Data ONTAP® 8.0 7-Mode
Software Setup Guide

Contents

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About this guide

You can use your product more effectively when you understand this document's intended audience and the conventions that this document uses to present information.

This document describes how to set up and configure storage systems that run Data ONTAP software. It covers all supported storage system models.

Note: This guide applies to systems running Data ONTAP 8.*x* 7-Mode, including V-Series systems. The *7-Mode* in the *Data ONTAP 8.x 7-Mode* product name means that this release has the features and functionality you are used to if you have been using the Data ONTAP 7.0, 7.1, 7.2, or 7.3 release families. If you are a Data ONTAP 8.*x* Cluster-Mode user, you use the Data ONTAP 8.*x* Cluster-Mode guides plus any Data ONTAP 8.*x* 7-Mode guides for functionality you might want to access with 7-Mode commands through the nodeshell.

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Audience

This document is written with certain assumptions about your technical knowledge and experience.

This document is for system administrators who are familiar with operating systems that run on the storage system's clients.

It also assumes that you are familiar with how to configure the storage system and how Network File System (NFS), Common Internet File System (CIFS), and Hypertext Transport Protocol (HTTP) are used for file sharing or transfers. This guide doesn't cover basic system or network administration topics, such as IP addressing, routing, and network topology.

If you are installing new storage systems, this is the correct guide for you. If you are unsure, use the following table to decide which guide to read.

If you are ...	Read ...
Configuring a new storage system	This guide
	If you are configuring a new V-Series system, see also your *V-Series Installation Requirements and Reference Guide*.
	If you are configuring a new storage system in an FC or iSCSI environment, see also your *Data ONTAP 7-Mode Block Access Management Guide for iSCSI and FC*.
Upgrading an existing storage system to this version of the Data ONTAP software	The *Data ONTAP 7-Mode Upgrade Guide*
Converting existing storage systems to a high-availability configuration	The *Data ONTAP 7-Mode High-Availability Configuration Guide*

Accessing Data ONTAP man pages

You can use the Data ONTAP manual (man) pages to access technical information.

About this task

Data ONTAP manual pages are available for the following types of information. They are grouped into sections according to standard UNIX naming conventions.

Types of information	Man page section
Commands	1
Special files	4
File formats and conventions	5
System management and services	8

Step

1. View man pages in the following ways:

   - Enter the following command at the console command line:

     `man command_or_file_name`

   - Click the manual pages button on the main Data ONTAP navigational page in the FilerView user interface.

     Note: All Data ONTAP 8.*x* 7-Mode man pages are stored on the system in files whose names are prefixed with the string "na_" to distinguish them from other man pages. The

prefixed names sometimes appear in the NAME field of the man page, but the prefixes are not part of the command, file, or service.

Terminology

To understand the concepts in this document, you might need to know how certain terms are used.

Storage terms

array LUN	The storage that third-party storage arrays provide to storage systems running Data ONTAP software. One array LUN is the equivalent of one disk on a native disk shelf.
LUN (logical unit number)	A logical unit of storage identified by a number.
native disk	A disk that is sold as local storage for storage systems that run Data ONTAP software.
native disk shelf	A disk shelf that is sold as local storage for storage systems that run Data ONTAP software.
storage controller	The component of a storage system that runs the Data ONTAP operating system and controls its disk subsystem. Storage controllers are also sometimes called *controllers*, *storage appliances*, *appliances*, *storage engines*, *heads*, *CPU modules*, or *controller modules*.
storage system	The hardware device running Data ONTAP that receives data from and sends data to native disk shelves, third-party storage, or both. Storage systems that run Data ONTAP are sometimes referred to as *filers*, *appliances*, *storage appliances*, *V-Series systems*, or *systems*.
third-party storage	The back-end storage arrays, such as IBM, Hitachi Data Systems, and HP, that provide storage for storage systems running Data ONTAP.

Cluster and high-availability terms

cluster	- In Data ONTAP 8.*x* Cluster-Mode, a group of connected nodes (storage systems) that share a global namespace and that you can manage as a single virtual server or multiple virtual servers, providing performance, reliability, and scalability benefits. - In the Data ONTAP 7.1 release family and earlier releases, a pair of storage systems (sometimes called *nodes*) configured to serve data for each other if one of the two systems stops functioning.

HA (high availability)   In Data ONTAP 8.*x*, the recovery capability provided by a pair of nodes (storage systems), called an *HA pair*, that are configured to serve data for each other if one of the two nodes stops functioning.

HA pair   In Data ONTAP 8.*x*, a pair of nodes (storage systems) configured to serve data for each other if one of the two nodes stops functioning. In the Data ONTAP 7.3 and 7.2 release families, this functionality is referred to as an *active/active configuration*.

Where to enter commands

You can use your product more effectively when you understand how this document uses command conventions to present information.

You can perform common administrator tasks in one or more of the following ways:

Note: Data ONTAP commands shown in this document are for Data ONTAP 8.*x* 7-Mode and the Data ONTAP 7.*x* release families. However, some of these commands might also be available at the nodeshell prompt on systems running Data ONTAP 8.*x* Cluster-Mode. See the *Data ONTAP Cluster-Mode Administration Reference* for more information.

• You can enter commands either at the system console or from any client computer that can obtain access to the storage system using a Telnet or Secure Shell (SSH) session.
  In examples that illustrate command execution, the command syntax and output shown might differ from what you enter or see displayed, depending on your version of the operating system.
• You can use the FilerView graphical user interface.
  For information about accessing your system with FilerView, see the *Data ONTAP 7-Mode System Administration Guide*.
• You can enter Windows, ESX, HP-UX, AIX, Linux, and Solaris commands at the applicable client console.
  In examples that illustrate command execution, the command syntax and output shown might differ from what you enter or see displayed, depending on your version of the operating system.
• You can use the client graphical user interface.
  Your product documentation provides details about how to use the graphical user interface.
• You can enter commands either at the switch console or from any client that can obtain access to the switch using a Telnet session.
  In examples that illustrate command execution, the command syntax and output shown might differ from what you enter or see displayed, depending on your version of the operating system.

Keyboard and formatting conventions

You can use your product more effectively when you understand how this document uses keyboard and formatting conventions to present information.

Keyboard conventions

Convention	What it means
The NOW site	Refers to the NetApp Support site at *now.netapp.com/.*
Enter, enter	• Used to refer to the key that generates a carriage return; the key is named Return on some keyboards. • Used to mean pressing one or more keys on the keyboard and then pressing the Enter key, or clicking in a field in a graphical interface and then typing information into the field.
hyphen (-)	Used to separate individual keys. For example, Ctrl-D means holding down the Ctrl key while pressing the D key.
type	Used to mean pressing one or more keys on the keyboard.

Formatting conventions

Convention	What it means
Italic font	• Words or characters that require special attention. • Placeholders for information that you must supply. For example, if the guide says to enter the `arp -d` *hostname* command, you enter the characters "arp -d" followed by the actual name of the host. • Book titles in cross-references.
`Monospaced` font	• Command names, option names, keywords, and daemon names. • Information displayed on the system console or other computer monitors. • Contents of files. • File, path, and directory names.
`Bold monospaced` font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Special messages

This document might contain the following types of messages to alert you to conditions that you need to be aware of.

Note: A note contains important information that helps you install or operate the system efficiently.

Attention: An attention notice contains instructions that you must follow to avoid a system crash, loss of data, or damage to the equipment.

How to send your comments

You can help us to improve the quality of our documentation by sending us your feedback.

Your feedback is important in helping us to provide the most accurate and high-quality information. If you have suggestions for improving this document, send us your comments by e-mail to *doccomments@netapp.com*. To help us direct your comments to the correct division, include in the subject line the name of your product and the applicable operating system. For example, *FAS6070— Data ONTAP 7.3*, or *Host Utilities—Solaris*, or *Operations Manager 3.8—Windows*.

Overview of the software setup process

The software setup process consists of satisfying environmental prerequisites, gathering configuration information, entering configuration information at setup prompts, and verifying initial configuration parameters.

Next topics

Software setup stages

The software setup process for your new storage system requires several steps after you have completed hardware setup.

Before you begin

This guide assumes that you have already prepared the physical site for your new storage system and that you have racked and cabled storage system hardware according to the following documents:

- *Site Requirements Guide*
- *Installation and Setup Instructions*
- *Data ONTAP 7-Mode High-Availability Configuration Guide*

   Note: The *Data ONTAP 7-Mode High-Availability Configuration Guide* also includes important information about high-availability configuration prerequisites and verification procedures that you will need to consult during the software setup process.

About this task

If your storage system is intended for use with third-party storage (a V-Series system configuration), you have additional configuration requirements.

Steps

1. Ensure that your network and storage environment meets storage system requirements.

2. Gather system configuration information and record it in the worksheet provided.

3. Power on the new system.

4. Choose the following option depending on your storage system configuration.

If you are setting up your storage system for using ...	Then ...
Native disk shelves	Enter the information you gathered when the setup command begins to run.
Only third-party storage	Perform V-Series system configuration tasks in maintenance mode, then enter the information you gathered when the setup command begins to run.

5. Verify that basic system functionality has been configured correctly.

6. Configure system features and provision your features as described in relevant documents of the Data ONTAP library.

Related concepts

Prerequisites to initial configuration on page 21

Configuration information you need to gather on page 29

Related tasks

Setting up your storage system for using native disk shelves on page 47

Setting up your system for using only third-party storage on page 59

Verifying software setup on page 79

Related information

Data ONTAP Information Library -- now.netapp.com/NOW/knowledge/docs/ontap/ ontap_index.shtml

Default storage system configuration

Before your storage system was shipped to you, a series of tasks was performed to configure your storage system for use. These tasks simplify the setup process for you and ensure that you can run the setup script on systems with native disk shelves.

V-Series systems that use only third-party storage require a number of prerequisite configuration steps and software installation before you run the setup script.

The following tasks were performed on storage systems containing native disk shelves:

- Your storage system was configured at the factory with an aggregate and FlexVol root volume.

  - For storage systems that have Data ONTAP 7.0 or later installed at the factory, the root volume is a FlexVol volume. Systems installed with earlier versions of Data ONTAP have a traditional root volume.
  - The root volume is installed at the factory on FAS systems and, starting with Data ONTAP 7.3, also on V-Series systems ordered with disk shelves.

- Licenses for protocols and features (such as CIFS, NFS, and controller failover) you have purchased were installed on your system.
- Bootloader files and firmware updates, including primary and secondary BIOS images, were installed on the boot device that shipped with your system.

About the setup process

The software setup process collects information that enables the storage system to serve data in your environment.

When Data ONTAP software is installed on your new storage system, the following files are not populated:

- /etc/rc
- /etc/exports
- /etc/hosts
- /etc/hosts.equiv
- /etc/nsswitch.conf
- /etc/resolv.conf

On systems with preinstalled software, when your new system is powered on for the first time, you can enter configuration values to populate these files and to configure the installed functionality of your system, depending on your system's hardware configuration and licensed features.

You have the option to enter configuration values manually in the command-line interface, enter configuration values manually in a graphical interface, or have configuration values populated from information in a DHCP server, depending on the setup method you select. You can also choose to enter all initial configuration values during the setup process or to enter only essential networking values and complete initial configuration at a later time.

Note: For V-Series systems ordered without native disk shelves, you must perform prerequisite configuration steps and install software before running the setup script.

Setup methods

You can provide initial setup configuration values through the command-line interface or through a graphical interface. These methods require a serial console connection, or a network connection and a DHCP server.

The most common method to set up a new system is to enter configuration values at the storage system command-line interface in a serial console session.

When you boot your system for the first time, a DHCP broadcast is issued from the management port (e0M, if your system has one) or from the first onboard network interface (usually e0a). If there is no response to the DHCP broadcast, the setup command begins to run automatically on the system

console. You can also elect to disregard a DHCP server response and enter configuration values at the command-line interface.

The setup script collects information to populate configuration files and to configure the installed functionality of your system. After the setup command begins to run on the system console, you can choose whether to continue setup at the console or using a Web browser. You might also be prompted to respond to setup commands for other system features.

The FilerView Setup Wizard provides an alternative to a serial console session for initial configuration. If you have configured a DHCP server in your environment, it will respond to the DHCP broadcast with an IP address. If you accept the assigned address, you can connect to the storage system's built-in Web server and enter setup values in the graphical FilerView setup screens.

Prerequisites to initial configuration

Before you begin the software setup process, you must ensure that you have prepared your network and storage environment for your new storage system.

Next topics

Requirements for the administration host

You should designate a Windows or UNIX client workstation as an administration host to limit access to the storage system's root file system, to provide a text editor to edit configuration files, or to provide the ability to administer a storage system remotely.

During the setup process, you are prompted to designate a workstation on the network as an administration host. For more information about administration hosts, see the *Data ONTAP 7-Mode System Administration Guide*.

Windows and UNIX client workstations can serve as administration hosts, with these requirements and privileges:

• If you plan to use a Windows client to manage the storage system, the Windows client must support a secure protocol such as SSH or SSL
  You can edit configuration files from any Windows client as long as you connect to the storage system as root or Administrator.
• If you plan to use a UNIX client to manage the storage system, the UNIX client must meet the following requirements:

  • Support a text editor that can display and edit text files containing lines ending with the newline character
  • Support a secure protocol such as SSH or SSL
  • Support the mounting of directories using the NFS protocol

When connecting from a UNIX client, the administrator operates as root.

Attention: If you change the name or IP address of an administration host on a storage system that has already been set up and configured, the /etc/exports files will be overwritten on system reboot.

High-availability (HA) requirements

For information about preparing your environment for a new high-availability pair, see the *Data ONTAP 7-Mode High-Availability Configuration Guide.*

Requirements for Windows domains

If you are joining your system to a Windows domain, the storage system administrator account must have permissions to add the system to an Active Directory domain. It might also be necessary to precreate a domain account for your new system before initial setup.

Permissions for adding a storage system to an Active Directory domain are the same as permissions required for adding any Windows server.

Note: When you run cifs setup, a Windows directory account is automatically created, unless you intend to use Windows NT4-style authentication. To use Windows NT4-style authentication, you must create a domain account using Windows tools before you run cifs setup. If you do not do this, cifs setup will terminate, prompting you to create the domain account.

Next topics

Assigning domain administrator privileges

Before adding a storage system to a Windows Active Directory domain, organizational unit (OU), or other Active Directory container object, you need to make sure the storage system administrator account has sufficient privileges and permissions to add a Windows Active Directory server to that domain or object.

