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rvs SNMP Agent
Version 1.0
User Manual

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1 Introduction

Following a general introduction and a brief presentation of rvs® SNMP Agent, the present chapter describes the rvs® SNMP Agent system components.

1.1 General Introduction

Network management systems (NMS) are used in large networks to poll the status of network elements (devices or applications such as rvs®) and to evaluate this status for network administrators.

Communication with the administered instance uses the SNMP standard protocol.

Agents are running on the network elements. The Agent provides a Management Information Base (MIB) for NMS configuration. This is some kind of information file that allows the properties of the network element (rvs®) to be read or edited. This information is specified in ASN.1 (Abstract Syntax Notation One).

rvs® SNMP Agent is an application that can respond to NMS queries and send rvs® status information to NMS.

During rvs® SNMP Agent installation, the generic rvs® MIB is also installed.

The following illustration shows network administration with an NMS in conjunction with rvs®.
Amongst others, there are the following SNMP commands for reading and editing network element properties (Management Information) in an MIB:

- **GET**: gets a data record.
- **GETNEXT**: gets the next data record.
- **SET**: edits a data record
- **RESPONSE**: responds to one of the previous packages.
- **TRAP**: unsolicited message of the administered system (e.g. rvs®) indicating that an event (e.g. start) has occurred.

Most of the SNMP functions use the question-answer principle. NMS sends a query (**GET, GETNEXT,**...) to Agent and receives a response package (**RESPONSE**). Setting values works the same way. New values are sent (**SET** command), which are confirmed with a response (also **RESPONSE**).

A **TRAP** is an unsolicited message a network element (e.g. rvs®) sends to the network management system without expecting an answer.

### 1.2 rvs® SNMP Agent system components

rvs® SNMP Agent bidirectionally communicates with rvs®.

It issues management commands via the management adapter; for this purpose, rvsMVS uses UDP, while rvs® portable uses RMI.

The rvs® SNMP Agent receives information from rvs® via the event adapter. This communication direction occurs via UDP.

**Note**: rvs® SNMP Agent was tested with Tivoli Net View.
2 rvs® SNMP Agent installation and configuration

The present chapter describes how to install and configure rvs® SNMP Agent.

2.1 Installation using the graphical user interface

The present chapter describes installation using the graphical user interface.

**Important:** At the moment the installation and usage of the rvs®-SNMP-Agent on the rvsMVS platform is possible only on the command prompt and not via GUI. Please, read the separate document rvsMVSSNMP.pdf for installation and the usage on the rvsMVS platform at the moment.

2.1.1 Installation on Windows systems

First we describe how to perform installation on Windows systems. Then we briefly cover installation on UNIX systems because installation is identical on both operating systems.

Follow these installation steps:

- Start Windows and log in as a user with administrator rights.
- **Start the installation software rvsSNMPAgent_X.X.setup.exe** (where X.X is the rvs® SNMP Agent version number) by double-clicking or with the Windows command: Start -> Run.
- The first dialog lets you select the installation language (German or English). Press <OK> to go to the next installation step.
• In the next dialog you can select the rvs® SNMP Agent destination folder. The default is: C:\ProgramFiles\rvsSNMPAgent.

• In the next dialog you can select the program group where the rvs® SNMP Agent icons are to be created.

• As rvs® SNMP agents run on various rvs® systems you must make a choice here.
Firstly we will describe the installation for rvsEVO. At the moment you cannot choose rvsMVS because the installation on the rvsMVS platform is possible only on the command prompt. The third platform choice is rvs® Client/Server. It is also described in this chapter, part “Installation for rvs® Client/Server” on page 10.

The following dialogs are used to configure the rvs® SNMP agent. The $AGENT_HOME/Agent.xml file holds these configuration settings.

