NetApp

cluster commands

Command reference

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cluster commands

cluster add-node-status-clear-failed

Remove failed nodes from the status list

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster add-node-status-clear-failed` command removes failed entries from the status list displayed by the cluster add-node-status command.

Examples

The following example removes failed entries:

```
clus1::> cluster add-node-status
      Node Name         Cluster IP          Status               Error
Reason
      --------------- ------------------ ------------------
--------------------------
      -                 2.2.2.2            failure              The
cluster port MTU
                                                               values do
not match.
                                                               Retry
cluster create or
                                                               join
after updating the
                                                               cluster
port MTUs to the
                                                               same
value.
      node1             1.1.1.1            success
      2 entries were displayed.
clus1::> cluster add-node-status-clear-failed
clus1::> cluster add-node-status
      Node Name         Cluster IP          Status               Error
Reason
      --------------- ------------------- -------------------
------------------------
      node1             1.1.1.1.           success
```

Related Links

- cluster add-node-status

cluster add-node-status

Show cluster expansion progress

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster add-node-status` command displays the progress of the node joining a cluster initiated by using the cluster create command or the cluster add-node command

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node-uuid <UUID>] - Node UUID

Select the node that match the specified node UUID.

[-node-name <text>] - Node Name

Select the nodes that match the specified node name.

[-cluster-ip <IP Address>] - IP Address of a Cluster Interface of Node

Select the nodes that match the specified cluster IP.

[-status <Cluster Operation Status>] - The Status of Current Task Being Performed

Select the nodes that match the specified status. This status shows whether the operation is ongoing or complete with success or failure. The various phases that a node goes through are node-initialization, joining-cluster, service-startup, post-cluster-setup and success or failure.

[-failure-msg <text>] - Error Reason

Select the nodes that match the specified error string.

[-last-updated <MM/DD/YYYY HH:MM:SS>] - Last Updated

The date/time stamp of the last update to the status.

Examples

The following example shows the progress of a node add operation:

```
clus1::> cluster add-node-status
       Node Name       Node IP         Status        Error Reason
       --------------- --------------- --------------
       ----------------------
       node1           1.1.1.1         success       -
```

Related Links

- [cluster create](#)
- [cluster add-node](#)

cluster add-node

Expand the cluster by discovering and adding new nodes

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster add-node` command discovers and adds new nodes to the cluster. When the `-node-count` parameter is specified, the command attempts to add that many nodes to the cluster. The `-node-ip` parameter can be specified to directly add a node. The `-cluster-ips` parameter can be specified to directly add one or more nodes in parallel. Only one of the `-node-count` , `-node-ip` and `-cluster-ips` parameters can be provided. The [system node show-discovered](#) command displays all the nodes discovered on the local network.

> (i) The `node-count` parameter is deprecated and may be removed in a future release of ONTAP. Use the `-cluster-ips` parameter instead.

> (i) The `node-ip` parameter is deprecated and may be removed in a future release of ONTAP. Use the `-cluster-ips` parameter instead.

Parameters

{ `-cluster-ips <IP Address>`,… - List of Cluster Interface IP Addresses of the Nodes Being Added

This parameter contains a comma separated list of cluster interface IP addresses of the nodes in the cluster you are creating. All the nodes specified in the list will be added to the cluster.

| `-retry <true>` - Retry a failed cluster add-node operation

Use this parameter to retry the most recently failed `cluster add-node` command with the originally specified parameters. Retry is not supported if the `cluster add-node` command was originally run with either the *-node-count* or *-node-ip* parameters.

| `-node-count <integer>` - (DEPRECATED)-Number of Nodes Being Added

Number of nodes to be added to the cluster. If fewer nodes are discovered, all the discovered nodes are added to the cluster and the command will fail since there are fewer nodes than specified. If more nodes are found than the number specified, the command will fail because there is no way to determine which

nodes you intend to add to the cluster.

> (i) The `-node-count` parameter is supported on non-shared architecture platforms only.

`| -node-ip <IP Address> ` - (DEPRECATED)-Cluster IP Address of Node }

Cluster IP address of the node to add. When this parameter is provided, the command directly adds the node.

`[-node-names <text>,…]` - List of Node Names

This parameter contains a comma separated list of node names of all the nodes in the cluster you are creating. The node names must have an one to one correspondence with `-cluster-ips` parameter. The names provided will be used to rename the nodes once they are added to the cluster.

`[-foreground {true|false}]` - Foreground Process

When set to `false` the command runs in the background as a job. The default is `true`, which causes the command to return after the operation completes.

`[-allow-mixed-version-join <true>]` - Allow a Node At a Different Version to Join Cluster

This parameter allows nodes with different, but compatible versions of ONTAP to be added to the cluster. A ONTAP best practice is to add nodes to the cluster that are of the same ONTAP version as the nodes in the cluster, but that may not always be possible.

Examples

The following example adds a node using `-cluster-ips`:

```
cluster1::> cluster add-node -cluster-ips 1.1.1.1, 2.2.2.2
      Use the 'cluster add-node-status' command to see the progress of the
add-node operation.
```

The following example adds 3 nodes using `-node-count`.

```
cluster1::> cluster add-node -node-count 3
      [Job 22] Job succeeded.
```

Related Links

* system node show-discovered

cluster create

Create a cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster create` command creates a cluster with one or more nodes. When the `-node-count` parameter is specified, the command attempts to add that many nodes to the cluster. The `-cluster-ips` parameter can be specified to add one or more nodes in parallel. Only one of the `-node-count` and `-cluster-ips` parameters can be provided.

