Storage System

Planning Guide for SANtricity™ Storage Manager Version 8.3x

TQ12772-E2, Second Edition

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Document Description

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This document describes versions 8.30 through 8.3x of SANtricity™ Storage Manager and will remain the official reference source for all revisions/releases of this product until rescinded by an update.

Intended Readers

This book is intended for system and storage administrators who are responsible for installing software. Readers must have a working knowledge of the applicable operating systems used with the storage management software. In addition, they should understand disk array, RAID, SCSI, network, and Fibre Channel technologies.

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Revision Record		
Edition or Revision	**Date**	**Affected Pages or Remarks**
First Edition	September 2002	This version supports SANtricity Storage Manager 8.30.
Second Edition	January 2003	This version supports SANtricity Storage Manager 8.30 through 8.33.

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Chapter 1

AIX Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the AIX Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been set up, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- "Disk Subsystem Names" on page A-2
- "Usable Disk Capacity" on page A-3
- "Management Methods" on page A-6
- "Event Monitor" on page A-10
- "Client Software" on page A-11

3 Make a photocopy of the AIX Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 1-1 AIX Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 1-1 AIX Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 1-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 1-9. ____ Identify controller names, IP addresses, and MAC addresses. Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	

Table 1-1 AIX Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Install host adapter and driver. (Refer to the documentation shipped with the host adapter.)	No installation activity required on the storage management station or host.	

Table 1-1 AIX Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 1-1 AIX Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 7.xx or 8.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine will be used as a storage management station *and* as the event monitoring machine.	____ Install SMclient on the storage management station or host acting as a storage management station.	
❑ This machine will be used *only* as a storage management station.	____ Install SMclient on the storage management station or host acting as a storage management station. ____ Disable the event monitor.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station and host specifications to ensure this AIX machine meets its operating system requirements.

Storage Management Station

An RS/6000 processor is required with:

- Minimum 43P (375 MHz PowerPC processor). A 44P (333 MHz Power 3-II 64-bit processor) model 170 or faster is recommended.
- CDROM drive
- Mouse or similar pointing device
- 128 MB system memory (minimum)
- For SMclient, at least 60 MB disk space must be available on /usr and root-equivalent permission is required for installation.
- Ethernet network interface card
- GXT110P or greater PCI video card
- Ensure the storage management station, or the host acting as a storage management station, is running on the AIX version 5.x or higher operating system.
- To check the current level of bos.rte.libc, use the following command:

  ```
  lslpp -ah bos.rte.libc
  ```

For AIX version 5.x, the Java runtime environment of the operating system requires the following base level file sets or later for all locales and an upgrade to AIX maintenance release 1 or later.

- x11.adt.lib 5.x
- x11.adt.motif 5.x
- bos.adt.include 5.x
- bos.adt.prof 5.x

Host

Refer to the following specifications to ensure this AIX machine meets its operating system requirements.

An RS/6000 processor is required with:

- F50 (332 MHz 604e3 processor) or higher. Also, SMP system with 2-way or more is supported.
- CDROM drive
- Mouse or similar pointing device
- 128 MB system memory (minimum)
- For SMclient, at least 60 MB disk space must be available on /usr and root-equivalent permission is required for installation.
- Ethernet network interface card
- GXT110P or greater PCI video card
- Ensure the host is running on the AIX version 5.x or higher operating system.
- To check the current level of bos.rte.libc, use the following command:

  ```
  lslpp -ah bos.rte.libc
  ```

For AIX version 5.x, the Java runtime environment of the operating system requires the following base level file sets or later for all locales and an upgrade to AIX maintenance release 1 or later.

- x11.adt.lib 5.x
- x11.adt.motif 5.x
- bos.adt.include 5.x
- bos.adt.prof 5.x

Chapter 2

HP-UX Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the HP-UX Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- "Disk Subsystem Names" on page A-2
- "Usable Disk Capacity" on page A-3
- "Coexistence Environments" on page A-4
- "Management Methods" on page A-6
- "Event Monitor" on page A-10
- "Client Software" on page A-11
- "Failover Protection" on page A-12
- "Cluster Configuration" on page A-14

3 Make a photocopy of the HP-UX Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 2-1 HP-UX Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide,* verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide,* install your selected disk subsystem hardware modules.

Table 2-1 HP-UX Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ___ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 2-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 2-9. ____ Identify controller names, IP addresses, and MAC addresses: Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 2-1 HP-UX Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer and model: _____ Host adapter – manufacturer and model: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch – manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Verify QLogic host adapter failover driver installation.	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 2-1 HP-UX Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 6.xx or 7.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
❑ This machine is running version 6.xx, which will coexist with version 8.3x.	____ Leave version 6.xx running on the storage management station and host.	
❑ This machine is running version 8.xx, which version 8.3x will replace.	____ Leave version 8.xx running on the storage management station and host. Version 8.3x will overwrite 8.xx during installation.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine is running no frameworks integration software and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: ____ Install SMclient.	
❑ This machine is running HP OpenView Node Network Manager and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: ____ Install SMclient. ____ (Optional) Install SMHPovcl.	
❑ This machine is running in a cluster configuration.	No installation activity required.	____ Install the software on the cluster hosts.

Table 2-1 HP-UX Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 3.xx.	____ Upgrade to firmware version 3.01.04 *first*, and then upgrade to version 4.01.02.30. ____ If desired, upgrade to version 5.00, using the software for version 8.21 installation CD.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this HP-UX machine meets its operating system requirements.

Storage Management Station

An HP 9000 series server is required with:

- 180 MHz or faster
- 128 MB system memory (256 MB or more preferred)
- 61 MB disk space available on /opt and root, or root-equivalent, privileges
- Ethernet network interface card
- CDROM drive
- Mouse or pointing device

Ensure the storage management station is running one of the following required patches for its respective operating system release. The storage management software installation program will not verify this for you. Some patches might be superseded by other patches. Refer to the operating system documentation, or contact your operating system supplier for more information.

IMPORTANT The following list does not show dependency patches. On the web page from which you download the patch, select the "dependency" link to ensure you install all required dependency patches.

- HP-UX 11.11 (11.i) PA-RISC Patches – PHCO_24777 PHCO_25452 PHKL 24255 PHKL 24569 PHKL_24751 PHKL_25389 PHKL_25729 PHKL_25840 PHNE_24035 PHSS_25092
- HP-UX 11.00 PA-RISC Patches – PHCO_23792 PHCO_23963 PHCO_ 25707 PHCO_25342 PHKL_18543 PHKL_22677 PHKL_23226 PHKL_23409 PHKL_25475 PHKL_25906 PHNE_21731 PHNE_25423 PHNE_24909 PHSS_24303
- For applications that use AWT, the following patches are required – PHSS_23566 PHSS_25091 PHSS_25787
- To run HP-UX Java 2 Platform applications and applets using GUIs – Ensure HP C++ runtime libraries are installed on your system. The latest version is available as patch PHSS_24627.
- For Euro Support - Ensure you have Europatches.

Ensure the maximum kernel parameters are configured as shown in Table 2-2.

Table 2-2 HP-UX Storage Management Station – Kernel Configuration Requirements

Parameter	Description	Configuration
max_thread_proc 64	Maximum threads per process	1024
maxfiles	Soft file limit per process	2048
maxuser	Influences other parameters	256 or greater
ncallout	Number of pending timeouts	4144

Host

An HP 9000 series server is required with:

- 180 MHz or faster
- 128 MB system memory (256 MB or more preferred)
- 12.5 MB disk space available on /opt and root, or root-equivalent, privileges
- Ethernet network interface card
- CDROM drive
- Mouse or pointing device

Ensure the storage management station is running one of the following required patches for its respective operating system release. The storage management software installation program will not verify this for you. Some patches might be superseded by other patches. Refer to the operating system documentation, or contact your operating system supplier for more information.

IMPORTANT The following list does not show dependency patches. On the web page from which you download the patch, select the "dependency" link to ensure you install all required dependency patches.

- HP-UX 11.11 (11.i) PA-RISC Patches – PHCO_24777 PHCO_25452 PHKL 24255 PHKL 24569 PHKL_24751 PHKL_25389 PHKL_25729 PHKL_25840 PHNE_24035 PHSS_25092
- HP-UX 11.00 PA-RISC Patches – PHCO_23792 PHCO_23963 PHCO_ 25707 PHCO_25342 PHKL_18543 PHKL_22677 PHKL_23226 PHKL_23409 PHKL_25475 PHKL_25906 PHNE_21731 PHNE_25423 PHNE_24909 PHSS_24303
- For applications that use AWT, the following patches are required – PHSS_23566 PHSS_25091 PHSS_25787
- To run HP-UX SDK for the Java 2 Platform applications and applets using GUIs – Ensure that HP C++ runtime libraries are installed on your system. The latest version is available as patch PHSS_24627.
- For Euro Support – Ensure you have Europatches.

Ensure the following maximum kernel parameters are configured as shown in Table 2-3.

Table 2-3 HP-UX Host – Kernel Configuration Requirements

Parameter	Description	Configuration
max_thread_proc 64	Maximum threads per process	1024
maxfiles	Soft file limit per process	2048
maxuser	Influences other parameters	256 or greater
ncallout	Number of pending timeouts	4144

Chapter 3

IRIX Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the IRIX Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Coexistence Environments” on page A-4
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11
- “Failover Protection” on page A-12
- “Cluster Configuration” on page A-14

3 Make a photocopy of the IRIX Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 3-1 IRIX Installation Profile (1 of 4)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 3-1 IRIX Installation Profile (2 of 4)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ___ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 3-8.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 3-8. ____ Identify controller names, IP addresses, and MAC addresses: Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table: ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 3-1 IRIX Installation Profile (3 of 4)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance.	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 3-1 IRIX Installation Profile (4 of 4)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 7.xx or 8.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine will be used as a storage management station *and* as the event monitoring machine.	____ Install SMclient on the storage management station or host acting as a storage management station.	
❑ This machine will be used *only* as a storage management station.	____ Install SMclient on the storage management station or host acting as a storage management station. ____ Disable the event monitor.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
Important Firmware version 5.3x is required to use the premium features of the software.		
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this IRIX machine meets its operating system requirements.

Storage Management Station

A 64-bit MIPS RISC R12000 (180 MHz) is required with:

- CDROM drive
- Mouse or similar pointing device
- 256 MB system memory (512 MB or more recommended)
- 256 MB (or more recommended) system swap area
- Ethernet network interface card

For SMruntime, at least 73 MB available disk space. Note that SMruntime must be installed before you install the SMclient software.

For SMclient, at least 53 MB available disk space on /opt is required.

Total required disk space is 113 MB

Ensure the storage management station or the host acting as a storage management station is running on an IRIX Version 6.5.14m or greater operating system.

Host

The packages below require the following available disk space on /opt:

- SMagent – at least 825 KB available disk space.
- SMruntime – at least 73 MB available disk space.
- SMclient – at least 39.5 MB available disk space.
- SMutil – at least 804 KB available disk space
- Total required disk space on /opt – at least 115 MB

Chapter 4

Linux Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the Linux Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11

3 Make a photocopy of the Linux Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 4-1 Linux Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D240 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 4-1 Linux Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management (Supported only with LSI Logic host bus adapter.) Host name or IP address:_____ Storage management station name: _____ ____ Verify installation of LSI Logic host bus adapter. ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 4-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 4-9. ____ Identify the controller names, IP addresses and MAC addresses: Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table: ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	

Table 4-1 Linux Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Verify QLogic host adapter failover driver installation.	No installation activity required on the storage management station or host.	

