SANtricity® System Manager 11.30

Installing and Configuring for AIX

Express Guide

■ **NetApp**®

Contents

Deciding whether to use this Express Guide

The express method for installing your storage array and accessing SANtricity System Manager is appropriate for setting up a standalone AIX host to an E-Series storage system. It is designed to get the storage system up and running as quickly as possible with minimal decision points.

> **Note:** The configuration that the express method provides might not meet the needs of your production environment. For additional options for installing and configuring the storage system, see the SANtricity Power Guide for your operating system.

The express method includes the following steps:

1. Setting up the Fibre Channel (FC) communication environment.

2. Creating logical volumes on the storage array and assigning a logical unit number (LUN) to each volume.

3. Making the volume LUNs available to the data host.

This guide is based on the following assumptions:

Component	Assumptions
Hardware	• You have used the Installation and Setup Instructions included with the controller shelves to install the hardware. • You have connected cables between any optional drive shelves and the controller shelf. • You have applied power to the storage array. • *Not including* the connection between the host and the storage array, you have installed all other hardware (for example, host bus adapter and switches) and made the necessary connections.
Host	• You have **not** yet made a connection between the storage array and the data host. • You have installed the host operating system. • You are not using AIX as a virtualized guest. • You are not configuring the data (I/O attached) host to boot from SAN.
Storage management station	• You are using a 1 Gb/s or faster management network. • You are using a separate station for management rather than the data (I/O attached) host. • You are using out-of-band management, in which a storage management station sends commands to the storage array through the Ethernet connections to the controller. • You have attached the management station to the same subnet as the storage management ports.

Component	Assumptions
IP addressing	• You have installed and configured a DHCP server. • You have obtained the MAC addresses for management port 1 on both controllers in the storage array.
Storage provisioning	• You will not use shared volumes. • You will create pools rather than volume groups.
Protocol: FC	• You have made all host-side FC connections and activated switch zoning. • You are using NetApp-supported FC HBAs and switches. • You are using FC HBA driver versions listed in the *NetApp Interoperability Matrix Tool*.

If these assumptions are not correct for your installation, or if you want more conceptual background information, see the SANtricity Power Guide for your operating system.
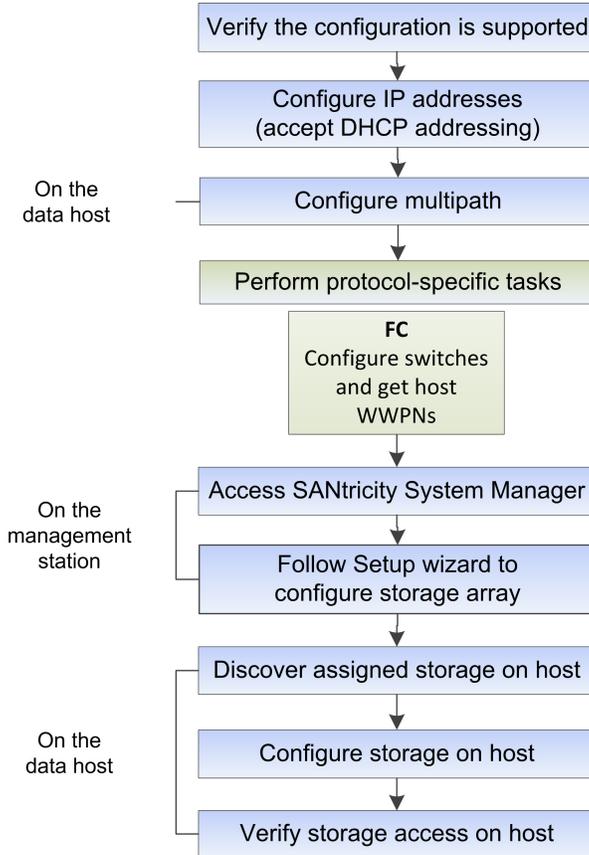
Related information

