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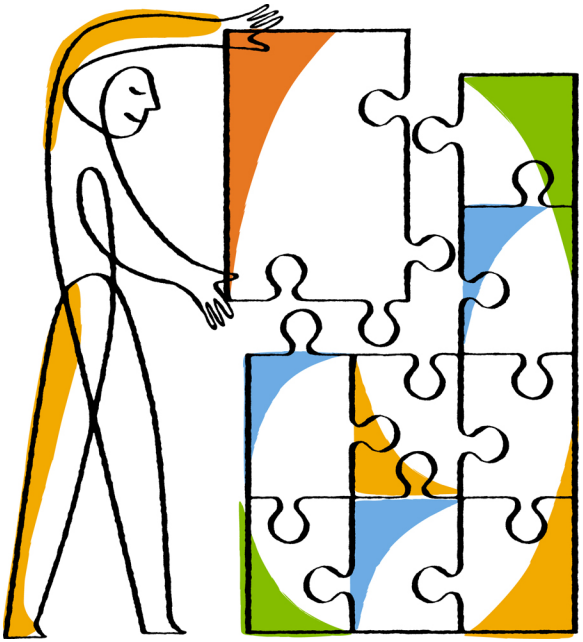
Clustered Data ONTAP® 8.2

Software Setup Guide



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Contents

Preparing for the software setup process

Before setting up the software, you must complete the software setup prerequisites, register on the NetApp Support Site, and gather cluster and Storage Virtual Machine (SVM) configuration information.

Requirements for software setup

Before you begin the software setup process, you should ensure that you have met the training, site, and installation requirements.

Training requirements

You should have completed the NetApp training program specific to your role. For more information, see the Customer Learning Map at the NetApp LearningCenter.

Site requirements

Your site must meet the physical, connectivity, power, and model-specific requirements for your cluster. For more information, see the *Site Requirements Guide*.

Hardware installation requirements

Each of the following hardware components should be installed:

- The controllers and disk shelves should be racked and cabled according to the *Installation and Setup Instructions* for your platform and the *Clustered Data ONTAP High-Availability Configuration Guide*.
- If you are setting up a switched cluster, the cluster management and interconnect switches should be installed and configured according to the *Clustered Data ONTAP Switch Setup Guide for Cisco Switches*.
- If your cluster uses array LUNs, then you should have reviewed the *FlexArray Virtualization Installation Requirements and Reference Guide*, and the *FlexArray Virtualization Implementation Guide for Third-Party Storage*.
- The serial console should be connected to the cluster.

Related information

The NetApp Support Site: support.netapp.com

Customer Learning Map: learningcenter.netapp.com/content/public/production/learning_maps/customer/lm_customer_t1.html

Registering on the NetApp Support Site

Registering on the NetApp Support Site involves creating a new user account and registering your installed products. After registering, you can access customized support information for your cluster, find troubleshooting information and product documentation, download software and firmware, and request technical assistance.

About this task

You should plan for one business day for your new user account request to be processed. For additional information and best practices about the NetApp Support Site, see the *NetApp Support Owner's Manual*.

Steps

1. Go to the NetApp Support Site at *support.netapp.com*.
2. Click **Register Now**, and follow the instructions on the page to register as a new user.

   You will be notified by email when your registration request has been processed. This process takes about a day.
3. Click **My Support > Register Products**, and follow the instructions on the page to register your new cluster.

   Registering your cluster ensures that NetApp can provide you with support for your installed products.

Related information

NetApp Support Owner's Manual: support.netapp.com/NOW/products/globalservices

Completing the cluster setup worksheet

Use this worksheet to record the values that you need during the cluster setup process. If a default value is provided, you can use that value or else enter your own.

System defaults (for clusters configured to use network switches)

The system defaults are the default values for the private cluster network. It is best to use these default values. However, if they do not meet your requirements, you can use the table below to record your own values.

You only need to consider the system defaults for clusters that are connected using network switches. Single-node clusters and two-node switchless clusters do not use a cluster network.

Types of information	Default	Your values
Private cluster network ports	See the *Clustered Data ONTAP Network Management Guide*.	
MTU size for cluster ports Every node in the cluster must have the same MTU size as the cluster interconnect switches.	9000 bytes	
Cluster network netmask	255.255.0.0	
Cluster interface IP addresses (for each cluster network port on each node) The IP addresses for each node must be on the same subnet.	169.254.x.x	

Cluster information

Types of information	Your values
Cluster name The name must begin with a letter, and it must be fewer than 44 characters. The name can include the following special characters: ".", "-", and "_".	
Cluster base license key To get this license key, go to the NetApp Support Site at *support.netapp.com* and click **My Support > Software Licenses**.	

Feature license keys

You can find license keys for your initial or add-on software orders at the NetApp Support Site under **My Support > Software Licenses**. For instance, you can search with the serial number of a node to find all license keys associated with the node. Your search results will include license information for all nodes in the cluster. You can also search by cluster serial number or sales order number. If you cannot locate your license keys from the Software Licenses page, you should contact your sales or support representative.

Types of information	Your values
Feature license keys	

Admin Storage Virtual Machine (SVM)

Types of information	Your values
Cluster administrator password The password for the admin account that the cluster requires before granting cluster administrator access to the console or through a secure protocol. The default rules for passwords are as follows: • A password must be at least eight characters long. • A password must contain at least one letter and one number.	

Types of information	**Your values**
Cluster management interface port The physical port that is connected to the data network and enables the cluster administrator to manage the cluster. Because the cluster management interface can fail over to any node in the cluster, the cluster management interface port should have a port role of data.	
Cluster management interface IP address A unique IP address for the cluster management interface. The cluster administrator uses this address to access the admin SVM and manage the cluster. Typically, this address should be on the data network. You can obtain this IP address from the administrator responsible for assigning IP addresses in your organization. Example: 192.0.2.66	
Cluster management interface netmask The subnet mask that defines the range of valid IP addresses on the cluster management network. Example: 255.255.255.0	
Cluster management interface default gateway The IP address for the router on the cluster management network.	
DNS domain name The name of your network's DNS domain. The domain name must consist of alphanumeric characters. To enter multiple DNS domain names, separate each name with either a comma or a space.	
Name server IP addresses The IP addresses of the DNS name servers. Separate each address with either a comma or a space.	

