

ADIC Management Console™ User's Guide

ADVANCED DIGITAL INFORMATION CORPORATION

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A Glossary

About This Guide and Your Product

This guide contains information and instructions necessary for the normal operation and management of the ADIC Management Console. This guide is intended for system administrators, operators, or anyone interested in learning about or using the ADIC Management Console. Be aware that administrator level privileges are required to configure many of the features described in this guide.

Explanation of Symbols and Notes

The following symbols appear throughout this document to highlight important information.



WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR BODILY INJURY.



CAUTION

Indicates a situation that may cause possible damage to equipment, loss of data, or interference with other equipment.



Note

Indicates important information that helps you make better use of your system.

Other Documents you Might Need

The following documents are also available for this product. These documents can be found on the product CD or at www.adic.com/manuals:

- *SNC Firmware 4 Reference Guide* (Document 6-00676-xx)
- *The User's Guide* for the SNC in your Scalar[®] library
- *The User's Guide or Installation and Operation Guide* for your Scalar library



Note

Release Notes are also available for this product. The Release Notes describe changes to your system or firmware since the last release, provide compatibility information, and discuss any known issues and workarounds. The Release Notes can be found in the product box or at www.adic.com/manuals.

Getting More Information or Help

More information about this product is available on the Customer Service Center website at www.adic.com/csc. The Customer Service Center contains a collection of information, including answers to frequently asked questions (FAQs). You can also access software, firmware, and drivers through this site.

For further assistance, or if training is desired, contact ADIC:

In the USA: 800-827-3822

In Europe and Japan: 00-800-9999-3822

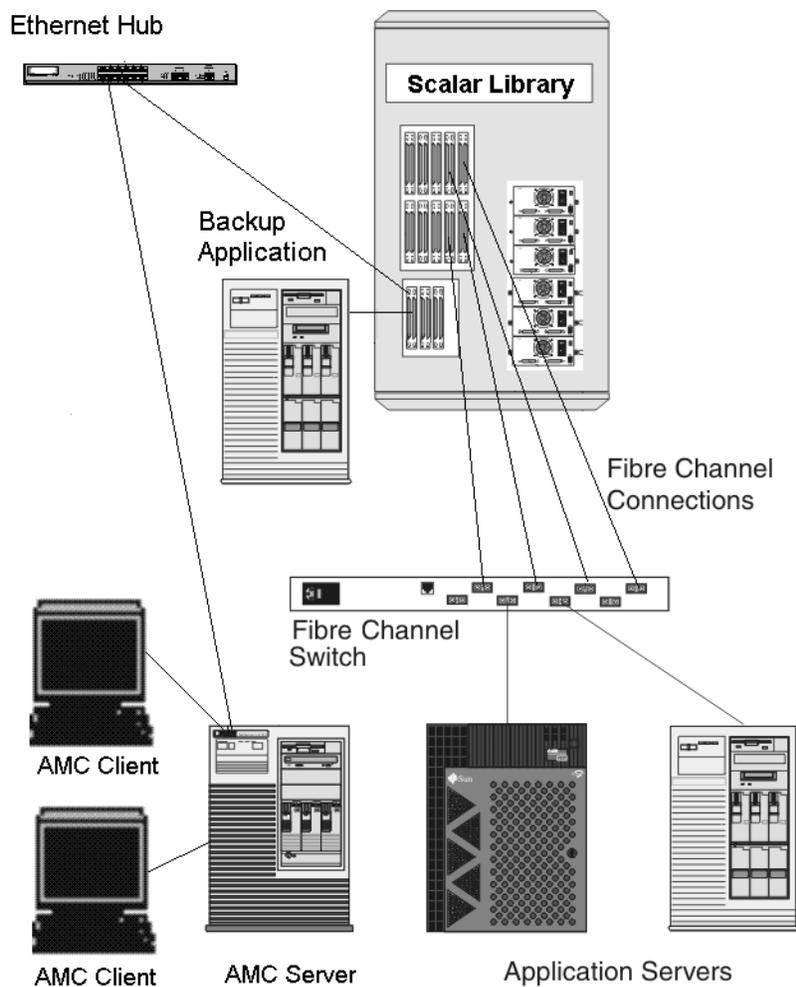
For additional contact information: www.adic.com/contact

To open a Service Request: www.adic.com/techsup

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Description

This chapter describes AMC (the ADIC Management Console). AMC is a fully-featured management tool for storage-area networks (SANs) with storage networking controller (SNC) or management control blade (MCB) connectivity. A SAN is a network linking servers or workstations to disk arrays, tape backup systems, switches, bridges, and other devices, over high-speed transports such as Fibre Channel or gigabit Ethernet. SANs keep storage traffic away from network traffic without compromising rapid access to stored data.



AMC provides several levels of access permissions and the ability to customize views and portals. By keeping track of different client views, you can recall a saved view from any client. The server provides security features by maintaining account names and passwords on behalf of the client application. AMC also provides functionality to support server-less backup, tools for LUN mapping, and easy channel zoning.

ADIC Management Console Functionality

AMC uses a three-tier client/server model. The three parts are: agent, server, and client. The agent communicates with the server and other managed agents via both Simple Network Management Protocol (SNMP) and SCSI over IP (SOIP) protocols. The server communicates with the agent as well as with the client or clients.

The Java Remote Method Invocation (RMI) API is used to communicate from the client to the server. You can install one or more instances of the server onto systems in the SAN running any of the UNIX or Windows platform software that are remote from MCBs or SNCs. Do not install more than one server per client system.

Using the SAN Client

The SAN client for the Scalar series of libraries is the AMC. Using AMC is an easy way to manage Scalar libraries as part of a SAN solution. When you choose to install both server and client from the product CD—this is called the **Full** installation—the default client is the AMC SAN client. The default AMC client consists of a Java-based user interface window and a trap event window. You can install one or more instances of the AMC client in your SAN.

Using a Library Management Client

If your SAN includes a library in the intelligent platform (i-platform) series—for example a Scalar i2000 or a Pathlight VX—you can launch a library management client from the AMC SAN interface. The library management client launched in this way is identical to the interface that runs on the library's touch screen.

ADIC Management Console Features

AMC provides status and controls for library and SNC features. The following features define AMC's management capabilities:

Event Logging

You can retrieve and view event logs. Filtering based upon the significance of events simplifies fault isolation. For more information, refer to [Monitoring and Managing Event Logs](#) on page 93 and [Configuring Policies](#) on page 58.

Reports

You can print or save reports that you have configured to meet your reporting requirements. For more information, refer to [Reporting the Current View](#) on page 55.

Heartbeat

AMC monitors system components to ensure continuity of service. If an SNC or MCB is no longer available, the server component notifies monitoring clients. For more information, refer to [Checking the Heartbeat](#) on page 103.

Health Checks

Instantaneous and periodic health checks allow monitoring of each appliance and the devices attached to it. For more information, refer to [Using Health Check](#) on page 102.

Channel Zoning

Channel zoning is a means of managing the access security between SAN connections and SCSI or FC devices on a channel by channel basis.

- Channel zoning can be used to secure access between a server and its storage, segregating them, for example, from other servers and their respective storage.
- The default settings allow all SAN connections to access all SCSI or FC devices.

Data Mover

The SNC can move data directly between storage devices that are attached to it. Data Mover frees-up valuable system resources on the server and substantially increases the speed of backup and restore operations.

Data Mover is the engine for server-free backup and restore and hierarchical storage management applications that support the extended copy specification (ANSI T10/99-143r1).

Scalar[®] Firewall Manager / Virtual Private SAN[®]

Scalar[®] Firewall Manager (SFM) and Virtual Private SAN[®] (VPS) technology enable SANs with multiple users to share the same connectivity channels in order to access the same or different storage elements by creating multiple virtual private connections.

SFM and VPS manage the access between an initiator (user, host, system) and a target/logical unit number (LUN).

extended VPS[®]

The extended Virtual Private SAN[®] (eVPS) functionality enables access control and mapping of FC and SCSI devices and provides the flexibility to map the attached devices to any user-defined LUN separately and individually for each Fibre Channel attached host. Because eVPS is backwardly compatible, current users of VPS and SFM can preserve current mappings when their licenses are upgraded.

Virtual Private Map

Virtual Private Map (VPM) technology enables legacy and new systems equipped with SCSI host bus adapters to access Fibre Channel devices. VPM allows Fibre Channel and SCSI target devices to be mapped to private SCSI host channels.

SNMP

SNMP (Simple Network Management Protocol) community strings are a part of the software agent's messaging functionality that serve to group network devices into logical collections for management purposes. The community strings on the server must match those on the appliance(s) you wish to manage.

Three strings are defined:

- Read— for querying the appliance
- Write—for controlling the appliance
- Trap—for receiving event messages from the appliance

The appliance can maintain 32 read and 32 write community strings and one trap community string.

A set of commands is provided for manipulating the Read and Write SNMP community strings. These strings logically group devices into management communities.

Library RMU Support

Data obtained from a Scalar library's RMU (remote management unit) includes global status data, drive data, and mover data. These data are displayed in the AMC data panel. RMU data can also be displayed from a library's right-click menu.

Security

Four levels of user privilege are defined, each with specific capabilities. For more information, refer to [Table 2](#) on page 40.

Network Discovery

Network discovery allows you to locate any appliance based on network addresses and ranges. This allows management of an appliance without knowing the specific Internet Protocol (IP) address beforehand.

Configuration Options

You can set up an appliance with a number of non-default parameters, channel settings, and event management variables. For more information, refer to [Performing Administrative Tasks](#) on page 57, and [Configuring SAN Access](#) on page 75.

Updating Firmware

You can update appliance and device firmware from the client. For more information, refer to [Updating Firmware](#) on page 64.

Obtaining Drive Dumps

You can download and save the drive's transaction and error logs. Sometimes this information is requested by service personnel for analysis. For more information, refer to [Obtaining a Drive Dump](#) on page 103.

Command Flow Logging

Logs of the SCSI commands processed by the SNC can be retrieved for analysis by service personnel. For more information, refer to [Checking the Command Flow Log](#) on page 104.

3

Getting Started

The AMC server communicates over Ethernet to its clients. To manage a SAN, install an instance of the server onto any open-platform system that is connected via Ethernet to each SNC and each AMC client. You must install at least one instance of the server to manage your SAN with AMC. The AMC client can be launched from any connected system on which it is installed. For intelligent-platform libraries, a library management client can also be launched from the AMC SAN client.



Note

A client capable of managing the SAN cannot be launched from the library management client on an i-platform library.

Installation Requirements

Minimum configuration guidelines are presented for each system platform are presented below.

Server System Requirements

Java Runtime Environment 1.4.1 is installed with AMC. The version of the operating system you choose must support this level.

Windows

The installation requirements for Microsoft® Windows® 2000, Microsoft® Windows® XP, or Microsoft® Windows® 2003 are as follows:

- Windows 2000, Microsoft Windows XP, or Microsoft Windows 2003
- Minimum memory: 96MB
- Free hard disk space: 40MB
- Ethernet with TCP/IP protocol installed

AIX

The minimum installation requirements for AIX are as follows:

- AIX® 5.2
- 128 MB system memory
- 60 MB of free disk space on destination partition

HP-UX

The installation requirements for HP-UX are as follows.

- HP-UX™ 11.0 or later
- 80MB or greater system memory
- 60MB free disk space in the destination partition

Solaris

The installation requirements for Solaris are as follows.

- Solaris™ 2.7 or 2.8. The maintenance level must support JDK 1.4.1
- 80MB or greater system memory
- 60MB free disk space in the destination partition
- Common Desktop Environment (CDE)



Note

Limitations in the OpenWindows Desktop Environment inhibit drag and drop editing functions in AMC's **Device Mapping** and **VPM** dialog boxes. If you need to use either of these AMC features, you must use the CDE rather than the OpenWindows Desktop Environment.

Linux

The installation requirements for Red Hat Linux are as follows.

- Advanced Server 2.1 or Enterprise Server 3.0
- Minimum memory: 80 MB
- Free hard disk space: 60 MB
- Ethernet with TCP/IP protocol installed
- Video adapter board for graphical input

Client System Requirements

Windows

- Windows 2000, Microsoft Windows XP, or Microsoft Windows 2003
- Minimum memory: 96 MB
- Free hard disk space: 30 MB
- Ethernet with TCP/IP protocol installed

UNIX platforms

Follow the requirements for the appropriate server platform, above.

Before Installing AMC

AMC uses Ethernet to communicate. Your Ethernet network must be in place before AMC is installed.

**CAUTION**

Verify that you have enough space, about 100 MB, in the temporary directory to be able to complete the installation.

- 1 Obtain the network parameters for the client, the server, as well as any other Scalar libraries in the SAN.
 - Use static IP addresses.
 - If the Scalar libraries in the SAN are not on the same TCP/IP subnet as the server, assign a default network gateway address and/or route table entries.
- 2 Save this configuration information for future reference.
- 3 Run Ethernet cable from the server to the network hub or switch.
- 4 Run Ethernet cable from clients to the network hub.
- 5 Run Ethernet cable from the network hub to the Scalar libraries in the SAN.
- 6 Configure the network according to the procedures for the operating system you are using.

Installing the AMC Server

To manage your SAN, you must install an instance of the server onto a system that is connected by Ethernet to your ADIC storage products and the systems where the clients are running. This server cannot be identical to the server embedded in the i-platform libraries.

Installing the Server on a Windows System

Install the AMC server after you have completed the steps in [Before Installing AMC](#) on page 10.

- 1 Load the product CD.
- 2 Click the install link under the ADIC Management Console.
- 3 Click **OK**.

This starts the InstallAnywhere program, which prompts you throughout the installation.

- 4 When you are prompted to choose an installation set, select **Server Only** if you do not wish to run the AMC client on that host, or **Full** if you do.

**CAUTION**

AMC server version must match AMC client version. When the client and the server are different versions, they may not be able to communicate.

- 5 When you are asked to configure network discovery, be sure the network segment you define includes the SAN components you identified in [Step 2](#) of [Before Installing AMC](#) on page 10.
- 6 The email configuration portion of the installation requires the following information:
 - Network name of your mail server, for example, MyMailServer.
 - Valid email account for the specified SMTP server, for example, Joan.Dow
 - Valid password for this email account, for example, *u!nBe
 - Email address that you want mail recipients to see when AMC contacts them. This need not be an email address that has been previously validated by a working mail server, for example, AMCAAlert@MyCompany.com
- 7 Proceed to [Launching the AMC Server](#) on page 13.

Installing the Server on a UNIX System

Install the AMC server after you have completed the steps in [Before Installing AMC](#) on page 10.

- 1 Load the product CD.
- 2 Navigate to the ADIC Management Console folder.
- 3 Open the folder and copy the image file to a temporary folder on the host.



CAUTION

Verify that you have enough space, about 100 MB, in the temporary directory to be able to complete the installation. On Solaris systems, if the /tmp directory is not large enough for InstallAnywhere to operate, the installation fails, even if the temporary directory is resized later.

Set the IATEMPDIR environment variable to the name of a directory that is big enough. InstallAnywhere uses that directory instead of /tmp.

To set the variable for Bourne shell (sh), ksh, bash and zsh:

```
$IATEMPDIR=/your/free/space/directory $ export  
IATEMPDIR -
```

To set the variable for C shell (csh) and tcsh:

```
$ setenv IATEMPDIR /your/free/space/directory
```

- 4 From the temporary folder, type: `chmod 777 <filename>`, for example,

```
chmod 777 MC043SOL.bin
```

and press **Enter**.

- 5 If the temporary folder is NOT in the user's path, type `[space]./<filename>`, for example,

```
./MC043HPX.bin
```

and press **Enter**.

This launches the installation from the current directory.

If the temporary folder is in the user's path, simply type: `<filename>` (including extension), for example,

```
MC043LIN.bin
```

and press **Enter**.

This starts the InstallAnywhere program, which prompts you throughout the installation.

- 6 When you are prompted to choose an installation set, select **Server Only** if you do not wish to run the AMC client on that host, or **Full** if you do.



CAUTION

AMC server version must match AMC client version. When the client and the server are different versions, they may not be able to communicate.

- 7 When you are asked to configure network discovery, be sure the network segment you define includes the SAN components you identified in [Step 2](#) of [Before Installing AMC](#) on page 10.
- 8 The email configuration portion of the installation requires the following information:

- Network name of your mail server, for example, MyMailServer.
- Valid email account for the specified SMTP server, for example, Joan.Dow
- Valid password for this email account, for example, *u!nBe
- Email address that you want mail recipients to see when AMC contacts them. This need not be an email address that has been previously validated by a working mail server, for example, AMCAAlert@MyCompany.com

9 Proceed to [Launching the AMC Server](#) on page 13.

Launching the AMC Server

After you launch the server, be sure it completes network discovery before you launch the client. When a server has completed network discovery and is ready to receive connections, the message `Ready. Waiting for commands` is displayed above the prompt in the server window.

Launching a Windows Server

Launch the server at the beginning of your SAN Management session, but do not exit the server when you are finished. Leave the server running.

- 1 Select the **Start** button, point to **Programs**.
- 2 Point to **ADIC Management Console**. Then select **Server**.

If you installed the AMC server on a non-default path, launch it from that location instead.

Once you launch the server, a window opens on your monitor. You will know that network discovery has been completed when you see the message `Ready. Waiting for commands` followed by a command prompt.

If your configuration consists of many large or remote network segments, discovery can take several minutes to complete.



Note

Do not close the server window. Follow the exit procedure in [Shutting Down the AMC Server](#) on page 19 to shut the server down.

3 Proceed to [Launching the AMC Client](#) on page 15.

Launching a UNIX Server

Launch the server at the beginning of your SAN Management session, but do not exit the server when you are finished. Leave the server running.

- To launch the AMC server from a UNIX system, type `Server` from a terminal window, and press **Enter**.

```
Server <enter>
```



Note

Uppercase S is mandatory.

The server window is displayed.

If your configuration consists of many large or remote network segments, discovery can take several minutes to complete.



Note

Do not close the server window. Follow the exit procedure in [Shutting Down the AMC Server](#) on page 19 to shut the server down.

Proceed to [Launching the AMC Client](#) on page 15.

Installing the AMC Client

The AMC Client is used to manage your SAN.

Before Installing the Client

If you have already installed an instance of the client, and want to install another, or if you have already installed an instance of the AMC server using the **Server Only** installation option, proceed to either [Installing a Windows AMC Client](#) on page 14 or to [Installing a UNIX Client](#) on page 14.

If you have already installed an instance of AMC using the **Full** option, and do not want to install another client, proceed to [Launching the AMC Client](#) on page 15.

Otherwise, complete the sections [Before Installing AMC](#) on page 10 and [Installing the AMC Server](#) on page 11 before proceeding with the client installation.

Installing a Windows AMC Client

An AMC Windows client can run on Windows 2000 or Windows XP.

- 1 Load the product CD.
- 2 Click the install link under the ADIC Management Console.
- 3 Click **OK**.

This starts the InstallAnywhere program, which prompts you throughout the installation.

- 4 When you are prompted to choose an installation set, select **Client Only**.
- 5 Proceed to [Launching the AMC Client](#) on page 15.

Installing a UNIX Client

An AMC client can run over Solaris, Linux, HP-UX, or AIX.

- 1 Load the product CD.
- 2 Navigate to the ADIC Management Console folder.
- 3 Open the folder and copy the image file to a temporary folder on the host.



CAUTION

Verify that you have enough space, about 80 MB, in the temporary directory to be able to complete the installation. On Solaris systems, if the /tmp directory is not big enough for InstallAnywhere to operate, the installation fails, even if the temporary directory is resized later.

Set the IATEMPDIR environment variable to have the name of a directory which is big enough. Then InstallAnywhere will use that directory instead of /tmp.

To set the variable for Bourne shell (sh), ksh, bash and zsh:

```
$IATEMPDIR=/your/free/space/directory $ export
IATEMPDIR -
```

To set the variable for C shell (csh) and tcsh:

```
$ setenv IATEMPDIR /your/free/space/directory
```

- 4 From the temporary folder, type: `chmod 777 <filename>`, e.g.

```
chmod 777 MC043SOL.bin
```

- 5 If the temporary folder is NOT in the user's path, type `[space] ./<filename>`, e.g.

```
./MC043SOL.bin
```

This launches the installation from the current directory.

If the temporary folder is in the user's path, simply type: `<filename>` (including extension), e.g.

```
MC043SOL.bin
```

This starts the InstallAnywhere program, which prompts you throughout the installation.

- 6 When you are prompted to choose an installation set, select **Client Only**.
- 7 Proceed to [Launching the AMC Client](#) on page 15.

Launching the AMC Client

To manage your SAN, connect your client to an instance of the AMC server that is remote to the Scalar i2000 or Pathlight VX.



Note

When a remote server is ready to receive connections, the message `Ready. Waiting for commands` is displayed above the prompt in the server window.

Use one of the following procedures to start the client, depending on the operating system your client is running:

Launching a Windows Client

If you launch the client before the remote server has completed discovery, the client will not attach to the server.

- 1 If you accepted the defaults during the installation, select the **ADIC Management Console** program group on the **Start** menu to see the client icon. If you chose a program group other than the default, go there instead.

- 2 Select **Client** to launch the program.

When the client launches, both the **ADIC Management Console** window and a **Receive Event Traps** window appear. If event traps are issued, messages appear in the **Received Event Traps** window. You cannot close the **Received Event Traps** while the client is running but you can minimize it.

- 3 If the remote server is running on a system that is also remote to the client, the client window displays a prompt for you to connect to a server. Proceed to [Connecting to the Server](#) on page 16.

If the remote server is running on the same system as the client, connection to the server is automatic. The client window displays a logon prompt. Proceed to [Logging on](#) on page 17.



CAUTION

After the initial log in, set up another SAN administrator. Setting up a SAN administrator will disable the default admin logon name. Refer to [Adding a New User Account on page 41](#).

Launching a UNIX Client

If you launch the client before the remote server has completed discovery, the client will not attach to the server.

- 1 To start the HP-UX, AIX, Solaris, or Linux client, start a terminal window and type

```
Client <enter>
```

and press **Enter**.



Note

Uppercase C is mandatory.

When the client launches, both the **ADIC Management Console** window and a **Received Event Traps** window appear. If and when event traps are issued, messages appear in the **Received Event Traps** window. You cannot close the **Received Event Traps** while the client is running. You can minimize it.

- 2 If the server is running on a system that is remote to the client, the client window prompts you to connect to a server. Proceed to [Connecting to the Server](#) on page 16.

If the server is running on a system that is local to the client, connection to the server is automatic. The client window displays a logon prompt. Proceed to [Logging on](#) on page 17.

Connecting to the Server

If the client is local to the server, connection is automatic.

- 1 In the **Connect to Server** dialog box, type the network name or IP address of the remote server.



Note

If you type the IP address of an i-platform library, you will not be able to manage your SAN. The servers installed on i-platform libraries are used to manage library operations.

- 2 Select **OK**.



Note

If your client is already launched, you can display the dialog box by selecting the **Session** menu, and then selecting **Connect to Server**.

- 3 Proceed to [Logging on](#) on page 17.

Logging on

The **Log On** dialog box is displayed automatically when a new connection to the server has been established. It can also be displayed when you select **Session** and then select **Log On**. The **Logon** dialog box is also displayed when you select the **Log On** toolbar button.



In the **Logon** dialog box, type "admin" as the user name. Type "password" as password, if this is the first time you have logged on.



