

IBM Remote Support Manager for Storage



Planning, Installation and User's Guide

IBM Remote Support Manager for Storage



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Note:

Before using this information and the product it supports, be sure to read the information in "Notices" on page 49.

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About this document

This guide provides details about planning, installation and using the IBM® Remote Support Manager for Storage (RSM for Storage) application.

Who should read this document

This document is intended for system operators and service technicians who have extensive knowledge of fibre channel and network technology.

How this document is organized

This document is organized as follows:

Chapter 1, “Planning for RSM for Storage,” on page 1 provides an overview of RSM for Storage and planning details to help you configure RSM for Storage.

Chapter 2, “Installation and configuration,” on page 7 provides instructions for installing the hardware and software necessary for using RSM for Storage.

Chapter 3, “Using RSM for Storage,” on page 21 provides an overview of the RSM for Storage programs, details on the different types user's for RSM for Storage, and information about managing the RSM for Storage application.

Appendix A, “Troubleshooting,” on page 33 addresses problems with the server that the Remote Support Manager is running on.

Appendix B, “Planning worksheets,” on page 39 provides worksheets to help you gather the necessary information to successfully install and configure RSM for Storage.

Appendix C, “Filtered events,” on page 45 provides a list of events that are not reported to IBM Service.

Appendix D, “Customizing the firewall,” on page 47 provides details to help you customize the firewall settings.

Notices and statements used in this document

The caution and danger statements used in this document also appear in the multilingual *IBM Safety Information* document provided with your Remote Support Manager for Storage product. Each caution and danger statement is numbered for easy reference to the corresponding statements in the safety document.

The following types of notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Getting information, help, and service

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your DS4000 Alert Manager Appliance system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation and use the diagnostic tools that come with your system.
- Check for technical information, hints, tips, and new device drivers at the following Web site:

www.ibm.com/storage/techsup.htm

- Use an IBM discussion forum on the IBM Web site to ask questions.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documents that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries® systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about the xSeries system and preinstalled software, if any, is available in the documents that come with your system. This includes printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions on how to use the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software.

Web sites

IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates.

- For DS4000 information, go to the following Web site:

www.ibm.com/servers/storage/support/disk/

The support page has many sources of information and ways for you to solve problems, including:

- Diagnosing problems using the IBM Online Assistant
- Downloading the latest device drivers and updates for your products
- Viewing frequently asked questions (FAQ)
- Viewing hints and tips to help you solve problems
- Participating in IBM discussion forums
- Setting up e-mail notification of technical updates about your products

- For the latest information about DS4000 operating system and HBA support, clustering support, SAN fabric support, and Storage Manager feature support, see the System Storage™ DS4000 Interoperability Matrix at the following Web site:
www.storage.ibm.com/disk/fastt/supserver.htm
- For the latest information about IBM xSeries products, services, and support, go to the following Web site:
www.ibm.com/eserver/xseries/
- You can order publications through the IBM Publications Ordering System at the following Web site:
www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi/

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services. Go to the following Web site for support telephone numbers:

www.ibm.com/planetwide/

Service is available for DS4000 subsystems attached to the RSM for Storage system according to the same terms and conditions of the maintenance agreement or warranty in effect for the attached DS4000 subsystems.

All subsystems to be monitored by the RSM for Storage application must be within warranty or covered by a current maintenance agreement.

Fire suppression systems

A fire suppression system is the responsibility of the customer. The customer's own insurance underwriter, local fire marshal, or a local building inspector, or both, should be consulted in selecting a fire suppression system that provides the correct level of coverage and protection. IBM designs and manufactures equipment to internal and external standards that require certain environments for reliable operation. Because IBM does not test any equipment for compatibility with fire suppression systems, IBM does not make compatibility claims of any kind nor does IBM provide recommendations on fire suppression systems.

RSM for Storage does not report fires or potential fires.

How to send your comments

Your feedback is important in helping us to provide the most accurate and high-quality information. If you have comments or suggestions for improving this publication, you can send us comments electronically by using these addresses:

- Internet: starpubs@us.ibm.com
- IBMLink™ from U.S.A.
- IBMLink from Canada
- IBM Mail Exchange

You can also mail your comments by using the Reader Comment Form in the back of this manual or direct your mail to:

International Business Machines Corporation
Information Development
Dept. GZW
9000 South Rita Road
Tucson, AZ 85744-0001
U.S.A.

Chapter 1. Planning for RSM for Storage

This chapter provides an overview of RSM for Storage and planning details to aid in the configuration of RSM for Storage.

What RSM for Storage does

The IBM Remote Support Manager for Storage (RSM for Storage) application is an application that installs on an IBM xSeries server running Novell SUSE Linux[®] Enterprise Server 9 and provides problem reporting and remote access for IBM Service for the DS4000 family of IBM storage subsystems.

The problem reporting provided by the RSM for Storage application automatically creates an entry in IBM's call management system for each subsystem that reports a problem. This is the equivalent of placing a voice call to IBM Service for a problem. Once in the system, problems are responded to with the same priority as specified by the maintenance agreement in place for the product.

RSM for Storage controls security for remote access by managing hardware and software components of the server it is installed on. Once installed, the server should be considered to be a single purpose appliance for problem reporting and remote access support for your storage subsystems. Only applications approved by IBM and specified in this document should be installed. (Management of the internal firewall and other configuration changes made by the software might prevent other applications from working.)

Remote access is provided by an external modem attached to the server. This connection provides IBM Service with a command line interface to the server. All bulk data transfers for logs and other problem determination files are sent to IBM via e-mail or by FTP using the server's Ethernet interface. Isolation of remote and local users of the system from other devices on your intranet is performed by an internal firewall that is managed by the RSM for Storage application. Remote users do not have the ability to change any security features of the application.

Monitoring of storage subsystems is performed by your existing IBM Storage Manager application which is configured to send SNMP traps to the Remote Support Manager when critical events are detected. Configuration of the management application is addressed later in this document.

The Remote Support Manager's user interface allows you to control and view status of four management areas:

- System configuration
- Reporting
- Remote access
- Internal firewall

Your configured contact person for the Remote Support Manager will also receive e-mails of status changes in these areas.

Supported products

The RSM for Storage application supports the subsystems, management applications and other SAN devices outlined in the following sections.

Storage subsystems

The RSM for Storage application supports the DS4000 family of mid-range storage subsystems and FAStT200 and FAStT500 subsystems. The storage subsystems must be covered under warranty or a current IBM maintenance agreement to be eligible to use the RSM for Storage application.

Storage management applications

The RSM for Storage application works with the Event Monitor of IBM Storage Manager. While you can use other applications for routine management of your storage subsystems, Storage Manager's Event Monitor must be running. The RSM for Storage application supports the DS4000 family of mid-range storage subsystems.

Other SAN devices

While RSM for Storage does not support problem reporting for other SAN devices (such as switches), you can specify other devices in the RSM for Storage configuration in order to permit IBM Service to access the management ports of these devices for problem determination. Remote access to these devices must be enabled by the administrator of the Remote Support Manager when access is required.

How many do I need?

One RSM for Storage system can support up to 50 subsystems. The RSM for Storage system must have IP connectivity to the Ethernet management ports of the subsystems.

If your storage is spread geographically across many time zones, and you do not have 24 hours coverage by administrative users, it may be desirable to have more than one RSM for Storage system.

RSM for Storage system must not require authorization through a firewall in order to access storage subsystems or your company's e-mail server.

Prerequisite hardware

The RSM for Storage application has the following hardware prerequisites.

Server

The RSM for Storage application is designed to run on an xSeries server. It has been tested with and is supported on the following xSeries servers:

- x306m 8849
- x100 8486

with these options:

- 512 MB memory
- 73GB hard disk drive

If your SAN devices are on a private management LAN, a second Ethernet port for accessing your company's SMTP server and the Internet will be required if your selected server has only a single Ethernet port.

- IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (52P8642) or equivalent

Modem

The RSM for Storage application is designed to work with an external modem attached to the first serial port.

The functional requirements for the modem are minimal and most "Hayes-compatible" external modems can be used. The modem should have a minimum speed of 56K bps supporting either V.90 or V.92, and support the following "AT" commands:

ATH0	Hangup
ATZ	Reset to default settings
AT&W	Save settings
ATS0=0	Do not answer

Be sure to use a modem and power cord appropriate for your country or region.

The RSM for Storage application has been tested with the following modems:

- Multitech Multimodem[®] II MT5600BA
- Multitech MultiModem ZBA MT5634ZBA

You will need to contact your IT support staff for installation and problem resolution related to the modem.

Prerequisite software

The RSM for Storage application is supported on SUSE Linux Enterprise Server 9 Service Pack 3 from Novell:

<http://www.novell.com/products/server9>

The RSM for Storage application receives SNMP traps from the Event Monitor included with IBM Storage Manager. The RSM for Storage application can not be installed on the same system used to manage your storage network. Your management station must have IBM Storage Manager 9.16 or later installed. It is recommended that you always use the latest version of IBM Storage Manager and controller firmware that is available.

Network connections

The RSM for Storage system requires an Ethernet connection to the management ports of the storage subsystems to be monitored and the management station running IBM Storage Manager's Event Monitor.

It also requires an Ethernet connection to your SMTP server and the Internet. If your SAN management LAN is separate from your intranet (that provides access to your SMTP server and the Internet), you will need a second Ethernet port or adapter in the RSM for Storage server.

Note: RSM for Storage system must not require authorization through a firewall in order to access storage subsystems or your company's e-mail server.

