

IBM System Storage Master Console for
SAN File System and SAN Volume Controller



Installation and User's Guide

Version 3.2.0

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SAN File System and SAN Volume Controller



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Note

Before using this information and the product it supports, read the information in "Notices."

Second Edition (June 2006)

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About this guide

This guide contains information about installing and using the master console.

- Chapter 1, “Overview,” on page 1 provides an overview of the master console.
- Chapter 2, “Concepts,” on page 3 discusses concepts that will help you understand how the master console works.
- Chapter 3, “Planning for the master console,” on page 9 describes how to plan for the installation of the master console.
- Chapter 4, “Installing master console software,” on page 17 provides the procedures required to install the master console, including how to use the master console installation wizard.
- Chapter 5, “Configuring the master console,” on page 35 explains how to configure the master console.
- Chapter 6, “Managing the master console,” on page 47 provides an overview of the tasks that you can perform from the master console.
- Chapter 7, “Removing master console software,” on page 57 provides a high-level overview of the procedures for uninstalling the master console software.
- Chapter 8, “Upgrading the master console to version 3.2,” on page 61 explains how to upgrade the master console software.
- Chapter 9, “Troubleshooting the master console,” on page 65 provides information about resolving problems with the master console.

Who should use this guide

This topic describes the audience for this guide.

The *IBM System Storage Master Console for SAN File System and SAN Volume Controller: Installation and User's Guide* should be used by the person or persons assigned to manage SAN File System or SAN Volume Controller on a regular basis.

Important: If you are a SAN File System user, refer to the version 2.4.01 *IBM TotalStorage Master Console Installation and User's Guide*.

An administrator should have experience in at least the following skills, or have access to personnel with experience in these skills:

- Microsoft® Windows® and Windows Advanced Server (depending on your client environment)
- Linux® system administration
- Networking and network management
- SAN management
- Command-line interface scripting
- Critical business issues (such as backup, disaster recovery, and security)

Conventions and notices

This topic describes the notice conventions used in this publication.

The following notices are used in this publication and convey these specific meanings:

Note: These notices provide important tips, guidance, or advice.

Attention: These notices indicate possible damage to programs, devices, or data. An attention notice appears before the instruction or situation in which damage can occur.

CAUTION:

These notices indicate situations that can be potentially hazardous to you. A caution notice appears before the description of a potentially hazardous procedure step or situation.

DANGER

These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice appears before a description of a potentially lethal or extremely hazardous procedure step or situation.

Emphasis

Different typefaces are used in this guide to show emphasis.

The following typefaces are used to show emphasis:

Boldface	Text in boldface represents menu items and command names.
<i>Italics</i>	Text in <i>italics</i> is used to emphasize a word. In command syntax, it is used for variables for which you supply actual values, such as a default directory or the name of a cluster.
Monospace	Text in monospace identifies the data or commands that you type, samples of command output, examples of program code or messages from the system, or names of command flags, parameters, arguments, and name-value pairs.

Web sites

This topic discusses any Web sites that offer additional, up-to-date information.

The following Web sites have additional and up-to-date information about SAN File System:

- www.ibm.com/storage/support/sanfs/
- www.ibm.com/storage/software/virtualization/sfs

The following Web site has additional and up-to-date information about SAN Volume Controller:

- www.ibm.com/storage/support/2145/

Master console library and related publications

A list of publications that are related to this product are provided to you for your reference.

The information in this section lists and describes the following publications:

- The publication that is available for the IBM System Storage master console for SAN File System and SAN Volume Controller
- Other IBM publications that relate to the master console

Master console library

The following publication is available in the master console library. It is provided in softcopy on the IBM® System Storage Master Console Publications CD and at <http://www.ibm.com/storage/support/2145>. To use the CD, insert it in the CD-ROM drive. If the CD does not launch automatically, follow the instructions on the CD label.

Note: The softcopy version of these publications are accessibility-enabled for the IBM Home Page Reader.

- *IBM System Storage Master Console for SAN File System and SAN Volume Controller: Installation and User's Guide, GC30-4090*

This publication provides detailed procedures to set up and cable the hardware, install and upgrade the master console software, configure the software components, and troubleshoot and resolve problems.

Other IBM publications

The following tables list and describe other IBM publications that contain additional information related to the master console.

SAN File System publications

The following publications are related to the SAN File System. Unless otherwise noted, these publications are available in Adobe portable document format (PDF) from the following Web site:

<http://www.ibm.com/software/tivoli/products/totalstorage-sfs/>

Title	Description	Order number
<i>IBM TotalStorage® SAN File System Installation and Configuration Guide</i>	This publication provides detailed procedures to set up and cable the hardware, install and upgrade the SAN File System software, perform the minimum required configuration, and migrate existing data.	GA27-4316
<i>IBM TotalStorage SAN File System Planning Guide</i>	This publication provides detailed procedures to plan the installation and configuration of SAN File System.	GA27-4344
<i>IBM TotalStorage SAN File System Maintenance and Problem Determination Guide</i>	This publication provides instructions for adding and replacing hardware components, monitoring and troubleshooting the system, and resolving hardware and software problems	GA27-4318

SAN Volume Controller publications

The following publications are related to the SAN Volume Controller. Unless otherwise noted, these publications are available in Adobe portable document format (PDF) from the following Web site:

<http://www.ibm.com/storage/support/2145>

Title	Description	Order number
<i>IBM System Storage SAN Volume Controller: Command-Line Interface User's Guide</i>	This guide describes the commands that you can use from the SAN Volume Controller command-line interface (CLI).	SC26-7544 or SC26-7903
<i>IBM System Storage SAN Volume Controller: Configuration Guide</i>	This guide provides guidelines for configuring your SAN Volume Controller	SC26-7543 or SC26-7902
<i>IBM System Storage SAN Volume Controller: Host Attachment Guide</i>	This guide provides guidelines for attaching the SAN Volume Controller to your host system.	SC26-7575 or SC26-7905
<i>IBM System Storage SAN Volume Controller: Installation Guide</i>	This guide includes the instructions the service representative uses to install the SAN Volume Controller.	SC26-7541 or GC26-7900
<i>IBM System Storage SAN Volume Controller: Planning Guide</i>	This guide introduces the SAN Volume Controller and lists the features you can order. It also provides guidelines for planning the installation and configuration of the SAN Volume Controller.	GA22-1052 or GA32-0551
<i>IBM System Storage SAN Volume Controller: Service Guide</i>	This guide includes the instructions the service representative uses to service the SAN Volume Controller.	SC26-7542 or GC26-7901

How to order IBM publications

The publications center is a worldwide central repository for IBM product publications and marketing material.

The IBM publications center

The IBM publications center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download free of charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM publications center through the following Web site:

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The IBM publications center Web site offers you a notification system for IBM publications. Register and you can create your own profile of publications that interest you. The publications notification system sends you a daily e-mail that contains information about new or revised publications that are based on your profile.

If you want to subscribe, you can access the publications notification system from the IBM publications center at the following Web site:

<http://www.ibm.com/shop/publications/order/>

How to send your comments

Your feedback is important to help us provide the highest quality information. If you have any comments about this book or any other documentation, you can submit them in one of the following ways:

- e-mail

Submit your comments electronically to the following e-mail address:

starpubs@us.ibm.com

Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

- Mail

Fill out the Readers' Comments form (RCF) at the back of this book. If the RCF has been removed, you can address your comments to:

International Business Machines Corporation
RCF Processing Department
Department 61C
9032 South Rita Road
Tucson, Arizona 85775-4401
U.S.A.

Summary of changes

This document contains terminology, maintenance, and editorial changes.

Changes made in release 3.2

Note: In this edition, the brand "IBM TotalStorage" has been replaced with "IBM System Storage" when referring to the master console and the SAN Volume Controller.

Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. This summary of changes describes new functions that have been added to this release and the previous release.

The following list describes the changes made to the *IBM System Storage Master Console for SAN File System and SAN Volume Controller: Installation and User's Guide* in release 3.2.

New information

New information in release 3.2 of this guide includes:

- Information clarifying the version of Tivoli® Storage Area Network Manger (Tivoli SAN Manager) has been added.
- A Windows 2003 example has been added to the instructions for mirroring the boot drive.
- A new section for upgrading the master console to version 3.2 was added.
- Several topics about setting up error notifications for the SAN Volume Controller were added.

Changed information

Changed information in release 3.2 of this guide includes:

- The information about remote access and the role of the IBM Connection Manager in that access has been enhanced.
- The conceptual information about service alerts and e-mail notifications was updated.
- The planning information for the master console has been enhanced and updated.
- Fibre Channel cables are no longer available with the master console.
- The system memory requirements for the hardware where the master console is installed is now 4 GB.
- The installation overview and several of the installation topics master console have been enhanced and updated.
- The configuration overview and most of the existing configuration topics were enhanced.
- Some of the troubleshooting information was enhanced or clarified.

Deleted information

Information that was deleted from release 3.2 of this guide includes:

- The hardware master console configuration steps have been removed from the planning section and incorporated into the configuring section.
- Topics and information related to Fibre Channel connections were removed since Fibre Channel connections are no longer available with the master console.
- The information about setting up service alert for the SAN Volume Controller was removed and replaced by several topics about setting up error notifications for the SAN Volume Controller
- The section for upgrading the master console to version 3.1 was removed and replaced with information about upgrading to version 3.2.

Changes made in release 3.1

The following list describes the technical changes and enhancements made to master console in release 3.1.

Installation enhancements

Installation enhancements for the master console in release 3.1 include:

- DS4000 Storage Manager Client (FAStT Storage Manager Client) and IBM TotalStorage SAN Volume Controller Console are optional components
- The master console information center is installed using the IBM WebSphere® Help System and is installed as a service.
- The installation wizard checks your hardware for prerequisites before installing the software.

- The installation wizard can be restarted if the installation is interrupted or fails.

Upgrade enhancements

You can upgrade an existing software-only master console (releases 2.3 or 2.4) or an existing hardware master console (releases 1.3 or 1.4) using the master console 3.1 installation wizard.

Note: In release 3.1, the product is referred to as *master console*.

Chapter 1. Overview

This topic provides an overview of the master console.

Important: If you are a SAN File System user, refer to the version 2.4.01 *IBM TotalStorage Master Console Installation and User's Guide*.

The master console provides a single point from which to manage the IBM TotalStorage SAN File System and the IBM System Storage™ SAN Volume Controller.

The master console provides you with the following capabilities:

- Access to the metadata servers in the SAN File System cluster. You can access these components:
 - SAN File System console through a Web browser.
 - Administrative command-line interface, through a Secure Shell (SSH) session.
 - Any of the metadata server engines in the cluster through an SSH session.
 - The RSA II adapter for any of the metadata server engines running SAN File System software through a Web browser.
 - Any of the SAN File System clients through an SSH session, a telnet session, or a remote-display emulation package, such as Virtual Network Computing (VNC), depending on the configuration of the client.

- Access to the SAN Volume Controller. You can access these components:
 - SAN Volume Controller console through a Web browser.
 - Administrative command-line interface, through a Secure Shell (SSH) session.

When using the master console with the SAN Volume Controller, you must install and configure it before configuring the SAN Volume Controller. The installation and configuration steps are different between the hardware master console and the software-only master console. For the hardware master console (in which the software is preinstalled), you must customize the default factory settings. The general steps for this are given in Chapter 5, “Configuring the master console,” on page 35.

- Access to the fibre channel switches and views of your SAN topology using Tivoli SAN Manager.
- Initiate a VPN connection, which allows an IBM support engineer to remotely access the master console. You can monitor that access and disconnect the session at any time. In addition, through the use of remote desktop access software, such as VNC, the IBM support engineer can view the desktop of the master console remotely.
- Manage SNMP traps through IBM Director, which can automatically notify IBM support personnel in the event of a severe error and can submit e-mail notifications to your personnel, such as a systems administrator.

The master console is an optional component for the SAN File System. If you have a configuration with only the SAN File System, using the VPN connection for remote access is a simpler alternative than setting up the master console. If you have a configuration with the SAN Volume Controller (with or without the SAN File System), you must use the master console for remote access.

A note on the two master console product options

Although you have two options in purchasing the master console product (you can buy the master console software and install and configure it on

hardware of your choice, or you can buy a hardware platform with the operating system and master console software preinstalled), the only difference between these two options is the installation and configuration process.

For the master console software option, the installation and configuration is performed by you in a single process managed by the installation wizard, as described in this guide.

For the preinstalled option, with the software installed on the hardware in the manufacturing plant using default settings, you must configure and customize the settings as part of its installation process.

Chapter 2. Concepts

This section discusses concepts that will help you understand how the master console works. Becoming familiar with the master console components and understanding the concepts in this section enables you to use the master console most effectively.

IBM Connection Manager and remote access

The IBM Connection Manager component of the master console is VPN connection software that provides *remote access* to the SAN Volume Controller Console.

Remote access allows IBM Support Center personnel to diagnose problems with your system. Remote access support can help to greatly reduce service costs and shorten repair times, which in turn reduces the impact of any failures on your business.

Remote access gives IBM support personnel full access to the SAN File System or the SAN Volume Controller through the master console, including querying and controlling the metadata servers and clients, and accessing metadata, log, dump, and configuration data. Remote access does not allow access without authentication. You must initiate a secure virtual private network (VPN) connection from the master console to allow IBM support personnel to remotely access the master console. From the master console, the support personnel can establish a connection to the SAN File System metadata servers or the SAN Volume Controller nodes. However, you can monitor that access and disconnect the session at any time.

In response to an error condition, you initiate a secure connection to the IBM VPN server using the IBM Connection Manager. You must provide the customer connection ID for the newly created connection to the IBM support personnel. The IBM support personnel initiates a secure connection to their VPN server, and then establishes a secure connection to the master console over the VPN tunnel using the customer connection ID and a pre-authorized account on the master console. Finally, IBM support personnel can access the SAN File System metadata server or the SAN Volume Controller node through SSH.

Figure 1 on page 4 shows the remote access architecture:

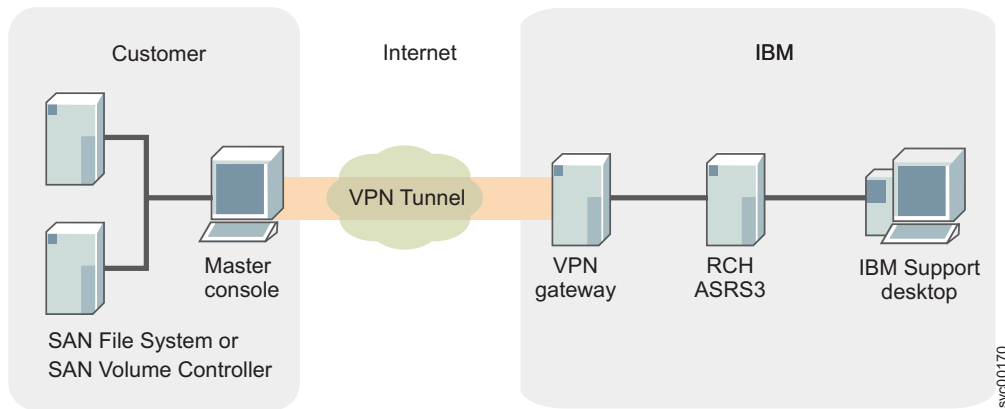


Figure 1. Remote access architecture

Related tasks

“Initiating remote support” on page 50

When IBM is helping you to resolve a problem with your SAN Volume Controller or SAN File System, you might receive a request to invoke an IP connection so that a remotely based IBM service representative can access the master console to collect additional information about the problem.

Service alerts and error notifications

This topic provides an overview of the service alerts and error notifications.

You can configure the master console to notify the SAN File System or SAN Volume Controller administrators of errors or failure conditions. If you are using SAN Volume Controller, you configure the IBM Director to send system administrator through e-mail when errors or events are logged or to initiate a call-home message to IBM when failures that require service actions are logged by the SAN Volume Controller.

SAN File System

For SAN File System, a “service alert” notifies the system administrator of significant errors or failure conditions. SAN File System issues an Simple Network Management Protocol (SNMP) trap and sends that trap to the IBM Director Server running on the master console in response to a sever error condition. The IBM Director Server catches the trap and converts it into a Simple Mail Transfer Protocol (SMTP) e-mail message. The e-mail message is then sent to your SMTP mail server and then forwarded to the system administrator. The system administrator can then call the IBM Support Center.