Table 4-1 Linux Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	
Identify required software.		
❑ This machine is running version 7.xx or 8.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management. (Supported with LSI Logic host bus adapter only.)	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine will be used as a storage management station *and* as the event monitoring machine.	____ Install SMclient on the storage management station or host acting as a storage management station.	
❑ This machine will be used *only* as a storage management station.	____ Install SMclient on the storage management station or host acting as a storage management station. ____ Disable the event monitor.	

Table 4-1 Linux Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required in order to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this Linux machine meets its operating system requirements.

Storage Management Station

An Intel x86 compatible processor is required with:

- CDROM drive
- Mouse or similar pointing device
- 128 MB system memory (minimum)
- Ethernet network interface card
- Video card either AGP (preferred), PCI, or ISA

The recommended display setting is 1024 x 768 pixels with 64K colors or better. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If using a display setting of 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the scrollbar area above or below the scroll placeholder.

Do *not* use the up or down arrow keys *or* select the scrollbar to move it for scrolling the online help screens.

IMPORTANT Many PC-based servers are not designed to run graphic-intensive software. If your server has difficulty running the storage management software without video problems, you may need to upgrade the server's video card.

The following processors are recommended for the optional use of laptop computers as management stations:

- Pentium II CPU (350 MHz or faster)
- Celeron CPU (366 MHz or faster)
- AMD-K6-2 CPU (400 MHz or faster)
- AMD-K6-III (350 MHz or faster)

The total available disk space requirement for a storage management station is 180 MB.

For SMclient, the following is required:

- At least 37 MB available disk space on /tmp (used only during installation)
- At least 85 MB available disk space on /opt

Refer to the *SANtricity Storage Manager Product Release Notes* to verify the operating system is supported by this software version.

Ensure the Linux machine is running, at minimum, one of the following Linux operating systems, based on the version of SANtricity Storage Manager, with the appropriate Linux kernel, C Library, and X11R6 distribution:

SANtricity Storage Manager, version 8.30

- Linux (Red Hat) 7.2, Kernel 2.4.7, glibc 2.2.4 or greater
- XFree86 X11 display server, 3.3.6 or later (refer to http://www.xfree86.org for more information)
- SuSE v.73

SANtricity Storage Manager, version 8.33

- Linux (Red Hat) 7.2, Kernel 2.4.7-10, glibc 2.2.4 or greater

Host

Refer to the *SANtricity Storage Manager Product Release Notes* to verify the operating system is supported by this software version.

Ensure the Linux machine is running, at minimum, one of the following Linux operating systems, based on the version of SANtricity Storage Manager, with the appropriate Linux kernel, C Library, and X11R6 distribution:

SANtricity Storage Manager, version 8.30

- Linux (Red Hat) 7.2, Kernel 2.4.7, glibc 2.2.4 or greater
- XFree86 X11 display server, 3.3.6 or later (refer to http://www.xfree86.org for more information)
- SuSE v.73

SANtricity Storage Manager, version 8.33

- Linux (Red Hat) 7.2, Kernel 2.4.7-10, glibc 2.2.4 or greater

Chapter 5

NetWare Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the NetWare Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11

3 Make a photocopy of the NetWare Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 5-1 NetWare Installation Profile (1 of 4)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Enter the disk subsystem name (30-character limit).		
_____	No installation activity required on the disk subsystem.	
Determine total usable disk capacity.		
____ Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.	
Select the array module or control module for this disk subsystem.		
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D240 ____ D280	No installation activity required on the disk subsystem.	
Select the drive module for this disk subsystem.		
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.	
Verify hardware site requirements.		
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.	

Table 5-1 NetWare Installation Profile (2 of 4)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management. Host name or IP address:_____ Storage management station name: _____ ___ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 5-8.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management. Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 5-8. ____ Identify the controller names, IP addresses and MAC addresses: Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 5-1 NetWare Installation Profile (3 of 4)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Install QLogic host adapter failover driver.	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 5-1 NetWare Installation Profile (4 of 4)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 7.xx or 8.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine will be used as a storage management station *and* as the event monitoring machine.	____ Install SMclient on the storage management station or host acting as a storage management station.	
❑ This machine will be used *only* as a storage management station.	____ Install SMclient on the storage management station or host acting as a storage management station. ____ Disable the event monitor.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following specifications to ensure this NetWare machine meets its operating system requirements.

Storage Management Station

You can run the NetWare client software only on a NetWare server or on a Windows NT or Windows 2000 storage management station.

If running the client software on a Windows storage management station or host, refer to the following, based on the operating system running on the machine:

- Windows NT – "Operating System Specifications" on page 8-9
- Windows 2000 – "Operating System Specifications" on page 9-9

If running the software on a NetWare server, verify that the server has 85 MB free space on SYS.

Ensure the host is running JVM 1.3.1 or higher.

The recommended display setting is 1024 x 768 pixels with 64K colors or better. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If using a display setting of 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the scrollbar area above or below the scroll placeholder.

Do *not* use the up or down arrow keys *or* select the scrollbar to move it for scrolling the online help screens.

Host

Each host must be configured with Novell NetWare 6.0 with Service Pack (SP) 1.

It is recommended that equipment used for the NetWare 6.0 operating system be on the Novell “Yes, Tested and Approved” Solutions list.

IMPORTANT NetWare Clustering Services has not been certified for use with the storage management software.

Ensure the host has a minimum of 512 MB system memory.

Ensure the host is running JVM 1.3.1 or higher.

The recommended display setting is 1024 x 768 pixels with 64K colors or better. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If using a display setting of 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the scrollbar area above or below the scroll placeholder.

Do *not* use the up or down arrow keys *or* select the scrollbar to move it for scrolling the online help screens.

Chapter 6

Solaris Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the Solaris Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, “host” refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Coexistence Environments” on page A-4
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11
- “Failover Protection” on page A-12
- “Cluster Configuration” on page A-14

3 Make a photocopy of the Solaris Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 6-1 Solaris Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D240 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 6-1 Solaris Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 6-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 6-9. ____ Identify controller names, IP addresses, and MAC addresses. Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 6-1 Solaris Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Install host adapter and driver. (Refer to the documentation shipped with the host adapter.)	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 6-1 Solaris Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 6.xx or 7.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
❑ This machine is running version 6.xx, which will coexist with version 8.3x.	____ Leave version 6.xx running on the storage management station and host.	
❑ This machine is running version 8.xx, which version 8.3x will replace.	____ Leave version 8.xx running on the storage management station and host. Version 8.3x will overwrite 8.xx during installation.	
All storage management stations and hosts require SMruntime. All hosts require SMutil.	____ Install SMruntime.	____ Install SMruntime. ____ Install SMutil.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
Important Configure the event monitor on *one* machine only to prevent receipt of duplicate error messages.		
❑ This machine is running no frameworks integration software and will be used as a: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	____ Install SMclient on the machine serving as a storage management station.	
❑ This machine is running HP OpenView Node Network Manager and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	____ Install SMclient on the machine serving as a storage management station. ____ (Optional) Install SMOVclnt on the machine serving as a storage management station.	
❑ This machine is running in a cluster configuration.	No installation activity required.	____ Install the software on the cluster hosts.

Table 6-1 Solaris Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify boot device installation requirements.		
❑ This machine will be used to install the boot device on a disk subsystem.	____ Install the boot device on the disk subsystem.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required in order to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 3.xx.	____ Use SM7migrate to upgrade to firmware version 3.01.03 *first*, and then to upgrade to version 4.01.02.30.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this Solaris machine meets its operating system requirements.

Storage Management Station

The minimum requirement is a Sparc S20 with:

- 256 MB system memory
- Ethernet network interface card
- CDROM drive
- Mouse or similar pointing device

For SMclient, at least 57 MB available disk space on /opt and root-level (super-user) permission is required for installation.

For SMruntime, at least 49 MB available disk space on /opt and root-level (super-user) permission is required for installation.

Ensure the storage management station or the host acting as a storage management station is running one of the following operating systems, based on the version of SANtricity Storage Manager:

SANtricity Storage Manager, version 8.30

- Solaris 2.6 with the following patches (minimum versions)
  - 105181-32 Kernel jumbo patch
  - 105600-19 SunOS 5.6 /kernel/drv/isp patch
  - 105359 (replaces obsolete 105797-07 SunOS 5.6/kernel/drv/sd patch)
- Solaris 7 with the following patches (minimum versions)
  - 106541-18 Kernel jumbo patch
  - 107078-18 (or later) Open Windows patch
- Solaris 8 with the 108528-15 jumbo patch
- Solaris 9

SANtricity Storage Manager, version 8.33

- Solaris 8 with the 108528-16 jumbo patch

Host

The minimum requirement is a SparcS20 processor with:

- 256 MB system memory
- CDROM drive
- Mouse or similar pointing device
- Ethernet network interface card

For RDAC, at least 1 MB available disk space on /opt and root-level (super-user) permission is required for installation.

For SMruntime, at least 49 MB available disk space on /opt and root-level (super-user) permission is required for installation.

For SMagent, at least 50 MB available disk space on /opt and root-level (super-user) permission is required for installation.

For SMclient, at least 57 MB available disk space on /opt and root-level (super-user) permission is required for installation.

Optionally for SM7migrate, at least 10 MB available disk space on /opt. Root-level (super-user) permission is required for installation.

Ensure the host is running one of the following operating systems, based on the version of SANtricity Storage Manager:

SANtricity Storage Manager, version 8.30

- Solaris 2.6 with the following patches (minimum versions)
  - 105181-32 Kernel jumbo patch
  - 105600-19 SunOS 5.6 /kernel/drv/isp patch
  - 105359 (replaces obsolete 105797-07 SunOS 5.6/kernel/drv/sd patch)
- Solaris 7 with the following patches (minimum versions)
  - 106541-18 Kernel jumbo patch
  - 107078-18 (or later) Open Windows patch
- Solaris 8 with the 108528-15 jumbo patch
- Solaris 9

SANtricity Storage Manager, version 8.33

- Solaris 8 with the 108528-16 jumbo patch

Chapter 7

Windows 98 Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

IMPORTANT Windows 98 supports only the SMclient software and direct management of the disk subsystems. Windows 98 machines can be used as storage management stations as long as the machines have an Ethernet connection to the disk subsystem.

Using the Windows 98 Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Coexistence Environments” on page A-4
- “Management Methods” on page A-6
- “Client Software” on page A-11
- “Failover Protection” on page A-12

3 Make a photocopy of the Windows 98 Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 7-1 Windows 98 Installation Profile (1 of 3)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 7-1 Windows 98 Installation Profile (2 of 3)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select management method.		
❑ Direct management (Host-agent method not supported for Win. 98). Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station meets its required specifications. Refer to "Operating System Specifications" on page 7-7. ____ Identify controller names, IP addresses, and MAC addresses. Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 7-1 Windows 98 Installation Profile (3 of 3)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 6.xx or 7.xx, which version 8.3x will replace.	____ Remove previous version.	
❑ This machine is running version 6.xx, which will coexist with version 8.3x.	____ Leave version 6.xx installed.	
❑ This machine is running version 8.xx, which version 8.3x will replace.	No software removal activity required. Version 8.3x will overwrite version 8.xx.	
This machine will be used as a storage management station.	____ Install SMclient.	
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 3.xx.	____ Upgrade to firmware version 3.01.03 *first*, and then upgrade to version 4.01.02.30.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station specifications to ensure this Windows 98 machine meets its operating system requirements.