About this task

When the cifs setup program adds the storage system to an Active Directory environment, it creates an Active Directory domain and joins the storage system's computer account to that domain. Before this happens, you need to assign permissions on certain domain objects.

Note: The following steps describe the procedure on a Windows 2000 Server. Details of this procedure might vary on other Windows server versions.

Steps

1. In the Active Directory Users and Computers View menu, ensure that the Advanced Features menu item is selected.

2. In the Active Directory tree, select the OU for your storage system.

3. Select the user or group that will add the storage system to the domain.

4. In the Permissions list, ensure that the following check boxes are enabled:

   - Change Password
   - Write Public Information
   - Create Computer Objects

Precreating a storage system domain account

If your security structure does not allow you to assign the setup program the necessary permissions to create the storage system domain account, or if you intend to use Windows NT4-style authentication, you must create the storage system domain account before `cifs setup` is run.

About this task

If you create the storage system domain account before `cifs setup` is run, follow these guidelines:

- You do not need to assign the Create Computer Objects permission.
- You can assign permissions specifically on the storage system domain account, instead of assigning them on the storage system container.

Steps

1. In the Active Directory Users and Computers View menu, ensure that the Advanced Features menu item is selected.

2. In the Active Directory tree, locate the OU for your storage system, right-click, and choose New > Computer.

3. Enter the storage system (domain account) name.

   Make a note of the storage system name you entered, to ensure that you enter it correctly when you run `cifs setup` later.

4. In the "Add this computer to the domain" field, specify the name of the storage system administrator account.

5. Right-click the computer account you just created, and choose Properties from the pop-up menu.

6. Click the Security tab.

7. Select the user or group that will add the storage system to the domain.

8. In the Permissions list, ensure that the following check boxes are selected:

   - Change Password
   - Write Public Information

After you finish

When `cifs setup` is run, you will see the prompt "Please enter the new hostname." Enter the storage system name you specified in Step 3.

Requirements for Active Directory authentication

If you are deploying your new system in an Active Directory domain with Kerberos authentication, you need to ensure that DNS and network infrastructure are configured correctly before initial system setup.

Note: Kerberos 5 authentication is dependent upon the synchronization of time between the clients and the Kerberos Key Distribution Centers (KDCs).

Next topics

Related concepts

Related tasks

Related information

Unified Windows and UNIX Authentication Using Microsoft Active Directory Kerberos -- www.netapp.com/library/tr/3457.pdf

DNS requirements for Active Directory

Active Directory Kerberos requires that a standards-based DNS implementation be configured. The implementation must support service locator records.

Your DNS solution must have the following capabilities:

- The DNS solution must be standards-based (RFC 1035).
- Service locator records must be supported.
  Windows 2000 and Windows Server 2003/2008 Active Directory requires service locator records for finding the domain controllers, global catalog servers, Kerberos servers, LDAP servers, and the KPASSWD servers.

The following additional capabilities are recommended:

- Support for dynamic updates
- Support for incremental zone transfers

The following DNS solutions meet the requirements:

- Microsoft Server 2000/2003 DNS
  This Active Directory integrated DNS provides the recommended capabilities. Service locator records are configured automatically.
- Berkeley Internet Name Domain (BIND) DNS
  If you use BIND DNS, you need to manually configure the service locator records.

Network infrastructure requirements for Active Directory

You should ensure that the infrastructure supports reliable communication between clients, the storage system, DNS servers, time servers, and Active Directory domain controllers.

Verify the following network infrastructure functionality:

- To ensure that clients can find the Active Directory LDAP and Kerberos servers, there must be reliable network connectivity between the clients and DNS servers containing the LDAP and Kerberos service records. If possible, this should be a high-bandwidth connection.
- Clients must have reliable connections to domain controllers that host both the LDAP and Kerberos services. If possible, this should be a high-bandwidth connection.
- When the enterprise contains more than one domain or utilizes universal groups, there must be adequate connectivity from domain controllers to a global catalog server. If possible, this should be a high-bandwidth connection.
- If the enterprise is located in multiple locations that have low-bandwidth connectivity, you should configure Active Directory sites. These sites group resources within a local high-bandwidth zone.
- If clients from other domains access resources on the storage system, there should be reliable connectivity between the storage system and all domain controllers with users who access resources on the storage system.

Time services requirements

You must configure your storage system for time service synchronization. Many services and applications depend on accurate time synchronization.

During CIFS setup, if the storage system is to be joined to an Active Directory domain, Kerberos authentication is used. Kerberos authentication requires the storage system's time and the domain controller's time to match (within 5 minutes). If the times do not match, setup and authentication attempts fail.

By default, within Active Directory domains, all domain controllers synchronize to the domain controller that is configured as the PDC Emulator Master. Therefore, one of the following configurations is required:

- All storage systems configured to synchronize to one of the domain controllers
- Both the storage systems and the controller configured to synchronize to a central time server.

For more information about time services supported by Data ONTAP, see the *Data ONTAP 7-Mode System Administration Guide*.

Switch configuration requirements for interface groups

If you use interface groups, you must ensure that your switches support the interface group type required for your storage system before powering on for the first time.

If you plan to use this type of interface group...	Your switch must support...
Dynamic multimode	Link Aggregation Control Protocol (LACP)
Static multimode	Aggregates (but must not have control packet exchange for configuring an aggregate)
Single-mode	No special switch requirements

For more information about interface groups, see the *Data ONTAP 7-Mode Network Management Guide*.

DHCP requirements for remote access

If you want to complete the setup process from the storage system's Web browser interface (the FilerView Setup Wizard) rather than the console, you must configure the Dynamic Host Configuration Protocol (DHCP).

When you enable DHCP to assign a static IP address to an onboard network interface during first-time setup, you can connect to the storage system through a Web browser running over HTTPS and complete the first-time configuration remotely using the FilerView Setup Wizard or an SSH client.

If your system includes an e0M interface, the system broadcasts a DHCP request through it. If a DHCP server responds, it will assign an IP address to the e0M interface. If your system does not have an e0M interface, the system uses the first onboard network interface (e0a, or e0 when there is only one onboard interface) for the DHCP broadcast.

When you use DHCP to assign an IP address to the onboard interface, the storage system performs the following operations:

- Obtains the address from the DHCP server when the storage system is turned on

- Configures the onboard interface with the IP address
- Becomes accessible to the Setup Wizard or an SSH client

You need to configure the following information into your DHCP server prior to running the Setup Wizard:

- Storage system MAC address
- Storage system fixed IP address
- Any of the following optional information:

  - Routers
  - Default route
  - DNS domain name
  - DNS servers
  - NIS domain name
  - NIS servers
  - WINS servers
  - SMTP server

Attention: When you use DHCP with a storage system, you must ensure that the DHCP server is configured to return a static IP address for the interface. If the server returns a dynamic IP address, the storage system displays an error message and continues to use the IP address permanently—which can result in an IP address conflict if the DHCP server assigns the IP address dynamically to other clients from time to time.

DHCPv6 servers are not currently supported.

Requirements for creating array LUNs for V-Series systems

Before setting up your V-Series system and installing Data ONTAP software, you must create LUNs on the storage array and make them available to the system. You provide information through the boot menu and the setup program to assign array LUN ownership.

V-Series system licensing requirements

You must enter a license to operate the V-Series system. The license must be installed within 72 hours of running setup or the system shuts down.

Licenses are not preinstalled on a V-Series system that is ordered without disk shelves. On a V-Series system that is ordered without native disks, you must install the Data ONTAP software after running setup and then enter any licenses that you purchased. For more information about installing Data ONTAP software and licenses, see *Installing Data ONTAP software on your system* on page 63.

Configuration information you need to gather

Before powering on your storage system for the first time, you should use the configuration worksheet to gather the information that the software setup process requires.

If you are configuring a storage system as part of a high-availability configuration, some information types must be unique for each storage system in the configuration, and some information types must be identical on both storage systems. Some of the tables in the following sections have a description column that indicates whether the information type must be unique for each storage system or identical on both storage systems.

Next topics

Configuration worksheet

Use the configuration worksheet to record values that you will use during the setup process.

Note: The alternate names used by the Setup Wizard for the term used in the `setup` command appear in parentheses.

Types of information		Your values
Storage system	Host name	
	Password	
	Time zone	
	Storage system location	
	Language used for multiprotocol storage systems	

Types of information		Your values
Administration host	Host name	
	IP address	
Interface groups	Name of the interface group (such as ig0)	
	Mode type (single, multi, or LACP)	
	Load balancing type (IP based, MAC address based, or round-robin based)	
	Number of links (number of physical interfaces to include in the interface group)	
	Link names (physical interface names such as e0, e0a, e5a, or e9b)	
	IP address for the interface group	
	Subnet mask for interface group	
	Partner interface group name	
	Media type for interface group	
Ethernet interfaces	Interface name	
	IP address	
	Subnet mask	
	Partner IP address or interface	
	Media type (network type)	
	Are jumbo frames supported?	
	MTU size for jumbo frames	
	Flow control	
e0M interface (if available)	IP address	
	Network mask	
	Partner IP address	
	Flow control	
Router (if used)	Gateway name	
	IP address	
HTTP	Location of HTTP directory	

Types of information		Your values
DNS	Domain name	
	Server address 1	
	Server address 2	
	Server address 3	
NIS	Domain name	
	Server address 1	
	Server address 2	
	Server address 3	

Types of information			Your values
CIFS	Windows domain		
	WINS servers	1	
		2	
		3	
	Multiprotocol or NTFS-only filer?		
	Should CIFS create default /etc/passwd and /etc/group files?		
	NIS group caching	Enable?	
		Hours to update the cache	
	CIFS server name (if different from default)		
	User authentication style: (1) Active Directory domain authentication (Active Directory domains only) (2) Windows NT 4 domain authentication (Windows NT or Active Directory domains) (3) Windows Workgroup authentication using the filer's local user accounts (4) /etc/passwd and/or NIS/LDAP authentication		
	Windows Active Directory domain	Domain name	
		Time server name(s) or IP address(es)	
		Windows user name	
		Windows user password	
		Local administrator name	
		Local administrator password	
	CIFS administrator or group		
	Active Directory container (command-line setup only)		

Types of information		Your values
RLM	MAC address	
	IP address	
	Network mask (subnet mask)	
	Gateway	
	AutoSupport mailhost	
	AutoSupport recipients	
ACP	Network interface name	
	Domain for network interface	
	Netmask (subnet mask) for network interface	

Required storage system information

You must provide basic information about the storage system during the setup process. This information is required regardless of licensed features and usage.

Note: In Data ONTAP 8.0 and later releases, the following security measures are enforced:

- SecureAdmin is set up automatically on storage systems shipped with Data ONTAP 8.0 or later installed. For these systems, the following are the default security settings:
  - Secure protocols (including SSH and SSL/HTTPS) are enabled by default.
  - Nonsecure protocols (including RSH, Telnet, FTP, and HTTP) are disabled by default.
- A root password is required during the initial setup of a storage system shipped with Data ONTAP 8.0 or later installed.

For more information about storage system security, see the *Data ONTAP 7-Mode System Administration Guide*.

Information type	Description
Host name (Hostname or Storage System Name)	The name by which the storage system is known on the network.
	If the storage system is licensed for the NFS protocol, the name can be no longer than 32 characters.
	If the storage system is licensed for the CIFS protocol, the name can be no longer than 15 characters.
	The host name must be unique for each storage system in a high-availability configuration.

Information type	Description
Password (Administrative Password)	A password for the root account that the storage system requires before granting administrative access at the console or through a secure protocol. The following are the default password rules. • The password must be at least eight characters long. • The password must contain at least one number. • The password must contain at least two alphabetic characters. For more information on passwords, see the *Data ONTAP 7-Mode System Administration Guide*.
Time zone (Timezone)	The time zone in which the storage system resides. See *Time zones* on page 93 for a list of valid time zones. The time zone must be identical on both storage systems in a high-availability configuration.
Storage system location (Location)	A description of the physical location of the storage system. The text you enter during the storage system setup process is recorded in the SNMP location information. Use a description that identifies where to find your storage system (for example, "Lab 5, Row 7, Rack B").
Language	The language used for multiprotocol storage systems if both the CIFS and NFS protocols are licensed. For a list of supported languages and their abbreviations, see *Supported languages* on page 103. The language must be identical on both storage systems in a high-availability configuration.
Administration host (Administrative Host)	A client computer that is allowed to access the storage system through a secure protocol.

Network information

You must provide basic information about the storage system's network connections. This information is required regardless of licensed features and usage.

Some of the Internet Protocol information is required both for physical interfaces and for interface groups.

For more information about these parameters, see the *Data ONTAP 7-Mode Network Management Guide* and the inconfig(1) man page.

Information type	Description
Network interface name	The name of the Ethernet (or GbE) interface, depending on what port the Ethernet card is installed in. Examples include e0 and e1 (for a physical interface on a single-port adapter or slot); and e3a, e3b, e3c, and e3d (for an Ethernet quad-port adapter). Network interface names are automatically assigned by Data ONTAP as it discovers them.
e0M interface (if available)	The network interface of the management port (if included in your system). You can use the e0M interface to access the storage system with protocols such as Telnet, RSH, and SNMP, as well as monitoring tools such as Operations Manager. This allows you to separate management traffic from data traffic on your storage system. **Note:** The e0M interface cannot be included in interface group or VLAN configurations. For more information about using the e0M interface to access your system, see the *Data ONTAP 7-Mode System Administration Guide*.
IP address	A unique address for each network interface. Example: 192.0.2.66
Subnet mask (Network Mask)	The subnet mask for the network to which each network interface is attached. Example: 255.255.255.0
Partner IP address (Interface to Take Over)	If your storage system is licensed for controller takeover, record the interface name or IP address belonging to the partner that this interface should take over during a high-availability configuration takeover. Examples: e0 or 10.10.10.2 When configuring interface groups, you must specify the interface group name rather than the IP address.