Node information (for each node in the cluster)

Types of information	Your values
Physical location of the controller A description of the physical location of the controller. Use a description that identifies where to find this node in the cluster (for example, "Lab 5, Row 7, Rack B").	
Node management interface port The physical port that is connected to the node management network and enables the cluster administrator to manage the node. Because the node management interface does not fail over, the node management interface port should typically have a port role of node management; however, if necessary, it can reside on a data port.	
Node management interface IP address A unique IP address for the node management interface on the management network. If you defined the node management interface port to be a data port, then this IP address should be a unique IP address on the data network. You can obtain this IP address from the administrator responsible for assigning IP addresses in your organization. Example: 192.0.2.66	
Node management interface netmask The subnet mask that defines the range of valid IP addresses on the node management network. If you defined the node management interface port to be a data port, then the netmask should be the subnet mask for the data network. Example: 255.255.255.0	
Node management interface default gateway The IP address for the router on the node management network.	

Types of information	Your values
System configuration backup destination address (single-node clusters only) The remote URL where the cluster configuration backups will be uploaded. You can specify either an HTTP or FTP address. **Note:** The web server that serves the remote URL must have PUT operations enabled.	
User name for the configuration backup destination address (single-node clusters only) The user name required to log in to the remote URL and upload the configuration backup file.	
Password for the configuration backup destination address (single-node clusters only) The password for the remote URL, if the user name requires a password.	
Service Processor (SP) interface IP address* The IP address for the node's SP.	
SP interface netmask* The subnet mask that defines the range of valid IP addresses on the SP network.	
SP interface default gateway* The IP address of the gateway for the SP network.	

* The Cluster Setup wizard provides you with the option to enable the SP network to use DHCP. If you intend to use DHCP, you do not need to gather the SP network values; they will be configured automatically using DHCP.

NTP server information

Types of information	Your values
NTP server address The IP address(es) of the Network Time Protocol (NTP) server at your site. This server is used to synchronize the time across the cluster.	

Completing the SVM setup worksheet

Before you start the Vserver Setup wizard to create and configure a Storage Virtual Machine (SVM), you must gather the required information to complete the wizard successfully.

Note: You can create and configure only SVMs with FlexVol volumes by using the Vserver Setup wizard.

The Vserver Setup wizard has the following subwizards, which you can run after you create the SVM:

- Network setup
- Storage setup
- Services setup
- Data access protocol setup

Each subwizard has its specific requirements, depending on the types of services, protocols, and protocol traffic.

You can use the following worksheet to record values for the setup process:

SVM information

Types of information	Your values
SVM name SVM names can contain a period (.), a hyphen (-), or an underscore (_), but must not start with a hyphen, period, or number. The maximum number of characters allowed in SVM names is 47. **Note:** SVM names must be unique across clusters. You must use the fully qualified domain name (FQDN) of the SVM or another convention that ensures unique SVM names across clusters.	
Data protocols Protocols that you want to configure or allow on that SVM.	
Client services Services that you want to configure on the SVM.	

Types of information	Your values
Aggregate name Aggregate on which you want to create the root volume for the SVM. The default aggregate name is used if you do not specify one.	
Language setting If you do not specify the language, the default language `C.UTF-8` or `POSIX.UTF-8` is used. The language is set for the SVM, which determines the language setting for each volume in that SVM unless you change the setting when you create the volume. For more information about the available language options, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.	
SVM root volume's security style Determines the type of permissions that can be used to control data access to a volume. For more information about the security styles, see the *Clustered Data ONTAP File Access Management Guide for CIFS* or *Clustered Data ONTAP File Access Management Guide for NFS*.	

Information for creating volumes on the SVM

Types of information	Values
Volume name The default volume name is used if you do not specify one.	
Aggregate name Aggregate on which you want to create the volume. The default aggregate name is used if you do not specify one.	
Volume size Size of the volume	

Types of information	Values
Volume junction path The default junction path is used if you do not specify one.	

Information for creating an IP network interface on the SVM

Types of information	Values
LIF name The default LIF name is used if you do not specify one.	
Protocols Protocols that can use the LIF. You cannot modify this value after the LIF is created.	
Home node The node on which you want to create a LIF. The default home node is used if you do not specify one.	
Home port The port on which you want to create a LIF. The default home port is used if you do not specify one.	
IP address	
Network mask	
Default gateway IP address	

Information for creating an FC network interface on the SVM

Types of information	Values
LIF name The default LIF name is used if you do not specify one.	
Protocols Protocols that can use the LIF. You cannot modify this value after the LIF is created.	

Types of information	Values
Home node The node on which you want to create a LIF. The default home node is used if you do not specify one.	
Home port The port on which you want to create a LIF. The default home port is used if you do not specify one.	

Information for configuring LDAP

Types of information	Values
LDAP server IP address	
LDAP server port number The default LDAP server port number is used if you do not specify one.	
LDAP server minimum bind authentication level	
Bind domain name and *password*	
Base domain name	

Information for configuring NIS

Types of information	Values
NIS domain name	
IP addresses of the NIS servers	

Information for configuring DNS

Types of information	Values
DNS domain name	
IP addresses of the DNS servers	

Information for configuring NFS

You do not need to enter any information to configure NFS on the SVM. The NFS configuration is created when you specify the protocol value as `nfs`.

Information for configuring CIFS

Types of information	Values
Domain name	
CIFS share name The default CIFS share name is used if you do not specify one. **Note:** You must not use space characters or Unicode characters in CIFS share names. You can use alphanumeric characters and any of the following special characters: ! @ # $ % & ( ) _ ' { } . ~ -	
CIFS share path The default CIFS share path is used if you do not specify one.	
CIFS access control list The default CIFS access control list is used if you do not specify one.	

Information for configuring iSCSI

Types of information	Values
igroup name The default igroup name is used if you do not specify one.	
Names of the initiators	
Operating system type of the initiator	
LUN name The default LUN name is used if you do not specify one.	
Volume for LUN Volume that is to be used for the LUN.	
LUN size	

Information for configuring Fibre Channel (FC) (including FCoE)

Types of information	Values
igroup name The default igroup name is used if you do not specify one.	
Worldwide port number (WWPN) of the initiators	
Operating system type of the initiator	
LUN name The default LUN name is used if you do not specify one.	
Volume for LUN Volume that is to be used for the LUN.	
LUN size	

Setting up the cluster

Setting up the cluster involves creating the cluster on the first node, joining any remaining nodes to the cluster, and configuring a number of features—such as synchronizing the system time—that enable the cluster to operate nondisruptively.