Storage Management Station

A Pentium or Pentium equivalent CPU (133 MHz or faster) is required with:

- CDROM drive
- Mouse or similar pointing device
- 98 MB system memory
- Ethernet network interface card
- AGP (preferred) or PCI video card (ISA cards not supported)

The recommended display setting is 1024 x 768 pixels with 64K colors. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If using a display setting of 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the scrollbar area above or below the scroll placeholder.

Do *not* use the up or down arrow keys *or* select the scrollbar to move it for scrolling the online help screens.

Hardware-based Windows acceleration – Desktop computers that use system memory for video memory are not recommended for use with the storage management software.

IMPORTANT Many PC-based servers are not designed to run graphic-intensive software. If your server has difficulty running the storage management software without video problems, you may need to upgrade the server's video card.

Improve a Server's Graphics Performance

1. Select Start >> Settings >> Control Panel from the Start Menu.

   The Control Panel dialog is displayed.

2. Double-click the Display icon.

   The Display Properties dialog is displayed.

3. Select the Effects tab.
4. Clear the check box of the Show window contents while dragging option.
5. Select OK.
6. Close the Control Panel dialog.

End Of Procedure

The following processors are recommended for the optional use of laptop computers as management stations:

- Pentium II CPU (350 MHz or faster)
- Celeron CPU (366 MHz or faster)
- AMD-K6-2 CPU (400 MHz or faster)
- AMD K6-III (350 MHz or faster)

For SMclient, at least 60 MB of disk space must be available.

Administrative privileges are required for installation.

Ensure the storage management station is running Windows 98, Second Edition, for support of SMclient only.

Chapter 8

Windows NT Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the Windows NT Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – During installation of the client software, you will be asked if you want to install the event monitor. Install the event monitor on one machine only to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Coexistence Environments” on page A-4
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11
- “Failover Protection” on page A-12
- “Cluster Configuration” on page A-14

3 Make a photocopy of the Windows NT Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 8-1 Windows NT Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
____ Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 8-1 Windows NT Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 8-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 8-9. ____ Identify controller names, IP addresses, and MAC addresses. Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 8-1 Windows NT Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Install host adapter and driver. (Refer to the documentation shipped with the host adapter.)	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 8-1 Windows NT Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 6.xx or 7.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
❑ This machine is running version 6.xx, which will coexist with version 8.3x.	____ Leave version 6.xx running on the storage management station and host.	
❑ This machine is running version 8.xx, which version 8.3x will replace.	____ Leave version 8.xx running on the storage management station and host. Version 8.3x will overwrite 8.xx during installation.	
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine is running IBM Director Client and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: ____ Install Microsoft Virtual Machine. ____ Install SMdirectorclient.	
❑ This machine is running no frameworks integration software and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: ____ Install Microsoft Virtual Machine. ____ Install SMclient.	
❑ This machine is running HP OpenView Node Network Manager, and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: ____ Install Microsoft Virtual Machine. ____ Install SMclient. ____ (Optional) Install SMOVclnt.	
❑ This machine will be used to install the boot device on a disk subsystem.	No installation activity required.	____ Install the boot device.

Table 8-1 Windows NT Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities corresponding to your configuration information selections.	
Identify required software (continued).		
All hosts require SMutil and RDAC.	No installation activity required.	____ Install SMutil. ____ Install RDAC.
❑ This machine will be used for host-agent management.	No installation activity required.	____ Install SMagent.
❑ This machine is running in a cluster configuration.	No installation activity required.	____ Install the storage management software on the other host in the cluster. ____ Install the cluster software.
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact technical support to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 3.xx.	____ Upgrade to firmware version 3.01.04 *first*, and then upgrade to version 4.01.02.30.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this Windows NT machine meets its operating system requirements.

Storage Management Station

A Pentium or Pentium equivalent CPU (133 MHz or faster) is required with:

- CDROM drive
- Mouse or similar pointing device
- 128 MB system memory
- Ethernet network interface card
- AGP (preferred) or PCI video card (ISA cards not supported)

The recommended display setting is 1024 x 768 pixels with 64K colors or better. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If using a display setting of 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the scrollbar area above or below the scroll placeholder.

Hardware-based Windows acceleration – Desktop computers that use system memory for video memory are not recommended for use with the storage management software.

IMPORTANT Many PC-based servers are not designed to run graphic-intensive software. If your server has difficulty running the storage management software without video problems, you may need to upgrade the server's video card.

Improve a Server's Graphics Performance

1. Select Start >> Settings >> Control Panel from the Start Menu.

   The Control Panel dialog is displayed.

2. Double-click the Display icon.

   The Display Properties dialog is displayed.

3. Select the Plus! tab.
4. Deselect the Show window contents while dragging option.
5. Select OK.
6. Close the Control Panel dialog.

End Of Procedure

The following processors are recommended for the optional use of laptop computers as storage management stations:

- Pentium II CPU (350 MHz or faster)
- Celeron CPU (366 MHz or faster)
- AMD-K6-2 CPU (400 MHz or faster)
- AMD K6-III (350 MHz or faster)

For SMclient, at least 60 MB of disk space must be available.

Administrator privileges are required for installation.

Ensure the storage management station or the host acting as a storage management station is running one of the following operating systems:

- Windows NT Workstation 4.0 with Service Pack 6a
- Windows NT Server 4.0 with Service Pack 6a
- Windows NT 4.0 Enterprise Edition with Service Pack 6a

If you want to install the client software on a standalone host and manage disk subsystems through the Fibre Channel I/O path, using a configuration similar to that supported by SYMplicity Storage Manager 6.22, then you will need to install the TCP/IP Protocol software on the host and assign a static IP address to the host.

Host

For RDAC, at least 7MB available disk space is required. Administrator privileges are required for installation.

For Microsoft Virtual Machine, at least 1 MB available disk space is required. Administrator privileges are required for installation.

IMPORTANT You will need to install Microsoft Virtual Machine only if you are running a version up to 5.00.3186. To obtain the latest version of Microsoft Virtual Machine, go to http://www.microsfot.com/downloads/search.asp

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For SMagent, at least 1 MB available disk space is required. Administrator privileges are required for installation.

For SMclient, at least 60 MB of disk space must be available. Administrator privileges are required for installation.

Ensure your host is running one of the following operating systems:

- Windows NT Server 4.0 with Service Pack 6a
- Windows NT 4.0 Enterprise Edition with Service Pack 6a

Chapter 9

Windows 2000 Installation Planning

Before You Begin

Use the Installation Profile to plan the installation of the disk subsystem hardware or software. The Installation Profile has two main columns: a Pre-installation Activity column and an Installation Activity column. The Pre-installation Activity column lists options from which you will enter or select configuration information based *only* on that which applies to your installation environment.

The Installation Activity column lists the installation activities you will perform on the disk subsystem, storage management station, and host, based on your configuration selections in the Pre-installation Activity column.

During the installation process, the *SANtricity Storage Manager Installation Guide* will refer you to the Installation Activity column to determine which installation activity to perform, in which sequence, and on which machine. You will perform only those activities that correspond to your selections in the Pre-installation Activity column.

Using the Windows 2000 Installation Profile

1 Review the following to ensure you complete the planning process correctly.

- Storage management station – A storage management station typically is a personal computer or a workstation connected to an Ethernet network, which you use to manage one or more disk subsystems.

  A storage management station also can be a host connected to the disk subsystem using a Fibre Channel I/O path by which you manage the disk subsystems. Although you can install the storage management software on a host, the host will communicate with the disk subsystem controllers using TCP/IP protocol.

- Host – A host is a computer that accesses the disk subsystem over a Fibre Channel I/O data connection. In this chapter, "host" refers to a standalone computer or a server in a cluster. A cluster is a group of servers that run clustering software and access the disk subsystem over a Fibre Channel I/O data connection.

- Host name – The IP address is required if you do not have a domain name server (DNS). If a DNS server has been setup, you can enter either the host name or the IP address. You will enter the host name in the Hardware Configuration section of the Pre-installation Activity column.

- Direct management restrictions – A maximum of eight clients can concurrently monitor a direct managed disk subsystem. This limit does not apply to client workstations managing the disk subsystem through the host-agent method. You will select the management method in the Hardware Configuration section of the Pre-installation Activity column.

- Disk subsystem type – A disk subsystem can be internal or external. An internal disk subsystem is one housed within a host machine. An external disk subsystem is one physically distinct from the host. You will select the disk subsystem type in the Hardware Configuration section of the Pre-installation Activity column.

- Event monitor – The event monitor installs automatically with the client software. After you have completed the installation process, you will be instructed to disable the event monitor on all but one machine to prevent receipt of duplicate error messages. You will identify the event monitoring machine in the Software Configuration section of the Pre-installation Activity column.

2 If you are unfamiliar with the concepts below, refer to the following for more information:

- “Disk Subsystem Names” on page A-2
- “Usable Disk Capacity” on page A-3
- “Coexistence Environments” on page A-4
- “Management Methods” on page A-6
- “Event Monitor” on page A-10
- “Client Software” on page A-11
- “Failover Protection” on page A-12
- “Cluster Configuration” on page A-14

3 Make a photocopy of the Windows 2000 Installation Profile for each storage management station and connected host on which you will install the software.

4 Complete the Pre-installation Activity column first, selecting only those items that apply to your installation environment.

5 When you have completed the Pre-installation Activity column, go to the *SANtricity Storage Manager Installation Guide* for installation procedures.

Table 9-1 Windows 2000 Installation Profile (1 of 5)

Pre-installation Activity	Installation Activity
Hardware Configuration Information	**Disk Subsystem**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.
Enter the disk subsystem name (30-character limit).	
_____	No installation activity required on the disk subsystem.
Determine total usable disk capacity.	
Calculation of total usable disk capacity requires assistance from technical support. Enter the following information *first* and then contact technical support for further assistance. Desired data storage configuration: ____ Data storage capacity (GB or TB) ____ RAID level ____ Total global hot spares Drive capacity: ____ Drive size (GB) ____ Drive quantity ____ Drive size (GB) ____ Drive quantity ____ Total usable disk capacity	No installation activity required on the disk subsystem.
Select the array module or control module for this disk subsystem.	
____ D173-010 ____ 9176 ____ D173-014 ____ D178 ____ D240 ____ D280	No installation activity required on the disk subsystem.
Select the drive module for this disk subsystem.	
____ 9170-014 ____ 9170-010 ____ D200	No installation activity required on the disk subsystem.
Verify hardware site requirements.	
____ Using the *Control Module and Drive Module Site Preparation Guide*, verify all site requirements.	____ Using the *Control Module and Drive Module Installation Guide*, install your selected disk subsystem hardware modules.