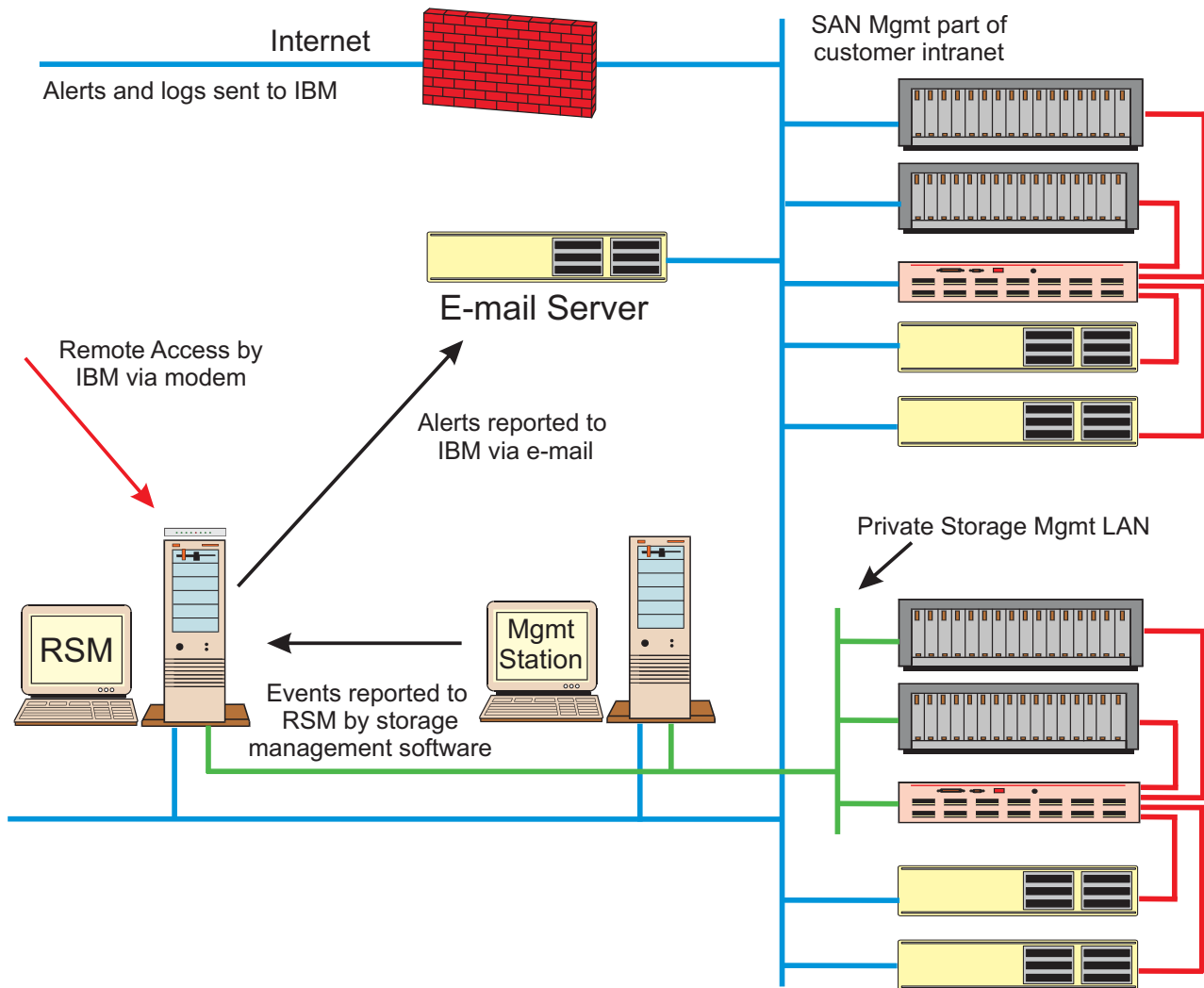


Figure 1. Network connection topology

Physical preparation

- ___ • Choose a server that meets the minimum requirements. See “Server” on page 2.
- ___ • Download the latest BIOS for the server.
- ___ • Verify that Serial Port A is enabled in BIOS Setup.
- ___ • Choose a modem. See “Modem” on page 3.
- ___ • Arrange for an analog phone line connection.
- ___ • Obtain SUSE Linux Enterprise Server 9 (with Service Pack 3).

Information you will need

To successfully install and configure RSM for Storage, you will need to gather various types of information including:

- Network setup information for the RSM for Storage server
- Company information and contact details
- Connection information

- Information on the storage subsystems to be monitored

Appendix B, “Planning worksheets,” on page 39 provides detailed worksheets to help you gather the information needed to successfully install and configure RSM for Storage.

Information used during the installation of the operating system

The following network setup information will be used during the installation of the Linux OS. Use “Worksheet #1: Network setup information for the RSM for Storage server” on page 39 to record this information.

- Time zone where the RSM for Storage system will be located
- Root user password
- Hostname for the server (ibmrsm is suggested)
- Your company's Domain Name
- IP addresses of your Domain Name Servers

It is recommended that you use static IP addresses for all network resources and management systems. The RSM for Storage system and the storage subsystems monitored by it must have static IP addresses.

- Static IP address to be assigned to the server
- Netmask for the server
- Gateway IP address

If a second Ethernet connection is required to reach the Internet and your SMTP server, you will need the information above for this port as well.

Information used during configuration of RSM for Storage

In addition to your company name and address, you will need to configure contact people, connection information for the RSM for Storage system, and each storage system to be monitored.

Contact people: At least one contact person must be defined as the primary contact for the RSM for Storage system.

If your storage subsystems are not physically located at the same location as the RSM for Storage system, you must define additional contacts for each different location. The following information is needed when configuring contact people:

- Name and e-mail address
- Primary phone number and the hours to call this number
- Alternate phone number and the hours to call this number
- Time zone

Use “Worksheet #4: Contact people” on page 41 to gather the necessary information to configure contact people.

Connection information for the RSM for Storage system: You will need to gather the following information to configure the connection for RSM for Storage system:

- IP address of your company's e-mail (SMTP) server
- Location of the server
- Address, City, State, and Postal Code
- Country or region
- Phone number for the modem

Use “Worksheet #3: Connection information for the RSM for Storage system” on page 40 to gather the appropriate information needed to successfully configure the connection for the RSM for Storage system.

Information for each storage subsystem to be monitored: Gather the following information for the storage subsystems that will be monitored by RSM for Storage:

- Storage subsystem name

Note: This must be the same name used to identify the subsystem in IBM Storage Manager.

- Static IP address of the controllers in each subsystem
- Location of subsystem
- Address, city state, postal code
- Country or region
- Contact person for this subsystem
(One of the previously configured contacts)
- IBM machine type, model and serial number
- Ensure that the storage subsystem is covered under warranty or a current IBM maintenance agreement.

Use “Worksheet #5: Information for each Storage Subsystem to be monitored” on page 42 to gather the appropriate information needed to successfully configure the subsystems to be monitored by RSM for Storage.

Information for other SAN devices: Additional devices such as SAN switches can be configured to be accessible from the RSM for Storage system. The RSM for Storage application will not monitor these for problems, but the system can be used to provide remote access for problem resolution if necessary.

Only the hostname and IP address of each device are required. Use “Worksheet #6: Information for other SAN devices to be accessible from the RSM for Storage system” on page 43 to gather the appropriate information for additional devices.

Chapter 2. Installation and configuration

This chapter provides detailed instructions for installing the hardware and software necessary for using RSM for Storage, instructions for verifying connectivity and details for configuring RSM for Storage.

Hardware installation

Use the following sections to install the appropriate hardware necessary for RSM for Storage to work in your environment.

Server

1. Install the server using the setup instructions that came with the server.
2. Verify that there are no fault indications Install the latest BIOS.
3. Go to the following Website and select BIOS to download the latest BIOS:
<http://www-307.ibm.com/pc/support/site.wss/document.do?Indocid=MIGR-61909>
4. Install the latest BIOS.
5. Verify the serial port configuration in Setup.
 - a. Boot the server and press **F1** when prompted to enter Setup.
 - b. Use the cursor key and Enter to select Devices and I/O ports.

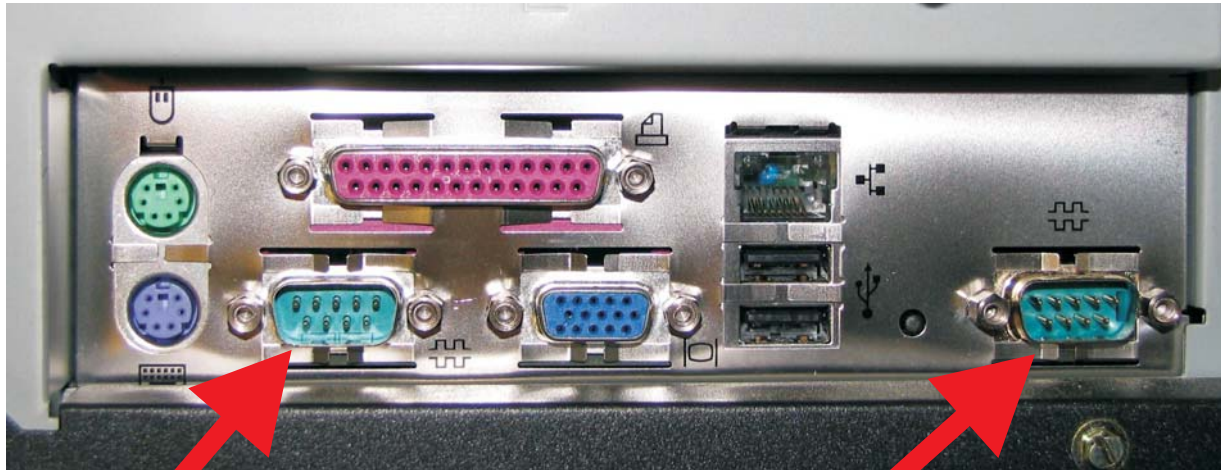


- c. If the Serial port is disabled, set it to use auto-configure or Port 3F8.
 - d. Press **Esc** to return to the main menu, and then Save Settings.
 - e. Exit Setup to reboot the server.
6. Connect one Ethernet cable from the server to an Ethernet switch or hub providing connection to your SAN Management LAN.
 7. If the Internet and your company's e-mail (SMTP) server are not accessible from your SAN Management LAN, connect a second Ethernet cable from the server to the Ethernet switch or hub providing connection to the Internet and e-mail server.

Modem

Install the modem using the setup instructions that came with the modem, and then do the following:

1. Connect the serial cable from the modem to the first serial port on the server. Figure 2 shows you how to make this connection.



Serial Port #1 (to modem)

Serial Port #2 (not used)

Figure 2. Serial port connection

2. Connect an analog phone line to the proper connector on the modem. Note that many modems have two connectors labeled LINE and PHONE. Make sure the analog phone cord is plugged into the connector labeled “LINE”.

Software installation

This section provides instructions for installing the Linux operating system, RSM for Storage, and updates to RSM for Storage. Before you begin installing the operating system, you will need to gather network setup Information for the RSM for Storage server.

Note: Refer to Appendix B, “Planning worksheets,” on page 39 for worksheets that will help you gather this information.

Installation of the operating system (SLES 9)

The Remote Support Manager is supported on Linux SLES 9. Depending on your hardware, there may be additional configuration screens presented that are not referenced here. Contact your IT support staff for assistance.

1. Insert CD labeled SLES1 Service Pack 3 in the CDROM drive and reboot the computer. You will be prompted for other service pack or base CDs as you go through the installation.
2. Click **Installation** from first screen.
3. Respond to the license agreement.
4. Click your language.
5. Click **Keyboard** and select a keyboard layout.
6. On the Installation Settings screen, click **New Installation**.
7. On the Installation Settings screen do the following:
 - a. Click **Partitioning**.
 - 1) Select **Create Custom Partition Setup** and click **Next**.
 - 2) For Hard Disk: select **1** and click **Next**.

- 3) For Installing: click **Use entire disk** and click **Next**.
- b. Click the **Change** button and then **Software**.
- c. Click the **Detailed Selection** button.
 - 1) In the left window, in addition to the default selections, click **Simple Webserver**.
 - 2) In the left window, in the Filter menu, select **Search**.