Steps

1. Creating the cluster on the first node on page 19
   You use the Cluster Setup wizard to create the cluster on the first node. The wizard helps you to configure the cluster network that connects the nodes (if the cluster consists of two or more nodes), create the cluster admin Storage Virtual Machine (SVM), add feature license keys, and create the node management interface for the first node.
2. Joining a node to the cluster on page 20
   After creating a new cluster, you use the Cluster Setup wizard to join each remaining node to the cluster one at a time. The wizard helps you to configure each node's node management interface.
3. Rebooting each node's Service Processor on page 21
   After joining each node to the cluster, you should reboot the Service Processor (SP) on each node to ensure that the hardware-assisted takeover feature is configured with the correct IP address for each node's SP.
4. Synchronizing the system time across the cluster on page 22
   Synchronizing the time ensures that every node in the cluster has the same time, and prevents CIFS and Kerberos failures.
5. Setting up AutoSupport on page 23
   You can control whether and how AutoSupport information is sent to technical support and your internal support organization, and then test that the configuration is correct.
6. Setting up the Event Management System on page 25
   You can configure EMS to reduce the number of event messages that you receive, and to set up the event destinations and the event routes for a particular event severity.
7. Setting up the Service Processor on page 28
   Before you can access the SP of a node, the SP network must be configured and enabled. You can configure the SP to use IPv4, IPv6, or both. The SP IPv4 configuration supports static and DHCP addressing, and the SP IPv6 configuration supports static addressing only.
8. Renaming a node on page 29
   You can change a node's name as needed.

Creating the cluster on the first node

You use the Cluster Setup wizard to create the cluster on the first node. The wizard helps you to configure the cluster network that connects the nodes (if the cluster consists of two or more nodes), create the cluster admin Storage Virtual Machine (SVM), add feature license keys, and create the node management interface for the first node.

Before you begin

The cluster setup worksheet should be completed, the storage system hardware should be installed and cabled, and the console should be connected to the node on which you intend to create the cluster.

Steps

1. Power on the first node.

   The node boots, and the Cluster Setup wizard starts on the console.

```
Welcome to the cluster setup wizard.

You can enter the following commands at any time:
  "help" or "?" - if you want to have a question clarified,
  "back" - if you want to change previously answered questions, and
  "exit" or "quit" - if you want to quit the cluster setup wizard.
     Any changes you made before quitting will be saved.

You can return to cluster setup at any time by typing "cluster setup".
To accept a default or omit a question, do not enter a value.


Do you want to create a new cluster or join an existing cluster?
{create, join}:
```

   Note: If a login prompt appears instead of the Cluster Setup wizard, you must start the wizard by logging in using the factory default setting, and then entering the `cluster setup` command.

2. Create a new cluster:

   `create`

3. Follow the prompts to complete the Cluster Setup wizard:

   - To accept the default value for a prompt, press Enter.
     The default values are determined automatically based on your platform and network configuration.
   - To enter your own value for the prompt, enter the value, and then press Enter.

4. After the Cluster Setup wizard is completed and exits, verify that the cluster is active and the first node is healthy:
   `cluster show`

   Example

   The following example shows a cluster in which the first node (cluster1-01) is healthy and eligible to participate:

```
cluster1::> cluster show
Node                  Health  Eligibility
--------------------- ------- ------------
cluster1-01           true    true
```

   You can access the Cluster Setup wizard to change any of the values you entered for the admin SVM or node SVM by using the `cluster setup` command.

After you finish

If the cluster consists of two or more nodes, you should join each remaining node to the cluster.

Joining a node to the cluster

After creating a new cluster, you use the Cluster Setup wizard to join each remaining node to the cluster one at a time. The wizard helps you to configure each node's node management interface.

Before you begin

The cluster must be created on the first node.

About this task

You can only join one node to the cluster at a time. When you start to join a node to the cluster, you must complete the join, and the node must be part of the cluster before you can start to join the next node.

Steps

1. Power on the node.

   The node boots, and the Cluster Setup wizard starts on the console.

```
Welcome to the cluster setup wizard.

You can enter the following commands at any time:
  "help" or "?" - if you want to have a question clarified,
  "back" - if you want to change previously answered questions, and
  "exit" or "quit" - if you want to quit the cluster setup wizard.
```

```
     Any changes you made before quitting will be saved.

You can return to cluster setup at any time by typing "cluster setup".
To accept a default or omit a question, do not enter a value.


Do you want to create a new cluster or join an existing cluster?
{create, join}:
```

2. Enter the following command to join the node to the cluster:

   `join`

3. Follow the prompts to set up the node and join it to the cluster:

   - To accept the default value for a prompt, press Enter.
   - To enter your own value for the prompt, enter the value, and then press Enter.

4. After the Cluster Setup wizard is completed and exits, verify that the node is healthy and eligible to participate in the cluster:

   `cluster show`

   Example

   The following example shows a cluster after the second node (cluster1-02) has been joined to the cluster:

   ```
   cluster1::> cluster show
   Node                  Health  Eligibility
   --------------------- ------- ------------
   cluster1-01           true    true
   cluster1-02           true    true
   ```

   You can access the Cluster Setup wizard to change any of the values you entered for the admin SVM or node SVM by using the `cluster setup` command.

5. Repeat this task for each remaining node.

Rebooting each node's Service Processor

After joining each node to the cluster, you should reboot the Service Processor (SP) on each node to ensure that the hardware-assisted takeover feature is configured with the correct IP address for each node's SP.

Step

1. Reboot the SP for each node:

   `system node service-processor reboot-sp -node` ***`node_name`***

Synchronizing the system time across the cluster

Synchronizing the time ensures that every node in the cluster has the same time, and prevents CIFS and Kerberos failures.

Before you begin

A Network Time Protocol (NTP) server should be set up at your site.

About this task

You synchronize the time across the cluster by associating each node in the cluster with the NTP server. For more information about managing the system time, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Steps

1. Verify that the system time and time zone is set correctly for each node.

   All nodes in the cluster should be set to the same time zone.

   a) Use the `cluster date show` command to display the current date, time, and time zone for each node.

   Example

   ```
   cluster1::> cluster date show
   Node         Date                Timezone
   ------------ ------------------- -----------------
   cluster1-01  04/06/2013 09:35:15 America/New_York
   cluster1-02  04/06/2013 09:35:15 America/New_York
   cluster1-03  04/06/2013 09:35:15 America/New_York
   cluster1-04  04/06/2013 09:35:15 America/New_York
   cluster1-05  04/06/2013 09:35:15 America/New_York
   cluster1-06  04/06/2013 09:35:15 America/New_York
   6 entries were displayed.
   ```

   b) Optional: Use the `cluster date modify` command to change the date or time zone for all of the nodes.

   Example

   This example changes the time zone for the cluster to be GMT:

   ```
   cluster1::> cluster date modify -timezone GMT
   ```

2. For each node in the cluster, use the `system services ntp server create` command to associate the node with your NTP server.

Note: The following examples assume that DNS has been configured for the cluster. If you have not configured DNS, you must specify the IP address of the NTP server.