Figure 2 on page 5 shows the service alert architecture for SAN File System:

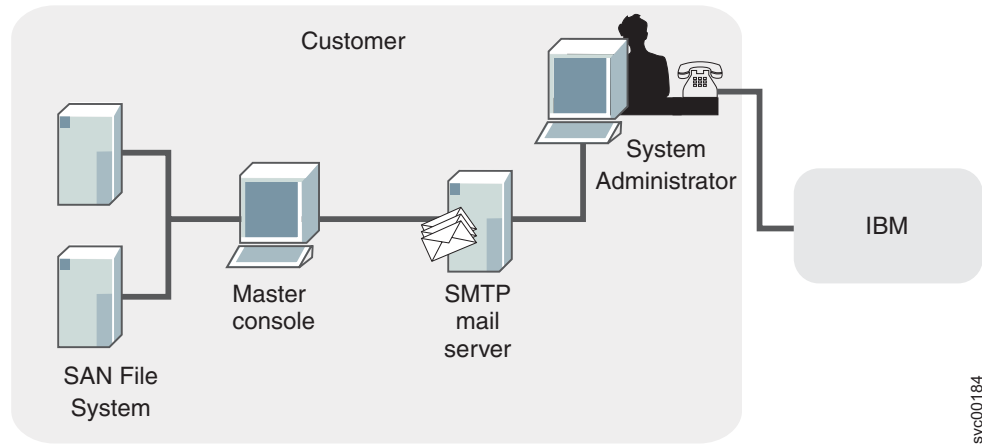


Figure 2. Service alert architecture for SAN File System

SAN Volume Controller

In response to a sever error condition, SAN Volume Controller issues a Simple Network Management Protocol (SNMP) trap and sends that trap to the IBM Director Server running on the master console. The IBM Director Server catches the trap and converts it into a Simple Mail Transfer Protocol (SMTP) e-mail message. Two e-mail messages can be produced: one to the systems administrator in the same way as in SAN File System, and another optional e-mail to the IBM support system. The optional e-mail to the IBM support system is sent to your SMTP mail server and then forwarded to the IBM support system, where it is converted into a problem record.

Figure 3 shows the call-home architecture for the SAN Volume Controller. Note that the path to the system administrator (as shown in Figure 2) is not shown in this figure:

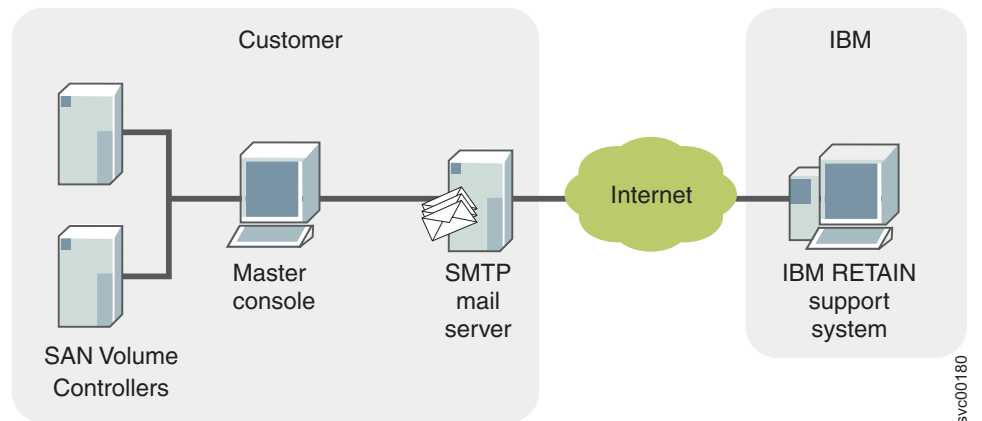


Figure 3. Call-home architecture for SAN Volume Controller

Related tasks

“Installing the SNMP service” on page 19

This topic describes how to install the SNMP services.

“Initiating remote support” on page 50

When IBM is helping you to resolve a problem with your SAN Volume Controller or SAN File System, you might receive a request to invoke an IP connection so

I that a remotely based IBM service representative can access the master
I console to collect additional information about the problem.

Secure Shell (SSH)

This topic provides an overview of Secure Shell (SSH).

Secure Shell (SSH), which is implemented through PuTTY, is the communication vehicle between the host system that you are using and the following components:

- The SAN File System command-line interface (CLI)
- The SAN Volume Controller CLI
- The master console.
- Each of the metadata server engines in the SAN File System cluster, using SSH from the master console.

SSH provides a secure communications channel between systems. You can configure SSH to use a private/public key pair to establish the secure connection. This private/public key pair is required for SAN Volume Controller, but it is optional for SAN File System.

If you are using a private/public key pair, the public key must be placed on any system to which you want to create an SSH connection (such as the SAN Volume Controller nodes or the SAN File System metadata servers and clients). In addition, any system to which you want to create an SSH connection must be running an SSH server.

Related tasks

“Generating an SSH key pair using PuTTYgen” on page 24

I Although not part of the master console installation wizard, you must generate
I SSH keys for the SAN Volume Controller. You are prompted for these keys
I when you install the SAN Volume Controller Console. You can leave the
I installation wizard in its current state while you generate the SSH keys.

Software components

This topic describes the software components that are provided for the master console.

The following software is provided for the master console:

- Adobe Reader
- DB2®
- DS4000 Storage Manager Client (FAStT Storage Manager Client)
- IBM Director
- PuTTY (SSH client software)
- SAN Volume Controller Console
- IBM Tivoli Storage Area Network Manager (Tivoli SAN Manager)
- IBM Connection Manager

I **Note:** The version of Tivoli SAN Manager that is included with the master
I console is the IBM Tivoli Bonus Pack for SAN Management, which
I provides the same SAN management capabilities as Tivoli SAN Manager

|
|
|

for environments up to 64 SAN switch ports. If more than 64 SAN ports are required in your enterprise, you can purchase the full Tivoli SAN Manager product.

Chapter 3. Planning for the master console

This topic provides an overview of the planning tasks that you must complete before you install and configure the master console.

Note: The hardware-related prerequisites in this section are relevant only when you are installing and configuring the master console software on hardware of your choice (that is, when you have purchased only the master console software).

Perform the following steps to plan for the installation of the master console:

- Verify that you have met the hardware and software prerequisites.
- Determine the cabling required for your configuration.
- Determine how the ports on the master console will be configured.
- Determine the IP addresses to be used for the master console.

The master console must be in the same room as the devices that it supports. In addition, place the master console within 50 feet of the SAN File System metadata servers or SAN Volume Controller nodes.

Master console prerequisites

This topic defines the hardware and software prerequisites that you must obtain for the master console.

Hardware prerequisites

If you do not already have hardware for the master console, you must obtain a rack-mounted, high-performance, highly-reliable Intel® server (such as the IBM eServer™ xSeries® 306m or equivalent) with the following options:

- One Pentium® 4 processor, minimum 2.6 GHz
- Minimum of 4 GB of system memory
- Two IDE hard disk drives, minimum 40 GB each. During installation, you will mirror these drives.
- CD-ROM and diskette drives
- Two 1Gb ports for Ethernet connections (fiber or copper)
- Keyboard, such as the Space Saver NLS keyboard or equivalent
- Monitor, such as Netbay 1U Flat Panel Monitor Console kit without keyboard or equivalent
- Mouse or equivalent pointing device

Example hardware configuration

- IBM xSeries 306m server (1U)
- Intel Pentium 4 3.0 GHz processor
- 4 GB memory DIMM (256 MB comes with base unit)
- Two 70 GB IDE hard disk drives (one comes with base unit)
- Two 10/100/1000 Copper Ethernet ports on planar
- NetBay 1U Flat Panel Monitor Console Kit with US keyboard

Software prerequisites

The master console requires that you obtain the following software:

- Operating system
 - The hardware master console is shipped with Windows Server 2003 preinstalled.
 - The software master console requires that one of the following operating systems is provided on your hardware platform:
 - Microsoft Windows Server 2003 Enterprise Edition
 - Microsoft Windows Server 2003 Standard Edition
 - Microsoft Windows 2000 Server Edition with Service Pack 4 or higher.
 - Microsoft Windows 2000 with Update 818043. To obtain this update:
 1. Point your browser to the following Web site:
<http://v4.windowsupdate.microsoft.com/catalog/en/default.asp>
 2. Click **Find updates for Windows operating systems**.
 3. Select **Windows 2000 Professional SP4**.
 4. Select **Advanced search options**.
 5. In the field, **Contains these words**, enter **818043**, and then click **Search**.
 6. Follow the directions on the Web site to download the update.
 7. After you download the update, navigate to the location where the update was downloaded and run the .exe file to install the update.
- Microsoft Windows Internet Explorer version 6.0 with Service Pack 1
- Antivirus software (not required but necessary to ensure protection of your computer).
- J2SE Java™ Runtime Environment (JRE) 1.4.2.
You can obtain JRE 1.4.2 by going to the following Web site and then clicking **Downloads** → **Java & Technologies** → **Java 2 Platform, Standard Edition 1.4** → **Download J2SE JRE**:
www.sun.com/

Cabling options

This topic describes the various options for cabling the hardware that runs the master console. This information helps you to plan the cabling of the hardware. However, to avoid any address conflicts, do not connect the Ethernet cables until after you have configured the IP addresses.

There are a variety of ways to cable the hardware that contains the master console. The option you choose depends on your environment as the following list discusses:

- A single master console that is used for a single SAN File System or SAN Volume Controller installation.
- A single master console that is shared between a SAN File System installation and a SAN Volume Controller installation.
- Two master consoles, one for a SAN File System installation and one for a SAN Volume Controller installation.

In all cases, the ports on the hardware for the master console is cabled as follows:

- One Ethernet port is cabled to your corporate intranet.
- One Ethernet port is cabled to the Internet through a corporate firewall. This port will be used for remote access functionality.

Related tasks

“Entering IP address for Ethernet port 1” on page 18

This topic describes how to configure the IP address for the external Internet connection for remote access (Ethernet port 1).

“Entering IP address for Ethernet port 2” on page 18

This topic describes how to configure the IP address for the internal IP network connection (Ethernet port 2).

Cabling a single master console machine

This topic illustrates a cable configuration in which you have a separate machines running the master console for SAN File System or SAN Volume Controller.

Figure 4 shows how you can cable a single master console machine that is used by a single SAN File System or a single SAN Volume Controller installation:

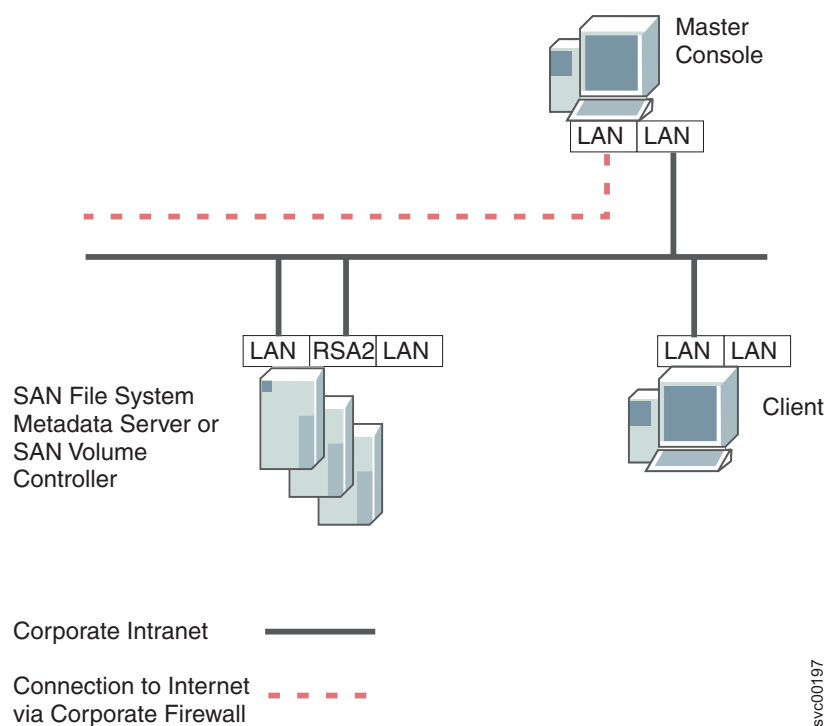


Figure 4. Cabling a single master console

Cabling a shared master console machine

This topic illustrates how to cable one master console machine that is shared between the SAN File System and the SAN Volume Controller or for a SAN Volume Controller.

Figure 5 on page 12 shows how you can cable a master console machine in a shared environment:

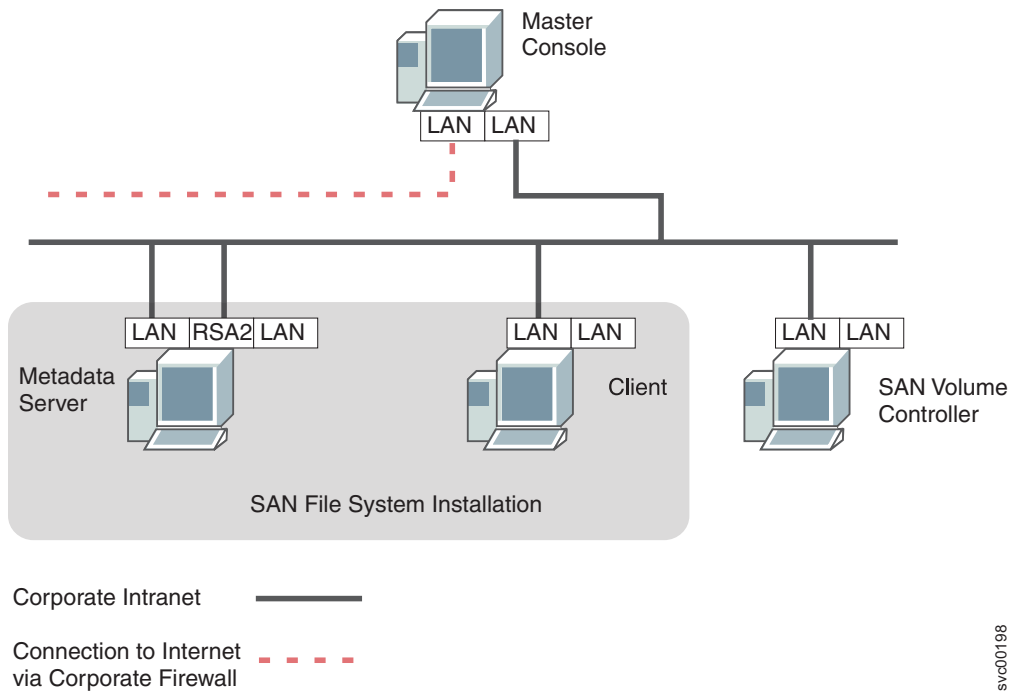


Figure 5. Cabling a shared master console machine

svc00198

Cabling multiple master console machines

This topic illustrates a cable configuration in which you have separate master console machines for the SAN File System and the SAN Volume Controller.

Figure 6 on page 13 shows how you can cable multiple machines running master consoles:

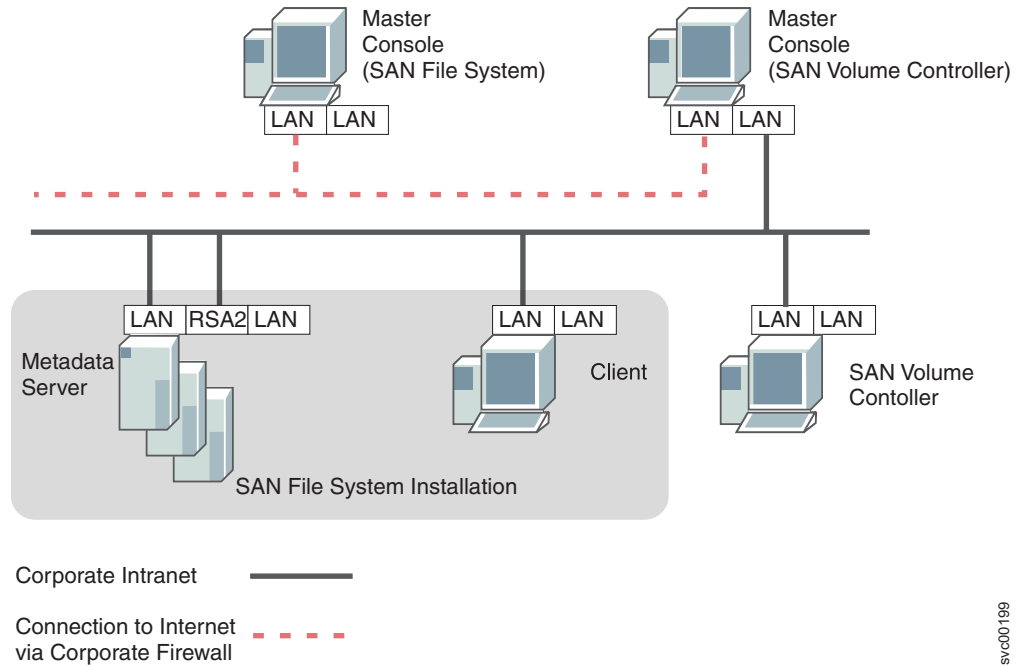


Figure 6. Cabling multiple master console machines

svr00199

Specifying port assignments

You must decide which ports to use for the master console so that you can determine the Ethernet cables that you will need.

Use Table 1 to record the port assignments.

When filling out Table 1, use the following descriptions

- Ethernet port 1: Used for your VPN connection. This port is required if you configure the master console to enable remote access. A remote access connection can be enabled only when this port has access to an external Internet connection. For added security, you can disconnect this port when a remote access connection is not being used.
- Ethernet port 2: Used to connect to the same IP network to which the SAN Volume Controller nodes or the SAN File System metadata server engines are connected.

Table 1. Port assignment table

Master console	Ethernet	
	VPN	Public Network

Table 2 provides an example of a completed port assignment table.