Note that single-node clusters do not require configuring the cluster network. A cluster network interface must be configured before other nodes can join the cluster.

> (i) The `node-count` parameter is deprecated and may be removed in a future release of ONTAP. Use the `-cluster-ips` parameter instead.

Parameters

`[-license <License Code V2>]` - (DEPRECATED)-Base License

> (i) This parameter is deprecated and may be removed in a future release of ONTAP.

Use this optional parameter to specify the base license for the cluster. Obtain this value from your sales or support representative.

`-clustername <text>` - Cluster Name

Use this parameter to specify the name of the cluster you are creating.

- The name must contain only the following characters: A-Z, a-z, 0-9, "-" or "_".
- The first character must be one of the following characters: A-Z or a-z.
- The last character must be one of the following characters: A-Z, a-z or 0-9.
- The maximum supported length is 44 characters.
- The system reserves the following names: "all", "cluster", "local" and "localhost".

| `[-cluster-ips <IP Address>,…]` - List of Cluster Interface IP Addresses of the Nodes Being Added

This parameter contains a comma separated list of cluster interface IP addresses of the nodes in the cluster you are creating. All the nodes specified in the list will be added to the cluster.

| `[-node-count <integer>]` - (DEPRECATED)-Node Count

Use this parameter to specify the number of nodes in the cluster you are creating.

- `-node-count` parameter is supported on non-shared architecture platforms only.

`[-node-names <text>,…]` - List of Node Names

This parameter contains a comma separated list of node names of all the nodes in the cluster you are creating. The node names must have an one to one correspondence with `-cluster-ips` parameter. The names provided will be used to rename the nodes once they are added to the cluster.

| `-retry <true>` - Retry a failed cluster create operation }

Use this parameter to retry the most recently failed `cluster create` command with the originally specified parameters. Retry is not supported if the `cluster create` command was originally run with either the `-node-count` or `-node-ip` parameters.

Examples

The following example creates a cluster named cluster1

```
cluster1::> cluster create -clustername cluster1
```

The following example creates a cluster named cluster1 with node-count 4 on a non-shared architecture platform.

```
cluster1::> cluster create -clustername cluster1 -node-count 4
```

cluster join

(DEPRECATED)-Join an existing cluster using the specified member's IP address or by cluster name

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

(i) This command is deprecated and may be removed in a future release of ONTAP. Use cluster add-node from a node in the cluster instead.

The `cluster join` command adds a node to an existing cluster. Use the cluster create command to create a cluster if one does not already exist.

Note that a cluster network interface must be configured for the cluster before other nodes can join the cluster.

Parameters

{ `-clusteripaddr <IP Address>` - IP Address of a Cluster Interface from a Node in the Cluster

Use this parameter to specify the IP address of a cluster interface. This must be the IP address of a cluster interface of a node that is already in the cluster. This parameter is mutually exclusive with the `-cluster -name` parameter.

| `-cluster-name <text>` - (DEPRECATED)-Cluster Name of the Cluster to Join }

Deprecated. Use this parameter to specify the name of an existing cluster to join.

[`-allow-mixed-version-join <true>`] - Allow a Node at a Different Version to Join Cluster

This parameter allows nodes with different, but compatible versions of ONTAP to join the cluster. A ONTAP best practice is to join nodes to the cluster that are of the same ONTAP version as the nodes in the cluster, but that may not always be possible.

[`-node-name <text>`] - Name to Use for the Node in the Cluster

This parameter specifies the name that the node will have when we join it to the cluster.

`-cluster-admin-user <text>` - Cluster Admin User on the Cluster to Join

Use this parameter to specify the username of a user with the "admin" role, for example the user "admin".

Examples

The following example joins the local node to a cluster. The IP address 192.0.2.66 is the address of a cluster interface of a node that already belongs to the cluster.

```
node::> cluster join -clusteripaddr 192.0.2.66
```

Related Links

- cluster add-node
- cluster create

cluster modify

Modify cluster node membership attributes

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster modify` command modifies the cluster attributes of a node, including its eligibility to participate in the cluster.

At the advanced privilege level, you can use the command to specify whether a node holds epsilon. Epsilon is an extra fractional vote that enables quorum to form using slightly weaker requirements. For example, two out of four eligible nodes are sufficient to form quorum if one of those two nodes holds epsilon.

Parameters

`-node {<nodename>|local}` - Node

Use this parameter to specify the name of the node to modify. If you do not specify a node, the command runs on the local node.

`[-epsilon {true|false}]` - Epsilon (privilege: advanced)

Use this parameter with the value `true` to specify that the node holds Epsilon in the cluster. Use this parameter with the value `false` to specify that the node does not hold Epsilon in the cluster. In a cluster, only one node can be designated as Epsilon at any given time. You can designate a node as Epsilon to add weight to its voting in a cluster with an even number of nodes.

`[-eligibility {true|false}]` - Eligibility (privilege: advanced)

Use this parameter with the value `true` to specify that the node is eligible to participate in the cluster. Use this parameter with the value `false` to specify that the node is not eligible to participate in the cluster.

If you modify a node as ineligible to participate in the cluster, the command prompts you for confirmation before it runs.