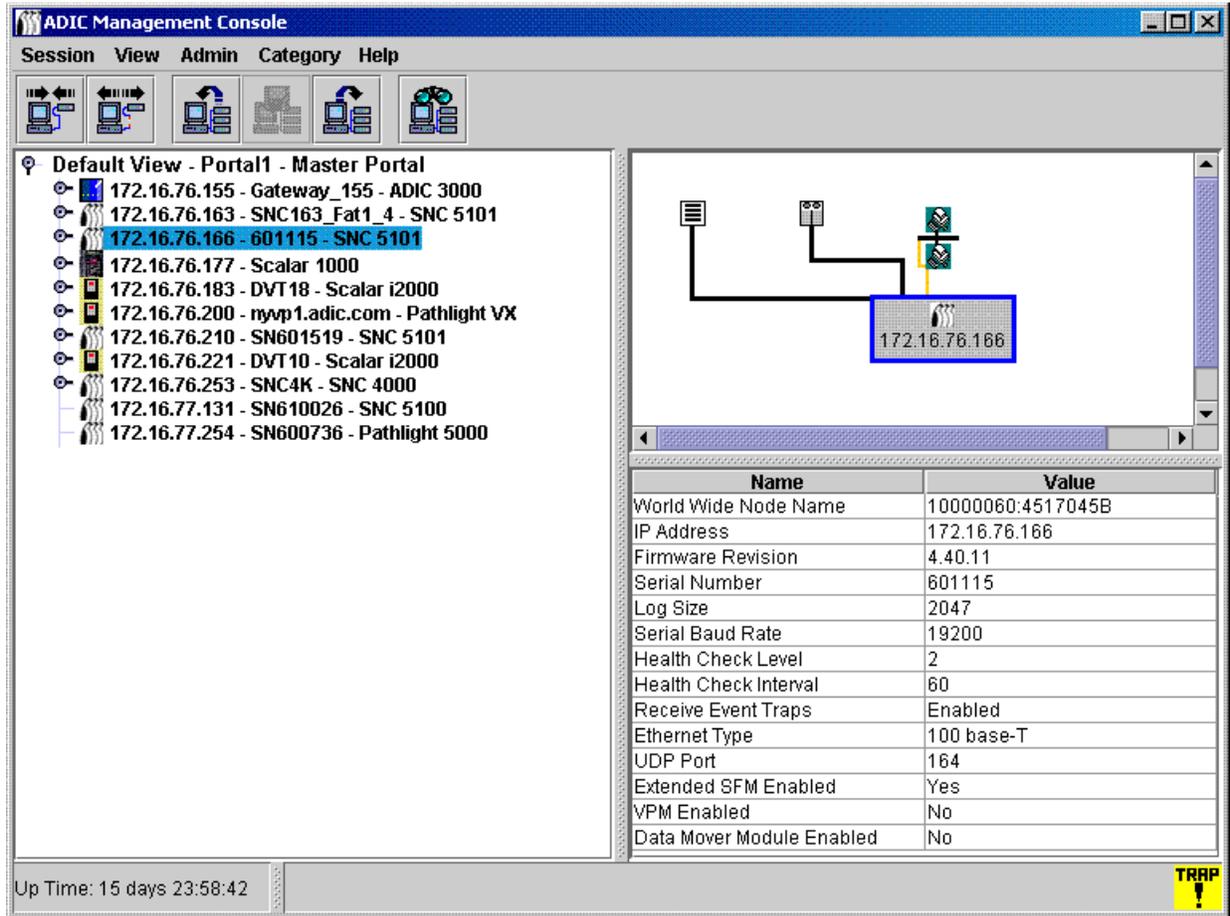
CAUTION

After the initial log in, set up another SAN administrator. Setting up a SAN administrator will disable the default admin logon name. Refer to [Adding a New User Account on page 41](#).

If you make an error logging on, the logon dialog box disappears and *Unsuccessful log on* appears in the **Status/Message Area** of the screen. Refer to [Status/Message Area](#) on page 35. Select **Session > Log On**, and re-type your logon information.

If your log on is successful, the client displays a status bar as it downloads master portal data. For more about the master portal and portals in general, refer to [Working with Portals](#) on page 43.

The default master portal consists of all the devices discovered, according to the discovery configuration file. When the download is complete, the AMC screen is filled with data. For information about this screen, refer to [Reading the SAN Management Information Panels](#) on page 26.



Logging off

Log off after you finish using AMC. You will not need to restart the client before your next management session.

- 1 Select the **Session** menu, then select **Log Off**.

A warning dialog box is displayed.

You can also launch the **Log Off** dialog box by selecting the **Log Off** toolbar button.



The warning dialog box is displayed.

- 2 Select **Yes** if you want to log off. If you select **Yes**, you are prompted to save your current view, if it has changed.

The **Save Current View** dialog box is displayed.

Select **No** if you have changed your mind. If you select **No**, you are returned to your view.

- 3 Select **Yes** if you have made changes to the view that you want to save.

Select **No** if you do not want to save changes.

Exiting the AMC Client

Exit stops the AMC client application and closes its window.

Use **Exit** if you want to restart the client application the next time you use AMC. Normally you will only log off, and leave the client running between sessions.

- 1 After logging off, select **Session > Exit**.

The **Exit** dialog box is displayed.

- 2 Select **Yes** if you want to exit. Your view is closed.

Select **No** if you have changed your mind.

If you select **No**, you are returned to your closed view.

Shutting Down the AMC Server

The way that the AMC server is shut down is the same for all platforms.



Note

You cannot shut down the server that is embedded in an i-platform library.

- 1 After you have logged off (refer to [Logging off](#) on page 18), and exited the client (refer to [Exiting the AMC Client](#) on page 19), position the cursor after the command prompt in the server window.

- 2 Type "exit", then press the **Enter** key.

The server window disappears.

4

Frequently Asked Questions

This section provides a reference of commonly asked questions and their answers.

What is a SAN?

A storage area network (SAN) links servers or workstations to disk arrays, tape backup systems, switches, bridges, and other devices, over high-speed transports such as Fibre Channel or gigabyte Ethernet.

What if I cannot see any SAN components after I install?

If you did not change the sample network segment statement (1.1.1.1 - 1.1.1.2) that appears in the **Configure Discovery Settings** screen of the installation wizard, SAN components will not be discovered.

Follow the instructions in [Discovering the SAN](#) on page 59 to modify the sample statement and to add statements that reflect your network environment. Add a separate statement for every subnet. Instructions are also given in this section for re-discovering the SAN.

What is the i-platform series?

The intelligent platform (i-platform) libraries all have integrated management services within intelligent storage devices designed specifically for operation in a storage network.

Can I manage a SAN from an i-platform library?

No. For libraries in the i-platform—such as the Scalar i2000 and Pathlight VX—AMC is available only from a remote client.

Do I have to install a server or client?

To manage the SAN you must install at least one instance of the AMC server and client on at least one remote system. Refer to [Before Installing AMC](#) on page 10. Do not install more than one instance of a server per client computer. You should upgrade both server and client when or if you upgrade, so that the server and the client communicate most effectively.

To manage a Scalar i2000 remotely (that is, not from the touch panel) you must install a SAN client.

Can I configure email even if I skip that step during installation?

Refer to [Configuring Email](#) on page 57.

How do I interpret interface components?

Refer to [Reading the SAN Management Information Panels](#) on page 26.

How do I create a SAN administrator account?

Refer to [Adding a New User Account on page 41](#).

What is a portal?

A portal is a collection of storage area networking devices that represent a particular user's universe. The SAN administrator's default portal is the entire set of SAN-capable appliances and associated storage on the subnet to which the AMC has access. This is called the master portal. Other users are granted privileges to subsets of the master portal by the SAN administrator.

How do I create user accounts?

Refer to [Creating, Modifying and Deleting User Accounts](#) on page 41.

How do I create portals for my users?

Refer to [Creating a New Portal](#) on page 43.

What privileges does each user type have?

Refer to [Table 2](#) on page 40.

How do I update firmware?

For the SNC and the devices connected to it, refer to [Updating Firmware](#) on page 64. For i-platform libraries, use the appropriate library management client.

How do I modify the discovery configuration?

Refer to [Discovering the SAN](#) on page 59.

How do I create policies?

For the SAN, refer to [Configuring Policies](#) on page 58. For i-platform libraries, use the appropriate library management client.

5

The SAN Management Interface

The AMC interface presents you with a number of menus and toolbar buttons.

Menus

AMC organizes user commands into a number of different menus:

- The **Session** menu consists of commands governing your current established connection: connecting to the server, logging off and on, changing your password, and exiting the program.
- The **View** menu consists of commands affecting the logical graphical representations of a portal: opening, saving, deleting, and creating views, as well as searching a view for a particular component, finding out which other users have access to the view, or printing view-based reports.
- The **Admin** menu consists of commands affecting SAN configuration, such as creating and managing users, portals, community strings, and policies.
- The **Category** menu consists of commands affecting categories—SAN components organized into logical groups.
- The **Help** menu provides access to online help, a statement of the server and client build numbers, and a copyright statement.

Toolbar

The toolbar consists of six buttons, representing commonly used commands that are also available on the menus.

- **Log On** launches the **Log On** dialog box. If there is a current user, confirmation must first be received that the current view will be closed.
- **Log Off** logs off the current user, after confirming the log off request.
- **Open View** launches a view browser, after confirming that the current view should be closed.
- **Save Current View** immediately saves the current view. This button is unavailable unless changes have been made to the view.
- **Close Current View** closes the current view after confirming the close view request. If changes have been made to the view, the user is prompted to save them first.
- **Find** displays a dialog box used to search for a specific SAN component.

Panels

The AMC interface consists of three information panels:

- The navigation panel presents you with a hierarchically organized representation of SAN components, using special graphical conventions as well as textual information to represent SAN structure
- The graphical panel presents you with a nontextual representation of your SAN, except for the text-bearing menus mapped to hotspots
- The data panel lists component, configuration, and build specifications for SAN components

Received Event Trap Window

Whenever AMC is running, a separate window showing the received event traps is always open. This window can be minimized, but not closed.

When the AMC SAN client is launched, a **Received Event Traps** window is displayed at the same time as the SAN Management window. If and when event traps are issued, messages appear in this window. You cannot close this window while the client is running, but you can minimize it. For more about traps, refer to [Monitoring and Managing Event Logs](#) on page 93.

Reading the SAN Management Information Panels

The AMC main screen is made up of three panels.

- The navigation panel lists SNCs and libraries with SNCs in IP address order. Detailed information about each configuration is coded into the display, both verbally and graphically.
- When an SNC or library has been selected in the navigation view, the graphical panel represents configuration information for that unit in a nonverbal format.
- When an SNC or library has been selected in the navigation view, the data panel presents status information about it in table format.

Navigation Panel

The left panel of the interactive display is called the navigation panel. In it, SAN components are hierarchically displayed.

SNCs and Scalar 24, 100, 1000, and 10K Libraries

The navigation panel string representing a standalone SNC, a Scalar 24, a Scalar 100, a Scalar 1000, or a Scalar 10K consists of three elements: the unit's IP address, its name, and its product family.

Click the node symbol at the left of a library's graphic to show aggregated Storage Networking Controllers (SNCs).



Note

An SNC is considered aggregated when it has been installed in a library, as opposed to performing as a standalone unit.

The node symbol is a toggle. Clicking it a second time collapses the expansion.

- Scalar 10K tape libraries contain multiple SNCs

- Scalar 1000 tape libraries contain three SNCs
- Scalar 100 tape libraries contain one SNC
- Scalar 24 tape libraries contain one SNC

SNC nodes expand to show channels. Channels expand to show attached hosts and devices. The node symbol for SNCs and channels also functions as a toggle. Clicking it a second time collapses the expansion. Refer to [Figure 1](#).

Figure 1 AMC representation of SNCs and system components

The screenshot displays the ADIC Management Console interface. On the left, a tree view shows the hierarchy of system components. The selected node is **172.16.76.215 - SN601193 - Pathlight 5000**. Below this node, several channels are listed, including SCSI Channels 1-4 and Fibre Channels 1-2. The right pane shows a graphical representation of the system components, with labels for 'medium changer', 'tape devices', 'SNC', and 'hosts'. The selected SNC node is highlighted with a blue box. Below the graphical view, a table provides detailed information about the selected node.

Name	Value
World Wide Node Name	10000060:451704A9
IP Address	172.16.76.215
Firmware Revision	4.40.13
Serial Number	601193
Log Size	2047
Serial Baud Rate	19200
Health Check Level	2
Health Check Interval	3
Receive Event Traps	Enabled
Ethernet Type	100 base-T
UDP Port	164
Extended VPS Enabled	Yes
VPM Enabled	Yes
Data Mover Module Enabled	Yes

Up Time: 12 days 17:55:50

[Figure 1](#) on page 27 shows a navigation panel with several navigation elements expanded. Because the SNC 5100 with IP address 172.16.76.215 is selected, it is shown in the navigation panel with blue highlighting. This SNC is aggregated into a Scalar 1000. For a list of symbols used in the graphical and navigation panels, see [Figure 2](#).

Figure 2 Symbols used in graphical and navigation panels

Symbol	Name
	Disk Device
	Tape Device
	Medium Changer
	SNC 4XXX, 5XXX, 6XXX
	SNC 3000
	Host
	Scalar Tape Library
	I-Platform Library
	Category

For a summary of channel mode graphics, see [Figure 3](#).

Figure 3 Channel mode graphics

Tree Panel Icon	Mode	Channel Type
Blue 	Target	SCSI High Voltage Differential
Green 	Initiator	SCSI High Voltage Differential
Blue 	Target	SCSI Low Voltage Differential
Green 	Initiator	SCSI Low Voltage Differential
Blue 	Target	Short Wave Fibre Optical
Green 	Initiator	Short Wave Fibre Optical
Purple 	Target/Initiator	Short Wave Fibre Optical

Target is the default mode for Fibre Channels. They are shown in blue. When channels are set to **Target**, you are able to see attached hosts. You must first be running the host registration software (HRS). Talk to your service representative about installing this software.

Green indicates that the channel is in **Initiator** mode. **Initiator** is the default mode for SCSI channels. When channels are set to **Initiator** you are able to see attached devices.

In addition to **Target** mode and **Initiator** mode, Fibre Channels can function in **Target and Initiator** mode. When that is the case, the Fibre Channel icon is purple.

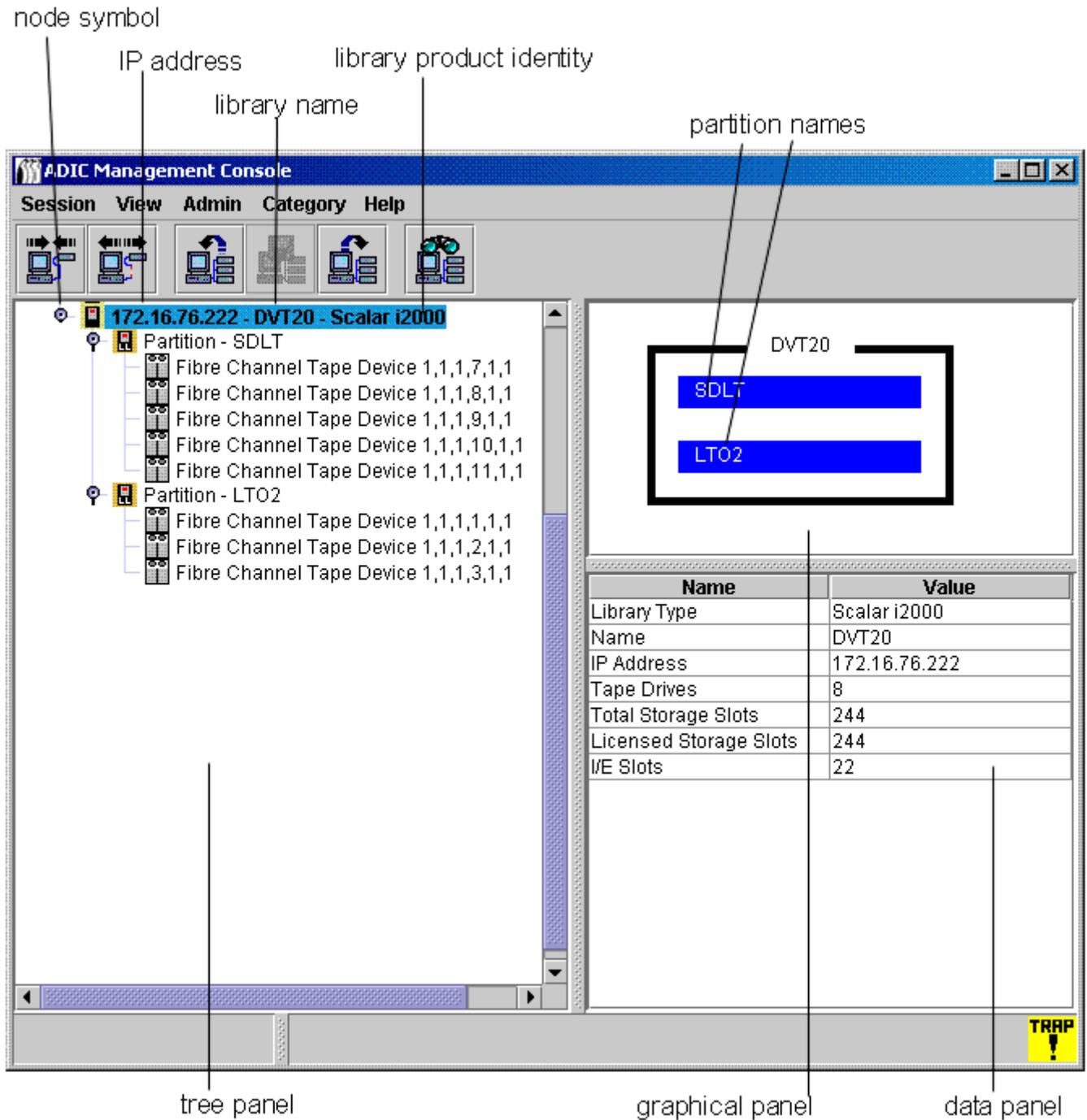
AMC displays both SCSI hosts and Fibre Channel hosts that are running HRS. Refer to the *User's Guide* for your SNC for information about installing HRS.

Right-clicking a selected Fibre Channel, a SCSI channel, a device, or the SNC in the navigation panel displays a command menu appropriate to the element you have right-clicked. To see these menus, refer to the following sections:

- [Getting Information About a Library](#) on page 65
- [Managing the SAN Appliance](#) on page 61
- [Managing the Fibre Channel](#) on page 69
- [Managing the SCSI Channel](#) on page 67
- [Managing a Device](#) on page 72

Refreshing data in the navigation panel causes the graphical and data panels to refresh as well.

Figure 4 AMC representation of the Scalar i2000



Scalar i2000

The navigation panel string representing the Scalar i2000 physical library consists of three elements: the IP address, the library's name (for example, **adclib**), and the library product identity (for example, **Scalar i2000**). Click the node symbol to the left of the library to show associated devices (drives) and partitions. All nodes have been expanded in [Figure 4](#). The node symbol is a toggle. Clicking it a second time collapses the expansion.

The Scalar i2000 library In [Figure 4](#) consists of a physical library divided into two partitions. In the line below the physical library line, the string representing the partition consists of two elements: the word **Partition** followed by the name of the partition. The partitions in [Figure 4](#) are named **SDLT** and **LTO**. The tape device strings consists of the phrase **SCSI Tape Device**, followed by the location coordinates for the drive. **Fibre Channel Tape Device** is also possible in this area. For an explanation of these features, refer to the *Scalar i2000 User's Guide*.

Figure 5 AMC representation of the Pathlight VX

node symbol

IP address

library name

library product identity

virtual library names

ADIC Management Console

Session View Admin Category Help

172.16.76.200 - nywp1.adic.com - Pathlight VX

Virtual Library - i2k

- i2k_DRIVE_001
- i2k_DRIVE_002
- i2k_DRIVE_003
- i2k_DRIVE_004

Virtual Library - s100

- s100_DRIVE_001
- s100_DRIVE_002
- s100_DRIVE_003
- s100_DRIVE_004

Virtual Library - s1k

- s1k_DRIVE_001
- s1k_DRIVE_002
- s1k_DRIVE_003

nywp1.adic.com

i2k

s100

s1k

Name	Value
Library Type	Pathlight VX
Name	nywp1.adic.com
IP Address	172.16.76.200
Total Virtual Libraries	3
Total Virtual Drives	11

tree panel

graphical panel

data panel

TRAP !

Pathlight VX

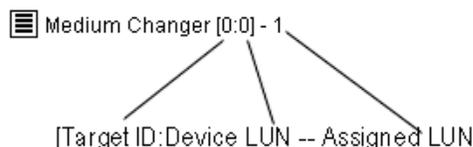
The navigation panel string representing the Pathlight VX is analogous to the string for the Scalar i2000. [Figure 5](#) shows the Pathlight VX as an expanded node. It consists of one virtual library named **nyvp1_lib1**. This virtual library consists of three drives. For more information about virtual libraries and drives, refer to the Pathlight VX online help.

Device Numbering

[Figure 1](#) on page 27 displays devices on different channels. The devices are all numbered according to a standard scheme. To interpret the numbering, refer to [Figure 6](#).

- The number before the colon inside the square brackets represents the target ID (or SCSI ID).
- The number after the colon inside the square brackets represents the device LUN (Logical Unit Number). This number is also sometimes referred to as the target LUN.
- The number after the dash is the assigned LUN. This number is also sometimes referred to as the internal LUN.

Figure 6 Device numbering conventions



SCSI channels provide target space for IDs 0-15. Device LUNs 0-31 are associated with each ID. The assigned LUN is the LUN the appliance assigns during discovery. The target ID and device LUN are physical concepts.

The Assigned LUN is a management concept and may be manipulated by the user to create private device maps. Refer to [Editing Device Maps](#) on page 73, [Using Scalar Firewall Manager \(SFM\)](#) on page 80, [Using eVPS](#) on page 84, or [Using VPM](#) on page 90.

Graphical Panel

On the right side of the screen, above the data panel, is a graphical representation of the networked configuration for the selected SNC. This is the graphical panel.

For standalone SNCs or for Scalar libraries that contain a storage networking appliance, selecting the SNC, a channel, a host, or a device in the navigation panel highlights in blue the associated symbol in the graphical panel. Unselected SCSI channels are drawn in black. See [Figure 1](#) on page 27. Unselected Fibre Channels are drawn in yellow.

Selecting an i-platform library also causes a display in the graphical panel. For example, a labeled black rectangle represents the physical library, inside of which an appropriate number of blue bars represents the associated number of partitions. A labeled black rectangle is also used to represent the Pathlight VX physical library, inside of which an appropriate number of blue bars represents the associated number of virtual libraries. See [Figure 4](#) on page 30 and [Figure 5](#) on page 31.

Right-clicking a selected Fibre Channel, a SCSI channel, a device, or the SNC in the graphical panel displays a command menu appropriate to the element you have right-clicked. To see these menus, refer to the following sections:

- [Getting Information About a Library](#) on page 65

- [Managing the SAN Appliance](#) on page 61
- [Managing the Fibre Channel](#) on page 69
- [Managing the SCSI Channel](#) on page 67
- [Managing a Device](#) on page 72

Data Panel

On the right side of the screen, below the graphical panel, is a tabular representation of selected status information. This is the data panel.