Table 9-1 Windows 2000 Installation Profile (2 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Select either or both management methods.		
Obtain host names and IP addresses from your network administrator. ❑ Host-agent management Host name or IP address:_____ Storage management station name: _____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 9-9.	No installation activity required.	When instructed to do so, you will install the SMagent software on the host later in the installation process.
❑ Direct management Gateway IP address:_____ Subnet mask:_____ ____ Verify the storage management station and host meet their required specifications. Refer to "Operating System Specifications" on page 9-9. ____ Identify controller names, IP addresses, and MAC addresses: Controller A name, IP address, and MAC address: _____ Controller B name, IP address, and MAC address: _____ ____ Add controller names and IP addresses to the DNS host table. ____ Configure a BOOTP server, if one has not been configured on your network. Refer to Appendix B for procedures.	No installation activity required on the storage management station or host.	
Identify other disk subsystems accessed by the host besides the control module or drive module you have already identified.		
Disk subsystem type: ❑ Internal ❑ External Manufacturer and model:_____ Storage management software:_____ Version:_____ Firmware version:_____	No installation activity required on the storage management station or host.	

Table 9-1 Windows 2000 Installation Profile (3 of 5)

Pre-installation Activity	Installation Activity	
Hardware Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify and verify connective hardware.		
Number of host ports available:_____ Host adapter – manufacturer, model, and driver level: _____ Host adapter – manufacturer, model, and driver level: _____ Host is connected to disk subsystem through: ❑ Direct connection ❑ Switch Manufacturer, model, and release: _____ ____ Verify host adapter and switch compatibility with the storage management software. Contact technical support for assistance. ____ Install host adapter and driver. (Refer to the documentation shipped with the host adapter.)	No installation activity required on the storage management station or host.	
Identify other applications running on host.		
❑ Network management software Name and version:_____ ❑ Volume management software Name and version:_____ ❑ Backup or recovery software Name and version:_____ ❑ Other type of applications Name and version:_____ Name and version:_____ ____ Verify storage management software compatibility with all host applications. Contact technical support for assistance.	No installation activity required on the storage management station or host.	

Table 9-1 Windows 2000 Installation Profile (4 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software.		
❑ This machine is running version 6.xx or 7.xx, which version 8.3x will replace.	____ Remove previous version from the storage management station and host.	
❑ This machine is running version 6.xx, which will coexist with version 8.3x.	____ Leave version 6.xx running on the storage management station and host.	
❑ This machine is running version 8.xx, which version 8.3x will replace.	____ Leave version 8.xx running on the storage management station and host. Version 8.3x will overwrite 8.xx during installation.	
Important Configure the event monitor on only *one* machine to prevent receipt of duplicate error messages.		
❑ This machine is running IBM Director Client and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	____ Install SMdirectorclient on the storage management station or the host acting as a storage management station.	
❑ This machine is running no frameworks integration software and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	____ Install SMclient on the storage management station or the host acting as a storage management station.	
❑ This machine is running HP OpenView Node Network Manager and will be used as: ❑ A storage management station *and* event monitoring machine. ❑ A storage management station *only.*	Install the following on the storage management station or the host acting as a storage management station: _____ Install SMclient. ____ (Optional for version 8.30 only) Install SMOVclnt.	
❑ This machine will be used to install the boot device on a disk subsystem.	No installation activity required.	____ Install the boot device.
All hosts require SMutil and RDAC.	No installation activity required.	____ Install SMutil. ____ Install RDAC.

Table 9-1 Windows 2000 Installation Profile (5 of 5)

Pre-installation Activity	Installation Activity	
Software Configuration Information	**Storage Management Station**	**Host**
Important Select only configuration items that apply to your system.	**Important** Perform only installation activities that correspond to your configuration information selections.	
Identify required software (continued).		
❑ This machine will be used for host-agent management.	No installation activity required.	___ Install SMagent.
❑ This machine is running in a cluster configuration.	No installation activity required.	___ Install the software on on the other cluster host.
Determine firmware upgrade requirements.		
Important The controller must be at firmware version 4.01.02.30 or higher to be managed with software version 8.3x or to be upgraded to firmware version 5.3x. **Important** Firmware version 5.3x is required in order to use the premium features of the software.	**Caution** The installation CD includes only firmware versions 5.21 and later. Contact your software vendor to obtain the appropriate firmware versions.	
❑ The controller is running firmware version 3.xx.	____ Use SM7migrate to upgrade to firmware version 3.01.03 *first*, and then to upgrade to version 4.01.02.30.	
❑ The controller is running firmware version 4.xx, 4.01.02.30, or a higher version.	____ If the controller is running 4.xx, upgrade to version 4.01.02.30. ____ If you wish to use the premium features of the software, upgrade from version 4.01.02.30 to version 5.3x, using the client GUI. Otherwise, a firmware upgrade is not required.	
You are finished with pre-installation activities. Refer to the *SANtricity Storage Manager Installation Guide for Version 8.3x* for installation procedures.	You are finished with the installation profile.	

Operating System Specifications

Refer to the following storage management station or host specifications to ensure this Windows 2000 machine meets its operating system requirements.

Storage Management Station

A Pentium or Pentium equivalent CPU (133 MHz or faster) is required with:

- CDROM drive
- Mouse or similar pointing device
- 128 MB system memory (256 MB recommended)
- Service Pack (SP) 2 for version 8.30 or Service Pack (SP) 3 for version 8.33
- Ethernet network interface card
- AGP (preferred) or PCI video card (ISA cards not supported)

The recommended display setting is 1024 x 768 pixels with 64K colors or better. The minimum display setting allowed is 800 x 600 pixels with 256 colors.

If the display setting is 256 colors, you may experience display problems when scrolling up or down in the online help screens. To scroll the online help screens, use the Page Up and Page Down keys or select the up or down scroll buttons. Do not use the up or down arrow keys or the scroll bar to scroll the online help screens.

Hardware-based Windows acceleration – Computers that use system memory for video memory are not recommended for use with the storage management software.

IMPORTANT Many PC-based servers are not designed to run graphic-intensive software. If your server has difficulty running the storage management software without video problems, you may need to upgrade the server's video card.

Improve a Server's Graphics Performance

1. Select Start >> Settings >> Control Panel from the Start Menu.

   The Control Panel dialog is displayed.

2. Double-click the Display icon.

   The Display Properties dialog is displayed.

3. Select the Effects tab.
4. Deselect the Show window contents while dragging option.
5. Select OK.
6. Close the Control Panel dialog.

End Of Procedure

The following processors are recommended for the optional use of laptop computers as storage management stations:

- Pentium II CPU (350 MHz or faster)
- Celeron CPU (366 MHz or faster)
- AMD-K6-2 CPU (400 MHz or faster)
- AMD K6-III (350 MHz or faster)

For SMclient, at least 60 MB of disk space must be available.

The total available disk space requirement is 100 MB.

Ensure the storage management station or the host acting as a storage management station is running one of the following operating systems, based on the version of SANtricity Storage Manager:

SANtricity Storage Manager, version 8.30

- Windows 2000 Professional with Service Pack 2
- Windows 2000 Server with Service Pack 2
- Windows 2000 Advanced Server with Service Pack 2, required for a cluster environment

SANtricity Storage Manager, version 8.33

- Windows 2000 Professional with Service Pack 3
- Windows 2000 Server with Service Pack 3
- Windows 2000 Advanced Server with Service Pack 3, required for a cluster environment

If you want to install the client software on a standalone host and manage disk subsystems through the Fibre Channel I/O path, using a configuration similar to that supported by SYMplicity Storage Manager 6.22, then you will need to install the TCP/IP protocol software on the host and assign a static IP address to the host.

Host

For RDAC, at least 1MB available disk space is required. Administrator privileges are required for installation.

For SMagent, at least 1 MB available disk space is required. Administrator privileges are required for installation.

For SM7migrate (if required), at least 10 MB available disk space is required. Administrator privileges are required for installation.

For SMclient, at least 60 MB of disk space must be available. Administrator privileges are required for installation.

The total available disk space requirement is 100 MB.

Ensure your host is running one of the following operating systems, based on the version of SANtricity Storage Manager:

SANtricity Storage Manager, version 8.30

- Windows 2000 Server with Service Pack 2
- Windows 2000 Advanced Server with Service Pack 2, required for a cluster environment

SANtricity Storage Manager, version 8.33

- Windows 2000 Server with Service Pack 3
- Windows 2000 Advanced Server with Service Pack 3, required for a cluster environment

Appendix A

Disk Subsystem Concepts

This appendix contains information about disk subsystem concepts, which you might find helpful when planning the storage management software installation.

Disk Subsystem Names

You can rename individual disk subsystems using the storage management software. All disk subsystems are displayed initially as <unnamed> after you have installed the storage management software. If you are upgrading the software from an earlier version, any previously named disk subsystems will display under their existing names. Use the following tips for devising disk subsystem names:

- The storage management software allows a name up to 30 characters. All leading and trailing spaces will be deleted.
- Use unique, meaningful names that will be easy to understand and remember.
- Avoid arbitrary names or names that would quickly lose their meaning in the future.

The storage management software displays disk subsystem names with the prefix "Disk Subsystem." Therefore, if you rename a disk subsystem "Engineering," it will be displayed as, "Disk Subsystem Engineering."

Usable Disk Capacity

Within a disk subsystem, a certain amount of disk capacity will be unavailable for data storage because of overhead or redundancy requirements. Thus the *total data storage disk capacity* is the sum of the member disks' capacities minus any capacity required for overhead and redundancy. The usable capacity of a volume participating in a mirroring relationship is the minimum of the primary and secondary volume actual capacities. The additional disk capacity needed for redundancy depends on the disk subsystem RAID level, hot spare configuration, and drive size and quantity.

RAID and Global Hot Spares

A Redundant Array of Independent Disks (RAID) is a disk array in which part of the physical storage capacity is used to store redundant information about user data. The redundant information enables reconstruction of user data in the event that one of the array's member disks or the access path to it fails. You can configure various levels of redundancy on your RAID disk array, depending on your data storage needs. Currently supported levels are RAID 1, 3, and 5.

A hot spare is a drive configured to automatically replace any failed drive within an array. A hot spare can substitute for any failed drive with the same or smaller capacity within specific RAID 1, 3, or 5 drive configurations, thereby increasing the redundancy level of the RAID configuration.

Coexistence Environments

A coexistence environment is one in which you manage disk subsystems running different versions of controller firmware from the same machine, using the storage management software version supported by the respective firmware versions as noted in Figure A-1.

A coexistence environment requires the following conditions:

- Both SYMplicity Storage Manager 6.22 and SANtricity Storage Manager for version 8.3x will be installed on this machine.
- SYMplicity Storage Manager 6.22 will be used to manage one or more disk subsystems from this machine with controllers running firmware up to version 3.01.04.
- SANtricity Storage Manager for version 8.3x will be used to manage one or more disk subsystems from this machine with controllers running firmware version 4.xx through 5.3x.

SANtricity Storage Manager for version 8.3x provides the interfaces necessary to manage controllers running 4.01.02.30 through 5.3x firmware. To manage coexisting controllers running firmware versions 4.01.02.30 and 5.3x, you first need to remove any previous version of the storage management software from the machine.