- In the first configuration dialog you must specify the host name (IP address) and the port number for the event adapter in the rvs® SNMP Agent for Traps reception (UDP requests/notifications) from rvs®. The default port is 3744.
• Then you must specify the IP address and port for the rvs® SNMP agent for SNMP requests reception from NMS. The default port is 161.

• In the next dialog you specify the host name (IP address) and port number for the NMS used to receive the Traps (requests/notifications).
SNMP SET commands are sent to rvs® via the RMI connection. In the following dialog you must specify the RMI connection parameters. The RMI Server host address is the address of the computer where rvs® is running. The default for rvs RMI Service Name is rvsEVO and the default port is 3755. The rvsClientAPIConfiguration.xml file stores the data specified in this dialog.
• In the following dialog you must specify the rvsEVO service start and stop commands. The service name is “rvs Server”. `net start` or `net stop` are Windows commands for starting or stopping a service.

Before installation actually starts, you have the chance to review the configuration settings. Press the **Install** button when you agree with these settings.

The last dialog informs you when rvs® SNMP Agent was successfully installed.

### Installation for rvs® Client/Server

The following dialogs appear when you have selected the rvs® Client/Server as platform. This section describes only those dialogs that differ from an installation for rvsEVO.

**Note:** if you choose the rvs® Client/Server as installation platform, the parameters, which are relevant for the rvs®-SNMP-Agenten, must be configured in rvsX/rvsXP (see chapter 2.2.2 "rvsX/rvsXP Configuration"). The installation of rvs® Client/Server is necessary because of RMI. rvs® portable uses RMI to set management commands via the Management Adapter.

The first dialog relevant for rvs® Client/Server prompts you to specify the RMI Server settings. rvs® SNMP Agent sends Management commands (SET) via RMI. For this reason you must specify the rvs® Middleware properties such as IP address or host name, Middleware name and Middleware port.
• In the second dialog you must specify the rvs® start and stop commands with their full path.

• In the third dialog you must type the user name and the password you use to log in at rvs® Middleware.
• In the next dialog you must specify the paths and names of the rvs\textsuperscript{®} middleware start and stop scripts.

2.1.2 Installation on UNIX Systems

As mentioned earlier in this chapter, installation on UNIX systems runs analogously to an installation on Windows systems. The installation file is named rvsSNMPAgent\_X\_X\_setup.bin and can be started as a
window-based installation under the X-Server or in the console mode with the -console option.

The installation prompts are identical in both modes (see section Installation on Windows systems).

After installation, there are the following subdirectories, files and scripts in the installation directory ($AGENT_HOME):

- Directory lib containing library files
- Directory mib containing the gedas and rvs® MIB (GEDAS-SNMP-MIB.txt and RVS-SNMP-MIB.txt files)
- File agent.jar.
- rvs® SNMP Agent configuration file AgentParameter.xml
- Configuration file rvsClientAPIConfiguration.xml with RMI connection parameters and start/stop scripts essential for the Client API.

2.2 Configuration and start at the command prompt

The present chapter describes how to configure and start the rvs® SNMP Agent at the command prompt.

Syntax:

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>-?</td>
<td>Help (Usage)</td>
</tr>
<tr>
<td>-w / --consoleWindow</td>
<td>Displays the activities in the console window</td>
</tr>
<tr>
<td>-c / --configure</td>
<td>This option calls the configuration setup (script). When you do not specify any other options (only -c), you will be prompted to specify values for the following options.</td>
</tr>
<tr>
<td>-h / --hostname</td>
<td>Host name of the rvs® SNMP agent for reception of Traps (notifications) from rvs®.</td>
</tr>
<tr>
<td>-l / --listener</td>
<td>Host name and IP Port of the rvs® SNMP Agent for reception of SNMP Requests</td>
</tr>
<tr>
<td>-n / --nms</td>
<td>NMS host name and IP port used to receive Responses and Traps</td>
</tr>
<tr>
<td>-p / --port</td>
<td>Port of the rvs® SNMP agent for reception of Traps (notifications) from rvs®.</td>
</tr>
</tbody>
</table>
Example:

```java
java -jar agent.jar -c
```

This command starts the interactive configuration of rvs® SNMP Agent. The following must be provided:

- address of the listener to wait for SNMP Requests from the NMS in the form `<hostname>/port number>`: Host name and IP Port of the rvs® SNMP Agent for reception of SNMP Requests; default: localhost/161. The corresponding parameter in the Agent configuration file `AgentParameter.xml` is: `udpListener`.