When a library is selected in the navigation panel, the following pieces of information, reported by the library's remote management unit (RMU), are displayed in the data panel:

Global Status	Current summary status of the library: unknown, ok, degraded, or failure
Last Global Status	Last summary status of the library: unknown, ok, degraded, or failure
SNMP Timeout	Refer to the documentation for the appropriate library
Agent Modifiers	Refer to the documentation for the appropriate library
Refresh rate	Refer to the documentation for the appropriate library
IP Address	A unique Internet Protocol Address
Host Name	Domain Name Server (DNS) host name of the RMU
RMU Version	Current firmware level of the library
Shutdown State	Current shutdown status of the library: other, unknown, normal, powerfail, errorreboot
Last Shutdown State	Last shutdown status of the library: other, unknown, normal, powerfail, errorreboot
Error Code	Integer value supplied for some Service Action Codes
Error Data	Parameter that adds precision to the Service Action Code
Service Action Code	Code used in diagnostics
Service Tag	Identification number of the original configuration

When an SNC is selected, the lower part of the data panel displays the following information:

World Wide Name	A globally unique node_name
IP Address	A unique Internet Protocol Address
Firmware Revision	A number in xx.xx.xx format indicating the level of firmware on the SNC
Serial Number	Number assigned to the SNC during manufacturing
Log Size	Size of the log file on the SNC

Serial Baud Rate	Speed of the HyperTerminal connection
Health Check Level	Level to which Health Check is set, 0-4
Health Check Interval	Interval between Health Checks, in minutes
Receive Event Traps	Status--either Enabled or Disabled
Ethernet Type	10-base T or 100-base T
UDP Port	User Datagram Protocol port where SNMP traps are received
VPS Enabled SFM Enabled	Yes (enabled) or No (disabled)
VPM Enabled	Yes (enabled) or No (disabled)
Data Mover Module Enabled	Yes (enabled) or No (disabled)

When a SCSI channel is selected, the lower part of the data panel display presents the following information:

Channel Type	Low Voltage or High Voltage, Single-Ended or Differential
Channel Mode	Target or Initiator
Host ID (if channel in initiator mode)	SCSI Bus Channel ID
Termination	Status--either Enabled or Disabled
Max Width	Bus width, in bits
Max Speed	Bus speed in megahertz
Status	Status--either Operational or Offline
Max IDs per Bus (if channel in initiator mode)	Number of SCSI IDs allowed
Max LUNs per ID (if channel in initiator mode)	Number of SCSI LUNs allowed

When a Fibre Channel is selected, the lower part of the data panel display presents the following information:

World Wide Port Name	Unique 64-bit identifier assigned to this port
World Wide Node Name	Unique 64-bit identifier assigned by the manufacturer
Serial Number	Number assigned to the FC connector during manufacturing
Media	Short Wave or Long Wave, Dual or Single PMC or GBIC type
Firmware Revision	FC controller firmware version
Port Type	Point-to-Point (N_Port), fabric loop (NL_Port), Fabric_Attached (N_Port), or none
Port Mode	Public or Private, Initiator or Target

Address Identifier	Arbitrated Loop_Physical Address (AL_PA) Address
Host Type	OS of attached Host
Loop ID	0-125
Frame Size	512, 1024, or 2048
Frame Buffer Size	Storage space, usually bigger than a single frame
Connection	Connection options for FC chips
Max Speed	1 GB or 2 GB
Status	Ready or Not Ready
Link Error Statistics	Header: Subsequent numbers are errors counted by SNC on full duplex channel between two network fabric connections
Link Failure Count	Counts used in diagnostics
Loss of Sync Count	Counts used in diagnostics
Loss of Signal Count	Counts used in diagnostics
Primitive Sequence Protocol Error Count	Transmission word containing special control information. A primitive sequence is recognized when three transmission words of the same value are received
Invalid Transmission Word Count	Transmission word is 40 bits, smallest information unit transmitted
Invalid CRC Count	Cyclic Redundancy Check, an error detection algorithm

When a device is selected, the lower part of the data panel display presents the following information:

Vendor ID	Vendor Name
Product ID	Product Name, assigned by Vendor
Revision	Vendor's release number
Serial Number	Number assigned to the device during manufacturing
Removable	Yes or No
Capacity	For Disk devices, Number of Blocks
Block Size	For Disk devices, Size of block
Width	For Tape devices, Bus width in bits
Speed	For Tape devices, Bus speed

Status/Message Area

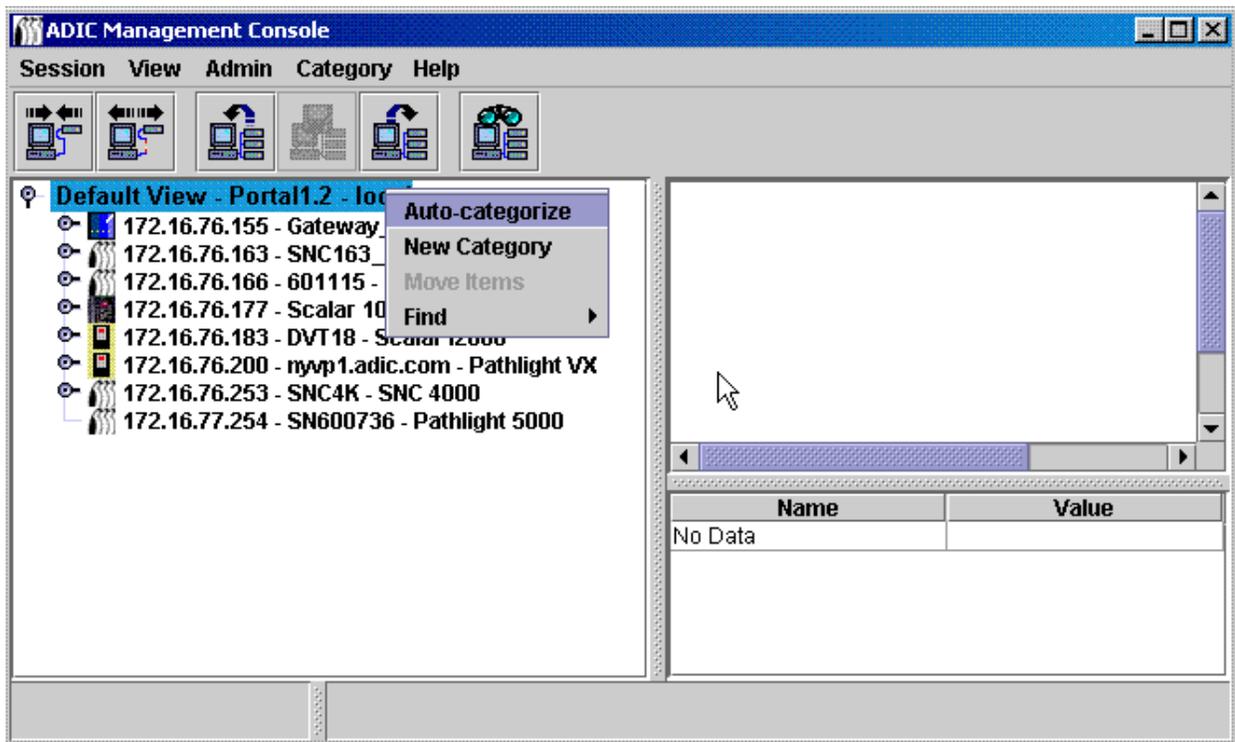
The area at the very bottom of the screen is used to display status messages. It is called the **Status/Message Area**.

In the leftmost corner of the **Status/Message Area**, the up time for the selected SNC is displayed. **Up Time** indicates how many hours, minutes and seconds have elapsed since the SNC was last booted.

Common SAN Management Options

When you select a view in the navigation panel, no topological representation is drawn. Right-click the view in the navigation panel for some of the most common SAN management operations. See [Figure 7](#).

Figure 7 Commands at navigation panel root view



The data panel displays no data. For more on the graphical panel and the data panel, refer to [Reading the SAN Management Information Panels](#) on page 26.

Auto-Categorize

Refer to [Auto-Categorizing the SAN](#) on page 47.

Creating a new Category

Refer to [Working With Category Components](#) on page 49.

Move Items

Refer to [Moving Items by Using the Menu](#) on page 51.

Find

Refer to [Working With Views](#) on page 51.

6

Managing User Accounts

AMC will enable you to create user accounts with the correct privilege levels for each user.

Changing the Administrator Password

SAN administrators must use this procedure to modify the SAN administrator password. To change a user's password, refer to [Modifying a User Account](#) on page 42.

Be certain to change the SAN administrator password periodically.



CAUTION

The default admin/password account is disabled after a new SAN Administrator account is created.

- 1 Log in as the SAN administrator.
- 2 Select the **Session** menu, then select **Change Password**.
The **Change Password** dialog box is displayed.
- 3 Type the old password in the first line.
- 4 Make a note of the new password.
- 5 Type the new password in the second line.
- 6 Confirm the new password by typing it again in the third line.
- 7 Select **OK** if you are satisfied with the new password.
Select **Cancel** to close the dialog box without making any changes.



Note

After using admin/password the first time you log on, create a new user at the SAN administrator level. Refer to [Creating, Modifying and Deleting User Accounts](#) on page 41.

Understanding User Privilege Levels

All AMC tasks are assigned to one or more of four specific user profiles:

- SAN administrator
- Portal administrator

- Power user
- Basic user

The basic user has the most limited set of user capabilities, including access and view only of assigned portals.

Power users have the basic user capability, as well as the ability to categorize assigned portals, save various views, and use all AMC tools—except Virtual Private Map (VPM)—to configure access. However, they cannot create, modify, or delete users, portals, or policies.

Portal administrators can carry out all basic user and power user tasks, as well as use all AMC configuration tools. They can also create, modify, or delete power users and basic users, and subportals of portals to which they have access. They cannot create policies. They cannot create users at the portal administrator or SAN administrator level. They cannot access the Master Portal.

SAN administrators can perform all tasks assigned to other users. They also have the ability to create policies and add users at the SAN administrator or portal administrator level. SAN administrators access the Master portal by default. [Table 2](#) on page 40 summarizes user capabilities based on privilege levels.

Table 2 User Capabilities Based on Privilege Level

Capability	SA ¹	PA ²	PU ³	BU ⁴
Access the master portal	Y	N	N	N
Create, modify or delete any SA or PA	Y	N	N	N
Create, modify or delete a portal or subportal to which user has access	Y	Y	N	N
Create, modify or delete a PU or BU	Y	Y	N	N
Grant user access to portals	Y	Y	N	N
Create, modify or delete any view for portals to which user has access	Y	Y	Y	N
Create views within portals to which the user has access	Y	Y	Y	Y
Delete view created by the user	Y	Y	Y	Y
Grant user access to views	Y	Y	Y	N
Configure, re-initialize, view, and suspend policies	Y	N	N	N
Create new categories, rename a category, delete a category, move items or move categories	Y	Y	Y	N
Configure channel zoning	Y	Y	Y	N
Configure SFM/eVPS	Y	Y	Y	N
Configure VPM	Y	Y	N	N
Enable Data Mover	Y	Y	Y	N
Map devices	Y	Y ⁵	Y ⁵	N
Configure Channels	Y	Y	Y	N
Upload configuration	Y	Y ⁵	Y ⁵	N
Upload firmware	Y	Y ⁵	Y ⁵	N

Table 2 User Capabilities Based on Privilege Level (Continued)

Restart the appliance	Y	Y ⁵	Y ⁵	N
Obtain CFL data	Y	Y	Y ⁵	N
Obtain drive dumps	Y	Y	Y ⁵	N
¹ SA=SAN administrator ² PA=portal administrator ³ PU=power user ⁴ BU=basic user ⁵ If the portal defined for the PA or PU includes only part of the appliance to be acted on, this privilege is assigned only to the SAN administrator.				

Creating, Modifying and Deleting User Accounts

All users who are not SAN administrators must be assigned privileges for one or more portals. Create the subportals before adding users. Refer to [Working with Portals](#) on page 43.

Adding a New User Account



CAUTION

After the initial log in, set up another SAN administrator. Setting up a SAN administrator disables the default admin logon name.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **User** menu, then select **New**.
- 3 The **New User Account** dialog box is displayed. Type a name for the new user account.
User names are case-sensitive.



Note

No two users can have the same user name.

- 4 Type the password after **Enter Password** and again after **Confirm Password**.
If you do not type the password the same way both times, a warning is displayed.
- 5 Assign a privilege level.
The choices are SAN administrator, portal administrator, power user, and basic user.
After you decide on the privilege level, use the radio buttons on the **New User Account** dialog box to assign it.
- 6 Once the **New User Account** dialog box is completed, select **Next**.
The **Grant Portal Access Permission** dialog box is displayed.
Select the checkboxes to check them and clear them until access is appropriately assigned.
Select **Back** to assign the new user to a different privilege level.
Select **Cancel** if you decide not to add a new user.
- 7 When access is appropriately assigned, select **Finish**.



Note

For user privileges associated with the different commands, refer to [Table 2](#) on page 40.

Modifying a User Account

SAN administrators and portal administrators use this procedure to modify another user's privileges. If you are changing your own password, go to [Changing the Administrator Password](#) on page 39.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **User**, then select **Modify**.
- 3 Select the name of the user whose privileges you want to modify in the **Modify User Account** grid.
- 4 Select **Next**.

The **Password** dialog box of the **Modify User Account** process is displayed. The privilege level radio button is defaulted automatically to the user's current type.
- 5 If you are changing the password, type the new user password, and then type it again to confirm. If not, proceed to [Step 6](#).
- 6 If you are changing the privilege level, select a radio button to assign a new privilege level to the user. When you have finished with this dialog box, select **Next**.
- 7 Select the checkbox in front of an available portal or subportal to allow user access.

To remove access to a portal, clear the check box by selecting an existing check mark.
- 8 When access is correctly assigned, select **Finish**.

Select the checkboxes to check and clear them until access is appropriately assigned.
Select **Back** if you decide to modify a different user account.
Select **Cancel** if you decide not to modify any user privileges.

Deleting a User Account

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **User**, then select **Delete**.
- 3 Select the name of the user account you would like to delete.
- 4 Select **Delete**.
- 5 The **Delete User Account** dialog box is refreshed.

The user name you have just deleted does not appear in the list.
- 6 Select **OK** to delete the user account.

Select **Cancel** to stop the deletion process.

7

Working with Portals

This section contains procedures for administering portals. Portals are physical collections of libraries and SAN appliances that are available to users, as defined by the SAN Administrator. The SAN Administrator has access to the entire set of appliances and libraries described as the master portal.

Creating a New Portal

Create portals to assign access to devices, channels, views, and subportals.

The master portal initially consists of all SAN components recognized when the server performs its initial discovery. Generally, SAN administrators retain access to the master portal and other users are granted access privileges to subsets of the master portal.

Logical collections are created as categories and saved as views. Refer to [Working with Categories and Views](#) on page 47.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **Portal**, then select **New**.
- 3 Select the portal you want to subdivide, and select **Next**.

The **New Portal** dialog box shows a hierarchy of portals existing on the server. Initially, no subportals of the default Master portal exist. After you have created some subportals, select whatever level of the hierarchy is appropriate for the new subportal you are creating.

After a few moments, the **New Portal** dialog box refreshes to show all the attached appliances that belong to the selected portal. The SNCs aggregated into libraries are displayed in this dialog box, but the Scalar libraries themselves are not displayed. I-platform libraries are displayed.

When the user that has been assigned to this portal logs in, the Scalar libraries associated with SNCs are displayed as a result of the network discovery process.

- 4 Expand the node in front of any IP address or channel to see associated devices.
To close the node, select it. Expanded nodes can exist in the same display as collapsed nodes.
- 5 Select the check boxes associated with items you want to include in the new portal.
Node check boxes are automatically filled in at the channel and appliance level when device check boxes are selected. Devices selected for a new portal are shown here.
- 6 Select **Next**. The **Portal Name** dialog box is displayed.
- 7 Type a name for the new portal. The name must be unique.
- 8 When you are satisfied with the name, select **Finish**.

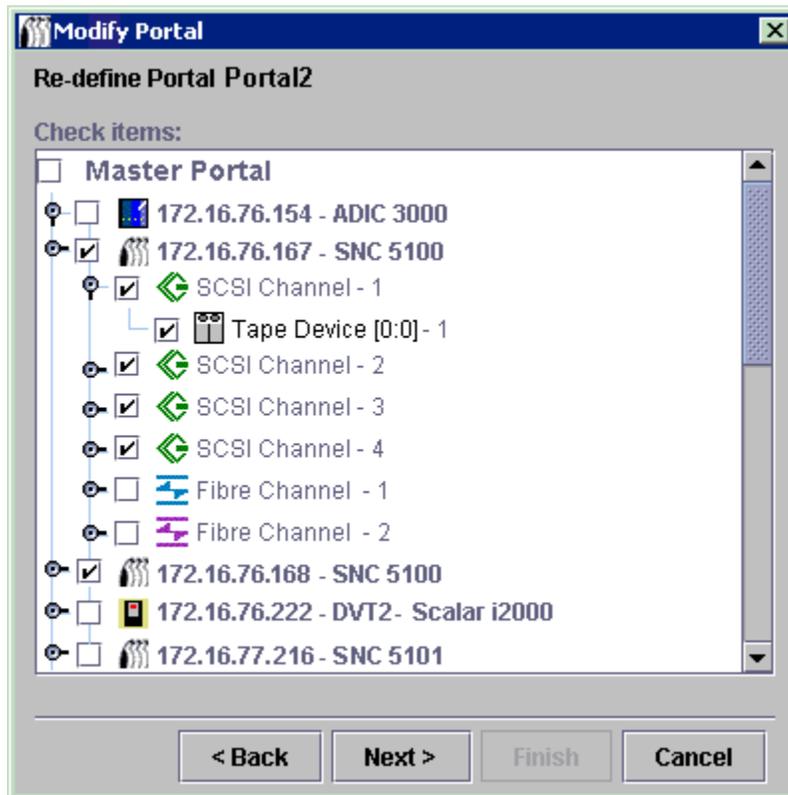
New portals appear as subportals in the parent portal list.

Modifying a Portal

 **Note** You cannot modify the master portal using this tool.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **Portal**, then select **Modify**.
- 3 Select the portal that you want to modify.
- 4 Select **Next**.
- 5 Check or clear the boxes in front of SAN appliances to appropriately modify the portal definition.

In the example, access to all the SCSI channels on 172.16.76.167 and all the channels on the appliance at 172.16.76.168 is indicated.



Devices attached to the Fibre Channels on 172.16.76.167 are not available.

- 6 When you are satisfied with the changes you have made, select **Finish**.
Portal successfully modified appears in the **Status/Message Area**.

Deleting a Portal

A portal can be deleted without loss to stored data. Deleting the only portal for a user will result in that user having no access to the SAN.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **Portal**, then select **Delete**.
- 3 Select the portal that you wish to delete. The **Delete** button becomes available.
- 4 Select **Delete**, and then select **OK**. The portal is deleted.

Setting Permissions for Portal Access

The SAN administrator can set permissions for all users. A portal administrator can set permissions for power users and basic users within the portal(s) to which the portal administrator is assigned.

- 1 Log on as SAN administrator or portal administrator.
- 2 Select the **Admin** menu, point to **Portal**, then select **Permissions**.
- 3 Select the portal for which you are assigning or revoking access.
- 4 Select **Next**.
A list is displayed that consists of all users with access privileges to the portal you selected.
- 5 Select the check boxes in the **Assign** column to grant or revoke access to the selected portal.
- 6 Select **Finish**.

8

Working with Categories and Views

SAN components can be organized into logical groupings to facilitate SAN management. When you categorize your SAN, you choose the categories—subnet, department, location, host type, etc. AMC uses the file folder icon to represent a category. See [Figure 2](#) on page 28 for more about icons used in the navigation panel.

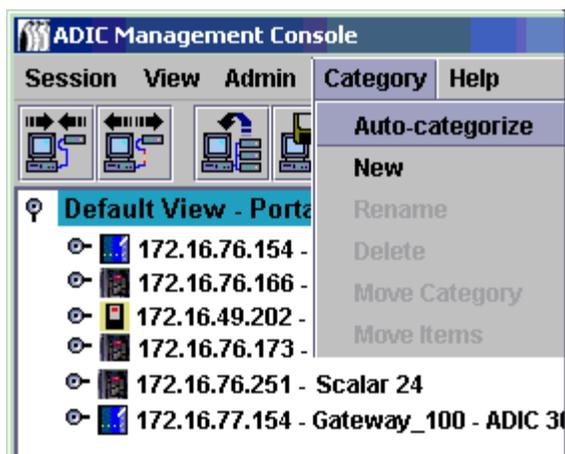
Working with SAN Categories

Creating categories of SAN appliances is an easy way to help you manage your SAN. Group appliances by subnet, host characteristics, similarities in connectivity, or other distinctive feature. You can categorize the portal in ways appropriate to different tasks or users, and then save each categorization as a view. You can provide specific users access to specific views.

Auto-Categorizing the SAN

Auto-categorizing automatically groups SAN components by subnet.

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the view that is at the root of your display.



- 3 Select the **Category** menu, select **Auto-categorize**.
A warning dialog box is displayed.

- 4 Select **Yes** if you want to proceed.
Otherwise, select **No**.
The navigation panel refreshes to include lines for the categories.
- 5 Save the categories as a view. Refer to [Saving Views](#) on page 54.

Creating a new Category

Categories are used to group SAN components visually in the navigation panel and the graphical panel.

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the view that is at the root of your display or the category you want to sub-categorize.
- 3 Select the **Category** menu, then select **New**.
- 4 In the **New Category** dialog box, type a name for the new category.
Select **OK**.
The window refreshes to include a line for the new category.
- 5 Drag and drop appliances into the new category folder icon.
For more information on dragging and dropping appliances, refer to [Working With Category Components](#) on page 49.
Sub-categorize an existing category by right-clicking an existing category and then selecting **New**. You can also use the **Category** menu. Refer to [Creating a new Category](#) on page 48.
- 6 Drag and drop items into the new category, as appropriate.
Refer also to [Working With Category Components](#) on page 49.
- 7 Save the categories as a view. Refer to [Saving Views](#) on page 54.

Renaming a Category

Categories can be renamed without loss of stored data.

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the category that you want to rename.
- 3 Right-click the category. Select **Rename**.
Or, having selected the category in the navigation panel, select the **Category** menu, then select **Rename**.
- 4 In the **Rename Category** dialog box, type a new name.
- 5 Select **OK**.
The window is refreshed and the new name is displayed.
- 6 Save the categories as a view. Refer to [Saving Views](#) on page 54.

Deleting a Category

Deleting a category does not delete stored data. If the category is not empty, move all its items to another category first. Refer to [Working With Category Components](#) on page 49.

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the category you want to delete.

- 3 Right-click the category. Select **Delete**.
- 4 Or, having selected the category in the navigation panel, select the **Category** menu, then select **Delete**.
The navigation panel window automatically refreshes.

Moving a Category

This section describes different ways to move categories. They are:

- Use drag and drop
- Use the **Move Categories** command

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the category that you want to move.
- 3 Drag and drop it into the correct category.

If you are moving the category to root, you can point anywhere on the root folder line.

If you are moving the category to nest inside another category, be sure the cursor is pointing inside the folder icon of the target category.

- 4 Save the categories as a view. Refer to [Saving Views](#) on page 54.

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the category that you want to move.
- 3 Select the **Category** menu, then select **Move Category**.

The **Move Category** dialog box is displayed.

After the caption **Source Category** at the top of the **Move Category** dialog box, the name of the category you selected to move in [Step 2](#) is displayed.

- 4 Select the category into which you want to move the category you selected in [Step 2](#).

The **OK** button becomes enabled.

- 5 Select **OK**.

The navigation panel refreshes to show appliances and categories at root level.

- 6 Select the node to the left of the new parent category to see the nested category.
- 7 Save the categories as a view. Refer to [Saving Views](#) on page 54.

Working With Category Components

This section describes different ways to move items into and out of categories. They are:

- Use drag and drop
- Use the **Move Items** command

Moving Items by Drag and Drop

- 1 Log on as SAN administrator, portal administrator, or power user.
- 2 Select the appliance that you want to move into a category.

In the example, the appliance at IP address 172.16.76.154 is selected.