Example

The following example associates a node named cluster1-01 with an NTP server named ntp1.example.com that is running the highest-numbered version of NTP available:

```
cluster1::> system services ntp server create -node cluster1-01 -
server ntp1.example.com -version max
```

3. Use the `system services ntp server show` command to verify that each node is associated with an NTP server.

Example

```
cluster1::> system services ntp server show
Node         Server                         Version
------------ ------------------------------ ----------
cluster1-01  ntp1.example.com               max
cluster1-02  ntp1.example.com               max
cluster1-03  ntp1.example.com               max
cluster1-04  ntp1.example.com               max
cluster1-05  ntp1.example.com               max
cluster1-06  ntp1.example.com               max
6 entries were displayed.
```

Setting up AutoSupport

You can control whether and how AutoSupport information is sent to technical support and your internal support organization, and then test that the configuration is correct.

About this task

Perform this procedure on each node in your system where you want to configure AutoSupport.

For more information about the following commands, see the man pages.

Steps

1. Ensure that AutoSupport is enabled by setting the `-state` parameter of the `system node autosupport modify` command to `enable`.
2. If you want technical support to receive AutoSupport messages, set the following parameters of the `system node autosupport modify` command:

   a) Set `-support` to `enable`.

b) Select a transport protocol for messages to technical support by setting `-transport` to `smtp`, `http`, or `https`.

c) If you chose HTTP or HTTPS as the transport protocol and you use a proxy, set `-proxy-url` to the URL of your proxy.

3. If you want your internal support organization or a support partner to receive AutoSupport messages, perform the following actions:

a) Identify the recipients in your organization by setting the following parameters of the `system node autosupport modify` command:

Set this parameter ...	To this...
`-to`	Up to five comma-separated individual email addresses or distribution lists in your internal support organization that will receive key AutoSupport messages
`-noteto`	Up to five comma-separated individual email addresses or distribution lists in your internal support organization that will receive a shortened version of key AutoSupport messages designed for cell phones and other mobile devices
`-partner-address`	Up to five comma-separated individual email addresses or distribution lists in your support partner organization that will receive all AutoSupport messages

b) Check that addresses are correctly configured by listing the destinations using the `system node autosupport destinations show` command.

4. If you are sending messages to your internal support organization or you chose SMTP transport for messages to technical support, configure SMTP by setting the following parameters of the `system node autosupport modify` command:

- Set `-mail-hosts` to one or more mail hosts, separated by commas.
  You can set a maximum of five.
- Set `-from` to the email address that sends the AutoSupport message.
- Set `-max-smtp-size` to the email size limit of your SMTP server.

5. If you want AutoSupport to specify a fully qualified domain name when it sends connection requests to your SMTP mail server, configure DNS.

For information about configuring DNS, see the *Clustered Data ONTAP Network Management Guide*.

6. Optional: Change the following settings:

If you want to do this...	Then set the following parameters of the `system node autosupport modify` command...
Hide private data by removing, masking, or encoding sensitive data in the messages	Set `-remove-private-data` to `true`. If you change from `false` to `true`, all AutoSupport history and all associated files are deleted.
Stop sending performance data in periodic AutoSupport messages	Set `-perf` to `false`.

7. Check the overall configuration using the `system node autosupport show` commandwith the `-node` parameter.
8. Test that AutoSupport messages are being sent and received:
   a) Use the `system node autosupport invoke` command with the `-type` parameter set to `test`.

      Example

      ```
      cluster1::> system node autosupport invoke -type test -node node1
      ```

   b) Confirm that NetApp is receiving your AutoSupport messages by checking the email addresses that were specified in the `autosupport.to` option.

      An automated response from the NetApp mail handler should have been sent to these email addresses.

   c) Optional: Confirm that the AutoSupport message is being sent to your internal support organization or to your support partner by checking the email of any address that you configured for the `-to` , `-noteto` , or `-partner-address` parameters of the `system node autosupport modify` command.

Setting up the Event Management System

You can configure EMS to reduce the number of event messages that you receive, and to set up the event destinations and the event routes for a particular event severity.

Steps

1. Display the mail server settings:

   `event config show`

Example

```
cluster1::> event config show

  Mail From: admin@localhost
Mail Server: localhost
```

2. Optional: If necessary, change the mail server settings to meet your requirements:

   event config modify -mailserver *name* -mailfrom *email address*

   Example

   The following example shows how to change the mail server and display the results:

```
cluster1::> event config modify -mailserver mailhost.example.com
-mailfrom admin@node1-example.com

cluster1::> event config show

  Mail From: admin@node1-example.com
Mail Server: mailhost.example.com
```

3. Create the destination for events by using the `event destination create` command.

   You can send events to email addresses, SNMP trap hosts, and syslog servers.

   Example

   The following command creates an email destination, sends all important events to the specified email address, and displays the results:

```
cluster1::> event destination create -name test_dest -mail
me@example.com

cluster1::> event destination show
                                                    Hide
Name      Mail Dest.      SNMP Dest.  Syslog Dest.  Params
--------  --------------- ----------- ------------- ------
allevents -               -           -             false
asup      -               -           -             false
criticals -               -           -             false
pager     -               -           -             false
test_dest me@example.com  -           -             false
traphost  -               -           -             false
```

4. Use the `event route add-destinations` command to define the severity level of messages to receive.

   You should set up event routes for critical and above events.

Example

The following example sends all critical, alert, and emergency events to the test_dest event destination:

```
cluster1::> event route add-destinations {-severity <=CRITICAL}
-destinations test_dest
```

5. To display all critical and above events, enter the following command:

   `event route show -severity <=CRITICAL`

Example

The following example shows the events with critical and above severity levels:

```
cluster1::> event route show -severity <=CRITICAL
                                                     Freq        Time
Message                Severity    Destinations     Threshd
Threshd
----------------------------------------------------------------------
--
adminapi.time.zoneDiff  ALERT       test_dest        0           3600
api.engine.killed       CRITICAL    test_dest        0           0
app.log.alert           ALERT       test_dest        0           0
app.log.crit            CRITICAL    test_dest        0           0
app.log.emerg           EMERGENCY   test_dest        0           0
```

6. If you are still getting too many event messages, use the `-timethreshold` parameter to specify how often events are sent to the destination.

Example

For example, the following event is sent to the destinations no more than once per hour:

```
cluster1::> event route modify -messagename adminapi.time.zoneDiff
-timethreshold 3600
```

Result

When you have completed these steps, all critical and above events are automatically sent to the destination specified in the event route.

Setting up the Service Processor

Before you can access the SP of a node, the SP network must be configured and enabled. You can configure the SP to use IPv4, IPv6, or both. The SP IPv4 configuration supports static and DHCP addressing, and the SP IPv6 configuration supports static addressing only.

Before you begin

To configure IPv6 connections for the SP, IPv6 must already be configured and enabled for Data ONTAP. The `network options ipv6` commands manage IPv6 settings for Data ONTAP. For more information about IPv6 configuration, see the *Clustered Data ONTAP Network Management Guide*.