`[-skip-quorum-check-before-eligible <true>]` - Skip Quorum Check Before Setting Node Eligible (privilege: advanced)

If this parameter is specified, quorum checks will be skipped prior to setting a node eligible. When setting a node to eligible, the operation will continue even if there is a possible data outage due to a quorum issue.

`[-skip-quorum-check-before-ineligible <true>]` - Skip Quorum Check Before Setting Node Ineligible (privilege: advanced)

If this parameter is specified, quorum checks will be skipped prior to setting a node ineligible. When setting a node to ineligible, the operation will continue even if there is a possible data outage due to a quorum issue.

Examples

This example modifies a node to make it eligible to participate in the cluster.

```
cluster1::*> cluster modify -node node3 -eligibility true
```

The following example removes epsilon from the node named node0 and adds it to the node named node1:

```
cluster1::*> cluster modify -node node0 -epsilon false
cluster1::*> cluster modify -node node1 -epsilon true
```

cluster ping-cluster

Ping remote cluster interfaces and perform RPC server check

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster ping-cluster` command probes network connectivity to remote cluster interfaces, and performs an RPC server check.

Parameters

`-node <nodename>` - Node (privilege: advanced)

Use this parameter to send the ping from the node you specify.

`[-use-sitelist {true|false}]` - Use Sitelist for Cluster Interfaces (privilege: advanced)

Use this parameter with the value `true` to specify that the command use the sitelist to determine any incomplete cluster IP information. Use this parameter with the value `false` to specify that the command not use the sitelist.

`[-skip-rpccheck {true|false}]` - Skip RPC Server Check (privilege: advanced)

Use this parameter with the value `true` to specify that the command not perform the rpcinfo check of remote hosts. Use this parameter with the value `false` to specify that the command perform the rpcinfo check. The rpcinfo check checks the status of the RPC servers on the remote hosts. By default, the rpcinfo

check runs on the program number of the portmapper. Use the `-rpc-prognum` parameter to override this default.

[-rpc-prognum <integer>] - RPC Server to Check (privilege: advanced)

Use this parameter to override default behavior and run the rpcinfo check on the program number you specify. By default, the rpcinfo check runs on the program number of the portmapper.

Examples

The following example shows typical output for this command.

```
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)
```

cluster remove-node

Remove a node from the cluster

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster remove-node` command removes a node from a cluster.

Before you can remove a node from a cluster, you must shut down all of the node's shared resources, such as virtual interfaces to clients. If any of a node's shared resources are still active, the command fails. The failure message will display which active resources must be shut down before the node can be removed from the cluster.

Parameters

{ `-node <nodename>` - Node to Unjoin (privilege: advanced)

Use this parameter to specify the name of the node to remove from the cluster.

| `-cluster-ip <IP Address>` - IP Address of a Cluster Interface of Node to Unjoin (privilege: advanced) }

Use this parameter to specify the cluster IP of the node to remove from the cluster.

[`-skip-quorum-check-before-unjoin <true>`] - Skip Quorum Check before Unjoin (privilege: advanced)

If this parameter is specified, quorum checks will be skipped prior to the remove-node command. The operation will continue even if there is a possible data outage due to a quorum issue.

[`-skip-last-low-version-node-check <true>`] - Skip the Check That Prevents Unjoining the Last Low Versioned Node (privilege: advanced)

This parameter allows the node with lowest version of ONTAP to be removed from the cluster.

Examples

The following example shows how to remove the node named `node4` from the cluster.

```
cluster1::*> cluster remove-node -node node4
```

cluster setup

Setup wizard

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

ⓘ   Use of this command to join a node to an existing cluster is deprecated and might be removed in a future release of ONTAP. From a node in the cluster use the system node show-discovered command and then use the cluster add-node command.

The `cluster setup` command runs the cluster setup wizard, which can be used to either create a cluster or join a node to an existing cluster. When you run the cluster setup wizard, enter the appropriate information at the prompts. You will be asked to provide the following information to create a cluster:

- Node management interface port, IP address, netmask, default gateway
- Cluster name
- Cluster base license key

ⓘ   This parameter has been deprecated. It may be removed from a future release of ONTAP.

- Feature license keys

- Cluster administrator's password
- Cluster management interface port, IP address, netmask, default gateway
- DNS domain names
- Name server IP addresses
- Location

You will be asked to provide the following information to join a cluster:

- Node management interface port, IP address, netmask, default gateway
- Cluster IP address

The cluster management interface is used for managing the cluster. It provides one IP address to manage the cluster and will fail over to another node, if necessary. This is the preferred IP address for managing the cluster, but you can also manage the cluster by logging in to the node management IP address of a node in the cluster. Since the cluster management interface must be able to fail over, the port role for the interface must be "data" and typically the best choice for an IP address is one on the data network. The node management interface will not fail over, so an IP address on the management network and a port with the role "node management" is the best choice. Alternatively, you can assign an IP address on the data network to the cluster management interface - if that is better in your network topology - but the port must be a data port. The two examples below illustrate the cluster create and cluster join operations, respectively.