- address of the NMS (trap receiver address): NMS host name and IP Port used to receive Responses and Traps. The default port is 162. You can configure several of these addresses. The corresponding parameter block in the Agent configuration file `AgentParameter.xml` is: `managementTarget` (with the `udpAddress` element).

- hostname and port number for the event adapter: Host name and port of the rvs® SNMP agent for reception of Traps from rvs®. The corresponding parameter block in the Agent configuration file `AgentParameter.xml` is: `eventListenerParameter` (with the `udpAddress` and `udpPort` elements).

- select the rvs platform you are using: Specify if your rvs® platform is a test installation, rvs® Client/Server, rvsMVS or rvsEVO.

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>-s / --system</td>
<td>rvs® platform chosen; for rvsMVS set <code>rvshost</code></td>
</tr>
<tr>
<td>-xhi &lt;hostname&gt;</td>
<td>hostname (or ip address) of rvsMVS</td>
</tr>
<tr>
<td>-xhsrvs &lt;port&gt;</td>
<td>port number at which rvsMVS waits for requests from the Management Adapter</td>
</tr>
<tr>
<td>-xhsext &lt;port&gt;</td>
<td>port number at which the external MVS SNMP task waits for a START request from the Management Adapter</td>
</tr>
<tr>
<td>-xhr &lt;port&gt;</td>
<td>port number at which the Management Adapter waits for responses from rvsMVS</td>
</tr>
<tr>
<td>-xht &lt;timeout&gt;</td>
<td>maximum time in milliseconds that the Management Adapter waits for a response to a corresponding request from rvsMVS</td>
</tr>
</tbody>
</table>
Syntax (only for rvsMVS):
To start the configuration of the rvs SNMP Agent for rvsMVS use the following command:

```
java -jar agent.jar -c -h <hostname> -p <port>
-l <hostname>/<port> -n <hostname>/<port>
-s "rvshost" -xhi <hostname> -xhsrvs <port>
-xhsext <port> -xhr <port> -xht <timeout>
```

Example (rvsMVS):

```
java -jar agent.jar -c -h 192.168.1.2 -p 1991
-l 192.168.1.2/161 -n 192.168.1.1/162
-s "rvshost" -xhi 192.168.1.3 -xhsrvs 1993
```

You can also change the rvs® SNMP Agent configuration by editing the
AgentParameter.xml configuration file. You need to edit only those fields that were mentioned before in the interactive configuration description.

Starting the rvs® SNMP Agent at the command prompt:

You can start the rvs® SNMP Agent at the command prompt as follows:

Example with console window for activities:
```
java -jar agent.jar -w
```

Example without console window:
```
java -jar agent.jar
```

2.2.1 rvsEVO configuration

You must edit the following parameters to be able to work with rvs® SNMP Agent.

- AgentActive
- AgentHeartbeatInterval
- AgentHostname
- AgentPort
- AgentLogLevel

Edit these parameters either in the graphical user interface (Admin window, Administration branch, Parameter item) or in the $RVS_HOME/conf/rvsConfig.xml XML configuration file.

The following table describes these parameters.
2.2.2 rvsX/rvsXP Configuration

Note: Because of RMI, which is necessary for the management commands, the rvs® SNMP Agent for rvsX/rvsXP has to be installed on the rvs® Client/Server platform.

