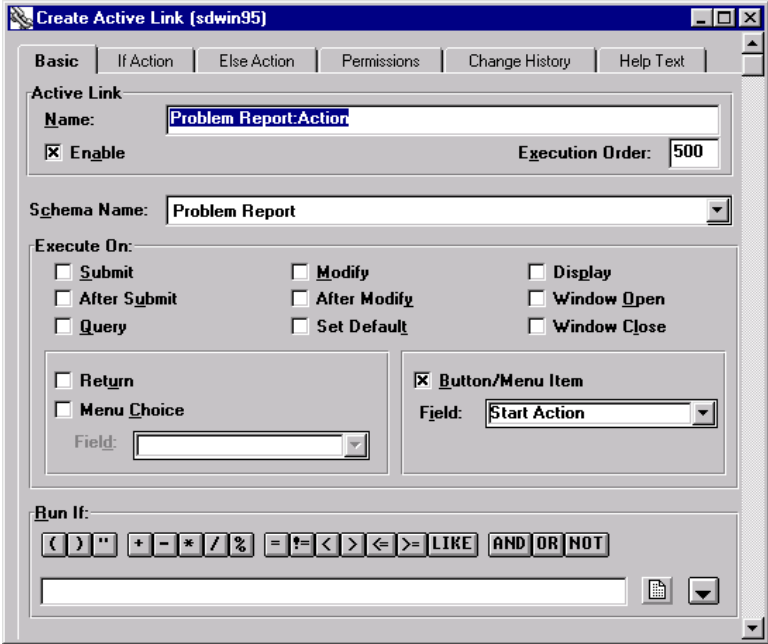
1. Use the ARS to create the appropriate buttons or menu items in the ARS schema as shown in [Figure 6-12](#).

Figure 6-12 Buttons for Active Links



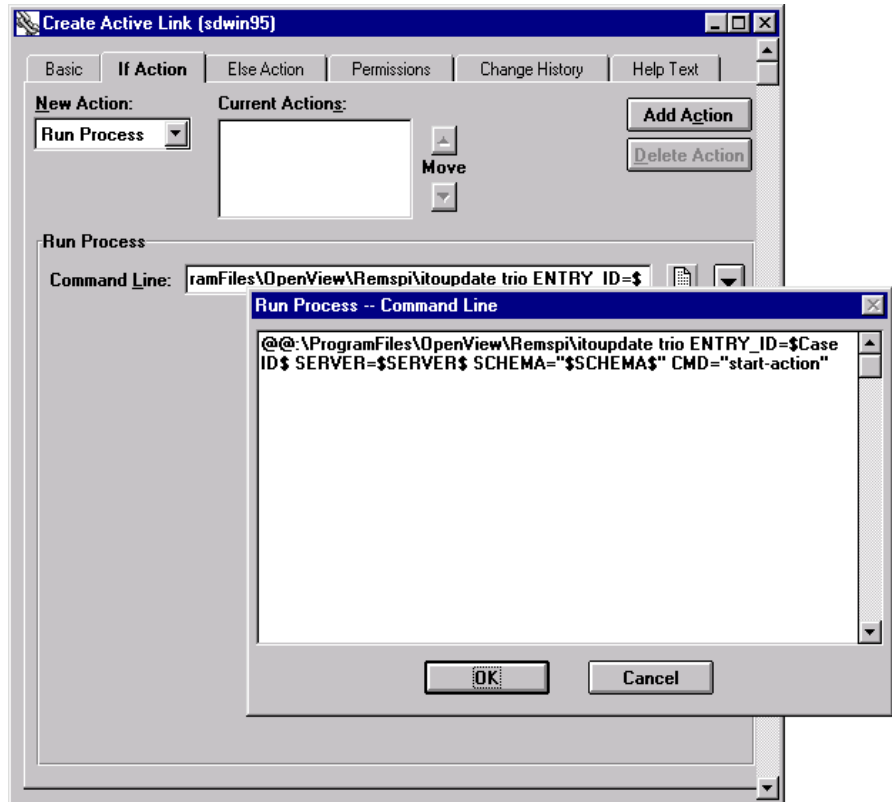
2. Create a new active link that runs when someone uses the menu item or button created in step 1.

Figure 6-13 A New Active Link



3. Add a run process that calls the SPI for Remedy ARS client as illustrated in [Figure 6-14](#). Note that the `CMD` parameter must have a value that matches the parameter of the `OP_ACTION` for this target. For more details, see [“Defining Update Rules” on page 93](#).

Figure 6-14 An Active Link’s Run Process



Customizing the SPI for Remedy ARS for Multiple Servers

The SPI for Remedy ARS enables you to use more than one action-request server, more than one HPOM server, or both. If any of these situations applies for your organization, you need to customize the SPI for Remedy ARS appropriately. [Figure 2-7 on page 31](#) shows an environment with multiple HPOM and action-request servers. This section provides information about the following topics:

- [“Using Multiple Action-Request Servers”](#)
- [“Using Multiple HPOM Servers”](#)

Using Multiple Action-Request Servers

If you want the SPI for Remedy ARS server to create and update action requests on more than one action-request server, create appropriate targets in the rules file. Define different action-request servers using the target’s `SERVER` attribute. For more details on defining targets, see [“Defining Targets” on page 89](#). This section provides information about the following additional topics:

- [“Moving a Ticket Between Action-Request Servers”](#)
- [“Notify the SPI for Remedy ARS Server about the Ticket Move”](#)
- [“Telling the SPI for Remedy ARS How to Handle the Ticket Move”](#)

Example 6-2

Defining Targets with Multiple Action-Request Servers

```
TARGET "ProbSysUSA"  
  SERVER "ars2.cnd.hp.com"  
  SCHEMA "Problem Report"  
  USER "spi_user"  
  PASSWORD "43B85572929960F64242C4D030C2CCABB65C236A"  
  
TARGET "ProbSysEUR"  
  SERVER "ars1.bbn.hp.com"  
  SCHEMA "Problem Report"  
  USER "spi_user"  
  PASSWORD "C338D5F22121E076C200F6E6B4E94B2C679B2DA"
```

[Example 6-2](#) shows two target definitions from a rules file. The first defines a target on an action-request server in the USA. The second defines a target on an action-request server in Europe.

To specify which action-request server to use in which situation, define conditions with actions that use the appropriate target. For more details on defining conditions, see [“Defining Conditions” on page 112](#).

Moving a Ticket Between Action-Request Servers

An action-request ticket may be moved from one to an other action-request server, this is known as a DSO transfer and performed as an action-request server function.