Parameters

Examples

An example of using `cluster setup` to create a cluster with IPv4 addresses is shown below.

```
node::> cluster setup
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.

This system will send event messages and periodic reports to NetApp
Technical
Support. To disable this feature, enter
autosupport modify -support disable
within 24 hours.

Enabling AutoSupport can significantly speed problem determination and
resolution should a problem occur on your system.
```

```
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/

Type yes to confirm and continue {yes}: yes

Enter the node management interface port [e0c]:
Enter the node management interface IP address: 192.0.2.66
Enter the node management interface netmask: 255.255.255.192
Enter the node management interface default gateway: 192.0.2.1
The node management interface has been modified to use port e0c with IP
address 192.0.2.66.
Use your web browser to complete cluster setup by accessing
https://192.0.2.66

Otherwise, press Enter to complete cluster setup using the command line
interface:
Do you want to create a new cluster or join an existing cluster? {create,
join}:
create
Do you intend for this node to be used as a single node cluster? {yes, no}
[no]:

Existing cluster interface configuration found:

Port    MTU     IP                  Netmask
e0a     9000    169.254.21.189  255.255.0.0
e0b     9000    169.254.29.73   255.255.0.0

Do you want to use this configuration? {yes, no} [yes]:

Enter the cluster administrator's (username "admin") password:

Retype the password:
Step 1 of 5: Create a Cluster
You can type "back", "exit", or "help" at any question.

Enter the cluster name: cluster1

Creating cluster cluster1

Starting cluster support services .

Cluster cluster1 has been created.
Step 2 of 5: Add Feature License Keys
You can type "back", "exit", or "help" at any question.

Enter an additional license key []:
```

```
Step 3 of 5: Set Up a Vserver for Cluster Administration
You can type "back", "exit", or "help" at any question.
Enter the cluster management interface port [e0d]:
Enter the cluster management interface IP address: 192.0.2.60
Enter the cluster management interface netmask: 255.255.255.192
Enter the cluster management interface default gateway [192.0.2.1]:
A cluster management interface on port e0d with IP address 192.0.2.60 has
been created.  You can use this address to connect to and manage the
cluster.

Enter the DNS domain names: data.example.com
Enter the name server IP addresses: 192.0.2.147
DNS lookup for the admin Vserver will use the data.example.com domain.

Step 4 of 5: Configure Storage Failover (SFO)
You can type "back", "exit", or "help" at any question.
SFO is licensed.
SFO will be enabled when the partner joins the cluster.
Step 5 of 5: Set Up the Node
You can type "back", "exit", or "help" at any question.

Where is the controller located []: Sunnyvale
Cluster "cluster1" has been created.

To complete cluster setup, you must join each additional node to the
cluster
by running "system node show-discovered" and "cluster add-node" from a
node in the cluster.
To complete system configuration, you can use either OnCommand System
Manager
or the ONTAP command-line interface.

To access OnCommand System Manager, point your web browser to the cluster
management IP address (https://192.0.2.60).

To access the command-line interface, connect to the cluster management
IP address (for example, ssh admin@192.0.2.60).
cluster1::>
```

An example of using `cluster setup` to join a cluster with IPv4 addresses is shown below.

```
node::> cluster setup
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.


This system will send event messages and periodic reports to NetApp
Technical
Support. To disable this feature, enter
autosupport modify -support disable
within 24 hours.


Enabling AutoSupport can significantly speed problem determination and
resolution should a problem occur on your system.
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/


Type yes to confirm and continue {yes}: yes


Enter the node management interface port [e0c]:
Enter the node management interface IP address: 192.0.2.67
Enter the node management interface netmask: 255.255.255.192
Enter the node management interface default gateway: 192.0.2.1
A node management interface on port e0c with IP address 192.0.2.67 has
been created.


Use your web browser to complete cluster setup by accessing
https://192.0.2.67


Otherwise, press Enter to complete cluster setup using the command line
interface:
Do you want to create a new cluster or join an existing cluster? {create,
join}:
join
Existing cluster interface configuration found:

Port    MTU     IP                Netmask
e0a     9000    169.254.31.170    255.255.0.0
e0b     9000    169.254.115.61    255.255.0.0


Do you want to use this configuration? {yes, no} [yes]:
Step 1 of 3: Join an Existing Cluster
You can type "back", "exit", or "help" at any question.
Enter the IP address of an interface on the private cluster network from
```

```
the
cluster you want to join: 169.254.115.8

Joining cluster at address 169.254.115.8

This node has joined the cluster cluster1.
Step 2 of 3: Configure Storage Failover (SFO)
You can type "back", "exit", or "help" at any question.
SFO is licensed.
SFO will be enabled when the partner joins the cluster.
Step 3 of 3: Set Up the Node
You can type "back", "exit", or "help" at any question.
This node has been joined to cluster "cluster1".

To complete cluster setup, you must join each additional node to the
cluster
by running "system node show-discovered" and "cluster add-node" from a
node in the cluster.
To complete system configuration, you can use either OnCommand System
Manager
or the ONTAP command-line interface.

To access OnCommand System Manager, point your web browser to the cluster
management IP address (https://192.0.2.60).

To access the command-line interface, connect to the cluster management
IP address (for example, ssh admin@192.0.2.60).
```
cluster1::>