NetApp Interoperability Matrix Tool
SANtricity 11.30 Installing and Configuring for AIX Power Guide for Advanced Users

Understanding the workflow

This workflow guides you through the "express method" for configuring your storage array and SANtricity System Manager to make storage available to a host.

```
              ┌─────────────────────────────────────────┐
              │   Verify the configuration is supported  │
              └─────────────────────────────────────────┘
                                 │
                                 ▼
              ┌─────────────────────────────────────────┐
              │          Configure IP addresses          │
              │         (accept DHCP addressing)         │
              └─────────────────────────────────────────┘
                                 │
                                 ▼
  On the       ┌─────────────────────────────────────────┐
  data host  ──│            Configure multipath           │
               └─────────────────────────────────────────┘
                                 │
                                 ▼
              ┌─────────────────────────────────────────┐
              │      Perform protocol-specific tasks     │
              └─────────────────────────────────────────┘
                       ┌──────────────────────┐
                       │          FC          │
                       │   Configure switches │
                       │     and get host     │
                       │        WWPNs         │
                       └──────────────────────┘
                                 │
                                 ▼
  On the        ┌─────────────────────────────────────────┐
  management  ──│      Access SANtricity System Manager    │
  station       └─────────────────────────────────────────┘
                                 │
                                 ▼
                ┌─────────────────────────────────────────┐
                │          Follow Setup wizard to          │
                │        configure storage array          │
                └─────────────────────────────────────────┘
                                 │
                                 ▼
                ┌─────────────────────────────────────────┐
                │     Discover assigned storage on host    │
                └─────────────────────────────────────────┘
                                 │
  On the                         ▼
  data host     ┌─────────────────────────────────────────┐
                │        Configure storage on host         │
                └─────────────────────────────────────────┘
                                 │
                                 ▼
                ┌─────────────────────────────────────────┐
                │       Verify storage access on host      │
                └─────────────────────────────────────────┘
```
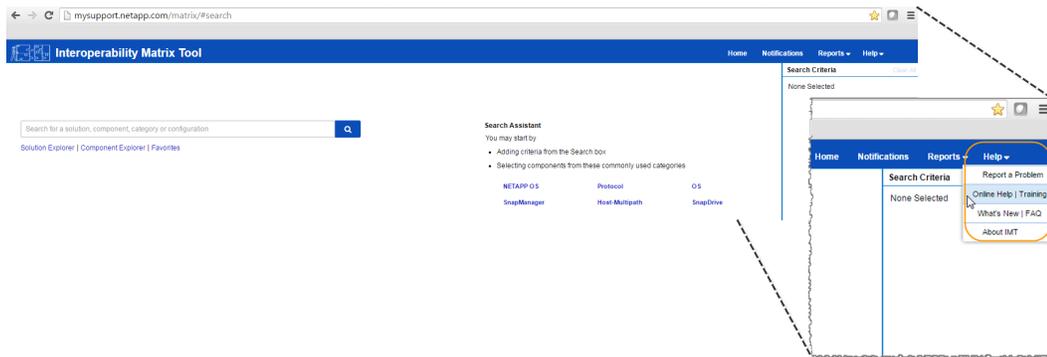
# Verifying the configuration is supported

To ensure reliable operation, you create an implementation plan and then use the NetApp Interoperability Matrix Tool (IMT) to verify that the entire configuration is supported.