The screenshot shows the ADIC Management Console interface. On the left, a tree view under 'Default View - Portal1 - Master Portal' lists several appliances, with '172.16.76.154 - ADIC Gateway' selected. The main area displays a network diagram with a central appliance icon. Below the diagram is a configuration table with the following data:

Name	Value
World Wide Node Name	10000060:451603B7
IP Address	172.16.76.154
Firmware Revision	3.43.06
Serial Number	00036
Log Size	2047
Serial Baud Rate	19200
Health Check Level	2
Health Check Interval	60
Receive Event Traps	Enabled
Ethernet Type	10 base-T
UDP Port	0

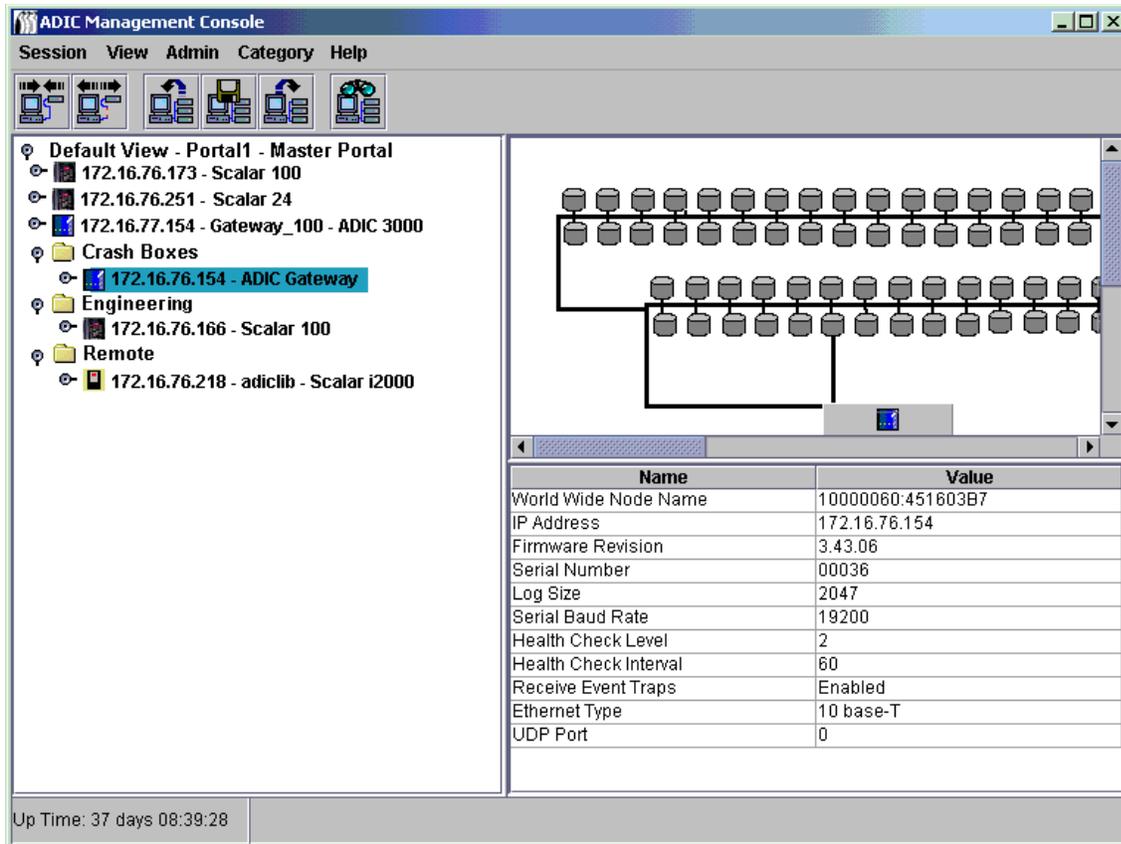
At the bottom left of the console, the status 'Up Time: 37 days 08:39:28' is displayed.

3 Drag and drop it into the correct category.

Be sure the cursor is pointing inside the folder icon of the target category.

If you are moving the item to root, you can point anywhere on the root view line.

- Continue until all items that you want to move have been moved.



- Save the categories as a view. Refer to [Saving Views](#) on page 54.

Moving Items by Using the Menu

- Log on as SAN administrator, portal administrator, or power user.
- Select the category into which you want to move items.
- Select the **Category** menu, then select **Move Items**.
- The **Move Items** dialog box is displayed.
 - In the top of the dialog box, click, shift-click, or control-click to select all the appliances you want to move.
 - In the bottom of the dialog box, select the category into which you want the items to move.
 - Select **OK**.
 - Select **Cancel** to exit the move process.

Working With Views

A **view** is a named graphical representation of a portal, generally one that has been saved to preserve a particular categorization. SAN administrators assign users access to a particular view associated with a particular portal. When a user logs in, this default view is the view that is displayed. You can create user profiles that allow access to more than one view.

Opening Saved Views

- 1 Select the **View** menu, then select **Open**.

The **Open View** procedure can also be initiated by selecting the **Open View** toolbar button.



- 2 If you already have an open view, you are prompted to confirm closing it.
If you have unsaved changes in your current view, you are prompted to save it.
Select **Yes** to save the current view. The view is saved. All SAN components disappear from the navigation panel display. The **Open View** dialog box is displayed.
- 3 If you did not select **Cancel**, the **Open View** dialog box is displayed.
Select the name of the portal that contains the saved view that you want to open. Then select **Next**.
A list of the saved views associated with the chosen portal are displayed in the dialog box.
- 4 To open a view, select its name, and then select **Finish**.
If the view you want is not in the portal you have selected, select **Back** and then repeat [Step 3](#).
Once you have selected the view you want to use, the window refreshes. The new view is displayed.
Refer to [Working with Categories and Views](#) on page 47.

Creating Views

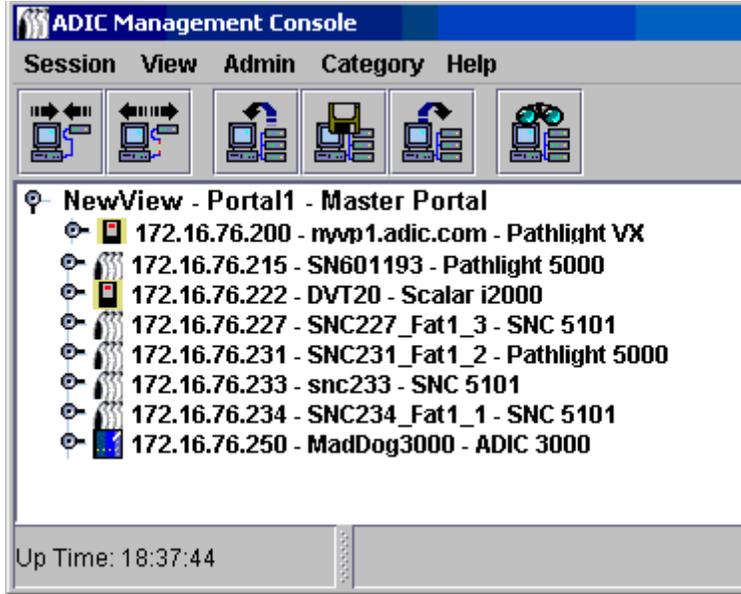
Create the appropriate portal before creating a view. Refer to [Working with Portals](#) on page 43.

A view is meant to be a logical representation of the physical SAN. You may want to categorize the portal before you save the view.

Refer to [Working With Category Components](#) on page 49.

- 1 Log in as the SAN administrator, portal administrator, or power user.
- 2 Select the **View** menu, then select **New**.
You are prompted to save any changes you have made to the current view and to close it before you create a new one.
The **Create a View** dialog box is displayed.
- 3 Enter a name for the view.
- 4 Select the portal that will be associated with the view.
OK is now available.
All portals that are available to the user for whom the view is being created are displayed.
For more about portals, refer to [Working with Portals](#) on page 43.
- 5 Click **OK**.
The view is created and the window is refreshed to show the new view.

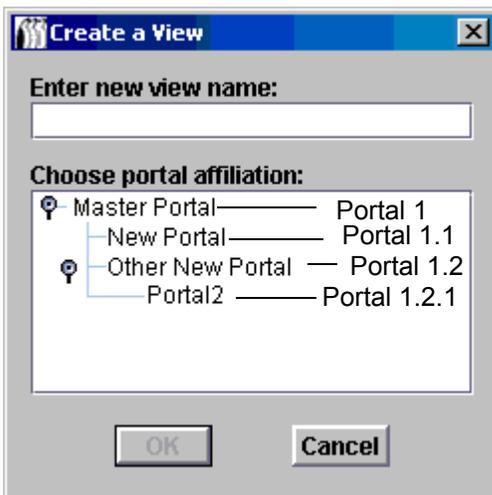
Figure 8 New view at default master portal level



Because the view was created directly under the master portal, **Portal1** is displayed between the name and the portal affiliation.

If the view had been created under the **NewPortal** or **OtherNewPortal** level (portals subordinated to the default portal), the numbered level would be **Portal1.1**, **Portal1.2**, etc.

Figure 9 Numbered levels for views



If you have not categorized your view, do so now.

Refer to the [Working With Category Components](#) on page 49.

6 Save your view. Refer to [Saving Views](#) on page 54.

Saving Views

Creating views, which are logical organizations of SAN components, allows you to work more efficiently. You must save the views you create, or you will have to re-create them.

If no changes have been made to a view, or the view is not newly created, the **Save** command is not available.

- 1 Log in as SAN administrator, portal administrator or power user.
- 2 Select the **View** menu, then select **Save**.

The **Save Current View** procedure can also be initiated by the **Save Current View** toolbar button.



The message *View successfully saved* appears in the **Status/Message area**.



Note You cannot save the default view with the **Save** command.

If you try to save the default view with the **Save** command, you are warned that this is not possible.

- 1 Log in as SAN administrator, portal administrator or power user.
- 2 Select the **View** menu, then select **Save as**.
- 3 In the **Save View As** dialog box, type a name for the view.

This name is displayed later when you open the **Select View** dialog box.

Deleting Views

Deleting a view does not delete stored data.

- 1 Select the **View** menu, then select **Delete**.
You are warned that the current view will be deleted.
- 2 Select **Yes** to confirm that you want to delete the current view.
Select **No** to exit the delete process.

Searching the Current View

In a large SAN, the Find command can be used to locate a SAN component quickly.

- 1 Select the **View** menu, then select **Find**.
The command defaults to **First Occurrence**.

You also can use the **Find** toolbar button to initiate a search of the SAN.



Type the search string into the dialog box. Select **OK**.

The navigation panel refreshes to show the line containing the first occurrence of the search string highlighted in blue.

- 2 To continue the search, select **Next Occurrence** on the **Find** submenu of the **View** menu. The navigation panel refreshes to show the line containing the next occurrence of the search string highlighted in blue.

If there is no next occurrence, a dialog box is displayed.

The **Find** command can also find disk devices and other SAN components.

Reporting the Current View

You can produce a number of different reports to help you manage your SAN.

- 1 Select the **View** menu, then select **Report Data**.
- 2 Use the check boxes and radio buttons to select the report you need.

Reports can be generated for SNCs, tape library controllers or disk array controllers, disk devices, tape devices, or all devices.



Note IP addresses for Scalar RMUs do not appear in the selection list.

Select the **Preview** button to get a preview of the report that can be generated based on the parameters you have selected.

9

Performing Administrative Tasks

This chapter describes procedures for a variety of administrative tasks. Some are SAN-wide in focus:

- Configuring E-mail
- Configuring Policies
- Discovering the SAN
- Configuring SNMP Community Strings

Others focus on the SNC as an appliance:

- Refreshing Data
- Saving and Loading Configuration Files
- Updating Firmware
- Using Restart

You can even get information about the library:

- Displaying Library RMU Data

Configuring Email

AMC can be configured to use email to report specified conditions.

- 1 Select the **Admin** menu, then select **Email configuration**.

The **Email Configuration Setting** dialog box is displayed.

If you typed data into the email configuration portion of the installation, that data is displayed in the dialog box. If not, the dialog box is empty.

- 2 Edit the name of the SMTP server to match the SMTP server on your network.
- 3 Edit the **Account** and **Password** fields to reflect an existing valid account and associated password for the SMTP server named in [Step 2](#).
- 4 Edit the **Sender Address** to reflect the sender you wish to have users see when AMC sends mail, for example, AMC@MyCompany.com.
- 5 Select **OK** to continue.

Select **Cancel** to close this dialog box without taking any action.

If you select **OK**, *Email configuration successfully set* is displayed in the **Status/Message Area**.

Configuring Policies

The policy engine is an expert system that allows AMC to alert persons specified by the administrator that certain SAN conditions have been met. These conditions are defined in terms of event traps. For more information about event reporting, refer to [Monitoring and Managing Event Logs](#) on page 93.

- 1 Select the **Admin** menu, point to **Policy Configurations**, then select **New Policy**.
The **Add New Rule** dialog box is displayed.
- 2 Select **Check traps when they arrive**.
This causes the **Next** button to become enabled.
- 3 Select **Next**.
- 4 Type the name of the new rule into the text box.
- 5 Assign a priority by selecting **High**, **Medium**, or **Low** from the drop-down list. If many alerts are generated, they will be prioritized before they are sent.
- 6 Select **Next**.
- 7 Select one or both of the two event notification conditions, by selecting the check box(es):
 - Specify trap number
 - Specify the appliance IP that the trap is from
- 8 Select **Specify Trap Number** to display a list of traps by number and description. Scroll down to see the entire list.
- 9 Select the condition that meets the requirements of the rule name you have chosen.
- 10 Do one of the following:
Select **OK** to associate this trap with the new rule.
- 11 Select **Specify the appliance IP that the trap is from** to display a list of available appliances.
- 12 Click, shift-click or control-click as many appliance IP addresses as you require.
- 13 Select **OK** to associate these SNCs with the new rule.
The conditions you have chosen are written into the lower panel of the **Add New Rule** dialog box. Scroll up or down to review the entire rule.
- 14 Select **Next** to go to the email configuration.
- 15 Select the email check box at the top of the **Mail Address of Trap Notice** dialog box. A second dialog box pops up on top of the email configuration screen.
- 16 Type the email address(es) of the intended recipient(s) and a subject line for the message. If multiple addresses are entered, separate the strings with semicolons.
- 17 Select **OK** to continue.
- 18 After selecting **OK**, review the rule and the email addresses as they appear in the lower panel of the **Add New Rule** dialog box. Select **Finish**.
- 19 Confirm that you want to add the rule to the database.
- 20 Select **Yes** to add the rule.
Policy added successfully appears in the **Status/Message area**.

Discovering the SAN

This section contains procedures for establishing and modifying the elements of the SAN.

- 1 Log on as SAN administrator.
- 2 Select the **Admin** menu, point to **Discover SAN**, then select **Modify Discovery Configuration**.
The **Discovery Configuration** dialog box opens.
All IP addresses are entered in dotted quad format, xxx.xxx.xxx.xxx.
- 3 Select a segment.
- 4 Do one of the following:
To add a network segment for discovery, select **Add**. The **Segment Configuration** dialog box is displayed. Proceed to [Step 5](#).
To reconfigure an existing segment, select the segment. Then select **Change**. The **Segment Configuration** dialog box is displayed. Proceed to [Step 5](#).
To delete an existing segment, select the segment. Then select **Delete**. Proceed to [Step 10](#).
- 5 Name or rename the segment by typing directly into the **Segment Name** text box. It is not mandatory to name or rename a network segment.
- 6 Select the radio button for **Single IP Address** or **IP Address Range** as needed, and the number of entry boxes defaults appropriately. Type the IP Address(es) that you want to have discovered. Do this if you are adding a segment or if you are modifying an existing segment.
- 7 Select **Add**. The new segment moves to the list of **IP Addresses to be discovered** at the bottom of the dialog box. If you are adding a new segment, proceed to [Step 12](#). If you are modifying an existing segment, proceed to [Step 8](#).
- 8 Select the statement for the segment that you no longer want to have discovered and then select **Delete**. The **Delete** button is only enabled when a segment in the box to its left (**IP Addresses to be discovered**) is selected.
If you are adding a new segment, complete the configuration by proceeding to [Step 12](#).
If you are modifying a configuration and you want to modify the advanced discovery configuration parameters, proceed to [Step 12](#).
If you are modifying a configuration and you are satisfied with the existing advanced parameters, proceed to [Step 9](#).
- 9 Select OK on the **Segment Configuration** dialog box.
- 10 Select OK on the **Discovery Configuration** dialog box.
A warning is displayed.
- 11 Select **Yes** to accept the update or **No** to close the dialog box without making changes.
- 12 To configure advanced discovery configuration parameters, select **Advanced** tab on the **Segment Configuration** dialog box.
- 13 Consider the following when you configure the parameters:
 - Type the IP addresses of systems you do not want to discover in the middle box of the **Advanced** tab.
 - Optional parameters like the **SNMP Timeout** value, and the **Read Community** setting for a new segment, are not associated with a new discovery segment unless you type them in the text boxes on the **Advanced** tab.

- **SNMP Timeout** values are entered in milliseconds. They limit the time allotted to wait for a response from each IP address that is being checked. The default value is intentionally set to a high number to make certain that all devices on a slow network are discovered. You may set the timeout value considerably lower than the default (5000 milliseconds) to speed discovery.
- The **SNMP Read Community** on Scalar SNCs is set to **public** by default. Unless you have changed that value on appliances in your network, the server value should also be set to **public**. **SNMP Read Community** values on the appliance must match those on the server.

14 When the **Advanced** tab reads the way you want it to, return to [Step 9](#).

Rediscovering a Segment

- 1 Select the **Admin** menu, point to **Discover SAN**, then select **Re-Discover Segment(s)**.
The **Re-Discover Segments** dialog box is displayed.
 - a. Select the **View** column to see the segment discovery configuration parameters.
 - b. Select **OK** to close the pop-up box.
- 2 Select the checkbox in the **Discover** column for the segment that you are rediscovering. Then select **OK**.

If you selected **OK**, a rediscovery warning is issued.

Messages in the **Status/Message Area** keep you posted during the discovery.

For more information on this area, refer to [Status/Message Area](#) on page 35.

When discovery has completed, *Discovery Process Finished* appears in the **Status/Message Area**.

Discovering a particular appliance

- 1 Select the **Admin** menu, point to **Discover SAN**, then select **Discover Appliance**.
The **Discover Appliance** dialog box is displayed.
- 2 Type the IP address of the appliance you wish to discover into the text box.
- 3 Select **OK** to continue.

If the appliance is already in the current view of the current portal, a message reports that fact.

If the appliance is not in the current view, it is added to the master portal affiliated with the current view. A message reports the addition.



Note

Appliances added to a view by using **Discover Appliance** do not automatically become permanent members of the view, even if the view is saved after they have been discovered. To make them permanent, use **Modify Discovery Configuration** to add their IP addresses to the discovery configuration string.

Configuring the SNMP Community Strings

SNMP community strings are a part of the software agent's messaging functionality that serve to group network devices into logical collections for management purposes. The community strings on the server must match those on the appliance(s) you wish to manage.



CAUTION

Do not edit the SNMP Community Strings values without consulting your ADIC customer service representative.

Two configurable strings are defined:

- **Read** allows AMC to get information from appliances with matching **Read** community strings.
- **Write** allows AMC to manipulate the settings of appliances with matching **Write** community strings.

The appliance can maintain 32 `Read` and 32 `Write` community strings.



CAUTION

Incorrect adjustment of the SNMP Community Strings can prevent the AMC from managing your system.

- 1 Log on as SAN administrator.



Note

Portal administrators, power users and basic users are not authorized to use this command. For user privileges, refer to [Table 2](#) on page 40.

- 2 Select an appliance in the navigation panel listing.
- 3 Select the **Admin** menu, and then select the **SNMP Community Strings** command.

The **Change SNMP Community Strings** dialog box is displayed.

- 4 Edit the settings as appropriate, then select **OK**.

To cancel edits to the SNMP Community Strings settings, select **Cancel**.

Managing the SAN Appliance

Certain functions are available by right-clicking the appliance you want to manage. Select the appliance by right-clicking either in the navigation panel or in the graphical panel. See [Figure 10](#) and [Figure 11](#).

Figure 10 Right-click from the graphical panel representation of appliance

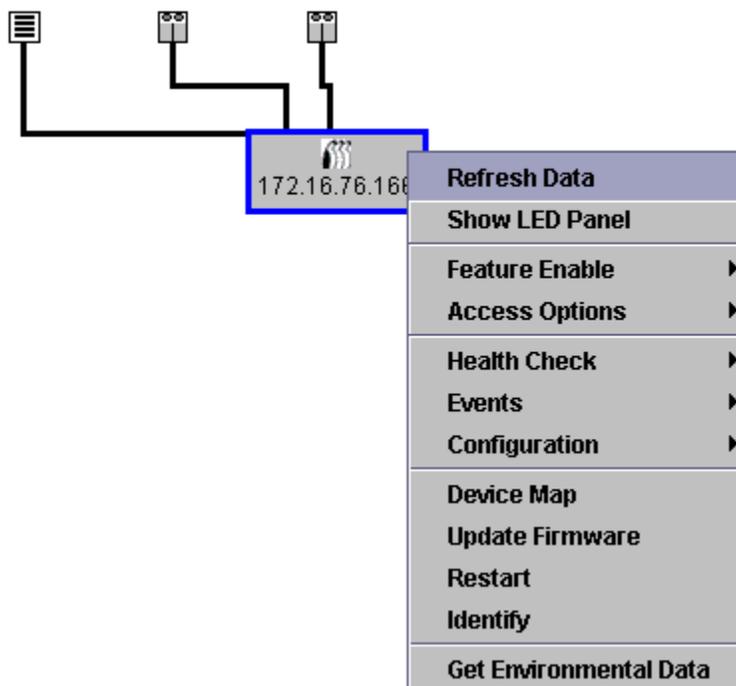
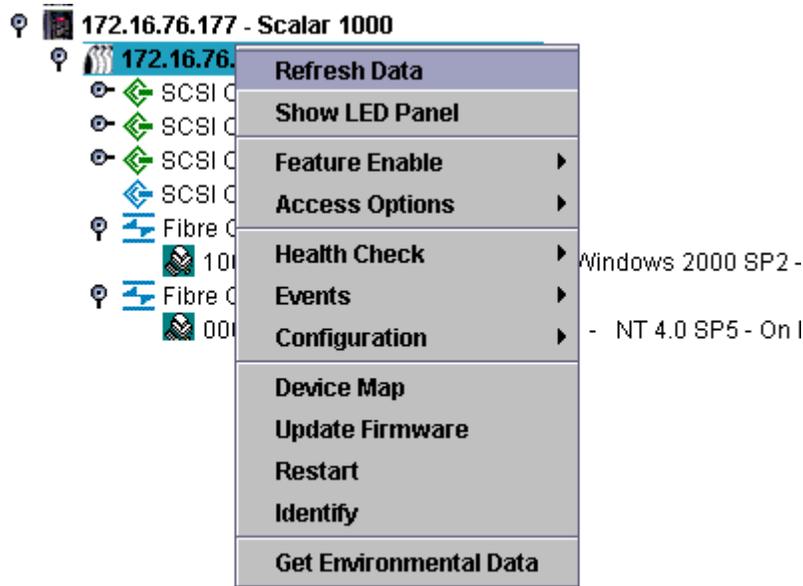


Figure 11 Right-click from the navigation panel representation of appliance



Refreshing Data

Refreshing the appliance displays host, device, and connection status changes.

 **Note** After adding a device to a channel, rescan the channel and refresh data on the appliance.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Refresh Data**.

The displayed data will refresh.

 **Note** If you have turned off trap event notices, **Refresh** will not turn them back on. To turn them back on, follow the procedure in [Receiving Event Traps](#) on page 97.

Saving and Loading the Configuration

 **CAUTION** **Best practice is to save your configuration files to a folder on a server that will be accessible at all times. Should SNC failure occur, this allows you to quickly reconfigure a replacement.**

Files that are saved when this option is chosen include the device map, Fibre Channel and SCSI port settings, VPM, SFM, eVPS settings, and channel zoning settings. The device map is a record of the target IDs, device LUNs, and assigned LUNs.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Configuration** menu, then select **Save Configuration**.
- 3 Type a name for the configuration you wish to save or select one from the list of configurations already on the server, if any.

After a few seconds the message *Successfully received configuration from xxx.xxx.xxx.xxx* appears in the **Status/Message Area**.

4 Select **Save Locally**.

5 A file browser opens.

It defaults to the “cfg” subfolder of the “Client” folder.

6 Select **Save**.

7 Select **Save on Server**.

After a few seconds the message *Configuration file saved successfully* appears in the **Status/Message Area**.



Note

It is a good idea to save the configuration both locally and on the server to ensure that you have access to the file.

8 Select **Close** when you are done.



CAUTION

It is important that you save the configuration of each appliance initially and any time there is a change in the device address maps, Fibre Channel settings or SCSI channel settings.

Loading a Local Configuration File

Your service representative may advise you to load a saved file onto your SNC.

1 Right-click an appliance in the navigation panel or the graphical panel.



CAUTION

If you replace the appliance and do not load the saved configuration, you might not be able to use the storage devices attached to it or you may lose data.

2 Select the **Configuration** menu, then select **Load a Local File**.

A file browser opens to the contents of the **Client** folder.

3 If your local file was saved to the default location, double-click the “cfg” subfolder. Or navigate to the appropriate location. Select the file you want to load.

4 Select **Open** to load the file. A message is displayed.

5 Right-click the appliance for which you’ve just loaded the configuration, either in the navigation panel or in the graphical panel.

6 Select **Restart**. Refer to [Using Restart](#) on page 64.

Restarting...Please Wait appears in the **Status/Message Area**.