Information type	Description
Media type (Network Type)	If the network interface is Gigabit or 10 Gigabit Ethernet, you do not need to configure the media type because these interfaces support only one speed and duplex.
	If the network interface is 10/100 or 10/100/1000 Ethernet, you can select autonegotiation or you can explicitly configure the speed and duplex using these media types:
	`auto` — Autonegotiate speed and duplex
	`100tx-fd` — 100Base-TX, full-duplex
	`100tx` — 100Base-TX, half-duplex
	`tp-fd` — 10Base-T, full-duplex
	`tp` — 10Base-T, half-duplex
	The switch must be configured to match the media type values you select.
Flow control	The management of the flow of frames between two directly connected link-partners. Options:
	`none` — No flow control
	`receive` — Ability to receive flow control frames
	`send` — Ability to send flow control frames
	`full` — Ability to send and receive flow control frames
Router (Routing Gateway)	Record the following information for the primary gateway to use for routing outbound network traffic: • Gateway name • IP address of the router

Interface group information

If you want to use interface groups, you should plan for them before installation and create them during the software setup process.

Interface groups were referred to as "virtual network interfaces" or "virtual interfaces (vifs)" in the Data ONTAP 7.2 and 7.3 release families.

During setup, you are first prompted to enter the number of interface groups that you want to configure. You must then enter configuration information for each interface group name you specify.

> **Note:** The interface group information must be identical on both storage systems in a high-availability pair.

For more information about interface groups and assigning the correct configuration values for your environment, see the *Data ONTAP 7-Mode Network Management Guide*.

Information type	Description
Name of interface group	Assign a name for the interface group, for example, ig0. Interface group names are user specified. An interface group's name should meet the following criteria: • It must begin with a letter. • It must not contain any spaces. • It must not contain more than 15 characters. • It must not already be in use for an interface group.
Interface group type	Select one of the following values: • `single [s]` Single-mode • `multi [m]` Static multimode • `lacp [l]` Dynamic multimode **Note:** You must ensure that the value you select corresponds to your network switch configuration. For more information, see "Switch configuration requirements for interface groups."
Load balancing type	Select one of the following values: • `IP based [i]` • `MAC based [m]` • `Round-robin based [r]` **Note:** Load balancing is applicable only for multimode interface groups. It is best to use the IP address load-balancing method with dynamic multimode interface groups.
Number and names of links	Record the number of physical interfaces to be included in the interface group and the name of each physical interface.

Information type	Description
Internet Protocol information	Record the following information: • IP address • Subnet mask • Media type For more information, see "Network information."
Partner interface group name	Record the interface group name (not the IP address) belonging to the high-availability partner that this interface should take over.

Related concepts

Switch configuration requirements for interface groups on page 26

Network information on page 34

HTTP information

If your storage system is licensed for HTTP, you must designate a directory from which Web files and directories are served or accept the default.

If you purchased an HTTP license, Web browsers can access all of the files in the HTTP server's root directory (or other directory you designate); otherwise, Web browsers can access the man pages and FilerView only. You can also connect a third-party HTTP server to your storage system. For more information about file access using HTTP, see the *Data ONTAP 7-Mode File Access and Protocols Management Guide*.

Note: It is not necessary to specify the HTTP directory if you want to provide administrative access to your system using HTTPS.

Information type	Description
Location of the HTTP directory	The directory where the Web files and directories are stored. The default directory is /home/http in the storage system's root volume. The /home/http path can be used by both HTTP and HTTPS.

DNS services information

To configure your storage system to use the Domain Name System (DNS), you must provide DNS domain and server names.

For more information about configuring DNS, see the *Data ONTAP 7-Mode Network Management Guide*.

Information type	Description	
DNS domain	The name of your network's DNS domain.	
	The DNS domain name must be identical on both storage systems in a high-availability configuration.	
	Note: The domain name cannot contain an underscore (_) and must consist of alphanumeric characters. If you use an underscore, you receive a "bad domain name" message.	
DNS servers	The IP addresses of your DNS servers.	
	If...	**You need the IP addresses of...**
	Your storage system will not use Active Directory services	One or more DNS servers that provide host-name lookup services to the storage system.
	You want to make Active Directory services available to CIFS	DNS servers that support your Windows Active Directory domain.

NIS services information

If your network uses the Network Information Service (NIS), you must provide NIS domain and server names.

For more information about configuring NIS, see the *Data ONTAP 7-Mode Network Management Guide*.

Information type	Description
NIS domain	The name of your NIS domain. The storage system can use an NIS domain to authenticate users and client computers.
	The NIS domain name must be identical on both storage systems if your network uses NIS.
	If multiprotocol access is enabled on the storage system, group caching is beneficial for CIFS access as well as NFS access. With multiprotocol access, user mapping of CIFS users to NFS users is performed. When a Windows user requests access to data with UNIX security style, the Windows user is first mapped to the corresponding UNIX user. The UNIX users' groups must then be ascertained before the storage system can determine appropriate access. Failure to enable these two options together could lead to slow CIFS access to resources due to time spent on NIS group lookups.
NIS servers	The host names of your preferred NIS servers.

	If...	You need...
	Your site uses NIS	The host names of your NIS servers.
	You want NIS to broadcast to find a server	To enter an asterisk (*) when asked for the NIS server names.

CIFS protocol information

If your storage system is licensed for the CIFS protocol, the `cifs setup` command runs automatically when basic setup has finished. You must provide information about the Windows domain, WINS servers, the Active Directory service, and your configuration preferences.

For more information about configuring CIFS, see the *Data ONTAP 7-Mode File Access and Protocols Management Guide*.

Information type	Description
Windows domain	The name of your Windows domain. If your site uses Windows domains and the storage system belongs to one of these domains, record the name of the domain to which the storage system should belong.
	Note: The Windows domain name value does not need to be identical on both storage systems in a high-availability configuration. Each storage system in a high-availability configuration can exist in a different domain and/or workgroup from its partner. If you have a multiprotocol environment and use UID to Secure ID (SID) mapping, the UNIX security information must be compatible between the two domains.

Information type	Description
WINS servers	The servers that handle Windows Internet Name Service (WINS) name registrations, queries, and releases. If you choose to make the storage system visible through WINS, you can record up to four WINS IP addresses.
	Note: The WINS server value does not need to be identical on both storage systems in a high-availability configuration. Each storage system in a high-availability configuration can exist in a different domain and/or workgroup from its partner.
Multiprotocol or NTFS-only	The setup utility determines if your system includes licenses for multiple file access protocols (to serve data to NFS, Windows, HTTP, and other clients) or for NTFS only (to serve data to Windows clients only).
CIFS server name	By default, the CIFS server is the same as the system host name. You can select a different name for the CIFS server, although the name can be no longer than 15 characters.
User authentication for CIFS services	Data ONTAP CIFS services support four styles of user authentication:
	1. Active Directory domain authentication (Active Directory domains only) Users are authenticated with the domain controller in an Active Directory domain using Kerberos authentication. If you select this option, you are also prompted for other Active Directory configuration parameters.
	2. Windows NT 4 domain authentication (Windows NT or Active Directory domains) Users are authenticated with the domain controller in an Active Directory or an NT domain using NT-style NTLM authentication only.
	3. Windows Workgroup authentication using the filer's local user accounts Users are authenticated with the storage system's local user database using NT-style NTLM authentication. A maximum of 97 local users is supported, and local users can be members of the local groups (local user and group SIDs are used). Local users and groups are managed with the `useradmin` command.
	4. /etc/passwd and/or NIS/LDAP authentication Users are authenticated on the basis of user names and passwords that are stored in the UNIX directory stores. Even if local Windows users are created on the storage system using the `useradmin` command, they are not used for session authentication. All authentication is done based on UNIX user information stored in the UNIX identity stores.
	You should select an authentication style appropriate to the storage system's environment and to the clients requesting the authenticated session. For more information about CIFS authentication, see the *Data ONTAP 7-Mode File Access and Protocols Management Guide*.
Active Directory domain name	Enter the fully qualified domain name of the domain; for example, example.com.

Information type	Description
Active Directory time services	In Active Directory-based domains, it is essential that the storage system's time match the domain controller's time so Kerberos-based authentication system works correctly. If the time difference between the storage system and the domain controllers is more than 5 minutes, CIFS authentication fails. **Note:** In Data ONTAP 8.0 and later releases, time service configuration is required to enable a storage system in Active Directory-based domains. The time services configuration should be identical on both storage systems in a high-availability configuration. When you configure Active Directory time services, you are prompted for the host name and IP address of the time server you wish to use, as well as for additional backup servers if desired.
Windows domain administrator user name (Windows user name)	The user name of a Windows domain administrator with sufficient privileges to add this storage system to the Windows domain. Joining a domain requires an administrator user and password. This also applies to NT4 domains.
Windows domain administrator password (Windows 2000 administrator password)	The password for the domain administrator user account. Joining a domain requires an administrator user and password. This requirement also applies to NT4 domains. The following are the password rules for this account; they are the same rules as for the root password. • The password must be at least eight characters long. • The password must contain at least one number. • The password must contain at least two alphabetic characters.
CIFS administrator	You can specify an additional user or group to be added to the storage system's local "BUILTIN\Administrators" group, thus giving them administrative privileges as well.

Information type	Description

Active Directory container	The Windows Active Directory container in which to place storage system accounts. This can be either the default Computers container or a previously created organizational unit (OU) on which you have the necessary permission to join the storage system to the domain. All OUs for which you have appropriate permissions will be displayed; the desired OU can be chosen from this list. If the person running setup does not have appropriate rights to the OU which will hold the storage system object, another user who does have the necessary permissions can be designated during the "join" step.
	
	Example:
	
	CIFS - Logged in as administrator@EXAMPLE.COM.
	
	The user that you specified has permission to create the storage system's machine account in several (7) containers. Please choose where you would like this account to be created.
	
	`(1) CN=computers`
	`(2) OU=java_users`
	`(3) OU=Engineer,OU=java_users`
	`(4) OU=Market,OU=java_users`
	`(5) OU=Filers`
	`(6) OU=Domain Controllers`
	`(7) None of the above`
	
	Choose 7:
	
	`Selection (1-7)? [1]: 7`
	`The user you specified,`
	`'Administrator@EXAMPLE.COM', may create the`
	`filer's machine account in the container(s)`
	`listed above. To use another container, you`
	`must specify a user with the appropriate`
	`privileges.`
	
	`Enter the name of the Windows user []:'`

Remote LAN Module information

If your storage system has a Remote LAN Module (RLM), you must provide information about the RLM's network interface and network connections.

If no static or DHCP address is configured, the RLM has no network connectivity.

For more information about configuring your RLM, see the *Data ONTAP 7-Mode System Administration Guide*.

Information type	Description
Media Access Control (MAC) address	If you are using DHCP addressing, record the MAC address of the RLM. You can obtain the address from the MAC address label on the RLM or by using the sysconfig -v command (if you configure the RLM after initial system setup). **Note:** You do not need to record IP and gateway addresses if you are using DHCP addressing for the RLM. DHCPv6 servers are not currently supported.
IP address	Record an available IP address for the RLM. **Note:** Currently, you can use only IPv4 addresses to connect to the RLM.
Network mask	Record the network mask of your network.
Gateway	Record the IP address for the gateway of your network.
Mail host	Record the name or IP address of the preferred mail host. The mail host delivers RLM alerts to the same destination as AutoSupport e-mail.

Service processor information

If your system includes a Storage Processor (SP), you must provide information about the SP's network interface and Autosupport settings.

The following is the information you need to gather:

- Network information
  You can configure for the SP to use DHCP or static addressing. If you are using a static IP address for the SP, you need the following information:

Information type	Description
IP address	Record an available IP address for the RLM.
Network mask	Record the network mask of your network.
Gateway	Record the IP address for the gateway of your network.

For information about network interfaces and management, see the *Data ONTAP 7-Mode Network Management Guide*.

- AutoSupport information
  The SP sends event notifications based on the following AutoSupport settings:

  - `autosupport.to`
  - `autosupport.mailhost`

  You should set at least the `autosupport.to` option before configuring the SP. Data ONTAP automatically sends AutoSupport configuration to the SP, allowing the SP to send alerts and notifications through an AutoSupport message. You are prompted to enter the name or the IP address of the AutoSupport mail host when you configure the SP.

  Note: The SP does not rely on the storage system's `autosupport.support.transport` option to send notifications. The SP uses the Simple Mail Transport Protocol (SMTP).

Shelf Alternate Control Path Management information

If you are planning to attach DS4243 disk shelves to your system, you should configure Shelf Alternate Control Path Management (ACP) during the software setup process.

Note: ACP connections must be cabled before you enter ACP configuration parameters on the storage system.

You can also configure ACP by using one of the following methods after the initial setup process:

- Running the Data ONTAP setup script
  You can run the `setup` command and enter ACP configuration information.
- Setting the `acp.enabled` option to on
  If the option has not previously been set, you will be prompted for ACP configuration values.

For more information about ACP configuration, see the *DS4243 Installation and Service Guide*.

Information type	Description
Network interface name	The name of the Ethernet (or GbE) interface that will be used exclusively for ACP traffic.
Domain for network interface	The network name (an IP address ending in 0) for the private subnet to be used exclusively by ACP. The default is 198.15.1.0.
Netmask for network interface	The subnet mask for the ACP interface.

The ACP subnet

The ACP subnet is a private Ethernet network that enables the ACP processor in the SAS module to communicate both with Data ONTAP and with the SAS IOMs in the disk shelves.

The ACP subnet is separate from the I/O data path that connects the disk shelves to the HBA on the storage controller. When you configure ACP on one of the system's network interfaces, you must

supply a private domain name that conforms to the standard for private internet addresses (RFC1918). You can use the system default domain, 198.15.1.0, or another network name (that is, an IP address ending in 0) that conforms to the standard.

If you are configuring ACP for disk shelves attached to an HA pair, you must supply the same ACP domain name and network mask for both systems.

> **Attention:** Do not connect the ACP port to a routed network, and do not configure switches or hubs between the ACP port and the designated Ethernet port. Doing so is not supported and causes interruptions in service.

After you select a domain name and network mask for the interface, Data ONTAP automatically assigns IP addresses for the ACP interface on the storage controller and both I/O modules on each disk shelf on the ACP subnet.

Setting up your storage system for using native disk shelves

When you power on a storage system for the first time, the setup command begins to run automatically and prompts you for configuration information. You must enter the information you collected in the configuration worksheet by responding to prompts on the command line or from the Setup Wizard.

Before you begin

If your system does not boot when you power it on for the first time, you must troubleshoot your hardware configuration before proceeding to software setup.

Note: You should carefully review the setup procedures and gather configuration information *before* powering on your system for the first time. After the setup script begins to run, you do not have the option of returning to previous steps to make corrections. If you make a mistake, you must complete the setup process and reboot your system, then begin the setup process again by entering setup at the command line.