Steps

1. Go to the *NetApp Interoperability Matrix Tool*.

2. Go to **Help > Online Help | Training** or **Help > What's New | FAQ** for training or refresher tools.

3. Use the search functions to enter the details of your configuration.
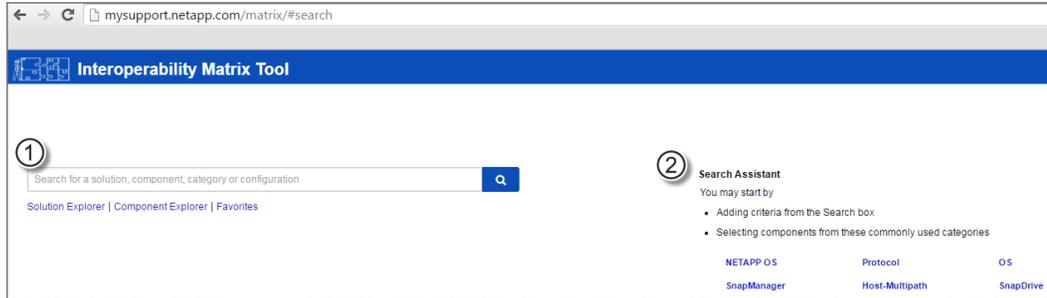
1	**Search box**: Enter a solution, component, category, or configuration for building initial criteria and inferring solutions.
2	**Search Assistant**: Use appropriate hints to infer solutions faster.

4. Click **View What Works With What** to select from a detailed matrix of components.

Example
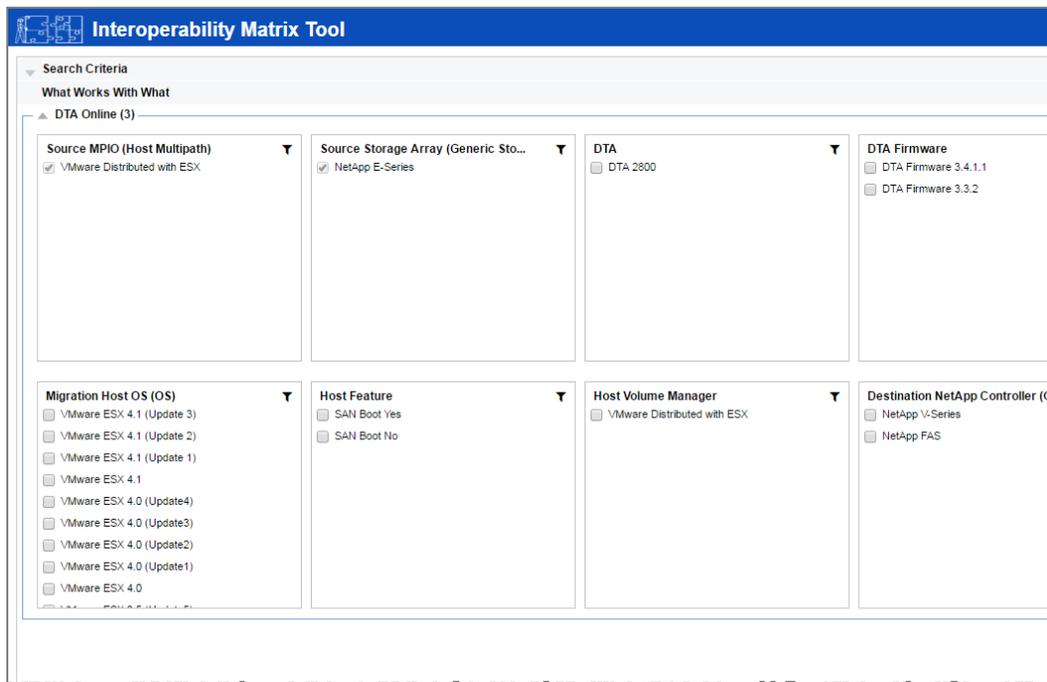
5. Review the information in the following tabs in the **Configuration Details** window:

    • **Notes**: Lists important information specific to your configuration. Review the alerts to identify the hot fixes that are required for your operating system.

    • **Policies & Guidelines**: Provides general guidelines for all SAN configurations.

6. As necessary, make the updates for your operating system and protocol as listed in the table.

Operating system updates	Protocol	Protocol-related updates
not applicable	FC	Host bus adapter (HBA) driver, firmware, and bootcode

Related information

[NetApp Interoperability Matrix Tool](#)

Configuring IP addresses using DHCP

In this express method for configuring communications between the management station and the storage array, you use Dynamic Host Configuration Protocol (DHCP) to provide IP addresses. Each storage array has either one controller (simplex) or two controllers (duplex), and each controller has two storage management ports. Each management port will be assigned an IP address.