An example of using `cluster setup` to create a cluster with IPv6 addresses is shown below.

```
node::> cluster setup
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.

This system will send event messages and periodic reports to NetApp
Technical
```

```
Support. To disable this feature, enter
autosupport modify -support disable
within 24 hours.

Enabling AutoSupport can significantly speed problem determination
and resolution, should a problem occur on your system.
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/

Type yes to confirm and continue {yes}: yes

Enter the node management interface port [e0c]:
Enter the node management interface IP address:
FD20:8B1E:B255:814E:8E31:DDF2:8224:593D
You are trying to create an IPv6 address. Creating an IPv6 address will
enable
IPv6 on this node.

Type yes to confirm and continue {yes, no}: yes
Enter the node management interface prefix length: 64
Enter the node management interface default gateway:
FD20:8B1E:B255:814E:0000:0000:0000:0001
A node management interface on port e0c with IP address
fd20:8b1e:b255:814e:8e31:ddf2:8224:593d has been created.

Use your web browser to complete cluster setup by accessing
https://[fd20:8b1e:b255:814e:8e31:ddf2:8224:593d]

Otherwise, press Enter to complete cluster setup using the command line
interface:
Do you want to create a new cluster or join an existing cluster? {create,
join}:
create
Do you intend for this node to be used as a single node cluster? {yes, no}
[no]:
Existing cluster interface configuration found:

Port  MTU  IP     Netmask
e0a   9000  172.31.6.130  255.255.192.0
e0b   9000  172.31.6.131  255.255.192.0

Do you want to use this configuration? {yes, no} [yes]:

Enter the cluster administrator's (username "admin") password:

Retype the password:
Step 1 of 5: Create a Cluster
```

```
You can type "back", "exit", or "help" at any question.

Enter the cluster name: cluster1

Creating cluster cluster1

Starting cluster support services ....

Cluster cluster1 has been created.
Step 2 of 5: Add Feature License Keys
You can type "back", "exit", or "help" at any question.

Enter an additional license key []:
Step 3 of 5: Set Up a Vserver for Cluster Administration
You can type "back", "exit", or "help" at any question.
Enter the cluster management interface port [e0d]:
Enter the cluster management interface IP address:
FD20:8B1E:B255:814E:4827:F558:6150:8D5F
Enter the cluster management interface prefix length: 64
Enter the cluster management interface default gateway
[fd20:8b1e:b255:814e::1]:
A cluster management interface on port e0d with IP address
fd20:8b1e:b255:814e:4827:f558:6150:8d5f has been created.  You can use
this address to connect to and manage the cluster.

Enter the DNS domain names: data.example.com
Enter the name server IP addresses:
FD20:8B1E:B255:814E:8F99:721C:5471:FC1E
DNS lookup for the admin Vserver will use the data.example.com domain.

Step 4 of 5: Configure Storage Failover (SFO)
You can type "back", "exit", or "help" at any question.
SFO will not be enabled on a non-HA system.
Step 5 of 5: Set Up the Node
You can type "back", "exit", or "help" at any question.

Where is the controller located []:
Cluster "cluster1" has been created.

To complete cluster setup, you must join each additional node to the
cluster
by running "system node show-discovered" and "cluster add-node" from a
node in the cluster.
To complete system configuration, you can use either OnCommand System
Manager
or the ONTAP command-line interface.
```

```
To access OnCommand System Manager, point your web browser to the cluster
management IP address (https://[fd20:8b1e:b255:814e:4827:f558:6150:8d5f]).

To access the command-line interface, connect to the cluster management
IP address (for example, ssh
admin@fd20:8b1e:b255:814e:4827:f558:6150:8d5f).
cluster1::>
```

An example of using `cluster setup` to join a cluster with IPv6 addresses is shown below.

```
node::> cluster setup
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.

This system will send event messages and periodic reports to NetApp
Technical
Support. To disable this feature, enter
autosupport modify -support disable
within 24 hours.

Enabling AutoSupport can significantly speed problem determination
and resolution, should a problem occur on your system.
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/

Type yes to confirm and continue {yes}: yes

Enter the node management interface port [e0c]:
Enter the node management interface IP address:
FD20:8B1E:B255:814E:3A9F:9EBC:BF57:7A89
You are trying to create an IPv6 address. Creating an IPv6 address will
enable
IPv6 on this node.

Type yes to confirm and continue {yes, no}: yes
Enter the node management interface prefix length: 64
Enter the node management interface default gateway:
```

```
FD20:8B1E:B255:814E:0000:0000:0000:0001
A node management interface on port e0c with IP address
fd20:8b1e:b255:814e:3a9f:9ebc:bf57:7a89 has been created.

Use your web browser to complete cluster setup by accessing
https://[fd20:8b1e:b255:814e:3a9f:9ebc:bf57:7a89]

Otherwise, press Enter to complete cluster setup using the command line
interface:
Do you want to create a new cluster or join an existing cluster? {create,
join}:
join
Existing cluster interface configuration found:

Port  MTU  IP      Netmask
e0a  9000  172.31.6.251  255.255.192.0
e0b  9000  172.31.6.252  255.255.192.0

Do you want to use this configuration? {yes, no} [yes]:
Step 1 of 3: Join an Existing Cluster
You can type "back", "exit", or "help" at any question.
Enter the IP address of an interface on the private cluster network from
the
cluster you want to join: 172.31.6.130

Joining cluster at address 172.31.6.130

Starting cluster support services ....

This node has joined the cluster cluster1.
Step 2 of 3: Configure Storage Failover (SFO)
You can type "back", "exit", or "help" at any question.
SFO will not be enabled on a non-HA system.
Step 3 of 3: Set Up the Node
You can type "back", "exit", or "help" at any question.
This node has been joined to cluster "cluster1".

To complete cluster setup, you must join each additional node to the
cluster
by running "system node show-discovered" and "cluster add-node" from a
node in the cluster.
To complete system configuration, you can use either OnCommand System
Manager
or the ONTAP command-line interface.

To access OnCommand System Manager, point your web browser to the cluster
```

```
management IP address (https://[fd20:8b1e:b255:814e:4827:f558:6150:8d5f]).

To access the command-line interface, connect to the cluster management
IP address (for example, ssh
admin@fd20:8b1e:b255:814e:4827:f558:6150:8d5f).
```
cluster1::>