About this task

After responding to prompts to designate an administration host machine, you can continue setting up your storage system using either the setup command (responding to prompts from the command-line interface) or the Setup Wizard (responding to further prompts from a Web browser).

If CIFS is licensed for your storage system, you will also be prompted for CIFS configuration information.

Next topics

Responding to setup command prompts

The setup command begins running at the storage system command prompt, where you must enter the information you gathered.

Before you begin

You must power on your storage system components and external switches following the instructions in the *Installation and Setup Instructions* for your hardware platform.

After the storage system boots, Data ONTAP begins discovering devices, interfaces, and licenses installed in the system. Data ONTAP displays messages on the console and starts the setup process, prompting you to enter setup information.

Note: Storage system components and external switches must be powered up in the correct order. The order is especially important the first time you boot the system to ensure that initial configuration is completed correctly.

About this task

Each step displays the setup command prompt. You should supply an appropriate response from the configuration worksheet.

Steps

1. Choose the following option that describes your configuration.

If you are...	Then...
Using a DHCP server to assign IP addresses to your storage system	Allow the DHCP search to finish, then go to the next step.
Not using a DHCP server to assign IP addresses to your storage system	Press Ctrl-C to skip the DCHP search, then go to the next step.

2. Please enter the new hostname.

You can name this host whatever you wish (for example, host1).

3. Do you want to configure interface groups?

You can type either **y** or **n** at this prompt.

If you type...	Then you are...
y	Prompted to enter additional configuration information for each of the interface groups. These prompts are: • `Number of interface groups to configure.` • `Name of interface group..` • `Is interface_group_name a single [s], multi [m] or a lacp [l] interface group?` • `Number of links for interface_group_name.` • `Name of link for interface_group_name.` If you have additional links, you should also enter their names here. • `IP address for interface_group_name.` • `Netmask for interface_group_name.` • `Should interface group interface_group_name take over a partner interface group during failover?` • `Media type for interface_group_name.`
n	Directed to the next prompt.

4. `Please enter the IP address for Network Interface e0a`

   Enter the correct IP address for the network interface that connects the storage system to your network (for example, 192.168.1.1).

5. `Please enter the netmask for Network Interface e0a.`

   After entering the IP address, you need to enter the netmask for your network (for example, 255.255.255.0).

6. `Should interface e0a take over a partner IP address during failover ?`

   Type either **y** or **n** at this prompt.

If you type...	Then you are...
y	Prompted to enter the address or interface name to be taken over by e0a. **Note:** If you type **y**, you must already have purchased a license for controller failover to enable this function.
n	Directed to the next prompt.

7. `Please enter media type for e0a (100tx-fd, tp-fd, 100tx, tp, auto (10/100/1000))`

   Enter the media type that this interface should use.

8. `Please enter flow control for e0a {none, receive, send, full} [full]`

   Enter the flow control option that this interface should use.

9. `Do you want e0a to support jumbo frames? [n]`

   Specify whether you want this interface to support jumbo frames.

10. Continue to enter network parameter values for each network interface when prompted.

11. `Would you like to continue setup through the Web interface?`

If you want to...	Enter...
Continue setup with the Setup Wizard in a Web browser.	**y** Go to *Responding to Setup Wizard prompts* on page 52.
Continue to use the command-line interface.	**n** Proceed to the next step.

12. `Please enter the name or IP address of the default gateway.`

   Enter the primary gateway that is used to route outbound network traffic.

13. `Please enter the name or IP address for administrative host.`
   `The administration host is given root access to the storage system's /`
   `etc files for system administration.`
   `To allow /etc root access to all NFS clients enter RETURN below.`

   Attention: If you change the name or IP address of an administration host on a storage system that has already been set up and configured, the /etc/exports files will be overwritten on system reboot.

14. `Please enter the IP address for (name of admin host).`

   Enter the IP address of the administration host you specified earlier (for example, 192.175.4.1).

   Note: The name listed here is the name of the host entered in the previous step.

15. `Please enter timezone`

   GMT is the default setting. Select a valid value for your time zone and enter it here.

   See *Time zones* on page 93 for a list of supported values.

16. `Where is the filer located?`

   This is the actual physical location where the storage system resides (for example, Bldg. 4, Floor 2, Room 216) .

17. `What language will be used for multiprotocol files?`

   Enter the language.

   See *Supported languages* on page 103 for a list of supported values.

18. `Enter the root directory for HTTP files`

   This is the root directory for the files that the storage system will serve through HTTP or HTTPS.

19. `Do you want to run DNS resolver?`

If you type **y** at this prompt, you need the DNS domain name and associated IP address.

20. `Do you want to run NIS client?`

If you type **y** at this prompt, you will be prompted to enter the name of the NIS domain and the NIS servers.

When you have finished with the NIS prompts, you see an advisory message regarding AutoSupport and you are prompted to continue.

21. `Would you like to configure the BMC LAN interface ?`

If you have a BMC installed in your system and you want to use it, type **y** at the prompt and enter the BMC values you collected.

22. `Would you like to configure the RLM LAN interface ?`

If you have an RLM installed in your system and you want to use it, type **y** at the prompt and enter the RLM values you collected.

23. `Do you want to configure the Shelf Alternate Control Path Management interface for SAS shelves ?`

If you are planning to attach DS4243 disk shelves to your system, type **y** at the prompt and enter the ACP values you collected.

24. `Setting the administrative (root) password for` *new_system_name*`...`
`New password:`
`Retype new password:`

Enter the new root password.

25. When setup is complete, to transfer the information you've entered to the storage system, enter the following command, as directed by the prompt on the screen.

reboot

> **Attention:** If you do not enter `reboot`, the information you entered does not take effect and is lost.

26. If you are configuring a pair of storage systems in a high-availability configuration and have not configured the other storage system, repeat these instructions to set up the other storage system in the configuration.

Responding to FilerView Setup Wizard prompts

If you have a DHCP server in your environment, you can use the FilerView Setup Wizard to complete initial configuration of your storage system.

Before you begin

You must configure a DHCP server as described in "DHCP requirements for remote access" in order to use the Setup Wizard. If you do not configure this information into your DHCP server, the corresponding fields in the Setup Wizard will be empty, and you will need to enter the information manually into the Setup Wizard fields.

About this task

You can use the FilerView Setup Wizard as an alternative to command-line setup procedures on the system console.

However, if you do not have a DHCP server, you can begin the setup process at the console and switch to the Setup Wizard. If you select **y** at the Web interface prompt (Step 14 of "Responding to setup command prompts"), a message is displayed with the name and IP address where you can use a Web browser and the FilerView application to properly configure your storage system. FilerView displays a system status screen with system information in the center frame and configuration options listed in the left frame.

Steps

1. From a storage system client's Web browser, enter the following URL:

   https://*ip_address*/api

   ip_address is the IP address for your storage system.

   ### Example
   If the IP address of the onboard Ethernet interface (named e0a) is 10.14.26.99, enter the following:

   https://10.14.26.99/api

   The browser displays the Setup Wizard startup page.

2. Fill in the Setup Wizard fields using the information you gathered earlier.

3. After you verify that the configuration information is correct as shown on the last screen, click Finish.

4. If you are configuring a pair of storage systems in a high-availability configuration and have not configured the other storage system, repeat these instructions to set up the other storage system in the configuration.

Related concepts

DHCP requirements for remote access on page 26

Related tasks

Responding to setup command prompts on page 48

Responding to cifs setup prompts

If you have a valid CIFS license, `cifs setup` starts automatically upon completion of the Setup Wizard or the `setup` command (unless `cifs setup` was run previously).

About this task

Each step displays the `cifs setup` command prompt. You should supply an appropriate response from the configuration worksheet.

Steps

1. `Do you want to make the system visible via WINS?`
   The system first determines if WINS should be configured. If you want to configure WINS, enter **y**.

2. `(1) Multiprotocol filer`
   `(2) NTFS-only filer`
   You are asked if you wish to configure the storage system for multiple protocols or for NTFS only. If you have purchased multiprotocol licenses (NFS, CIFS, HTTP, and so on), enter **1**.

3. `CIFS requires local /etc/passwd and /etc/group files and default files`
   `will be created. The default passwd file contains entries for 'root', .`
   `'pcuser', and 'nobody'`
   `Enter the password for the root user []:`
   `Retype the password:`

   Enter the root password.

4. When the default name of the CIFS server is listed, you see the following prompt:
   `Would you like to change this name?`

   If you wish to specify a different name, you can enter it here.

5. Select the style of user authentication appropriate to your environment:
   `(1) Active Directory domain authentication (Active Directory domains`
   `only)`
   `(2) Windows NT 4 domain authentication (Windows NT or Active Directory`
   `domains)`
   `(3) Windows Workgroup authentication using the filer's local user`
   `accounts`
   `(4) /etc/passwd and/or NIS/LDAP authentication`

If you selected ...	Then ...
1	Go to the next step.
2, 3, or 4	Go to Step 10, then see the *Data ONTAP 7-Mode File Access and Protocols Management Guide* for more information about CIFS setup for these authentication options.

6. `What is the name of the Active Directory domain?`

   Enter the fully qualified domain name.

7. `Would you like to configure time services?`

   If you answer **y**, respond to the following prompts:
   ```
   Enter the time server host(s) and/or addresses?
   Would you like to specify additional time servers?
   ```

8. `Enter the name of the Windows user.`
   `Password for Windows_user_name:`

   Enter the name and password of a Windows account with sufficient privileges to add computers to the Active Directory domain.

   If you enter a Windows user name and password, you will be prompted to supply Active Directory container names in which to create machine accounts for the storage system.

9. `Do you want to create the (name of filer) administrator account?`

   You should create a local administrator account.

   If you answer **y**, respond to the following prompts:
   ```
   Enter the new password for (storage system name).
   Retype the password.
   ```

10. `Would you like to specify a user or group that can administer CIFS?`

    If you answer **y**, respond to the following prompt:
    ```
    Enter the name of a user or group that will administer CIFS on the
    filer.
    ```

Result

After you complete this step, CIFS is configured and the name registrations are complete. You see the following message:
```
CIFS local server is running.
```

Responding to rlm setup prompts

If your system includes an RLM, `rlm setup` starts automatically after the `setup` command (of the `cifs setup` if CIFS is licensed on your system).

About this task

For each step, you should supply an appropriate response from the configuration worksheet.

Steps

1. When the RLM setup asks you whether to configure the RLM, enter **y**.

   If you answer **n** here, you can configure the RLM at a later time.

2. Do one of the following when the RLM setup asks you whether to enable DHCP on the RLM.

   • To use DHCP addressing, enter **y**.
   • To use static addressing, enter **n**.

3. If you do not enable DHCP for the RLM, the RLM setup prompts you for static IP information. Provide the following information when prompted:

   • The IP address for the RLM

       Note: Entering **0.0.0.0** for the static IP address disables IPv4 for the RLM.

   • The netmask for the RLM
   • The IP address for the RLM gateway
   • The name or IP address of the mail host to use for AutoSupport (if you use the `setup` command.)

Examples for configuring the RLM

The following example shows that the RLM is configured to use a static IP address:

```
   The Remote LAN Module(RLM) provides remote management capabilities
   including console redirection, logging and power control.
   It also extends autosupport by sending
   additional system alerts. Your autosupport settings are used
   for sending these alerts via email over the RLM LAN interface.
Would you like to configure the RLM? y
Would you like to enable DHCP on the RLM LAN interface? n
Please enter the IP address for the RLM []: 192.168.123.98
Please enter the netmask for the RLM []: 255.255.255.0
Please enter the IP address for the RLM gateway []: 192.168.123.1
Verifying mailhost settings for RLM use...
```

The following example shows that the RLM is configured to use DHCP:

```
   The Remote LAN Module(RLM) provides remote management capabilities
```

```
     including console redirection, logging and power control.
     It also extends autosupport by sending
     additional system alerts. Your autosupport settings are used
     for sending these alerts via email over the RLM LAN interface.
Would you like to configure the RLM? y
Would you like to enable DHCP on the RLM LAN interface? y
Verifying mailhost settings for RLM use...
```

Responding to sp setup prompts

If your system includes a Service Processor, `sp setup` starts automatically after the `setup` command (or the `cifs setup` if CIFS is licensed on your system).

About this task

You must use either a static or a DHCP address for SP configuration. If no static or DHCP address is configured, the SP has no network connectivity.

Steps

1. At the storage system prompt, enter one of the following commands:

   - **setup**
   - **sp setup**

   If you enter `setup`, the `sp setup` command starts automatically after the `setup` command finishes running.

2. When the SP setup asks you whether to configure the SP, enter **y**.

3. Do one of the following when the SP setup asks you whether to enable DHCP on the SP.

   - To use DHCP addressing, enter **y**.
   - To use static addressing, enter **n**.

4. If you do not enable DHCP for the SP, the SP setup prompts you for static IP information. Provide the following information when prompted:

   - The IP address for the SP
   - The netmask for the SP
   - The IP address for the SP gateway
   - The name or IP address of the mail host to use for AutoSupport (if you use the `setup` command.)

5. At the storage system prompt, enter the following command to verify that the SP network configuration is correct:

   sp status

6. At the storage system prompt, enter the following command to verify that the SP AutoSupport function is working properly:

```
sp test autosupport
```

> **Note:** The SP uses the same mail host information that Data ONTAP uses for AutoSupport. The sp test autosupport command requires that you set up the autosupport.to option properly.

The following message is a sample of the output Data ONTAP displays:
```
Sending email messages via SMTP server at mailhost@companyname.com. If
autosupport.enable is on, then each email address in autosupport.to
should receive the test message shortly.
```

Additional steps required to set up V-Series systems using native disk shelves and third-party storage

For V-Series systems using both native disk shelves and third-party storage, you have completed the configuration of the native disk shelves, but you must now configure your third-party storage. The information you need to connect third-party storage to Data ONTAP is given in the *V-Series Installation Requirements and Reference Guide* and the *Data ONTAP 7-Mode Storage Management Guide*.

Setting up your system for using only third-party storage

V-Series systems ordered without native disk shelves require some initial setup before Data ONTAP is installed and the system becomes operational.

Next topics

Before starting setup for using third-party storage

A number of tasks must be completed to prepare your system for connection to third-party storage arrays.