NOTE

The actual move of the action-request ticket is done by the action-request server and not by the SPI for Remedy ARS. The SPI is only notified after the action-request server has completed the move to update the SPI databases.

In addition to the steps which have to be done in the action-request server configuration (see the action-request server documentation for details), the SPI for Remedy ARS has to be informed about the ticket move. This has to be done in two steps:

- Notify the SPI server about the ticket move
- Instruct the SPI server to handle the move request

Notify the SPI for Remedy ARS Server about the Ticket Move

The move notification is sent to the SPI server by executing the SPI client program `itupdate` with a special parameter set. This execution of the SPI client can be configured as a filter or an active link bound to a button in an action-request form.

Here is the syntax how the `itupdate` program must be called in case an action-request ticket has been moved between action-request servers:

```
itupdate \  
  <SPI for Remedy ARS server> \  
  ENTRY_ID=<AR ticket ID on source server> \  
  SERVER=<AR source server> SCHEMA=<source form> \  
  <filter or active link name>
```



```
CMD=DSO-TRANSFER \  
ENTRY_ID=<AR ticket ID on destination server> \  
SERVER=<AR destination server> SCHEMA=<dest. form>
```

Telling the SPI for Remedy ARS How to Handle the Ticket Move

The SPI server, receiving the move notification, will have to delete the association of the source ticket ID with the associated HPOM messages and then have to add a new association between the new ticket ID and the same HPOM messages. In addition, the information about the new action-request server has to be saved for this association, too.

Remember that the SPI server saves the description of the condition which created an action-request ticket. This "*creating*" condition is then later used to process manual attachments or changes to the HPOM messages.

In case of a DSO transfer, the new ticket has not been created by the SPI for Remedy ARS, but by the action-request server. Thus, no such information about the *creating* condition is available, but this information is needed for later manual attachments or changes to associated HPOM messages which is expected to result in a modification of the action-request ticket.

This special "*creating*" condition has to be configured in the `rules` file in case of a DSO transfer.

```
DESCRIPTION "Catch All" DSO_TARGET  
CONDITION  
SET TARGET "ProbSys"  
..
```

The condition which has to be used for later updates on the action-request ticket is marked with the keyword `DSO_TARGET`.

If the SPI server receives a move notification, all conditions which have the target action-request server in their `SET TARGET` list are checked for this keyword. The first condition which is found is saved as the "*creating*" condition.

NOTE

If no such condition is found, the old association between the source action-request ticket and the associated HPOM messages is removed, but no new association is established.

In addition, the HPOM message which is associated with the moved action-request ticket may be modified.

In order to modify the HPOM message in the context of the target from which the message is moved away, use the `ON_MOVE_FROM_ME` keyword in the target definition section.

In order to modify the HPOM message in the context of the target to which the message is moved to, use the `ON_MOVE_TO_ME` keyword in the target definition section.

For details, see “Defining Move-From and Move-To Rules” on page 112.

Using Multiple HPOM Servers

If you want to create and update action requests based on HPOM messages from more than one HPOM server, you need further SPI for Remedy ARS servers. Install one SPI for Remedy ARS server on each machine where an HPOM server runs.

If each of your SPI for Remedy ARS servers has exclusive access to a set of action-request schemas, you can customize the SPI for Remedy ARS servers normally. Even if the schemas are on the same action-request server, the SPI for Remedy ARS instances function independently.

However, if more than one SPI for Remedy ARS server accesses the same schema, you need to configure the schema, filter, and rules file appropriately. The SPI for Remedy ARS client must know which SPI for Remedy ARS server created an action request so that it contact the correct server with when someone changes the action request.

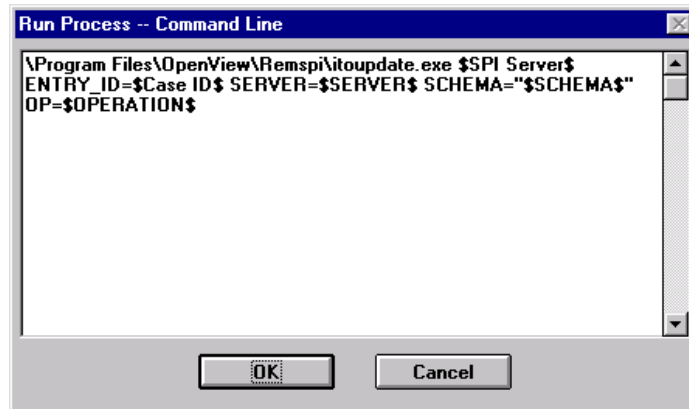
To enable this, you must complete the following steps for each schema:

1. Create a field in the schema to store the name of the SPI for Remedy ARS server. This can be a hidden field if the action-request system users do not need to see it.
2. Amend the filter that calls the SPI for Remedy ARS client. Reference the new field as the first parameter in the SPI for Remedy ARS client command.

Figure 6-15 shows an example filter’s run process where field `SPI_Server` contains the name of the SPI for Remedy ARS server that created the action request.

The exact path and name for the SPI for Remedy ARS client program depends on the platform and your setup. For more details, see “Installing the SPI for Remedy ARS” on page 42.

Figure 6-15 Filter Run-Process for Multiple HPO Servers



3. Amend the rules file for *both* SPI for Remedy ARS servers. Each rules file must contain an action that puts the name of the SPI for Remedy ARS server into the appropriate field using the action variable `HOST_NAME`.

The action must use the `FIRST` keyword to ensure that the SPI for Remedy ARS enters only one value. For more details about defining actions, see “Defining Actions” on page 121.

[Example 6-3](#) shows a default action for a target. The action puts the name of the SPI for Remedy ARS server in field 1000000006.

Example 6-3 Default Action for Multiple HPOM Servers

```
TARGET "ProbSysEUR"  
  SERVER "ars1.bbn.hp.com"  
  SCHEMA "Problem Report"  
  USER "spi_user"  
  PASSWORD "C338D5F22121E076C200F6E6B4E94B2C679B2DA"  
  
FIRST FIELD 1000000006 "$HOST_NAME$"
```

Using Backup Action-Request-System Servers

The SPI for Remedy ARS allows you to specify at most one action-request-system server as a backup server. If the primary action-request-system server is not reachable and the action-request ticket cannot be created, then, if a backup server is defined, the action-request ticket is created on the backup server. Updates to action-request tickets are performed on the action-request-system server where the ticket was originally created.

Note that the backup ARS server needs the same configuration as the primary ARS server, that is: the name of the action-request form (schema), the action-request user (and user password) defined on the backup ARS server must be identical to the values used in the configuration on the primary server.