IMPORTANT Depending on the firmware version running on the controller, you may need to upgrade the controller firmware to prevent system problems. Procedures for determining if you need to upgrade your firmware are provided in the *SANtricity Storage Manager Installation Guide.*

If your operating system will use a storage management software version 8.3x failover driver, both version 6.22 and version 8.3x will share the failover driver installed with version 8.3x.

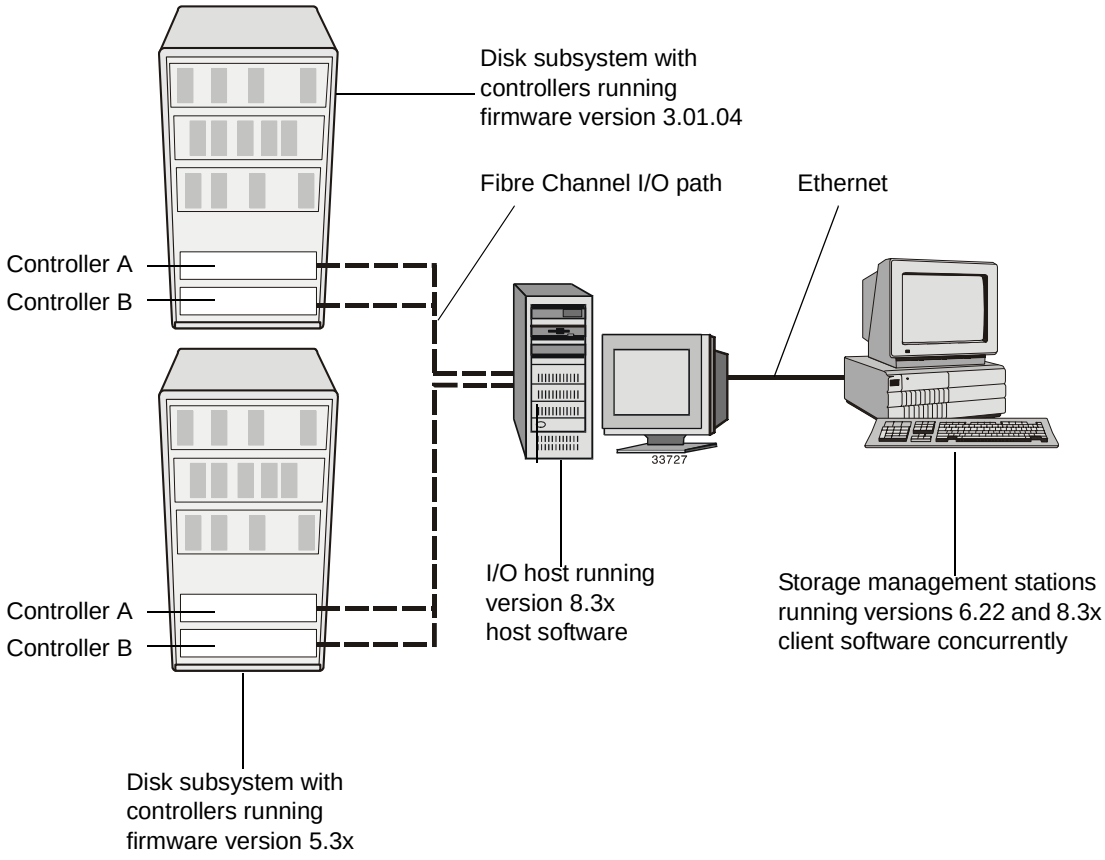

Figure A-1 Example of Coexistence Environment

Management Methods

You can manage the disk subsystem controllers from a storage management station or host using either the direct management or host-agent management method. You can use either or both methods, depending on your system configuration. See "Direct Management," below, or "Host-Agent Management" on page A-8.

Direct Management

With the direct management method, you manage the disk subsystem directly over the network through an Ethernet connection from a storage management station to the controllers (Figure A-2).

IMPORTANT The maximum number of clients that can concurrently monitor a direct managed disk subsystem is limited to eight. This limit does not apply to client workstations that are managing the disk subsystem through the host-agent method.

The direct management method offers the following advantages:

- You can use a storage management station to manage disk subsystems connected to a host that is running an operating system not supported by the storage management software. Contact technical support for more information.
- You can configure the maximum number of LUNs supported by your operating system and host adapters. This method does not require an Access Volume, so it does not require the use of a LUN.

The direct management method requires the following:

- An Ethernet cable is required to connect each controller to the network.
- You must specify a gateway IP address and subnet mask for each controller whenever adding disk subsystems.
- A BOOTP server is required to configure the controller on the network.

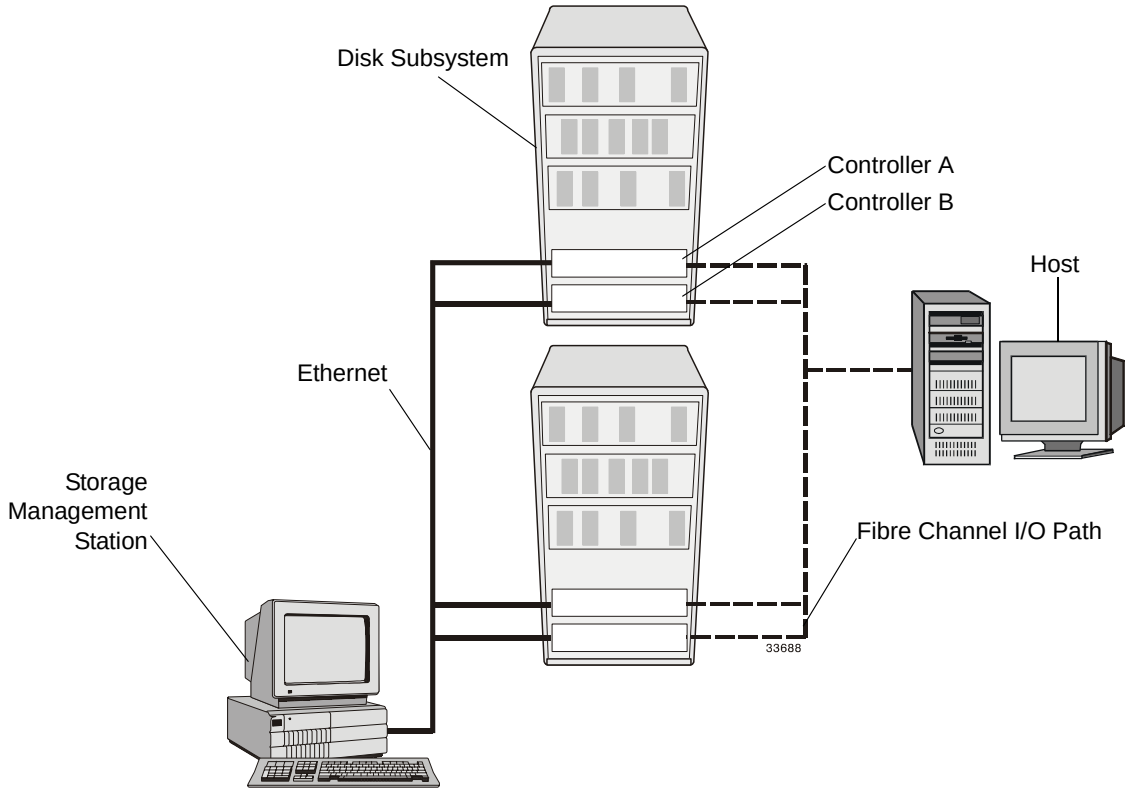

Figure A-2 Direct Management Method

Host-Agent Management

With the host-agent management method, you use the storage management client software to manage disk subsystems through an Ethernet connection to a host (Figure A-3). The host-agent software receives communication from the storage management client software and passes it to the disk subsystem controllers along a Fibre Channel I/O path.

IMPORTANT Windows 98 supports only the SMclient software. Thus, machines running this operating system can be used only as storage management stations or as hosts acting as storage management stations with Ethernet connections to the disk subsystem.

IMPORTANT Windows 98, Windows NT, and Windows 2000 storage management stations require the TCP/IP protocol software to support host-agent management of the disk subsystems. Ensure the TCP/IP protocol software has been installed on any Windows storage management station that will be used for host-agent management and ensure the machine has been assigned a static IP address.

The host-agent management method offers the following advantages:

- Ethernet cables are not used to connect each controller to the network.
- A BOOTP server is not required to configure the controller on the network.
- Network configuration tasks for each controller are not required.
- Only the host name or IP address of the host must be specified when adding disk subsystems. After you add the specific host name or IP address, the host-agent software automatically detects any disk subsystems connected to that host.

The host-agent management method requires an Access Volume on the host machine to communicate with the disk subsystem controllers. The default Volume-to-LUN mapping assigned to the Access Volume is 7 for AIX, Linux, NetWare, Windows 98, Windows NT, and Windows 2000. For HP-UX, IRIX and Solaris, the default Volume-to-LUN mapping is 31. When a default Volume-to-LUN mapping is assigned, the total Volume-to-LUN mappings available are one less than the maximum allowed by the operating system and host adapters.

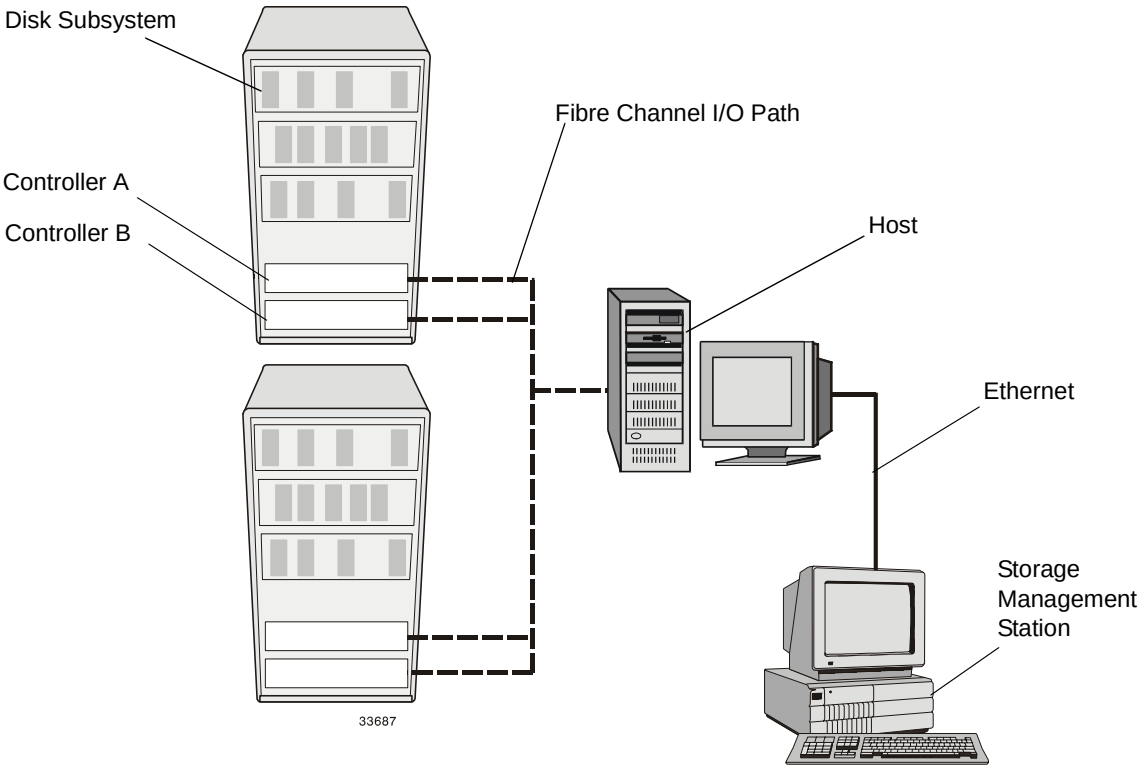

Figure A-3 Host-Agent Management Method

Event Monitor

The event monitor, which is packaged with the client software, monitors disk subsystems and handles error notification through e-mail or SNMP traps when the storage management software is not actively running on the host. To provide continuous monitoring, use the event monitor on a storage management station that normally runs 24 hours a day.