Steps

1. Configure and enable the SP by using the `system node service-processor network modify` command.
   - The `-address-type` parameter specifies whether the IPv4 or IPv6 configuration of the SP is to be modified.
   - The `-enable` parameter enables the network interface of the specified IP address type.
   - The `-dhcp` parameter specifies whether to use the network configuration from the DHCP server or the network address that you provide.
     You can enable DHCP (by setting `-dhcp` to `v4`) only if you are using IPv4. You cannot enable DHCP for IPv6 configurations.
   - The `-ip-address` parameter specifies the public IP address for the SP.
   - The `-netmask` parameter specifies the netmask for the SP (if using IPv4.)
   - The `-prefix-length` parameter specifies the network prefix-length of the subnet mask for the SP (if using IPv6.)
   - The `-gateway` specifies the gateway IP address for the SP.

   For more information about the `system node service-processor network modify` command, see the man page.
2. Display the SP network configuration to verify the settings by using the `system node service-processor network show` command.

   For more information about the SP, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Example of configuring the SP network

The following example configures the SP of a node to use IPv4, enables the SP, and displays the SP network configuration to verify the settings.

```
cluster1::> system node service-processor network modify -node local
-address-type IPv4 -enable true -ip-address 192.168.123.98
-netmask 255.255.255.0 -gateway 192.168.123.1

cluster1::> system node service-processor network show -instance -node local

                          Node: node1
                  Address Type: IPv4
            Interface Enabled: true
               Type of Device: SP
                       Status: online
                  Link Status: up
                  DHCP Status: none
                   IP Address: 192.168.123.98
                  MAC Address: ab:cd:ef:fe:ed:02
                      Netmask: 255.255.255.0
 Prefix Length of Subnet Mask: -
   Router Assigned IP Address: -
        Link Local IP Address: -
           Gateway IP Address: 192.168.123.1


                          Node: node1
                  Address Type: IPv6
            Interface Enabled: false
               Type of Device: SP
                       Status: online
                  Link Status: disabled
                  DHCP Status: none
                   IP Address: -
                  MAC Address: ab:cd:ef:fe:ed:02
                      Netmask: -
 Prefix Length of Subnet Mask: -
   Router Assigned IP Address: -
        Link Local IP Address: -
           Gateway IP Address: -
2 entries were displayed.

cluster1::>
```

Renaming a node

You can change a node's name as needed.

Step

1. To rename a node, use the `system node rename` command.

   The maximum length of a node's name is 47 characters.

Example

The following command renames node “node1” to “node1a”:

```
cluster1::> system node rename -node node1 -newname node1a
```

Verifying cluster setup

Misconfiguring the cluster during cluster setup can result in errors that are difficult to troubleshoot. Accordingly, after setting up the cluster, you should complete verification tasks to ensure that the cluster is operational and configured according to your requirements.

Verifying cluster health

After completing cluster setup, you should verify that each node is healthy and eligible to participate in the cluster.

About this task

For more information about node health and eligibility, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Step

1. Use the `cluster show` command to view the status of each node.

Example

This example shows that each node is healthy and eligible as indicated by status `true` in the `Health` and `Eligibility` columns (Status `false` indicates a problem).

```
cluster1::> cluster show
Node                  Health  Eligibility
--------------------- ------- ------------
node0                 true    true
node1                 true    true
node2                 true    true
node3                 true    true
4 entries were displayed.
```

Verifying that the cluster is in quorum

After setting up the cluster, you must ensure that all nodes are participating in a replicated database (RDB) quorum and that all rings are in the quorum. You must also verify that the per-ring quorum master is the same for all nodes.

About this task

For more information about cluster replication rings and RDB quorums, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Steps

1. At the advanced privilege level, display each RDB process:

To display this RDB process...	Enter this command...
Management application	**cluster ring show -unitname mgmt**
Volume location database	**cluster ring show -unitname vldb**
Virtual-Interface manager	**cluster ring show -unitname vifmgr**
SAN management daemon	**cluster ring show -unitname bcomd**

Example

This example shows the volume location database process for a cluster running Data ONTAP 8.1.x:

```
cluster1::*> cluster ring show -unitname vldb

Node   UnitName Epoch DB Epoch DB Trnxs Master
------ -------- ----- -------- -------- ---------
node0  vldb     154   154      14847    node0
node1  vldb     154   154      14847    node0
node2  vldb     154   154      14847    node0
node3  vldb     154   154      14847    node0
4 entries were displayed.
```

Example

This example shows the volume location database process for a cluster running Data ONTAP 8.2.x:

```
cluster1::*> cluster ring show -unitname vldb
Node      UnitName Epoch    DB Epoch DB Trnxs Master    Online
--------- -------- -------- -------- -------- --------- ---------
node0     vldb     154      154      14847    node0     master
node1     vldb     154      154      14847    node0     secondary
```

```
node2     vldb     154      154      14847    node0     secondary
node3     vldb     154      154      14847    node0     secondary
4 entries were displayed.
```

For each process, verify the following configuration details:

- The relational database epoch and database epochs match for each node.
- The per-ring quorum master is the same for all nodes.
  Note that each ring might have a different quorum master.

2. If you are operating in a SAN environment, verify that each node is in a SAN quorum:

   `event log show -messagename scsiblade.*`

   The most recent `scsiblade` event message for each node should indicate that the scsi-blade is in quorum.

   If a node is out of SAN quorum, you can use the `storage failover takeover` and `storage failover giveback` commands to perform a planned takeover and giveback with the node's high-availability partner and bring the node back into SAN quorum.

Example

In this example, both nodes in the cluster are in SAN quorum.

```
cluster1::> event log show -messagename scsiblade.*
Time                Node              Severity      Event
------------------- ----------------- ------------- --------------------------
8/13/2013 14:03:51  node0             INFORMATIONAL scsiblade.in.quorum: The scsi-blade ...
8/13/2013 14:03:51  node1             INFORMATIONAL scsiblade.in.quorum: The scsi-blade ...
```

Verifying network connectivity

You should verify that the cluster, cluster management, and node management interfaces are configured correctly.

Steps

1. If the cluster has more than one node, at the advanced privilege level, use the `cluster ping-cluster` command to ping all combinations of the cluster LIFs from each node.

   If the cluster consists of a single node, you should skip this step.