In the event that neither the primary nor the backup action-request server is reachable, then - if configured - the request is buffered.

The decision to use the backup server is taken each time action-request requests the creation of a ticket.

Maintaining a backup copy of the SPI database

The SPI for Remedy ARS stores the information regarding the association between HPOM messages and action-request tickets in a separate database. When in use by the SPI for Remedy ARS server, the database is locked to prevent concurrent access. If there is a need to copy this SPI database, the SPI server would need to be stopped to guarantee a consistent copy.

To allow on-line backups of the SPI for Remedy ARS database, an alternative directory for the SPI for Remedy ARS database may be specified in the `remspi.cfg` file. This alternative directory is synchronized by the SPI for Remedy ARS server and always contains a consistent copy as long as the access rules described in this section are obeyed.

[Example 6-4 on page 165](#) shows how to enable the alternate SPI for Remedy ARS database by adding (or activating) the line displayed in the `remspi.cfg` file. You will have to replace the name of the directory used in the example with the name of the directory on your system.

Example 6-4 Configuring SPI DB Backup Copy

```
REMSPI_SPIDB_ALTDIR /mnt/MyAlternateDBDir
```

In addition, the file `remspi_altdb.sync` has to be created as an initially empty file in this directory to enable the alternative SPI for Remedy ARS database. The SPI for Remedy ARS server maintains a request ID in this file to determine when the alternative database needs to be synchronized.

The SPI for Remedy ARS server now keeps a copy of the its internal database in this directory. Before writing to this alternative database, the SPI for Remedy ARS server tries to create the file `remspi_altdb.lock` in this directory. If the file can exclusively be created (it does not exist before), then the lock is assumed to be granted and the alternative database is propagated. Note that the lock file is deleted after the write operation is finished.

So, if an external process needs to copy a consistent alternative SPI for Remedy ARS database, the lock file `remspi_altdb.lock` must be exclusively created (must not exist before). After the copying the data, the external process must remove the lock file.

In addition, the external process cannot expect the data to be consistent if the lock file already exists. The existence of the lock file indicates that the SPI for Remedy ARS server is currently propagating the alternative database.

If the alternate directory is not available when the SPI for Remedy ARS server tries to propagate the alternative SPI for Remedy ARS database, a note is written to the SPI for Remedy ARS log file. The directory is considered to be unavailable if the `remspi_altdb.sync` file is not readable.

Using the SPI for Remedy ARS on Cluster Nodes

If you want to use the SPI for Remedy ARS on nodes in a high-availability cluster, you need to take into consideration several important configuration issues. This section provides information about the following topics:

- [“Remedy ARS Server on a Cluster Node”](#)
- [“HPOM Server on a Cluster Node”](#)

NOTE

The following rules only describe the SPI-specific requirements which have to be satisfied to use the SPI for Remedy ARS on cluster nodes. For detailed explanations about how to set up the HPOM management server or the HPOM managed node on cluster nodes, see the appropriate HPOM documentation.

Remedy ARS Server on a Cluster Node

In this section, the Remedy ARS server running on a cluster node is referred to as the *AR package*. If you are configuring the SPI for Remedy ARS to run in a cluster environment, you will need to consider the following points:

- Monitoring
 - To enable the AR package:

The following commands have to be inserted in the package switching script:

```
— opctemplate -e "RemSPI_ARS_server_UX"  
— opctemplate -e "RemSPI_ARS_server_UX_Up"  
— opctemplate -e "RemSPI ARS Server errors (UX)"
```
 - To disable the AR package:

The following commands have to be inserted in the package switching script:

```
— opctemplate -d "RemSPI_ARS_server_UX"  
— opctemplate -d "RemSPI_ARS_server_UX_Up"  
— opctemplate -d "RemSPI ARS Server errors (UX)"
```

- Communication: HPOM server to Remedy ARS server

In the rules file, use the *package name/IP* as the name of the TARGET.

- Communication: action-request server to HPOM server

The filters and active links on the Remedy ARS server starting the SPI client `itoupdate` have to pass the *AR package name/IP* for the sender ID as a parameter.

HPOM Server on a Cluster Node

If the HPOM management server is running on a cluster node, we will refer to it as the *HPOM package*. In this situation, the following areas are impacted:

- Monitoring

— To enable the HPOM package:

The following commands have to be inserted in the package switching script:

```
— opctemplate -e "RemSPI_QSize"  
— opctemplate -e "RemSPI_Server"
```

— To disable the HPOM package

The following commands have to be inserted in the package switching script:

```
— opctemplate -d "RemSPI_QSize"  
— opctemplate -d "RemSPI_Server"
```

- Communication: Remedy ARS server to HPOM server

The filters and active links on the Remedy ARS server starting the SPI client `itoupdate` have to pass the *HPOM package name/IP* for the destination address as a parameter.

Using External Actions and Data

The first time the SPI for Remedy ARS submits an HPOM message to the action-request system, you can use external data and start external actions. However, we strongly recommend that you use this feature if, *and only if*, you are an experienced shell programmer. This section covers the following areas:

- [“Starting External Actions”](#)
- [“The remspiupd Command”](#)
- [“Using External Value Files”](#)
- [“Formatting External Value Files”](#)
- [“Referencing External Values”](#)

Starting External Actions

To submit an HPOM message to the SPI for Remedy ARS, the scripts `remspi_sub_auto.sh` (Trouble Ticket interface) and `remspi_sub_man.sh` (HPOM application) pass the message ID to the `remspiupd` command, which forwards the information to the SPI for Remedy ARS server process. The two scripts have a special `User Code` section, to which you can add commands. For example, you could include commands to start any external actions that are necessary. Similarly, the commands could trigger actions to update or retrieve data in an external database. For example, you could use the name of a node and the object type to find out who is responsible for a printer that is giving problems. The information you retrieve could even include the responsible person’s telephone number.

The user code section could also include actions that generate external value files. External value files contain additional information that the HPOM message does not provide. The SPI for Remedy ARS can add this extra information when it creates a new action request.

The remspiupd Command

The `remspiupd` command handles the internal communication between the SPI for Remedy ARS server and HPOM. The command can be used both to submit and update HPOM messages and is called by the `remspisub_*` scripts. For more information on the `remspisub_*` scripts, see “Data Components” on page 31.