Table 2. Example completed port assignment table

Master console	Ethernet	
	VPN	Public Network
Master console	Ethernet hub 1, port 6	Ethernet hub 1, port 5

Related tasks

“Entering IP address for Ethernet port 1” on page 18

This topic describes how to configure the IP address for the external Internet connection for remote access (Ethernet port 1).

“Entering IP address for Ethernet port 2” on page 18

This topic describes how to configure the IP address for the internal IP network connection (Ethernet port 2).

Specifying IP information

This topic describes the IP configuration information that you specify for the master console.

Complete the master console IP configuration worksheet for the master console. When filling out the port assignment table, use the following descriptions.

- **Machine name:** A fully-qualified Domain Name Server (DNS) name for the master console.
- **Master console IP addresses :** The addresses that will be used for access to the master console.
- **Gateway IP address:** The default gateway IP address used by the master console.
- **Subnet mask :** The subnet mask for the master console.

master console IP configuration worksheet

master console IP configuration worksheet		
Machine name:	Ethernet port 1	Ethernet port 2
master console IP address		
Gateway IP address		
Subnet mask		

Related tasks

“Entering IP address for Ethernet port 1” on page 18

This topic describes how to configure the IP address for the external Internet connection for remote access (Ethernet port 1).

“Entering IP address for Ethernet port 2” on page 18

This topic describes how to configure the IP address for the internal IP network connection (Ethernet port 2).

Configuring firewall support

This topic provides information about your firewall configuration.

Local Area Connection 1 on the master console must be allowed to connect to the IBM Remote Support Gateway through UDP port 500 and UDP port 1701. If you have a NAT (network address translation) firewall, allow Local Area Connection 1 on the master console to connect to the IBM Remote Support Gateway through UDP port 4500.

Note: For Remote Support to work, a maximum of two ports must be permitted to connect to the Local Area Connection 1 on the master console. Check with

your network system administrator to find out if you have access to the necessary ports and to gain access, if necessary.

The following list provides the ports and protocol requirements:

- L2TP - UDP 500, UDP 1701
- NAT-T - UDP 4500
- ESP - IP protocol 50

Chapter 4. Installing master console software

If you purchased the master console software to run on your own hardware, this section guides you through the software installation process. If you have purchased the hardware preinstalled with the master console software, you can skip the software installation tasks and proceed with configuring the master console.

Before you install the master console software, you must have completed the following tasks:

- Installed all hardware prerequisites for the master console.
- Installed all prerequisite software.
- Enabled SNMP services by completing the following steps:
 1. Click **Start** → **Programs** → **Control Panel**.
 2. Double-click **Add or Remove Programs**.
 3. Select **Add/Remove Windows Components**.
 4. Click on the text for **Management and Monitoring Tools** and click **Details**.
 5. Select the **Simple Network Management Protocol** check box and click **OK**.

In addition, view the release notes for the master console software on the following IBM support Web site for the latest information:

<http://www.ibm.com/storage/support/2145>

You can use the installation wizard to help you install all of the master console software components instead of installing each component individually.

The following tasks are involved in the master console software installation process:

- **Task 1:** Prepare the master console environment
- **Task 2:** Install the master console software by using the installation wizard.
- **Task 3:** Mirror the boot drive

Important: Other than antivirus software, ensure that the master console software is the only type of software that is installed on the hardware that you are using for the master console.

Preparing the master console environment

This topic provides an overview of the steps that are required to set up the master console in preparation for installing the master console software.

To set up the master console, you must perform the following steps. These steps are explained in more detail in other topics in this book.

1. Configure the IP address for the Ethernet port that is to be connected to the external Internet (Ethernet port 1). “Entering IP address for Ethernet port 1” on page 18 provides more details for this step.
2. Configure the IP address for the Ethernet port that is to be connected to the internal IP network (Ethernet port 2). “Entering IP address for Ethernet port 2” on page 18 provides more details for this step.
3. Configure the host name for the master console. “Configuring the master console host name” on page 19 provides more details for this step.
4. Set up the internet browser. “Configuring the browser” on page 19 provides more details for this step.

5. Install the SNMP service (if you did not install it when you installed the operating system). “Installing the SNMP service” on page 19 provides more details for this step.

Entering IP address for Ethernet port 1

This topic describes how to configure the IP address for the external Internet connection for remote access (Ethernet port 1).

Tip: After configuring the connection, you can disable it when you are not using remote access.

Perform the following steps to configure the IP address for the external Internet connection:

1. From the desktop, right-click the **My Network Places** icon.
2. Click **Properties**.
3. Right-click **Local Area Connection 1**.
4. Click **Properties**.
5. Click **Internet Protocol (TCP/IP)**.
6. Click **Properties**.
7. Enter all required information for the IP and DNS addresses.
8. Click **OK** until you return to the desktop.
9. Connect Ethernet port 1 to the network.

Related reference

“Specifying IP information” on page 14

This topic describes the IP configuration information that you specify for the master console.

“Specifying port assignments” on page 13

You must decide which ports to use for the master console so that you can determine the Ethernet cables that you will need.

“Cabling options” on page 10

This topic describes the various options for cabling the hardware that runs the master console. This information helps you to plan the cabling of the hardware. However, to avoid any address conflicts, do not connect the Ethernet cables until after you have configured the IP addresses.

Entering IP address for Ethernet port 2

This topic describes how to configure the IP address for the internal IP network connection (Ethernet port 2).

Perform the following steps to configure the IP address for the internal network connection:

1. From the desktop, right-click the **My Network Places** icon.
2. Click **Properties**.
3. Right-click **Local Area Connection 2**.
4. Click **Properties**.
5. Click **Internet Protocol (TCP/IP)**.
6. Click **Properties**.
7. Type all required information for the IP and DNS addresses.
8. Click **OK** until you return to the desktop.

9. Connect Ethernet port 2 to the network.

Related reference

“Specifying IP information” on page 14

This topic describes the IP configuration information that you specify for the master console.

“Specifying port assignments” on page 13

You must decide which ports to use for the master console so that you can determine the Ethernet cables that you will need.

“Cabling options” on page 10

This topic describes the various options for cabling the hardware that runs the master console. This information helps you to plan the cabling of the hardware. However, to avoid any address conflicts, do not connect the Ethernet cables until after you have configured the IP addresses.

Configuring the master console host name

You must set up the master console host name using the IP configuration information that you have specified during planning.

Perform the following steps to configure the host name:

1. From the desktop, right-click the **My Computer** icon and select **Properties**.
2. Click the **Network Identification** tab.
3. Click **Properties**.
4. Enter the master console name in the **Computer name** field.
5. Click **More**.
6. Enter the full path information in the **Primary DNS suffix for this computer** field.
7. Click **OK** until you return to the desktop.

Configuring the browser

After you install the SAN Volume Controller components, you can connect to the master console using any supported Web browser on your system that is correctly configured.

Perform the following steps to configure the browser:

1. Ensure that the browser settings allow new windows (pop-ups) to automatically open when you visit a Web site.
2. Uninstall or turn off any applications on the system that cause the browser to block or suppress pop-up windows.

Your browser is now configured to use the SAN Volume Controller Console.

Installing the SNMP service

This topic describes how to install the SNMP services.

You must install the SNMP service if it was not installed when you installed the operating system. Perform the following steps to install the SNMP service:

1. Click **Start-->Settings-->Control Panel**.
2. Double-click **Add/Remove Programs**.
3. Click **Add/Remove Windows components** on the left side of the panel.
4. Click **Management and Monitoring Tools**, and then click **Details**.

5. Check **Simple Network Management Protocol**, and click **OK**.
6. Click **Next** to complete the installation process.
7. From the Control Panel, double-click **Administrative Tools**.
8. Double-click **Computer Management**.
9. Expand **Services and Applications**.
10. Click **Services**.
11. In the list of services, double-click **SNMP Service**.
12. Click the **General** tab and select **Automatic** as the startup type.
13. Click the **Security** tab and perform the following actions:
 - a. Click **Add** under the **Accepted Community Names** field, enter `public` as the new community name, and leave the community rights as read-only.
 - b. Ensure that the **Accept SNMP packets from any host** option is selected.

Note: On some operating systems, the default is **Accept SNMP packets from these hosts**, with an empty field underneath for you to specify certain hosts. This option causes the NetView® part of the installation to fail.

Related concepts

“Service alerts and error notifications” on page 4

This topic provides an overview of the service alerts and error notifications.

Using the installation wizard

This topic describes the installation process and lists the programs that you can install using the installation wizard.

The master console installation wizard provides the framework for installing all the required software for the master console. It ensures that the master console meets all prerequisites and launches the installation program for each software component that is being installed.

Important: During the installation process, some products require a system reboot after they are installed. Reboot the system any time that you are prompted to do so. After each system reboot, the master console installation wizard continues the installation process from the point where it was interrupted by the required reboot.

The installation wizard helps you to install the following products:

- Adobe Reader
- PuTTY
- DB2
- SAN Volume Controller Console (optional)
- DS4000 Storage Manager Client (FAS*St* Storage Manager Client) (optional)
- Tivoli Storage Area Network Manager (Tivoli SAN Manager)
- IBM Director

You must use the master console CD-ROMs to install the master console software.

Related reference

Chapter 8, “Upgrading the master console to version 3.2,” on page 61

This topic provides information about upgrading the master console to version 3.2.

Logging in

This topic describes the permissions that are required to perform the master console installation.

To begin installing software on the master console, you must be logged in as a local administrator (for example, as the Administrator user) on the system where the master console software is to be installed.

Starting the installation wizard

This topic describes the steps for starting the installation wizard.

Before you begin the installation wizard, ensure that you have logged in with a user ID that has administrative privileges.

Perform the following steps to start the installation wizard:

1. Insert the Master Console CD-ROM 1 in the CD-ROM drive.
2. Click **Start**—>**Run** to open the Run dialog.
3. Enter ***cd-rom_drive*:\setup.exe**, where *cd-rom_drive* is the letter of the drive in which you inserted the CD. Click **OK**.

The following message is displayed in the DOS-prompt window.

```
+-----+
| Initializing InstallShield Wizard...
| Preparing Java (tm) Virtual Machine .....
| .....
+-----+
```

4. When you are prompted, select the language to be used for the installation wizard and click **OK**.
5. The installation wizard Welcome panel is displayed. Read the information from the panel and then click **Next**.
6. The installation wizard License Agreement panel is displayed. Click **I accept the terms in the license agreement**, and then click **Next** to begin installing the Adobe Reader.

Note: Before Adobe Reader is installed, the program performs the following checks:

- a. The installation wizard verifies that all software prerequisites are installed on the system. If not, a window opens that describes the prerequisite software that is not currently installed. When you click **OK**, the installation wizard ends.

After installing the prerequisite software, start the installation wizard again.

- b. If any hardware requirements are not met on your system, a panel is displayed that states that the hardware requirements are not met and warns about a decrease in the performance level if these requirements are not met.

Installing the Adobe Reader

This topic describes how to install the Adobe Reader using the master console installation wizard.

Adobe Reader is silently installed by the installation wizard. It allows you to open online versions of documentation, such as this document, through a pop-up window.

From the Install Acrobat Reader panel of the wizard, click **Next** to start the installation of Adobe Reader.

When the installation is complete, an information panel is displayed. From this panel, you can access this document or IBM Support Web sites by right-clicking on the left side of the window.

Click **Next** to select the destination directory where you want the master console to be installed.

Choosing the master console destination directory

This topic describes how to specify the installation directory for the master console software when you use the installation wizard.

Perform the following steps to choose the destination directory:

1. By default, the master console is installed in c:\Program Files\IBM\MasterConsole. To choose a different directory, click **Browse** and select a different directory from the Select a directory dialog box.
2. After you specify the destination directory, click **Next**.

Selecting the port for the information center

This topic describes how to select the port value that accesses the master console information center.

Perform the following steps to select a port value:

1. Enter a port value between 1 and 65535. To ensure that the port value is not in use by another application on your system, open a command prompt and enter the command **netstat -a** to see which port values are in use.
2. After entering the information center port value, click **Next** to display the list of optional products that you can select to be installed for the master console.

Selecting the optional features

This topic describes how to select the optional features to be installed by the master console installation wizard.

Perform the following steps to select the optional features to install:

1. Select **DS4000 Storage Manager Client (FAStT Storage Manager Client)** if you want to install that feature, otherwise clear the check box.
If you clear the **DS4000 Storage Manager Client (FAStT Storage Manager Client)** check box, a message is displayed when you click **Next** that warns you that you must install this feature if DS4000 disk drives are part of the current configuration.
2. Select **SAN Volume Controller Console** if you want to install that feature, otherwise clear the the check box.
If you clear the **SAN Volume Controller Console** check box, a message is displayed when you click **Next** that warns you that you must install this feature if the SAN Volume Controller Console is part of the current configuration.

After you select or deselect the optional features, click **Next** to display the list of products that are to be installed for the master console.

Viewing the products to be installed

This topic describes the panel that displays the list of products to be installed for the master console, and it explains the next steps in the master console installation process.

Using the list of products to be installed for the master console, the installation wizard determines if any of these products are already installed and, if so, whether the installed version is a later version than the version to be installed. The Product List panel lists the following results:

- Products of the master console stack
- Versions of already-installed products
- Required versions for the products
- Actions to be done by the installation wizard or by you

The table containing the list of the products to be installed or upgraded is saved as *MasterConsoleProducts.htm* in the location where the master console is installed.

Depending on the installed version of each product, the installation wizard determines whether to install the product based on the following conditions:

- If the product is not installed or its installed version is lower than the desired version, the product is installed or upgraded by launching the specific installer of the product.
- If the product is installed at a version equal to or higher than the desired version, the product is left as it is. The corresponding panels that launch and verify the specific product installation are skipped. For the products with higher versions than the required ones, the installation wizard displays a warning that tells you that these products are not tested with the master console.
- If a product in the list of products to be installed or upgraded is not properly installed on the system, you are asked to continue with the installation by reinstalling the product with the product-specific installer. If this action does not succeed, you must exit the master console installation wizard, manually remove the product from your system, and restart the master console installation wizard.
- For DB2, the installation wizard also checks the installed edition. If the installed edition is not "Enterprise Edition," the installation wizard inserts "**Wrong edition" in the Installed Version column. You must manually uninstall the wrong installed edition.

To manually uninstall the wrong installed edition:

1. Click **Cancel** to exit the master console installation wizard.
2. Manually uninstall the wrong DB2 edition.
3. After you uninstall the wrong edition of DB2, start the master console installation wizard again.

After you have reviewed the information presented in the table on this panel, click **Next**.

Installing PuTTY

This topic describes how to install PuTTY using the master console installation wizard. PuTTY is the SSH client software used by the master console.

Perform the following steps to install PuTTY:

1. From the PuTTY installation panel, click **Next** to begin the installation of PuTTY.

2. The installation wizard installs PuTTY silently. Wait for the wizard to complete the installation.
3. From the master console installation wizard, click **Next**. The installation wizard validates the installation of PuTTY. If the validation is not successful, an error panel is displayed. If errors were found, correct the errors and start the installation wizard again.

Before you continue with the installation wizard, create an SSH key pair using PuTTYgen. You need these keys when you install the SAN Volume Controller Console.

Generating an SSH key pair using PuTTYgen

Although not part of the master console installation wizard, you must generate SSH keys for the SAN Volume Controller. You are prompted for these keys when you install the SAN Volume Controller Console. You can leave the installation wizard in its current state while you generate the SSH keys.

Perform the following steps to generate SSH keys on the master console using the PuTTY Key Generator (PuTTYgen):

1. Start PuTTYgen by clicking **Start** → **Programs** → **PuTTY** → **PuTTYgen**.
2. Click **SSH2 RSA** as the type of key to be generated.
3. Click **Generate**.
4. Move the cursor around the blank area of the **Key** section to generate a random number.
5. Click **Save public key** to save the public key.
6. Type `icat` as the name of the key and click **OK**.
7. Click **Save private key** to save the private key.
8. When you are prompted to confirm that you want to create the key without a passphrase, click **Yes**.
9. Type `icat.ppk` as the name of the key and click **OK**.
10. Close PuTTYgen.

Related concepts

“Secure Shell (SSH)” on page 6

This topic provides an overview of Secure Shell (SSH).

Installing DB2

This topic describes how to install DB2 using the master console installation wizard.

Perform the following steps to install DB2:

1. From the Launch DB2 Installation panel, click **Next** to begin the installation of DB2.
2. If prompted to insert a different CD, insert it in the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
3. The DB2 setup wizard starts. Using the DB2 setup wizard, perform these steps to install DB2:
 - a. From the Welcome to the DB2 Setup Wizard panel, click **Next**.
 - b. From the License Agreement panel, accept the terms of the license agreement and then click **Next**.
 - c. From the Select the installation type panel, click **Next** to accept the default values.

- d. From the Select the installation action panel, click **Next** to accept the default value.
- e. From the Select installation folder panel, click **Next** to accept the default destination.
- f. From the Set user information for the DB2 Administration Server panel, you can use the default user name (db2admin). However, you must specify a password.

Note: Ensure that **Use the same user name and password for the remaining DB2 services** is selected. This allows you to use this same user name and password for the remainder of the DB2 installation. Otherwise, you are prompted to enter a user name and password for several additional panels.