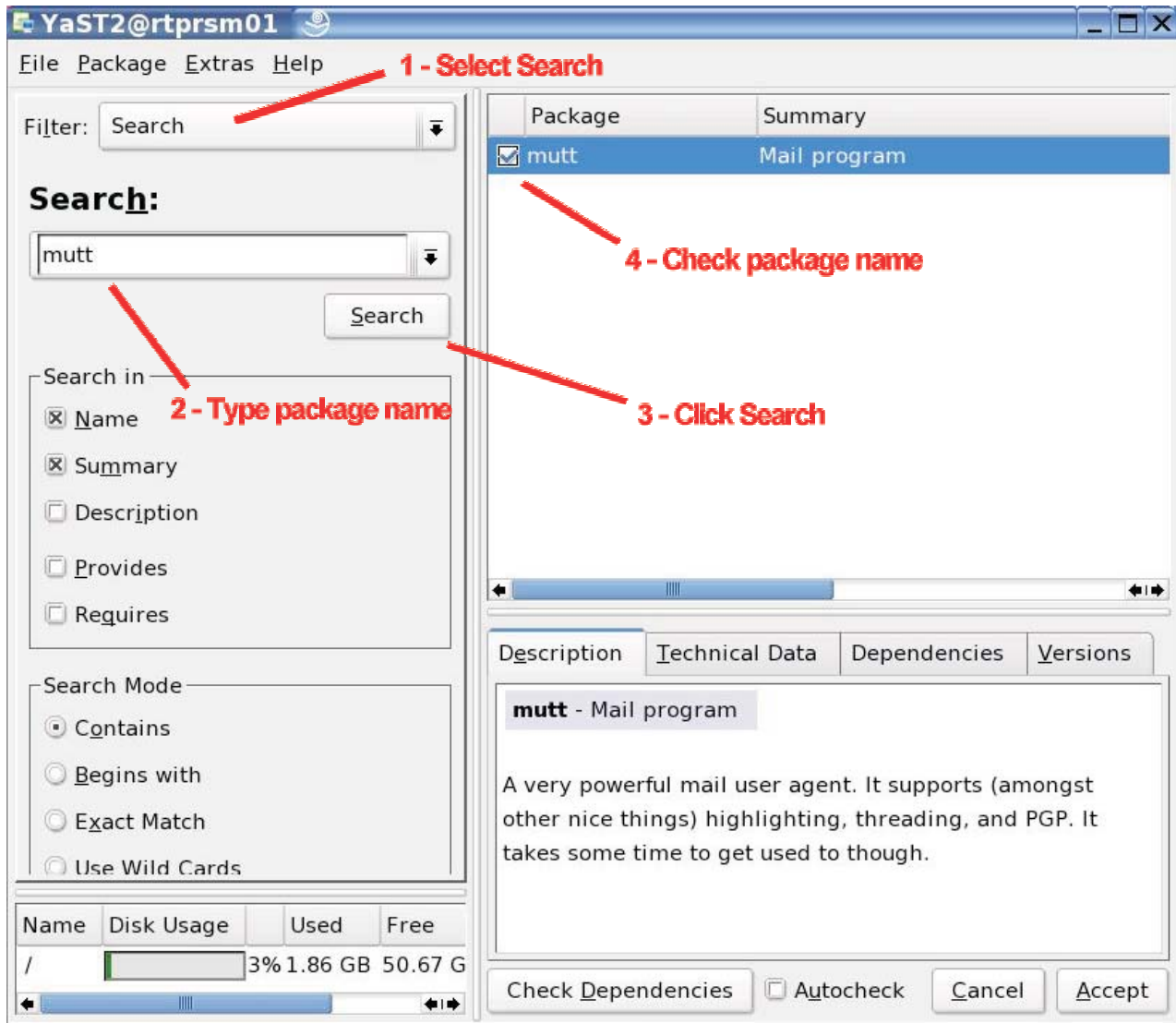


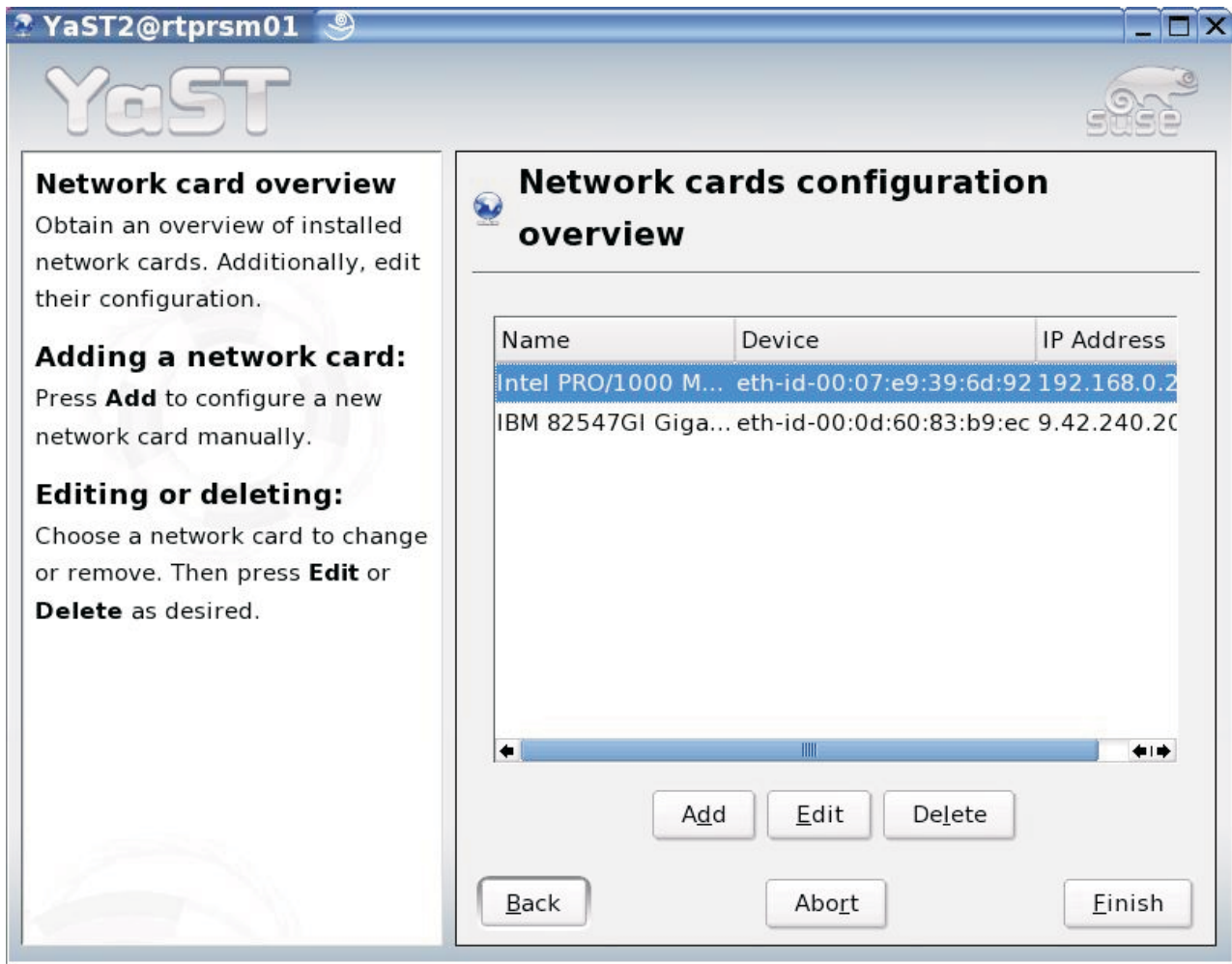
Figure 3. Package selection window

- a) Type **mutt** in the search window and click **Search**.
- b) In the right window, check the box to the left of the **mutt** package.
- c) Repeat steps 2a) and 2b) for **mgetty**, **expect**, and **minicom**.
- 3) Click **Accept** in the lower right of the screen.
- 4) Click **Continue** if any Automatic Changes are suggested.
- d. Click the **Change** button.
 - 1) Select **Time zone** and set the Hardware clock to use the local time.
 - 2) Click **Accept** in the lower right of the screen.

- e. Click **Accept** in the lower right of the Installation Settings screen.
- f. Click **Yes**, install to start the installation.

Note: After the CDs are loaded, the system automatically reboots and presents the initial menu, allow the system to default to the Boot from Hard Disc selection.

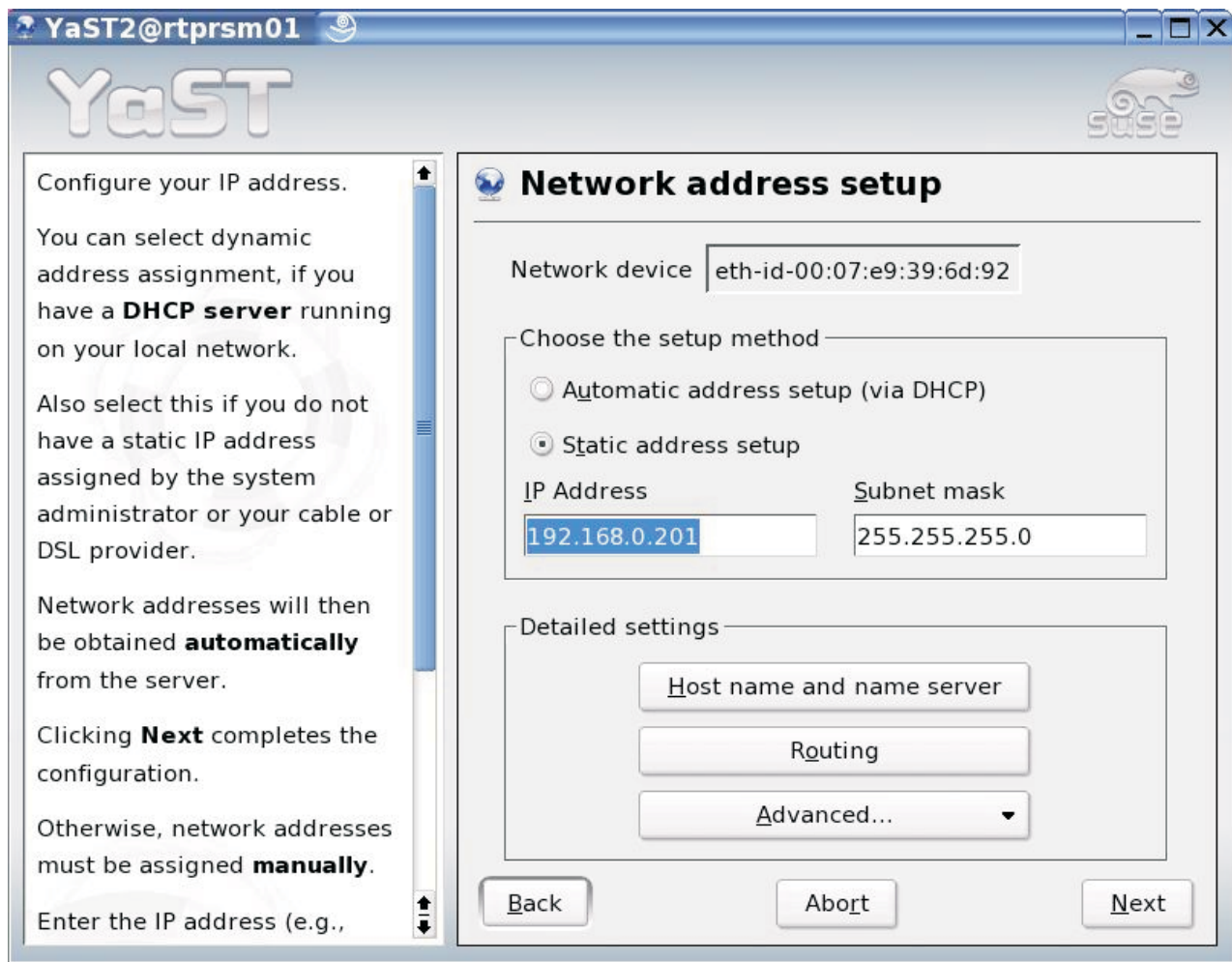
8. Insert additional CDs when prompted.
9. Provide a password for the "root" user and click **Finish**.
10. On the Network Configuration screen, click the **Change** button and then click **Network Interfaces**. Then do the following:
 - a. Click **Network Interfaces**.



If you are not sure how to enter network configuration information, check with your network administrator.

The server running the Remote Support Manager must be able to reach the storage subsystems to be monitored, your e-mail (SMTP) server and the Internet. Depending on your network topology this may require one or two network interfaces for this system.