The `remspiupd` command accepts the following command line arguments:

```
remspiupd [-d] [-t] [-q] [-a] \  
          [-u <HPOM user submitting the message>] \  
          [-i <instruction-text>] \  
          [-f <external value file>] \  
          <HPOM message ID> [ ...]
```

where at least one HPOM message ID must be specified, and the following options are allowed:

- `-a(ttach)`
enables one message to be *attached* to another message. Note that at least *two* HPOM message IDs must be specified.
- `-d(ebug)`
option writes *debugging* information to `stdout`
- `-t(race)`
option writes *trace* information to `remspiupd.trace`
- `-i(nstr)`
option allows you to specify an instruction text, which may be referred to with the `HLP_TEXT` action keyword during processing
- `-f(ile)`
option allows you to specify an external value `file` which may contain arbitrary values that are used during processing
- `-q(quiet)`
option enables *quiet* mode. Normally the `remspiupd` program waits for a reply from the SPI for Remedy ARS server and prints this to `stdout`. This is intended for submission from the HPOM GUI to

immediately display the result of the submission. The default submission scripts use the `-q` option for automatic submission by the HPOM server.

- `-u (user)`

option allows to specify the HPOM user submitting the message

If you are using the `itoupdate` command to submit a message, *no* HPOM messages must already be assigned to the action-request ticket. If you are using the `itoupdate` command to *update* messages, the whole set of message IDs which you specify *must* meet the following conditions:

- At least *one* HPOM message must already have been submitted
- The previously submitted HPOM messages must be associated with only *one* action request
- There must be at least *one* HPOM message which has *not* yet been assigned

If any one of these conditions is *not* met, the `remspiupd` command returns an error and the message submission fails. The command `remspiupd` exits with the value 0 (zero) if the submission succeeds and a non-zero (0) value if the submission fails. Note that the `remspiupd` command writes error information to the file `remspiupd.log`. For more information on the contents of the `remspiupd.log` file and where to find it, see [“Error Logs and Tracing” on page 181](#).

Using External Value Files

The SPI for Remedy ARS allows you to use external values as a source of information in a similar way to the attributes and fields of an HPOM messages. These external values are stored in an external file, an example of which is located in:

```
/etc/opt/OV/share/conf/remspi/extval
```

You can use external value files to add information to an action request that is not available in the original HPOM message. An external value file can be either one of the following:

- Static and rarely change
- Generated dynamically using external actions

NOTE

You need to specify the name of the external value file. In addition, you can use variables in the shell script to access one of a number of files, for example; depending on the node. How you go about doing this depends to a very large extent on what parameters are available in the shell script.

The name of the external file is stored in the `User Code` section of the scripts `remspisub_auto.sh` and `remspisub_man.sh`, which submit the HPOM message to the SPI for Remedy ARS server (and thus, to the action-request server). If you need to configure dynamic access to the external values you define, these scripts should calculate the required values, write them to a text file, and pass the location of this text file to the SPI for Remedy ARS server by setting the script variable `EXT_VAL_FILE` in the `User Code` section.

NOTE

If the external value file does not exist, an error message is logged.

Formatting External Value Files

All external value files must consist of key and value pairs with the following format rules:

- The file contains plain text.
- Each key / value pair appears on a separate line.
- The key consists of any printable characters, but the size of the key is limited to 2048 characters.
- At least one space or tab separates each key and value.
- The value is a string with any characters (including spaces), the size of this string is limited to 4096 characters.

[Example 6-5](#) shows a simple external value file that contains extra details about a printer.

Example 6-5 External Value File

```
# Last updated 11/12/1999

LOCATION      Building 4 - Level 1
CONTACT_NAME Wilson, J
CONTACT_EXT  2345
```

NOTE

An external value file can contain blank lines and comments. The first character of a comment line must be #.

In the rules file, the length of a token (a string is a token, too) is limited to 2048 characters. Hence, if the value of an external key is used in a condition, its length must not exceed 2048 characters in the rules file (if it is longer, consider using a regular expression).

Referencing External Values

To add external values to an action request, you must reference them in actions within the rules file by using the following variable-keyword combination:

```
EXTERNAL <external key>
```

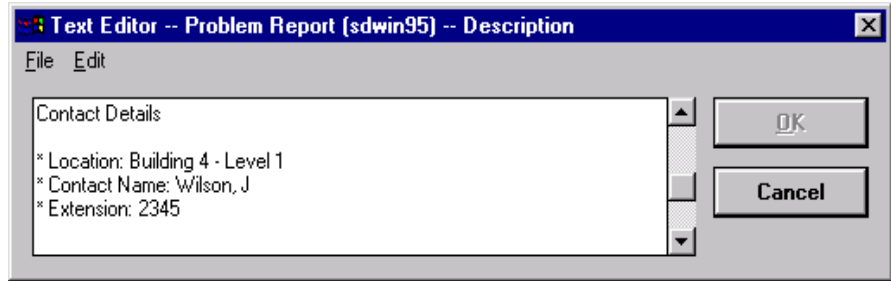
You use this like any other variable in the rules file, except that it consists of two keywords. For more details on actions, see [“Defining Actions” on page 121](#).

[Example 6-6](#) shows an action that puts external data from [Example 6-5](#) into a text field. [Figure 6-16](#) shows the result in the action request.

Example 6-6 **References to External Values**

```
FIELD 1000000008 "Contact Details \\n
* Location:      $EXTERNAL LOCATION$
* Contact Name:  $EXTERNAL CONTACT_NAME$
* Extension:     $EXTERNAL CONTACT_EXT$"
```

Figure 6-16 **External Values in an Action Request**



NOTE

The SPI for Remedy ARS only evaluates external values when it creates the action request. You cannot use external values to update existing action requests.

Miscellaneous Configurations Tasks

The SPI for Remedy ARS may be configured at a global level by adding special configuration lines to the `remspi.cfg` file. This section describes the following areas:

- [“Setting the Date and Time Format” on page 176](#)

Setting the Date and Time Format

The format which is used to convert date and time information to text strings may be configured with the following entries in the `remspi.cfg` file:

- `REMSPI_DATE_FORMAT`

This format is used whenever a time value (whether it's extracted from a HPOM message or an AR ticket field) should be converted to a date string. Default is: `%m/%d%%Y`, e.g. 12/31/2007

- `REMSPI_TIME_FORMAT`

This format is used whenever a time value (whether it's extracted from a HPOM message or an AR ticket field) should be converted to a time string. Default is: `%H:%M:%S`, e.g. 11:57:32

If a time value should be converted to a combined date and time field, both format definitions are used. For details regarding the variables used in these formats, see the documentation of the UNIX `date` command or the `strftime()` API call.