IMPORTANT Enable the event monitor only on *one* storage management station. If the event monitor is enabled on multiple machines, you may receive duplicate event messages.

The storage management software requires Microsoft Virtual Machine to run the event monitor on Windows machines. The storage management software installation CD provides the version of Microsoft Virtual Machine tested for use with the storage management software. You will be instructed on when and how to install this package during the installation process. For more information about the event monitor feature, refer to the *Understanding SANtricity Storage Manager Concepts Guide.*

Client Software

The storage management client software provides the graphical user interface for managing disk subsystems and is required on all storage management stations. Which client package you need to install depends on the operating system running on the machine and whether you are running a frameworks integration package.

If the storage management station is running Windows 2000 and IBM Director 3.1 or later and you want to integrate the client into the node network management framework, then you will install SMdirectorclient. Otherwise, you will install SMclient.

IMPORTANT The SMdirectorclient, which is supported on Windows 2000 and Windows NT only, automatically installs SMmonitor. The SMclient installation offers the option to install SMmonitor on Windows machines.

Optionally, if the machine is running HP-UX, Solaris, Windows NT, or Windows 2000 and HP OpenView Node Network Manager, you can integrate the SMclient into, and launch it from, the frameworks application.

IMPORTANT HP OpenView Node Network Manager is a third-party utility and is not included on the storage management software installation CD. If you will use this option, ensure HP OpenView Node Network Manager has been installed on the storage management station.

Failover Protection

The storage management software supports several types of failover protection using multi-path drivers. A multi-path driver is an I/O path failover driver installed on a host computer that accesses the disk subsystem. The multi-path driver transfers I/O requests from the preferred controller to an alternate controller when a component failure or some other error occurs on the data path to the preferred controller.

Using a failover protection method to reroute these I/O requests will maintain I/O access while you correct the error. Depending on the host operating system, you may have a choice of failover methods for a disk subsystem.

- Failover driver software – A multi-path failover driver provided by the storage management software for Solaris, Windows NT, and Windows 2000 operating systems. You will install the failover driver software on hosts running Solaris, Windows NT, and Windows 2000.
- Third-party failover driver – A multi-path failover driver native to the operating system, such as the Logical Volume Manager failover driver native to HP-UX. For information on multi-path failover protection, see your specific operating system documentation.
- Host-adapter specific I/O path failover drivers – An I/O path failover provided by the host adapter driver. The failover driver provides redundancy in the event of host adapter and other types of I/O path failures. The QLogic host adapter failover driver and the LSI host adapter failover driver each have been certified by LSI as compatible for use on Linux hosts running the storage management software. Additionally, the QLogic host adapter failover driver has been certified compatible for use on NetWare hosts running the storage management software.
- No failover – No failover protection means no multi-path driver is installed to transfer volumes of a failed controller to its alternate controller in a disk subsystem with dual, active controllers. Although each volume on the disk subsystem may be assigned a preferred controller, the volumes will not move to the alternate controller if a component on that controller's I/O path fails. When a component fails, such as a cable or the controller, I/O cannot reach the disk subsystem and data may be lost. The component failure must be corrected before I/O can resume.

For an overview of the default failover settings by operating system, refer to Table A-1.

Table A-1 Default Failover Settings by Operating System

Operating System	Multi-Path Driver	Default Failover Setting		
		Multi-Path Driver		No Multi-Path Driver
		AVT Disabled	AVT Enabled	AVT Disabled
Solaris	SANtricity Storage Manager RDAC	Default		
Windows NT	SANtricity Storage Manager RDAC	Default		
Windows 2000	SANtricity Storage Manager RDAC	Default		
HP-UX	HP Logical Volume Manager (LVM)		Default	
Linux	QLogic Driver		Default	
	LSI Logic Driver		Default	
NetWare	QLogic Driver		Default	
AIX	Failover support not available.			Default
IRIX	Failover support not available.			Default

Cluster Configuration

A cluster environment is a collection of interconnected computers used as a single computing resource. HP-UX, Solaris, or Windows NT or 2000 have been certified to use the storage management software in a cluster environment.

IMPORTANT For hosts running different operating systems, it is recommended that you install the storage management software only in a standard (non-cluster) environment.

A cluster configuration lets you share a computing load over several systems without either the users or system administrators needing to know that more than one system is involved (Figure A-4). If any hardware or software component in the system fails, the users may see degraded performance, but will not lose access to the service. Although several systems in the cluster may have access to a device or resource, the cluster is effectively owned and managed by a single system at a time. Note that in a cluster configuration, both the direct management and host-agent management methods can be used.

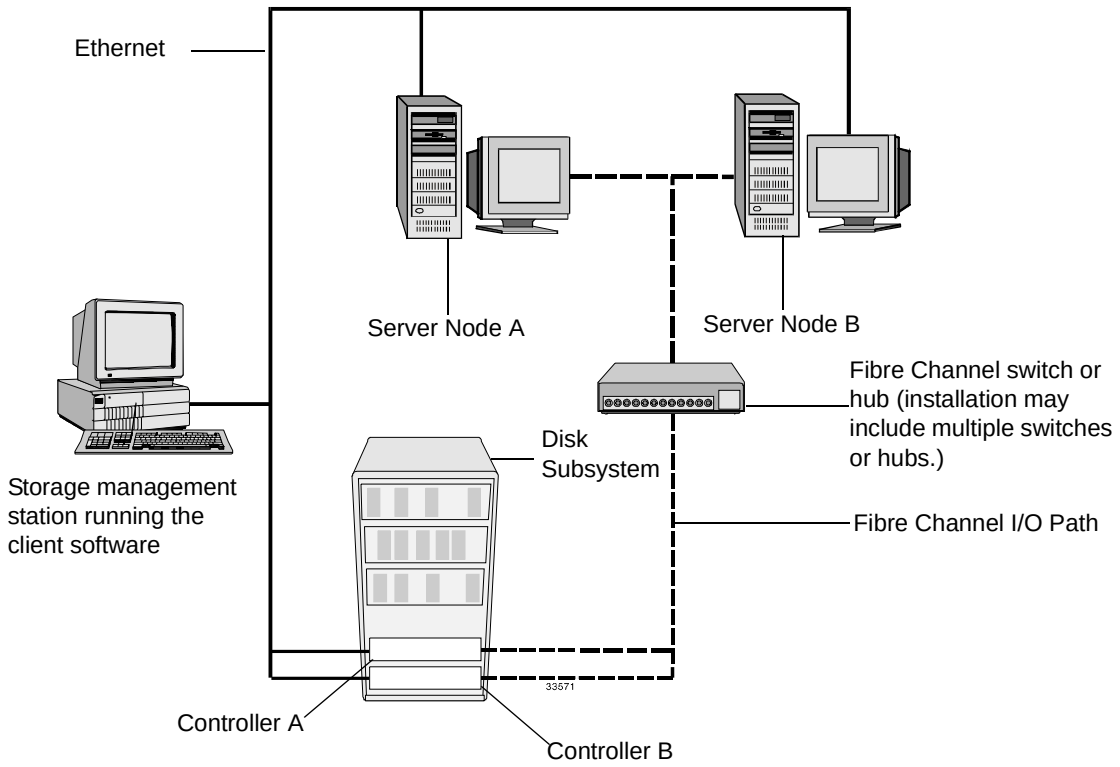

Figure A-4 Example of Cluster Environment

Appendix B

Setting Up a BOOTP Server

To manage a disk subsystem using the direct management method, you first must set up a BOOTP server. Use the procedures in this appendix to set up a BOOTP server, based on your BOOTP server type. This chapter provides procedures for setting up a UNIX BOOTP server, setting a Windows DHCP Server, and setting up NetWare BOOTP-compatible DHCP service.

Setting Up a UNIX BOOTP Server

The following procedure covers setting up the BOOTP server for AIX, HP-UX, IRIX, Linux, and Solaris. The basic parameters are provided in Table B-1. For specific procedures and more information, refer to your operating system software documentation.

1 Edit the bootptab file in the /etc directory using a text editor. Refer to your completed installation profile for the required BOOTP table entries, which are listed in Table B-1. The Remote Management Station (RMS) and Network Management Station (NMS) entries are not required when using the storage management software to manage disk subsystems with controllers running firmware version 4.00.x or greater.

Table B-1 Example of Required Entries for Setting Up a UNIX BOOTP Server

Entry	Description	Sample Format in BOOTP Server
subnet mask	Mask used to route packets to defined subnets	dot notation (sm=255.255.255.0)
gateway (if applicable)	IP address of machine that routes packets between networks	dot notation (gw=192.168.1.1)
controller name	Name associated with the controller	name (denver_a)
IP address (Ethernet address)	IP address of the controller	dot notation (ip=192.168.1.13)
MAC address	Physical hardware address of network interface device	Hexadecimal notation (ha=00a0b8020420)

Refer to the following example when configuring the UNIX BOOTP server. The *Ns4.default:*\ entry denotes settings common to all controllers. The *tc=s4.default:*\ entry associates this common setting group to a specific controller.

NOTE Refer to your specific operating system user's manual for detailed information on setting up the BOOTP server.

```
Ns4.default:\ common settings)
  ht=ether:\

  sm=255.255.255.0:\
```

```
gw=192.168.1.1:\
hn:
 denver_a:\
 tc=s4.default:\ common settings)
 ip=192.168.1.13:\
 ha=00a0b8020420:
 denver_b:\
 tc=s4.default:\
 ip=192.168.1.14:\
 ha=00a0b80000d8:
```

2 Restart the disk subsystems for the parameters in the BOOTP table to take effect.

a Turn off power to the disk subsystems.

b Wait at least 60 seconds for the drives to spin down.

c Turn on power to the disk subsystems.

3 Add the IP address and host name for each network controller by editing the DNS or host table using the example shown in Table B-2.

Table B-2 Example of Edited Host Table

IP Address	Host Name for Controller
127.0.0.01	localhost
153.79.144.13	denver_a
153.79.144.14	denver_b

IMPORTANT Opening ports to your network creates potential security risks.

4 If you plan to manage the disk subsystems through a network firewall, contact technical support.

End Of Procedure

Installing a Windows DHCP Server

To configure a Dynamic Host Configuration Protocol (DHCP) server, the DHCP Manager must be installed on a machine connected to the same subnet as the controllers you will configure.