The first Ethernet port is automatically configured for DHCP. You should assign a static IP address for this system.



Click on the name to highlight it and then click **Edit**.

- 1) Define a static IP address for this system:
 - a) Click **Static Address Setup** and enter the static IP address and Subnet Mask for the system.
 - b) Enter the IP addresses of the Name Servers in your intranet.
 - c) Click **Routing** under Detailed Settings to configure the Default Gateway, then click **OK**.
 - d) Setup your Domain Name Server, refer to "Worksheet #1: Network setup information for the RSM for Storage server" on page 39 for more information.
- 2) Click **Next** to return to the Network Card Configuration Overview.
 - a) If your storage subsystems are on a private LAN, you need to configure a second Ethernet port to be able to access an SMTP e-mail server and the Internet. Additional un-configured network adapters/ports appear in the box at the top of the screen. Click the port to configure and then **Edit** to configure additional ports.
 - b) Click **Next** to exit Network Card Configuration Overview.
 - c) Click **Next** to exit Network Configuration.

Note: It is not necessary to configure the firewall at this time because this will be managed by the RSM for Storage application.

11. On the Test Internet Connection screen, do the following:
 - a. Click **Yes** and **Next**.
 - b. If the test fails, check with your network configuration and verify that the previously entered configuration is correct. You can click **Back** to return to the Network Configuration menus.
 - c. If the test continues to fail, contact your IT support staff. You can also resolve the network problem after the installation of the operating system has completed. Continue the installation by clicking **No, Skip This Test** and **Next**.
 - d. If the test is successful, you will be given the option to install Online Updates.
 - e. These may include security updates and should be installed. You can install them now or at a later time. If you are not sure which updates to install, choose "Reload All Patches from Server".
12. On Service Configuration screen, select **Skip Configuration** and click **Next**.
13. On User Authentication Method screen, select **Local** and then click **Next**.
14. On Add a New Local User screen, click **Next** and **Yes** to the pop-up window. (RSM for Storage application will create users when it is installed.)
15. Review the Release Notes and then click **Next**.
16. On Hardware Configuration screen, you should change the monitor and screen resolution to 1024 x 768 or higher if supported by your monitor. To change the settings:
 - a. Click **Change** and then **Graphics Cards**.
 - b. Click **Monitor** and the **Properties** button.
 - 1) Select the monitor, color and resolution for your monitor and then click **OK**, and then **Finish**.
 - 2) Click **Finalize**.
 - 3) Follow on-screen instructions for testing the settings.
 - c. Click **Next** to exit the Hardware Configuration screen.
17. On Installation Completed screen, click **Finish**.
18. Log in as user root using the previously entered password.
19. Depending on your system configuration, you might be prompted for screen or monitor configuration after logging in for the first time.
20. If you did not start the installation by booting the Disk 1 from SLES 9 Service Pack 3, you can install the service pack now.
 - a. Load Disk 1 for the service pack in the CDROM drive.
 - b. Following the directions to install all recommended patches. You can normally accept all of the defaults.
21. Continue with verification of network connectivity in the next section.

Verify IP connectivity of the server and Linux OS

Your server should now be configured as a Linux system. To verify the IP connectivity of the server and Linux OS, do the following:

1. Open a console window by clicking the shell icon and use the "ping" command to verify that you can contact the following devices.

To open a console window, click on the icon of a monitor in the bottom left of the screen. Type: ping ip_address (use the IP address of your Gateway.

Refer to "Worksheet #1: Network setup information for the RSM for Storage server" on page 39 for more information. You should see a response similar to the following:

```
> ping 192.168.1.10
PING 192.168.1.10 (192.168.1.10) 56(84) bytes of data
64 bytes from 192.168.1.10:icmp_seq=1: ttl=64 time=0.093 ms
64 bytes from 192.168.1.10:icmp_seq=1: ttl=64 time=0.078 ms
64 bytes from 192.168.1.10:icmp_seq=1: ttl=64 time=0.071 ms
```

2. Cancel the ping by pressing **Ctrl-C** at the same time.

If the IP address cannot be reached, you will see a "Network is unreachable" message or something similar to the following:

```
> ping 172.24.6.10
PING 192.168.1.10 (192.168.1.10) 56(84) bytes of data
From this_systems_IP_address: icmp_seq=1 Destination Host Unreachable
From this_systems_IP_address: icmp_seq=1 Destination Host Unreachable
From this_systems_IP_address: icmp_seq=1 Destination Host Unreachable
```

3. Cancel the ping by pressing **Ctrl-C** at the same time.
4. Repeat the ping test using the address of a controller for one of your storage subsystems.
5. Open a Web browser and verify that you can reach www.ibm.com and do the following:
 - a. Click the icon in the lower left of the screen to bring up the applications menu.
 - b. Select **Internet** → **Web Browser**.
 - c. Type www.ibm.com in the address bar and verify that the Web site is accessible.

If any of these checks fail, contact your IT support staff.

You can use the YaST tool to review the Network Interface settings that were entered during the installation of the OS.

1. Click the icon in the lower left of the screen to bring up the application menu.
2. Select **System** → **YaST** to start YaST.
3. Click on **Network Devices** and then **Network Card**.

When you can successfully ping a storage subsystem and your company's e-mail (SMTP) server and you can reach IBM's Web site, you are ready to continue with installation of the RSM for Storage application on page 13.

RSM for Storage installation

You can download the RSM for Storage application from the following Website:

CAUTION:

Do not proceed with RSM for Storage Installation until installation of the operating system is complete and you have successfully verified connectivity.

To install RSM for Storage, log in to the server as root. Insert the Remote Support Manager for Storage CD into the CDROM drive, and continue with one of the following:

1. If the Autorun dialog box displays, click **Yes** to install RSM for Storage and continue to Step 3.
2. If the Autorun dialog box does not display, open a console shell window by clicking the monitor icon on the lower left side of the screen and do the following:

- a. Type the following into the window:

```
cd /
mkdir -p packages
mkdir -p /media/cdrom
mount -r -t iso9660 /dev/cdrom /media/cdrom
cp /media/cdrom/* /packages      ( this will take a minute)
cd /packages ./rsm-setup
```

There will be a number of status messages as the software is installed.

3. Type `umount /media/cdrom` to unmount the CDROM drive.
4. When the installation is complete, remove the CD from the drive.

In the console shell window, do the following:

1. Create the passwords for user "admin": type `rsm-passwd admin` to set the password for the RSM for Storage browser interface.
This is the user and password that will be used to configure and manage the Remote Support Manager.
2. Next, type `passwd admin` to set the password for the Linux login.
3. Create the password for user "lservice": type `rsm-passwd lservice` to set the password for the RSM for Storage browser interface.
This is the user and password that can be used locally by IBM Service. This user can not configure or change any of the security aspects of the Remote Support Manager. It can be used to view, acknowledge and close alerts.
4. Next, type `passwd lservice` to set the password for the Linux login.
5. Logout as "root" by clicking the N icon and select **End current session**.
6. Log in as "lservice".
7. Let the desktop do its first time initialization and wait approximately 15 seconds for the icons to appear.
8. Click on the shell console icon in the bottom tray, then close the window. This changes the desktop appearance to RSM for Storage.
9. Logout as "lservice" by clicking the N icon and select **End current session**.
10. Log in in as "admin".
11. Let the desktop do its first time initialization.
12. Click on the monitor icon in the bottom tray, then close the window.

Note: New icons have been placed on the desktop to facilitate management of RSM for Storage.

Note: Normally, you should always log in to the server running the RSM for Storage as the "admin" user. Continue with "Configuration" on page 15.

Desktop icons

A number of icons are added to the desktop to provide quick access to management and log information related to operation of the RSM for Storage application. These icons can vary depending on which type of user is logged in and include the following:

Manage	This is the primary user interface for the RSM for Storage application.
Activity Log	This opens a console window and displays the contents of the activity log. This log is located at <code>/var/log/rsm/activity.txt</code> and contains a record of events and processing tasks performed by the application. Problems that are detected are also logged here.

Security Log This opens a console window and displays the contents of the security log. This log is located at `/var/log/rsm/security.txt` and contains a record of security related events and state changes.

Help This opens Master Help page.



This icon opens a list of programs and utilities. Click this icon to log out or shutdown the RSM for Storage system.



This logs the current user out of a session.

Installing updates to RSM for Storage

Updates to the Remote Support Manager software will be distributed as a CDROM or as a CDROM Image file (.iso). All configuration files will be preserved during the update process. Some updates might require that additional configuration details be provided after update.

You can expect to update your RSM for Storage software each time a new version of controller firmware is installed on your storage subsystems. Update procedures are the same as the initial installation of RSM for Storage described in “RSM for Storage installation” on page 13.

If additional configuration information is required for the update, the System status will be Incomplete and you need to supply the new information before the RSM for Storage system will send alerts to IBM.

If new configuration information is now required, all previously configured information should be present and the RSM for Storage system should be operational.

Configuration

This section provides detailed configuration information for the following:

- “RSM for Storage”
- “IBM DS4000 Storage Manager” on page 16
- “Modem connectivity” on page 17
- “Activation” on page 18

RSM for Storage

To configure RSM for Storage, do the following:

Note: The Appendix B, “Planning worksheets,” on page 39 can help you get through this configuration process.

1. Launch the RSM for Storage user interface by clicking the **Manage** icon on the desktop.
2. If this is the first time you have started the browser, the summary status will be Configuration Incomplete.
3. Log in to the RSM for Storage application as "admin".
4. Select **Update Configuration** and then provide the requested information for the following configuration areas:
 - a. Contacts

- b. Company
- c. Connections
- d. Storage
- e. Switches

For additional information about any of the configuration fields, click on the help link in the upper right of each page.

Appendix B, "Planning worksheets," on page 39 are provided to help you fill in the required information for these areas.

If any information is missing or appears to be incorrectly formatted, a status of Incomplete will be shown and the specific field on that page that is incomplete will be flagged with an asterisk. Click on the help link for the page for suggestions how to correct the problem.

5. When each configuration section shows a status of OK, an option to run a Configuration Test will be available at the bottom of the screen.

The RSM for Storage Configuration Test will verify connectivity to all configured devices. Click **Refresh Status** until the test completes and the results are shown. Any problems are indicated by a status of Problem and the specific device will be flagged with a double asterisk. Click on the areas indicating a problem to determine which device and/or IP address could not be reached. Additional information about test results are written to the Activity Log. Click the icon on the desktop to view the Activity Log. Refer to the Online Help for a detailed explanation of the problem status.

Re-run the configuration test until all problems are resolved.

IBM DS4000 Storage Manager

This section defines the configuration changes you must make to your management application when attaching RSM for Storage to a DS4000 product. These instructions are for IBM Storage Manager 9.16 or higher.

Notes:

1. The subsystem name used in IBM Storage Manager must match exactly (including case) the name used configured in the RSM for Storage application.
2. These changes must be made in IBM Storage Manager running on your management station, not on the RSM for Storage system.

Configure SNMP traps to be sent to the Remote Support Manager

The RSM for Storage system sends alerts to IBM Service when SNMP traps with event information are received from the subsystems being monitored. For DS4000 subsystems, SNMP traps are sent by the IBM Storage Manager client and/or the IBM Storage Manager's Event Monitor service. As the Storage Manager Client may not always be running, it is recommended that the Event Monitor be installed.

Note: The Event Manager is installed during the installation of the IBM Storage Manager. For information about determining whether Event Manager is installed, refer to the documentation that came with your DS4000 subsystem.