Utilities installed with the SPI

The SPI for Remedy ARS installs utilities which you may use in your own scripts. This section describes the following utilities:

- [“Direct access to AR tickets: remspi_arutil” on page 177](#)

Direct access to AR tickets: remspi_arutil

Direct access to existing action-request tickets is available via the utility `remspi_arutil`. With this command, field contents of existing tickets may be retrieved and modified, without using the SPI configuration or the SPI server itself.

Syntax of `remspi_arutil`:

```
remspi_arutil -help
remspi_arutil -version
remspi_arutil -get AR-Spec
remspi_arutil -set AR-Spec -value value
```

The third type of command retrieves the contents of the specified field of an existing ticket, the fourth type of command may be used to set the field to a specified *value*.

The action-request server, the login data and field information is abbreviated as *AR-Spec* above and consist of the following elements:

- `-server hostname`
The hostname or IP address of the action-request server on which the ticket exists. This parameter is mandatory.
- `-schema formname`
The name of the action-request form in which the ticket exists. This parameter is mandatory.
- `-user username`
The name of the action-request account which is used to access the ticket. This parameter is mandatory.
- `-passwd password`

The password of the action-request account specified with *-user*. Note that the password must be specified in its encrypted form, i.e. the output of the SPI tool *remspipasswd* must be used. This parameter is optional and may be omitted if the action-request account is configured without a password.

- *-ar ticket_id*

The ID of the action-request ticket which should be accessed. This parameter is mandatory.

- *-fieldid fieldid*

The numerical id of the action-request ticket field. This parameter is mandatory.

Example 6-7

Example of *remspi_arutil*

```
remspi_arutil -get -server arstest1 \  
              -schema "Problem Report" \  
              -user Demo \  
              -ar 0000000002901 -fieldid 5
```

```
Problem Report@arstest1[0000000002901]:5 = Demo
```

7

Troubleshooting the SPI for Remedy ARS

This section describes how to troubleshoot the Smart Plug-in for Remedy Action Request System.

In this Section

This section describes how to go about troubleshooting the Smart Plug-in for Remedy Action Request System. In this section you will find information concerning:

- [“Error Logs and Tracing”](#)
- [“Troubleshooting the SPI for Remedy ARS Installation”](#)
- [“Troubleshooting SPI for Remedy ARS Rules”](#)
- [“Troubleshooting SPI for Remedy ARS Usage”](#)
- [“Troubleshooting the SPI for Remedy ARS Internal Database”](#)
- [“Troubleshooting the SPI for Remedy ARS Performance”](#)
- [“Handling Message Storms”](#)

Error Logs and Tracing

Log File Locations

This section describes the log files to which the SPI for Remedy ARS server writes information concerning errors and tracing. [Table 7-1 on page 181](#) lists the log files that you can examine as a first step in the event of any serious problem and indicates where the files can be found.

Table 7-1 **Log-File Locations**

File Name	SPI for Remedy ARS System	Location
itoupdate.log	Client	Same directory as itoupdate command
remspi.log	Server	/var/opt/OV/log/remspi
remspi.diag		/var/opt/OV/log/remspi
remspiupd.trace		/var/opt/OV/share/tmp/remspi
remspi_submit.log		/var/opt/OV/log/remspi
trace		/var/opt/OV/share/tmp/remspi

Traditional Tracing

You can control the amount of information written to the trace file in the SPI for Remedy ARS configuration file `remspi.cfg`.

The keywords used for tracing are listed in [Table 7-2 on page 182](#).

The `itoupdate` command on the SPI for Remedy ARS client writes error messages to the `itoupdate.log`. The `itoupdate.log` itself is written to the directory in which the `itoupdate` command is installed. The path is determined by the execution of the action-request filter itself. For example, if the action-request filter executes `/abc/itoupdate`, then the log file will be written to `/abc/itoupdate.log`.

The `remspi.log` contains error messages from the SPI for Remedy ARS server and information relating to the self-monitoring of the SPI for Remedy ARS server. For more information, see [“Troubleshooting SPI for Remedy ARS Usage” on page 191](#).

The `remspi.diag` contains diagnostic messages from the SPI for Remedy ARS server. For more information, see [“Troubleshooting the SPI for Remedy ARS Performance” on page 197](#).

The `remspiupd.trace` contains trace information relating to attempts by the SPI for Remedy ARS to submit HPOM messages to the ARS and attach modifications to existing HPOM messages. For more information, see [“The remspiupd Command” on page 171](#). Note that this file is not written by default.

The `remspi_submit.log` contains information relating to the manual or automatic submission of HPOM messages to the ARS. For more information, see [“Troubleshooting SPI for Remedy ARS Usage” on page 191](#).

The `trace` file contains information relating to the internal control flow of the SPI programs, especially the internal processing in the SPI server.

Table 7-2

Keywords for Tracing

Keyword	Parameter
SPI_TRC_LEVEL	An integer value ranging from 1 to 9. Level 1 emits less messages, level 9 emits the most information. For support purposes, level 5 is the mostly sufficient. Level 6 adds detailed information about the usage of the Remedy API calls, i.e. all input and output parameters are listed together with the result of the API call.
SPI_DIAG_MODE	The integer 0 (no diagnostic logging) or 1 (diagnostic logging enabled).

To turn tracing on, you have to follow these steps:

- Add/enable the line `SPI_TRC_LEVEL 5` in the `remspi.cfg` file (set a trace level according to your needs)

- Restart the SPI server using the command sequence
`remspi.sh stop; remspi.sh start`

As an alternative, you may send a signal to the running SPI for Remedy ARS server after having updated the `remspi.cfg` file. This will force the SPI for Remedy ARS server to re-read its configuration file `remspi.cfg` and to switch the trace mode accordingly:

- HP-UX: `kill -USR2 <pid of remspisrv process>`
- Solaris: `kill -PROF <pid of remspisrv process>`

To turn tracing off, you have to follow these steps:

- Delete/comment the line `SPI_TRC_LEVEL n` in the `remspi.cfg` file
- Restart the SPI for Remedy ARS server using the following commands:
`remspi.sh stop; remspi.sh start`

As an alternative, you may send a signal to the running SPI for Remedy ARS server after having updated the `remspi.cfg` file. This will force the SPI for Remedy ARS server to re-read its configuration file `remspi.cfg` and to switch the trace mode accordingly.

NOTE

Essential information is written to the trace file if the trace mode is turned on before the SPI for Remedy ARS server is started. Thus, this should be the preferred way to produce a trace file.

Enhanced Tracing

Traditional tracing results in one trace file used by all SPI for Remedy ARS processes and tools. The location and the name of the trace file is predefined and may not be changed. In addition, the trace file grows without bounds.