Before you begin

You have installed and configured a DHCP server on the same subnet as the storage management ports.

About this task

The following instructions refer to a storage array with two controllers (a duplex configuration).

Steps

1. If you have not already done so, connect an Ethernet cable to the management station and to management port 1 on each controller (A and B).

   The DHCP server assigns an IP address to port 1 of each controller.

   > **Note:** Do not use management port 2 on either controller. Port 2 is reserved for use by NetApp technical personnel.

   > **Important:** If you disconnect and reconnect the Ethernet cable, or if the storage array is power-cycled, DHCP assigns IP addresses again. This process occurs until static IP addresses are configured. It is recommended that you avoid disconnecting the cable or power-cycling the array.

   If the storage array cannot get DHCP-assigned IP addresses within 30 seconds, the following default IP addresses are set:

   • Controller A, port 1: 192.168.128.101

   • Controller B, port 1: 192.168.128.102

   • Subnet mask: 255.255.255.0

2. Locate the MAC address label on the back of each controller, and then provide your network administrator with the MAC address for port 1 of each controller.

   Your network administrator needs the MAC addresses to determine the IP address for each controller. You will need the IP addresses when you add the storage array to SANtricity Storage Manager.

Configuring the multipath software for AIX

Multipath software provides a redundant path to the storage array in case one of the physical paths is disrupted. Before you can use multipathing, you need to install SANtricity Storage Manager. This software contains the multipath package for AIX.

About this task

Follow the instructions below to install SANtricity Storage Manager. After you install the software, follow the instructions to enable the multipath driver.

Installing SANtricity Storage Manager

Perform the following steps to install SANtricity Storage Manager and use the multipath package for AIX.

Before you begin

- You must have root privileges.

- You must ensure the system that will contain the SANtricity Storage Manager client has the following minimum requirements:

  ◦ **RAM**: 2 GB for Java Runtime Engine

  ◦ **OS/Architecture**: Refer to *NetApp Support* **Downloads > Software > E-Series** for guidance on determining the supported operating system versions and architectures.

  ◦ **Disk space**: 5 GB

About this task

> **Important:** Do not attach the E-Series storage array before you install SANtricity Storage Manager.

Steps

1. Download the SANtricity software release from *NetApp Support* **Downloads > Software > E-Series/EF-Series SANtricity Storage Manager**.

2. Change your current directory to the installation directory by typing cd `<install>` on the command line and pressing **Enter**.

   `<install>` is the name of the directory on your server to which you downloaded the installation file.

3. Change the file permissions for the installer by running the chmod 777 SMIA-AIX-81.25.*.bin command.

4. Execute the installer by running the ./SMIA-AIX-81.25.*.bin command.

   The following messages appear in the console window:

   ```
   Preparing to install...
   Extracting the JRE from the installer archive...
   Unpacking the JRE...
   Extracting the installation resources from the installer archive...
   Configuring the installer for this system's environment...
   ```

```
Launching installer...
Graphical installers are not supported by the VM. The console mode
will be used instead...
===============================================================
SANtricity (created with InstallAnywhere)
---------------------------------------------------------------
Preparing CONSOLE Mode Installation...
===============================================================
Introduction
------------
The installation program will allow you to select and install
the storage array host software and tools required to configure,
manage, and monitor a storage array.
Respond to each prompt to proceed to the next step in the
installation.
If you want to change something on a previous step, type 'back'.
You may cancel this installation at any time by typing 'quit'.
PRESS <ENTER> TO CONTINUE:
```

5. Press **Enter** when prompted.

The first section of the license agreement is displayed in the console window.

6. Continue pressing **Enter** as you read through the license agreement.

7. When asked DO YOU ACCEPT THE TERMS OF THIS LICENSE AGREEMENT? (Y/N): enter **Y** to accept.

You are prompted to select your installation type.