- g. Click **Next**. If you are prompted to create the user, click **Yes**.
- h. From the Set up the administration contact list panel, select **Local → Create a contact list on this system**, and then click **Next**.

Note: If you receive a warning stating that the SMTP server has not been specified, click **OK** to continue.

- i. From the Configure DB2 instances panel, select **DB2** from the **DB2 Instances** list, and then click **Next**.
 - j. From the Prepare the DB2 tools catalog panel, click **Do not prepare the DB2 tools catalog on this computer** and then click **Next**.
 - k. From the Specify a contact for health monitor notification panel, click **New contact**, and enter the appropriate information in the **Name** and **Email address** fields.
 - l. Click **Next**.
 - m. From the Start copying files panel, click **Install** to begin installing DB2.
 - n. Click **Finish** to complete the installation.
 - o. When the IBM DB2 Universal Database Welcome panel starts, click **Exit First Steps**.
4. From the master console installation wizard, click **Next** to verify DB2 installation. The installation wizard validates the installation of DB2. If the validation is not successful, an error panel is displayed. If errors were found, correct the errors and start the installation wizard again.

Installing SAN Volume Controller Console

This topic describes how to install the SAN Volume Controller Console by using the master console installation wizard.

Perform the following steps to install the SAN Volume Controller Console:

1. From the master console installation wizard, click **Next** to launch the SAN Volume Controller Installer wizard.
2. From the SAN Volume Controller Installer wizard, perform these steps to install the SAN Volume Controller Console:
 - a. From the Welcome panel, click **Next**.
 - b. From the License Agreement panel, click **I accept the terms of the license agreement**, and then click **Next**.
 - c. From the Destination Directory panel, click **Next** to accept the default directory.

- d. From the PuTTY configuration panel, enter the private key (default is `icat.ppk`) that you created after installing PuTTY. Then, click **Next**.
- e. From the CIMOM ports panel, click **Next** to accept the default ports.
- f. From the embedded WebSphere Application Server ports panel, click **Next** to accept the default ports.
- g. From the installation confirmation panel, click **Install** to install the SAN Volume Controller Console.
- h. Click **Finish** to complete the installation.

Note: If you click **View post installation tasks**, you can view the steps needed to access the SAN Volume Controller Console.

3. From the master console installation wizard, click **Next**.
The master console installation wizard validates the installation of the SAN Volume Controller Console. If the validation is not successful, an error panel is displayed. If errors were found, correct the errors and start the installation wizard again.

Installing the DS4000 Storage Manager Client (FAStT Storage Manager Client)

This topic describes how to install the DS4000 Storage Manager Client (FAStT Storage Manager Client) using the master console installation wizard.

Perform the following steps to install the DS4000 Storage Manager Client (FAStT Storage Manager Client):

1. From the master console installation wizard, click **Next** to start the installation of the DS4000 Storage Manager Client (FAStT Storage Manager Client).
When upgrading the DS4000 Storage Manager Client (FAStT Storage Manager Client) from a version lower than version 9, the installation wizard automatically uninstalls the old version first and then begins the installation of the new version, as follows:
 - a. The DS4000 Storage Manager Client (FAStT Storage Manager Client) uninstallation panel is displayed. Click **Next** to remove the old version of the product from the system.
 - b. The DS4000 Storage Manager Client (FAStT Storage Manager Client) uninstallation verification panel is displayed. Click **Next** to verify that the product was successfully removed from the system.
 - c. The DS4000 Storage Manager Client (FAStT Storage Manager Client) installation panel is displayed. Click **Next** to begin installing the new version of the product.
2. From the DS4000 Storage Manager Client (FAStT Storage Manager Client) installation wizard, perform these steps to install the client:
 - a. From the Welcome panel, click **Next**.
 - b. At the copyright prompt, click **OK**.
 - c. From the License Agreement panel, click **Yes**.
 - d. From the Destination Directory panel, click **Next** to accept the default directory.
 - e. When prompted to start the Event Monitor service, click **Yes**.
 - f. From the Operation Complete panel, click **Finish**.
3. From the master console installation wizard, click **Next**. The master console installation wizard validates the installation of the DS4000 Storage Manager

Client (FAStT Storage Manager Client). If the validation is not successful, an error panel is displayed. If errors were found, correct the errors and start the installation wizard again.

Installing Tivoli SAN Manager

This topic describes how to install the Tivoli SAN Manager using the master console installation wizard.

Note: The version of Tivoli SAN Manager that is included with the master console is the IBM Tivoli Bonus Pack for SAN Management, which provides the same SAN management capabilities as Tivoli SAN Manager for environments up to 64 SAN switch ports. If more than 64 SAN ports are required in your enterprise, you can purchase the full Tivoli SAN Manager product.

Before you begin installing the Tivoli SAN Manager, ensure that the SNMP service is started and that a public community string is defined. In addition, ensure that the SNMP Trap service is set to manual and stopped by performing the following steps:

1. Right-click **My Computer** from the desktop, and then click **Manage**.
2. Expand **Services and Applications**.
3. Click **Services**.
4. Select **SNMP Service** and verify that the status is set to started.
5. Right-click **SNMP Service** and click **Properties**.
6. Click the **Security** tab and verify that there is a public community name with a minimum of Read rights.
7. Click **OK** to close the SNMP Service properties dialog.
8. From the list of services, select **SNMP Trap Service**. Verify that the status is not set to started and that the startup type is set to manual.

Perform the following steps to install the Tivoli SAN Manager:

1. From the master console installation wizard, click **Next** to start the installation of IBM Tivoli Storage Area Network Manager.
2. If you are prompted to insert a different CD, insert it into the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
3. From the Tivoli Storage Area Network Manager setup wizard, perform the following steps:
 - a. Select the language to be used for the installation, and click **OK**.
 - b. From the Controller Firmware Warning panel, click **OK**.
 - c. From the Welcome panel, click **Next**.
 - d. From the License Agreement panel, click **I accept the terms in the license agreement**, and then click **Next**.
 - e. From the Destination Directory panel, click **Next** to accept the default directory.
 - f. From the base port number panel, click **Next** to accept the default.
 - g. From the data repository panel, click **DB2**, and then click **Next**.
 - h. From the Single/Multiple User ID/Password Choice panel, you can decide to use the DB2 Administrator user name and password that you specified during the DB2 installation for all IDs and passwords on this panel. You can also choose to use different IDs and passwords for each of the IDs and passwords on this panel. After you make your choices, click **Next**.

- i. Enter the DB2 Administrator user name and password. Confirm the password and click **Next**.

Note: If you chose not to use the DB2 Administrator user name and password, you are prompted to enter IDs and passwords for DB2, Websphere, host authentication, and NetView.

- j. From the database name panel, click **Next** to accept the default.
 - k. From the Tivoli Network installation drive panel, click **Next** to accept the default.
 - l. From the installation confirmation panel, click **Next**.
 - m. When you are prompted, click **Finish** to complete the installation of the Tivoli SAN Manager. Note that the machine restarts and the master console installation wizard continues.
4. From the master console installation wizard, click **Next**. The master console installation wizard validates the installation of Tivoli SAN Manager. If the validation is not successful, the Verify Tivoli SAN Manager Installation panel displays an error. Correct all errors and restart the master console installation wizard.

Before you continue with the master console software installation, you must disable the NetView component of Tivoli SAN Manager from receiving traps from the Windows SNMP Trap Service. Both NetView and IBM Director receive traps on the same port by default, which can cause a conflict when SNMP traps are sent from the SAN File System or the SAN Volume Controller. Therefore, you must configure IBM Director to forward traps to NetView (you configure IBM Director to forward traps after you install it).

Perform the following steps to disable the NetView component from receiving SNMP traps:

1. Edit the Windows registry by opening a DOS prompt and entering `regedit` from the command line.
2. Locate the key **HKEY_LOCAL_MACHINE\SOFTWARE\Tivoli\NetView\CurrentVersion**.
3. Double-click the **trapdSharePort162** value name and change its value data to **0**.
4. Right-click the key **HKEY_LOCAL_MACHINE\SOFTWARE\Tivoli\NetView\CurrentVersion** and click **New** → **DWORD Value**.
5. Change the value name to **trapdTrapReceptionPort**.
6. Double-click the **trapdTrapReceptionPort** value name, change its value data to an available port number (such as 9950), and select **Decimal**.

Tip: Remember the port number that you set here, because you refer to that number when you modify the IBM Director configuration.

7. Close the Registry Editor window.
8. Open a Command Prompt window.
9. Remove the NetView service.
`C:\usr\ov\bin\nvservice -remove`
10. Reinstall the NetView service (which removes the dependency on the SNMP Trap Service).
`C:\usr\ov\bin\nvservice -install -username .\NetView -password password`

where *password* is the password of the local NetView account.

Installing Tivoli SAN Manager Agent

This topic describes how to install the Tivoli SAN Manager agent using the master console installation wizard.

Perform the following steps to install the Tivoli SAN Manager agent:

1. From the master console installation wizard, click **Next** to begin the installation of the Tivoli SAN Manager agent.
2. If prompted to insert a different CD, insert it in the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
3. Select the language to be used by the Tivoli SAN Manager Agent Setup Wizard, and click **OK**.
4. The Tivoli SAN Manager Agent Setup Wizard is launched. From the Setup Wizard perform these steps to install the Tivoli SAN Manager Agent:
 - a. From the Software License Agreement panel, click **I accept the terms in the license agreement**, and click **Next**.
 - b. From the Installation Directory panel, click **Next** to accept the default directory.
 - c. From the Manager name and port number panel, enter **localhost** for the Tivoli Manager name (because both the Manager and the Agent are on the master console). Leave the default for the Port Number, and click **Next**.
 - d. From the Base Port Number panel, click **Next** to accept the default.
 - e. From the Host Authentication Password panel, enter the password of the Host Authentication ID you specified when you installed Tivoli SAN Manager - Manager.

Note: If you chose to use the DB2 Administrator username and password for all IDs when you installed the Tivoli SAN Manager, enter it on this panel as well. Otherwise, enter the ID that you specified for the host authentication ID when you installed the Tivoli SAN Manager.
 - f. From the Installation Confirmation menu, click **Next**.
 - g. Click **Finish** to complete the installation of the Tivoli SAN Manager Agent.
5. From the master console installation wizard, click **Next**. The master console installation wizard validates the installation of Tivoli SAN Manager agent. If the validation is not successful, the Verify Tivoli SAN Manager Agent Installation panel displays an error. If errors were found, correct the errors and restart the master console installation wizard.

Installing IBM Director

This topic describes how to install IBM Director using the master console installation wizard.

Perform the following steps to install IBM Director:

1. From the master console installation wizard, click **Next** to begin the installation of IBM Director.
2. If you are prompted to insert a different CD, insert it in the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
The IBM Director Setup Wizard is launched.
3. From the Setup Wizard, perform the following steps to install IBM Director:
 - a. From the Welcome panel, click **Next**.

- b. From the License Agreement panel, click **I accept the terms in the License Agreement**, and click **Next**.
 - c. From the Server Plus Pack panel, click **Next**.
 - d. From the Feature and Installation Directory panel, click the Red x for SNMP Access and Trap Forwarding. Click **This Feature will be installed on the local hard drive**, and click **Next**.
 - e. From the IBM Director service account information panel, fill in the following fields:
 - **Domain:** Enter the host name for the master console.
 - **User name:** Enter a Windows user account that has administrative privileges.
 - **Password:** Enter the password for the Windows user account (and confirm it).
 Click **Next**.
 - f. From the Encryption Settings panel, click **Next** to accept the defaults
 - g. From the Software distribution settings panel, click **Next** to accept the defaults.
 - h. Click **Install** to begin the installation.
 - i. From the Network Drivers configuration window, select the first port and click **Enable driver**.
 - j. From the IBM Director database configuration, make sure that **Microsoft Jet 4.0**, which is the default, is selected. Do not select DB2 here. Then click **Next**.
 - k. From the IBM Director Microsoft Jet database configuration, click **Next** because you cannot change any of the Jet database configuration values.
 - l. Click **Finish** to complete the installation.
 - m. When you are prompted to restart the system, click **No**.
4. From the master console installation wizard, click **Next**. The master console installation wizard validates the installation of IBM Director. If the validation is not successful, the Verify IBM Director Installation panel displays an error. Correct all errors and restart the master console installation wizard.

After you complete the installation but before you continue with the master console installation wizard, you must configure the IBM Director to forward traps to the NetView component of Tivoli SAN Manager.

Perform the following steps to forward traps to the NetView component:

1. Open a Command Prompt window.
2. Change to the IBM Director snmp directory by issuing the following command:
`cd Director_installation_directory\data\snmp`

where *Director_installation_directory* is the directory where the IBM Director is installed. This directory is C:\Program Files\IBM\Director by default.

3. Edit **SNMPServer.properties**.
4. Find the line **snmp.trap.v1.forward.address.1=**.
5. Uncomment the line (delete the # sign), and add the name of the master console machine. For example:
`snmp.trap.v1.forward.address.1=master1`
6. Find the line **snmp.trap.v1.forward.port.1=**.

7. Uncomment the line (delete the # sign), and add the port that you specified for the trapdTrapReceptionPort value in the Windows registry key KEY_LOCAL_MACHINE\SOFTWARE\Tivoli\NetView\CurrentVersion\. For example:

```
snmp.trap.v1.forward.port.1=9950
```
8. Save and close the file.
9. Reboot the master console.

Preconfiguring IBM Director

This topic describes how the master console installation wizard performs some preconfiguration tasks for IBM Director.

IBM Director preconfiguration tasks consist of creating a set of event action plans designated for managing specific events generated by the master console system. These action plans are imported from configuration archive files that should exist on the master console installation package.

Perform the following steps to launch the IBM Director preconfiguration tasks:

1. If at least one of the event action plans is in the installation package, you are asked to provide, in the Superuser account panel, a Director superuser (member of DirSuper group) name and password needed in the IBM Director preconfiguration process.
Provide the name and password, and click **Next** to continue.
2. Wait for the master console wizard to restart IBM Director and to discover IBM Director-managed systems.
3. The installation wizard finishes the preconfiguration tasks. If one or more configuration files are not found in the installation package, or if an error occurs during the creation of event action plans, a message is displayed in a panel warning the user that these action plans must be manually created later, after the installation is completed.
Click **Next** to continue.

After the master console installation wizard has completed the preconfiguration tasks for IBM Director, you need to complete the following steps to ensure that the local system account can log on to IBM Director:

1. Close IBM Director.
2. Right-click **My Computer** from the desktop, and then click **Manage**.
3. Expand **Services and Applications**.
4. Click **Services**.
5. Right-click **IBM Director Server** and click **Properties**.
6. Select the **Log On** tab.
7. Click **Local System account** and select **Allow service to interact with desktop**. Click **Apply**.
8. You are prompted that the new properties will not take effect until you stop and restart the service. Click **OK** at the prompt.
9. Click **OK** to close the Properties dialog.
10. Stop the IBM Director service, and then restart it.

Related tasks

“Setting up error notification for the SAN Volume Controller” on page 39
This topic provides an overview of configuring error notifications for the SAN Volume Controller.

“Setting up the service alert feature for the SAN File System” on page 42
This topic provides an overview of configuring service alerts for SAN File System.

Installing documentation and support utilities

This topic describes how to use the master console installation wizard to install the master console documentation, Document Launcher, IBM Connection Manager, configuration files, IBM WebSphere Help System, and create the directories structure and icons.

Perform the following steps to copy the documentation files and to install the utilities:

1. From the master console installation wizard, click **Next** to begin installing the documentation and support utilities.
2. If prompted to insert a different CD, insert it in the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
3. The documentation and support utilities are copied.
4. The installation wizard installs the IBMConnection Manager, loads registry info and creates the IBM VPN client object.
5. The installation wizard copies Eclipse files of IBM WebSphere Help System and installs the master console information center (copies master console-specific documentation into the IBM WebSphere Help System).
6. The program installs the IBM master console information center as a service.
7. After all documentation and utilities are installed, the Finish panel is displayed.
8. Review the master console installation log (mclog.txt) to ensure that all products are properly installed. The log file is located in *<installation_directory>\logs*, where *<installation_directory>* is the directory where the master console was installed. The default installation directory is C:\Program Files\IBM\MasterConsole.
9. Click **Finish** to complete the installation
10. If a system reboot is required, accept the prompt to complete the master console installation process.

Mirroring the boot drive

You can use the Microsoft Windows software mirroring capability to mirror the boot drive on the master console.