Related Links

- system node show-discovered
- cluster add-node

cluster show

Display cluster node members

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster show` command displays information about the nodes in a cluster.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node {<nodename>|local}] - Node

Selects the nodes that match this parameter value.

[-node-uuid <UUID>] - UUID (privilege: advanced)

Selects the nodes that match this parameter value.

[-epsilon {true|false}] - Epsilon (privilege: advanced)

Selects the nodes that match this parameter value. In a cluster, only one node can be designated as Epsilon at any given time. You can designate a node as Epsilon to add weight to its voting in a cluster with an even number of nodes.

[-eligibility {true|false}] - Eligibility

Selects the nodes that match this parameter value (true means eligible to participate in the cluster).

[-health {true|false}] - Health

Selects the nodes that match this parameter value (true means online).

Examples

The following example displays information about all nodes in the cluster:

```
cluster1::> cluster show
Node                  Health  Eligibility
--------------------- ------- ------------
node0                 true    true
node1                 true    true
node2                 true    true
node3                 true    true
```

The following example displays information about the node named node1:

```
cluster1::> cluster show -node node1
Node: node1
Eligibility: true
     Health: true
```

cluster agent commands

cluster agent connection create

Create Cloud Agent connection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

Create a websocket connection to an external manager that will be used to monitor this cluster. The external manager will have access to REST APIs and CCMA counters based upon the privilege of the user creating the connection.

Parameters

`-name <text>` - Name (privilege: advanced)

Specify connection name.

`-destination <text>` - Destination URL (privilege: advanced)

Specify destination URL. For secure WebSocket, this should be amqpwss://<host[:port]>.

`[-use-proxy {true|false}]` - Use Proxy (privilege: advanced)

Establish this connection through the HTTP proxy server associated with this connection's IPspace.

`[-subscribe-address <text>]` - Subscribe Address (privilege: advanced)

AMQP address to which ONTAP will subscribe. Defaults to "ontap.agent.manager".

[-publish-address <text>] - Publish Address (privilege: advanced)

AMQP address to which ONTAP will publish. Defaults to "ontap.agent.cluster".

[-certificate-uuid <UUID>] - Authentication Certificate UUID (privilege: advanced)

Specify UUID of an existing certificate to use for authentication to the destination.

[-csr-url <text>] - Authentication CSR URL (privilege: advanced)

URL to send certificate signing request (CSR) that will be used for authenticating with the destination.

[-csr-token <text>] - Authentication CSR Token (privilege: advanced)

Token for authenticating with CSR URL. Not audited.

[-manager-token <text>] - Manager Token (privilege: advanced)

Specify token supplied by manager application to correlate the connection setup back to the workflow that initiated it.

[-ipspace <IPspace>] - IPspace for Connection (privilege: advanced)

The IPspace to use for the connection.

[-idle-timeout <integer>] - Idle Timeout (in seconds) (privilege: advanced)

AMQP idle timeout. Defaults to 0. If set, the local peer will disconnect if it does not receive AMQP frames within the timeout.

[-address-family {unknown|ipv4|ipv6}] - Address Family (privilege: advanced)

Specify address family.

[-auto-delete-error-minutes {<integer>|-}] - Time to Auto-delete when disconnected (in minutes) (privilege: advanced)

Specify time to live in minutes for cloud agent connection in error state. Connection will be deleted if it stays in error state beyond this time.

Examples

```
cluster-1::> cluster agent connection create -name cloud_agent
-destination amqpwss://manager.example.com
```

cluster agent connection delete

Delete Cloud Agent connection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

Delete the connection to an external manager.

Parameters

`-name <text>` - **Name (privilege: advanced)**

Specify connection name.

Examples

```
cluster-1::> cluster agent connection delete -name cloud_agent
```

cluster agent connection modify

Modify Cloud Agent connection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

Modify agent connection properties.

Parameters

`-name <text>` - **Name (privilege: advanced)**

Specify connection name.

`[-destination <text>]` - **Destination URL (privilege: advanced)**

Specify destination URL. For secure WebSocket, this should be amqpwss://<host[:port]>.

`[-use-proxy {true|false}]` - **Use Proxy (privilege: advanced)**

Establish this connection through the HTTP proxy server associated with this connection's IPspace.

`[-subscribe-address <text>]` - **Subscribe Address (privilege: advanced)**

AMQP address to which ONTAP will subscribe. Defaults to "ontap.agent.manager".

`[-publish-address <text>]` - **Publish Address (privilege: advanced)**

AMQP address to which ONTAP will publish. Defaults to "ontap.agent.cluster".

`[-certificate-uuid <UUID>]` - **Authentication Certificate UUID (privilege: advanced)**

Specify UUID of an existing certificate to use for authentication to the destination.