Two configuration steps are required in rvs® (rvsX and rvsXP in this case) to work with the rvs® SNMP Agent. Firstly: You must add two new variables to the $RVSPATH/rvsenv.dat rvs® environment file. Secondly: New global rvs® parameters are to be enabled to activate the transmission of particular messages to NMS.

Environment variables

Configure the following variables in the rvs® $RVSPATH/rvsenv.dat environment file: AGENT_SERVER and AGENT_PORT. The AGENT_SERVER variable is mandatory. It comprises the IP address or the computer name on which the Agent is running. AGENT_PORT is the Agent IP port. The default port 6123 is used if this variable is not set.

There are two ways to set the environment variables: either by way of the graphical user interface in the rvsXP Administrator (Edit -> Environment File -> New) or by editing the $RVSPATH/ rvsenv.dat file (rvsX and rvsXP).

rvs® parameters

The following new rvs® parameters govern the transmission of rvs® SNMP messages: AGENT_HEARTBEAT and AGENT_LOGLEVEL.

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgentActive</td>
<td>This parameter defines whether or not rvs® SNMP Agent is enabled or disabled: Default: Y (Yes). Possible values: Y (Yes) or N (No).</td>
</tr>
<tr>
<td>AgentHeartbeatInterval</td>
<td>This parameter defines the interval (in seconds) at which rvsEVO sends a Heartbeat message to the Agent UDP address (AgentHostname + AgentPort).</td>
</tr>
<tr>
<td>AgentHostname</td>
<td>Agent computer name (or IP address). Default: localhost.</td>
</tr>
<tr>
<td>AgentPort</td>
<td>Agent IP port. Default: 3744.</td>
</tr>
<tr>
<td>AgentLogLevel</td>
<td>This parameter defines whether or not rvs® EVO sends log messages to the Agent. Possible values: 0, 1. 0: no log messages are sent. 1: all log messages are sent.</td>
</tr>
</tbody>
</table>
**AGENT_HEARTBEAT**: With this parameter enabled (0 = off; any value greater than 1 = on), rvs® monitor sends a heartbeat message to the TCP/IP address of the agent at regular intervals. When the rvs® monitor is idle, this parameter depends on the rvs® SLEEP parameter as follows: When the value of the **AGENT_HEARTBEAT** parameter is smaller than the value of the SLEEP parameter (default is 30 seconds), the value of the SLEEP parameter is adopted. There are no dependencies on the SLEEP parameter when rvs® Monitor is active; the actual value of the **AGENT_HEARTBEAT** is used.

**Example**: **AGENT_HEARTBEAT=6** (less than 30 seconds); when idle, rvs® Monitor sends a heartbeat message every 30 seconds, when active, every 6 seconds.

**AGENT_LOGLEVEL**: defines, which log messages are to be sent: 0 = none; 1 = all; 2 = error (message class: Error and Warning).

The following messages are always sent (provided the **AGENT_SERVER** variable is set in the $RVPATH/rvset.dat file).
- **START**: rvs® Monitor sends a start message to rvs® SNMP Agent.
- **STOP**: rvs® Monitor sends a stop message to rvs® SNMP Agent.
- **LICENCE**: When the monitor log contains a license warning, this warning is sent to the rvs® SNMP Agent.

### 2.2.3 rvsMVS Configuration

The following illustration shows the general architecture of rvs® SNMP Agent on rvsMVS platform:
You must configure the following new parameters for the SNMP component in the rvsMVS CNTL member.