Before you mirror the boot drive, ensure that you meet the following prerequisites:

- You must have a second drive that is as large or larger than your original boot drive.
- If the target disk has a partition that is assigned to it (that is, it already has a drive letter), perform the following steps to remove the partition:
 1. Back up any necessary data on the existing partition. When you remove an existing partition, you lose any data that is on it.
 2. Remove the partitioning by right-clicking **My Computer**, selecting **Manage** → **Storage** → **Disk Management**, right-clicking the target disk drive, and then selecting **Delete Partition**

Perform the following steps to mirror the boot drive:

1. Right-click **My Computer** on the desktop.
2. Click **Manage**.

3. Click **Storage** → **Disk Management**.
4. Right-click the disk icon for the system disk.
5. Convert the disk to a dynamic disk by performing the following actions:
 - For Windows 2000 systems:**
 - a. Click **Upgrade to dynamic disk** and then click **OK**.
 - b. Right-click the disk icon for the disk that you want to become the mirror of the system disk.
 - c. Click **Upgrade to dynamic disk** and then click **OK**.
 - d. If you receive a warning, click **Yes**.
 - e. If your system restarts, restart the Disk Management utility.
 - For Windows 2003 systems:**
 - a. Click **Convert to dynamic disk**.
 - b. Select both drives and click **OK**.
 - c. Click **Convert**.
 - d. Click **Yes** to continue when you receive an operating system boot warning.
 - e. Click **Yes** to unmount file systems and to continue.
 - f. Allow the system to reboot.
 - g. Restart the Disk Management utility.
6. For Windows 2000 systems, right-click the disk icon for the system disk or, for Windows 2003 systems, right-click the system disk partition.
7. Click **Add Mirror**.
8. Select the disk that you want to become the mirror of the system disk, and then click **Add Mirror**.
9. Click **OK** to continue when you receive a warning indicating that you must update the boot.ini file.
10. Perform the following steps to update the boot.ini file:
 - a. Double-click **My Computer** on the desktop.
 - b. Click **Tools** → **Folder options**.
 - c. Click the **View** tab.
 - d. In the **Advanced settings** list, perform one of the following actions, depending on your operating system:
 - For Windows 2000 systems, select **Show hidden files and folders**.
 - For Windows 2003 systems, select **Show hidden files and folders** and clear the **Hide protected operating system files** option. Click **Yes** when you receive a warning.
 - e. In the My Computer window, click **Local disk (C:)**.
 - f. Open the C:\boot.ini file in a text editor.

Attention: Be cautious when you edit this file and make only the specified changes. Do not modify any other lines in this file.
 - g. In the operating system section, add **Primary** to the end of the operating description for the system disk.
 - h. Copy the line for the system disk, change **Primary** to **Secondary**, and change the system disk (for example, **rdisk(0)**) to mirrored disk (for example, **rdisk(1)**). The file looks similar to one of following examples.

Windows 2000 example:

```
[boot loader]
timeout=30 default=multi(0)disk(0)rdisk(0)partition(1)\WINNT
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINNT="Microsoft Windows 2000 Advanced
  Server Primary" /fastdetect
multi(0)disk(0)rdisk(1)partition(1)\WINNT="Microsoft Windows 2000 Advanced
  Server Secondary" /fastdetect
```

Windows 2003 example:

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(1)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Windows Server 2003,
  Standard Primary" /fastdetect
multi(0)disk(0)rdisk(1)partition(1)\WINDOWS="Windows Server 2003,
  Standard Secondary" /fastdetect
```

- i. Save and close the file.
- j. Restart the machine.
After the machine completes the Power On Self Test (POST), the system prompts you to select the Windows operating system to use for the boot process
- k. Select the secondary operating system and press Enter to verify that the machine successfully restarts from the mirrored drive.
- l. Restart the machine again.
After the machine completes the POST, the system again prompts you to select the Microsoft Windows operating system to use for the boot process.
- m. Select your operating system and press Enter to verify that the machine successfully restarts from the system drive.

Chapter 5. Configuring the master console

This topic provides an overview of the steps for configuring the master console.

Perform the following process to configure your master console:

1. Log on as a local administrator (for example, as the Administrator user) to the system where the master console software is installed.

Note: If you purchased the software-only master console, skip to step 6 since you completed the steps 2 through 5 when you installed the master console software.

2. Configure the master console host name. “Configuring the master console host name” on page 19 provides more details for this step.
3. Configure the network. “Configuring the network” on page 36 provides more details for this step.
4. Configure the browser. “Configuring the browser” on page 37 provides more details for this step.
5. Generate an SSH key pair using the PuTTYgen. “Generating an SSH key pair using PuTTYgen” on page 24 provides more details for this step.
6. Configure a default PuTTY session only for command-line interface (CLI) access. “Configuring a default PuTTY session” on page 37 provides more details for this step.
7. Store keys in the SAN Volume Controller Console software. “Storing keys in the SAN Volume Controller Console software” on page 38 provides more details for this step.
8. Set up e-mail notification and call home for the SAN Volume Controller. “Setting up e-mail notification for the SAN Volume Controller” on page 39 and “Setting up the call home feature for the SAN Volume Controller” on page 40 provide more details for this step.
9. Set up e-mail notification for the SAN File System. “Setting up e-mail notification for the SAN File System” on page 45 provides more details for this step.
10. Install your chosen antivirus software on the master console system.

Configuring the master console host name

You must configure the master console host name as part of the configuration process.

Perform the following steps to configure the host name:

1. From the desktop, click **Start**.
2. Right-click on **My Computer**.
3. Click **Properties**.
4. Click **Computer Name**.
5. Click **Change**.
6. Type the master console host name in the **Computer name** field.
7. Click **More**.
8. Type the full path information in the **Primary DNS suffix of this computer** field.

9. Run the *install_path*\MasterConsole\Support Utils\mcconfig.exe file, where *install_path* is the drive letter and the directory where the master console is installed.

Configuring the network

You must configure the network by entering the IP addresses for the Ethernet ports.

Entering IP address for Ethernet port 1

This topic describes how to configure the IP address for the external Internet connection for remote access (Ethernet port 1).

Tip: After configuring the connection, you can disable it when you are not using remote access.

Perform the following steps to configure the IP address for the external Internet connection:

1. From the desktop, right-click the **My Network Places** icon.
2. Click **Properties**.
3. Right-click **Local Area Connection 1**.
4. Click **Properties**.
5. Click **Internet Protocol (TCP/IP)**.
6. Click **Properties**.
7. Enter all required information for the IP and DNS addresses.
8. Click **OK** until you return to the desktop.
9. Connect Ethernet port 1 to the network.

Related reference

“Specifying IP information” on page 14

This topic describes the IP configuration information that you specify for the master console.

“Specifying port assignments” on page 13

You must decide which ports to use for the master console so that you can determine the Ethernet cables that you will need.

“Cabling options” on page 10

This topic describes the various options for cabling the hardware that runs the master console. This information helps you to plan the cabling of the hardware. However, to avoid any address conflicts, do not connect the Ethernet cables until after you have configured the IP addresses.

Entering IP address for Ethernet port 2

This topic describes how to configure the IP address for the internal IP network connection (Ethernet port 2).

Perform the following steps to configure the IP address for the internal network connection:

1. From the desktop, right-click the **My Network Places** icon.
2. Click **Properties**.
3. Right-click **Local Area Connection 2**.
4. Click **Properties**.
5. Click **Internet Protocol (TCP/IP)**.

6. Click **Properties**.
7. Type all required information for the IP and DNS addresses.
8. Click **OK** until you return to the desktop.
9. Connect Ethernet port 2 to the network.

Related reference

“Specifying IP information” on page 14

This topic describes the IP configuration information that you specify for the master console.

“Specifying port assignments” on page 13

You must decide which ports to use for the master console so that you can determine the Ethernet cables that you will need.

“Cabling options” on page 10

This topic describes the various options for cabling the hardware that runs the master console. This information helps you to plan the cabling of the hardware. However, to avoid any address conflicts, do not connect the Ethernet cables until after you have configured the IP addresses.

Configuring the browser

If you plan to access the SAN Volume Controller Console using a browser other than the one that is preinstalled on the master console system, use the configuration instructions of your chosen browser to ensure that new windows (pop-ups) can automatically open when you visit a Web site. Also, uninstall or turn off any applications that block or suppress pop-up windows.

Generating an SSH key pair using PuTTYgen

You must generate SSH keys for the SAN Volume Controller.

Perform the following steps to generate SSH keys on the master console using the PuTTY Key Generator (PuTTYgen):

1. Start PuTTYgen by clicking **Start** → **Programs** → **PuTTY** → **PuTTYgen**.
2. Click **SSH2 RSA** as the type of key to be generated.
3. Click **Generate**.
4. Move the cursor around the blank area of the **Key** section to generate a random number.
5. Click **Save public key** to save the public key.
6. Type `icat` as the name of the key and click **OK**.
7. Click **Save private key** to save the private key.
8. When you are prompted to confirm that you want to create the key without a passphrase, click **Yes**.
9. Type `icat.ppk` as the name of the key and click **OK**.
10. Close the PuTTYgen.

Configuring a default PuTTY session

This topic explains how to configure a default PuTTY session so that you can run SSH from a command-line interface.

You must perform these steps only if you are planning to run the PuTTY from a command prompt window and you are using private and public keys.

Remember: Keys are required for the SAN Volume Controller, but they are not required for the SAN File System.

Perform these steps to configure the PuTTY session on the master console:

1. Click **Start** → **Programs** → **PuTTY** → **PuTTY** to open the PuTTY Configuration GUI window.
2. In the categories pane, make sure that **Session** is selected.
3. Select **SSH** as the protocol under the PuTTY basic options.
4. In the categories pane, click **Connection** → **SSH**.
5. Select **2** as the preferred SSH protocol version.
6. In the categories pane, click **Auth**.
7. Type the fully-qualified file name of the SSH client private key file that you specified when you used the PuTTY Key Generator in the **Private key file for authentication** field in the Authentication Parameters. For example, C:\Support Utils\PuTTY\icat.ppk.
If you do not know the file name, you can click **Browse** to select the file name from the system directory.
8. In the categories pane, click **Session**.
9. In the Saved Sessions window, click **Default Settings**.
10. Click **Save** to save your settings.

Storing keys in the SAN Volume Controller Console software

This topic describes how to store your SSH keys in the SAN Volume Controller Console software. When the keys that are used to communicate with the SAN Volume Controller are changed, you must store a copy of the new private key in the SAN Volume Controller Console software.

Perform the following steps to store a copy of the new private key in the SAN Volume Controller Console software:

1. Open a command prompt window by clicking **Start** → **Run**.
2. Type **cmd.exe** in the Open box. Click **OK**.
3. Type the following command:

```
copy path\filename C:\Program Files\IBM\svconconsole\cimom\icat.ppk
```

where *path\filename* is the path and the file name where you stored the SSH private key when it was generated in the previous procedure.

Note: Directory names with embedded spaces must be surrounded by double quotation marks.

4. Stop and start the IBM CIM Object Manager to make the change take effect. Perform the following:
 - a. Click **Start** → **Settings** → **Control Panel**.
 - b. Double-click **Administrative Tools**.
 - c. Double-click **Services**.
 - d. From the list of services, right-click **IBM CIM Object Manager**. Select **Stop** and wait for Windows to stop the service.
 - e. From the list of services, right-click **IBM CIM Object Manager**. Select **Start**.

Setting up error notification for the SAN Volume Controller

This topic provides an overview of configuring error notifications for the SAN Volume Controller.

Before you perform these procedures, ensure that the following prerequisites are met:

- The SAN Volume Controller must be installed and configured.
- You know the serial number of the SAN Volume Controller.

You can configure the IBM Director to alert your system administrator through e-mail when errors or events are logged by the SAN Volume Controller. You can also choose to initiate a call-home message to IBM when failures that require service actions are logged by the SAN Volume Controller.

Related tasks

“Preconfiguring IBM Director” on page 31

This topic describes how the master console installation wizard performs some preconfiguration tasks for IBM Director.

Setting up e-mail notification for the SAN Volume Controller

This task provides instructions for configuring IBM Director to alert your system administrator by e-mail when errors or events are logged by the SAN Volume Controller.

Perform the following steps to configure the IBM Director to notify your system administrator of SVC errors and events:

1. Initiate a test SNMP trap to be sent to the master console IP address by causing a temporary error on the SAN Volume Controller. For example, temporarily remove one of the SAN Volume Controller fibre-channel cables to cause error code *1060* to be displayed on the front panel of the SAN Volume Controller node. After this error is displayed, replace the fibre-channel cable, and delete the entry in the SAN Volume Controller error log.
2. Log on to the master console.
3. From the desktop, double-click the **IBM Director console** icon to open the IBM Director console.
4. Log on to the IBM Director console.
5. Validate that the IBM Director received the test trap that was sent by the SAN Volume Controller by using the following steps:
 - a. Double-click the **Event Log** in the right column of the IBM Director console.
 - b. Verify that the test SNMP trap was received. SAN Volume Controller traps can be identified by displaying the **Event Type** field of the log. For SAN Volume Controller traps, the field contains text starting with `SNMP.iso.org.dod.internet.private.enterprises.ibm.ibmProd.190`. If the test trap was not received, perform one or more of the following actions:
 - Contact your network administrator to ensure that there is not a networking problem.
 - Verify that the error notification setting on the SAN Volume Controller is not set to **none**.
 - Verify that the master console IP address has been configured.
 - c. Close the Event Log.

6. From the IBM Director main panel, click **Tasks>Event Action Plan Builder**. The Event Action Plan Builder panel opens.
7. Expand the **Send an Internet (SMTP) E-mail** hierarchy in the right column of the Event Action Plan Builder panel.
8. Double-click **2145EventNot**.
9. Type the following information in the form that is displayed:
 - a. **Internet E-mail Address:** Type an e-mail address (for example, the e-mail address of the system administrator).
 - b. **Reply to:** Type the e-mail address to which you want replies to be directed.
 - c. **SMTP E-mail server:** Type the name or IP address of the SMTP mail server.
 - d. **SMTP port:** Type the port number through which e-mail is sent to your e-mail server. The default is 25.
 - e. **Subject of E-mail Message:** Type 2145 Event Notification.
 - f. **Body of E-mail Message:** Type any information that you want to be sent to the recipient of the e-mail (for example, the machine location information). The body of the e-mail also contains all the SNMP trap data that contains the details of the event.
10. Click **File->Save**.
11. Close the Event Action Plan Builder panel.
12. Close the main IBM Director panel.

Setting up the call home feature for the SAN Volume Controller

This topic provides instructions for configuring IBM Director for the SAN Volume Controller error notification and service alert (the call home feature).

Perform the following steps to configure the master console to support the call home feature:

1. Log on to the master console.
2. From the desktop, double-click the **IBM Director console** icon to open the IBM Director console.
3. Log on to the IBM Director console.
4. From the IBM Director main panel, click **Tasks → Event Action Plan Builder**. The Event Action Plan Builder panel opens.
5. Expand the **Send an Internet (SMTP) E-mail** hierarchy in the right column of the Event Action Plan Builder panel.
6. Double-click **2145CallHome**.
7. Type the following information in the form that is displayed:
 - a. **Internet E-mail Address:** If the SAN Volume Controller is located in North America, Latin America, South America or the Caribbean Islands, type the following address into the field:
`callhome1@de.ibm.com`

 If the SAN Volume Controller is located anywhere else in the world, type the following address into the field:
`callhome0@de.ibm.com`
 - b. **Reply to:** Type the e-mail address to which you want replies to be directed.

- c. **SMTP E-mail server:** Type the name or IP address of the SMTP mail server.
- d. **SMTP port:** Type the port number through which e-mail is sent to your e-mail server. The default is 25.
- e. **Subject of E-mail Message:** Type 2145 Error Notification
- f. **Body of E-mail Message:** Complete the following text fields. Do not change any other fields in the body of the e-mail message.

```
# Contact name = contact_name
# Contact phone number = primary_telephone_number
# Offshift phone number = offshift_telephone_number
# Machine location = machine_location
```

where *contact_name* is the name of the person who the IBM service representative can contact about this call home request, *primary_telephone_number* is the primary telephone number to use to reach the contact person, *offshift_telephone_number* is the telephone number where the contact person can be reached during nonbusiness hours, and *machine_location* is the location of the machine. You can enter a maximum of 72 characters for each field.

- 8. Click **File** → **Save**.
- 9. Double-click **2145Test**.
- 10. In the **Body of E-mail Message** section of the form that displays, type the same information that you entered in step 7f along with the following information:

```
# Machine Type/Model = type_model
# Serial Number = serial_number
```

where:

- *type_model* is the machine type and model of the installed SAN Volume Controller that is involved in this call home request. Possible values for *type_model* are **21454F2** (default) or **21458F2**. The default value is **21454F2**. Do not enter any hyphens when you type the machine type and model.
- *serial_number* is the serial number of the SAN Volume Controller that is involved in this call home request. To find the value for *serial_number* on 4F2 models, find the serial number label, which is located on the right edge of the front panel. For the 8F2 model, the label is located on the center of the front panel. Do not enter any hyphens when you type the serial number.

- 11. Click **File** → **Save**.
- 12. Right-click **2145Test** and select **Test**.
A call-home record is generated. An IBM service representative will call you within 24 hours to confirm that the call-home test has been successful. If you do not receive a phone call, report this to IBM as a call-home failure.
- 13. Close the Event Action Plan Builder panel.
- 14. Close the main IBM Director panel.

Note: The action plan is preconfigured. If this becomes corrupted, the call-home function and event notifications will fail and, before you continue, you must recover the data.

Related concepts

“Recovering Action Plan preconfiguration data” on page 49
IBM Director is preconfigured to help you set up error notification for the SAN

Volume Controller. If this preconfiguration data becomes corrupted, the call home function and event notifications fail.

Setting up the service alert feature for the SAN File System

This topic provides an overview of configuring service alerts for SAN File System.

The service alert feature works as follows:

1. The SAN File System raises an SNMP trap as the result of a detected error.
2. IBM Director on the master console receives notification of the trap.
3. IBM Director collects the trap and sends a specifically formatted e-mail to the specified system administrator.

Note: When an alert is sent by SAN File System, the system administrator can contact IBM Support Center if assistance is needed.

To configure service alerts, you must compile the MIBs for the SAN File System and the RSA II adapter, and configure Service Alerts. You can also set up e-mail notification.

Related tasks

“Preconfiguring IBM Director” on page 31

This topic describes how the master console installation wizard performs some preconfiguration tasks for IBM Director.

Compiling MIBs for the SAN File System

This topic describes how to compile MIBs for the SAN File System on the master console.

The SAN File System cluster must be installed and operational and the metadata server must have been configured to send traps to the master console.

You must compile MIBs for the SAN File System Service Alert feature and for the RSA II adapter.

Perform the following steps to compile the Service Alert MIB.

1. Use secure copy to copy the MIB from the metadata server to the master console:
 - a. Open a DOS command prompt on the master console.
 - b. Change to the putty directory (cd /program files/putty) and run **pscp** to copy a file from a metadata server engine. Note that you enter the command on one line and that *target_file* needs to end in the extension .mib.