`[-csr-token <text>]` - **Authentication CSR Token (privilege: advanced)**

Token for authenticating with CSR URL. Not audited.

`[-idle-timeout <integer>]` - **Idle Timeout (in seconds) (privilege: advanced)**

AMQP idle timeout. Defaults to 0. If set, the local peer will disconnect if it does not receive AMQP frames within the timeout.

`[-address-family {unknown|ipv4|ipv6}]` - **Address Family (privilege: advanced)**

Specify address family.

[-auto-delete-error-minutes {<integer>|-}] - Time to Auto-delete when disconnected (in minutes) (privilege: advanced)

Specify time to live in minutes for cloud agent connection in error state. Connection will be deleted if it stays in error state beyond this time.

Examples

```
cluster-1::> cluster agent connection modify -name cloud_agent
-destination amqpwss://new-manager.example.com
```

cluster agent connection show

Display Cloud Agent connections

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

This command displays the connections that have been established to help external managers manage the cluster.

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>, …` parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-name <text>] - Name (privilege: advanced)

Selects the connections that match the supplied name.

[-uuid <UUID>] - UUID (privilege: advanced)

Selects the connections that match the supplied UUID.

[-destination <text>] - Destination URL (privilege: advanced)

Selects the connections that match the supplied destination.

[-state {connecting|connected|error|disabled|partial|static}] - State (privilege: advanced)

Selects the connections that match the supplied state. The state can have one of the following values:

- connecting - The agent is in the process of establishing the connection.
- connected - The connection is up and active.
- error - The connection is down due to a problem. See error-message and error-time for details.
- disabled - The connection has been administratively disabled.

- partial - The connection has been partially established and is not ready to deliver messages.

- static - The agent is of static instance type and does not require an external connection.

`[-use-proxy {true|false}]` - Use Proxy (privilege: advanced)

Establish this connection through an HTTP proxy server associated with this connection's IPspace

`[-subscribe-address <text>]` - Subscribe Address (privilege: advanced)

AMQP address to which ONTAP will subscribe. Defaults to "ontap.agent.manager".

`[-publish-address <text>]` - Publish Address (privilege: advanced)

AMQP address to which ONTAP will publish. Defaults to "ontap.agent.cluster".

`[-certificate-uuid <UUID>]` - Authentication Certificate UUID (privilege: advanced)

Selects the connections that match the supplied certificate UUID.

`[-csr-url <text>]` - Authentication CSR URL (privilege: advanced)

URL to send certificate signing request (CSR) that will be used for authenticating with the destination.

`[-manager-token <text>]` - Manager Token (privilege: advanced)

Selects the connections that match the supplied manager token.

`[-ipspace <IPspace>]` - IPspace for Connection (privilege: advanced)

The IPspace to use for the connection

`[-error-code <integer>]` - Last Error Code (privilege: advanced)

Selects the connections that match the supplied error code.

`[-error-message <text>]` - Last Error Message (privilege: advanced)

Selects the connections that match the supplied error message.

`[-error-time <MM/DD/YYYY HH:MM:SS>]` - Last Error Time (privilege: advanced)

Selects the connections that match the supplied error time.

`[-node <nodename>]` - Node Owning the Connection (privilege: advanced)

The node owning the connection

`[-msg-recv-total <integer>]` - Total Messages Received from Manager (privilege: advanced)

Total messages received from manager

`[-msg-recv-manifest <integer>]` - Total Manifest Messages Received from Manager (privilege: advanced)

Total manifest messages received from manager

`[-msg-recv-baseline-request <integer>]` - Total baseline.request Messages Received from Manager (privilege: advanced)

Total baseline.request messages received from manager

`[-msg-recv-counters-request <integer>]` - Total counters.request Messages Received from Manager (privilege: advanced)

Total counters.request messages received from manager

[-msg-recv-connection-status <integer>] - Total Connection Status Messages Received from Manager (privilege: advanced)
Total connection status messages received from manager

[-msg-recv-connection-modify <integer>] - Total Connection Modify Messages Received from Manager (privilege: advanced)
Total connection modify messages received from manager

[-msg-recv-agent-status <integer>] - Total agent.status.request Messages Received from Manager (privilege: advanced)
Total agent.status.request Messages received from Manager

[-msg-recv-subscription-create <integer>] - Total Subscription Create Messages Received from Manager (privilege: advanced)
Total subscription create messages received from manager

[-msg-recv-subscription-delete <integer>] - Total Subscription Delete Messages Received from Manager (privilege: advanced)
Total subscription delete messages received from manager

[-msg-recv-unknown <integer>] - Total Unknown Messages Received from Manager (privilege: advanced)
Total unknown messages received from manager

[-msg-send-total <integer>] - Total Messages Sent to Manager (privilege: advanced)
Total messages sent to manager

[-msg-send-manifest-request <integer>] - Total manifest.request Messages Sent to Manager (privilege: advanced)
Total manifest.request messages sent to manager

[-msg-send-baseline <integer>] - Total Baseline Messages Sent to Manager (privilege: advanced)
Total baseline messages sent to manager

[-msg-send-counters <integer>] - Total Counters Messages Sent to Manager (privilege: advanced)
Total counters messages sent to manager

[-msg-send-connection-status <integer>] - Total Connection Status Messages Sent to Manager (privilege: advanced)
Total connection status messages sent to manager