In situations where a problem occurs rarely, activating the trace mode for a long time may result in a very large trace file.

Enhanced tracing may be used in these situations. Enhanced tracing differs from traditional tracing as follows:

- Separate trace file sets are used for each process and tool
- Number of trace files may be specified for each set

- Maxium size and lifetime for each trace file may be specified
- Location and name for the trace files may be specified

Using enhanced tracing, the filesystem usage for trace information may thus be limited.

Enhanced tracing is configured in the `remspi.cfg` file using the following keywords. Note that traditional tracing has to be activated by setting a trace level greater 0 in order for enhanced tracing to work.

Table 7-3 **Keywords for Enhanced Tracing**

Keyword	Parameter
SPI_ETRC_ENABLED	<p>An integer value ranging from 0 to 1.</p> <p>A value of 0 disabled the enhanced trace mode, a value of 1 enabled the enhanced trace mode.</p> <p>Note that enhanced tracing uses the same trace level as traditional tracing.</p> <p>Default: 0</p>
SPI_ETRC_PATHNAME	<p>A string specifying the pathname of the trace files used in enhanced tracing.</p> <p>The trace files will be created using this name, with a file extension indicating the file generation. The most current file has generation number 1, older files have increasing generation numbers.</p> <p>Default: Pathname of traditonal trace file.</p>

Table 7-3 Keywords for Enhanced Tracing (Continued)

Keyword	Parameter
SPI_ETRC_MAXFILES	<p>The maximum number of trace files used in a set, where one set is created for each process and tool. If a limit (size, lifetime) for the currently active trace file is reached, it is closed and all trace files will have their generation number increased by one. The oldest trace file is deleted if its generation number exceeds this parameter. A new active trace file will be created with generation number 1.</p> <p>Default: 1</p>
SPI_ETRC_MAXSIZE	<p>This parameter limits the size of each trace file. The size limit is specified in kB. If a trace file exceeds this size limit, it is closed. See SPI_ETRC_MAXFILES for details.</p> <p>The actual maximum size of a file may be slightly larger than this limit (max. 20kB).</p> <p>Default: 0 (no size limit)</p>
SPI_ETRC_MAXTTL	<p>This parameter limits the lifetime of each trace file. The maximum lifetime is specified in seconds. If a trace file is older than this limit, it is closed. See SPI_ETRC_MAXFILES for details.</p> <p>Default: 0 (no time limit)</p>

Tracing the Rules

If you want to see what is happening during the parsing of the `rules` file, you can start the SPI for Remedy ARS server process manually using the following command.

- `/opt/OV/bin/remspi/remspisrv -debug`

Error Logs and Tracing

This keeps the `remspisrv` process in the foreground and prints trace information to `stderr` during the parsing phase of the rules file.

Troubleshooting the SPI for Remedy ARS Installation

To verify that the installation of the Smart Plug-in for Remedy Action Request System completed successfully on the HPOM management server, carry out the steps in the following list:

1. On the command line of an HPOM for Unix management server, enter: **swlist** or **pkginfo**

Look for the following entry:

SPI-Remedy 4.01

2. In the HPOM GUI, check that the following elements have been added:

- Node Groups:
 - Remedy SPI Servers
 - AR Servers NT
 - AR Servers UX
 - AR Servers AIX
- Message Groups:
 - Remedy-SPI
 - AR System
- Tool Groups:
 - Remedy SPI Admin
 - Remedy SPI
- Users:
 - remspi_adm
 - remspi_op
- Policy Groups:
 - Remedy SPI - AR Server NT

- Remedy SPI - AR Server UX
- Remedy SPI - AR Server AIX
- Remedy SPI - ITO

3. If either of these steps fails to produce the desired results:

- a. Check the following log files for more specific information relating to problems concerning the installation of the SPI for Remedy ARS:
 - `/var/adm/sw/swagent.log`
 - `/var/adm/sw/swinstall.log`
- b. Cross check your installation with the information provided in [Table 3-5, “File Locations on the HPOM Management Server,”](#) on page 46.

NOTE

After you install the SPI for Remedy ARS client program on an action-request server, you do not normally need to configure it. However, if the default TCP port 13603 is not available for the SPI for Remedy ARS server, you will need to configure an alternative in the `/etc/services` file on the SPI for Remedy ARS server machine.

To modify port a number:

1. On the HPOM management server, open the `services` file in a text editor.
2. Find the section that begins with the following comment:

```
# HP Operations Remedy SPI entries
```

If no such section exists, add a new section with appropriate comment.
3. Edit the TCP port number as necessary. For example, if port 42 should be used, enter:

```
remspi 42/tcp
```

Note that the same change must be implemented on the action-request server system, too.

Troubleshooting SPI for Remedy ARS Rules

The `rules` file determines how the SPI for Remedy ARS should react to messages from HPOM that are intended for ARS, and action requests from the action-request system, which are intended for HPOM. For more information about the syntax and structure of the `rules` file, see [“Customizing the Rules File” on page 82](#).

NOTE

The SPI for Remedy ARS server will not start if the `rules` file contains any errors. To check for errors, use the `remspiconfig` command, which is located in the directory containing the SPI for Remedy ARS binaries.

The `remspiconfig` command parses the `rules` file and writes the output to a terminal window. The `Validating...` section gives details of any errors that have been encountered. [Example 7-1](#) shows the messages that appear when the `rules` file references a non-existent schema field.

Example 7-1 remspiconfig Output

```
Remedy SPI configuration utility
=====

Loading rules file '/etc/opt/OV/share/conf/remspi/rules' ...
Reading rules file '/etc/opt/OV/share/conf/remspi/rules' ...

Validating ...
01/30/2003 10:41:40 [ERROR] (remspiconfig-26082): Can't initialize rules table
from file '/etc/opt/OV/share/conf/remspi/rules'. (SPI215-50)
Can't validate target 'ProbSys'. (SPI215-66)
Can't validate AR System field '22' of target 'ProbSys'. (SPI215-62)
ARS error[0]: 314: 'Field does not exist on current form'. (SPI215-61)

Connecting ITO as 'opc_adm' ...
Conenction succeeded.

All done.
```

The lines beginning with `Can't validate...` enable you to locate the error in the `rules` file. In [Example 7-1](#), the error is a reference to field 22 in the `ProbSys` target.

Lines that begin with the words `ARS error` describe error messages that the action-request system returns to the SPI for Remedy ARS. The text that appears gives a brief explanation of the error. The number after the term `ARS Error` and preceding the error description is the action-request system error number (in this example; 314). For more information about the error, use the error number, for example 314, to refer to the action-request-system documentation.