```
pscp -I private_key_file -2 userID@engine_IP_address:  
/usr/share/snmp/mibs/IBM-SANFS-MIB.txt target_file.mib
```

If private keys have not been exchanged with the metadata servers, use the following syntax:

```
pscp.exe -2 userID@engine_IP_address:  
/usr/share/snmp/mibs/IBM-SANFS-MIB.txt target_file.mib
```

2. Open the IBM Director console.

Note: When you log in to IBM Director, the password for the IBM Director Login window must match the password for the IBM Director Server services.

3. In the Tasks menu, click **Discover Systems** and then **SNMP Devices**.

4. In the Groups pane on the left side of the panel, expand the All Groups group and right-click the SNMP Devices group, then click **Compile a new MIB**.
5. When the window opens, asking you to select the location of the new MIB, click the IBM-SANFS-MIB.txt file that you have saved.
6. The Status Messages window presents the following:


```
MIB file submitted to the server.
Starting MIB compile...
MIB Parsing complete
Resolving MIB imports
Saving MIB objects...
MIB Compile Finished.
```
7. Close the Status Messages window.
8. Compile the MIB for the RSA II adapter to configure it to send traps as well.
 - a. Download the RSA MIB. The MIB is obtained from the IBM Support Web site at <http://www.ibm.com/pc/support> as part of the firmware package for the RSA II adapter. You download the firmware update from IBM as a single executable file.
 - b. Run the executable file, which will request that you insert a diskette. The diskette is formatted and the updated software is copied to the diskette (including the MIB).
 - c. Use the same process for compiling the RSA MIB as for the SAN File System MIB. For more information, refer to the RSA II firmware documentation.

Related tasks

“Configuring the service alert feature for the SAN File System”

This task provides instructions for configuring IBM Director for the SAN File System error notification and service alert.

“Setting up e-mail notification for the SAN File System” on page 45

This task provides step-by-step instructions about setting up your e-mail notification for the SAN File System.

Configuring the service alert feature for the SAN File System

This task provides instructions for configuring IBM Director for the SAN File System error notification and service alert.

The SAN File System management information base (MIB) must have been compiled on the master console. In addition, the SAN File System cluster must be installed and operational, and the metadata servers must have been configured to send traps to the master console. See the *SAN File System Installation and Configuration Guide* for information about configuring SNMP traps on metadata server engines.

Perform the following steps to configure the master console to support the Service Alert feature:

1. Verify that the metadata servers can send Simple Network Management Protocol (SNMP) traps to the master console. From the master metadata server, run the following **snmptrap** commands. Note that the quote marks are two single quotes:

```
snmptrap -v 2c -c public master_console_IP_address '' SNMPv2-MIB:colldStart
```

```
snmptrap -v 2c -c public master_console_IP_address '' IBM-SANFS-MIB:sanfsGenericTrap
```

where *master_console_IP_address* is the IP address or host name of the master console.

2. Log on to the master console.
3. From the desktop double-click the **IBM Director console** icon to open the IBM Director console.
4. Log on to the IBM Director console.
5. Validate that IBM Director received the traps sent by the SAN File System master metadata server.
 - a. Double-click **Event Log** in the right column of the IBM Director console.
 - b. Verify that the SNMP traps were received. Look for the metadata server hostname or IP address under the Sender Name column. If the traps were not received:
 - Contact your network administrator to ensure that there was not a networking problem.
 - Make sure that the SAN File System sent the traps.
 - c. Close the event log.
6. From the IBM Director main panel, click **Tasks**.
7. In the Tasks menu, click **Event Action Plan Builder**. The Event Action Plan Builder window opens.
8. From the Event Action Plan Builder window, right-click **Simple Event Filter** and click **New**.
9. A new simple event filter builder window opens. Perform the following steps:
 - a. In the Event Type tab, make sure that the **Any** option is *not* checked.
 - b. Expand the tree in the Event Type tab to select the following:

**SNMP.iso.org.dod.internet.private.enterprises.ibm.ibmProd.
ibmSanfsModule.ibmSanfsTraps**
 - c. Click **File**, and then click **Save as**.
 - d. Enter **tankGenericTrap** and the name of the event filter and click **OK**.
10. Right-click **Send an Internet (SMTP) E-mail** in the right column of the Event Action Plan Builder menu and click **Customize**.
11. Enter the following information in the displayed form:
 - **Internet E-mail address**. Fill in an e-mail address to which to send service notifications (for example, the e-mail address of the system administrator).
 - **Reply to**. Fill in an e-mail address to which to send service notifications (for example, the e-mail address of the system administrator).
 - **SMTP e-mail server**. Enter the name or IP address of the SMTP mail server.
 - **SMTP port**. Enter the port number through which e-mail is sent on your e-mail server. The default is 25.
 - **Subject of E-mail Message** — Enter the following text: IBM SAN FS Call-home Notification.
 - **Body of E-mail message** — Enter the following text as shown.


```
#Machine type=machine_type
#Device serial number=serial_number
#Record type=1
#Component id=software
#Contact name=contact_name
#Contact phone=telephone_number
#Mgmt node=&system
#Date recvd=&date
#Time recvd=&time
```

where:

- *Machine_type* is a four-digit device type and three-digit model.
- *Serial_number* is the serial number of the master engine in the cluster.
- The *contact_name* and *telephone_number* can be any length and format.
- The values &system, &date, and &time are entered exactly as shown. They are not variables.

Note: E-mails will include the text of the service alert message.

12. Click **File**, and then click **Save As**.
13. Enter **IBM SAN FS Call-home Notification** as the name of the e-mail action, and then click **OK**.
14. Expand the **Event Action Plan** → **Log All Events** hierarchy in the left column of the Event Action Plan window.
15. Expand the **Simple Event Filter** hierarchy in the middle column of the Event Action Plan Builder window.
16. Drag the **tankGenericTrap** event filter from the middle column to **Log All Events** in the left column.
17. Click **Yes** in response to any warning pop-up windows that open.
18. Expand the **Send an Internet (SMTP) E-mail** hierarchy in the right column of the Event Action Plan Builder menu.
19. Drag the **IBM SAN FS Call-home Notification** item from the **Send an Internet (SMTP) E-mail** hierarchy to the **tankGenerictrap** item in the left column.
20. Click **Yes** in response to any warning pop-up windows that open.
21. Optionally, enable the action history, which will show a history of all events.
 - a. Right-click the action plan that you just created.
 - b. Click **Action History**.
 - c. Click **Enable**.
22. Close the Event Action Builder window.
23. Close the IBM Director window.

Related tasks

“Compiling MIBs for the SAN File System” on page 42

This topic describes how to compile MIBs for the SAN File System on the master console.

Setting up e-mail notification for the SAN File System

This task provides step-by-step instructions about setting up your e-mail notification for the SAN File System.

Perform the following steps to set up your e-mail notification:

1. Start IBM Director by clicking the **IBM Director Console** icon on the desktop.
2. From the IBM Director Console menu bar, select **Tasks** → **Event Action Plan Builder**.
3. In the **Actions** column, expand the item **Send an Internet (SMTP) E-mail**.
4. Right-click **IBM SAN FS Call-home Notification** and select **Update**. The **Customize Action: IBM SAN FS Call-home Notification** panel displays.
5. Fill in the following items:
 - **Internet E-mail Address** — Fill in an e-mail address (for example, the e-mail address of the system administrator)

- **Reply to** — Fill in the e-mail address to which you want any replies to be directed.
- **SMTP E-mail Server** — Fill in the address of your e-mail server.
- **SMTP Port** — Change this, if required, to your SMTP server port number.
- **Subject of E-mail Message** — Fill in SAN File System Event Notification.
- **Body of E-mail message** — Enter the following text as shown.

Machine location = Data Centre

6. Click **File** → **Save** to save the information.
7. Close the Event Action Plan Builder window.
8. Close the IBM Director Console window.

Related tasks

“Compiling MIBs for the SAN File System” on page 42

This topic describes how to compile MIBs for the SAN File System on the master console.

Chapter 6. Managing the master console

This section provides an overview of the tasks that you can perform from the master console.

Tasks that you can perform from the master console include:

- Starting Tivoli SAN Manager.
- Accessing SAN File System.
- Initiating remote support.
- Replacing the SSH key pair for SAN Volume Controller.
- Replacing the client SSH private key known to the SAN Volume Controller software.
- Setting passwords for Tivoli SAN Manager, DB2, and SAN Volume Controller.

Starting Tivoli SAN Manager

This task provides step-by-step instructions about how to start the Tivoli SAN Manager. Ensure that you configure the Tivoli SAN Manager to meet your requirements.

Perform the following steps to start Tivoli SAN Manager:

1. Double-click **Tivoli NetView** icon on your desktop, or select **Start** → **Programs** → **Tivoli Console**.
2. On the menu bar, select **SAN** → **Configuration**.
3. Click **Configuration Manager**.
4. Select **Switches and Other SNMP Agents** → **SNMP Agents** .
5. Add the IP address for each Fibre Channel switch into the SNMP Agents list:
 - a. Click **Add**.
 - b. Type the IP address or name of the Fibre Channel switch and click **OK**.
 - c. In the SNMP Agents section of the Switches and Other SNMP Agents panel, select the entry for the Fibre Channel switch and click **Advanced**.
 - d. Type the user ID and password for that particular switch (the manufacturing defaults for user ID is admin and password is passwOrd). This enables Tivoli SAN Manager to access the switch to collect zoning information.
 - e. To enable this access, configure the Fibre Channel switch to allow SNMP Command Access. Refer to your Fibre Channel switch documentation for procedures on setting up this access.
6. Verify the installation by running a SAN discovery. From the menu bar, click **SAN** → **Configure Manager**. This displays the Configure Manager panel
7. Select **Clear History** → **OK**.
8. Select **Cancel** on the Configure Manager panel.
9. Ensure that the Tivoli SAN Manager discovers all expected Fibre Channel connections and devices. You can visually check that the Tivoli SAN Manager discovers all expected connections and device by displaying the topology map for each fabric and seeing that all the expected devices are presented.

Accessing the SAN File System

This topic describes how to access the SAN File System metadata server engines through an SSH session.

From the master console, you can access the metadata server engines in the SAN File System cluster using PuTTY to establish an SSH session. For more information about PuTTY, refer to the PuTTY user's manual.

Accessing the SAN File System from the command line

This topic describes how to access the SAN File System metadata server engines through an SSH session from the command line.

Perform these steps to establish an SSH session to any of the engines in the SAN File System from the command line.

1. Open a DOS command prompt on the master console.
2. Change to the PuTTY directory.

```
cd \Program Files\PuTTY
```
3. Run **putty** to establish an SSH session with a master metadata server engine.

```
putty.exe -ssh engine_IP_address -I private_key_file -2
```

Note: If you are not using private/public keys with the SAN File System, omit the -I and -2 parameters.

4. Log in to the master metadata server engine using a Linux user ID and password.

After connecting to the engine, you can access the SAN File System administrative command-line interface (CLI) to run SAN File System commands. These commands provide the ability to manage engines, metadata servers, and administrative servers.

In addition, you can perform operating system commands from the SSH session as well.

Accessing the SAN File System from the desktop

This topic describes how to access the SAN File System metadata server engines through an SSH session from the master console desktop.

Perform these steps to establish an SSH session to any of the engines in the SAN File System from the master console desktop.

Note: If you are using secure keys, make sure that you have configured SSH to use those secure keys.

1. Double-click the **PuTTY** icon.
2. Fill in the IP address of the engine to be accessed.
3. Select **SSH** as the protocol.
4. Click **Open**.
5. After the session is established, log in using a Linux user ID and password.

After connecting to the engine, you can access the SAN File System administrative command-line interface (CLI) to run SAN File System commands. These commands provide the ability to manage engines, metadata servers, and administrative servers.

In addition, you can perform operating system commands from the SSH session as well.

Transferring files using pscp

This topic describes how to use the PuTTY secure copy function to copy files from a metadata server engine and the master console.

Perform these steps to transfer files from a metadata server engine in the SAN File System cluster to the master console using secure copy. For more information about **pscp**, see the PuTTY user's manual.

1. Open a DOS command prompt on the master console.
2. Run **pscp** to copy a file from a metadata server engine.

```
pscp.exe userID@engine_IP_address:source_file target_file -l  
private_key_file -2
```

Transferring files using psftp

This topic describes how to use the PuTTY ftp function to transfer files between a metadata server engine and the master console.

Perform these steps to transfer files between a metadata server engine in the SAN File System cluster and the master console using FTP. For more information about psftp, refer to the PuTTY user's manual..

1. Open a DOS command prompt on the master console.
2. Start the psftp session.

```
psftp
```
3. Open a connection to the metadata server engine.

```
open userID@engine_IP_address
```
4. Change to the appropriate directory on the metadata server (for example, type

```
cd /path
```

).
5. Change directories to the appropriate directory on the master console (for example, type

```
lcd /path
```

).
6. Use the **put** command to transfer files to the metadata server engine and the **get** command to retrieve files from the metadata server engine as shown in the following examples:

```
put file_name new_file_name  
or  
get file_name new_file_name
```
7. End the FTP session by entering quit.

Recovering Action Plan preconfiguration data

IBM Director is preconfigured to help you set up error notification for the SAN Volume Controller. If this preconfiguration data becomes corrupted, the call home function and event notifications fail.

Use the following Web site to download the most recent SAN Volume Controller Management Information Base (MIB) and preconfiguration recovery files and procedures:

<http://www.ibm.com/storage/support/2145>

Note: Although preconfiguration recovery files exist on the master console, these files might not be compatible with the latest version of SAN Volume Controller software or with the latest SAN Volume Controller MIB.

Related tasks

“Setting up the call home feature for the SAN Volume Controller” on page 40
This topic provides instructions for configuring IBM Director for the SAN Volume Controller error notification and service alert (the call home feature).

Initiating remote support

When IBM is helping you to resolve a problem with your SAN Volume Controller or SAN File System, you might receive a request to invoke an IP connection so that a remotely based IBM service representative can access the master console to collect additional information about the problem.

Perform the following steps to initiate a remote service session:

1. Invoke the remote service connection.
2. Add an additional subnet route.

Related concepts

“IBM Connection Manager and remote access” on page 3
The IBM Connection Manager component of the master console is VPN connection software that provides *remote access* to the SAN Volume Controller Console.

“Service alerts and error notifications” on page 4
This topic provides an overview of the service alerts and error notifications.

Invoking a remote service connection

This topic describes how to invoke a remote service connection.

Note: To ensure that the IBM Support Center has the correct access to the master console and its various software packages, you might be required to provide passwords, including the Administrator password, or you might have to be present during the remote service session to input the required passwords.

Perform the following steps to set up a secure connection to IBM with the IBM Connection Manager:

1. Double-click the **IBM Connection Manager** icon in the Master Console folder on the desktop to open the IBM Connection Manager window.
2. Select **IBMVPN** from the destination drop-down menu.
3. Click **Make Connection** when you are ready for the IBM remote service representative to log in. The status “Disconnected” at the bottom of the window changes to “Connected.”
4. Click **Generate Connection ID**. An alphanumerical string displays in the box to the right of the **Generate Connection ID** button. This is your unique connection ID. Give this connection ID to the IBM remote service representative.
5. After all remote support actions are complete, click **Disconnect** to terminate the connection.
6. When prompted to confirm the connection termination, click **OK**. The status “Connected” at the bottom of the window changes back to “Disconnected.”
7. To close down the application, click **Cancel**, and then click **OK**.

Related tasks

“Adding an additional subnet route” on page 51
This topic describes how to add a new route for the IBM support network after the VPN connection has been established using the IBM Connection Manager.

Adding an additional subnet route

This topic describes how to add a new route for the IBM support network after the VPN connection has been established using the IBM Connection Manager.

Perform the following steps to add an additional subnet route.

1. Determine the support network IP address of the master console:
 - a. Click **Start** → **Programs** → **Accessories** → **Command Prompt**.
 - b. Issue the following command:

```
ipconfig /all
```

The end of the output looks similar to the following example:

```
PPP adapter IBMVPN :
    Connection-specific DNS Suffix . . . :
    Description . . . . . : WAN (PPP/SLIP) Interface
    Physical Address. . . . . : 00-53-45-00-00-00
    DHCP Enabled. . . . . : No
    IP Address. . . . . : 198.74.64.60
    Subnet Mask . . . . . : 255.255.255.255
    Default Gateway . . . . . :
    DNS Servers . . . . . :
```

2. Determine the support network interface number (IF) by issuing the following command:

```
route print
```

The beginning of the routing table looks similar to the following example:

```
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x1000003 ...00 02 55 7b 0c 09 ..... Intel(R) 82546EB Based Dual Port
                                   Network Connection
0x1000004 ...00 02 55 7b 0c 08 ..... Intel(R) PRO/1000 MT Dual Port
                                   Network Connection
0x2000004 ...00 53 45 00 00 00 ..... WAN (PPP/SLIP) Interface
=====
```

The support network interface is identified as the WAN (PPP/SLIP) Interface. The number given is in hexadecimal and must be converted to decimal; for example, 0x2000004 (hex) = 33554436 (decimal).

3. Add the new route for the support network by issuing the following command:

```
route ADD 198.74.64.0 MASK 255.255.252.0 [remote_support_IP]
IF [IF_decimal_number] Metric 2
```

Where *remote_support_IP* is the master console IP address determined in step 1 and *IF_decimal_number* is the interface number that is determined in step 2 (for example, route ADD 198.74.64.0 MASK 255.255.252.0 168.74.64.60 IF 33554436 Metric 2).

4. Verify that the new route was added by issuing the following command:

```
route print
```

Find the 198.74.64.0 255.255.252.0 entry in the table. The output looks similar to the following example:

```

=====
Interface List
0x1 ..... MS TCP Loopback interface
0x1000003 ...00 02 55 7b 0c 09 ..... Intel(R) 82546EB Based Dual Port
Network Connection
0x1000004 ...00 02 55 7b 0c 08 ..... Intel(R) PRO/1000 MT Dual Port Network
Connection
0x2000004 ...00 53 45 00 00 00 ..... .WAN (PPP/SLIP) Interface
=====

Active Routes:
Network Destination Netmask Gateway Interface Metric
0.0.0.0 0.0.0.0 9.47.101.1 9.47.101.159 1
0.0.0.0 0.0.0.0 9.47.101.1 192.168.70.105 1
9.47.101.0 255.255.255.0 9.47.101.159 9.47.101.159 1
9.47.101.159 255.255.255.255 127.0.0.1 127.0.0.1 1
9.255.255.255 255.255.255.255 9.47.101.159 9.47.101.159 1
127.0.0.0 255.0.0.0 127.0.0.1 127.0.0.1 1
192.168.0.0 255.255.0.0 192.168.70.105 192.168.70.105 1
192.168.70.105 255.255.255.255 127.0.0.1 127.0.0.1 1
192.168.70.255 255.255.255.255 192.168.70.105 192.168.70.105 1
198.74.64.0 255.255.252.0 168.74.64.60 198.74.64.60 2
198.74.64.0 255.255.255.0 198.74.64.60 198.74.64.60 1
224.0.0.0 224.0.0.0 9.47.101.159 9.47.101.159 1
224.0.0.0 224.0.0.0 192.168.70.105 192.168.70.105 1
255.255.255.255 255.255.255.255 9.47.101.159 9.47.101.159 1
Default Gateway 9.47.101.1

Persistent Routes:
None
=====

```

5. Verify routing to the support network by issuing the following command:

```
ping 198.74.67.235
```

Related tasks

“Invoking a remote service connection” on page 50

This topic describes how to invoke a remote service connection.

Replacing the SSH key pair for SAN Volume Controller

This topic provides step-by-step instructions for replacing the SSH key pair.

Note:

- If you change the SSH keys that will be used by the master console to communicate with the SAN Volume Controller Console you will have to store the client SSH private key in the SAN Volume Controller Console software as described previously and then store the client SSH public key on the SAN Volume Controller cluster.
- If you change the IP address of your SAN Volume Controller cluster after you have added the cluster to SAN Volume Controller Console, the SAN Volume Controller Console will not be aware of the existence of the cluster.

To correct this, remove the cluster from the SAN Volume Controller Console and add it back again. Perform the following steps:

1. Start the SAN Volume Controller Console by clicking on the desktop icon or by using your Web browser to go to `http://IP_address:9080/ica`, where *IP_address* is the IP address of the master console. The Signon window is displayed. This might take a few moments to open.
2. Enter the user ID superuser and the password passw0rd. The Welcome window is displayed.

3. Click **Clusters** from the portfolio.
4. Check the **Select** box for the cluster for which you wish to replace the key.
5. Click **Remove a cluster** in the selection box
6. Click **Go**.
7. Click **Clusters** from the portfolio.
8. Click **Add a cluster** in the selection box.
9. Input the IP address of the cluster.
10. Do *not* check the **Create (Initialize Cluster)** box.
11. Click **OK**.
12. Enter the user name and password. When you see the pop-up window, enter the network password and click **OK**.
13. Add the SSH client public key to the SAN Volume Controller cluster:
 - a. Click **Browse...** for the key file to upload and locate the public key or input the key in the **Key (direct input)** field
 - b. Type an identifier in the **ID** field, which uniquely identifies the key to the cluster.
 - c. Select the **Administrator** radio button.
 - d. Click **Add Key**.
 - e. Click **Clusters** from the portfolio to check the status of the cluster. If the cluster status remains **SSH Key Refused**, you do not have a good key pair. You can reset the SAN Volume Controller Console private SSH key. However, if you have successfully contacted other clusters, you will break that connectivity.

Replacing the client SSH private key known to the SAN Volume Controller software

This task provides step-by-step instructions to replace the client SSH private key known to the SAN Volume Controller software.

Attention: If you have successfully contacted other SAN Volume Controller clusters, you will break that connectivity if you replace the client SSH private key known to the SAN Volume Controller software.

Perform the following steps to replace the client SSH private key:

1. Sign off the SAN Volume Controller Console.
2. Using the Windows Services facility, stop the IBM CIM Object Manager:
 - a. Click **Start** → **Settings** → **Control Panel**.
 - b. Double-click **Administrative Tools**.
 - c. Double-click **Services**.
 - d. Select **IBM CIM Object Manager** in the list of services, right click, and select **Stop**.
 - e. Leave the Services panel open.
3. Copy the client SSH private key into the appropriate SAN Volume Controller Console directory. Perform the following:
 - a. Open a command prompt window by clicking **Start** → **Run**.
 - b. Type **cmd.exe** in the **Open** field.
 - c. Click **OK**.
4. Type the following command:

copy filename C:\program files\IBM\svcconsole\cimom\licat.ppk

where *filename* is the path and file name of the client SSH private key

- Restart the IBM CIM Object Manager. Select **IBM CIM Object Manager** in the list of services, right click and select **Start**.
- Log on to the SAN Volume Controller Console.
- Click **Clusters** in the portfolio.
- Check the status of the cluster.

Setting passwords

This topic lists the passwords that you must set on the master console.

The following passwords must be set on the master console:

- Tivoli SAN Manager (changing the Host Authorization)
- DB2 user IDs and passwords
- SAN Volume Controller user ID and password

Changing the Host Authorization for Tivoli SAN Manager password

This topic describes how to set the Host Authorization for Tivoli SAN Manager password on the master console.

Note: Verify that the file C:\Support Utils\ChangeWASAdminPass.bat is present. If not, download it into the C:\Support Utils directory from the 2145 Support Web site, by selecting **Downloadable files** from the following URL:
www.ibm.com/storage/support/2145

These IDs and passwords are used internally by the master console, and can be changed if required.

You can change this password by performing the following steps:

- Open a command prompt window by selecting **Start** → **Programs** → **Accessories** → **Command Prompt**.
- Type **cd C:\Support Utils**.
- Type **ChangeWASAdminPass new_user_ID new_password**.
- Reboot the master console.

Setting the DB2 user IDs and passwords

This topic describes how to set the DB2 user IDs and passwords on the master console.

You can change the DB2 user IDs and passwords by performing the following steps:

- Use the Computer Management Administrative tool to change the password for the Base User ID password (db2admin):
 - Select **Start** → **Settings** → **Control Panel**.
 - Double-click **Administrative Tools** → **Computer Management** → **Local Users and Groups** from the left-hand navigation.
- Use the Computer Management Administrative tool to change the database password used by Tivoli SAN Manager. If it is changed, you must perform the following steps:

- a. Open a command line window by selecting **Start** —> **Programs** —> **Accessories** —> **Command Prompt**.
- b. Enter `cd c:\tivoli\itsanm\manager\bin\w32-ix86`.
- c. Enter `srmcp -u userID -p password ConfigService setAuthenticationPw newPassword` where *userID* is your user ID, *password* is your password, and *newPassword* is the new host authentication password.

Setting SAN Volume Controller user ID and password

This topic describes how to set the SAN Volume Controller user ID and password on the master console.

These are set using the SAN Volume Controller Web pages accessed using a Web browser or using the SAN Volume Controller Console function. See the SAN Volume Controller documentation for more information about changing the ID and password.

Chapter 7. Removing master console software

This topic provides a high-level overview of the procedures for removing the master console software.

To remove the master console software, you must explicitly remove the components separately using the Microsoft Windows Add or Remove Programs dialog box. Because of product dependencies, you must remove the software packages in the following order:

1. IBM Director
2. Tivoli SAN Manager Agent
3. Tivoli SAN Manager
4. DS4000 Storage Manager Client (FAStT Storage Manager Client)
5. SAN Volume Controller Console
6. DB2
7. PuTTY
8. Adobe Acrobat Reader
9. Master console

Note: When you remove the master console, you remove documentation, support utilities, and icons. Therefore, you can continue to access all product documentation until you remove the master console. The documentation is located in *<destination_location>\Documents*, where *<destination_location>* is the location where the master console was installed on the system. The default location is *system_drive\Program Files\IBM\MasterConsole*.

Accessing the Add or Remove Programs dialog panel

Perform the following steps to access the Add or Remove Programs dialog panel:

1. From the Windows menu bar, click **Start->Settings->Control Panel**.
2. From the Control Panel window, double-click the **Add/Remove Programs** icon.

Uninstalling IBM Director

This topic describes how to uninstall IBM Director from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall IBM Director:

1. In the Add/Remove Programs panel, scroll to **IBM Director**, and click to select it.
2. Click **Change/Remove**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**.
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

Uninstalling Tivoli SAN Manager Agent

This topic describes how to uninstall Tivoli SAN Manager Agent from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall the Tivoli SAN Manager Agent:

1. In the Add/Remove Programs panel, scroll to **IBM Tivoli Storage Area Network Manager - Agent**, and click to select it.
2. Click **Change/Remove**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**.
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

Uninstalling Tivoli SAN Manager

This topic describes how to uninstall Tivoli SAN Manager from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall the Tivoli SAN Manager:

1. In the Add/Remove Programs panel, scroll to **IBM Tivoli Storage Area Network Manager - Manager**, and click to select it.
2. Click **Change/Remove**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**.
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

Uninstalling the DS4000 Storage Manager Client (FAST Storage Manager Client)

This topic describes how to uninstall the DS4000 Storage Manager Client (FAST Storage Manager Client) from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall the DS4000 Storage Manager Client (FAST Storage Manager Client):

1. In the Add/Remove Programs panel, scroll to the product name, and click to select it.
2. Click **Change/Remove**.

3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

Uninstalling the SAN Volume Controller Console

This topic describes how to uninstall the SAN Volume Controller Console from the master console.

Perform the following steps to uninstall the SAN Volume Controller Console:

1. Open the Add/Remove Programs window from the Windows Control Panel.
2. Find and select **IBM TotalStorage SAN Volume Controller Console**.
3. Click **Remove** or **Change**.
4. Navigate through the uninstallation wizard, selecting the **Next** button of each panel.
5. Wait for the program to be removed, and then click **Finish**
6. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

Uninstalling DB2

This topic describes how to uninstall DB2 from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall DB2:

1. In the Add/Remove Programs panel, scroll to **IBM DB2**, and click to select it.
2. Click **Change/Remove**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

After removing DB2, you must also remove the following directories:

- The directory where DB2 was installed. The default directory is *system_drive*\Program Files\SQLLIB.
- The DB2 directory that contains database data,. The default directory is *system_drive*\DB2.
- The DB2log directory containing the DB2 log files. The default directory is *system_drive*\DB2.

Uninstalling PuTTY

This topic describes how to uninstall PuTTY from the master console using the Add/Remove Programs dialog panel.

This procedure assumes that you have accessed the Add/Remove Programs dialog panel.

Perform the following steps to uninstall PuTTY:

1. In the Add/Remove Programs panel, scroll to **PuTTY**, and click to select it.
2. Click **Change/Remove**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**

Uninstalling Adobe Reader

You can uninstall Adobe Reader from the system that is running the master console.

Perform the following steps to uninstall Adobe Reader:

1. Open the Add or Remove Programs window from the Windows Control Panel.
2. Find and select the line for Adobe Reader in the Add or Remove Programs window.
3. Click **Remove** or **Change**.
4. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
5. Wait for the program to be removed, and then click **Finish**.

Uninstalling the master console

This topic describes how to uninstall the master console.

This procedure assumes that you have opened the Microsoft Windows Add or Remove Programs dialog box.

Perform the following steps to uninstall the master console:

1. Find and select **IBM TotalStorage Master Console for SAN File System and SAN Volume Controller** in the Add or Remove Programs window.
2. Click **Remove** or **Change**.
3. Navigate through the uninstallation wizard, selecting the **Next** button of each window.
4. Wait for the program to be removed, and then click **Finish**
5. If you are prompted to reboot the system, answer **yes** to reboot the system and complete the removal of the product.

To complete the removal process, you can remove the directory where the master console was installed. The default is *system_drive*\Program Files\IBM\Master Console.

Chapter 8. Upgrading the master console to version 3.2

This topic provides information about upgrading the master console to version 3.2.

Before you begin the following procedure to upgrade to master console version 3.2, ensure that you have logged in with a user ID with administrative privileges.

1. Insert the Master Console CD-ROM 1 in the CD-ROM drive.
2. Click **Start** → **Run** to open the Run dialog box.
3. Enter *cd-rom_drive:\setup.exe*, where *cd-rom_drive* is the letter of the drive in which you inserted the CD, and click **OK**.

The following message is displayed in the DOS-prompt window:

```
Initializing InstallShield Wizard...  
Preparing Java (tm) Virtual Machine
```

4. When prompted, select the language to be used for the installation wizard and click **OK**.
5. The installation wizard Welcome panel is displayed. Click **Next**.
6. The installation wizard License Agreement panel is displayed. Click **I accept the terms in the license agreement**, and then click **Next** to continue the upgrading.

The installation wizard verifies that all software prerequisites are installed on the system. If they are not, a pop-up opens describing the prerequisites that are not currently installed. Click **OK** to stop the installation wizard, then install the prerequisite software. After you have installed the prerequisites, start the installation wizard again.

7. The installation wizard displays the version of the currently installed master console. Click **Next** to continue upgrading.
8. If any hardware requirements are not met on your system, a panel is displayed stating the hardware requirements that are not met and warning about a decrease of the performance level if these requirements are not met.
9. If the Adobe Acrobat Reader is installed at a lower version than the required one or is not installed on your system, the installation wizard panel Upgrading/Installing the Adobe Acrobat Reader is displayed. Click **Next** to begin the upgrading or installation of Adobe Acrobat Reader.
10. The installation wizard Destination panel is displayed. You can keep the old destination location displayed on the panel or select a different location. If you select a different location, the installation program first uninstalls the product from the old location and then it installs the master console in the new location that you specified.
11. The installation wizard stops the IBM master console information center service. Wait for the installation program to stop this service.
12. The installation wizard displays the Select the information center port panel. You can keep the old information center port value or change it by selecting an unused port value between 1 and 65535. To see the ports that are being used by other applications, open a Command Prompt window, and enter the **netstat -a** command.
13. The Select the optional features panel is displayed. Select or deselect the optional features:
 - Install DS4000 Storage Manager Client (FAS*T* Storage Manager Client). If DS4000 Storage Manager Client (FAS*T* Storage Manager Client) is deselected, a message is displayed when you click the **Next** button to warn

you that this feature should be deselected only when DS4000 disk drives are not part of the current configuration.

- Install IBM TotalStorage SAN Volume Controller Console. If SAN Volume Controller console is deselected, a message is displayed when you click the **Next** button to warn you that this feature should be deselected only when SAN Volume Controller console is not part of the current configuration.

After selecting or deselecting the optional features, click **Next** to display the list of products that will be upgraded by the master console wizard.

14. The List of products panel is displayed. The installation wizard displays the list of the products of the master console, comparing the installed product versions with the required ones in a table with the following columns:
 - Products of the master console
 - Versions of the already installed products
 - Required versions for the products
 - Actions to be done by the master console installation wizard

The table containing the list of the products to be installed or upgraded is saved as *MasterConsoleProducts.htm* in the location where the master console is installed.

Depending on the installed version of each product, the installation wizard determines whether to install or upgrade the product using the following conditions:

- If the product is installed and its installed version is lower than the required version, the product will be upgraded by launching the specific installer of the product.
- If the product is installed at a version equal to or higher than the required version, the product is not installed. The corresponding panels that launch and verify the specific product installation will be skipped. For the products with higher versions than the required ones, the installation wizard displays a warning telling you that these products were not tested with master console.
- If a product from the list of products to be installed or upgraded is found to be not properly installed on the system, you are asked to continue with the installation by trying to reinstall the product with the product-specific installer. If this action does not succeed, you need to exit the master console installation wizard, manually remove the product from your system, and restart the master console installation wizard.
- For DB2, if the installed edition is not Enterprise Edition, the installation wizard inserts **Wrong edition* in the Installed Version column. You must manually uninstall the wrong installed edition. To manually uninstall the wrong installed edition:
 - a. Click **Cancel** to exit the master console installation wizard.
 - b. Manually uninstall the wrong DB2 edition.
 - c. After uninstalling the wrong installed edition of DB2, start the master console installation wizard again.

From this panel, click **Next** to continue upgrading the products.

15. All the product upgrades are done by launching the specific installer for each product. However, the upgrade is skipped for any product that is already installed with the same version or a higher version than the required one.

If the product-specific installer cannot manage the upgrading, then it is better to manually uninstall the old product version and then install the new one using the master console installer.

Note on upgrading DS4000 Storage Manager Client

When upgrading DS4000 Storage Manager Client (FAStT Storage Manager Client) from a version lower than version 9, the installation wizard automatically uninstalls the old version first and then installs the new one, as follows:

- a. The DS4000 Storage Manager Client (FAStT Storage Manager Client) uninstallation panel is displayed. Click **Next** to remove the old version of the product from the system.
- b. The DS4000 Storage Manager Client (FAStT Storage Manager Client) uninstallation verification panel is displayed. Click **Next** to verify the product was successfully removed from the system.
- c. The DS4000 Storage Manager Client (FAStT Storage Manager Client) installation panel is displayed. Click **Next** to begin installing the new version of the product. (Follow the instructions in “Installing the DS4000 Storage Manager Client (FAStT Storage Manager Client)” on page 26 step 2 on page 26.)
- d. The DS4000 Storage Manager Client (FAStT Storage Manager Client) installation verification panel is displayed. Click **Next** to verify the product was successfully installed on the system.

Before you upgrade IBM Director

Before starting the IBM Director upgrading wizard, the master console wizard performs the following actions:

- a. Stops the IBM Director services (IBM Director Server and IBM Director Support Program).
- b. Checks the Log On As property of the IBM Director Server service (the account used to log on to IBM Director).
- c. If the Log On As property is set to *Local/System*, the master console wizard displays a message telling you to change this property value to the user name that you intend to use for the IBM Director.

After receiving such a message, you must manually change the Log On As property of the IBM Director Server service by following these steps:

- a. Open the Services window by selecting **Start -> Settings -> Control Panel -> Administrative Tools -> Services**.
- b. In the Services window, select the **IBM Director Server** service.
- c. Right-click on the selected service and select **Properties** to open IBM Director Server Properties.
- d. Click on the **Log On** tab and deselect the **Local System account** radio button.
- e. Select **This account** radio button and then enter the user ID and its password.
- f. Save the changes by clicking the **Apply** and then **OK** buttons.

You need to remember this account and password because you will be asked for it when upgrading IBM Director and then after the upgrading when preconfiguring IBM Director (see step 16 on page 64). This account value is read by the installer as the default value for the IBM Director account when upgrading.

Note: All the individual software packages are provided on CDs with the master console. Installation instructions for the software packages are located in the individual software installation guides.

Upgrades to the master console software products are available at the following Web site: www.ibm.com/storage/support/2145/. Instructions for downloading and installing upgraded software packages are also available at this site.

16. The IBM Director Superuser Account panel is displayed. You need to enter the name and password for the IBM Director superuser to perform the preconfiguration tasks.
17. The installation program starts the IBM Director Support Program service. Wait for Director to start and then discover the Director-managed systems.
18. If IBM Director was never preconfigured since its installation (that is, there are no action plans for managing specific events defined in the Director), the installation program performs the IBM Director preconfiguration tasks. These tasks consist of creating a set of action plans designated for managing specific events generated by the master console system. These action plans are imported from configuration archive files that exist on the installation package. If one or more configuration files are not found on the installation package, or if an error occurs while action plans are being imported, a message is displayed warning that these action plans must be manually created after installation is completed.
19. The upgrading of the Master Console Documentation and Support Utilities is performed in the following steps:
 - a. The installation wizard uninstalls the old documentation and utilities files, IBM Connection Manager, Document Launcher, and information center.
 - b. If a system reboot is required, accept the prompt to complete the uninstallation.
 - c. From the Documents and Support Utilities installation panel, click **Next** to begin the installation of new documentation and utilities files.
 - d. If prompted to insert a different CD, insert it in the CD-ROM drive and enter the CD-ROM drive letter in the location field. Then click **OK**.
 - e. The documentation and support utilities files are copied.
 - f. The installation wizard installs the IBM Connection Manager, loads registry info, and creates the IBM VPN client object.
 - g. The installation wizard copies Eclipse files of the IBM WebSphere Help System and installs the master console information center (copying master console-specific documentations into the IBM WebSphere Help System).
 - h. The program installs the master console information center as a service.
 - i. After all documentation and utilities are installed, the Finish panel is displayed.
20. Click **Finish**.
21. If a system reboot is required, accept the prompt to complete the master console upgrading process.
22. Review the master console installation log (mclog.txt) to ensure that all products are properly installed. The log file is located in *<installation_directory>\logs*, where *<installation_directory>* is the directory where the master console was installed. The default installation directory is C:\Program Files\IBM\MasterConsole.

Related reference

“Using the installation wizard” on page 20

This topic describes the installation process and lists the programs that you can install using the installation wizard.

Chapter 9. Troubleshooting the master console

These topics provide information that you need to troubleshoot and resolve problems with the master console.

Recovering from a disk failure on the master console system

At some point, you might have to recover from a disk failure on the system that runs the master console.

The hard disk drive on the system that runs the master console is actually a mirrored pair of hard disks, if you set up mirroring. This strategy protects against loss of the master console due to a disk failure. If one of these mirrored pair of disk drives fails and must be replaced, perform the following steps:

1. Right-click the **My Computer** icon on your desktop and select **Manage**.
2. Select **Disk Management**. The hard drives display in the right panel.
3. If the failing disk drive displays, right-click the main volume of the drive and select **Break Mirror**.
4. Shut down the computer that runs the master console and replace the failing disk drive using the procedures that are detailed in the documentation for your replacement hard drive. Ensure that the new drive has its jumpers set the same as the drive that is being replaced. The new drive must be the same capacity or larger than the drive being replaced.

Notes:

- a. It can be difficult to tell which of the two drives has failed. In this case, reboot with each drive one at a time to isolate the failed drive.
 - b. If the replacement drive has a boot record that is present, erase the boot record prior to using the replacement drive. However, if the master console computer fails to boot because it cannot find the boot record, change the boot sequence in the BIOS to the other hard drive.
5. Restart the computer.
 6. Right-click the **My Computer** icon on your desktop and select **Manage**.
 7. Select **Disk Management**. The hard drives display in the right panel.
 8. If a disk drive is marked **Missing**, remove that disk drive by right-clicking the drive and selecting **Remove Disk**.
 9. If the new disk drive has a no entry sign that is displayed on it, right-click that disk drive and select **Write Signature**. This removes the no entry sign.
 10. Right-click the new disk drive and select **Upgrade to Dynamic Disk**.
 11. Right-click the volume that you want to mirror and select **Add Mirror**. The Add Mirror wizard is started.
 12. Use the Add Mirror wizard to configure the second volume.
 13. Ignore the window for making changes to the boot.ini file.

The status of both volumes, the existing drive, and the new drive changes to **Regenerating**. After a short period of time, the status shows the percentage of regeneration that has completed. When the regeneration completes, the status displays as **Healthy**.

Troubleshooting SAN Volume Controller Console problems

If you have problems with the SAN Volume Controller Console, you can use the instructions in this topic to help you resolve them.

If the SAN Volume Controller Console closes unexpectedly

This problem has the following symptoms:

- The following dialog box is displayed:
You have signed off
- The window closes.

To resolve this problem, perform the following actions:

1. Before checking for hardware errors, open a new browser window and attempt to reconnect to the SAN Volume Controller Console. The logoff message is generally caused by the open session timing out (the browser window was left open from a previous session).
2. If you cannot reconnect, try the following actions to resolve the problem:
 - Check current memory availability. This problem can be caused by a memory failure in the master console, causing it to run with less than the required one gigabyte of memory. If there is a memory problem, you need to correct it.
 - Determine if the IP address of the master console has changed since the last reboot. If so, reboot the master console to correct the problem.

Troubleshooting Tivoli SAN Manager problems

This topic describes how to troubleshoot problems with Tivoli SAN Manager.

If the Tivoli SAN Manager loses information

If Tivoli SAN Manager shows all resources as red (offline or out of contact), ensure that you have installed the Ethernet connections correctly using the following guidelines:

- Port 1 must be connected to the (public) network (such as the rest of your LAN).
- Port 2 must be connected to the (private) device network—that is, the devices that are connected to the SAN Volume Controller nodes or SAN File System cluster, the storage controllers, and the SAN switches.

If the Tivoli SAN Manager shows a black (blank) topology

If the Tivoli SAN Manager shows a black (blank) topology, perform the following steps:

1. Check that the file in use exists in the C:\Program Files\SQLIB\java12\ directory. If it does not, shut down Tivoli SAN Manager and run the jdbc2 batch file.
2. Edit c:\WINNT\system32\drivers\etc\hosts. If the local host is defined, verify that it is in the following format:
IP_address fully_qualified_domain_name short_name
If it is not, add another entry for the local host using this format.

Troubleshooting VPN problems

If you have problems with the virtual private network (VPN), you can use the instructions in this topic to help you resolve them.

If you are having trouble establishing the VPN connection

Perform the following steps to resolve the problem:

1. Attempt to ping 198.74.67.235 from the master console. If you do not receive a response, follow the steps below:
 - a. Ensure that you have added an additional subnet route.
 - b. Run the **netstat -rn** command and verify that you have results similar to the following.

Note: The items in bold text can differ depending on the hardware that is running the master console.

```
Newly added: 198.74.64.0    255.255.252.0    198.74.64.21
198.74.64.21          2
Default:    198.74.64.0    255.255.255.0    198.74.64.21
198.74.64.21          1
```

2. Perform the following steps to view the IP Security Monitor:
 - a. Issue the following command from a command window on the master console:

```
ipsecmom
```

If there is no information in the Security Associations window, a VPN connection is not running.
 - b. Click **Options** to increase or decrease the refresh value.
3. Verify that an active tunnel is running. Perform the following steps from the master console:
 - a. Ensure that the IBM Connection Manager has started and is properly connected.
 - b. View the IP Security Monitor.
4. If the IBM Connection Manager is repeatedly trying to connect, perform the following steps:
 - a. Ensure that the connection is configured properly and that you have added additional subnet routes.
 - b. Check the IP Security Monitor to ensure a connection has been established.
 - c. Stop and restart the IPSec Service from a command prompt by issuing the following commands:

```
net stop policyagent
net start policyagent
```

Troubleshooting Windows boot problems

If you have problems with the Microsoft Windows booting, you can use the instructions in this topic to help you resolve them.

If Windows does not boot

During the Windows boot process, if Windows tries to start but fails with a 'blue screen' with a Inaccessible Boot Device message and another reboot does not solve the problem, this could be due to the windows boot code being corrupted on the startup device.

Perform the following steps to resolve the problem:

1. Reboot the computer where the master console resides.
2. Press F1 to display the **Configuration/Setup** menu.
3. Select **Start Options**.
4. Select **Start Sequence**.
5. Step down the sequence to the one that contains the hard disk.
6. Use the left and right cursor keys to select the other hard disk. For example, if the hard disk is set to 1, select 0. If it is set to 0, select 1.
7. Press Esc to exit until you get the option to save and exit. Then select **Yes**.
8. If the master console boots, proceed with the steps for recovering from a master console disk failure. Otherwise, contact your IBM support representative.

Viewing error information on the master console

This topic describes how to view error information on the master console.

All of the SAN Volume Controller nodes, SAN File System metadata servers, fibre-channel switches, and storage (for example, DS4000), generate SNMP traps as a result of events, such as errors and configuration changes. The errors are usually sent to the IBM Director and are listed in the Director Event Log. You can view all the events with their time stamps to help you determine which event is most likely to have caused the problem

For example, the loss of a fibre-channel path or link because of a cable or GBIC fault can result in a number of different events being logged to the Director Event Log from the devices at each end of the failing cable, such as a SAN Volume Controller, fibre-channel switch, or storage.

Some SAN component communication, such as fibre-channel path errors, can also be seen in the Tivoli SAN Manager topology displays. The link or component, or both, are shown in red. If the problem is intermittent, you might see the component shown in yellow. For example, you might see a yellow component if there is a loss of the link but the link is now restored.

Loss of only a component (shown in red) without the loss of the fibre-channel path (still showing in black) to it can indicate an IP connection problem between the master console and the component. Loss of the IP connection between the master console and a host can—if that host is the only host with a Tivoli SAN Manager Agent installed that has VDisks assigned from that SAN Volume Controller cluster—result in one or more SAN Volume Controller nodes also showing in red.

If you identify a fibre-channel path or link problem, the failure might be the fibre-channel cable, GBICs, SAN component, or host adapter at the ends of the failing link.

To resolve the problem, you might have to see the service documentation for the link end device involved (SAN Volume Controller, fibre-channel switch, DS4000, host)

If you identify a particular SAN Component failure, see the service documentation for that component to resolve the problem. The master console C:\Documents directory contains copies of the various component documentation.

Appendix. Accessibility features for the SAN File System and SAN Volume Controller

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features for the SAN File System

The following list includes the major accessibility features in the SAN File System:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen.

Tip: The SAN File System Information Center and its related publications are accessibility-enabled for the IBM Home Page Reader.

- You can operate all features using the keyboard instead of the mouse.

Accessibility features for the SAN Volume Controller

The following list includes the major accessibility features in the SAN Volume Controller. These features support:

- Keyboard-only operation.
- Interfaces that are commonly used by screen readers.
- Keys that are tactilely discernible and do not activate just by touching them
- Industry-standard devices for ports and connectors.
- The attachment of alternative input and output devices.

Tip: The SAN Volume Controller Information Center and its related publications are accessibility-enabled for the IBM Home Page Reader. You can operate all features using the keyboard instead of the mouse.

Keyboard navigation

This product uses standard Microsoft Windows navigation keys.

IBM and accessibility

See the *IBM Accessibility Center* for more information about the commitment that IBM has to accessibility.

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Electronic emission notices

The following electronic emission statements apply to this product. The statements for other products that are intended for use with this product are included in their accompanying documentation.

China Class A EMC compliance in Simplified Chinese

Ensure that you are familiar with the China Class A EMC compliance in Simplified Chinese statement.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical actions.

声 明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰，在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Federal Communications Commission (FCC) statement

Ensure that you are familiar with the Federal Communications Commission (FCC) statement.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, might cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer is responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device might not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

Japanese Voluntary Control Council for Interference (VCCI) statement

Ensure that you are familiar with the Japanese Voluntary Control Council for Interference (VCCI) statement.

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product might cause radio interference, in which event the user might be required to take adequate measures.

Korean Government Ministry of Communication (MOC) statement

Ensure that you are familiar with the Korean Government Ministry of Communication (MOC) statement.

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find that this device is not suitable for your use, you can exchange it for one that is approved for non-business purposes.

New Zealand compliance statement

Ensure that you are familiar with the New Zealand compliance statement.

This is a Class A product. In a domestic environment this product might cause radio interference, in which event the user might be required to take adequate measures.

International Electrotechnical Commission (IEC) statement

This product has been designed and built to comply with (IEC) Standard 950.

Avis de conformité à la réglementation d'Industrie Canada

Ensure that you are familiar with the avis de conformité à la réglementation d'Industrie Canada.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Industry Canada compliance statement

This Class A digital apparatus complies with IECS-003.

United Kingdom telecommunications requirements

This apparatus is manufactured to the International Safety Standard EN60950 and as such is approved in the U.K. under approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

European Union (EU) statement

Ensure that you are familiar with the European Union (EU) statement.

This product is in conformity with the protection requirements of EU council directive 89/336/EEC on the approximation of the laws of the Member States relating to

electromagnetic compatibility. Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards not supplied by the manufacturer.

Radio protection for Germany

Ensure that you are familiar with the radio protection for Germany.

Zulassungsbescheinigung laut Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995.

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Deutschland.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2):

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.
--

EN55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG: "Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministeriums für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind." (Auszug aus dem EMVG, Para.3, Abs.4). Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022: "Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Massnahmen durchzuführen und dafür aufzukommen."

Anmerkung: Um die Einhaltung des EMVG sicherzustellen, sind die Geräte wie in den Handbüchern angegeben zu installieren und zu betreiben.

Taiwan Class A compliance statement

Ensure that you are familiar with the Taiwan Class A compliance statement.

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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