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNMPUSE</td>
<td>This parameter defines whether or not rvs® SNMP Agent is enabled or disabled: Default: NO. Possible values: YES or NO.</td>
</tr>
<tr>
<td>SNMPPIMA</td>
<td>Port number at which rvsMVS waits for requests from the rvs® SNMP Agent’s Management Adapter. Default: 1993</td>
</tr>
<tr>
<td>SNMPPIEX</td>
<td>Port number at which the external MVS SNMP task waits for a START request from the rvs® SNMP Agent’s Management Adapter (Modul: DF031M; see drawing). Default: 1992</td>
</tr>
<tr>
<td>PARAMETER</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>SNMPPOMA</td>
<td>Port number at which the rvs® SNMP Agent’s Management Adapter waits for responses from rvsMVS (Modul: DF031Z). Default: 1990.</td>
</tr>
<tr>
<td>SNMPPIADR</td>
<td>IP address of the rvs® SNMP Agent.</td>
</tr>
<tr>
<td>SNMPSTOP</td>
<td>allows the rvs® SNMP Agent to stop rvsMVS by the SET STOP command. Possible values: YES or NO. Default: NO.</td>
</tr>
<tr>
<td>TIME</td>
<td>Time period in milliseconds for the heartbeat. This parameter is also used for the DS command. Default: 10.</td>
</tr>
</tbody>
</table>
3 Working with rvs® SNMP Agent

The present chapter describes the major elements of RVS SNMP MIB and supporting commands and messages vital for working with rvs® SNMP Agent.

3.1 RVS SNMP MIB

A Management Information Base (MIB) is a group of objects (similar to a database) required for administering a network. Objects in an MIB feature a tree structure.

The RVS SNMP MIB (file RVS-SNMP-MIB.txt) also features a tree structure.

The following picture shows the RVS SNMP MIB in an MIB browser.

Major elements in the rvsMIB branch are rvsEvents and rvsObjects.

rvsEvents contains all Traps (or requests/notifications) sent by rvs® SNMP Agent.

rvsObjects contains all objects provided by rvs® SNMP Agent.
3.2 Supported SNMP commands and messages

An rvs® SNMP Agent supports the **GET** and **SET** commands and can send **TRAP** messages to an NMS. You can send the **GET** and **SET** commands from an MIB browser (see picture in chapter 3.1 "RVS SNMP MIB").

The following **TRAPS** are sent to an NMS:

- **HEARTBEAT**
- **START**
- **STOP**
- **LICENCE EXPIRED**
- **LOG MESSAGES**
- **JobFailed MESSAGES** *(only for rvsEVO systems)*

You can configure the interval for sending the **HEARTBEAT** TRAP using rvs® parameters (e.g. `AgentHeartBeatInterval` in rvsEVO, see the rvsEVO User Manual). The ODETTE ID of rvs® station is displayed.

A **START STOP** or **LICENSE EXPIRED** TRAP is always sent (at each start, stop or license expired message sent by rvs®). The ODETTE ID of rvs® station is displayed. With license expired messages also the expiration date of the license key is displayed.

The **LOG MESSAGES** are sent only if the rvs® parameter for LogLevel (e.g. `AgentLogLevel` for rvsEVO) is enabled. The output is ODETTE ID of rvs® station, LogLevel and log message.

**JobFailed MESSAGES** were transmitted from rvsEVO after a failed transmission. You get the following information: ODETTE ID, JobID, ODETTE ID of originator, ODETTE ID of destination, VDSN, creation date of send job, status, category, time of last change in the job status, error type and error text.

You can use the **GET** (**GET NEXT, GET ALL**) command to retrieve the following data records from the RVS SNMP MIB (**rvsMIB**, branch **rvsObjects**) in an MIB browser:

- **rvsStatus**
- **rvsControlAction**
- **rvsLogLevel**

You can neither read nor edit **rvsLogMessageText**, **rvsLogLevel** and **rvsLicenseValidUntilDate**. They will be used for **rvsEvents** (in case of a TRAP) in the **rvsLogMessageNotification** or **rvsLicenseExpireNotification**.

The **rvs®** SNMP Agent features the following **SET** commands:

- **rvsControlAction**: Start or stop.
- `rvsLogLevel` (e.g. `rvsEVO parameter AgentLogLevel`): 1 = off; any other values = on.

The data record value to be defined with the `SET` command is to be specified in the `Value` text box.