8. Based on the type of installation you are performing, select one of these options by entering the corresponding number.

The steps in this procedure describe a typical (full) installation.

- **1**—Typical (Full Installation) (default). All of the packages are installed on the system. Choose this option if you do not know which installation type to select.

- **2**—Management Station. This option is for your workstation or management computer and includes the software needed to configure, manage, and monitor a storage array.

- **3**—Host. This option is for the host (server) connected to the storage array and includes the storage array server software.

- **4**—Customize. This option lets you customize the features to be installed.

A pre-installation summary appears.

```
======================================================================
Pre-Installation Summary
-----------------------
Please Review the Following Before Continuing:
Install Folder:
/opt/StorageManager
Required Disk Space
875 MB
Available Disk Space
5,032 MB
PRESS <ENTER> TO CONTINUE:
```

9. Press **Enter** to continue.

The installation may take several minutes. After it has completed, the following message appears:

```
======================================================================
Installation Complete
---------------------
```

```
Congratulations. SANtricity has been successfully installed to:
/opt/StorageManager
PRESS <ENTER> TO EXIT THE INSTALLER:
```

10. Press **Enter** to exit the installer.

    Several files and program packages are installed to the `/opt/SMgr` directory and the `/opt/StorageManager` directory.

11. If you added the LUNs/hdisks before installing SANtricity Storage Manager, reboot the AIX host.

    To avoid a reboot, you must remove all the LUNs/hdisks before running the `cfgmgr` command in the next topic.

Enabling multipath

AIX installations use the native MPIO (non-ALUA) driver for failover, so you just need to enable the Object Data Manager (ODM) multipath driver.

Step

1. Follow the appropriate step:

   - If you connected your E-Series storage array to the host before you installed the SANtricity Storage Manager software, reboot the host to activate the multipath driver.

   - If you connected your E-Series storage array to the host after you installed the software, you do not need to reboot the host.

   For additional information, see *SANtricity 11.30 Installing and Configuring for AIX Power Guide for Advanced Users* .

Performing FC-specific tasks

For the Fibre Channel protocol, you configure the switches and determine the host port identifiers.

Configuring the switches—FC

Configuring (zoning) the Fibre Channel (FC) switches enables the hosts to connect to the storage array and limits the number of paths. You zone the switches using the management interface for the switches.

Before you begin

- You must have administrator credentials for the switches.

- You must have used your HBA utility to discover the WWPN of each host initiator port and of each controller target port connected to the switch.

  Note: It is helpful to record the WWPNs on the *FC worksheet* on page 19.

About this task

For details about zoning your switches, see the switch vendor's documentation.

You must zone by WWPN, not by physical port. Each initiator port must be in a separate zone with all of its corresponding target ports.

Steps

1. Log in to the FC switch administration program, and then select the zoning configuration option.

2. Create a new zone that includes the first host initiator port and that also includes all of the target ports that connect to the same FC switch as the initiator.

3. Create additional zones for each FC host initiator port in the switch.

4. Save the zones, and then activate the new zoning configuration.

Determining the host WWPNs—FC

To add the host to SANtricity Storage Manager, you determine the worldwide port name (WWPN) of each host port.