To send traps to the RSM for Storage system, configure the RSM for Storage system as a destination for SNMP traps in the Storage Manager client. This configuration will also be applied to the Event Monitor (if installed) on that same system.

Note: The following procedure assumes that all DS4000 subsystems managed by the storage manager will be configured for reporting in the RSM for Storage application. If this is not the case, configure individual subsystems in step 2 below. Do not configure any subsystem that is not covered by warranty or a current maintenance contract.

1. Select **Task Assistant** from the View menu pull-down.
2. Click the **Configure Alerts** button.
3. Select **All storage subsystems**, and then click **OK**.
4. Select the **SNMP** tab.
5. Enter the IP address of the RSM for Storage system in the Trap Destination window.
6. Click **Add**.
7. Click **validate** to send a test trap the RSM for Storage system.

The RSM for Storage application ignores test alerts such as these, but you can verify that it was received by viewing the RSM for Storage Activity Log. Click on the magnifying glass icon on the desktop labeled Activity Log. The reception of the test alert and the fact that it was ignored should be logged.

Storage Manager passwords: Storage Manager has a privileged mode of operation. If a password has been entered for the admin user, then any attempt to change the configuration of the DS4000 will require the "admin" password. It is recommend that the admin password be set. If you choose to have IBM Service make configuration changes for you, you will need to provide them with the admin password or disable it for the duration of the service action.

Shell access security: DS4000 controllers provide a way to access the controller shell environment using the rlogin protocol. rlogin has limited security and is generally considered a security risk. Storage Manager provides a way to disable the rlogin support in the subsystems controllers and it is generally recommended that it be disabled. If IBM Service requires access to the shell, they will need to contact you to have rlogin access enabled.

Modem connectivity

Communication between the modem and the Remote Support Manager

During configuration of the Remote Support Manager, you performed a configuration test (See "RSM for Storage" on page 15). Part of this test is to verify that the RSM for Storage software can communicate with the modem. If the configuration test completed without errors then the modem is connected to the correct serial port and is communicating with the Remote Support Manager for Storage.

Remote access to the modem

On the RSM for Storage Remote Access page, click **Enable Remote Access**. This will enable the modem to answer when called. Verify modem connectivity by calling the modem phone number from a voice phone.

Most modems will either flash an led or you may hear a sound when a call is being received.

1. If there is no indication that a call is being received:
 - a. Plug the phone cable into a voice phone and verify that a dial tone is present.

- b. If a dial tone is present, dial the number again and verify that the phone you connected rings.
 - c. Reconnect the phone cord to the modem connector labeled line #1.
2. Check the cable connection between the modem and the server and verify that the cable is connected to serial port #1.
3. Try again to verify the modem connectivity by calling the modem phone number from a voice phone.
4. Check the instructions that came with the modem and review any troubleshooting information.

Activation

Before the Remote Support Manager for Storage will send alerts to IBM it must be activated by contacting IBM Service. This is also the last step in verifying correct operation of the RSM for Storage.

On the RSM for Storage user interface, click **Remote Access** and enable remote access.

Call the number for IBM Service for your region and give the IBM Machine Type and Serial Number of one of the storage subsystems to be monitored by the RSM for Storage. Go to www.ibm.com/planetwide for support telephone numbers in your country or region. When you are contacted by the disk subsystem support team, verify that you are talking with DASD Support for DS4000 and tell them you are activating a RSM for Storage system.

Provide IBM Service with the phone number of the modem attached to the RSM for Storage system. IBM Service will dial into the system, verify that the configuration is correct and the activate the system.

Note: If you decide to install the RSM for Storage application on another server, you will need to contact IBM Service to obtain a new Activation key for the new server.

IBM Service will also generate a test alert to verify that the system can send an e-mail, and create a problem report in IBM's call management system. IBM Service will call the primary contact for the RSM for Storage system to confirm that the problem report was received.

When the RSM for Storage system is ready to receive events, the System Status will be OK.

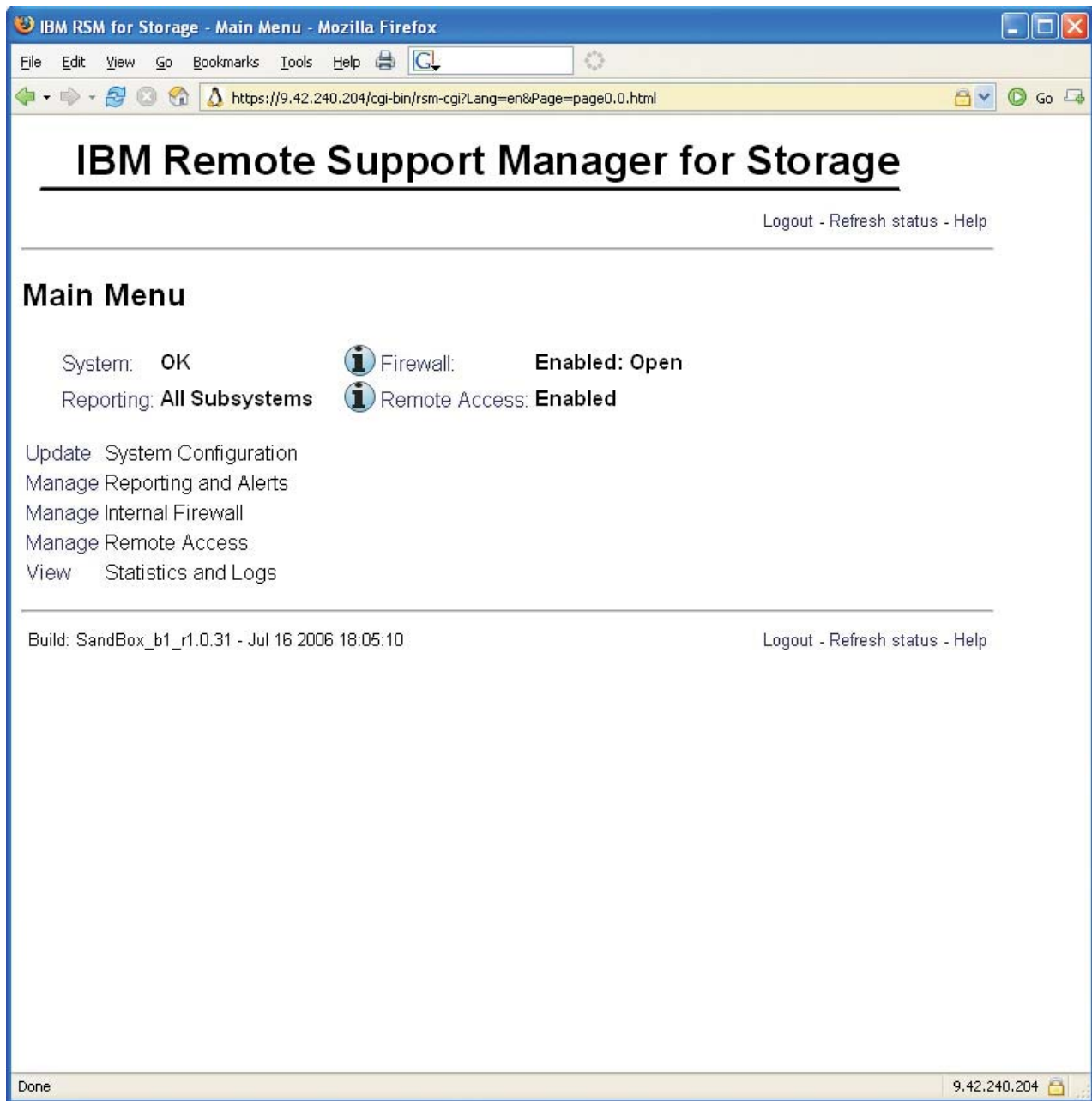


Figure 4. Example of a configured system

You can leave the browser session running, but you will need to select **Refresh status** to see changes in status.

Note: After 10 minutes of no activity on the user interface, you will be prompted to log in again.

Chapter 3. Using RSM for Storage

This chapter provides an overview of the RSM for Storage programs, details on the different types of users for RSM for Storage, and information about managing the RSM for Storage application.

User IDs and desktops

During installation, the RSM for Storage software creates three user IDs:

admin This is the Administrative user that can perform management and configuration tasks.

lservice

This is the Local Service user intended for use by IBM Service when on-site.

rservice

This is the Remote Service user that is used exclusively for remote access to the system.

The local desktops for the admin and lservice users are setup with different backgrounds so you can easily tell which user is logged into the RSM for Storage system. The lservice user has some restrictions on directories it can access that prevent it from changing any configuration that might affect security of the system.

Icons

The desktop has four icons to launch RSM for Storage programs.

Manage

Starts a Web browser and opens the management page for RSM for Storage.

Help

Starts a Web browser and opens the master help page.

Activity Log

Opens a console window and displays the most recent entries in the Activity Log. The Activity Log contains time stamped entries for actions performed by the RSM for Storage application.

Security Log

Opens a console window and displays the most recent entries in the RSM for Storage Security Log. This log contains time stamped entries for actions performed by the RSM for Storage application that affect the security of the system.

Notification e-mails

The RSM for Storage application sends e-mails to notify you about important changes in status.

Remote Access notifications are sent when:

- Remote access is enabled or disabled.
- A remote user connects or disconnects from the system.

- The remote access automatic timeout is about to expire and the system has one or more active alerts. Timeout warnings are sent at 4 hours, 2 hours and 1 hour before the timeout occurs.

Alert Status notifications are sent when an alert has been sent to IBM Service.

Daily Status e-mails serve as a heartbeat notification that the RSM for Storage system is operational. It includes the summary status for the system and status for alerts that may be active for storage subsystems.

Firewall Status notifications are sent when any change is made to the internal firewall settings for the RSM for Storage system.

Ignored Event notifications are sent when an event is received that is configured to be ignored by the RSM for Storage system. These are events for which a response by IBM Service is not usually required. See Appendix C, “Filtered events,” on page 45 for a description of these events.

E-mail contacts

When the RSM for Storage application was configured, you selected one of the contact persons to be the Primary Contact for the RSM for Storage system. Additional contacts might have been associated with different storage subsystems.

Table 1. E-mail contacts

Notification	Primary contact	Subsystem contact
Remote Access is enabled or disabled.	X	
Remote User connects and logs into the RSM for Storage system or logs out.	X	
Firewall is enabled or disabled or access to a reporting subsystem is allowed.	X	
Remote Access is about to expire or has expired.	X	X
An alert occurs for a subsystem.	X	X
Daily status updates at local noon.	X	
Daily status updates at local noon when a subsystem has an active alert.		X

Browser interface

Management of the RSM for Storage system is performed with a Web browser.

The management page can be accessed on the RSM for Storage system with the URL: localhost, or by clicking the Manage icon on the desktop.

Remote management can be performed using HTTPS by specifying the hostname of the RSM for Storage system or its IP address. (for example: https://192.168.1.100).

During installation of the RSM for Storage software, self-signed SSL certifications are created for use with the HTTPS interface. Any warnings you receive from your browser can be ignored.

Management pages

There are four management areas:

- System configuration
- Firewall
- Remote access
- Reporting and alerts

System configuration

The system configuration page allows you to specify the following:

- Company name and address.
- One or more contact people that IBM Service should call or e-mail when responding to a problem report.
- Connection information about the RSM for Storage system.
- Storage subsystems to be monitored by the RSM for Storage system.
- Other SAN devices.
- System activation.

There are two validation checks made on configuration information.