Loading a Configuration File from the Server

Save copies of your configuration both on the server and in a location that can be accessed if the server is unavailable.

1 Right-click an appliance in the navigation panel or the graphical panel.

2 Select the **Configuration** menu, then select **Load from Server**.

3 Select the file you want to load.

- 4 Select **Load** to continue with the load.

Updating Firmware

The **Update Firmware** command can only be used on appliances. To update firmware on a device attached to an appliance, go to [Managing a Device](#) on page 72.

 **Note** To update firmware on any component of an i-platform library, refer to the documentation for those systems.

- 1 Stop all I/O to the appliance. For instructions, refer to the *Hardware User Guide* for the appliance.
- 2 Log on as SAN administrator, portal administrator, or power user.

 **Note** Basic users are not authorized to upload firmware. If the portal administrator or power user have access to a portal with only partial access to the appliance for which firmware is to be uploaded, only the SAN administrator can upload firmware.

- 3 Right-click an appliance in the navigation panel or the graphical panel.
- 4 With the appliance selected, select **Update Firmware**.
A file browser is displayed.
- 5 If the firmware file you want is not in the default folder, navigate to the correct folder.
- 6 Select the file you want to load.
- 7 Select the **Open** button.
A warning is displayed.
- 8 Select **Yes** to proceed.
The firmware takes a few minutes to upload. A message posts to the **Status/Message Area** when the firmware upload is complete. You are prompted to restart the appliance.
- 9 **Restart** the appliance. Refer to [Using Restart](#) on page 64.

Using Restart

Use the **Restart** command after updating firmware, or making changes to the device map, channel zoning, SFM, or VPS configurations.

- 1 Stop all I/O to the appliance. For instructions, refer to the *Hardware User Guide* for the appliance.
- 2 Log on as SAN administrator, portal administrator, or power user.

 **Note** Basic users are not authorized to restart an appliance. If the portal administrator or power user have access to a portal with only partial access to the appliance that is to be restarted, only the SAN administrator can restart the appliance.

- 3 Right-click an appliance in the navigation panel or the graphical panel.
- 4 Select **Restart**.
A warning is displayed.
- 5 Select **Yes** to continue.

Select **No** to cancel the restart.

Restarting...Please Wait appears in the **Status/Message Area**.

Getting Information About a Library

Scalar Library RMU data can be accessed by right-clicking the library and selecting the **Show RMU Data** command.

For more information about displaying RMU data, refer to [Displaying RMU Data](#) on page 65.



Note

I-platform libraries do not have RMUs.

Displaying RMU Data

Not all appliances in the SAN are capable of providing this data. If the appliance you select is not capable of communicating this information, **Show RMU Data** does not appear on the appliance menu.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Show RMU Data**.

If the appliance is capable of reporting RMU Data, but no RMU unit is attached, a dialog box is displayed. Enter the IP address of the RMU into the dialog box.

Once connected to an RMU, information about it is displayed. The default tab is the **Global Status** tab.

The **Mover** tab provides information about library robotics.

The last tab is the **Drives** tab. It provides detailed information about managed drives.

- 3 When you are finished viewing the RMU data, select **OK**.

10

Configuring Channels and Devices

In the course of managing your SAN, you will want to rescan or reset channels, change connection modes and options, or update device or drive firmware. AMC has a structure in place to meet those needs. You can also adjust the device map from the AMC.

Managing the SCSI Channel

By right-clicking a network appliance's SCSI channel, you can directly configure SCSI channel parameters, or instantly rescan and reset the SCSI channel. If VPM has been enabled, you can configure VPM parameters. Refer to [Enabling Licensed Features](#) on page 75.

Rescanning the SCSI Channel

Rescan the SCSI bus after adding or removing devices.

- 1 Expand the appliance in the navigation panel or the graphical panel.
- 2 Right-click the appropriate SCSI channel graphic.
- 3 Select **Rescan**.

A warning is displayed.

- 4 Select **Yes** to continue.

The following message is displayed in the **Status/Message Area**:

Rescanning SCSI Channel n on xxx.xxx.xxx.xxx. Please wait several minutes before doing a 'Refresh.'

In this example, the "n" represents the SCSI channel number and xxx.xxx.xxx.xxx represents the IP address of the appliance.

- 5 If you rescanned because you added a device, proceed to [Refreshing Data](#) on page 62.

Resetting the SCSI Channel

Using the **Reset** command causes the appliance to cancel all pending commands, reset the channel, and perform a rescan. Reset the SCSI channel after making changes to the channel configuration.

**CAUTION**

Use Reset carefully because it causes pending I/O commands to return failed status back to the host operating system and may have unexpected results. Make sure all I/O is stopped before issuing this command. For instructions on doing so, refer to the appliance's Hardware User Guide.

- 1 Expand the appliance in the navigation panel or the graphical panel.
- 2 Right-click the appropriate SCSI channel graphic.
- 3 Select **Reset**.

A warning is displayed.

- 4 Select **Yes** to continue.

The following message is displayed in the **Status/Message Area**:

Resetting SCSI Channel n on xxx.xxx.xxx.xxx. Please wait several minutes before doing a 'Refresh'.

In this example, the "n" represents the SCSI channel number and xxx.xxx.xxx.xxx represents the IP address of the appliance.

Configuring the SCSI Channel

The **Configure** command is used to change a SCSI channel's mode, host ID, reset setting, and termination status.

- 1 Log on as SAN administrator, portal administrator, or power user.

**Note**

Basic users are not authorized to configure SCSI channels.

**CAUTION**

If you change any of the SCSI channel parameter settings, you must reset the SCSI channel or reboot the appliance to use the new settings.

- 2 Expand the appliance in the navigation panel or the graphical panel.
- 3 Right-click the appropriate SCSI channel graphic.
- 4 Select **Configure**.

The **SCSI Channel Parameters** dialog box is displayed.

- 5 Use the drop-down boxes and check boxes to make changes to the configuration as necessary.

Refer to [Channel Mode](#), [Host ID](#), [Bus Reset on Power Up](#), [Enable Termination](#), or [Alternate Initiator ID](#), below.

- 6 When you are finished viewing or setting SCSI channel parameters, select **OK** to continue.

The following message is displayed in the **Status/Message Area**:

Pending changes on xxx.xxx.xxx.xxx.

In this example, xxx.xxx.xxx.xxx represents the IP address of the appliance.

Select **Cancel** to cancel all changes and return to the main screen.

- 7 Reset the channel. Refer to [Resetting the SCSI Channel](#) on page 67.

Channel Mode

Channel Mode identifies the channel as either an initiator or a target. When a SCSI channel is changed from target to initiator mode, the values that appear in the host ID and alternate host ID boxes do not default to 0. They default to values that the appliance has most recently used.

Host ID

Host ID is typically assigned as 7.

Bus Reset on Power Up

Bus Reset on Power Up is typically enabled. Removing the check mark from this box disables SCSI bus reset on power-up.

Enable Termination

Enable Termination is typically enabled. Removing the check mark from this box disables the internal termination circuits.

Alternate Initiator ID

The default **Alternate Initiator ID** is set automatically by the appliance. When the appliance scans the SCSI bus, it determines which IDs currently are being used by target devices and sets the alternate ID to the highest ID not in use. Change the alternate ID by using the pull-down list or typing a new number. To restore the automatic default selection, select **Automatic** from the drop-down list. This option is grayed out when the SCSI channel is being set to target mode.

Managing the Fibre Channel

By right-clicking a network appliance's Fibre Channel, you can directly configure Fibre Channel parameters, or instantly rescan and reset the Fibre Channel.

Rescanning the Fibre Channel

Rescan the Fibre Channel bus after adding or removing devices.

- 1 Expand the appliance in the navigation panel or the graphical panel.
- 2 Right-click the appropriate Fibre Channel graphic.
- 3 Select **Rescan**.

A warning is displayed.

- 4 Select **Yes** to continue.

The following message is displayed in the **Status/Message Area**:

Rescanning Fibre Channel n on xxx.xxx.xxx.xxx. Please wait several minutes before doing a 'Refresh.'

In this example, the "n" represents the Fibre Channel number and xxx.xxx.xxx.xxx represents the IP address of the appliance.

If you rescanned because you added a device, proceed to [Refreshing Data](#) on page 62.

Resetting the Fibre Channel

Using the **Reset** command cancels all pending commands, resets the channel, and performs a rescan. Use this command after making changes to the channel configuration.



CAUTION

Use Reset carefully because it causes pending I/O commands to return failed status back to the host operating system and may have unexpected results. Make sure all I/O is stopped before issuing this command. For instructions on doing so, refer to the appliance's Hardware User Guide.

- 1 Expand the appliance in the navigation panel or the graphical panel.
- 2 Right-click the appropriate Fibre Channel graphic.
- 3 Select **Reset**.

A warning is displayed.

- 4 Select **Yes** to continue.

The following message is displayed in the **Status/Message Area**:

Resetting Fibre Channel n on xxx.xxx.xxx.xxx. Please wait several minutes before doing a 'Refresh.'

In this example, the "n" represents the Fibre Channel number and xxx.xxx.xxx.xxx represents the IP address of the appliance.

Configuring the Fibre Channel

Fibre Channel parameters you can set are host type, loop ID, frame size, connection type, and port mode.

- 1 Log on as SAN administrator, portal administrator, or power user.



Note

Basic users are not authorized to configure Fibre Channels.



CAUTION

If you change any of the Fibre Channel parameter settings, you must reset the channel or reboot the appliance to use the new settings.

- 2 Expand the appliance in the navigation panel or the graphical panel.
- 3 Right-click the appropriate Fibre Channel graphic.
- 4 Select **Configure**.
The **Fibre Channel Parameters** dialog box is displayed.
- 5 Use the drop-down boxes and check boxes to make changes to the configuration as necessary. Refer to [Understanding Port Mode Options](#) on page 71 and [Understanding Connection Type Options](#) on page 71.
- 6 When you are finished viewing or setting Fibre Channel parameters, select **OK** to continue.
A warning is displayed.
- 7 Select **Yes** to proceed with the **Reset**.

The following message posts in the **Status/Message Area**:

Resetting Fibre Channel n on xxx.xxx.xxx.xxx. Please wait several minutes before doing a 'Refresh.'

In this example, the "n" represents the Fibre Channel number and xxx.xxx.xxx.xxx represents the IP address of the appliance.

Understanding Port Mode Options

The Fibre Channel ports support **Private** and **Public** Fibre Channel attachments. The default port mode setting is **Public Target**. You can view the settings and change port parameters.

INITIATOR

In this mode, the port operates as an initiator allowing Fibre Channel targets (disks, tape devices, or FC switch) to attach to it.

TARGET

In this mode, the port operates as a target allowing a Fibre Channel initiator (host or FC switch) to attach to it.

TARGET AND INITIATOR

In this mode, the appliance has access to target devices on the Fibre Channel, and initiators on the Fibre Channel have access to targets attached to the appliance. The port operates simultaneously as a target and initiator.

PRIVATE

With this option, the appliance scans the local loop for devices but does not check for fabric devices. Select this option if you are connecting target devices directly to the port.

PUBLIC

With this option, the appliance scans the loop for fabric devices. If it finds a fabric device, it logs on and queries the name server for target devices that are available on the fabric. If it finds targets attached to the fabric, it adds all of them to the device map. Select this option if you are connecting a Fibre Channel switch to the port and you want the appliance to have access to all of the available target devices attached to the switch. Otherwise, if target devices are connected directly to the port, it automatically switches to **Private** mode.

Understanding Connection Type Options

The Fibre Channel ports support both **Loop** and **Point-to-Point** connection options. The default connection setting is **Loop**. You can view the settings and change port parameters.

LOOP

With this connection option, the port operates with attached loop-capable devices. If a point-to-point device is attached, the appliance is not able to communicate with it.

POINT-TO-POINT

With this connection option, the port supports point-to-point fabric connection (F_Port Login). It also operates in “old port mode” for compatibility with N_Port devices that do not support **Loop**. If loop-capable devices are attached, the appliance is not able to communicate with them.

LOOP PREFERRED

With this connection option, the port operates in **Loop** mode unless it detects a connection to an N_Port device in which case it automatically switches to **Point-to-Point**.

Host Type

Host Type has many possible values: **AIX**, **AS400**, **Gateway**, **HP-UX**, **Linux**, **NT** (includes Windows 2000, XP, and 2003), **Netware**, **Generic**, **Solaris**, and **Autosense/NT** (same as “NT”). Hosts running other operating systems use the setting **Generic**. The default setting is **NT**. The host type is either the name of the host operating system or the type of appliance attached to the port. This setting controls the way the appliance translates SCSI commands, such as the format of SCSI sense data, which needs to be presented differently for some hosts. If eVPS OR SFM is enabled, the host type setting in the eVPS OR SFM control panel are used instead of this setting.

Loop ID

The default **Loop ID** setting is **Soft** and typically should not be changed. (It may be appropriate to use another **Loop ID** setting when using Fibre Channel switches). If you remove the check mark from the box, you can type a **Loop ID** value from 0 to 125.

Frame Size

Frame size has three possible values: 512, 1024, and 2048. The Fibre Channel frame size is specified by each receiving node and need not match any other node. The frame size typically should be set to 2048. (It may be appropriate to use another frame size if required by a particular software application.)

Managing a Device

You can use AMC to update firmware on devices and edit device maps. To update firmware on the appliance, refer to [Updating Firmware](#) on page 64.

Updating Firmware on a Device

- 1 Stop all I/O to the device. For instructions, refer to the appliance's *Hardware User Guide*.
- 2 Log on as SAN administrator, portal administrator, or power user.



Note

Basic users are not authorized to upload firmware. If the portal administrator or power user have access to a portal with only partial access to the appliance for which firmware is to be uploaded, only the SAN administrator can upload firmware.

- 3 Expand the appliance in the navigation panel or the graphical panel. Expand the appropriate channel.
- 4 Right-click the device graphic.
- 5 Select **Update Firmware**.
A file browser is displayed.
If the firmware file you want is not in the default folder, navigate to the correct folder.
- 6 Select the file you want to load.
- 7 Select the **Open** button.
A warning dialog box is displayed.
Be sure all I/O to the device has been stopped.
- 8 Select **Yes** to proceed.

If I/O to the device cannot be stopped, or if you change your mind, select **No** to cancel the firmware upload.

After the firmware upload is complete, you will be prompted to **Restart** the appliance. Refer to [Using Restart](#) on page 64.

Editing Device Maps

Some applications require LUNs to be presented in an order other than the order that the discovery routine presents them to the SNC.

- 1 Log on as SAN administrator, portal administrator, or power user.



Note

Basic users are not authorized to configure the device map. If the portal administrator or power user have access to a portal with only partial access to the device mapping configuration, only the SAN administrator can modify access.

- 2 Right-click the appliance in the navigation panel or the graphical panel.
- 3 Select **Device Map**.



CAUTION

Making changes to LUN assignments in the persistent address map database can affect SFM, eVPS, and VPM access settings. If you assign different LUNs to devices that are under access control by more than one of these methods, the same LUN could become associated with different devices and data would be lost.

The **Device Mapping** dialog box is displayed.

The **Device Mapping** dialog box uses the device numbering format “Channel [Target ID:Device LUN]” after the channel type, “SCSI” or “Fibre.”

Grayed-out images of these same devices, without the assigned LUNs, appear in the right column.

LUN 0 typically is occupied by the appliance’s “Control LUN,” unless it has been manually assigned to another LUN.

Devices are assigned LUNs by the initial discovery. They appear in black type on the left.

- 4 To reassign the LUN, drag a device that is displayed in the left column back to the right column or directly to another space in the left column.



Note

The right column can temporarily hold an item while you scroll to an appropriate open space in the left column, but no items can be left in the right column. They must all be mapped to an assigned LUN position in the left column.

To delete a device, drag and drop it onto the trash can icon.

- 5 Continue until all devices are assigned.
- 6 When you are satisfied with the assignments that have been made, select **OK**.
- 7 Restart the appliance. Refer to [Using Restart](#) on page 64.
- 8 Reboot the host, or use some other method to ensure that the host is aware of the new device map.

Pre-Assigning Device Numbers

The **New Device** command is used to assign a LUN to a device that is currently not present on the system, but for which a soft LUN—a LUN registered by the SNC during discovery—is not adequate.

A medium-changer will typically be the first odd numbered LUN (1) if available, or the first odd LUN available after the last tape.

Particular applications or tools may require settings that are different than the defaults. To hard-code a particular LUN for a particular device, add it into the device map first. Then bring the device online.

Devices usually come online before the SNC does. When the SNC boots up, it scans all devices and determines where they are. At the end of the boot process, the appliance knows the LUNs available and is ready to use them.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Device Map**.
- 3 Select the **Device Mapping** dialog box, point to the **Tools** menu, then select **New Device**.
The default new device is a SCSI device on port (channel) 1, at target ID 0, and target LUN (device LUN) 0.
- 4 Use the pull-downs at the end of each field to identify the device appropriately.
If the device to be added is a Fibre Channel device, you must supply the correct Unit ID.
- 5 Select **OK**.
The new device or devices is displayed in the right column of the **Device Mapping** dialog box.
- 6 Drag and drop the new device to a LUN assignment.
- 7 Select **OK**.
- 8 Rescan the channel.
Go to either [Rescanning the SCSI Channel](#) on page 67 or [Rescanning the Fibre Channel](#) on page 69, as appropriate.
- 9 Rediscover the network segment. Go to [Discovering the SAN](#) on page 59.
- 10 Refresh data on the appliance. Go to [Refreshing Data](#) on page 62.

11

Configuring SAN Access

In addition to providing security via user privilege assignments, AMC allows you to configure SAN access for a particular channel or group of LUNs, or from a particular host perspective.

Enabling Licensed Features

Use the **Feature Enable** menu to enable licensed features for the selected appliance. Features that must be enabled before you use them are:

- Scalar® Firewall Manager (SFM)
- extended Virtual Private SAN® (eVPS)
- Virtual Private Map (VPM)
- Data Mover Module



Note

If the feature is already enabled or not available, the menu item is grayed out on the menu bar.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Feature Enable** menu. From the submenu that opens, elect the functionality you want to enable. If a feature is already enabled or not available for a particular appliance, it is grayed out on the menu.
- 3 Type the license key for the feature you are enabling. If the feature has been factory enabled, type the word **enable**.
- 4 Select **OK** to continue.
- 5 If you enabled SFM, proceed to [Using Scalar Firewall Manager \(SFM\)](#) on page 80.
If you enabled eVPS, proceed to [Using eVPS](#) on page 84.
If you enabled VPM, proceed to [Using VPM](#) on page 90.
If you enabled the Data Mover Module, you do not need to adjust other settings.

Data Mover Module



Note

Basic users are not authorized to enable the Data Mover Module. For user privileges, refer to [Table 2](#) on page 40.

The data mover module allows you to use server-free tape backup applications that support SNIA extended SCSI copy. Enabling this feature allows the appliance to move blocks of data directly between storage devices attached to it.

Using Channel Zoning

Channel zoning (also called “port zoning”) configures access to an entire target channel and all the LUNs on that channel for the exclusive use of a host or group of hosts on a single initiator channel. Each initiator channel can connect a maximum of 64 hosts.

A LUN (Logical Unit Number) is a 3-bit identifier used on a SCSI bus to distinguish between as many as eight devices with the same SCSI ID.

In a situation where the devices are tape devices and more than one host is connected to the initiator channel, the tape library application typically manages host requests to the zoned channel.

- 1 Log on as SAN administrator, portal administrator, or power user.



Note

Basic users are not authorized to configure channel zoning. If the portal administrator or power user have access to a portal with only partial access to the channel zoning configuration, only the SAN administrator can modify access.

- 2 Right-click an appliance in the navigation panel or the graphical panel.

- 3 Select the **Access Options** menu, then select **Channel Zoning**.

The default settings allow all SAN connections to access all target channels.

- 4 Select the check boxes to remove or create restricted access zones for the desired SAN connections and target channels.

All combinations are possible.

Bear in mind that an entire channel is zoned when the box is checked.

If you make changes to the channel zoning settings you must restart the appliance for the new settings to take effect.

- 5 To copy or print a text file of your channel zoning settings, select the **Tools** menu on the **Channel Zoning** dialog box. Then select **Copy Channel Zoning** or **Print Channel Zoning**.



CAUTION

If you create restricted access zones with channel zoning, then SFM, eVPS, and VPM can only assign access permission within each accessible zone. For more information refer to [Using Scalar Firewall Manager \(SFM\)](#) on page 80, [Using eVPS](#) on page 84, or [Using VPM](#) on page 90.

- 6 Select **OK** to proceed with any changes you made.

Select **Cancel** to leave channel zoning unchanged.

Installing HRS

The Host Registration Service (HRS) presents host information that SNCs and MCBs use to manage host access and data retrieval. The information that is presented includes host name, host type, host connection and the online or offline status. This information is sent periodically over the host Fibre Channel connection. The default HRS setting re-registers the host every 5 minutes. You can change the re-registration period to any value between 1 and 255 minutes.

Once HRS is installed, you can get help by typing

```
hrs -h
```

on the command line, and then pressing **Enter**.

AMC uses HRS to facilitate use of **SFM**, **eVPS**, and **VPM**, which are LUN mapping schemes. For more information about them, refer to [Using Scalar Firewall Manager \(SFM\)](#) on page 80, [Using eVPS](#) on page 84, and [Using VPM](#) on page 90.



Note

If you plan to use **SFM**, **eVPS**, or **VPM** install HRS on the appropriate hosts. If you do not plan to use **SFM**, **eVPS**, or **VPM** you can manage your SAN without installing HRS. However, HRS insures that data path conditioning includes the host portion of the data path.

Installing the Host Registration Service for Windows

Install this software on a host computer running the Windows operating system that is attached to an SNC, MCB or network chassis.

- 1 Verify that the Windows host you are configuring has an installed Host Bus Adapter (HBA).
- 2 Obtain `HstRegSrv.exe` from your service representative.
- 3 Select the Windows **Start** button, and then select **Run**.
- 4 Point to `HstRegSrv.exe`.
- 5 Select **OK**.
- 6 Once installation completes, reboot the system.

HRS executes as a service and therefore launches at boot time.



Note

On a Windows system, the re-registration period cannot be changed, because HRS runs as a service rather than an independent program.

Installing the Host Registration Service for Solaris

Install this software on a host computer running the Solaris operating system that is attached to an SNC, MCB or network chassis.



Note

You must uninstall previous versions of HRS on Solaris before installing a newer version.

- 1 Verify that the Solaris host you are configuring has an installed Host Bus Adapter (HBA).
- 2 Obtain `HstRegSrv.tar` from your service representative.
- 3 From the command line type

```
ps -A | grep hrs
```

and press **Enter**.

If a previous version of HRS is found, a message similar to the following displays:

```
<219 ?          0:00 hrs>
```

- 4 If no messages similar to the output in [Step 3](#) display, proceed to [Step 6](#).

If a similar message displays, type

```
pkgrm <package name>
```

and press **Enter**.

- 5 If you removed a package, reboot the host:

```
reboot -- -r
```

- 6 Load the product CD into the Solaris host.

- 7 Find the `HstRegSrv.tar` file.

- 8 Copy `HstRegSrv.tar` to a temporary directory.

- 9 From the directory that has `HstRegSrv.tar` in it, type:

```
tar xf HstRegSrv.tar
```

and press **Enter**.

- 10 Type the following command:

```
pkgadd -d .
```

and press **Enter**.

- 11 Type the following command:

```
reboot -- -r
```

and press **Enter**.

HRS runs when the system is booting. The file that controls this process is `s99hrs` and it can be found in the folder `/etc/rc2.d`

The default re-registration period is 5 minutes.

Changing the re-registration period

- 1 Find the PID for the current HRS process. Type

```
ps -ef | grep hrs
```

and press **Enter**.

- 2 Kill the HRS process. Type

```
kill -9 [PID]
```

and press **Enter**.

- 3 Restart HRS. For the phrase in brackets, substitute the number of minutes you want to elapse between registrations. Type:

```
hrs -i[interval in minutes] -D &
```

and press **Enter**.

This causes HRS to run in the background as a daemon, registering at the specified time interval.

Installing the Host Registration Service for HP-UX

Install this software on a host computer running the HP-UX operating system that is attached to an SNC, MCB or network chassis.