Before you start setting up your system and installing Data ONTAP software on it, you must do the following:

- On the storage array, create LUNs and make them available to Data ONTAP, as described in the following documentation:

  - *V-Series Installation Requirements and Reference Guide*
  - *V-Series Systems Implementation Guide* for your vendor
    The process of making array LUNs available to Data ONTAP varies among storage array types.
  - Your storage array documentation
- Connect your V-Series system and storage array as described in the *V-Series Installation Requirements and Reference Guide*.

Providing array LUN ownership and system ID for V-Series systems

If your V-Series system is using only third-party storage, you must provide information through the boot menu and the setup program to assign array LUN ownership and identify your system on the network.

Before you begin

You should complete the worksheet in the *Configuration worksheet* on page 29 . The setup program prompts you for this information. The worksheet includes a definition of each parameter that you need to enter to set up the system on the network.

About this task

You must create the LUNs on the storage array that you want this system to own. You must create at least one array LUN. You can create more array LUNs at this stage or wait to create additional array LUNs after Data ONTAP is installed.

> **Attention:** You must use LUN security to prevent V-Series systems from accessing array LUNs owned by non V-Series hosts, and to prevent non V-Series hosts from accessing array LUNs owned by V-Series systems. Although Data ONTAP provides controls to prevent one V-Series system from owning an array LUN that is assigned to another V-Series system, there are no controls to prevent you from assigning V-Series system ownership of an array LUN owned by a non V-Series system host. Using the disk assign command to write ownership information to a LUN owned by a non V-Series system causes irreversible data corruption.

Steps

1. Power on the system to load the kernel from the boot device.

   The system boot process begins.

2. Interrupt the boot process by pressing Ctrl-C when you see the following message on the console:
   ```
   Press Ctrl-C for boot menu
   ```

3. Select Maintenance Mode.

4. To identify the LUNs on the storage array that you can configure this system to own, enter the following command:

   disk show -v

   You see a list of all LUNs available on the storage array port to which the system is physically connected.

5. To assign the LUNs on the storage array that you want this system to own, enter the following command. (You must assign at least one array LUN.)

disk assign {*disk_name* | all | -n *count*} [-p *pool*] [-c *block/zoned*]

> **Attention:** This step causes irreversible data corruption when performed on an array LUN that is being used by or that will be used by a non V-Series host.

- *disk_name* | all | -n *count*: Required option. Identifies the array LUNs assigned to this system.

  - *disk_name* specifies, by LUN name, the array LUNs to be assigned. In most cases, you identify the name of the specific array LUNs that this system is to own, in the following form:
  - *all* causes all array LUNs that are made available on the storage array to the V-Series neighborhood to be assigned to this system.
  - -n *count* causes the number of unassigned array LUNs specified by count to be assigned to this system.

- -p *pool*

  - If you are not going to be deploying SyncMirror, you do not need to enter the pool parameter. The pool parameter defaults to 0 (zero).
  - For details, see the information about RAID mirroring in the *V-Series Installation Requirements and Reference Guide*.

- -c *block* | *zoned*

  Checksum type, either block or zoned. The default value is block.

  When a LUN from the storage array is mapped to be used by the system, it is treated as a "raw," unformatted disk (LUN). This unformatted array LUN needs to be formatted in either of two ways:

  - Block checksum: Reserves 12.5 percent of the space in the array LUN for checksum.
  - Zoned checksum: Entries for 63 WAFL blocks are stored in a 4-KB block following each set of 63 WAFL blocks. The 1/64 space for the zoned checksum is taken from the 10 percent WAFL reserve. Therefore, the net effect is that no additional storage is lost above the core dump and WAFL reserve.

  > **Note:** An array LUN of type "block" is expected to be used with block checksum aggregates. An array LUN of type "zoned" is expected to be used with zoned checksum aggregates. For details about planning for checksums, see the *Data ONTAP Data Protection Online Backup and Recovery Guide*.

Example

In the following example the disk assign command is used to assign storeAlun1 and storeAlun2 to pool 0 and storeBlun1 storeBlun2 to pool1:

disk assign storeAlun1 storeAlun2 -p 0

disk assign storeBlun1 storeBlun2 -p 1

6. To see the results of assigning the LUNs, enter the following command:

disk show -v

The local system ID is shown and the array LUNs (disks) exported on the port are shown.

Review the list of array LUNs to confirm that all array LUNs you expected to be assigned to this system (the local system) are shown with the ID of this system.

7. To halt and then reboot the system, enter the following commands:

```
halt
```

```
boot
```

8. When you see the following message on the console, interrupt the boot process by pressing Ctrl-C:
```
Press Ctrl-C for Boot Menu
```

The boot options menu appears.

9. Create the root volume with one of the array LUNs that you assigned to this storage system by selecting the following:
```
Clean configuration and initialize all disks.
```

10. When the system prompts you whether you want to install a new file system, enter:

```
y
```

11. The system responds with the following message:
```
This will erase all the data on the disks, are you sure?
```
Enter:

```
y
```

The storage system creates a FlexVol root volume named "vol0" in an aggregate named "aggr0" (the system automatically creates the aggregate). After these are created on one of the assigned array LUNs, the system prompts for setup information.

If you entered multiple array LUNs with the disk assign command, an array LUN is automatically selected. The system first tries to select an array LUN with a block checksum, if one is available, and then it selects the smallest array LUN.

12. When the system prompts you whether you want to install a new file system, enter:

```
y
```

13. The system displays the following prompt:
```
Would you like to continue setup through the Web interface?
```
Enter:

```
n
```

Answer the prompts in the setup program, using the information that you recorded in the *Configuration worksheet* on page 29.

14. After the setup program is complete, install protocol and features licenses; then install Data ONTAP software, as described in *Installing Data ONTAP software on your system* on page 63.

Installing Data ONTAP software on a V-Series system

This section provides you with the information you need to install Data ONTAP on a V-Series system. Installing Data ONTAP is required only on V-Series systems that were ordered without native disk shelves. If your system was ordered with native disk shelves, Data ONTAP was already installed for you.

Before you begin

Before you start the installation process described in this section, you should have completed the procedures in *Setting up your system for using only third-party storage* on page 59.

Next topics

Data ONTAP installation stages

You need to install Data ONTAP only on V-Series systems that were ordered without native disk shelves.

Installing Data ONTAP on a V-Series system is a three-stage process:

1. Install licenses on the system.
   Before you can install the Data ONTAP software, you must install the appropriate protocol license:

   • If you are installing from a Windows client, you must install a CIFS license.
   • If you are installing from a UNIX client, you must install an NFS license.
   • If you are installing from an HTTP server, no license is required.

2. Obtain the installation image.

3. Install the software.

How you install licenses on a storage system

Your storage system requires a license for the V-Series software and may require protocol licenses to complete the installation process. You can install other licenses such as licenses for SyncMirror, SnapMover, or HTTP Server, before or after you install Data ONTAP software.

The procedure you use to install licenses differs slightly, depending on whether you are installing licenses on a single system or on an HA pair.

Next topics

Installing licenses on a single system

To install licenses on a single system, you use the `license add` command along with the license code you were given when you purchased the license.

Before you begin

Before installing licenses, you should have completed the procedures in *Setting up your system for using only third-party storage* on page 59.

Steps

1. Enter the following command on the console:

   `license add code ...`

   `code` is the license code that you were given when you purchased the license for the service or protocol.

   Example
   In this example, the license code for CIFS is ABCDEFG and the license code for the V-Series system is v-series:

   `license add ABCDEFG v-series`

   The storage system acknowledges each license, in a manner similar to that shown in the following example:

   ```
   A cifs license has been installed.
            Use "cifs setup" to configure cifs.
            Run cifs setup to enable cifs.
   A v-series license has been installed.
   v-series storage will be enabled after reboot.
   ```

2. Reboot the storage system using the following command:

reboot

> **Note:** If you are installing a SyncMirror license, you do not need to reboot.

Installing licenses on an HA pair

To install licenses on an HA pair, you use the `license add` command on both storage system consoles.

Before you begin

Before installing licenses, you should have completed the procedures in *Setting up your system for using only third-party storage* on page 59.

Steps

1. Enter the HA pair license code using the following command on both storage system consoles:

   license add *code*

   code is the license code.

2. Reboot both storage systems using the following command:

   reboot

3. Enable the HA pair on each storage system by entering the following command on each console:

   cf enable

4. Ensure that the HA pair is enabled by entering the following command on each console:

   cf status

   When enabled, each system responds with a message similar to the following:
   Cluster enabled, V-Series 2 is up

5. Repeat Step 1 for each licensed product installed on the HA pair.

6. Reboot both storage systems in the HA pair.

   > **Note:** If you are installing a SyncMirror license, you do not need to reboot the systems.

Obtaining Data ONTAP software images

You must copy a software image from the NOW site to your storage system using UNIX or Windows client connections. Alternatively, you can copy software images to an HTTP server on your network and then storage systems can access the images using the `software` command.

To upgrade the storage system to the latest release of Data ONTAP, you need access to software images. Software images, firmware version information, and the latest firmware for your storage system model are available on the NOW site. Note the following important information:

- Software images are specific to storage system models.
  Be sure to obtain the correct image for your system.
- Software images include the latest version of system firmware that was available when a given version of Data ONTAP was released.

Attention: Beginning with Data ONTAP 8.0, .exe images are no longer used for Data ONTAP software upgrades. You must use one of the following image types, depending on the upgrade you are performing:

- .zip images, for upgrades from an earlier release family to Data ONTAP 8.0
- .tgz images, for upgrades from any Data ONTAP 8.0 release to a later release

After you have upgraded to Data ONTAP 8.0 or later, you can only use .tgz images for further upgrades.

Next topics

Related information

Download Software -- now.netapp.com/NOW/cgi-bin/software
System Firmware + Diagnostics Download -- now.netapp.com/NOW/cgi-bin/fw

HTTP server steps

If you have an HTTP server that is accessible to your storage system, you can copy Data ONTAP software images to the HTTP server and use the `software` command to download and install Data ONTAP software images to your storage system.

Note: You can also use HTTPS connections when SecureAdmin is installed and enabled on the storage system.

When you use an HTTP server to provide Data ONTAP software images, you do not have to mount the storage system to a UNIX administration host or map a drive to the storage system using Windows to perform the installation.

You can copy Data ONTAP system files to both single systems and storage systems in a high-availability configuration.

For more information, see the software (1) man page.

Next topics

Copying the software image to the HTTP server

You must copy the software image file to the HTTP server. This task prepares the HTTP server to serve software images to storage systems in your environment.

Step

1. Copy the software image (for example, `80_setup_i.tgz`) from the NOW site or another system to the directory on the HTTP server from which the file will be served.

Copying software images from the HTTP server without installing the images

You can copy software images to your storage system without immediately installing them. You might do this, for instance, if you want to perform the installation at a later time.

Step

1. Enter the following command from the storage system console:

   software get *url* -f *filename*

   url is the HTTP location from which you want to copy the Data ONTAP software images.

   Use the following URL syntax if you need to specify a user name, password, host, and port to access files on the HTTP server using Basic Access Authentication (RFC2617):

   http://*username*:*password*@*host*:*port*/*path*

   Use the -f flag to overwrite an existing software file of the same name in the storage system's /etc/software directory. If a file of the same name exists and you do not use the -f flag, the download will fail and you will be prompted to use -f.

   filename is the file name you specify for the software file being downloaded to your storage system. If no destination file name is specified, Data ONTAP uses the file name listed in the URL from which you are downloading and places the copy in the /etc/software directory on the storage system.

Example

In the following example, the software get command uses a new destination file name.

```
software get http://www.example.com/downloads/x86-64/80_setup_i.tgz
80_mailboxes_i.tgz
```

You see a message similar to the following:

```
software: copying to /etc/software/80_mailboxes_i.tgz
software: 100% file read from location.
software: /etc/software/80_mailboxes_i.tgz has been copied.
```

UNIX client steps

If you are using a UNIX client to copy a Data ONTAP software image to your storage system, you need access to both the storage system's console and the system's administration host. If the administration host does not have a Web connection, you must also have access to a client system that can reach the NOW site.

Next topics

Mounting the storage system on your client

Before you copy a software image to your storage system, you must mount the system on your UNIX administration host.

Steps

1. As root user, mount the storage system's root file system to the client's /mnt directory, using the following command:

   mount *system:*/vol/vol0 */mnt

   system is the name of the storage system.

   /mnt is the directory on the client where you want to mount the storage system's root file system.

2. Change to the /mnt directory using the following command on your UNIX client console:

   cd */mnt

   /mnt is the directory on the client where you mounted the storage system's root file system.

3. To acquire Data ONTAP files, download the Data ONTAP files using a Web browser from the NOW site.

Obtaining software images

You can use a Web browser to copy the software image from the NOW site to a UNIX client. You can copy the software image directly to your administration host. If your administration host does not have Web access, you can copy the software image to portable storage media attached to a different client, then copy the image from portable storage to the administration host.

Steps

1. Use a Web browser to log in to the NOW site.

2. Click **Service & Support**.

3. Click **Download Software**.

4. In the Software Download table, click the **Select Platform** list box in the Data ONTAP product row.

5. Select your storage system type from the list and click **Go**.

6. Follow the prompts to reach the software download page.

7. After you have chosen the software image that corresponds to your platform, complete one of the following actions, depending on your Web environment.

If you are connecting to the NOW site from...	Then...
An administration host	Save the image to the `.../etc/software` directory on the mountpoint that you chose when you mounted the storage system on your client.
Another UNIX client	a. Save the image to portable storage media.
	b. Connect the portable storage media to your administration host.
	c. Copy the image to the `.../etc/software` directory on the mountpoint that you chose when you mounted the storage system on your client.

8. Continue with the installation procedures.

Windows client steps

If you are using a Windows client to copy a Data ONTAP software image to your storage system, you need access to both the storage system's console and the system's administration host. If the administration host does not have a Web connection, you must also have access to a client system that can reach the NOW site.

Next topics

Mapping the storage system to a drive

Before you copy a software image to your storage system, you must map the root directory of the system to your Windows administration host.

You should make sure that the CIFS service is running and that the Administrator user is defined in CIFS as having authority to access the C$ directory.

Steps

1. Log in to your client as Administrator or log in using an account that has full control on the storage system C$ directory.

2. Map a drive to the C$ directory of your storage system.

    Note: On some computers, firewall software might not permit you to map a drive to the C$ directory of a storage system. In order to complete this procedure, disable the firewall until you no longer need access to the storage system through your laptop.