NOTE

If the `remspiconfig` command starts while the SPI for Remedy ARS server is running, the SPI for Remedy ARS displays an error message indicating that some files could not be locked. The problem occurs because both the SPI for Remedy ARS server and the `remspiconfig` command try to lock the SPI for Remedy ARS databases.

Note that on HP-UX IA64 HPOM management servers, the SPI for Remedy ARS process `remspiproxy -proxy` needs to be started. Use the command `ovstart RemedySPI-Proxy` to start this process separately.

Troubleshooting SPI for Remedy ARS Usage

This section describes some of the problems that can occur when using the Smart Plug-in for Remedy Action Request System. Some of the problems are indicated by the arrival of a message in the HPOM for UNIX message browser. The section covers the following areas:

- [“SPI for Remedy ARS Monitors”](#)
- [“Name Resolution”](#)
- [“REMSPI_ITO_USER Responsibilities”](#)
- [“Removing Buffered Action Requests”](#)
- [“Setting the Language of the SPI server”](#)
- [“Remedy AR server installed in non standard directory”](#)

SPI for Remedy ARS Monitors

- Symptom

If you acknowledge (or take ownership of) a large number of HPOM messages that are linked to ARS, the overall performance of the SPI for Remedy ARS can be significantly affected.
- Explanation

The SPI for Remedy ARS provides a number of self-monitoring processes, which can trigger an alert as soon as an issue arises and, as a result, allow timely intervention in the event of a problem. One of the monitors watches the size of the HPOM request queue, `RemSPI_QSize`, on the SPI for Remedy ARS server. `RemSPI_QSize` holds SPI for Remedy ARS-related HPOM messages with a severity level of either `warning` or `critical`. If the number of messages in `RemSPI_QSize` exceeds 1000, the SPI for Remedy ARS generates a message. Note that self-monitoring error messages are written to the log file; `remspi.log`.

Name Resolution

- Symptom

Problems appear to occur during the resolution of IP addresses on Remedy ARS servers with multiple host names (multi-homed hosts).

- Explanation

You can use short host names, long host names, or the IP address of the action-request system when defining names for Remedy ARS servers within the SPI for Remedy ARS. However, the SPI for Remedy ARS uses the following, specific order when resolving these names for Remedy ARS servers:

1. Short hostname
2. Long hostname
3. IP address

For more information on defining an action-request server in SPI for Remedy ARS target definitions, see [“Defining Targets” on page 89](#).

REMSPI_ITO_USER Responsibilities

- Symptom

Errors occur when message are submitted either manually or automatically. There may be multiple symptoms depending on the configuration of the rules file. Symptoms include: error from the action-request server about missing (but required) fields or invalid field values, the constructed action-request ticket is missing field values, etc.

- Explanation

The HPOM user configured as the REMSPI_ITO_USER in the `remspi.cfg` file must be responsible for all the HPOM messages which are to be submitted to the action-request system. If this is not the case, the SPI for Remedy ARS writes error messages to the log file and displays the message as application output (for manually submitted messages).

Removing Buffered Action Requests

- Symptom

If you want to clear the list of buffered action requests (if `OPTION BUFFER_TT` is specified), then you may use the tool `remspi_qutil`.

- Explanation

The tool `remspi_qutil` may be called using the following syntax:

Example 7-2 Usage of `remspi_qutil`

```
remspi_qutil [-prio HIGH | MEDIUM | LOW] [-mce] -list
remspi_qutil [-prio HIGH | MEDIUM | LOW] [-mce] -delete ARS
```

Where:

- `prio`
specifies the priority of the queue. Default: `LOW`
- `mce`
uses the queued message change events instead of the queued submit requests
- `list`
lists the entries of the specified queue
- `delete`
deletes entries of the specified queue which are targeted to the named ARS server

Setting the Language of the SPI server

- Symptom

If you experience problems creating new tickets on an action-request server, and the server rejects the requests with complaints about illegal user names or passwords, it may be that the SPI for Remedy ARS server is running in a language environment that is not supported by the action-request server. You can check this by enabling trace level 6 and inspecting the return parameters of the action-request API calls.

- Explanation

To start the SPI for Remedy ARS server in a specific language environment, you may configure the language in the `remspi.cfg` file.

To start the SPI for Remedy ARS server in a “C” language environment, add the following line to the `remspi.cfg` file and restart the SPI server:

REMSPI_LANG C

Duplicated annotations

- Symptom

If you see multiple, duplicated annotations to HPOM messages or duplicated entries in action-request tickets, you may decide to reconfigure your rules file or to establish a new action-request user performing the action-request ticket updates.

- Explanation

If the rules file is configured in such a way that changes to action-request tickets are added as annotations to the HPOM messages and changes to the HPOM messages are treated as an update request for the action-request tickets, then it may happen that some changes are duplicated on one or both sides. This is because the SPI for Remedy ARS is not able to determine whether the action-request ticket was updated manually or by the SPI for Remedy ARS itself.

To help the SPI for Remedy ARS to distinguish between manual and automatic (SPI-initiated) updates, you can use a special action-request user for all SPI for Remedy ARS transactions. This action-request account is then not used for interactive users. See [“Configuring a Special IF_MODIFIED ARS Filter Manually”](#) on [page 154](#) for details on how to configure.

Remedy AR server installed in non standard directory

- Symptom

If it's not possible to start and stop the AR server using the tools provided by the SPI for Remedy ARS or if messages show up in the message browser indicating that the AR server is not running although you know it is, it may happen that the AR server is installed in a directory unknown to the SPI.

- Explanation

The SPI for Remedy ARS looks in standard places for installed AR servers (`/opt/ar`, `/usr/ar`). If the server is installed in a different directory, it may not be found. In this case, create a symbolic link in `/opt/ar` or in `/usr/ar` which points to the actual installation directory.

Troubleshooting the SPI for Remedy ARS Internal Database

The SPI for Remedy ARS stores the association between HPOM messages and action-request tickets in its own database. This database can be maintained and verified using the `remspidbutil` command.