- 1 Verify that the HP-UX host you are configuring has an installed Host Bus Adapter (HBA).
- 2 Obtain `HstRegSrv.depot` from your service representative.
- 3 From the command line type

```
sam
```

and press **Enter**.

- 4 Select the **Software Management** menu, then select **Install Software on the Local Host**.
- 5 After **Source Host Name**: type your host's name.
- 6 After **Source Depot Path**: type the name of the directory that contains the *.depot file.
Type the full file name, `HstRegSrv.depot`
- 7 Select **OK**.
- 8 Select the **Action** menu, then select **Install (analysis...)**
- 9 At the confirmation window select **Yes**.
- 10 Select **Done** when Installation completes.

HRS is located in `/usr/contrib/bin`

- 11 Reboot.
- 12 Optionally, change the re-registration period, by typing

```
hrs -i[interval in minutes] -D &
```

and press **Enter**.

This causes HRS to run in the background as a daemon, registering at the specified time interval.

The default re-registration period is 5 minutes.

Installing the Host Registration Service for AIX

Install this software on a host computer running the AIX operating system that is attached to an SNC, MCB or network chassis.

- 1 Verify that the AIX host you are configuring has an installed Host Bus Adapter (HBA)
- 2 Obtain `HstRegSrv.bff` from your service representative.
- 3 From the command line type

```
smit
```

and press **Enter**.

- 4 Select the **Software Installation and Maintenance** menu, point to **Install and Update Software**. Then select **Install and Update Software by Package Name (includes devices and printers)**.
- 5 Type the path to the `HstRegSrv.bff` file at the command prompt, or select the **List** button on the right side of the screen to select this file.
If you are entering the path, be sure you include the `HstRegSrv.bff` as the file name.
- 6 When prompted to **Select Packages to List**, select **package**.
- 7 When prompted to **Select Software to Install**, select **1.13.0.0 ADIC Host Registration Service**

The software installs.

- 8 Reboot.
- 9 Optionally, change the re-registration period, by typing

```
hrs -i[interval in minutes] -D &
```

and press **Enter**.

This causes HRS to run in the background as a daemon, registering at the specified time interval.

The default re-registration period is 5 minutes.

Installing the Host Registration Service for Linux

To install HRS, perform the following steps:

- 1 Obtain the HRS file from the ADIC website or from your customer service representative.
- 2 At the command line, type `rpm -i HostRegServ-2.0-x.i386.rpm`
- 3 Reboot the host.

The HRS utility will start when the system is booting.

If you reinstall the HRS utility, you must uninstall previous versions first. Use the following procedure:

- 1 At the command line, type `ps -ef | grep hrs`
This command outputs the process ID.
- 2 At the command line, type `kill -9 (process id)`

At the command line, type `rpm -e HostRegServ`

Using Scalar Firewall Manager (SFM)

Scalar® Firewall Manager (SFM) is a software feature that collects all host and target information and manages the end-to-end access control in the SAN. It allows the system administrator to control access privileges between individual Host Bus Adapters (HBAs) and target devices connected to the appliance's SCSI and Fibre Channels.



Note

If you are using an SNC outside of a Scalar library, the SFM feature is called Virtual Private SAN (VPS). To use VPS, you can still follow these instructions. Wherever the instructions specify "SFM," substitute "VPS."

SFM provides you with a finer degree of access control than channel zoning. The **Channel Zoning** feature allows you to map an entire channel to specified host or hosts. SFM maps selected LUNs on selected channels to a specified host or hosts on a SAN-wide basis.

SFM can be used to allow multiple Fibre Channel hosts connected via switches and hubs to be able to share the same SCSI or Fibre Channels while restricting their access to selected LUNs on those channels.

Using SFM does not require the purchase of a license when used to manage access control in SANs consisting of ADIC FC libraries.



Note

When you migrate to extended VPS (eVPS) your mappings must be managed through eVPS. The SFM screen is disabled as a result of the migration.

Installing SFM

Installation of SFM into a system with a developed SAN is different than installation of SFM into a new system.

- 1 Log in as SAN administrator, portal administrator or power user.



Note

Basic users are not authorized to configure SFM. If the portal administrator or power user have access to a portal with only partial access to the SFM configuration, only the SAN administrator can modify access.

- 2 If you want to install the host registration service (HRS) on the hosts that are involved, consult your service representative.
- 3 If you are installing SFM as part of a new SAN installation, proceed to [Step 4](#). For installation into a pre-existing SAN, proceed to [Step 5](#).
- 4 If you are installing SFM into a pre-existing SAN, follow these steps:
 - a. Install HRS on the hosts.
 - b. Leave the hosts running.
 - c. Enable SFM. Refer to [Enabling Licensed Features](#) on page 75.
 - d. Right-click the appliance with SFM enabled.
 - e. Select **Refresh Data**. Refer to [Refreshing Data](#) on page 62.
 - f. Proceed to [Step 6](#).
- 5 If you are installing SFM into a new SAN, follow these steps:
 - a. Load HRS onto the hosts.
 - b. Shut the hosts down.
 - c. Restart the appliance. Refer to [Using Restart](#) on page 64.
 - d. Start up the hosts.
 - e. Enable SFM. Refer to [Enabling Licensed Features](#) on page 75.
 - f. After the hosts are finished booting, right-click the appliance with SFM enabled.
 - g. Select **Refresh Data**. Refer to [Refreshing Data](#) on page 62.
 - h. Proceed to [Step 6](#).
- 6 Expand all node symbols to display all hosts, devices and their assigned LUNs. Refer to [Device Numbering](#) on page 32.

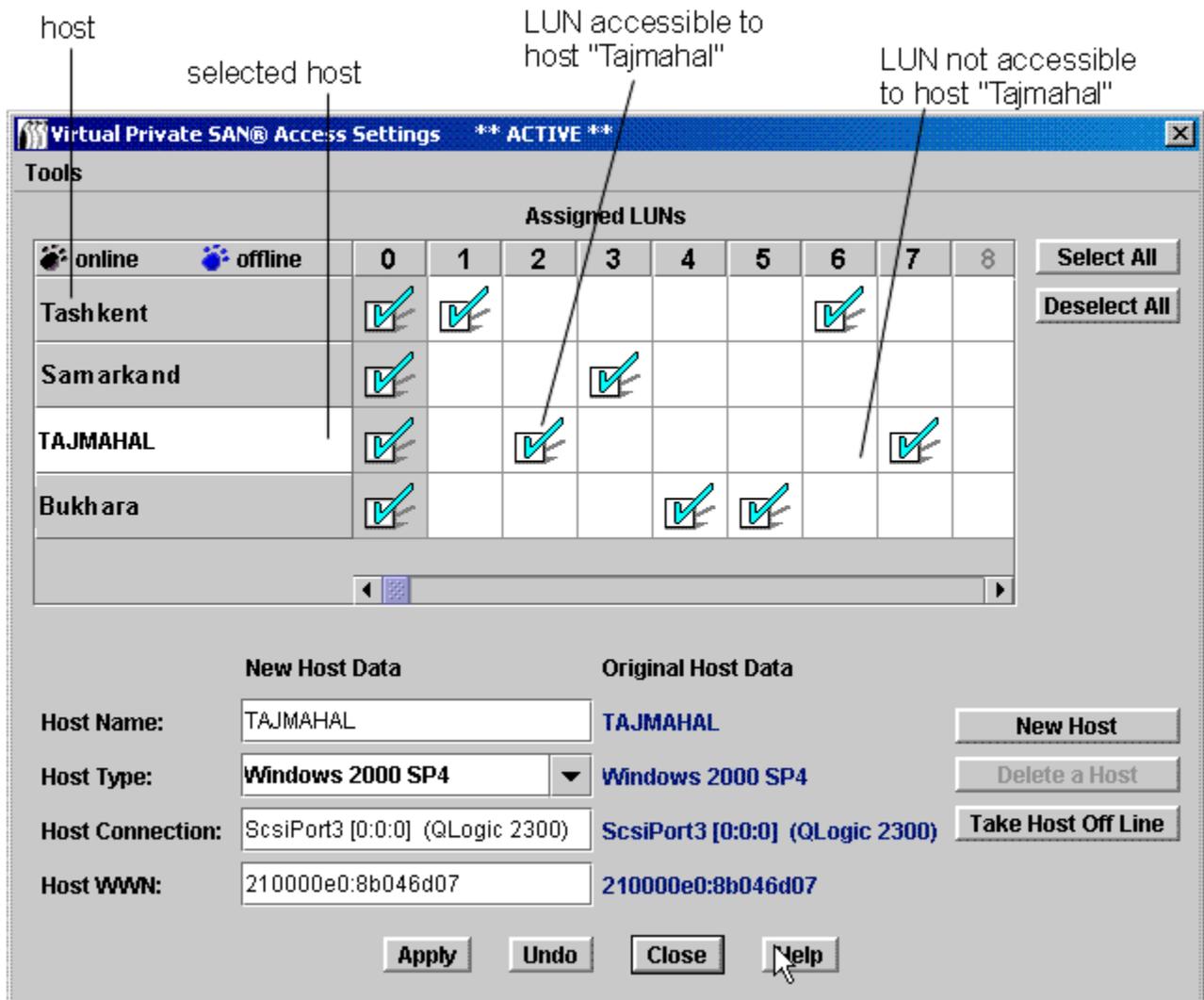
Configuring Access Through SFM

Configure access to certain LUNS for certain hosts. Other hosts will no longer see those LUNs.

- 1 Make a list of which LUNs you want to assign to which hosts.
- 2 From the navigation panel or the graphical panel, right-click the appliance with SFM enabled.
- 3 Select the **Access Options** menu, select **Scalar® Firewall Manager**.

The **Scalar® Firewall Manager Access Settings** dialog box is displayed. See [Figure 12](#) on page 82.

Figure 12 Scalar Firewall Manager access settings dialog box



[Figure 12](#) shows labeled components of the **Scalar® Firewall Manager Access Settings** dialog box.

Registered hosts are shown in the column on the left. When a host is online its name is displayed in black.

When a host is registered but not currently online its name is displayed in blue.

To have complete host information appear in the display, you must first be running HRS. Consult your service representative.

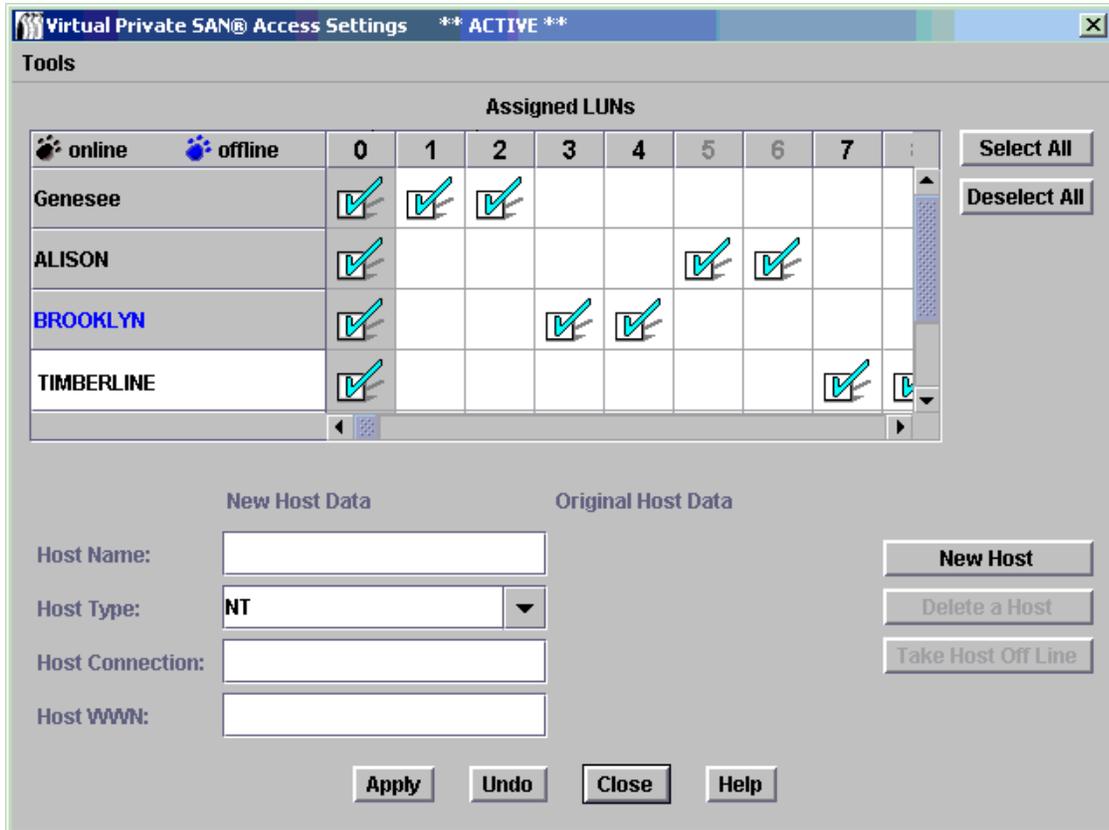
 **Note** Hover the mouse over a LUN or a host in order to have details about it display in a blue popup.

- 4 Select the **Assigned LUN** check boxes to indicate that access is enabled between a LUN and the corresponding host. Select again to revoke access.
 - To select or deselect access to every LUN in a particular host's line, use the **Select All** or **Deselect All** buttons located on the right side of the screen.

- To select or deselect access to all LUNs for a host, find the host's name in the list of hosts in the upper left corner of the screen and select it. Then select **Select All** or **Deselect All**.

Figure 13 on page 83 shows LUNs assigned so that no host can access LUNs that any other host is accessing.

Figure 13 LUNs restricted for selective access by four hosts



- Select **Apply** to keep the changes you made to host data fields and LUN assignments. Select **Undo** button to cancel all changes since the last time **Apply** was used. Select the **Close** button to close the dialog box, or select the **x** button in the upper right corner of the dialog box. If you made changes, a confirmation box presents you with the option of not closing until you apply the changes. Select **Help** if you want context-sensitive help.
- Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Adding SFM Hosts

Hosts can be added to the SAN after initial SFM configuration.

- Select the **New Host** button to add a new host to the system manually. The text boxes in the lower left corner of the screen become available. If you do not have the data for these fields, let the host registration service (HRS) discover the data for you. Talk to your service representative about installing this software.
- Fill in **Host Name** and other information.

- Select the correct **Host Type**, which is the operating system or appliance type, from the **Host Type** drop-down list.
 - The **Host Connection** consists of the port number that the host attaches to, the host's IP Address, and information about the HBA.
 - You must know the host's World Wide Name to add it manually.
- 3 When you are finished, select either **Accept New Host** or **Quit New Host**.
 - 4 Select the **Apply** button to keep the changes you made to host data fields and LUN assignments.
 - 5 Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Deleting SFM Hosts

Hosts can be removed from the SAN after initial SFM configuration.

- 1 Select the host's name in the **SFM Access Settings** dialog box.
In [Figure 13](#) on page 83, the hosts online are Genesee, Alison, and Timberline.
If the host is currently online, you cannot delete it until you select the **Take Host Off Line** button.
Once a host is selected, information about it is displayed in the bottom portion of the dialog box.
- 2 Select the **Delete a Host** button.
- 3 Select the **Apply** button to keep the changes you made to host data fields and LUN assignments.
Select the **Undo** button to cancel all changes since the last time **Apply** was used.
Select the **Close** button to close the dialog box, or select the x button in the upper right corner of the dialog box. If you made changes, a confirmation box presents you with the option of not closing until you apply the changes.
- 4 Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Using eVPS

The access control you achieve with SFM for SAN-wide LUN mapping can be extended to per-host LUN mapping using eVPS (extended Virtual Private SAN).



Note

When you migrate to eVPS, your mappings must be managed through eVPS. The SFM screens are disabled as a result of the migration.

You can achieve faster, cleaner management access to mapped LUNs with eVPS. All hosts see the LUNs to which they have access beginning at LUN 1, rather than beginning at a potentially very high LUN number that is the device's actual LUN. Like SFM, eVPS can be used to allow multiple Fibre Channel hosts connected via switches and hubs to be able to share the same SCSI or Fibre Channels while restricting their access to selected LUNs on those channels.

- Use eVPS to map LUNs to hosts on a per host basis.
- The total number of LUNs that can be mapped is 2048.
- The total number of LUNs that can be mapped per host is 256.

Using eVPS requires you to purchase a license.



CAUTION

Windows Server products only support up to 254 LUNs per Target ID.

Installing eVPS

Installation of eVPS into a system with a developed SAN is different than installation of eVPS into a new system.



Note

Basic users are not authorized to configure eVPS. If a portal administrator or power user has access to a portal with only partial access to the eVPS configuration, only the SAN administrator can modify access.

- 1 Log on as the SAN administrator, portal administrator, or power user.



CAUTION

If you have made channel zoning assignments, review them to be sure they do not conflict with eVPS assignments. If your SAN has a large number of hosts, it is not recommended that channel zoning be run simultaneously with eVPS.

- 2 If you want to install the host registration service (HRS) on the hosts that are involved, consult your service representative.
- 3 If you are installing eVPS as part of a new SAN installation, proceed to Step 5. For installation into a pre-existing SAN, proceed to [Step 4](#).
- 4 If you are installing eVPS into a pre-existing SAN, follow these steps:
 - a. Install HRS on the hosts.
 - b. Leave the hosts running.
 - c. Enable eVPS. Refer to [Enabling Licensed Features](#) on page 75.
 - d. Right-click the appliance with eVPS enabled.
 - e. Select **Refresh Data**. Refer to [Refreshing Data](#) on page 62.
 - f. Proceed to [Step 6](#).
- 5 If you are installing eVPS into a new SAN, follow these steps:
 - a. Load HRS onto the hosts.
 - b. Shut the hosts down.
 - c. Restart the appliance. Refer to [Using Restart](#) on page 64.
 - d. Start up the hosts.
 - e. Enable eVPS. Refer to [Enabling Licensed Features](#) on page 75.
 - f. After the hosts are finished booting, right-click the appliance with eVPS enabled.
 - g. Select **Refresh Data**. Refer to [Refreshing Data](#) on page 62.
 - h. Proceed to [Step 6](#).
- 6 Expand all node symbols to display all hosts, devices and their assigned LUNs. Refer to [Device Numbering](#) on page 32.

Configuring Access Through eVPS

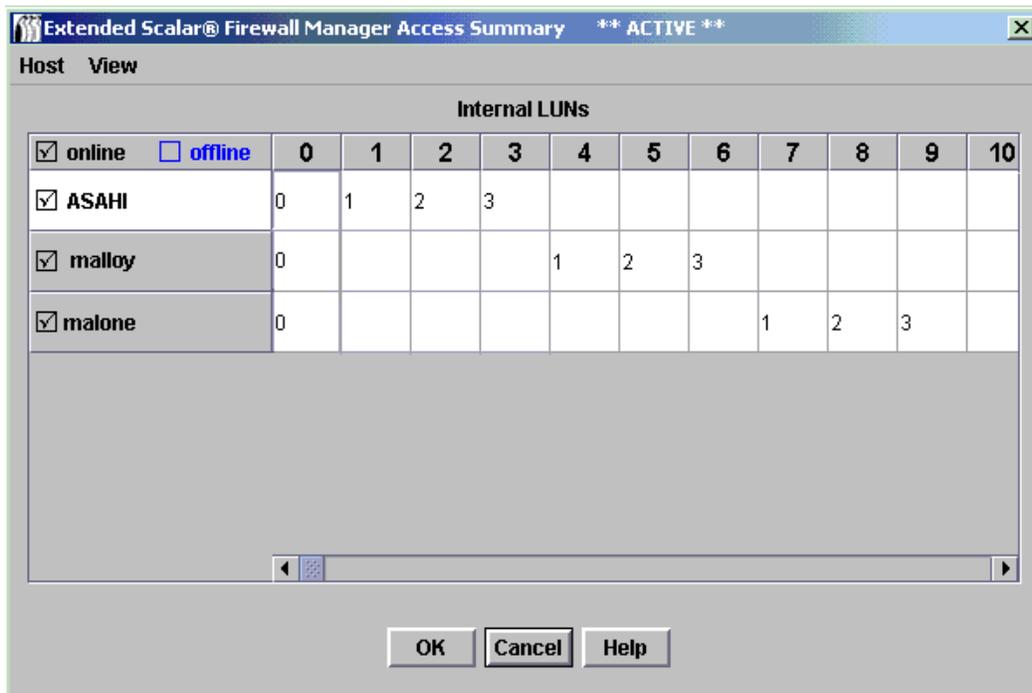
Configure access to certain LUNs for a particular host, beginning the LUN numbering at 1. The host will no longer have to scan the full bus in order to see devices with high LUNs to which it has access. Those LUNs will appear to the host as if their numbering begins at 1. Once mapping is complete, other hosts will no longer see LUNs mapped to a particular host. There are two perspectives from which to do this mapping:

- From the appliance's perspective
- From the host's perspective

Assigning LUNs to host(s) using the appliance perspective

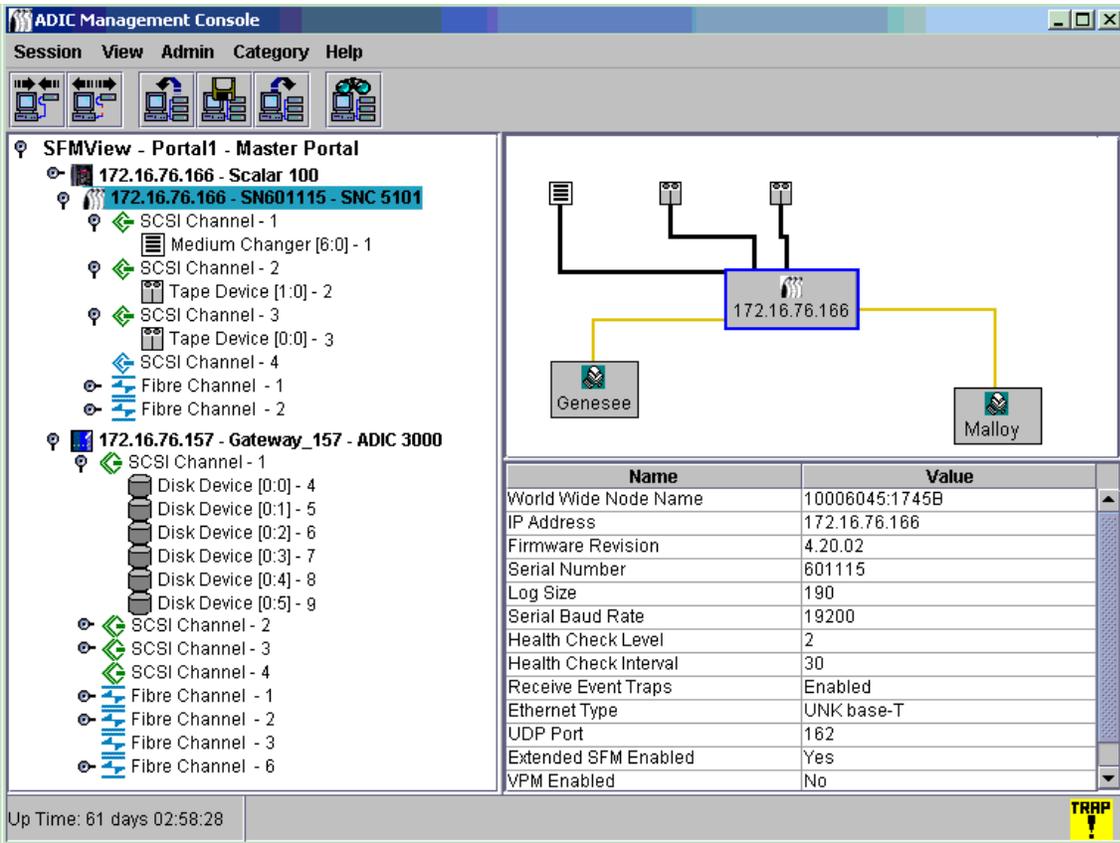
- 1 Make a list of which LUNs you want to assign to which host(s). A maximum of 64 hosts can be connected to a Fibre Channel.
- 2 Right-click the appliance with eVPS enabled.
- 3 Select the **Access Options** menu, select **Extended Virtual Private SAN®**.
The **eVPS Access Settings** dialog box is displayed.