Example

This example pings the cluster LIFs from node1.

```
cluster1::*> cluster ping-cluster -node node1
Host is node1
Getting addresses from network interface table...
Local = 10.254.231.102  10.254.91.42
```

```
Remote = 10.254.42.25    10.254.16.228
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 1500 byte MTU on 4 path(s):
    Local 10.254.231.102 to Remote 10.254.16.228
    Local 10.254.231.102 to Remote 10.254.42.25
    Local 10.254.91.42 to Remote 10.254.16.228
    Local 10.254.91.42 to Remote 10.254.42.25
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

Complete this step for each node in the cluster. For each node, you should verify the following:

- All of the paths are up.
- The pings are successful at each MTU size (1500, 4500, and 9000).

  If the pings are only successful for MTU size 1500, then verify that the cluster network switch and cluster ports are configured with the correct MTU sizes. For more information about configuring the MTU size for a port, see the *Clustered Data ONTAP Network Management Guide*.

2. Use the `network interface show` command to verify that the cluster management and node management LIFs are configured correctly.

Example

```
cluster1::> network interface show
            Logical    Status     Network            Current       Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port    Home
----------- ---------- ---------- ------------------ ------------- ------- ----
cluster1
            cluster_mgmt up/up    172.17.178.119/24  ie3070-1      e1a     true
node0
            clus1        up/up    172.17.177.120/24  ie3070-1      e0a     true
            clus2        up/up    172.17.177.121/24  ie3070-1      e0b     true
            mgmt1        up/up    172.17.178.120/24  ie3070-1      e1a     true
node1
            clus1        up/up    172.17.177.122/24  ie3070-2      e0a     true
            clus2        up/up    172.17.177.123/24  ie3070-2      e0b     true
            mgmt1        up/up    172.17.178.122/24  ie3070-2      e1a     true
node2
            clus1        up/up    172.17.177.124/24  ie3070-3      e0a     true
            clus2        up/up    172.17.177.125/24  ie3070-3      e0b     true
            mgmt1        up/up    172.17.178.124/24  ie3070-3      e1a     true
node3
            clus1        up/up    172.17.177.126/24  ie3070-4      e0a     true
            clus2        up/up    172.17.177.127/24  ie3070-4      e0b     true
            mgmt1        up/up    172.17.178.126/24  ie3070-4      e1a     true
```

For each cluster management and node management LIF, verify the following:

- The LIF is up.
- The IP address is configured correctly.

For more information about changing the configuration of a LIF, see the *Clustered Data ONTAP Network Management Guide*.

3. Use the `network port show` command to verify that the cluster, node management, and data ports are assigned correctly.

If the cluster consists of a single node, the node's ports will be assigned to the data and node management roles.

Example

```
cluster1::> network port show
                                      Auto-Negot  Duplex     Speed (Mbps)
Node   Port   Role     Link   MTU Admin/Oper  Admin/Oper Admin/Oper
------ ------ -------- ---- ----- ----------- ---------- ------------
node0
       e0a    cluster  up    9000  true/true  full/full   1000/1000
       e0b    cluster  up    9000  true/true  full/full   1000/1000
       e0c    data     up    1500  true/true  full/full   1000/1000
       e0d    data     up    1500  true/true  full/full   1000/1000
       e1a    mgmt     up    1500  true/true  full/full   1000/1000
node1
       e0a    cluster  up    9000  true/true  half/full     10/1000
       e0b    cluster  up    9000  true/true  half/full     10/1000
       e0c    data     up    1500  true/true  half/full     10/1000
       e0d    data     up    1500  true/true  half/full     10/1000
       e1a    mgmt     up    1500  true/true  full/full   1000/1000
node2
       e0a    cluster  up    9000  true/true  full/full   auto/1000
       e0b    cluster  up    9000  true/true  full/full   auto/1000
       e0c    data     up    1500  true/true  full/full   auto/1000
       e0d    data     up    1500  true/true  full/full   auto/1000
       e1a    mgmt     up    1500  true/true  full/full   auto/1000
node3
       e0a    cluster  up    9000  true/true  full/full   auto/1000
       e0b    cluster  up    9000  true/true  full/full   auto/1000
       e0c    data     up    1500  true/true  full/full   auto/1000
       e0d    data     up    1500  true/true  full/full   auto/1000
       e1a    mgmt     up    1500  true/true  full/full   auto/1000
```

Verify that each port has the correct role assigned for your platform. For more information about default port roles and changing the role assignment for a port, see the *Clustered Data ONTAP Network Management Guide*.

Verifying licensing

You should verify that the correct feature licenses are installed on your cluster.

About this task

For more information about feature licenses, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Step

1. Use the `system license show` command to verify that the correct feature licenses are installed on your cluster by verifying license names as listed in the `Description` column of the command output.

Example

```
cluster1::> system license show

Serial Number: 1-80-123456
Owner: cluster1
Package           Type    Description           Expiration
----------------- ------- --------------------- --------------------
Base              site    Cluster Base License  -
NFS               site    NFS License           -
CIFS              site    CIFS License          -
SnapRestore       site    SnapRestore License   -
SnapMirror        site    SnapMirror License    -
FlexClone         site    FlexClone License     -
SnapVault         site    SnapVault License     -
7 entries were displayed.
```

Verifying the configuration backup schedule for single node clusters

If the cluster consists of a single node, you should verify that the configuration backup schedule is configured to back up the cluster configuration to a remote URL. This ensures that you can recover the cluster's configuration even if the node is inaccessible.

About this task

For more information about backing up and restoring the cluster configuration, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.

Steps

1. Set the privilege level to advanced:

   set -privilege advanced

2. To verify that the cluster configuration backup files can be uploaded to the remote URL, create a test configuration backup file:

   system configuration backup create -node *node_name* -backup-name *configuration_backup_name* -backup-type cluster

   #### Example

   ```
   cluster1::*> system configuration backup create -node cluster1-01 -
   backup-name test_config_backup -backup-type cluster
   [Job 3592] Job is queued: Cluster Backup OnDemand Job.
   ```

3. Verify that the test configuration backup file can be uploaded to the remote URL:

   system configuration backup upload -node *node_name* -backup *configuration_backup_name* -destination *remote_URL*

   #### Example

   ```
   cluster1::*> system configuration backup upload -node cluster1-01 -
   backup test_config_backup.7z -destination ftp://www.example.com/
   config/uploads/testconfig
   ```

4. Return to the admin privilege level:

   set -privilege admin

Verifying the high-availability configuration

If the cluster consists of more than one node, you should verify that storage failover is configured for each HA pair. If you have a two-node cluster, then you should also verify that cluster high availability is configured.

About this task

Single node clusters do not use storage failover.

For more information about storage failover and cluster high availability, see the *Clustered Data ONTAP High-Availability Configuration Guide*.

Steps

1. Use the `storage failover show` command to verify that storage failover is enabled for each HA pair.

Example

```
cluster1::> storage failover show
                    Takeover
Node     Partner  Possible State
-------- -------- -------- ------------------
node0    node1    true     Connected to node1
node1    node0    true     Connected to node0
node2    node3    true     Connected to node3
node3    node2    true     Connected to node2
4 entries were displayed.
```

2. If the cluster consists of only two nodes (a single HA pair), then use the `cluster ha show` command to verify that cluster high availability is configured.

Example