Example 7-3 Using the `remspidbutil` Command

```
remspidbutil -help |
             -list [ -target target ... ] |
             -verify [ -target target ... ] |
             -delete [ -target target ... ] [-ar] ID ...
             -modify [ -cleanup ] -old_ovo_id ID -new_ovo_id ID
```

where

- `help`
Shows the usage information for the tool
- `list`
Check and list entries in the internal SPI database, but do not connect to action-request servers. If targets from the `rules` file are specified, only entries for those targets are checked and listed, else all targets defined in the `rules` file are processed.
- `verify`
Verifies the internal database and connect to action-request servers. If a target (see the `rules` file) is specified, then only the database entries for this target are checked, else all targets defined in the `rules` file are checked. If inconsistencies are found, the tool asks for confirmation to cleanup.
- `modify`
Scans the complete internal SPI database and changes all occurrences of the specified old HPOM message id to the specified new HPOM message id. This may be used if a HPOM message was exchanged by a newer one and the SPI should connect the existing action-request tickets for this old message to the new message. If the

option `-cleanup` is specified, inconsistent entries in the internal SPI database are deleted, otherwise a warning is issued. Note that modifications are applied to all targets defined in the `rules` file.

- `delete`

Deletes entries from the internal database. If the option `-ar` is specified, then the action-request ticket ids are expected as `ID ...` arguments, else HPOM message ids are expected. If explicit targets are given, the entries are deleted only when occurring in these associations.

NOTE

If the `remspidbutil` command is started while the SPI server is running, an error message is printed indicating the fact that some files could not be locked. This is because the SPI server as well as the `remspidbutil` command try to lock the SPI databases. Note that on HP-UX IA64 HPOM management servers, the SPI for Remedy ARS process `remspiproxy -proxy` needs to be started. Use the command `ovstart RemedySPI-Proxy` to start this process separately.

Troubleshooting the SPI for Remedy ARS Performance

The SPI for Remedy ARS logs diagnostic information regarding incoming events and their processing including timing information to a separate log file. To enable diagnostic logging, add the line `SPI_DIAG_MODE 1` to the `remspi.cfg` configuration file and restart the SPI for Remedy ARS server processes (see “[Error Logs and Tracing](#)” on page 181). If you enable diagnostic logging, the SPI for Remedy ARS logs each event and its processing in one separate text line in the file `remspi.diag` as illustrated in [Example 7-4](#) on page 197.

Example 7-4 The `remspi.diag` File Syntax

```
Date/Time SPI(remspisrv-pid): Init Type Chan Src-Object ->
Tgt-Object MCE-Type (Duration [ms]) (SPI215-msgnum)
```

where

- *Date/Time*
shows the date and the time of the event
- *pid*
is the PID of the SPI server process
- *Init*
is the initiator of the event: OVO or ARS
- *Type*
is the type of the event: SUB for submitting a HPOM message, MCE for modifying a HPOM message or UPD for update of an AR ticket
- *Chan*
is the channel via which the event arrived: COM for network communication, INT for events generated internally in the SPI
- *Src-Object*
is the description of the source object which triggered the event; HPOM messages are listed as `MSG=Msg-ID`, AR tickets are listed as `TTN=Ticket-ID@AR-Form@AR-Server`

- *Tgt-Object*
is the description of the target object which is modified by the event; HPOM messages are listed as MSG=Msg-ID, AR tickets are listed as TTN=Ticket-ID@AR-Form@AR-Server
- *MCE-Type*
is the list of message change events which triggered the event (*Type* is MCE)
- *Duration*
is the duration in milliseconds for processing the event

Handling Message Storms

The SPI for Remedy ARS may be configured to temporarily skip the creation of action-request tickets in case of a message storm.

If the file `/etc/opt/OV/share/conf/remspi/no_auto_tickets` exists, the script `remspisub_auto.sh` suppresses the current request and does not forward the message to the SPI server. A note is written to the SPIs log file instead.

There is no need to restart the SPI server when the file is created or deleted. Manually submitted tickets are still processed.

8 **De-installing the SPI for Remedy ARS**

This section describes how to de-install the SPI for Remedy ARS software from the systems on which you have installed it.

In this Section

This section describes how to de-install the Smart Plug-in for Remedy Action Request System software from the systems on which you have installed it. The section covers the following areas:

- [“Removing Action-Request Filters”](#)
- [“Removing the SPI for Remedy ARS from the HPOM GUI”](#)
- [“Removing the SPI for Remedy ARS from the HPOM Server”](#)
- [“Removing the SPI for Remedy ARS from the Remedy ARS Server”](#)

Removing Action-Request Filters

To remove or unregister action-request-system filters, use the `remspifilter` command with the `-d(elete)` option. For example:

```
remspifilter -delete <filter name>
```

For more information about how to use the `remspifilter` command and which options the command accepts, see [“Configuring the ARS Filter Automatically” on page 153](#).

You can use the ARS administrator’s GUI to see a complete list of the filters.

NOTE

If you have defined special `IF_MODIFIED` filters manually, you have to remove them manually using the ARS administrator’s GUI. The command `remspifilter` is not able to delete these filters from the action-request server.

Removing the SPI for Remedy ARS from the HPOM GUI

The SPI for Remedy ARS integration with the HPOM GUI has to be removed manually. You will have to remove the following components from the HPOM GUI:

- Managed Nodes Groups

Note that you should not remove the action-request servers from the managed nodes repository until you have removed the HPOM agent software including the SPI for Remedy ARS policies. For more information, see [“Removing the SPI for Remedy ARS from the Remedy ARS Server”](#) on page 206.

- Message Groups
- Tools and Tool Groups
- Policies and Policy Groups
- Users

For more information on how to remove elements from the HPOM GUI, see the *HP Operations Administrator's Reference*.

Removing the SPI for Remedy ARS from the HPOM Server

To remove the Smart Plug-in for Remedy Action Request System components from the HPOM management server and complete the general clean up process:

1. On a HP-UX HPOM management server, enter:

```
swremove SPI-Remedy
```

2. On a Solaris HPOM management server, enter:

```
pkgrm SPI-Remedy
```

3. On a Linux HPOM management server, enter:

```
rpm -e HPOvSpiRemedy-04.01.001
```

4. Remove the HPOM management server and the action-request servers from the SPI for Remedy ARS node groups. Then re-deploy the policies to the managed nodes using the normal HPOM deployment tools.
5. Cleanup the GUI by removing the SPI for Remedy ARS-specific elements. For more information, see [“Removing the SPI for Remedy ARS from the HPOM GUT” on page 204](#).

Removing the SPI for Remedy ARS from the Remedy ARS Server

After you have removed from the HPOM GUI those elements added by the SPI for Remedy ARS and removed the SPI for Remedy ARS software from the HPOM management server, you need to remove the SPI for Remedy ARS software from the action-request server.

To remove the SPI for Remedy ARS instrumentation from the action-request server, re-deploy the instrumentation to the action-request server using HPOM means.

After you have removed the SPI for Remedy ARS installation from the Remedy ARS servers, you can remove the Remedy ARS servers from the managed-nodes bank in the HPOM GUI.

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