Figure 14 eVPS mappings for internal LUNs 0-9



Compare the Internal LUNs in [Figure 14](#) to the assigned LUNs in the navigation panel shown in [Figure 15](#) on page 87.

Figure 15 Assigned LUNs 1-9 in the navigation panel



In [Figure 14](#) on page 86, registered hosts are shown in the column on the left. When a host is online its name is displayed in black. When a host is registered but not currently online its name is displayed in blue.

The number in the “Internal LUN” row is in black if a LUN is online. Otherwise the Internal LUN number is grayed out.

To have complete host information appear in the display, you must first be running HRS. Consult your service representative.

- 4 Type a number into an Internal LUN check box to indicate that access is enabled between a LUN and the corresponding host.

Delete the number to revoke access.

In [Figure 14](#) on page 86, each host has had LUNs mapped to it that it will see as LUNs 0-3.

- 5 Select the **OK** button to keep the changes you made to host data fields and LUN assignments.

Select the **Cancel** button to cancel all changes.

Select the **Help** button to get context-sensitive help.

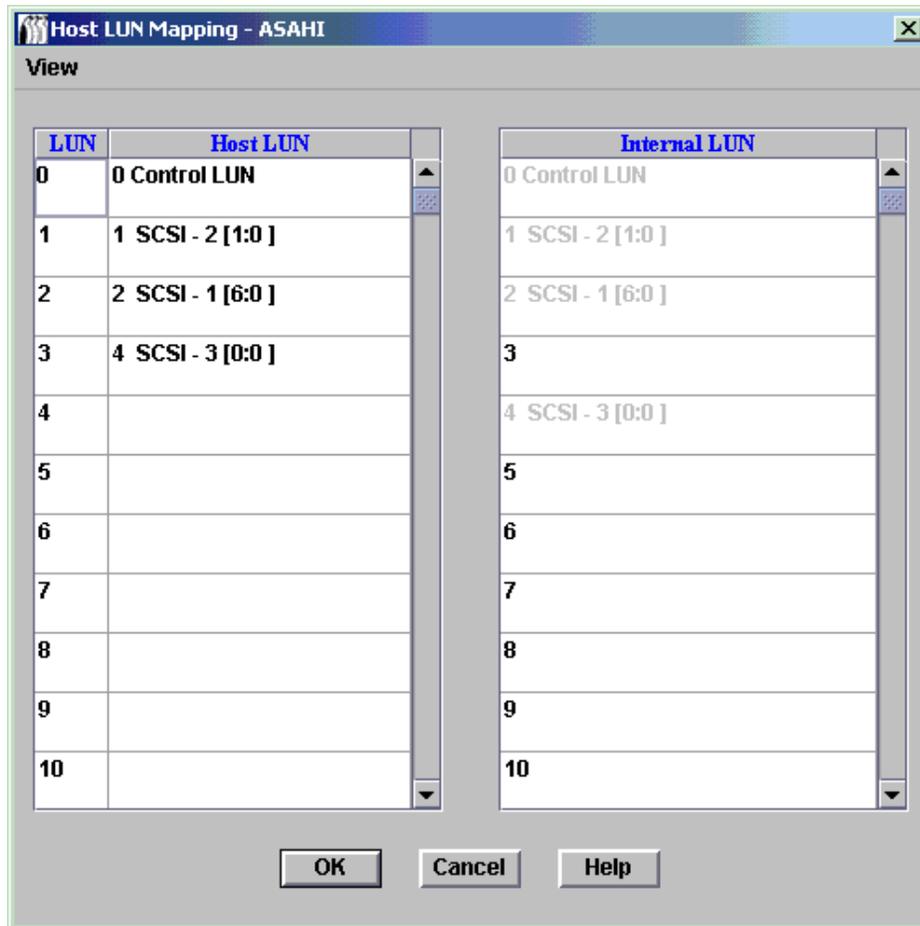
- 6 Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Assigning LUNs to host(s) using the host perspective

- 1 Select the **Host LUN Mapping** command from the **Host** menu on the **eVPS Access Summary** dialog box.

The **Host LUN Mapping** dialog box is displayed.

Figure 16 Host LUN mapping



The host LUN mapping in [Figure 16](#) is for the host named “Asahi.” Compare the mapping displayed in [Figure 14](#) on page 86 to the host LUN map in [Figure 16](#) . The host LUNs 0-3 in [Figure 16](#) on page 88 correspond to Internal LUNs 0, 1, 2, and 4.

- 2 Make any necessary changes.
- 3 Select **OK**.

The **View** command on the **Host LUN Mapping** dialog box operate as a toggle, in the same way that the **View** menu operates on the **eVPS Access Summary** dialog box.

Refer also to [Using the eVPS View Menu](#) on page 89.

Adding or Modifying eVPS Hosts

Hosts can be added to the SAN after initial eVPS configuration.

- 1 Select **Add Host** or **Modify Host** from the **Host** menu on the **eVPS Access Summary** dialog box.
- 2 Fill in **Host Name**, **Host Type**, **Host Connection**, and **Host WWN**.

Refer to [Adding SFM Hosts](#) on page 83 for details on filling out these fields. The **eVPS Host Configuration** dialog box is used to let AMC know about hosts that are using SFM.

- 3 Select the **OK** button to keep the changes you made to host data fields and LUN assignments.
- 4 Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Deleting eVPS Hosts

Hosts can be removed from the SAN after initial SFM configuration.



CAUTION

Be sure the host that you want to delete is offline. Offline hosts are shown in blue.

- 1 If the host is not offline, select **Take Host Offline** from the **Host** menu on the **eVPS Access Summary** dialog box.
- 2 Select **Delete a Host** from the **Host** menu on the **eVPS Access Summary** dialog box.
- 3 Select **OK** to proceed with the host deletion.
- 4 Save your configuration. Refer to [Saving and Loading the Configuration](#) on page 62.

Using the eVPS View Menu

The **Show Details** and **Show All LUNs** commands are used to get quick info on the eVPS device map.

Check and uncheck the boxes in front of the toggled choices **Show Details** and **Show All LUNs** under the **View** command on the **eVPS Access Summary** dialog box.

[Figure 17](#) and [Figure 18](#) on page 90 illustrate a view of all LUN space available to eVPS and a view of only the LUNs under eVPS control, respectively.

Figure 17 eVPS **Show all LUNs** command

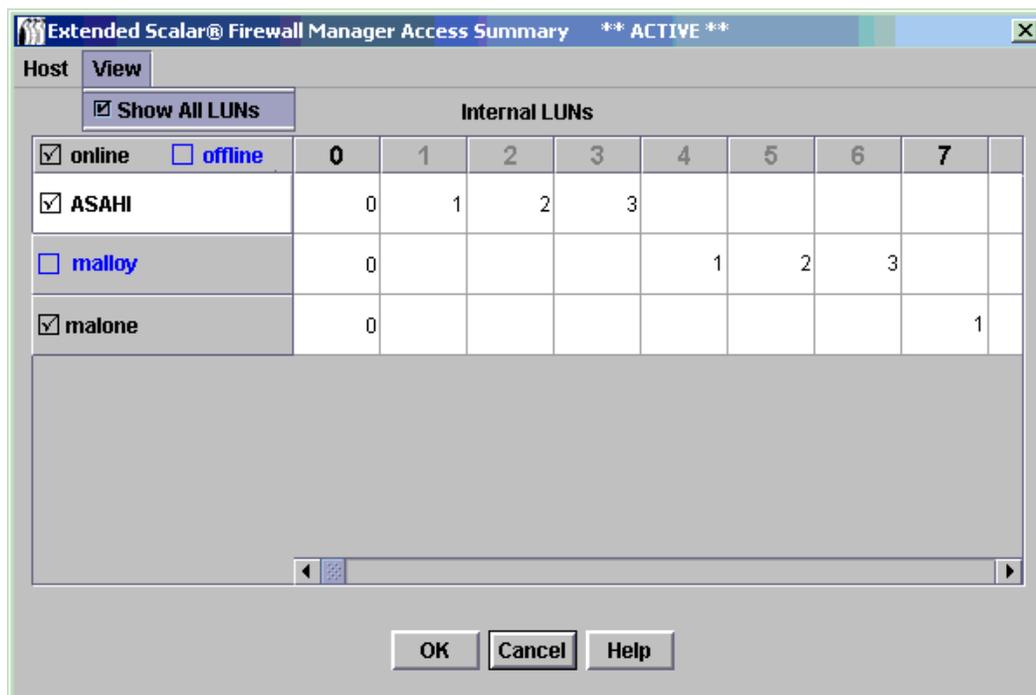
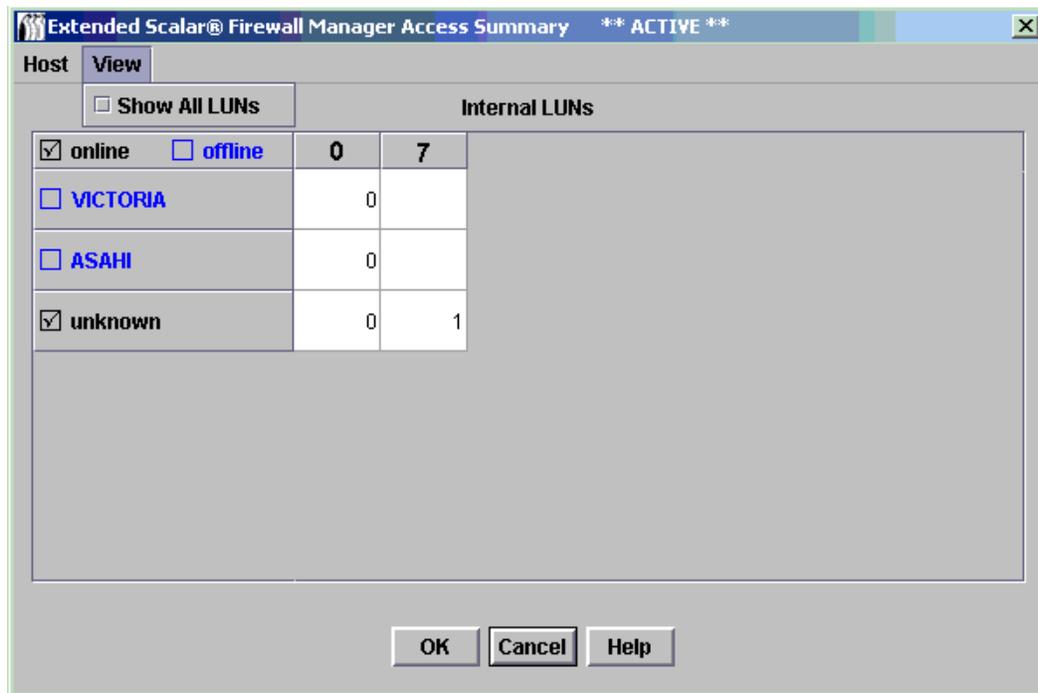


Figure 18 eVPS Do Not Show All LUNs command



Using VPM

VPM (Virtual Private Map) allows a SCSI attached host to map Fibre Channel devices to Fibre Channel LUNs.

If you have made channel zoning assignments, review them to be sure they are not in conflict with VPM assignments. It is not recommended that channel zoning be run simultaneously with VPM.

Preparing to Use VPM

- 1 Log on as the SAN administrator or portal administrator.



Note

Basic users and power users are not authorized to configure VPM.

- 2 If you want to install the host registration service (HRS) on the hosts that are involved, consult your service representative.
- 3 Right-click the SCSI channel where the host is attached.
- 4 Change SCSI channel port mode to **Target**. Refer to [Configuring the SCSI Channel](#) on page 68.



CAUTION

Do not forget to reset the channel, which is the last step in the Configure SCSI channel procedure.

- 5 Reboot the host.
- 6 Enable VPM. Refer to [Enabling Licensed Features](#) on page 75.

Making VPM assignments

- 1 Right-click the SCSI channel that has been set to **Target**.
- 2 Select **Virtual Private Map**.



Note

If you right-click a SCSI channel not set to **Target**, or if you have not enabled VPM, the VPM command on the selected SCSI channel is not available.

The **VPM** dialog box opens.

The **ID/LUN/Device** column of the VPM display provides map space for IDs 0-15 associated with the selected SCSI channel, LUNs 0-7 associated with each ID, and a box into which a device from the **Device** column can be dragged and dropped in order to occupy a particular ID and LUN on the SCSI host channel. For information about device numbering, refer to [Device Numbering](#) on page 32.

Drag and drop the devices from the **Device** column to the appropriate LUN in the **ID/LUN/Device** column.

When a target device has been mapped, it is displayed in gray in the **Device** column.

To see the grayed out images of the Fibre Channel devices, scroll the **Device** column down to the higher LUN range to which these devices were mapped during discovery.

- 3 Select **OK** to save mapping.

The VPM map is automatically saved as part of the configuration.

The message *Made Virtual Private Mapping changes* appears in the **Status/Message Area**.

12

Troubleshooting the SAN

This section references event codes and error messages that may appear in the event trap window or the event log maintained by the AMC server. For in-depth maintenance, repair, and troubleshooting information refer to the maintenance manual for your library or the hardware guide for your SNC.

Monitoring and Managing Event Logs

For libraries that have an SNC, submenus under **Events** allow you to control the way the event log is displayed and how traps are generated. Traps (messages) are generated when an event occurs at a specific frequency. Refer to [Setting the Event Trap Threshold](#) on page 97. Events can also be managed by the policy engine, so that you receive email notices about trap event conditions. Refer to [Configuring Policies](#) on page 58.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Events** menu, then select **View Event Log**.
The event reporting level is displayed.
- 3 Select **Warning** to display **Warning** and **Notice** events.
Select **Information** to display **Information**, **Warning** and **Notice** events.
Selecting **All Events** is equivalent to selecting **Information**.
- 4 Select **OK** to continue. If you selected **OK**, the event log is displayed. Use scroll bars to navigate through the log.
 - a. Click, shift-click, control-click to select all or some of the events in the event log, or from the **Edit** menu, select **Select All**.
 - b. To copy the selected events to a text file, select the **Edit** menu, then select **Copy**.
 - c. To save events to a text file, select the **File** menu, then select **Save**.

Printing the Event Log

- 1 Follow the procedure in [Monitoring and Managing Event Logs](#) on page 93.
- 2 With the event log window displayed, select the **File** menu, then select **Print**.
The printer dialog box opens.
- 3 Confirm that the log be sent to your printer.
By default, all pages are sent to the printer.

- If you do not want to print all the pages of a lengthy event log, click, shift-click and/or control-click to select the lines you want to print.
- Paste this text into a file editor.
- Select the **File** menu, then select **Print**.

Saving a Copy of Currently Displayed Entries

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Events** menu, then select **Save Event Log**.
- 3 Type a name for the file in the browser dialog box.
If you do not want to save the file to the default location, browse to a new location.
- 4 After the log is saved, you are asked if you want to clear the event log on the selected appliance.
Select **Yes** to clear the event log.
Select **No** to preserve the event log as is.

Interpreting the Event Log

Use [Table 4](#) to interpret listed events. Make a note of pertinent event codes and refer to the *SNC Firmware 4 Reference Guide* for troubleshooting actions.

If there are no abnormal events, but behavior is still unacceptable, go to [Performing Health Check](#) on page 102.

Table 4 Event Codes and Actions

Event Code	Description
8	Sense data recorded following a check condition. Note: Normally, the host system will request and process sense data and then perform error recovery.
9	LUN reports a “unit attention” condition on a non-removable media device
11	SNC reports a temperature change (event message indicates the change to high, very high, reduced to high, or OK)
13	Appliance is shutting down as requested by AMC (a Restart was requested)
14	Additional status information used for diagnostics
16	A SCSI bus reports an unexpected interrupt
17	Fibre Channel interface reports a LIP reset was received from a host
18	Fibre Channel interface reports a system error
19	Fibre Channel interface reports an error processing a request
20	Fibre Channel interface reports an error processing a response
21	Appliance processor memory fault detected
22	Fibre Channel interface detected a LIP

Table 4 Event Codes and Actions

Event Code	Description
23	Fibre Channel interface reports a loop up
24	Fibre Channel interface reports a loop down
25	Appliance PCI bus parity error detected
26	Appliance PCI interface error detected
27	A device has been added to a SCSI bus
28	A SCSI bus reports a reset has been detected
29	Appliance has added a device to its configuration table Note: The trap is delayed until the appliance has been up for 60 seconds.
30	Appliance has removed a device from its configuration
31	Appliance logging service has started
33	An interface has detected a bus fault (event message indicates the specific interface)
34	An interface has detected a device fault (event message indicates the specific interface)
35	A SCSI interface reported an unexpected disconnect by a device
36	A parity error was detected on a SCSI bus
37	Fibre Channel port database change detected
39	Directory Server on fabric has changed
40	Maximum LUN limit has been exceeded
41	Fibre Channel transfer failure Note: Error recovery may have succeeded.
42	Maximum device limit has been exceeded (persistent address map database is full)
43	Fibre Channel interface driver reported debug file dump (event log contains further information)
58	Power has returned to nominal from warning or alarm stage
59	Power has entered warning range from nominal range (power falling) or alarm range (power improving)
60	Power has entered alarm range
61	Inlet air, outlet air, or I/O processor temperatures have entered nominal range from a warning or alarm range
62	Inlet air temperature has entered warning range from nominal range (heating up) or alarm range (cooling down)
63	Inlet air temperature has entered alarm range
64	Outlet air temperature or I/O processor temperature has entered warning range from nominal or alarm ranges

Table 4 Event Codes and Actions

Event Code	Description
65	Outlet air temperature or I/O processor temperature has entered alarm range
66	Fan is operating in nominal range after operating in a fault state
67	Fan speed has entered warning range (tachometer fans only)
68	Fan speed has entered alarm range (tachometer fans) or is stalled (rotor stall fans)
70	Appliance restart completed
71	Firmware upload completed
72	More than 64 initiators per FC Channel
73	Data path failover has occurred at FCn WWPN=nnnnnnnn:nnnnnnnn lun=nxn loopId=nxn
75	Host has gone offline.
76	Has has come online.
150	The event log is about to overwrite the earliest events
	Health Check Event Descriptions
100	Power supply is out of specification
102	Temperature change detected since the last report (event message indicates the change to high, very high, reduced to high, or OK)
106	Fibre Channel interface failed health check
107	SCSI interface failed health check
109	Target device failed health check
110	Fibre Channel link status changed
111	Fibre Channel transfer failures detected since the last report Note: Error recovery may have succeeded.
112	Blower/Fan is running in warning or alarm range
113	Power is running in warning or alarm range
114	Temperature is running in warning or alarm range
115	Network is running at 10 Mb/sec
	Heartbeat Event Descriptions Note: These event codes are not logged in the event log. Notification of these events occurs from AMC.
200	The server could not verify the connection to the appliance
201	The client could not communicate with the server
202	The server could not communicate with the Client
203	Heartbeat communication restored

Setting the Event Trap Threshold

The **Trap Threshold Level** determines how many times an event can occur in a ten minute period before it is reported to client **Received Event Trap** windows. To receive email messages, in addition to event traps, refer to [Configuring Policies](#) on page 58.

- 1 Log on as SAN administrator.



Note

Portal administrators, power users, and basic users are not authorized to change event trap thresholds. For user privileges, refer to [Table 2](#) on page 40.

- 2 Right-click an appliance in the navigation panel or the graphical panel.

- 3 Select the **Events** menu, then select **Set Event Trap Threshold**.

The **Event Trap Thresholds** dialog box is displayed.

- 4 Select the event.

- 5 Select the **Change** button.

The **Event Threshold** dialog box is displayed.

No event is recorded when an FCAL Loop Down occurs, because the threshold is set to “0.”

Most events are set to a threshold of “1,” which means that an event is recorded whenever the condition occurs.

The **FCAL LIP Occurred** event is the only event that has a threshold set to something other than “0” or “1.” It is set to “10.” Users are not typically interested in the occurrence of FCAL LIPs, unless they are happening once a minute or more.

- 6 Set the trap event threshold to the number that you have determined will optimize performance.

Do not change trap thresholds unless recommended by your service representative.

- 7 Select **OK**.

Receiving Event Traps

By default, event traps are received by the client.

- 1 Right-click an appliance in the navigation panel or the graphical panel.

- 2 Select the **Events** menu, then select **Receive Event Traps**.

- 3 Select the check box before the phrase **Receive Event Traps**.

The check mark is removed and a confirmation dialog box is displayed.

- 4 Select **Yes** if you do not want to receive event traps.

Select **No** if you want to continue receiving event traps.



Note

If you exit and restart the AMC client, event traps will be received until you turn them off again.

Monitoring Received Event Traps

When a trap is received, a symbol is displayed in the **Status/Message Area** on the bottom of the main screen.

- 1 Select the **Received Event Traps** window, which is always running when an instance of the client is running. It may be minimized, however.

For more about the **Received Event Traps** window, refer to [Reading the SAN Management Information Panels](#) on page 26.

- 2 Look in the **Received Event Traps** window to see trap messages.

Messages identify the appliance by its IP address. They also include a date and timestamp, an event code, and a description of the event that caused the trap.

- 3 Double-click an event in the window to display more detailed information about the event.

Select **OK** to close the detail.

Monitoring the LED Panel

When I/O is running, the LED panel of the SNC is active. If there are problems when the SNC is being brought online, the LEDs will freeze in specific meaningful configurations. To determine the meaning of the LEDs and LED patterns, consult the *Hardware User's Guide* for the appliance. I-platform libraries have different LED panels that cannot be displayed by AMC. Consult their documentation for LED information.

- 1 Right-click an appliance in the navigation panel or the graphical panel.

- 2 Select **Show LED Panel**.

A new window opens with a graphical representation of the appliance's LED panel. You can monitor LED activity in real time by looking at this window. See [Figure 19](#) through [Figure 23](#).