The first check occurs when you click the Update Configuration button on each configuration page. This verifies the format and content of each configuration field. Any problems will be indicated with a Configuration Incomplete status.

When all configuration Incomplete problems have been fixed, an option will be available at the bottom on the System Configuration page to run a Configuration Test. This test checks that the RSM for Storage system has IP connectivity to all configured SAN devices and that the system can communicate with the attached external modem. Any problems detected during the test are will be indicated with a Configuration Problem status.

Note: The RSM for Storage application will not process any events until all configuration errors are corrected and the System Activation step has been completed.

For more information refer to Chapter 2, “Installation and configuration,” on page 7 or “Configuration procedures and issues” on page 26.

Firewall

The firewall page provides status for the RSM for Storage server internal firewall. The purpose of the internal firewall is to limit the scope of access that local and remote users of the system have to your network.

The normal state for the firewall is Enabled:Closed which means that the firewall is operational and configured to allow SNMP traps to be received and e-mails to be sent, however, access to other devices on your network is not allowed.

The Enabled:Open state means that access to one or more other devices has been enabled. The firewall allows access to any storage subsystem that has an active alert, and also storage subsystems and other SAN devices that have been placed in Service Access mode.

Service Access mode allows you to manually allow access to a device from the RSM for Storage system. You can select storage subsystems or "Other SAN Devices" that you have previously configured.

Disabling the firewall allows unrestricted access from the RSM for Storage system to your network. To maintain the security of your network, disabling the firewall will also disable remote access. Likewise, enabling Remote Access will automatically enable the firewall.

Remote access

The Remote Access page provides controls and status for Remote Access to the RSM for Storage system. Enabling Remote Access unlocks the rservice user id and allows the modem to answer an incoming call.

Once enabled, and a remote user connects to the system, the status will change to Active.

You can select to have Remote Access automatically enabled when an alert is sent to IBM Service. Or you can wait to be contacted by IBM Service by phone before manually enabling it.

This page also allows you to set the Remote Access Timeout. This guarantees that the system will return to a secure state, without intervention. If the problem is difficult to resolve, or occurs intermittently, you may need to refresh the timeout to allow IBM Service more time to work on the problem.

If you disable Remote Access while a remote user is connected, the remote user will be disconnected.

Reporting and alerts

Normally all configured storage subsystems will be enabled for reporting. This means that the RSM will accept and process any events related to the subsystem. If you are relocating a subsystem or performing any task that might generate events (that IBM does not need to respond to), you can disable reporting until the subsystem is fully operational again.

While you are making configuration changes to the RSM for Storage application, the Reporting Status may be "Suspended". This is a reminder that no events will be processed by the RSM for Storage system while any configuration problems exist.

This page will show a summary of all alerts being tracked by the RSM for Storage application and allow you to view details about alerts that are active for each subsystem.

When a subsystem first reports a problem, an alert is sent to IBM Service. Once IBM has been alerted to a problem, additional alerts for that subsystem are held at the RSM for Storage system. IBM will respond to the alert either by connecting to the RSM for Storage system or calling you.

If IBM Service connects to the RSM for Storage system, they will either acknowledge or close all of the alerts for the subsystem. Alerts are acknowledged to indicate they have been seen by IBM Service but work on the problem has not been completed. Closing all of the alerts for a subsystem indicates that service is complete.

When all alerts for a subsystem are closed, the RSM for Storage application will consider the next event from that subsystem to be a new problem and an alert will be sent to IBM Service.

The Reporting and Alerts page will show the number of alerts sent, acknowledged and pending for each subsystem that has active alerts.

Pending alerts are ones that are candidates to be sent to IBM Service, but are being held at the RSM for Storage system for one of three reasons.

Holding

Another alert has already been sent to IBM Service for the subsystem.

Queued

The RSM for Storage application attempted to send the alert, but received an error. The most likely cause is a network problem that prevents the RSM for Storage application from reaching the SMTP server. The RSM for Storage application will attempt to re-send the alert every few minutes.

Waiting

IBM Service was remotely connected to the RSM for Storage system when the alert occurred. If all other alerts have been closed and the remote user disconnects without acknowledging this alert, it will then be sent to IBM Service as a new problem.

Navigation links and status summary




Navigation links at the top and bottom of each page allow you to move backwards to any previous level.



At the top of each page two lines of summary status for the four management areas are displayed. You can navigate to any of the management pages by clicking on the names in the summary status lines.

In addition to the text status, icons are used when your attention is required:

Table 2. Status summary icons

	An information status indicates a normal condition that is expected when a change to reporting, firewall, or remote access status occurs.
	A condition that usually requires your attention or awareness.
	This indicates a problem that prevents the RSM for Storage system from reporting subsystem problems to IBM.

Help pages

Each of the management pages in the browser interface has a link to a help page:



Refer to these help pages for questions about the meaning of status indications, controls, options or format of configuration fields.

In addition, the help page for the Main Menu contains a link to a master help index page that has general help for the following topics.

- Desktop icons
- Systems users and capabilities
- Browser user interface
- Command line utilities
- Configuring IBM Storage Manager to work with RSM for Storage
- Saving and restoring configuration files
- Troubleshooting

Configuration procedures and issues

The following sections provide detailed information about the following configuration procedures:

- Adding a new subsystem
- Changing who receives e-mails
- Changing passwords
- Saving and restoring configuration files

Adding a new subsystem

To add a new subsystem, do the following:

1. Ensure that the new subsystem is covered under warranty or a current IBM maintenance agreement.
2. Add the subsystem to the RSM for Storage configuration by doing the following:
 - a. Use the exact hostname used in IBM Storage Manager.
 - b. Make sure to enter the correct IBM machine type, model and serial number.
 - c. Include the IP addresses of the controllers.
 - d. Include the location of the subsystem.
 - e. Select the contact person that is physically near the subsystem.
3. Run the Configuration Test to verify IP connectivity and hostname.

Changing who receives e-mails

To change who receives e-mail notifications, do the following:

1. Add or verify the person's information in the Contacts page in System Configuration.

2. To change the primary contact person for the RSM, check the box at the bottom of the configuration page for that person.
3. To change the contact for a specific storage subsystem, go to the subsystem's configuration page and choose from the list of configured contact people. The contact for a subsystem should be physically near the subsystem so they can work with IBM Service if required.

Changing passwords

Use the command `rsm-passwd` to set the passwords for the RSM for Storage browser user interface:

1. Log in to the server running the Remote Support Manager application as the "root" user.
2. Open a console window and type: `rsm-passwd admin` or `rsm-passwd lservice`.

To change the Linux log in passwords, use the command `passwd`.

Saving and restoring configuration files

The configuration files are stored in the directory: `/etc/rsm`. These files can be backed up by saving them to a floppy diskette or by using FTP to store them on another machine.

Note: When you update the RSM for Storage software, the configuration files are preserved. However if you should ever need to install the RSM for Storage software on a new server, having a backup copy will save considerable time.

Saving the configuration files

Log in to the server running the Remote Support Manager application as the "root" user. Open a console window and type: `rsm-cfg-save`. The program will create a compressed file containing the configuration files. This file is stored as: `/packages/rsm-configuration-files.zip`. You can then choose to save the file to diskette, or exit the program and manually FTP the file to another machine.

How to FTP the configuration file to another machine: Use the Remote Support Manager's user interface to disable the internal firewall. Note that while the firewall is disabled, the RSM for Storage application will continue to process events, but will not automatically enable Remote Access.

Attention: Be sure and remember to re-enable the firewall.

As the root user, open a console window and:

1. Run the `rsm-cfg-save` program as described in the previous section.
2. Use FTP to copy the file `/packages/rsm-configuration-files.zip` to another machine.
3. Close the console window.

Use the Remote Support Manager's user interface to re-enable the internal firewall.

Restoring saved configuration files

Place the saved configuration file (`rsm-configuration-files.zip`) in the `/packages` directory. As the root user, open a console window and do the following:

1. Run the `rsm-cfg-restore` program.
2. Run `rsm-stop`.
3. Run `rsm-start`.

4. Close the console window.

Power off/on sequence

If you are powering your SAN off for maintenance, the RSM for Storage system should be powered off first and back on last, in order to prevent reporting of events that may be associated with power cycling of other devices.

Working with IBM Service

This section provides details about using RSM for Storage to work with IBM Service to resolve issues.

Enabling remote access

On the Remote Access management page, you have the option of allowing remote access to be automatically enabled when an alert is sent to IBM. This allows IBM to connect to the RSM for Storage system without needing to first speak with the contact person for the system. If you choose to disable this function, IBM Service will contact you to have remote access enabled manually when an alert is received.

Acknowledging alerts

The acknowledge state of an alert is an indication that IBM Service has seen or is aware of the alert. When IBM Service dials into the RSM for Storage system they will view the existing alerts and acknowledge them. In some situations, IBM Service may not require remote access to the RSM or subsystem in order to determine the cause of a problem and may call you to discuss the problem resolution. You can also acknowledge (or close) alerts.

Closing alerts

The RSM for Storage application sends a single alert to IBM Service for each subsystem. Additional alerts that occur after the first alert is sent to IBM, are available for examination in the RSM for Storage application. When all of these active alerts for a subsystem are closed, the next alert will again be sent to IBM Service.

When intermittent problems are occurring, it may be necessary for all alerts for the subsystem to be closed, so the RSM for Storage application can be used to automatically notify IBM when the problem recurs.

IBM Service will normally close all alerts for a subsystem then dialed into the RSM for Storage system, but resolution of the problem does not require dialing into the RSM for Storage system. You might be asked to close the existing alerts so that the RSM can resume sending alert to IBM.

Closing an alert in the RSM for Storage application, does not close the problem report with IBM Service.

Remote access timeout

To ensure that you do not have to remember to disable remote access to the RSM for Storage system in order to make it secure, the RSM for Storage application will automatically disable Remote Access based on a timeout. You can configure this timeout for between 12 and 96 hours. Some intermittent problems may require occasional access by IBM Service over a period of days and it may be necessary

for you to extend the timeout. To extend the Remote Access Timeout, click the "Update Remote Access Timeout" button on the Remote Access management page.

Providing additional privileges

When the RSM for Storage sends an alert to IBM, it often will contain all the information needed to identify the problem. When IBM Service dials into the RSM for Storage system, they will be able to connect to those subsystems that have reported a problem. Depending on how you have specified options in IBM Storage Manager, IBM's access may be limited to viewing configuration and downloading logs. If additional access is required to resolve a problem, you may need to:

- Provide IBM with the password for the subsystem.
- Enable RLOGIN for the subsystem so the controller's shell interface can be accessed.

Performance issues or other concerns that do not trigger an alert

When you place a voice call to IBM for Service, you can provide IBM Service with access to the RSM for Storage system and to storage subsystems, switches or hosts in your network. You can manually enable Remote Access to the RSM for Storage system and place any configured storage subsystem or other SAN device in Service Access mode and provide IBM Service with the phone number of the modem connected to the RSM for Storage system.

Note that the RSM for Storage system is normally used by the IBM Support Centers supporting storage subsystems. Support Centers for other devices such as switches will not be familiar with uses of the RSM for Storage system and may not have immediate access to the internal IBM tools that enable log in to the RSM for Storage system.

Event filtering and handling

The RSM for Storage application does not directly monitor storage for problems. Your existing IBM Storage Manager application already polls each DS4000 subsystem looking for problems. Storage Manager is configured to send critical events to the RSM for Storage systems as SNMP traps.