3. Copy the software image from the NOW site.

Obtaining software images

You can use a Web browser to copy the software image from the NOW site to a Windows client. You can copy the software image directly to your administration host. If your administration host does not have Web access, you can copy the software image to portable storage media attached to a different client, then copy the image from portable storage to the administration host.

Steps

1. Use a Web browser to log in to the NOW site.

2. Click **Service & Support**.

3. Click **Download Software**.

4. In the Software Download table, click the **Select Platform** list box in the Data ONTAP product row.

5. Select your storage system type from the list and click **Go**.

6. Follow the prompts to reach the software download page.

7. After you have chosen the software image that corresponds to your platform, complete one of the following actions, depending on your Web environment.

If you are connecting to the NOW site from...	Then...
An administration host	Save the image to the \etc\software directory on the mountpoint that you chose previously, when you mounted the storage system on your client.
Another Windows client	**a.** Save the image to portable storage media. **b.** Connect the portable storage media to your administration host. **c.** Copy the image to the \etc\software directory on the mountpoint that you chose previously, when you mounted the storage system on your client.

8. Continue with the installation procedures.

Installing Data ONTAP software images

You should use the software update command to extract and install the system files on a storage system.

You can use the software update command to install a software image you have already copied to your storage system, or to copy and install the image from an HTTP server.

You must know the location of and have access to the software image. The software update command requires one of the following as an argument:

- The name of the software image you copied to the /etc/software directory
- The URL of the HTTP server that you configured to serve software images

The software update command allows you to perform several operations at one time. For example, if you use an HTTP server to distribute software images, you can copy an image from the HTTP server, extract and install the system files, download the files to the boot device, and reboot your system with one command.

For more information about the software update command and its options, see the software(1) man page.

Next topics

Installing software images from the /etc/software directory

To complete this procedure, the new software image must be present in the /etc/software directory on your storage system.

Steps

1. From the storage system prompt, enter the following command:

   software update *file options*

   - *file* is the name of the software image you copied to the /etc/software directory.
   - *options* is one or more of the following:

     - The -d option prevents the download command from being run automatically after the system files are installed.
     - The -f option overwrites the existing image in the /etc/software directory.
     - The -r option prevents the system from rebooting automatically after the download command has finished (default).
     - The -R option causes the system to reboot automatically after the download command has finished.

Example

If you are running Data ONTAP...	And you want to...	Then you can enter...	
8.0.1 or later	Install the new system files from the `/etc/software` directory	`software update my_80_setup_i.tgz -d`	
	Download the new system files to the boot device immediately after installing them	`software update my_80_setup_i.tgz`	
	Copy and install the image from your HTTP server	`software update http://www.example.com/downloads/x86-64/my_80_setup_i.tgz`	
	Copy from your HTTP server and overwrite an existing image	`software update http://www.example.com/downloads/x86-64/my_80_setup_i.tgz -f`	
	8.0 or a 7.3.x release	Install the new system files from the `/etc/software` directory	`software update my_80_setup_i.tgz -d -r`
Download the new system files to the boot device immediately after installing them			`software update my_80_setup_i.tgz -r`
Copy and install the image from your HTTP server			`software update http://www.example.com/downloads/x86-64/my_80_setup_i.tgz`
Copy from your HTTP server and overwrite an existing image			`software update http://www.example.com/downloads/x86-64/my_80_setup_i.tgz -f`

When you use the `software update` command without the options, a message similar to the following appears on your storage system console:

```
software: You can cancel this operation by hitting Ctrl-C in the next 6
seconds.
software: Depending on system load, it might take many minutes
software: to complete this operation. Until it finishes, you will
software: not be able to use the console.
software: copying to <filename>
software: 100% file read from location.
software: /etc/software/<filename> has been copied.
software: installing software, this could take a few minutes...
software: Data ONTAP Package Manager Verifier 1
software: Validating metadata entries in /etc/boot/NPM_METADATA.txt
software: Checking sha1 checksum of file checksum file: /etc/boot/
NPM_FCSUM-pc.sha1.asc
software: Checking sha1 file checksums in /etc/boot/NPM_FCSUM-
pc.sha1.asc
software: installation of <filename> completed.
Mon Oct 2 13:26:17 PDT [filer: rc:info]: software: installation of
<filename> completed.
```

```
software: Reminder: You might need to upgrade Volume SnapMirror
destination
software: filers associated with this filer. Volume SnapMirror can not
mirror
software: if the version of ONTAP on the source filer is newer than
that on
software: the destination filer.
Mon Oct 2 13:26:17 PDT [filer: download.request:notice]
```

2. Complete the installation as described in the sections on downloading to single systems or HA pairs.

Installing software images from an HTTP server

To complete this procedure, you must know the URL of an HTTP server in your environment that is configured to serve software images.

Steps

1. From the storage system prompt, enter the following command:

   software update *url options*

   - *url* is the URL of the HTTP server and subdirectory.
   - *options* is one or more of the following:

     - The -d option prevents the `download` command from being run automatically after the system files are installed.
     - The -f option overwrites the existing image in the /etc/software directory.

- The `-r` option prevents the system from rebooting automatically after the `download` command has finished (default).
- The `-R` option causes the system to reboot automatically after the `download` command has finished.

Example

If you are running Data ONTAP...	And you want to...	Then you can enter...
8.0.1 or later	Copy and install the image from your HTTP server	**software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -d**
	Copy from your HTTP server and overwrite an existing image	**software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -d - f**
	Copy and install the image from your HTTP server, then download the new system files to the boot device immediately after installing them	**software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz**
	Copy and install the image from your HTTP server to a single system, then download the new system files and reboot immediately	**software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -R**

If you are running Data ONTAP...	And you want to...	Then you can enter...
8.0 or a 7.3.x release	Copy and install the image from your HTTP server	`software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -d -r`
	Copy from your HTTP server and overwrite an existing image	`software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -d -r -f`
	Copy and install the image from your HTTP server, then download the new system files to the boot device immediately after installing them	`software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz -r`
	Copy and install the image from your HTTP server to a single system, then download the new system files and reboot immediately	`software update http:// www.example.com/ downloads/x86-64/ my_80_setup_i.tgz`

When you use the `software update` command without the options, a message similar to the following appears on your storage system console:

```
software: You can cancel this operation by hitting Ctrl-C in the next 6
seconds.
software: Depending on system load, it might take many minutes
software: to complete this operation. Until it finishes, you will
software: not be able to use the console.
software: copying to <filename>
software: 100% file read from location.
software: /etc/software/<filename> has been copied.
software: installing software, this could take a few minutes...
software: Data ONTAP Package Manager Verifier 1
software: Validating metadata entries in /etc/boot/NPM_METADATA.txt
software: Checking sha1 checksum of file checksum file: /etc/boot/
NPM_FCSUM-pc.sha1.asc
software: Checking sha1 file checksums in /etc/boot/NPM_FCSUM-
pc.sha1.asc
software: installation of <filename> completed.
Mon Oct 2 13:26:17 PDT [filer: rc:info]: software: installation of
<filename> completed.

software: Reminder: You might need to upgrade Volume SnapMirror
destination
```

```
software: filers associated with this filer. Volume SnapMirror can not
mirror
software: if the version of ONTAP on the source filer is newer than
that on
software: the destination filer.
Mon Oct 2 13:26:17 PDT [filer: download.request:notice]
```

2. Complete the installation as described in the sections on downloading to single systems or HA pairs.

Managing files in the /etc/software directory

After you have copied Data ONTAP system files to the /etc/software directory on your storage system, you can manage them from the storage system console with the software command.

If you want to...	Then use the following command...
List the contents of the /etc/software directory	software list
Delete files from the /etc/software directory	software delete

For more information, see the software(1) man page.

Verifying software setup

As soon as hardware and software setup is complete, you should verify network connections, licensed functionality, and other relevant configurations in your environment.

Next topics

Verifying network connectivity

You use the ping command to verify that your clients can connect to the IP addresses you configured on the storage system during setup.

About this task

You must perform these tasks from a network client system.

For more information, see the *Data ONTAP 7-Mode Network Management Guide*.

Steps

1. To verify network connectivity to an IP address, enter the following command:

ping *IP_address*

IP_address is the IP address that the storage system assigned to that interface during setup.

Example

The following command tests the network connections for a storage system with an interface named e0a installed at 192.0.2.66:

ping 192.0.2.66

2. Repeat the test once for each interface that is installed in the storage system.

Result

You should be able to reach your new storage system from clients on your network. If you cannot, use the recommended troubleshooting procedures.

Troubleshooting connections to new network interfaces

There are several ways to identify a problem when new network interfaces do not respond to a `ping` command.

Steps

1. Check to make sure that the interface is securely attached to the network.

2. Check to make sure that the media type is set up correctly if the interface is using a multiport Ethernet card with different port speeds.

3. Check to make sure that the routers function properly with correct routing information if the `ping` command is issued from a network not directly attached to the interface.

4. If you received a response from the IP address ping but not the host-name ping, check to see whether there is a problem with host-name resolution.

Related tasks

Verifying host-name resolution

You should ensure that host names you configured during `setup` are resolved into IP addresses.

About this task

When you ran `setup`, the storage system generated a host name for each interface by appending the name of the interface to the storage system host name. You need to make sure that these automatically generated host names are resolved into IP addresses.

For example, the interface name for the first interface on a storage system named "toaster" might be toaster-e0a; the second interface might be toaster-e0b.

For more information about host-name resolution, see your *Data ONTAP 7-Mode Network Management Guide*.

Steps

1. Take one of the following actions from a client system:

If you use...	Then add an entry in...

DNS or NIS for name resolution	Your DNS or NIS databases for each of the storage system interfaces.
	
	 The following example shows how the entries might look for a storage system with four interfaces:
	
	 `192.16.3.145 toaster-e0a`
	`192.16.3.146 toaster-e0b`
	`192.16.3.147 toaster-f0`
	`192.16.3.148 toaster-a5`

`/etc/hosts` files for name resolution	Each host's `/etc/hosts` file for each of the storage system interfaces.

2. To verify host-name resolution for a network interface, enter the following command:

ping *hostname-interface*

hostname is the host name that you assigned to the storage system when you ran setup.

interface is one of the interface names that the storage system assigned when you ran setup.

Example

The following command tests the network connections for a storage system that has the host name "toaster" with an interface named e0a installed.

ping toaster-e0a

3. Repeat the test once for each interface that is installed in the storage system.

Result

If you received a response from the IP-address ping but not the host-name ping, there might be a problem with name resolution.

Verifying that the storage system is available

You can use the exportfs command to verify that the root path and root directory are available to clients.

About this task

After setup is complete, the storage system is online, and the following entities should exist on the storage system:

- /vol/vol0 (a virtual root path)
- /vol/vol0/home (a directory)

Note that /vol is not a directory–it is a special virtual root path under which the storage system mounts its volumes. You cannot mount /vol to view all the volumes on the storage system; you must

mount each storage system volume separately. NFS and CIFS protocols provide the following access characteristics for the /vol virtual root path:

- For NFS

  /vol/vol0 is exported to the administration host for root access; /vol0/home is exported to the administration host for root access and to all clients for general access.
- For CIFS

  By default, /vol/vol0 is shared as C$ and /vol/vol0/etc/ is shared as $ETC. These two shares are created with "Full Control" given to the Builtin Administrators group and with no access given to any other users or groups. By default, the Builtin Administrators group members are the local administrator account, the Domain Administrator's group (if the storage system belongs to a domain), and any user or group that you configured with Administrative access during CIFS setup. The /vol/vol0/home directory is shared as HOME with "Full Control" access granted to the group Everyone.

Step

1. To verify that the /vol/vol0 path and /vol/vol0/home directory entities exist on your storage system, enter the following command at the storage system command line:

   exportfs

   You should see a listing that includes lines similar to the following:

   ```
   /vol/vol0 -sec=sys,rw=admin_host,root=admin_host,nosuid
   /vol/vol0/home -sec=sys,rw,root=admin_host,nosuid
   ```

Verifying licensing

You can use the license command at the storage system command line to verify that the appropriate protocol and service licenses are installed on your system, or to configure additional licenses.

About this task

For more information about storage system licensing, see your *Data ONTAP 7-Mode System Administration Guide* and the license(1) man page.

Step

1. Enter the appropriate license command to manage your licenses.

If you want to...	Enter this command at the storage system prompt...
View existing licenses	**license**
	Result: You see a list of licenses and license codes.

If you want to...	Enter this command at the storage system prompt...
Add a license	`license add license_code`
	Result: The new protocol or service is enabled and added to the list of licenses.
Remove a license	`license delete service`
	Result: The protocol or service is disabled and removed from the list of licenses.

Preparing NFS clients to access the storage system

To make storage system data available to NFS clients, you need to export the storage system's file system. You must also mount the file system on your NFS clients.

For more information about NFS configuration, see your *Data ONTAP 7-Mode File Access and Protocols Management Guide* and your NFS client documentation.

Exporting file systems to NFS clients

Before NFS clients can mount file systems, you need to export those file systems by adding them to the storage system's /etc/exports file.

About this task

Security styles of file systems–UNIX, NTFS, and Mixed–are all available for exporting and can be mounted by NFS clients. However, for accessing a volume with NTFS effective security style (NTFS volume or mixed volume with NTFS effective security style), file access is granted based on NTFS permissions. To properly ascertain file permissions, UNIX user names are mapped to corresponding Windows user names, and access is granted based on NTFS permissions granted to the mapped Windows user.

Steps

1. Determine valid path names for directories by entering the following command at the storage system prompt:

   `qtree status`

   Example
   The following display shows sample output from the qtree status command:

   ```
   Volume          Tree      Style    Oplocks   Status
   ------          ----      -----    -------   -------
   vol0            home      unix     enabled   normal
   vol1snap        qtree1    unix     enabled   normal
   vol2eng         team1     mixed    enabled   normal
   vol2mkt         nt        ntfs     enabled   normal
   ```

2. From the `qtree` command output, convert the first two entries into valid path names. To do so, use this format:

   /Volume/Tree

   Example

   ```
   /vol0/home
   /vol1snap/qtree1
   /vol2eng/team1
   ```

3. Use a text editor from an NFS client to open the /etc/exports file on the storage system.

4. Add the storage system directories to the /etc/exports file.

   Example

   ```
   /vol/vol0/home -sec=sys, rw, root=admin_host
   /vol/vol1snap/qtree1 -sec=sys, rw, root=admin_host
   /vol/vol2eng/team1 -sec=sys, rw=10.0.0.0/24:172.17.0.0/16,
   root=admin_host
   /vol/vol2mkt/nt -sec=sys, rw=netgroup1:netgroup2,
   root=admin_host:10.0.0.100
   ```

   For information about specifying entries and access permissions in the /etc/exports file, see the chapter about file access using NFS in your *Data ONTAP 7-Mode File Access and Protocols Management Guide*.