Figure 19 SNC 5101 LED panel

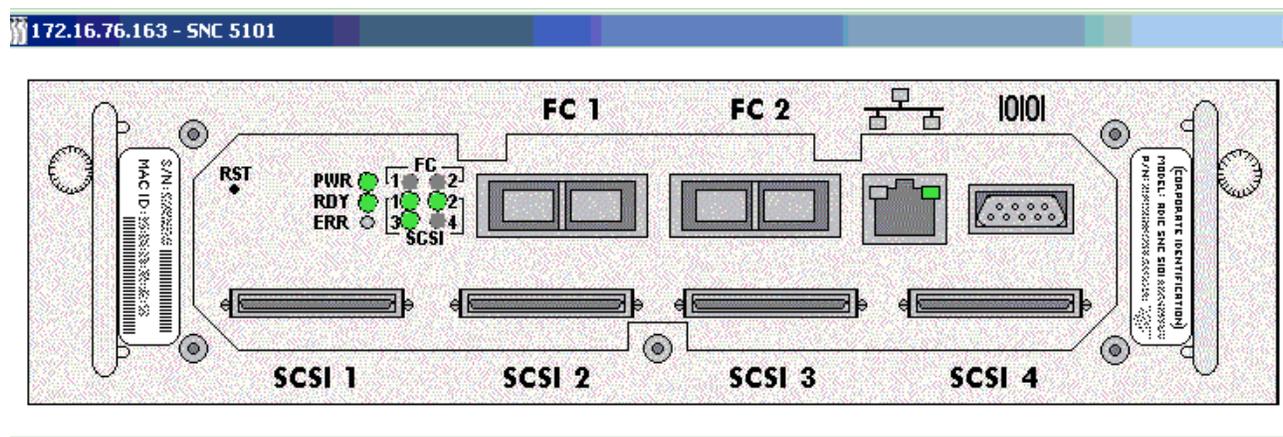


Figure 20 ADIC SNC 3000 LED panel

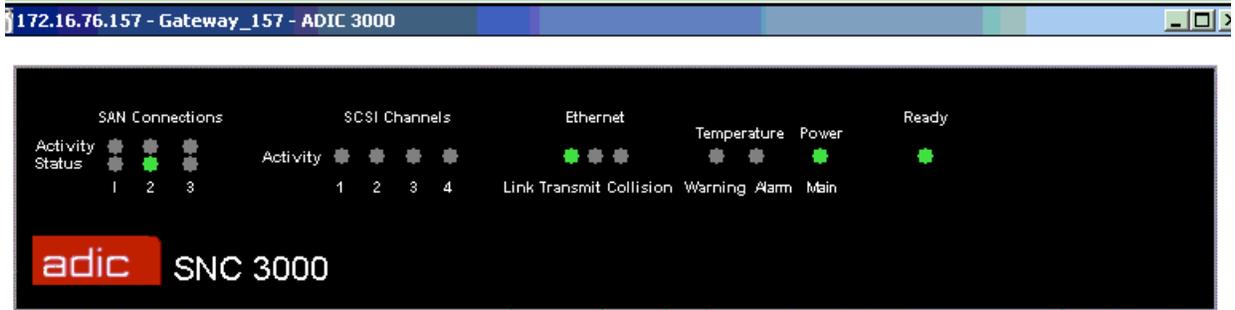


Figure 21 SNC 4000 LED panel

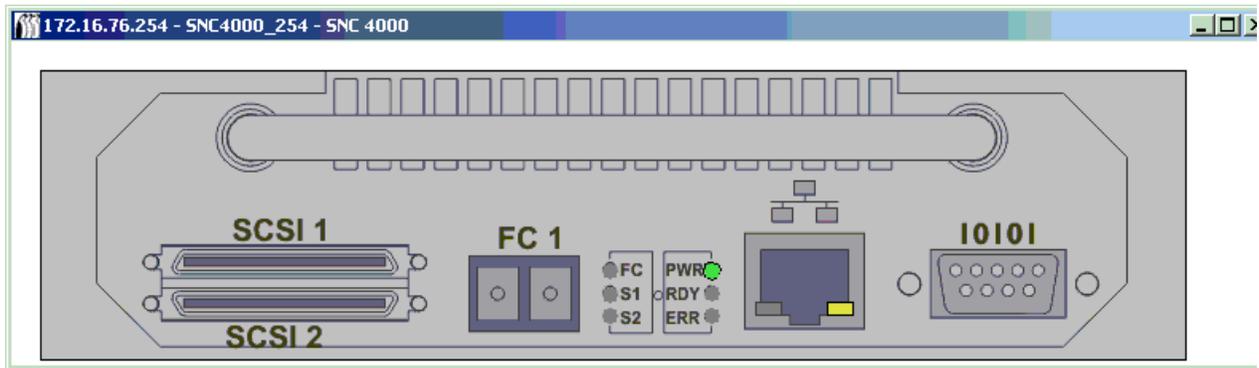


Figure 22 SNC 5100 LED panel

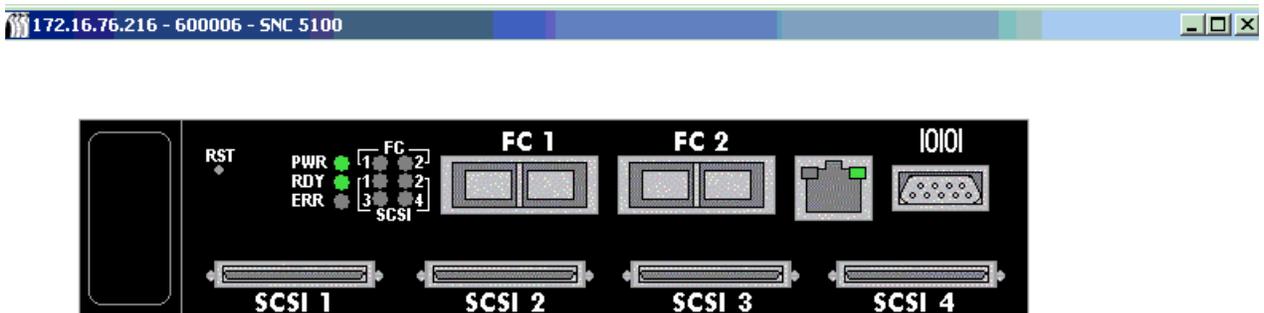


Figure 26 SNC 4000 Ready LED

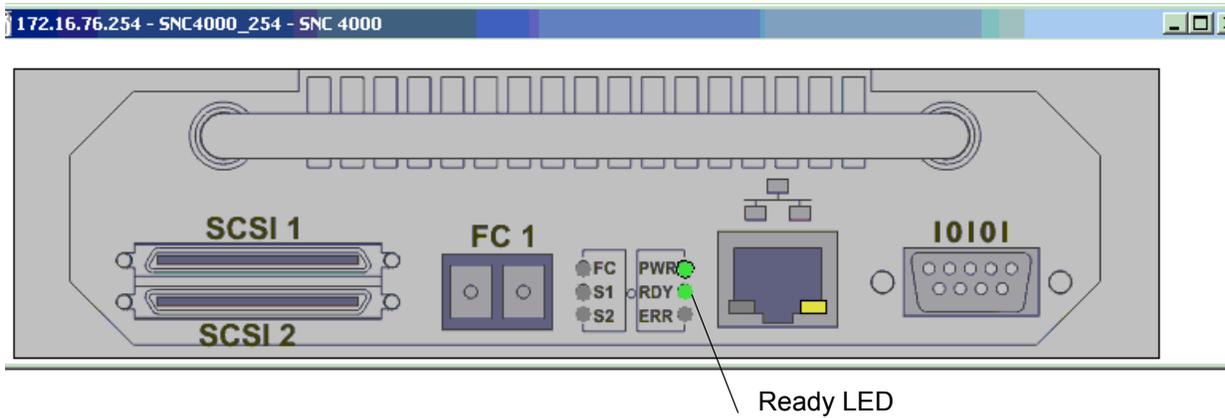
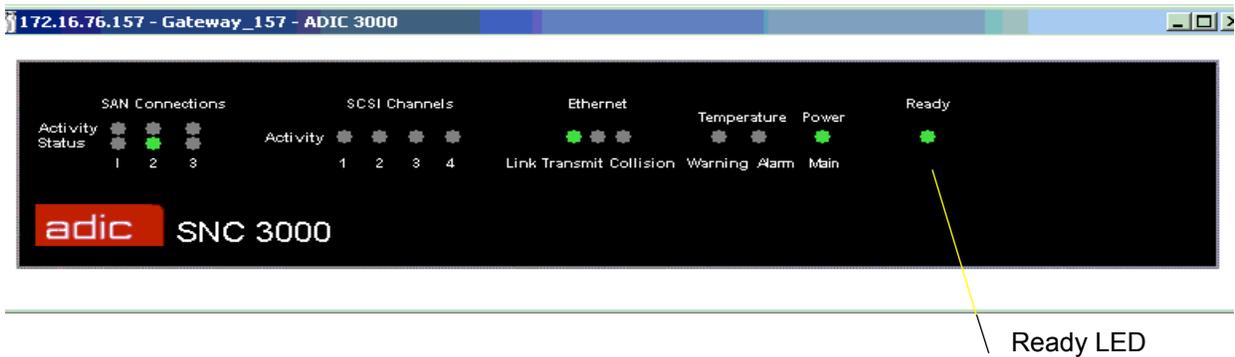


Figure 27 ADIC 3000 Ready LED



- 5 After you have identified the appliance, select **Cancel** in the **Flash Ready LED** dialog box to return the **RDY** LED to normal functionality.

Monitoring Environmental Data

Not all appliances in the SAN are capable of providing this data. If the appliance you select is not capable of communicating this information, **Get Environmental Data** does not appear on the appliance menu.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Get Environmental Data**.
- 3 The **Environmental Data** dialog box is displayed.

Real-time measurements are indicated by the white pointers in each graphic.

The nominal range for each parameter is all values between the yellow bars.

The warning ranges for each parameter are the ranges at either end, bordered by one yellow bar and one red bar.

The alarm ranges for each parameter are the ranges at either end, bordered by one red bar and the absence of a bar.

- 4 When you are finished viewing the data, select **OK**.
- 5 Environmental data ranges may vary from appliance type to appliance type.

Using Health Check

Health Check allows you to determine periodically the operational state of SNC connections to the interfaces it controls. When the **Health Check** is disabled, the SNC performs no periodic checks beyond monitoring environmental status lines, which indicate power supply and temperature conditions. The **Health Check** function posts SNMP traps when required to convey status information to the user interface.

Performing Health Check

The **Perform Health Check** command requests an immediate health check at the current level specified. This check is performed regardless of the Health Check Interval setting.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Health Check** menu, then select **Perform Health Check**.

Unless you have reset the level, Health Check is performed at the **Interface Test** level. Refer to [Table 3](#).

Table 3 Health Check Levels

Level Name	Functionality
None	Health check disabled
Basic Function	Check power supply and temperature status
Interface Test	Everything from Basic level in addition to checking all interfaces
Device Test	Everything from Interface Test level, in addition to performing a Device Inquiry on each target device
Device Ready	Everything from Device Test level, in addition to performing a Test Unit Ready on each target device (non-removable media only)



Note

Health check levels in AMC are not identical to the health check levels used by the library management clients for the i-platform libraries.

A message posts in the **Status/Message area** if the test is successful, For example, *Successful Health Check* is displayed in this area.

Configuring Health Check

You can configure **Health Check** settings.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Health Check** menu, then select **Health Check Settings**.

The default tab is the **Level** tab. See [Table 3](#) on page 102. Options on this tab allow you to choose how thorough the health check will be when it is performed.

- 3 When you are satisfied with the level, select **OK**.

If you decide not to change the health check level settings, select **Cancel**.

- If you selected **Cancel**, above, and you want to adjust the interval when Health Checks are performed, repeat [Step 1](#) - [Step 3](#) above.
 - Then select the **Interval** tab.
- 4 On the **Interval** tab, type the amount of time that should elapse between automatic health checks on the selected appliance. The interval can range from 0 to 65,535 minutes. The default interval is 60 minutes. Selecting 0 disables the Health check.

Checking the Heartbeat

The heartbeat is a simple communication check between an appliance and a device.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select the **Health Check** menu, then select **Check Heartbeat**.

If the test is successful, *xxx.xxx.xxx.xxx is responding*, where the x's represent an IP address, is displayed in the **Status/Message Area**.

Heartbeat checks are performed automatically at five minute intervals.

Obtaining a Drive Dump

As a part of troubleshooting, you can download a drive dump. A drive dump is a recording of the state of the drive at a particular instant used for purpose of debugging. Two logs are pulled: the current log and the forced log.

- 1 Stop all I/O to the device. For instructions, refer to the appliance's Hardware User Guide.
- 2 Log on as SAN administrator, portal administrator, or power user.



Note

Basic users are not authorized to obtain drive dumps. If the portal administrator or power user have access to a portal with only partial access to the appliance for which firmware is to be uploaded, only the SAN administrator can obtain a drive dump.

- 3 Expand the appliance in the navigation panel or the graphical panel. Expand the appropriate channel.
- 4 Right-click the device graphic.
- 5 Select **Drive Dump**.

A file browser is displayed.

- 6 Enter the location that you want to save the drive dump to.
- 7 Click OK.

First the current drive log is retrieved. It is saved with the name entered in Step 6. Then the forced drive log is retrieved. It is saved with the filename entered in Step 6, followed by the string "_force."

- 8 Work with your service representative to interpret the drive dump.



Note

Drive dumps can be obtained for SDLT-320 drives, SDLT-600 drives, and all IBM LTO drives.

Checking the Command Flow Log

Two kinds of events are recorded in the command flow log (CFL) file: sequence events and single command events. Sequence events are Read/Write commands. All other events are single command events. You can retrieve the CFL log file for use as a diagnostic tool.

Not all appliances in the SAN are capable of providing CFL data. If the appliance you select is not capable of communicating this information, Command Flow Log does not appear on the appliance menu.

- 1 Right-click an appliance in the navigation panel or the graphical panel.
- 2 Select **Command Flow Log**.

The system attempts to log the user on to the SNC FTP server. If no default logon account is found, the user is prompted to enter logon credentials. After you have logged on, the **Save Command Flow Log** dialog box is displayed.

- 3 Navigate to the location you want to save the log to. Enter a filename.
- 4 Click **Save**.

The number of bytes being saved is shown and is updated periodically until the entire file is saved.

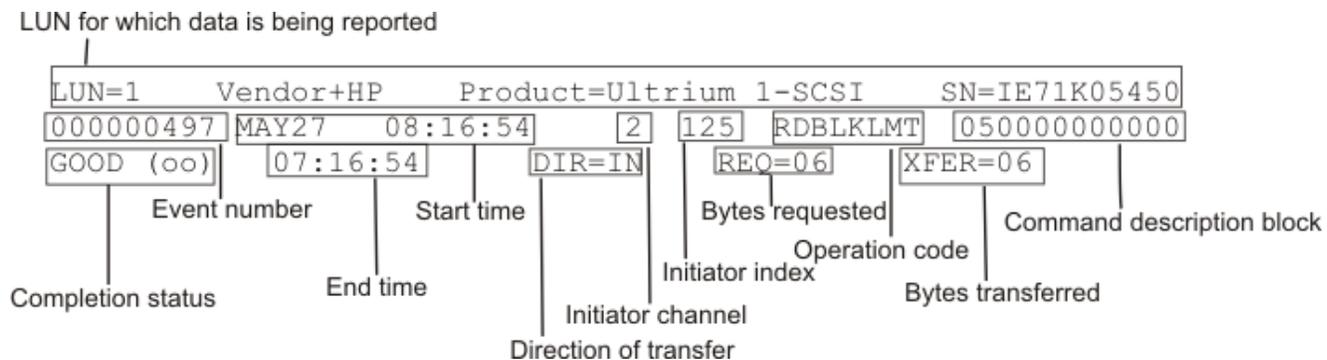
- 5 Open the log file with a text editor.

Interpreting CFL Output

SCSI commands flow through SNCs connected to tape libraries. These commands are logged in command flow log (CFL) areas on the SNC. CFLs exist for each target, including the SNC, up to a maximum of 10 targets. The following information is recorded in the CFL:

- LUN number of the device for which information is being provided.
- Device's vendor, product ID, and serial number
- Month, day of the month, start time
- Initiator channel, initiator index
- Event name
- Number of times the SNC carried out the event
- Number of errors recorded in the course of the event being carried out
- Direction of data transfer (to or from the host)
- Number of bytes actually transferred
- Operation code
- Command descriptor block
- Command completion status
- End time

Figure 28 CFL output



The output starts with the internal LUN number of the device for which information is being provided. The device's vendor, product ID, and serial number are also listed in this line:

```
LUN=1 Vendor=HP Product=Ultrium 1-SCSI SN=IE71K05450
```

After this line, numbered events pertaining to the cited LUN are printed. Each line begins with an event number. In the following example, the event number is 506:

```
000000506 MAY27 08:17:12 2 125 WRITE=021540 ERR=000000 08:28:45
```

In event 506 the word "Write" after the initiator index indicates that the sequence event "Write" is being logged. The number "021540" after "Write" represents the number of times the SNC carried out the "Write" command. No errors were recorded in the course of the command being carried out. The event number is followed by the month, day of the month, start time, initiator channel and initiator index. In event 497 shown in [Figure 28](#) the word "RDBLKMT" after the initiator index indicates that the single command event "Read Block Limit" is being logged. Compare the time stamp in the next line to the start time in the second line to determine how long it took the SNC to complete the event.

If data was transferred to or from the host, a new line is displayed indicating the direction of the transfer ("DIR=IN" is to the host and "DIR=OUT" is from the host), the number of bytes requested (REQ) and the number of bytes actually transferred (XFER):

```
DIR=IN REQ=14 XFER=14
```

If the event is a single command event, as in event 511 below, the initiator index is followed by an 8 character abbreviation for the operation code, the command descriptor block—which may be 6, 10, 12 or 16 bytes in length—the command completion status, and end time:

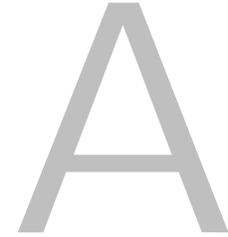
```
000000511 MAY27 08:28:51 2 125 MODE SNS 1a0000000c00 GOOD(00) 08:28:51
```

Refer to a SCSI command reference guide to understand the operation code and command descriptor block information.

Whenever the command completion status is not good (check condition 02), the 18 byte sense data is also displayed, as in event 739 below.

```
000000739 MAY27 08:37:38 2 125 LOG SNS 4d002e00000000040000 CHK(02)08:37:38
DIR=IN REQ=400 XFER=00
DEV-SENSE=70 00 05 00 00 00 00 0a 00 00 00 00 24 00 00 cf 00 02
Illegal Request: Invalid Field in CDB
```

The status origin is shown as DEV if the status is from the device and SNC if the SNC returned the status. The sense data fields for Filemark, EOM, ILI, key, additional sense code, and additional sense code qualifier are translated and displayed on the next line. Refer to a SCSI command reference guide to understand the the sense data in these fields.



Glossary

This glossary consists of terms that can be used for components that you may have in your SAN.

Aggregation

The navigation panel representation of an SNC, so that it is subordinate to the Scalar library in which it is contained.

AMC (ADIC Management Console)

Client-server software. The AMC client-server is used to manage the SAN.

Appliance

An SNC, whether embedded or standalone. For example, the Scalar i2000 is not and does not contain an appliance, but the Scalar 100 contains an embedded appliance. The Pathlight 5000 is a standalone appliance.

ATAC

ADIC Technical Assistance Center. The ADIC customer help desk.

Category

A logical grouping of the SAN components belonging to a specific view. For example, subnet, department, location, etc.

Channel zoning

A method of subdividing a SAN into disjoint zones on a per-channel basis in order to enhance security and qualify access.

Community strings

Statements describing administrative relationships between SNMP agents and community members.

Data panel

The lower right quadrant of the AMC window, where information is displayed in table format.

Data path

One of the many possible paths that data can move in the SAN environment, potentially involving many components or connections between initiators and targets that have been massaged since the initial configuration occurred.

Device menu

An AMC menu that when a disk or a tape device is right-clicked from either the navigation panel or the graphical panel.

DNS (Domain Name Service)

A service that translates domain names into IP addresses.

Event

A condition that matches a numbered, predefined set of circumstances. The AMC client can be configured to display events at specified severity levels and to generate traps (also called “event traps”) for specified occurrences.

Event log

A list of all pre-defined events logged by the AMC server, whether or not the AMC client has been configured to display these events to the user.

eVPS (extended Virtual Private SAN)

A virtual LUN mapping scheme for Fibre Channel hosts that runs on the SNC. It allows each host to see the LUN map as if the LUN map began at “1”, subject to an overall device total of 2048, and a per-host device total of 256.

FC (Fibre Channel)

A high speed data transfer architecture. Using optical fibre to connect devices, Fibre Channel communications are serial communications that occur at full duplex and achieve data transfer rates of 200 MBps.

Graphical panel

The upper right quadrant of the AMC window, where configuration information is displayed in graphical format.

Health check

An AMC feature that provides predictive alerts, warning of any loss of connectivity or device failure using local or remote alerts. Health check allows administrators to correct faults before they affect backup or other data transfer operations.

Host initiator

A host bus adapter that provides the host with a Fibre Channel port capable of initiating SCSI commands at the host’s request.

HRS (Host Registration Service)

Presents host information that the AMC server uses to manage host access and data retrieval. This information includes host name, host type, host connection and the online or offline status.

I-Platform

Intelligent platform. The i-platform libraries all have integrated management services within intelligent storage devices designed specifically for operation in a storage network. Libraries in the i-platform series include the Scalar i2000 and the Pathlight VX.

IP (Internet Protocol)

A protocol that specifies the formats of packets and addresses. Addresses are formulated as dotted quads, e.g. 123.456.789.123.

LED panel

AMC’s representation of the LED-bearing surface of the SNC, e.g. for the Pathlight 5000, this is the same as the connector side, for the ADIC 3000 this side is opposite the connector side.

Library

An ADIC tape library product including the Scalar 24, Scalar 100, Scalar 1000, Scalar 10K, and the Scalar i2000.

Library menu

An AMC menu that appears when a library is right-clicked from either the navigation panel or the graphical panel.

Library Manager

The Library Manager button launches the library management client for the Scalar i2000 from the AMC interface.

LUN (Logical Unit Number)

A unique identifier used on a SCSI bus to distinguish between devices that share the same bus. SCSI is a parallel interface that allows up to eight devices (target IDs) to be connected along a single cable. Each of these eight devices has access to 16 unique address spaces (LUNs). A specified intersection of target ID and target LUN can be construed as the Assigned LUN.

LVD (Low Voltage Differential)

A type of drive.

MAP (Maintenance Action Plan)

A CLI routine that guide a user through troubleshooting system or component error.

MIB (Management Information Base)

A database of objects that can be monitored by SNMP or other database management system.

NDMP

Network Data Management Protocol

Partition

An abstraction of an underlying physical library that may present a different personality, capacity, or both to a host. It is a representation of real physical elements, combined to create a grouping that is different from the physical library.

Policy

A rule within the AMC expert notification system that allows AMC to alert persons specified by the administrator that specified SAN error conditions have been met.

Portal

A collection of storage area networking devices that represent a particular user's universe. The SAN administrator's default portal is the entire set of SAN-capable appliances and associated storage on the subnet to which AMC has access. This is called the master portal. Other users are granted privileges to subsets of the master portal by the SAN administrator.

POST (Power On Self Test)

A diagnostic testing sequence run by the SNC or MCB BIOS (basic input/output system) when the power is initially turned on.

Point to Point

A Fibre Channel topology.

RAS (Reliability, Availability, and Serviceability)

Three key attributes of computing system design.

Realization

For Pathlight VX, writing disk information to physical tape media.

Remote server

An instance of the AMC server that is distinct from the server embedded in the MCB or the Pathlight VX.

RMU (Remote Management Unit)

A library feature that allows a user to monitor library operations remotely. Not all libraries have an RMU.

SAN (Storage Area Network)

A SAN is a dedicated, high-performance network whose primary purpose is the transfer of data along FC or high-speed Ethernet connections between servers, interconnect devices, and storage peripherals.

SCSI (Small Computer System Interface)

A parallel interface standard.

SCSI Channel menu

An AMC menu that allows the user to configure the SCSI channel parameters for an SNC. It appears when a SCSI Channel is right-clicked from either the navigation panel or the graphical panel.

SFM (Scalar Firewall Manager)

A virtual LUN mapping scheme for Fibre Channel hosts, allowing an overall LUN total of 2048 devices to be virtually remapped on a SAN-wide basis.

SNC (Storage Networking Controller)

ADIC term for a storage networking appliance. The SNC enables high-performance, networked communications that support intelligence functionality within the Scalar storage system.

SNC menu

An AMC menu that allows the user to configure the appliance parameters for an SNC. It appears when an SNC is right-clicked from either the navigation panel or the graphical panel.

SNMP (Simple Network Management Protocol)

SNMP is the protocol governing network management and the monitoring of network devices and their functions.

Status/Message area

The bottom of the AMC window, where event traps and other messages are posted.

Target ID

SCSI bus address. See also LUN.

Trap

An SNMP alert that is sent to the AMC client when predefined conditions are met.

Received event traps

A named window that is always opened when the AMC client is running. In it, events that are configured to precipitate traps are displayed. Events must have been previously configured to produce traps in order to display in this window.

Navigation panel

The left half of the AMC window, where SAN components are listed in a highly conventionalized visual/textual format.

View

In AMC, a named graphical representation of a portal, generally one that has been saved to preserve a particular categorization.

Virtual device

For Pathlight VX, a device presented to an operating environment by control software or by a volume manager. From an application standpoint, a virtual device is equivalent to a physical one.

Virtual library

For Pathlight VX, disk storage that appears as if it were a tape drive or tape library.

VLI (Virtual Library Interface)

The management interface for the Pathlight VX.

Virtualization

For Pathlight VX, writing tape media data to disk.

VPM (Virtual Private MAP)

A per-host, virtual LUN mapping scheme for SCSI-attached hosts. It allows each host to see the LUN map as if the LUN map began at "1," subject to an overall device total of 2048, and a per-host device total of 256.

VPS (Virtual Private SAN)

A SAN-wide, virtual LUN mapping scheme for FC-attached hosts, allowing an overall LUN total of 2048 devices.

WWN

World Wide Name, a unique number assigned by a recognized naming authority. The WWN is integral to Fibre Channel operations.

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