Ignored Events

Any SNMP trap that does not come from a DS4000 subsystem via Storage Manager is ignored.

Events that are received for a storage subsystem that is not configured or has had reporting disabled are ignored.

A few events reported by Storage Manager do not usually require a response by IBM Service. These are normally reported to the configured contact person for the subsystem via e-mail. See Appendix C, "Filtered events," on page 45 for a list of events that are ignored by the RSM for Storage Application.

Duplicates

Some failures result in duplicate event codes being sent to the RSM for Storage system. When duplicate events are detected, a duplicate count is incremented for the previous Alert.

Security

Adding a modem to one of your systems creates a potential entry point for unauthorized access to your network. The RSM for Storage application modifies many characteristics and behaviors of the system it is installed on to protect this entry point and to maximize the amount of control you have in managing remote access. To ensure the integrity of these controls, you should consider the server the RSM for Storage application is installed on to be a single purpose appliance.

RSM for Storage application controls initial access to the system by remote users and then limits the scope of access a remote user has to your network.

Access to the RSM for Storage system

Modem access to the system has four layers of control.

- The modem is configured to only answer when Remote Access is enabled by the RSM for Storage application.

You can manually enable and disable remote access, or you can choose to have remote access automatically enabled when a storage subsystem reports a problem. When remote access is enabled a timer is started which will automatically disable remote access when it expires. You don't have to remember to make the system secure after service has been completed.

The person identified as the primary contact for the RSM for Storage system is notified by e-mail whenever a change in the remote access settings occurs and all state changes are also written to the Security Log.

- The userid reserved for remote access (rservice) is only valid when Remote Access is enabled. Attempts to log in using the root, admin or lservice userids are rejected.

Note: For this reason you should not create additional users on this system.

- The initial login password is changed daily at midnight UTC. IBM Service has an internal tool that provides the current password for RSM for Storage systems.
- After validation of the initial login password, remote users are presented with a challenge string, which also requires access to an internal IBM tool in order to obtain the correct response. The response also includes an IBM employee user name that is recorded in the RSM for Storage Security Log.

Scope of access to your network

The following sections provide detailed information about the different user access permissions and privileges available in your network.

User permissions and privileges

Once a remote user has logged into the RSM for Storage system, that user will have all of the privileges of a normal user that is logged into the system locally. The only users that should exist on the system are those created by the RSM for Storage application (such as admin, lservice and rservice).

- **root** has complete control of the system and should be used only for installation of software or maintenance.
- **admin** performs configuration and management of the RSM for Storage application. The password for this user is set by the root user of the system.
- **lservice** is primarily intended for use by on-site IBM Service. This user can acknowledge and close alerts and view configuration settings. The lservice user can log into the system locally and is also recognized by the RSM for Storage browser interface.

- **rservice** is used by IBM Service and is only valid on the remote modem connection.

The Switch User (su) command is disabled to prevent a normal user from attempting to become "root" and have unrestricted access to the system. The RSM for Storage application makes other changes in program and directory permissions to limit what programs and files these users can access.

IP connections

The remote connection made by IBM into the RSM for Storage system is a console interface and programs that can initiate an IP connection on this interface are removed from the system during installation of the RSM for Storage application.

The following programs are removed from the system during installation of the RSM for Storage application:

- rcp
- rsh
- rexec
- tftpd
- vsftpd
- telnetd

Note: rlogin, which is required for shell access to DS4000 storage subsystems, is not removed.

The only daemons (or services) running on the RSM for Storage system are snmptrapd, sshd and httpd, which listen for SNMP traps, secure shell session requests and HTTP(S) requests respectively.

Note: While the secure shell daemon is running, it is not normally used for management of the RSM for Storage system and you must disable the RSM for Storage firewall before attempting to connect with a secure shell client.

Firewall states

The RSM for Storage application manages an internal firewall that limits the IP destinations that can be accessed by local and remote users of the system. The "rules" for inbound and outbound IP traffic that control the internal firewall are managed dynamically by the RSM for Storage application. There are three general states the firewall can be in:

Disabled:

All IP traffic is permitted both into and out of the system.

Enabled:Closed:

This the normal state when there are no active alerts present and the system is waiting for notification from IBM Storage Manager of a problem.

- The firewall will accept incoming SNMP traps, ping, traceroute and HTTPS requests.
- Outbound traffic for DNS, ping, traceroute, IBM's WWW and FTP sites and port 25 of your configured SMTP (e-mail) server.
- There is no access to any of your configured SAN devices or other addresses except as previously noted.
- Forwarding of IP traffic is also disabled, which prevents the system from being used as a router.

Enabled:Open:

In this state outbound access to one or more configured storage systems or other configured SAN devices also permitted. Access is allowed only to those devices that have active alerts or those that you have placed in Service Access mode.

Customizing the firewall

If you determine that it is appropriate for all local and remote users of the RSM for Storage system to be able to access other systems in your network at any time, you can create a configuration file that will enable access to them through the internal firewall. This configuration file can only be created or modified by the root user. See Appendix D, "Customizing the firewall," on page 47.

The Linux system management tool (YaST) tool may show that the Linux firewall is disabled or "managed by another program". This is expected as the RSM for Storage application is managing the firewall.

Log in to SAN devices

While the RSM for Storage application can limit the scope of access to your network, you must ensure that passwords and services running on your SAN devices are secure. DS4000 controllers have two levels of user login: Operator and Administrator.

The RSM for Storage system includes the Storage Manager CLI program (SMcli) which is used to access storage controllers. The default permissions for SMcli are that of an operator that can view settings and download logs, but cannot change the configuration or load new software. Access to the administrator commands require use of a password. It is recommended that you install this password and provide it to IBM Service when required to resolve a problem.

A lower level of access to DS4000 controller is the shell interface. The controller shell can be accessed from the RSM for Storage system with RLOGIN without a password (if the RLOGIN service is enabled for the controller). IBM Storage Manager for DS4000 has an option to disable RLOGIN and it is recommend that RLOGIN normally be disabled. IBM Service will contact you if shell access is required to resolve a problem.

The RSM for Storage application enables you to place other configured SAN devices in Service Access mode thereby allowing IP connections to them from the RSM for Storage system. You should ensure that proper user Ids and passwords are in place for these systems and provide them to IBM Service as required.

Appendix A. Troubleshooting

This appendix provides information for troubleshooting and resolving problems while working with RSM for Storage.

Hardware problems with the server

This section addresses problems with the server that the Remote Support Manager is running on. If you are having problems with the operation of the Remote Support Manager application see "Problems with operation of the Remote Support Manager" on page 36.

Remote Support Manager interactions with server problem determination

Because the Remote Support Manager application automatically controls an internal firewall, you should stop the Remote Support Manager before trouble shooting a possible hardware problem. You can also uninstall the Remote Support Manager application. Configuration files are not removed during an uninstall, and you can quickly re-install it after resolving the hardware problem without needing to re-configure it or perform the activation.

To stop the Remote Support Manager

Log in to the server as the "root" user Open a console window and type: rsm-stop. If there are events being processed, this may take while to complete. When the rsm-stop program completes, the system should now function as a normal workstation.

To re-start the Remote Support Manager

Log in to the server as the "root" user Open a console window and type: rsm-start.

General tips for troubleshooting problems with xSeries servers

IBM xSeries servers have front panel status indicators and often "Light Path Diagnostics" to identify failing components. If you do not have the documentation for your server, check the inside of the cover for an information label.

System x (xSeries) servers also have a system log that can accessed during POST by pressing the F1 key during the boot process.

Refer to the documentation that came with your xSeries server for more information. To place a service call for the xSeries server, call IBM Service and provide the IBM Machine Type and Serial number of the server.

IBM xSeries Service and Support may ask you to download and run a program called "Dynamic System Analysis". This program should operate normally provided that the Remote Support Manager has been stopped.

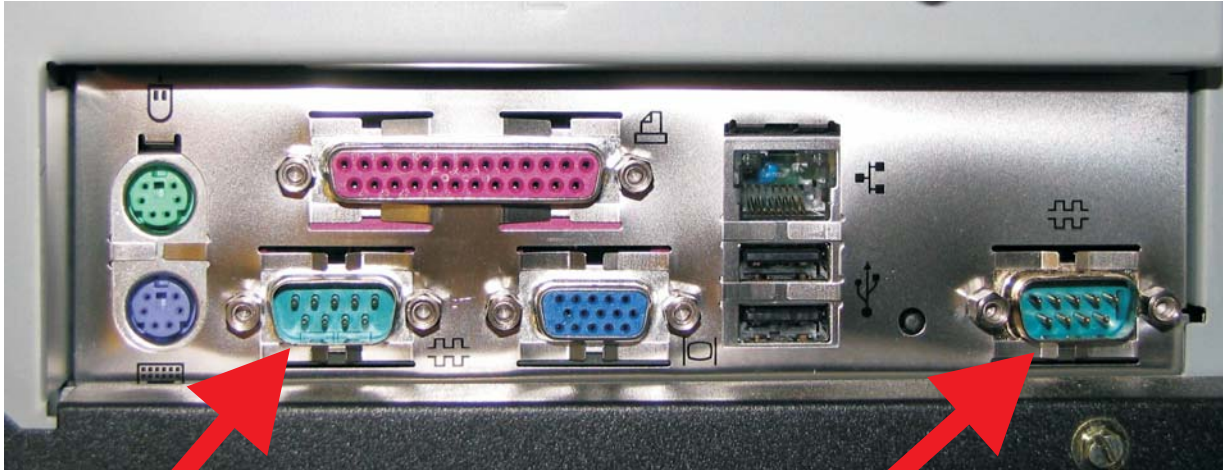
Problems with the external modem

- "Quick physical checks" on page 34
- "None of the indicators light" on page 34
- "Configuration test problems" on page 34
- "Verifying the Serial port is enabled in the BIOS" on page 35

- “The modem will not answer” on page 35

Quick physical checks

1. Serial cable is connected to the modem and serial port #1 on the RSM for Storage system.



Serial Port #1 (to modem)

Serial Port #2 (not used)

2. Phone line:
 - Modem is connected to an analog phone line.
 - Phone cable is inserted in the LINE connector on the modem.
3. Modem powers on. See next section.

None of the indicators light

When you turn on the modem, the LED indicators on the front panel should flash briefly as the modem runs a self-test. If the LEDs remain off, the modem is probably not receiving power. Make sure the modem’s power switch is on.

If your modem has a separate power supply, make sure the power supply is firmly connected to the modem and the power supply’s power cord is firmly connected to both to the power supply and the wall outlet or power strip.

If your modem is on, try moving the power code to a different outlet. Test that the outlet is live by plugging another device, such as a lamp, into it.

The modem or power supply may be defective. If you have another, try swapping modems. If the problem goes away, the first modem or power supply might be defective. Call the modem manufacturer’s technical support for assistance.

Configuration test problems

If the modem is not detected when the Configuration Test is run, the modem phone number on the “Connections” configuration page will be flagged with a double asterisk. The Activity Log will also contain an error message related to the modem.

If no problem is indicated, the system is able to communicate with the modem.

Possible causes of a configuration test error

1. The serial port is disabled in the BIOS (see procedure in the next section).
2. The serial cable is plugged into the wrong serial port (see previous section).
3. Try resetting your modem by turning it off and on.
4. If the modem is on, the cable is plugged into the correct port, the fault might be in the serial cable.
 - Make sure it is firmly connected at both ends.
 - If this the first time you have used the cable, it may be damaged.
 - Check the cable description on the packaging to make sure the cable is the right one for your computer.
5. The serial port might be defective.
6. The modem might have a problem beyond the scope of the user guide. If another modem is available, try swapping modems. If the problem goes away, have customer call Multi-Tech Technical Support for assistance (see the Multi-Tech documentation for contact information).