5. Save the file and exit the text editor.

6. To make your changes to the /etc/exports file effective immediately, issue the `exportfs` command with the reload option:

   exportfs -r

Preparing CIFS clients to access the storage system

If you are in an Active Directory domain, you must ensure that DNS is correctly configured to ensure CIFS client access.

Once setup is complete, the storage system establishes CIFS client connectivity by automatically registering with the master browser. If cross-subnet browsing is configured correctly, the storage system is now visible to all CIFS clients. For more information about cross-subnet browsing, see Microsoft networking documentation.

Note: Although CIFS visibility has been established, you need to configure shares with CIFS access permissions before any storage system data can become accessible to CIFS clients. For information about how to make a test share available to CIFS clients, see the *Data ONTAP 7-Mode File Access and Protocols Management Guide*.

You will also need to provide information to Windows client users about how to access data on the storage system for their particular Windows version.

Creating a storage system DNS "A" record for CIFS client access

In Active Directory domains, you must create a storage system DNS "A" record on the DNS server before providing access to CIFS clients.

About this task

The storage system's DNS "A" record can be created manually or registered dynamically.

Step

1. To enable dynamic DNS, set one of the following options:

   dns.update.enable on

   dns.update.enable secure

   Use secure if your DNS supports secure updates.

   To disable dynamic DNS, set the dns.update.enable option to off.

Verifying the configuration for high-availability storage systems

There are two ways you can check your high-availability configuration before placing the pair online: running the HA Configuration Checker (formerly the Cluster Configuration Checker) or using the command-line interface.

When you configure high-availability systems, the following configuration information needs to be the same on both systems:

- Parameters
- Network interfaces
- Configuration files
- Licenses and option settings

Note: The values for domain controllers and WINS servers no longer need to be identical on both storage systems in a high-availability configuration. You can have each storage system exist in a different domain or a different workgroup, or both. However, if you have a multiprotocol environment and use UID-to-SID mapping, the UNIX security information must be compatible between the two domains. For example, if you have a UID of 119, it must map to the same Windows account for both storage systems.

For more information about verifying your configuration and managing storage systems in a high-availability configuration, see your *Data ONTAP 7-Mode High-Availability Configuration Guide*.

Related information

[HA Configuration Checker -- now.netapp.com/NOW/download/tools/cf_config_check/](now.netapp.com/NOW/download/tools/cf_config_check/)

Verifying RLM connections

You can use this procedure to verify that the Remote LAN Module (RLM) is set up correctly and connected to the network.

Before you begin

It is best to use the RLM with AutoSupport. Data ONTAP automatically sends the AutoSupport configuration to the RLM, allowing the RLM to send alerts and notifications through an AutoSupport message. AutoSupport is enabled by default when you configure your storage system for the first time.

About this task

The RLM network interface is not used for serving data, so it does not show up in the output for the `ifconfig` command.

For more information about AutoSupport and about using the RLM to manage remote storage systems, see your *Data ONTAP 7-Mode System Administration Guide*.

Steps

1. To verify that AutoSupport is enabled and AutoSupport options are valid, enter the following command:

   options autosupport

   The AutoSupport options should be set as follows:

   ```
   autosupport.enable on
   autosupport.support.enable on
   autosupport.mailhost name or IP address of mailhost
   autosupport.to name or email address of alert recipients
   ```

2. Enter the following command to verify the configuration of the RLM interface:

   rlm status

   Note: It might take a few minutes for the new network settings for the RLM to take effect.

3. Enter the following command to verify that the RLM AutoSupport function is working properly:

   rlm test autosupport

Note: The RLM uses the same mail host information that Data ONTAP uses for AutoSupport. You must ensure that the `autosupport.to` option is set properly before issuing this command.

The following message is a sample of the output Data ONTAP displays:

```
Sending email messages via SMTP server at
mailhost@companyname.com. If autosupport.enable is on,
then each email address in autosupport.to should receive
the test message shortly.
```

The RLM should send e-mail within a few minutes. If the test fails, you should verify storage system connectivity and check whether the mail host and recipients are valid.

Example for displaying configuration information

The following example displays the RLM status and configuration information:

```
storage-system> rlm status
    Remote LAN Module        Status: Online
                Part Number:        110-00030
                Revision:           A0
                Serial Number:      123456
                Firmware Version:   3.0
                Mgmt MAC Address:   00:A0:98:01:7D:5B
                Ethernet Link:      up, 100Mb, full duplex, auto-neg complete
                Using DHCP:         no
                IP Address:         192.168.123.98
                Netmask:            255.255.255.0
                Gateway:            192.168.123.1
```

Verifying the existence of two paths to an array LUN in a V-Series system

Data ONTAP automatically maps each storage system port to a secondary path on the storage array, if the primary path fails. You want to ensure that there are two paths to each array LUN so that the storage system can continue to work when running on a single path.

Next topics

Verifying the existence of two paths with the storage show disk command

You should verify that your V-Series system is configured with two paths to a LUN, providing a secondary path should the primary path fail or be taken offline.

Steps

1. Enter the following command to show the primary and secondary paths to LUNs:

   storage show disk -p *all*

   The system displays information similar to the following:

   ```
   PRIMARY          PORT                SECONDARY   PORT             SHELF BAY ADAPTER
   -------------------- ---- ------------------------ ---- ---
   vnmc4500s32:4.127L1    -    vnmc4500s33:19.127L1    -     -    -    0a
   vnmc4500s32:4.127L12   -    vnmc4500s33:19.127L12   -     -    -    0a
   vnmc4500s33:19.127L2   -    vnmc4500s32:4.127L2     -     -    -    0c
   vnmc4500s33:19.127L13  -    vnmc4500s32:4.127L13    -     -    -    0c
   ```

   Note: When you use the *all* variable, adapters are displayed, but unassigned LUNs are not visible.

2. Determine whether a primary path and a secondary path to the array LUNs are shown.

   If you do not see a primary and secondary path, check zoning, host group configuration, and cabling.

   Note: Do not continue with testing until you see two paths.

3. Look at the adapters shown to see whether all paths are on a single adapter.

   If you see both paths through one port (for example, both paths through the 0c port), this is an indication that the back-end zoning is redundantly crossed. This is not a supported configuration.

   Note: Data ONTAP changes the path to array LUNs, as necessary, for load balancing. Therefore, the primary and secondary paths for a given array LUN can change when the storage show disk command is issued at different times.

Verifying the existence of two paths with the storage array show-config command

You should verify that your V-Series system is configured with two paths to a LUN, providing a secondary path should the primary path be taken offline or fail.

Step

1. Enter the following command to show the primary and secondary paths to LUNs:

   storage array show-config

You see information similar to the following.

```
LUN Group Array Name Array Target Ports     Switch Port Initiator
Group 0 (4 LUNS) HP_V210 50:00:1f:e1:50:0a:86:6d  vnmc4300s35:11 0b
                         50:00:1f:e1:50:0a:86:68  vnbr4100s31:1  0a
                         50:00:1f:e1:50:0a:86:6c  vnmc4300s35:6  0d
Group 1(50 LUNS) HP_V200 50:00:1f:e1:50:0d:14:6d  vnbr4100s31:5  0a
                         50:00:1f:e1:50:0d:14:68  vnmc4300s35:3  0d
```

This example shows output from a V-Series system connected to two storage arrays. Each LUN group is comprised of LUNs that share the same two paths. Group 0 contains a total of 4 LUNs on the HP_V210 array and Group 1 contains 50 LUNs on the HP_V200 array.

Array LUNs that are not configured with two paths are shown as one or more LUNs with a single path, similar to the following example.

```
LUN Group Array Name Array Target Ports     Switch Port  Initiator
         (4 LUNS) HP_V210 50:00:1f:e1:50:0a:86:6d  vnmc4300s35:11 0b
```

Verifying path failover for array LUNS in a V-Series system

You want to demonstrate that the V-Series system continues to work when running with a single path, for example, when a switch or array port is taken offline. You can test path failover by physically removing fibre cables or taking ports offline using Data ONTAP commands.

The procedure you use to test path failover differs slightly, depending on whether you are testing a stand-alone system or an HA pair.

Next topics

Verifying path failover for array LUNs in a stand-alone system

Use this procedure to demonstrate that a stand-alone V-Series system continues to operate on a single path.

Steps

1. Set your privilege level to advanced:

   priv set advanced

2. Set port *0a* offline using the following command:

   fcadmin offline 0a

3. Show the number of disks seen on each adapter using the following command:

   sysconfig

No disks will be assigned to adapter *0a*.

4. Show the primary and secondary paths using the following command:

   storage show disk -p

5. Return port *0a* to online:

   fcadmin online 0a

Verifying path failover for array LUNs in an HA pair

Use this procedure to demonstrate that cluster failover and then path failover occur in an HA pair of a V-Series system, so that the system can to continue to operate on a single path.

Steps

1. Set your privilege level to advanced:

   priv set advanced

   You will need to enter this command on the local and partner node.

2. On the local node, enter the following command to set port 0a offline (assuming the redundant port pair is 0a and 0c):

   fcadmin offline *0a*

3. Verify that only one path is available on the port pair:

   storage show disk -p

4. Enter the following command to initiate cluster takeover:

   cf takeover

5. On the partner node, enter the following command:

   cf giveback

6. After the partner node is back online, repeat Steps 1, 2, and 3 on the partner node.

Where to go from here

Product documentation for the storage system is available online and in printed format.

Documentation is available on the NOW site. You can also order printed copies from this Web site. See the *Release Notes* for information about this Data ONTAP release.

For information about...	Go to the NOW site for the...
New features, enhancements, known issues, and late-breaking news for your version of Data ONTAP software	*Data ONTAP 7-Mode Release Notes* for your version of Data ONTAP
Setting up and verifying software configuration	*Data ONTAP 7-Mode Software Setup Guide*
Managing all aspects of your system	Documentation for your version of Data ONTAP. See the *Data ONTAP 7-Mode Documentation Roadmap* for an overview.
Cabling, configuring, and disk ownership	*Data ONTAP 7-Mode High-Availability Configuration Guide* *Data ONTAP 7-Mode System Administration Guide* *Data ONTAP 7-Mode Data Protection Online Backup and Recovery Guide* *Data ONTAP 7-Mode Storage Management Guide*
Setting up and managing network configurations of storage systems	*Data ONTAP 7-Mode Network Management Guide*
Configuring and managing the FC protocol, and creating and managing LUNs and initiator groups with the FC service	*Data ONTAP 7-Mode Block Access Management Guide for iSCSI and FC*
The most current information about your system hardware	*Hardware Information Library* page
Hardware configuration options available for your system	*System Configuration Guide*
Troubleshooting your system	*Platform Monitoring Guide*
Testing field-replaceable units and diagnosing and correcting system hardware problems	*Diagnostics Guide*
Configuring Remote Management after initial setup	*Data ONTAP 7-Mode System Administration Guide*
Managing your disk shelves	DS14mk2 AT, DS14mk2 FC, or DS14mk4 FC *Hardware Guide* *DS4243 Installation and Service Guide*

Related information

Data ONTAP Information Library -- now.netapp.com/NOW/knowledge/docs/ontap/ontap_index.shtml

Hardware Information Library -- now.netapp.com/NOW/knowledge/docs/hardware/hardware_index.shtml

Time zones

You must select a valid time zone value from the lists provided, record it in the configuration worksheet, and enter the value at the `setup` prompt.

Data ONTAP uses time zones defined by the standard UNIX zoneinfo database. You can set your system time zone using one of the following types of terms:

* A geographic region, usually expressed as *area*/*location*
* Greenwich Mean Time (GMT) or the difference in hours from GMT
* A valid alias; that is, a term defined by the standard to refer to a geographic region or GMT
* A system-specific or other term not associated with a geographic region or GMT

The following are examples of valid aliases:

Alias	Standard reference
Jamaica	US/Eastern
Navajo	US/Mountain
UCT	GMT
UTC	
Universal	
Zulu	

In most cases, you should select an appropriate geographical or GMT term unless you have special requirements in your environment.

If you need to change your selected time zone after setup is complete, you can use the `timezone` command.

For more information about time zones in Data ONTAP, see the timezone(1) and zoneinfo(5) man pages.

Next topics

Time zones by geographical region

The names of geographical time zones that are valid in Data ONTAP combine an area and location, in which the latter can be a major city, region, or other geographical feature. You should find the most accurate combination for you and enter it at the `setup` prompt.