Steps

1. If you have not already done so, connect the storage array to the AIX host.

2. Run the following command:

```
# lsdev -Cc adapter
```

3. Record the initiator identifiers on the worksheet. The output will be similar to this example:

```
ent0    Available 03-00 4-Port Gigabit Ethernet PCI-Express Adapter
(e414571614102004)
ent1    Available 03-01 4-Port Gigabit Ethernet PCI-Express Adapter
(e414571614102004)
```

```
ent2     Available 03-02 4-Port Gigabit Ethernet PCI-Express Adapter
(e414571614102004)
ent3     Available 03-03 4-Port Gigabit Ethernet PCI-Express Adapter
(e414571614102004)
fcs0     Available 04-00 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
fcs1     Available 04-01 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
fcs2     Available 0B-00 8Gb PCIe2 Low Profile 4-Port FC Adapter
(7710322514101e04)
fcs3     Available 0B-01 8Gb PCIe2 Low Profile 4-Port FC Adapter
(7710322514101e04)
fcs4     Available 0C-00 8Gb PCIe2 Low Profile 4-Port FC Adapter
(7710322514101e04)
fcs5     Available 0C-01 8Gb PCIe2 Low Profile 4-Port FC Adapter
(7710322514101e04)
fcs6     Available 06-00 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
fcs7     Available 06-01 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
fcs8     Available 07-00 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
fcs9     Available 07-01 PCIe2 2-Port 16Gb FC Adapter
(df1000e21410f103)
```

4. To ensure the HBA settings are correct, follow the instructions in the SANtricity Power Guide for your operating system.

Related concepts

FC worksheet on page 19

Related information

NetApp Interoperability Matrix Tool

Accessing SANtricity System Manager and using Setup wizard

You use the Setup wizard in SANtricity System Manager to configure your storage array.

Before you begin

- You have ensured that the device from which you will access SANtricity System Manager contains one of the following browsers:

Browser	Minimum version
Google Chrome	42
Microsoft Internet Explorer	11
Microsoft Edge	2.0
Mozilla Firefox	24
Safari	6

- You are using out-of-band management.

About this task

The wizard automatically relaunches when you open System Manager or refresh your browser and *at least one* of the following conditions is met:

- 0 pools and volume groups are detected.

- 0 workloads are detected.

- 0 notifications are configured.

If the Setup wizard does not automatically appear, contact technical support.

> **Important:** System Manager allows you to manage just your E2800 storage array. You need SANtricity Storage Manager to manage the storage enterprise and arrays other than the E2800. See the SANtricity *Storage* Manager Express Guide for your operating system for installation instructions.

Steps

1. From your browser, enter the following URL:

   `https://<DomainNameOrIPAddress>`

   `IPAddress` is the DHCP-assigned address for one of the storage array controllers.

   The login page for the System Manager GUI appears.

2. Enter the System Manager password.

   When you open System Manager and no pools, volumes groups, workloads, or notifications have been configured, the Setup wizard launches.

3. Use the Setup wizard to perform the following tasks:

   - **Verify hardware (controllers and drives)** – Verify the number of controllers and drives in the storage array. Assign a name to the array.

- **Verify hosts and operating systems** – Verify the host and operating system types that the storage array can access.

- **Select applications** – Specify applications, such as Exchange or SQL. System Manager optimizes storage based on application type.

- **Define workloads** – Set up workloads, which are storage objects that support applications. You define one or more workloads per application.

- **Accept pools** – Accept the recommended pool configuration for the express installation method. A pool is a logical group of drives.

- **Configure alerts** – Allow System Manager to automatically notifications when a problem occurs with the storage array.

- **Enable AutoSupport** – Automatically monitor the health of your storage array and have dispatches sent to technical support.

4. Create volumes by going to **Storage > Volumes > Create > Volume**.

   For more information, see the online help for SANtricity System Manager.

Related information

SANtricity Storage Manager 11.30 Installing and Configuring for AIX Express Guide

Discovering storage on the host

LUNs on your storage system appear as hdisks to the AIX host. When you add new LUNs, you must manually rescan the associated disks to discover them. The host does not automatically discover new LUNs.

Steps

1. Scan the LUNs by running the # cfgmgr command from a terminal window on the host.

2. Verify disk discovery by running the # lsdev -Cc disk command.

Example

```
#lsdev -Cc disk
hdisk0 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk1 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk2 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk3 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk4 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk5 Available 0c-00-02 MPIO NetApp E-Series Disk
hdisk6 Available 0c-00-02 MPIO NetApp E-Series Disk
```

Verifying storage access on the host

Before using the LUN, you verify that the host can write data to the LUN and read it back.