Instead of using BOOTP to receive IP addresses, Windows uses the DHCP server. DHCP software automatically assigns IP addresses to client workstations logging onto a TCP/IP network. Like BOOTP, DHCP eliminates having to manually assign permanent IP addresses.

For specific procedures and more information, refer to your operating system software documentation.

Windows NT Server – Installing the DHCP Manager

1. Is the DHCP Manager already installed on the appropriate server?
   - Yes – Go to "Windows NT Server – Configuring the DHCP Server."
   - No – Go to step 2.
2. Select Start >> Settings >> Control Panel.
3. Double-click the Network icon.
4. When the Network screen is displayed, select the Services tab.
5. From the Services tab, select Add.
6. Select Microsoft DHCP Server, then select OK.
7. Specify the path to the NT Install file, then select Continue.

   You will see a dialog display stating the static IP address is required.
8. Select OK.
9. When the Network screen is displayed, select the Protocols tab >> TCP/IP >> Properties.

   The TCP/IP Properties windows is displayed.
10. Verify the IP address information is correct and make any necessary corrections from this screen. If each field contains fewer than three characters, press the period key to advance to the next field.
11. Select OK.
12. When the Network screen is displayed, select Close.
13. Wait for the Network Settings Change dialog to complete and then select Close.

14 Ensure any diskettes and CDs are removed, then select Yes to restart.

15 Re-install the service pack that was on your host to apply any new DHCP information associated with the respective service pack.

16 Go to "Windows NT Server – Configuring the DHCP Server" on page B-6.

Windows NT Server – Configuring the DHCP Server

IMPORTANT Before proceeding, read through this procedure and contact your network administrator for any required information.

Use the following procedure to create a scope and set up the DHCP server. A scope defines a group of controllers by their IP addresses. You must create and configure a scope to assign dynamic IP addresses to controllers on your network. Refer to your completed installation profile for the required BOOTP server installation information.

1 Select Start >> Programs >> Administrative Tools >> DHCP Manager.

The DHCP Manager Screen is displayed.

2 Create a scope.

a Ensure Local Machine is selected, then double-click it.

A small minus (-) sign on the left side of Local Machine is displayed.

IMPORTANT If you have only one controller, type its address for both the starting and ending addresses. If you have two controllers, their IP addresses might not be consecutive numbers. Nonetheless, type the beginning (lower number) and ending (higher number) IP addresses. Any IP addresses within that range can be excluded when the New Scope Wizard prompts you for that information.

b Select Scope >> Create.

The Create Scope screen is displayed (Figure B-1).

If each field contains fewer than three characters, press the period key to advance to the next field. If you have only one controller, type its address for both the starting and ending addresses.

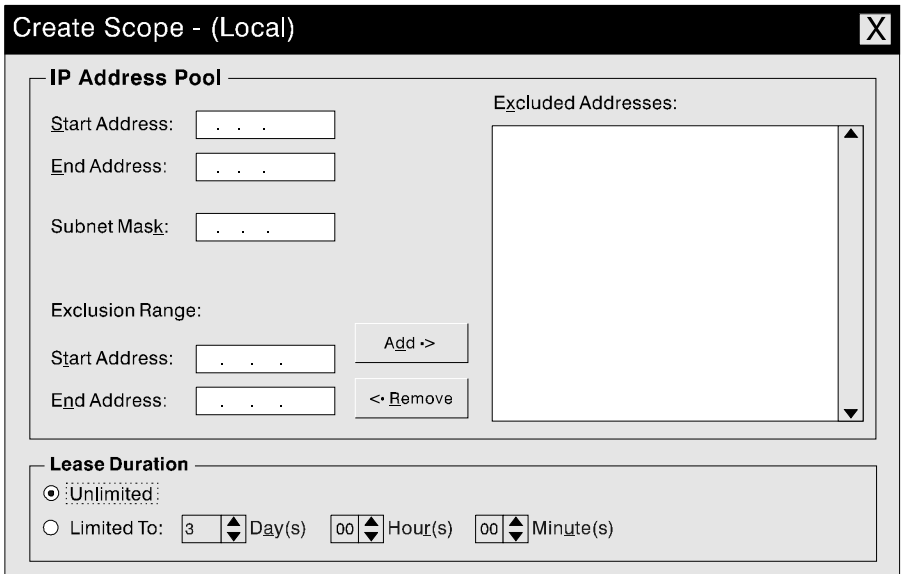

Figure B-1 Create Scope Screen

c Type the starting and ending IP addresses of the controllers you are configuring on the network.

For example, if the subnet is 192.168.1.0 and you are configuring 50 controllers, the starting address would be set to 192.168.1.1 and the ending address would be set to 192.168.1.50.

d Type the subnet mask obtained from the network administrator.

e Using the Add Exclusions screen, type IP addresses that need to be excluded from the beginning and ending addresses that you just typed in step 2b through step 2d, then select Add.

f Set the Lease Duration to Unlimited to make the connection permanent.

g If desired, add a Scope Name and Comment, then select OK.

h When the scope has been successfully created, select Yes to activate it.

The DHCP Manager screen showing the scope is displayed.

3 Configure global scope options:

a Select the scope you want to configure, then select DHCP Options >> Global.

The DHCP Options: Global screen is displayed (Figure B-2).

b Select the router in the Unused Options list and select Add to move it to the Active Options list.

c Select Value to assign an IP address to the active option.

The Edit Array option box is displayed in the lower part of the screen.

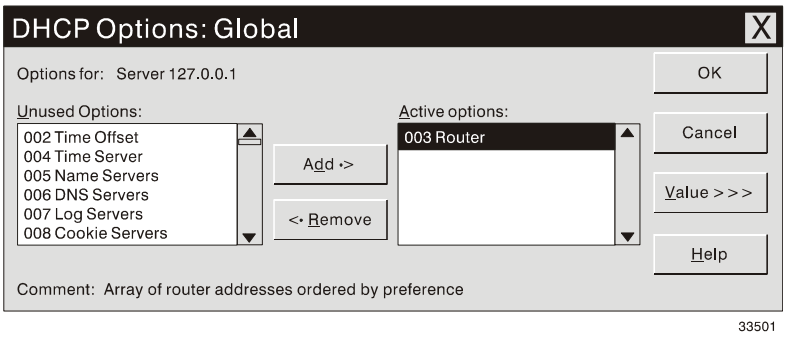

Figure B-2 DHCP Options: Global Screen

d Select Edit Array to add the IP address of your router.

The IP Address Array Editor screen is displayed (Figure B-3).

e Type the unique IP address for the router you added.

For example, the router IP address shown in Figure B-3 is 192.168.1.1.

f Select Add to move it to the IP Address list, then select OK.

You return to the DHCP Options: Global screen.

g Select OK.

The DHCP Manger screen is displayed.

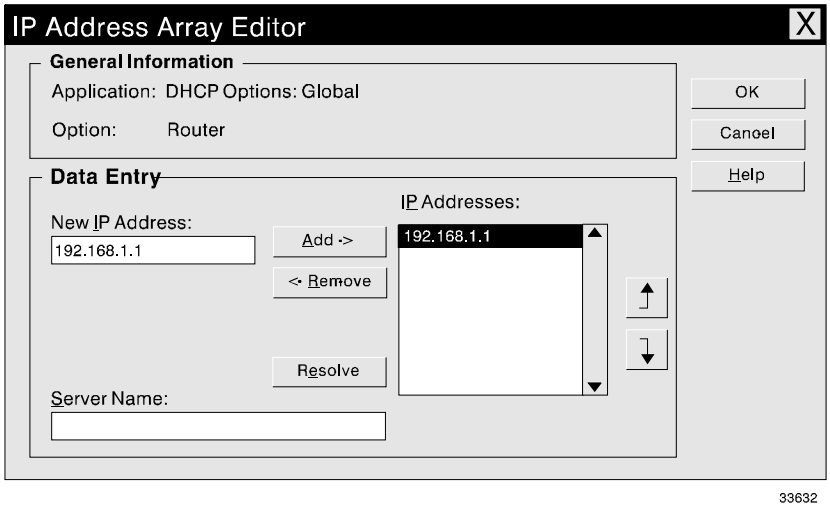

Figure B-3 IP Address Array Editor Screen

4 Create a reservation for each controller. Refer to the controller information you recorded on the installation profile in the section labeled “Select either or both management methods.” to ensure you have included each controller that will be managed directly through the Ethernet connections.

a Select Scope >> Add Reservations.

The Add Reserved Clients screen is displayed (Figure B-4).

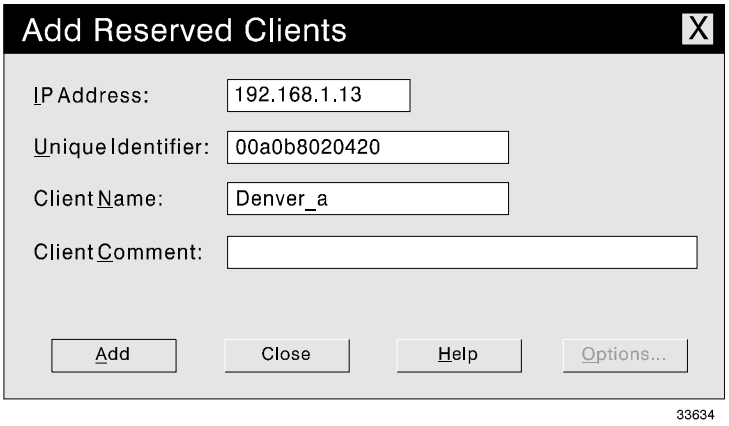

Figure B-4 Add Reserved Clients Screen

b In the IP Address field, type the IP address for the first controller listed in the completed installation profile.

IMPORTANT As you type information in step 4c, do not type decimal points or spaces; only type the numbers.

---

c In the Unique Identifier field, type the controller’s hardware Ethernet address.

d In the Client Name field, type the controller’s host name listed on the completed installation profile, then select Add.

Optionally, you can add comments in the Client Comment field.

e Select Add.

The screen is reset and ready for the next entry.

f Repeat step step 4b through step 4d for each controller listed on the completed installation profile.

g When you have entered all of the controllers, select Close.

The DHCP Manager screen is displayed.

5 Assign the host name in the controller-specific options. Doing so allows the host name to be displayed in the Active Leases list when the reservation is in use.

a Ensure the scope you want to configure is selected, then select Scope >> Active Leases.

The Active Leases screen is displayed (Figure B-5).

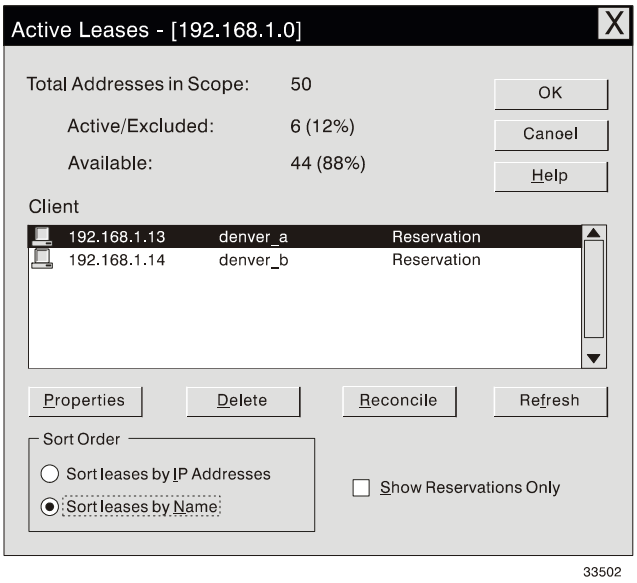

Figure B-5 Active Leases Screen

b Select the first controller in the list, then select Properties.