Verifying the Serial port is enabled in the BIOS

1. Press F1 when prompted after rebooting the server.
2. When the Setup menu appears, select Devices and I/O ports.



3. Verify that Serial Port A is not disabled.
If it is, set it to auto configure or Port 3F8. Press Esc to return to the main menu.
4. Save the changes and exit Setup.

The modem will not answer

If the configuration Test passes, but the modem will not answer, make sure that Remote Access is enabled in the RSM for Storage application. This will enable the modem to answer when called.

Verify modem connectivity by calling the modem phone number from a voice phone. If there is no indication that a call is being received:

- Plug the phone cable into a voice phone and verify that a dial tone is present.
- If a dial tone is present, dial the number again and verify that the phone you just connected rings.

- Reconnect the phone cord to the modem connector labeled line #1.

Check the instructions that came with the modem and review any troubleshooting information.

Problems with operation of the Remote Support Manager

Configuration problems and various other issues can occur during operation of RSM for Storage. The following sections provide details for troubleshooting these problems.

Configuration problems

Most configuration problems will be detected when the information is entered or when the **Test Configuration** option is selected. The Configuration Test will verify that all of the configured devices and the SMTP e-mail server can be reached via the Ethernet interface.

Correct any Configuration Incomplete errors and then Run the Configuration Test (on the System Configuration page).

If any problems are indicated, review the RSM for Storage Activity Log. To open the Activity Log, go to the RSM for Storage system desktop and click the Activity Log icon.

You can also open the Activity Log by selecting View Statistics and Logs from the Main Menu.

Other problems

The following section provides details for troubleshooting and resolving some of the miscellaneous issues that can occur during operation of RSM for Storage.

Icons for RSM for Storage on the desktop are missing or do not work

The most likely cause is that the Gnome desktop was selected instead of KDE during the installation of the Operating System.

1. Log out.
2. On the login screen for the desktop, click **Session**, if KDE is listed as a choice select it and log in as root.
3. If not, as the root user, use YaST to install the software for the KDE desktop.
4. Re-install the RSM for Storage software. (Your configuration files will not be affected).
5. Log in as "lservice", wait about 15 seconds for KDE to initialize the desktop, then open a console by clicking the shell icon.

The desktop icons will be configured for RSM for Storage.

6. Log out, and then log in as "admin". Open a console window and the desktop icons will be configured for RSM for Storage.

Events for a subsystem are not reported by RSM for Storage

The RSM for Storage application relies on your existing IBM Storage Manager application to detect problems in your storage subsystem and report them to the RSM for Storage system as SNMP traps. To resolve this problem, do the following:

1. Verify that the IP address of the RSM for Storage system is correctly specified as a destination for SNMP traps in Storage manager. (See page 16 in the installation section). Use the **Validate** button on the SNMP configuration window

in Storage Manager to send a test trap to the RSM for Storage system. Receipt of the trap can be verified in the RSM for Storage Activity Log.

2. It is possible to configure IBM Storage Manager to report events for all subsystem or individual subsystems. It is also possible to reach the Configure Alerts dialogs from either the Task Assistant or from the Edit menu in the Enterprise Window. If alerts were configured starting from the Edit menu in the Enterprise Management window, then alerts may have been configured for the storage subsystem highlighted in the Enterprise Management window. Use the Task Assistant as described on page 16 in the installation section) to configure alerts for all subsystems.

3. If events are reported sometimes, but not at others, IBM Storage Manger's Event Monitor may not be running on the management station.

The Event Monitor is an installation option for Storage Manager that monitors subsystems for problems when the Storage Manager client is not running. You must reinstall IBM Storage Manger to activate the Event Monitor.

There is no special configuration for the Event Monitor. Configuring SNMP traps in the Storage Manager client also configures the Event Monitor.

RSM does not indicate a problem that appears in Storage Manager

Storage Manager may not be configured to send SNMP traps to the RSM for Storage system. There are two ways to enter the alert configuration menus in Storage Manager:

- If you select Configure Alerts from the Enterprise Management windows and have a subsystem highlighted, your configuration will apply only to that subsystem.
- If you start from the Task Assistant, you will be given the option of configuring alerts for All Storage Subsystems or an Individual Storage Subsystem.

Reporting for the subsystem may have been disabled in the RSM for Storage system.

The event may be one that the RSM for Storage system ignores because it is a problem that usually does not require a response by IBM Service.

Multiple e-mails about the same problem

Storage Manager can be configured to send e-mail notifications when a problem is detected. When RSM for Storage is installed, e-mail alerts in Storage Manager should be disabled.

To disable e-mail alerts in Storage Manager, do the following:

1. Select **Configure Alerts in Storage Manager's Task Assistant** and select **All Storage Subsystems**.
2. On the E-mail Tab, delete any configured e-mail destinations.

Email notifications from the RSM for Storage have a subject of "RSM for Storage..."

Email notifications from Storage Manager usually have a subject of "Critical Alert for..."

A problem detected by the RSM for Storage application, but no e-mail was about it and the status of the alert is "Queued"

The RSM for Storage system could not ping the SMTP server when it tried to send an alert to IBM Service. The alert to IBM is retried every five minutes. Customer notifications are not retired.

E-mail received that said the event was ignored and not sent to IBM Service

Some events that do not normally require a response by IBM Service are ignored by the RSM for Storage system. The customer is notified when this situation occurs. See Appendix C, "Filtered events," on page 45 for more information.

After an earlier problem was resolved, the RSM stopped sending alerts to IBM

The RSM for Storage system only sends a single alert to IBM for each problem. Reporting will not resume until all active alerts for a subsystem are closed.

Note: The daily status e-mail will include this information.

I/O error message in IBM Storage Manager when trying to validate SNMP trap configuration

If you have an internal firewall installed on the management station running Storage Manager, make sure it allows access to the RSM for Storage system.

Appendix B. Planning worksheets

The installation and configuration of RSM for Storage requires a variety of information about network setup, contacts, and connections. The worksheets provided in this appendix will help you gather this information so that you can successfully install and configure RSM for Storage.

Worksheet #1: Network setup information for the RSM for Storage server

This information will be used during the installation of the Linux OS. (Check with your network administrator to obtain this information)

Hostname for the server _____ (ibmrsm is suggested)

Your company's Domain Name _____

It is recommend that you use static IP addresses for all network resources and management systems.

The server that the RSM for Storage application is installed on must have a static IP address.

IP address to be assigned to the server _____._____._____. ____

Subnet Mask for the server: _____._____._____. ____

Gateway IP address: _____._____._____. ____

If a second Ethernet connection is required to reach the Internet and your SMTP server:

Subnet Mask for the second _____._____._____. ____

IP address of your Domain Name Server _____._____._____. ____

Worksheet #2: Company information

Company Name _____

Address #1 _____

Address #2 _____

Worksheet #3: Connection information for the RSM for Storage system

This information will be used to configure connections to the RSM for Storage system.

IP address of your company's e-mail (SMTP) server _____

Location of the server _____ (building, floor, city, state)

Country or region server is in _____

Phone number of the modem _____

Is the modem supplied by IBM (YES | NO)

Worksheet #4: Contact people

Contact person for RSM for Storage

This is the person that will receive status e-mail from the Remote Support Manager and will be the default contact for subsystems monitored by the Remote Support Manager:

Name _____
E-mail address _____
Primary phone number _____
Hours to call primary number _____
Alternate phone number _____
Hours to call alternate number _____
Time zone _____

Other contact people may be configured and associated with specific storage subsystems. These contacts will only receive e-mail directly related to those storage subsystems. This is useful if a single Remote Support Manager installation is monitoring subsystem in different locations.

Note: You can configure up to 20 contact people in the RSM for Storage product.

Contact #__

Name _____
E-mail address _____
Primary phone number _____
Hours to call primary number _____
Alternate phone number _____
Hours to call alternate number _____
Time zone _____

Contact #__

Name _____
E-mail address _____
Primary phone number _____
Hours to call primary number _____
Alternate phone number _____
Hours to call alternate number _____
Time zone _____

Contact #__

Name _____
E-mail address _____
Primary phone number _____
Hours to call primary number _____
Alternate phone number _____
Hours to call alternate number _____
Time zone _____

Worksheet #5: Information for each Storage Subsystem to be monitored

Storage subsystem #__

Storage subsystem name _____

IP address of controller #1 _____

IP address of controller #2 _____ (if present)

Location of subsystem _____ (building, floor, city, state)

Country subsystem is in. _____

Contact Person for this subsystem _____

IBM Machine Type and model _____ (8 characters: TTTT-MMM)

IBM Serial Number _____ (7 characters)

Storage subsystem #__

Storage subsystem name _____

IP address of controller #1 _____

IP address of controller #2 _____ (if present)

Location of subsystem _____ (building, floor, city, state)

Country subsystem is in. _____

Contact Person for this subsystem _____

IBM Machine Type and model _____ (8 characters: TTTT-MMM)

IBM Serial Number _____ (7 characters)

Storage subsystem #__

Storage subsystem name _____

IP address of controller #1 _____

IP address of controller #2 _____ (if present)

Location of subsystem _____ (building, floor, city, state)

Country subsystem is in. _____

Contact Person for this subsystem _____

IBM Machine Type and model _____ (8 characters: TTTT-MMM)

IBM Serial Number _____ (7 characters)

Worksheet #6: Information for other SAN devices to be accessible from the RSM for Storage system

Gather the following information for the SAN devices to be accessible from the RSM for Storage system.

Note: You can configure up to 10 SAN devices.

__

Name _____

IP Address _____

#__

Name _____

IP Address _____

#__

Name _____

IP Address _____

#__

Name _____

IP Address _____

#__

Name _____

IP Address _____

Appendix C. Filtered events

The following events are not reported to IBM Service. However, you will receive an e-mail from the RSM for Storage system when these events occur.

Table 3. Filtered events

Event code	Event text
6200	FlashCopy [®] repository logical drive capacity - threshold.
6202	FlashCopy logical drive failed.
none	The persistent monitor running on Host xxxxxxx cannot reach the indicated Storage Subsystem.
none	The persistent monitor running on Host xxxxxxx can now reach the indicated Storage Subsystem.
4011	Logical Drive not on preferred path due to ADT/RDAC.

Appendix D. Customizing the firewall

The file `/etc/rsm/rsm-firewall.conf` provides a way to allow access to specific IP addresses from the RSM for Storage system.

IP addresses listed in this file, will always be accessible to all local and remote users of the RSM for Storage system. Include one address on each line of the file as shown below:

```
ADDRESS ip_address
```

OR

```
ADDRESS ip_address/netmask
```

After changing the `rsm-firewall.conf` file, you need to stop and restart the RSM for Storage application. Enter `rsm-stop` followed by `rsm-start`.

Note: Any active alerts will be lost when the `RSM-stop` command is run, so this update should be performed when there are no active alerts.

A second firewall configuration file is used to list IP addresses for IBM's external Web and FTP sites. This file is contained in the `/etc/rsm` directory and is named `rsm-firewall-ibm.conf`. Files in this directory cannot be modified by the Local Service user or the remote IBM user.

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IBM Remote Support Manager for Storage
Planning, Installation and User's Guide

Publication No. GC26-7933-00

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Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to your tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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