Before you begin

You must have initialized the LUN and formatted it with a file system.

Steps

1. On the host, copy one or more files to the mount point of the disk.

2. Copy the files back to a different folder on the original disk.

3. Run the `diff` command to compare the copied files to the originals.

4. Run the `multipath -ll` command to view the paths to the LUN, and verify that you have four paths.

5. Force a controller failover, preferably by pulling all cables from one controller, and then verify that you can still access the files on the LUN. When you are finished, reset the storage to an optimal state.

After you finish

Remove the file and folder that you copied.

FC worksheet

You can use this worksheet to record FC storage configuration information. You need this information to perform provisioning tasks.

The illustration shows a host connected to an E-Series storage array in two zones. One zone is indicated by the blue line; the other zone is indicated by the red line.
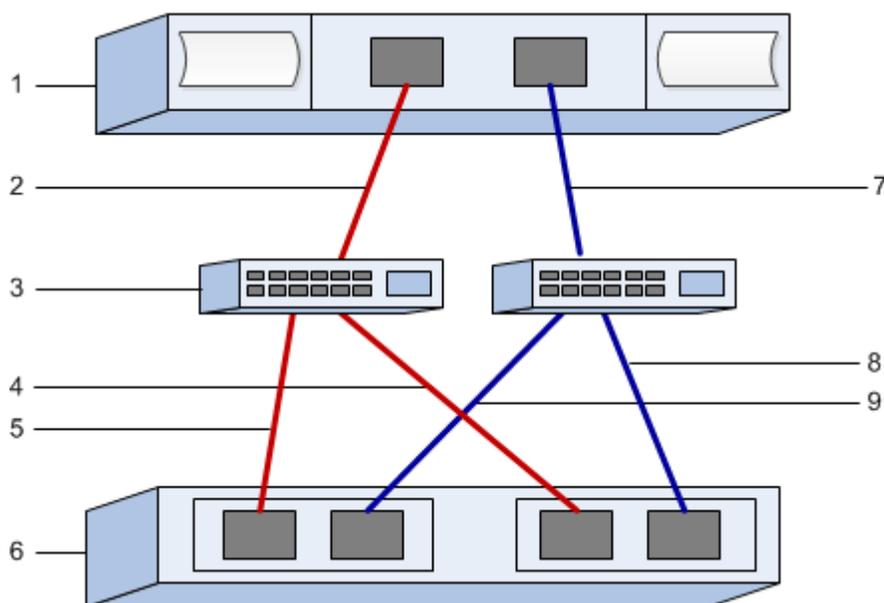
Host identifiers

Callout No.	Host (initiator) port connections	WWPN
1	Host	*not applicable*
2	Host port 0 to FC switch zone 0	
7	Host port 1 to FC switch zone 1	

Target identifiers

Callout No.	Array controller (target) port connections	WWPN
3	Switch	*not applicable*
6	Array controller (target)	*not applicable*
5	Controller A, port 1 to FC switch 1	
9	Controller A, port 2 to FC switch 2	
4	Controller B, port 1 to FC switch 1	
8	Controller B, port 2 to FC switch 2	

Mapping host

Mapping host name	

Host OS type	

Where to find additional information

Use the resources listed here if you need additional information. You can also use the online help for SANtricity System Manager.

- *SANtricity 11.30 Installing and Configuring for AIX Power Guide for Advanced Users* describes:

    ◦ Software installation options

    ◦ Configuration options

    ◦ Multipath options

    ◦ Installation on a boot device

- Online help describes how to use SANtricity System Manager to complete configuration and storage management tasks. It is available within the product and as a PDF download.

- *NetApp Knowledgebase* (a database of articles) provides troubleshooting information, FAQs, and instructions for a wide range of NetApp products and technologies.

- For additional documentation and instructions for E-Series products, including SANtricity software, go to the *NetApp E-Series and EF-Series Systems Documentation Center*.

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