The Client Properties screen is displayed (Figure B-6), displaying the information you have already added.

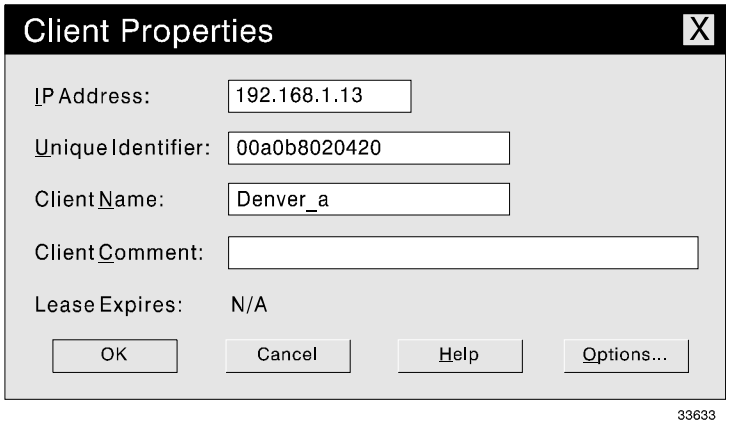

Figure B-6 Client Properties Screen

c Correct any information as necessary from the Client Properties screen. When finished, select OK.

d Select Options.

The DHCP Options – Reservations screen is displayed.

e Select the 012 host name entry in the Unused Options list and select Add to move it to the Active Options list.

f Select Value to assign a host name to the active option.

g Type the host name in the String field at the bottom of the screen for the controller you have selected, then select OK.

The Client Properties screen is displayed.

h Select OK.

The Active Leases screen is displayed.

6 Repeat step 5 to add the host names for each desired controller.

7 Select OK at the Active Leases screen.

The DHCP Manager screen is displayed.

8 Detach and attach the network server for the controller to take effect.

9 Go to "Verify TCP/IP Protocol and Controller Name" on page B-19.

Windows 2000 Server – Installing the DHCP Server

1 Is the DHCP Manager already installed on the appropriate server?

- Yes – Go to "Windows 2000 Server – Configuring the DHCP Server."
- No – Go to step 2.

2 Select Start >> Settings >> Control Panel >> Add/Remove Programs.

The Add/Remove Components screen is displayed.

3 Select Add/Remove Windows Components on the left side of the screen.

The Windows Components Wizard screen is displayed.

4 Select Components, scroll to and select Networking Services >> Details.

5 Under Subcomponents of Networking Services, check the box next to Dynamic Host Configuration Protocol and select OK >> Next.

6 If prompted, type the full path to the Windows 2000 distribution files and select Continue.

The required files are copied to your hard disk. The server software can be used after restarting the system.

After installing the DHCP Manager, you might want to refer to its online help for additional information.

7 Select Finish >> Close.

8 Go to "Windows 2000 Server – Configuring the DHCP Server" on page B-14.

Windows 2000 Server – Configuring the DHCP Server

IMPORTANT Before proceeding, read through this procedure and contact your network administrator for any required information.

Use the following procedure to create a scope and to set up the DHCP server. A scope defines a group of controllers by their IP addresses. You must create and configure a scope to assign dynamic IP addresses to controllers on your network. Refer to your completed installation profile for the required BOOTP server installation information.

1 Create a scope:

a Select Start >> Programs >> Administrative Tools >> DHCP.

The DHCP screen is displayed.

b Ensure that the server you want to configure is selected.

The Add a Scope window is displayed on the right side of the screen and displays the procedure.

c Type a scope name and description.

If each field contains fewer than three characters, press the period key or space bar to advance to the next field.

IMPORTANT If you have only one controller, type its address for both the starting and ending addresses. If you have two controllers, their IP addresses might not be consecutive numbers. Nonetheless, type the beginning (lower number) and ending (higher number) IP addresses. Any IP addresses within that range can be excluded when the New Scope Wizard prompts you for that information.

d Type the starting and ending IP addresses of the controllers you are configuring on the network. For example, if the subnet is 192.168.1.0 and you are configuring 50 controllers, set the starting address to 192.168.1.1 and the ending address to 192.168.1.50.

e Type the subnet mask obtained from the network administrator.

f Using the Add Exclusions screen, type IP addresses that need to be excluded from the beginning and ending addresses that you just typed in step 1d, then select Add.

g Set the Lease Duration obtained from the network administrator.

h Go to step 2 on page B-15.

2 Configure the DHCP Options.

a From the DHCP screen, open the directory structure for the newly created scope.

b Right-click on Scope Options and select Configure Options.

c Type an IP address for a router and select Next.

d Type the domain name and DNS servers and select Next.

e Type the server name and IP address in the WINS Servers screen and select Next.

f Activate the scope: Select Yes >> Next >> Finish.

The DHCP screen is displayed, showing the scope name you have typed.

g At the DHCP screen, open the directory structure below the newly-created scope.

h Right-click on Reservation, and select New Reservation.

IMPORTANT At the bottom of the New Reservations screen, you need to make a selection under Supported Type. It is recommended that you select Both.

---

i Enter the Reservation name, IP address, MAC address, and description and select Close.

j Select the General Tab, then scroll and select Host Name.

k Type a specific host name for each controller. You may want to name the controller the same as the Reservation name.

l Repeat step 2k to add the host names for each controller, then select Close.

3 Detach and attach the network server for the controller to take effect.

4 Go to "Verify TCP/IP Protocol and Controller Name" on page B-19.

Setting Up the NetWare DHCP Service

Rather than using BOOTP to receive IP addresses, NetWare uses the Dynamic Host Configuration Protocol (DHCP) server. DHCP software automatically assigns IP addresses to client workstations logging onto a TCP/IP network. Like BOOTP, DHCP eliminates having to manually assign permanent IP addresses.

When a DHCP client workstation boots, it broadcasts a DHCP request for its IP address and network configuration. When the DHCP server receives the message, it checks its database to determine which configuration information to return. The DHCP server replies by sending a DHCP reply message that includes all TCP/IP configuration information required by the specific client that sent the request.

For specific procedures and more information, refer to your operating system software documentation.

Before installing the DNS/DHCP service, you must complete the following tasks in the order indicated:

- “Extending the NDS Schema.”
- “Installing the Novell Client Software” on page B-18.
- “Installing the DNS/DHCP Management Console” on page B-18.
- “Configuring the NetWare DNS/DHCP Service” on page B-18.

Extending the NDS Schema

The following is a basic procedure to extend the NDS schema. The procedure may vary from your graphical user interface and operating system. For specific procedures and more information, refer to your operating system software documentation. Perform the following procedure to extend the NDS schema and create three required default DNS/DHCP (Domain Name System) objects using the NetWare installation program at the server console.

1. Select the graphical console at the server console.
2. Select Novell >> Install.

   The Install Products dialog is displayed.
3. Select Add and follow the procedure displayed on the dialog.

   The Source Path window is displayed.
4. Type the path to the Install directory in the Source Path window and select OK.

   You can use the Browse button to find the NetWare installation files.
5. Select the Novell DNS/DHCP services box in the Additional Products and Services dialog, if applicable.

   If you do not have the DNS/DHCP services installed, you can obtain the files from your NetWare software installation CD.
6. Authenticate yourself to Novell Directory Services (NDS) as a user with rights to extend the NDS schema. You must have supervisor rights to the root of the NDS tree.
   a. Type your fully distinguished name in the User Name field.
   b. Type your password in the Password field.
   c. Select OK.
   d. Select Close to close the dialog.
7. Locate the Novell DNS/DHCP services file in the Products dialog.
8. Type the NDS context where you want to create the DNS-DHCP locator, DNSDHCP-GROUP, and RootServerInfo Zone objects.
9. Select Next.
10. Select Finish in the Summary dialog. When the installation is complete, the Installation Complete dialog is displayed.
11. Select Yes to reboot the server.
12. After the server reboots, you must log in again to continue.
13. Go to “Installing the Novell Client Software” on page B-18.

Installing the Novell Client Software

Install the Novell Client software on the machine that will run the DNS/DHCP Management Console. For specific installation procedures, refer to the user documentation shipped with your NetWare software. When finished, go to “Installing the DNS/DHCP Management Console.”

Installing the DNS/DHCP Management Console

To view and manage the new DNS/DHCP objects in the NDS tree, you must install the DNS/DHCP Management Console and NetWare Administrator snap-in files. For specific procedures and more information, refer to your NetWare software documentation. When finished, go to “Configuring the NetWare DNS/DHCP Service.”

Configuring the NetWare DNS/DHCP Service

Before using the DNS/DHCP services, you must configure the DNS/DHCP server. For specific procedures and more information, refer to your NetWare software documentation. When finished, go to “Verify TCP/IP Protocol and Controller Name.”

Verify TCP/IP Protocol and Controller Name

To use the BOOTP server, you will need to complete the following verifications for Windows and NetWare:

- Verify the TCP/IP Protocol software is installed on all storage management stations.
- If you are managing the disk subsystems directly, use the Domain Name Service (DNS) or host table to verify that each controller's host name corresponds to its appropriate IP address.
- Optionally, you can use the Windows Internet Name Service (WINS) instead of the DNS. Ask your Network Administrator to set up the DNS or WINS if it is not already installed and running.

1 Choose one of the following to verify the TCP/IP Protocol software installation:

- Windows NT – Select Start >> Settings >> Control Panel >> Network >> Protocols.

  The window should have the TCP/IP protocol listed in the network components window. If the TCP/IP protocol software has not been installed, load it from the Microsoft Windows CDROM, then select Start >> Settings >> Control Panel >> Network >> Protocols >> Add.

- Windows 2000 – Select Start >> Settings >> Network and Dial-up Connections >> Local Area Connection >> Properties.

  In the list of components, the Internet Protocols (TCP/IP) should have been selected. If the TCP/IP protocol software is not installed, load it from the Microsoft Windows CDROM, then select Start >> Settings >> Network and Dial-up Connections >> Local Area Connection >> Properties >> Install >> Protocols >> Add.

2 Edit the DNS or host table to associate a host name with an IP address. If you do not have DNS or WINS, edit the two host tables found in the following directories:

Windows NT and Windows 2000

c:\winnt\system32\drivers\etc\hosts

c:\winnt\system32\drivers\etc\lmhosts

For example, to set up the host tables for the controllers connected to Network A, use a text editor to create the controller IP address and name entries (Table B-3):

Table B-3 Example of IP Address and Controller Host Name Entries

IP Address	Controller Host Name
127.0.0.01	localhost
192.168.1.13	denver_a
192.168.1.14	denver_b

CAUTION Opening ports to your network creates potential security risks.

3 If you plan to manage disk subsystems through a network firewall, contact your system administrator.

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W