```
cluster1::> cluster ha show
High Availability Configured: true
```

Testing storage failover

If the cluster consists of more than one node, you should verify that each node can successfully fail over to another node. This helps ensure that the cluster is configured correctly and that you can maintain access to data if a real failure occurs.

Before you begin

The cluster must consist of more than one node.

About this task

You should test storage failover on one HA pair at a time. To simplify troubleshooting if needed, do not try to fail over more than one node at a time.

For more information about storage failover, see the *Clustered Data ONTAP High-Availability Configuration Guide*.

Steps

1. Check the failover status by entering the following command:

   `storage failover show`

2. Take over the node by its partner using the following command:

   `storage failover takeover -ofnode` ***`nodename`***

Example

```
storage failover takeover -ofnode cluster1-02
```

3. Verify that failover was completed by using the **`storage failover show`** command.
4. Give back the storage to the original node by using the following command:

   `storage failover giveback -ofnode` ***`nodename`***

   Example

   ```
   storage failover giveback -ofnode cluster1-02
   ```

5. Verify that giveback was completed by using the **`storage failover show-giveback`** command.
6. Revert all LIFs back to their home nodes by entering the following command:

   `network interface revert *`

7. Repeat these steps for each remaining node in the cluster.

Setting up Storage Encryption

During initial setup, your storage system checks whether it is properly configured with self-encrypting disks and is running a version of Data ONTAP that supports Storage Encryption. If the check is successful, you can then launch the Storage Encryption setup wizard after completion of the storage system setup wizard.

What Storage Encryption is

Storage Encryption is an optional feature that you can enable for additional data protection. It is available on certain supported storage controllers and disk shelves that contain disks with built-in encryption functionality.

In a standard storage environment, data is written to disk in cleartext format. This makes the data vulnerable to potential exposure to unauthorized users when disks removed from a storage system are lost or stolen.

When you enable Storage Encryption, the storage system protects your data at rest by storing it on self-encrypting disks.

The authentication keys used by the self-encrypting disks are stored securely on external key management servers.

Limitations of Storage Encryption

You must keep certain limitations in mind when using Storage Encryption.

- For the latest information about which storage systems, disk shelves, and key management servers are supported with Storage Encryption, see the Interoperability Matrix.
- All disks in the storage system and optional attached disk shelves must have encryption functionality to be able to use Storage Encryption. You cannot mix regular non-encrypting disks with self-encrypting disks.
- Storage Encryption is not supported with Flash Pool aggregates.
- Storage Encryption `key_manager` commands are only available for local nodes.
  They are not available in takeover mode for partner nodes.
- Do not configure Storage Encryption to use 10 Gigabit network interfaces for communication with key management servers. This limitation does not apply to serving data.
- Storage Encryption supports a maximum of 128 authentication keys per key management server.
  You receive a warning when the number of stored authentication keys reaches 100. You cannot create new authentication keys when the number of stored authentication keys reaches the limit of 128. You must then delete unused authentication keys before you can create new ones.

Related information

Interoperability Matrix: support.netapp.com/matrix

Information to collect before configuring Storage Encryption

You must gather certain information to successfully set up Storage Encryption on your storage system.

Information to collect	Details	Required	Optional
Network interface name	You must provide the name of the network interface the storage system should use to communicate with external key management servers. **Note:** Do not configure 10 Gigabit network interfaces for communication with key management servers.	x	
Network interface IP address	You must provide the IP address of the network interface.	x	
Network interface subnet mask	You must provide the subnet mask of the network interface.	x	
Network interface gateway IP address	You must provide the IP address for the network interface gateway.	x	
IP address for external key management server	You must link the storage system to at least one external key management server during setup.	x	
IP address for additional external key management servers	You can link the storage system to multiple additional external key management servers during setup for redundancy.		x
Port number for each external key management server	You must provide the port number that each key management server listens on. The port number must be the same for all key management servers.	x	
Public SSL certificate for storage system	You must provide a public SSL certificate for the storage system to link it to the external key management server.	x	
Private SSL certificate for storage system	You must provide a private SSL certificate for the storage system.	x	

Information to collect	Details	Required	Optional
Public SSL certificate for external key management servers	You must provide a public SSL certificate for each external key management server to link it to the storage controller.	x	
Key tag name	You can provide a name that is used to identify all keys belonging to a particular storage system. The default key tag name is the system's host name.		x

Using SSL for secure key management communication

The storage system and key management servers use SSL connections to keep the communication between them secure. This requires you to obtain and install various SSL certificates for the storage system and each key management server before you can set up and configure Storage Encryption.

To avoid issues when installing SSL certificates, you should first synchronize the time between the following systems:

- The server creating the certificates
- The key management servers
- The storage system

Requirements for SSL certificates

Before obtaining and installing SSL certificates, you must understand what certificates are required and their requirements.

SSL certificates for Storage Encryption must use the Privacy Enhanced Mail (PEM) Base-64 encoded X.509 format and follow a strict naming convention. The following table describes the required certificate types and naming conventions:

Certificate for...	Certificate type	Certificate file name
Storage system	Public	`client.pem`
Storage system	Private	`client_private.pem`
Key management server	Public	*`key_management_server_ipaddress`*`_CA.pem` *`key_management_server_ipaddress`* must be identical to the IP address of the key management server that you use to identify it when running the Storage Encryption setup program.

These public and private certificates are required for the storage system and key management servers to establish secure SSL connections with each other and verify each other's identities.

The certificates for the storage system are only used by the storage system's KMIP client.

The private certificate can be passphrase protected during creation. In this case, the Storage Encryption setup program prompts you to enter the passphrase.

If your key management server does not accept self-signed certificates, you also need to include the necessary certificate authority (CA) public certificate.

In an HA pair, both nodes must use the same public and private certificates.

If you want multiple HA pairs that are connected to the same key management server to have access to each other's keys, all nodes in all HA pairs must use the same public and private certificates.

Installing SSL certificates on the storage system

You install the necessary SSL certificates on the storage system by using the `keymgr install cert` command. The SSL certificates are required for securing the communication between the storage system and key management servers.

Before you begin

You must have obtained the public and private certificates for the storage system and the public certificate for the key management server and named them as required.

Steps

1. Access the nodeshell by entering the following command:

   `system node run -node` *`node_name`*

2. Copy the certificate files to a temporary location on the storage system.
3. Install the public certificate of the storage system by entering the following command at the storage system prompt:

   `keymgr install cert` *`/path/`*`client.pem`

4. Install the private certificate of the storage system by entering the following command at the storage system prompt:

   `keymgr install cert` *`/path/`*`client_private.pem`

5. Install the public certificate of the key management server by entering the following command at the storage system prompt:

   `keymgr install cert` *`/path/key_management_server_ipaddress`*`_CA.pem`

6. If you are linking multiple key management servers to the storage system, repeat Step 4 for each public certificate of each key management server.
7. Exit the nodeshell and return to the clustershell by entering the following command:

   `exit`

Running the Storage Encryption setup wizard

You launch the Storage Encryption setup wizard by using the `key_manager setup` command. You should run the Storage Encryption setup wizard after you complete setup of the storage system and the storage volumes or when you need to change Storage Encryption settings after initial setup.

Steps

1. Access the nodeshell by entering the following command:
   `system node run -node node_name`
2. Enter the following command at the storage system prompt:
   `key_manager setup`
3. Complete the steps in the wizard to configure Storage Encryption.
4. Exit the nodeshell and return to the clustershell by entering the following command:
   `exit`

Example

The following command launches the Storage Encryption setup wizard and shows an example of how to configure Storage Encryption:

```
storage-system*> key_manager setup
Found client certificate file client.pem.
Registration successful for client.pem.
Found client private key file client_private.pem.
Is this file protected by a passphrase? [no]:
Registration successful for client_private.pem.
Enter the IP address for a key server, 'q' to quit:  172.22.192.192
Enter the IP address for a key server, 'q' to quit:  q
Enter the TCP port number for kmip server [6001] :

You will now be prompted to enter a key tag name. The
key tag name is used to identify all keys belonging to this
Data ONTAP system. The default key tag name is based on the
system's hostname.

Would you like to use <storage-system> as the default key tag name?
[yes]:

Registering 1 key servers...
Found client CA certificate file 172.22.192.192_CA.pem.
Registration successful for 172.22.192.192_CA.pem.
Registration complete.

You will now be prompted for a subset of your network configuration
setup.  These parameters will define a pre-boot network environment
allowing secure connections to the registered key server(s).
```

```
Enter network interface:  e0a
Enter IP address:  172.16.132.165
Enter netmask:   255.255.252.0
Enter gateway:  172.16.132.1

Do you wish to enter or generate a passphrase for the system's
encrypting drives at this time? [yes]:  yes

Would you like the system to autogenerate a passphrase? [yes]:  yes

Key ID:
080CDCB2000000000100000000000003FE505B0C5E3E76061EE48E02A29822C

Make sure that you keep a copy of your passphrase, key ID, and key
tag
name in a secure location in case it is ever needed for recovery
purposes.

Should the system lock all encrypting drives at this time? yes
Completed rekey on 4 disks: 4 successes, 0 failures, including 0
unknown key and 0 authentication failures.
Completed lock on 4 disks: 4 successes, 0 failures, including 0
unknown key and 0 authentication failures.
```

Setting up SVMs with FlexVol Volumes

You can create and configure Storage Virtual Machines (SVMs) with FlexVol volumes fully to start serving data immediately or with minimal configuration to delegate administration to the SVM administrator by using the `vserver setup` command.

Before you begin

You must have understood the *requirements and gathered the required information* on page 12 before you start the Vserver Setup wizard or any of the subwizards.

About this task

By using the `vserver setup` command, which launches a CLI wizard, you can perform the following tasks:

- Creating and configuring SVMs fully
- Creating and configuring SVMs with minimal network configuration
- Configuring existing SVMs
  - Setting up a network interface
  - Provisioning storage by creating volumes
  - Configuring services
  - Configuring protocols

    Note: When you select NDMP as one of the protocols for protocol configuration, NDMP is added to the allowed list of protocols of the SVM. The Vserver Setup wizard does not configure the NDMP protocol.

When you start the Vserver Setup wizard, the following is displayed:

```
cluster1::>vserver setup
Welcome to the Vserver Setup Wizard, which will lead you through
the steps to create a virtual storage server that serves data to clients.

You can enter the following commands at any time:
"help" or "?" if you want to have a question clarified,
"back" if you want to change your answers to previous questions, and
"exit" if you want to quit the Vserver Setup Wizard. Any changes
you made before typing "exit" will be applied.

You can restart the Vserver Setup Wizard by typing "vserver setup". To accept a
default or omit a question, do not enter a value.

Vserver Setup wizard creates and configures only data Vservers.
If you want to create a Vserver with Infinite Volume use the vserver create
command.
```

Steps

1. Use the vserver setup command to launch the wizard and create a fully configured SVM.
2. Use the `vserver show` command to verify the newly created SVM.

   You can view the attributes of the SVM in detail by using the `vserver show -instance` command.

Example

The following example shows how to display information about all existing SVMs:

```
cluster1::>vserver show
                     Admin     Root                  Name    Name
Vserver          Type    State     Volume     Aggregate  Service Mapping
-----------      ------- --------- ---------- ---------- ------- -------
vs1.example.com   data   running   root_vol1   aggr1      file    file
cluster1          admin   -         -          -          -       -
cluster1-01       node    -         -          -          -       -
cluster1-02       node    -         -          -          -       -
vs2.example.com   data   running   root_vol2   aggr2      file    file
5 entries were displayed.
```

Result

The SVM is created with root volume of size 1 GB. A root volume with 1 GB space prevents any failures when mounting any volume in the SVM root volume due to lack of space or inodes.

The SVM is started automatically and is in the `running` state. By default, the vsadmin user account is created and is in the `locked` state. The vsadmin role is assigned to the default vsadmin user account.

After you finish

- You must set up a password, unlock the vsadmin user account, create a LIF for accessing the SVM, and enable the firewall policy for managing the SVM to delegate the administration to an SVM administrator.

  For more information about delegating administration to an SVM administrator, see the *Clustered Data ONTAP System Administration Guide for Cluster Administrators*.
- You should protect the root volume of an SVM by creating a load-sharing mirror copy of the SVM root volume on each node of the cluster.

  For more information about creating load-sharing mirror copy, see the *Clustered Data ONTAP Logical Storage Management Guide*.

Where to go from here

After setting up the software, you can use the NetApp Support Site to find information about how to configure your cluster for array LUNs, how to provision storage, and how to manage the cluster.

For information about configuring the software to use LUNs on a storage array, see the *Clustered Data ONTAP Physical Storage Management Guide*.

For information about provisioning your storage by using FlexVol volumes, see the *Clustered Data ONTAP Logical Storage Management Guide*.

For information about provisioning your storage by using Infinite Volumes, see the *Clustered Data ONTAP Infinite Volumes Management Guide*.

To find documentation about managing your cluster after the software is set up, see the *Clustered Data ONTAP Documentation Map*.

Related information

The NetApp Support Site: support.netapp.com

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