Africa

Africa/Abidjan	Africa/Djibouti	Africa/Maputo
Africa/Accra	Africa/Douala	Africa/Maseru
Africa/Addis_Ababa	Africa/Freetown	Africa/Mbabane
Africa/Algiers	Africa/Gaborone	Africa/Mogadishu
Africa/Asmera	Africa/Harare	Africa/Monrovia
Africa/Bamako	Africa/Johannesburg	Africa/Nairobi
Africa/Bangui	Africa/Kampala	Africa/Ndjamena
Africa/Banjul	Africa/Khartoum	Africa/Niamey
Africa/Bissau	Africa/Kigali	Africa/Nouakchott
Africa/Blantyre	Africa/Kinshasa	Africa/Ouagadougou
Africa/Brazzaville	Africa/Lagos	Africa/Porto-Novo
Africa/Bujumbura	Africa/Libreville	Africa/Sao_Tome
Africa/Cairo	Africa/Lome	Africa/Timbuktu
Africa/Casablanca	Africa/Luanda	Africa/Tripoli
Africa/Conakry	Africa/Lumumbashi	Africa/Tunis
Africa/Dakar	Africa/Lusaka	Africa/Windhoek
Africa/Dar_es_Salaam	Africa/Malabo	

America

America/Adak	America/Grenada	America/Noronha
America/Anchorage	America/Guadeloupe	America/Panama
America/Anguilla	America/Guatemala	America/Pangnirtung
America/Antigua	America/Guayaquil	America/Paramaribo

America/Aruba	America/Guyana	America/Phoenix
America/Asuncion	America/Halifax	America/Port_of_Spain
America/Atka	America/Havana	America/Port-au-Prince
America/Barbados	America/Indiana	America/Porto_Acre
America/Belize	America/Indianapolis	America/Puerto_Rico
America/Bogota	America/Inuvik	America/Rainy_River
America/Boise	America/Iqaluit	America/Rankin_Inlet
America/Buenos_Aires	America/Jamaica	America/Regina
America/Caracas	America/Jujuy	America/Rosario
America/Catamarca	America/Juneau	America/Santiago
America/Cayenne	America/Knox_IN	America/Santo_Domingo
America/Cayman	America/La_Paz	America/Sao_Paulo
America/Chicago	America/Lima	America/Scoresbysund
America/Cordoba	America/Los_Angeles	America/Shiprock
America/Costa_Rica	America/Louisville	America/St_Johns
America/Cuiaba	America/Maceio	America/St_Kitts
America/Curacao	America/Managua	America/St_Lucia
America/Dawson	America/Manaus	America/St_Thomas
America/Dawson_Creek	America/Martinique	America/St_Vincent
America/Denver	America/Mazatlan	America/Swift_Current
America/Detroit	America/Mendoza	America/Tegucigalpa
America/Dominica	America/Menominee	America/Thule
America/Edmonton	America/Mexico_City	America/Thunder_Bay
America/El_Salvador	America/Miquelon	America/Tijuana
America/Ensenada	America/Montevideo	America/Tortola
America/Fort_Wayne	America/Montreal	America/Vancouver
America/Fortaleza	America/Montserrat	America/Virgin
America/Glace_Bay	America/Nassau	America/Whitehorse

America/Godthab	America/New_York	America/Winnipeg
America/Goose_Bay	America/Nipigon	America/Yakutat
America/Grand_Turk	America/Nome	America/Yellowknife

Antarctica

Antarctica/Casey	Antarctica/Mawson	Antarctica/Palmer
Antarctica/DumontDUrville	Antarctica/McMurdo	Antarctica/South_Pole

Asia

Asia/Aden	Asia/Irkutsk	Asia/Qatar
Asia/Alma-Ata	Asia/Ishigaki	Asia/Rangoon
Asia/Amman	Asia/Istanbul	Asia/Riyadh
Asia/Anadyr	Asia/Jakarta	Asia/Saigon
Asia/Aqtau	Asia/Jayapura	Asia/Seoul
Asia/Aqtobe	Asia/Jerusalem	Asia/Shanghai
Asia/Ashkhabad	Asia/Kabul	Asia/Singapore
Asia/Baghdad	Asia/Kamchatka	Asia/Taipei
Asia/Bahrain	Asia/Karachi	Asia/Tashkent
Asia/Baku	Asia/Kashgar	Asia/Tbilisi
Asia/Bangkok	Asia/Katmandu	Asia/Tehran
Asia/Beirut	Asia/Krasnoyarsk	Asia/Tel_Aviv
Asia/Bishkek	Asia/Kuala_Lumpur	Asia/Thimbu
Asia/Brunei	Asia/Kuching	Asia/Tokyo
Asia/Calcutta	Asia/Kuwait	Asia/Ujung_Pandang
Asia/Chungking	Asia/Macao	Asia/Ulan_Bator
Asia/Colombo	Asia/Magadan	Asia/Urumqi
Asia/Dacca	Asia/Manila	Asia/Vientiane
Asia/Damascus	Asia/Muscat	Asia/Vladivostok
Asia/Dubai	Asia/Nicosia	Asia/Yakutsk

Asia/Dushanbe	Asia/Novosibirsk	Asia/Yekaterinburg
Asia/Gaza	Asia/Omsk	Asia/Yerevan
Asia/Harbin	Asia/Phnom_Penh	
Asia/Hong_Kong	Asia/Pyongyang	

Atlantic

Atlantic/Azores	Atlantic/Faeroe	Atlantic/South_Georgia
Atlantic/Bermuda	Atlantic/Jan_Mayen	Atlantic/St_Helena
Atlantic/Canary	Atlantic/Madeira	Atlantic/Stanley
Atlantic/Cape_Verde	Atlantic/Reykjavik	

Australia

Australia/ACT	Australia/LHI	Australia/Queensland
Australia/Adelaide	Australia/Lindeman	Australia/South
Australia/Brisbane	Australia/Lord Howe	Australia/Sydney
Australia/Broken_Hill	Australia/Melbourne	Australia/Tasmania
Australia/Canberra	Australia/NSW	Australia/Victoria
Australia/Darwin	Australia/North	Australia/West
Australia/Hobart	Australia/Perth	Australia/Yancowinna

Brazil

Brazil/Acre	Brazil/East
Brazil/DeNoronha	Brazil/West

Canada

Canada/Atlantic	Canada/Eastern	Canada/Pacific
Canada/Central	Canada/Mountain	Canada/Saskatchewan
Canada/East- Saskatchewan	Canada/Newfoundland	Canada/Yukon

Chile

Chile/Continental	Chile/EasterIsland

Europe

Europe/Amsterdam	Europe/Kiev	Europe/San_Marino
Europe/Andorra	Europe/Kuybyshev	Europe/Sarajevo
Europe/Athens	Europe/Lisbon	Europe/Simferopol
Europe/Belfast	Europe/Ljubljana	Europe/Skopje
Europe/Belgrade	Europe/London (BST)	Europe/Sofia
Europe/Berlin	Europe/Luxembourg	Europe/Stockholm
Europe/Bratislava	Europe/Madrid	Europe/Tallinn
Europe/Brussels	Europe/Malta	Europe/Tirane
Europe/Bucharest	Europe/Minsk	Europe/Vaduz
Europe/Budapest	Europe/Monaco	Europe/Vatican
Europe/Chisinau	Europe/Moscow	Europe/Vienna
Europe/Copenhagen	Europe/Oslo	Europe/Vilnius
Europe/Dublin	Europe/Paris	Europe/Warsaw
Europe/Gibraltar	Europe/Prague	Europe/Zagreb
Europe/Helsinki	Europe/Riga	Europe/Zurich
Europe/Istanbul	Europe/Rome	

Indian (Indian Ocean)

Indian/Antananarivo	Indian/Comoro	Indian/Mauritius
Indian/Chagos	Indian/Kerguelen	Indian/Mayotte
Indian/Christmas	Indian/Mahe	Indian/Reunion
Indian/Cocos	Indian/Maldives	

Mexico

Mexico/BajaNorte	Mexico/BajaSur	Mexico/General

Pacific

Pacific/Apia	Pacific/Johnston	Pacific/Ponape
Pacific/Auckland	Pacific/Kiritimati	Pacific/Port_Moresby
Pacific/Chatham	Pacific/Kosrae	Pacific/Rarotonga
Pacific/Easter	Pacific/Kwajalein	Pacific/Saipan
Pacific/Efate	Pacific/Majuro	Pacific/Samoa
Pacific/Enderbury	Pacific/Marquesas	Pacific/Tahiti
Pacific/Fakaofo	Pacific/Midway	Pacific/Tarawa
Pacific/Fiji	Pacific/Nauru	Pacific/Tongatapu
Pacific/Funafuti	Pacific/Niue	Pacific/Truk
Pacific/Galapagos	Pacific/Norfolk	Pacific/Wake
Pacific/Gambier	Pacific/Noumea	Pacific/Wallis
Pacific/Guadalcanal	Pacific/Pago_Pago	Pacific/Yap
Pacific/Guam	Pacific/Palau	
Pacific/Honolulu	Pacific/Pitcairn	

GMT offset and miscellaneous time zones

If you are not using a standard geographical time zone, you must select a GMT value or other valid term and enter it at the setup prompt.

Tables in this section contain the following valid time zone values:

* Time zones defined by GMT offset (how many hours different they are from Greenwich Mean Time)
* Time zones that are not associated with a geographical region
* Regional time zones that are not grouped by major land mass

GMT

GMT	GMT+9	GMT-5
GMT+1	GMT+10	GMT-6
GMT+2	GMT+11	GMT-7
GMT+3	GMT+12	GMT-8

GMT+4	GMT+13	GMT-9
GMT+5	GMT-1	GMT-10
GMT+6	GMT-2	GMT-11
GMT+7	GMT-3	GMT-12
GMT+8	GMT-4	

Etc

Etc/GMT	Etc/GMT+11	Etc/GMT-9
Etc/GMT+0	Etc/GMT+12	Etc/GMT-10
Etc/GMT+1	Etc/GMT0	Etc/GMT-11
Etc/GMT+2	Etc/GMT-0	Etc/GMT-12
Etc/GMT+3	Etc/GMT-1	Etc/GMT-13
Etc/GMT+4	Etc/GMT-2	Etc/GMT-14
Etc/GMT+5	Etc/GMT-3	Etc/Greenwich
Etc/GMT+6	Etc/GMT-4	Etc/UCT
Etc/GMT+7	Etc/GMT-5	Etc/Universal
Etc/GMT+8	Etc/GMT-6	Etc/UTC
Etc/GMT+9	Etc/GMT-7	Etc/Zulu
Etc/GMT+10	Etc/GMT-8	

Miscellaneous

Arctic/Longyearbyen	HST	Portugal
CET	Iceland	PRC
CST6CDT	Iran	PST8PDT
Cuba	Israel	ROC
EET	Japan	ROK
Egypt	Kwajalein	Singapore
Eire	Libya	Turkey
EST	MET	UCT

EST5EDT	MST	Universal
Factory	MST7MDT	UTC
GB	Navajo	WET
GB-Eire	NZ	W-SU
Greenwich	NZ-CHAT	Zulu
Hongkong	Poland	

System V

SystemV/AST4	SystemV/EST5EDT	SystemV/PST8PDT
SystemV/AST4ADT	SystemV/HST10	SystemV/YST9
SystemV/CST6	SystemV/MST7	SystemV/YST9YDT
SystemV/CST6CDT	SystemV/MST7MDT	
SystemV/EST5	SystemV/PST8	

Supported languages

You must select a supported language from the list provided and record its abbreviation in the configuration worksheet.

Next topics

Specifying the language code

When you enter language codes during setup, you might need to specify a suffix, such as UTF-8.

Step

1. When prompted during setup, enter the code that corresponds to the appropriate language. To use UTF-8 as the NFS character set, append UTF-8 to the abbreviation.

   Example

   ```
   ko.UTF-8
   ```

Language choices

When you respond to the setup prompt for language, you need to enter the language code (abbreviation).

Note: You can also view supported languages and their abbreviations by entering `vol lang` at the storage system prompt.

Language	Abbreviation	Language	Abbreviation
Arabic	ar	Norwegian	no
Croatian	hr	Polish	pl
Czech	cs	Portugese	pt
Danish	da	POSIX	C
Dutch	nl	Romanian	ro
English	en	Russian	ru

Language	Abbreviation	Language	Abbreviation
English (U.S.)	en_US	Simplified Chinese	zh
Finnish	fi	Simplified Chinese (GBK)	zh.GBK
French	fr	Slovak	sk
German	de	Slovenian	sl
Hebrew	he	Spanish	es
Hungarian	hu	Swedish	sv
Italian	it	Traditional Chinese euc-tw	zh_TW
Japanese euc-j	ja	Traditional Chinese Big 5	zh_TW.BIG5
Japanese PCK (sjis)	ja_JP.PCK	Turkish	tr
Korean	ko		

What to do if the system does not boot when powered on

If your system does not boot when you power it on for the first time, you can troubleshoot the problem by following a series of steps appropriate to your system.

For 31xx or FAS2040 systems, use the procedure provided in this guide.

For the following systems, use the procedure provided with the *Installation and Setup Instructions* that shipped with your system hardware.

- 60xx
- 30xx
- SA600 and SA300

Troubleshooting if the FAS31xx or FAS2040 system does not boot

If your FAS31xx or FAS2040 system does not boot when you power it on, you can troubleshoot the problem by following a series of steps.

Steps

1. Look for a description of the problem on the console.

   Follow any instructions provided on the console.

2. Check all cables and connections, making sure they are secure.

3. Ensure that power is supplied and is reaching your system from the power source.

4. Make sure that the power supplies on your controller and disk shelves are working.

If the LEDs on a power supply are...	Then...
Illuminated	Proceed to the next step.
Not illuminated	Remove the power supply and reinstall it, making sure that it connects with the backplane.

5. Verify disk shelf compatibility and check the disk shelf IDs.

6. Ensure that the Fibre Channel disk shelf speed is correct.

   If you have DS14mk2 FC and DS14mk4 FC shelves mixed in the same loop, set the shelf speed to 2 Gb, regardless of module type.

7. Check disk ownership to ensure that the disks are assigned to the system:

   a. Verify that disks are assigned to the system by entering **disk show**.

   b. Validate that storage is attached to the system, and verify any changes you made, by entering **disk show -v**.

8. Turn off your controller and disk shelves, and then turn on the disk shelves.

   For information about LED responses, check the quick reference card that came with the disk shelf or the hardware guide for your disk shelf.

9. Use the onboard diagnostics to check that Fibre Channel disks in the storage system are operating properly.

   a. Turn on your system and press Ctrl-C. Enter **boot_diags** at the LOADER> prompt.

   b. Enter **fcal** in the Diagnostic Monitor program that starts at boot.

   c. Enter **73** at the prompt to show all disk drives.

   d. Exit the Diagnostic Monitor by entering **99** at the prompt, as needed.

   e. Enter the **exit** command to return to LOADER.

   f. Start Data ONTAP by entering **autoboot** at the prompt.

10. Use the onboard diagnostics to check that SAS disks in the storage system are operating properly.

    a. Enter **mb** in the Diagnostic Monitor program.

    b. Enter **6** to select the SAS test menu.

    c. Enter **42** to scan and show disks on the selected SAS.

       This displays the number of SAS disks.

    d. Enter **72** to show the attached SAS devices.

    e. Exit the Diagnostic Monitor by entering **99** at the prompt, as needed.

    f. Enter the **exit** command to return to LOADER.

    g. Start Data ONTAP by entering **autoboot** at the prompt.

11. Try booting your system again.

If your system...	Then...
Boots successfully	Proceed to set up the software.
Does not boot successfully	Call NetApp technical support at +1 (888) 4-NETAPP. The system might not have the boot image downloaded on the boot device.

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