[-msg-send-subscription-status <integer>] - Total Subscription Status Messages Sent to Manager (privilege: advanced)
Total subscription status messages received from manager

[-msg-send-errors <integer>] - Total Error Messages Sent to Manager (privilege: advanced)
Total error messages sent to manager

`[-msg-delivery-errors <integer>]` - Total Errors Encountered Attempting to Send/receive (privilege: advanced)

    Total errors encountered attempting to send/receive

`[-msg-send-topicrelay <integer>]` - Total ONTAP PubSub Topic Messages Sent to Manager (privilege: advanced)

    Total ONTAP PubSub Topic messages sent to manager

`[-msg-send-agent-status-details <integer>]` - Total agent.status Messages Sent to Manager (privilege: advanced)

    Total agent.status Messages sent to Manager

`[-msg-connection-total <integer>]` - Total Connection Attempts (privilege: advanced)

    Total connection attempts

`[-msg-connection-errors <integer>]` - Total Connection Errors (privilege: advanced)

    Total connection errors

`[-msg-transport-errors <integer>]` - Total Transport Errors (privilege: advanced)

    Total transport errors

`[-application <text>]` - Client Application (privilege: advanced)

    Selects the connections that match the supplied application.

`[-application-url <text>]` - Application URL (privilege: advanced)

    Selects the connections that match the supplied application URL.

`[-idle-timeout <integer>]` - Idle Timeout (in seconds) (privilege: advanced)

    AMQP idle timeout. Defaults to 0. If set, the local peer will disconnect if it does not receive AMQP frames within the timeout.

`[-address-family {unknown|ipv4|ipv6}]` - Address Family (privilege: advanced)

    Specify address family.

`[-auto-delete-error-minutes {<integer>|-}]` - Time to Auto-delete when disconnected (in minutes) (privilege: advanced)

    Specify time to live in minutes for cloud agent connection in error state. Connection will be deleted if it stays in error state beyond this time.

Examples

```
cluster-1::> cluster agent connection show
Name          Destination                  State      Application    Use
Proxy
------------- ---------------------------- ---------- --------------
---------
cloudinsights amqpws://172.31.50.251       connected  Cloud Insights
false
```

cluster contact-info commands

cluster contact-info modify

Modify contact information for the cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster contact-info modify` command modifies contact information for the cluster administrators. If any values contain spaces, you must enclose those values in quotes.

Use the cluster contact-info show command to display contact information for the cluster administrators.

Parameters

`[-primary-name <text>]` - Name of Primary Contact

Use this parameter to specify the name of the primary contact.

`[-primary-phone <text>]` - Phone Number of Primary Contact

Use this parameter to specify the phone number of the primary contact.

`[-primary-alt-phone <text>]` - Alternate Phone Number of Primary Contact

Use this parameter to specify the alternate phone number of the primary contact.

`[-primary-email <text>]` - Email Address or User ID of Primary Contact

Use this parameter to specify the email address of the primary contact.

`[-secondary-name <text>]` - Name of Secondary Contact

Use this parameter to specify the name of the secondary contact.

`[-secondary-phone <text>]` - Phone Number of Secondary Contact

Use this parameter to specify the phone number of the secondary contact.

`[-secondary-alt-phone <text>]` - Alternate Phone Number of Secondary Contact

Use this parameter to specify the alternate phone number of the secondary contact.

`[-secondary-email <text>]` - Email Address or User ID of Secondary Contact

Use this parameter to specify the email address of the secondary contact.

`[-business-name <text>]` - Business Name

Use this parameter to specify the name of the business responsible for this cluster.

`[-address <text>]` - Business Address

Use this parameter to specify the street address of the business responsible for this cluster.

`[-city <text>]` - City Where Business Resides

Use this parameter to specify the name of the city in which the business is located.

[-state <text>] - State Where Business Resides

Use this parameter to specify the name of the state or province in which the business is located.

[-country <Country Code>] - 2-Character Country Code

Use this parameter to specify the 2-character country code of the country in which the business is located.

[-zip-code <text>] - Postal Code Where Business Resides

Use this parameter to specify the postal or ZIP code area in which the business is located.

Examples

The following example changes the name and phone numbers of the secondary contact person for the cluster.

```
cluster1::> cluster contact-info modify -secondary-name "John Doe"
-secondary-phone 123.555.0156 -secondary-alt-phone 123.555.0178
```

The following example changes the mailing address of the business responsible for the cluster.

```
cluster1::> cluster contact-info modify -address "123 Example Avenue"
-city Exampleville -state "New Example" -zip-code 99999 -country US
```

Related Links

- cluster contact-info show

cluster contact-info show

Display contact information for the cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster contact-info show` command displays contact information for the cluster administrators.

Examples

The following example shows example output for this command.

```
cluster1::> cluster contact-info show
Name of Primary Contact : Richard Roe
            Phone Number of Primary Contact : 123.555.0123
   Alternate Phone Number of Primary Contact : 123.555.0145
 Email Address or User Id of Primary Contact : roe@example.com
                    Name of Secondary Contact : John Doe
          Phone Number of Secondary Contact : 123.555.0167
 Alternate Phone Number of Secondary Contact : 123.555.0189
Email Address or User Id of Secondary Contact : doe@example.com
                              Business Name : Example Dot Com
                           Business Address : 123 Example Avenue
                City Where Business Resides : Exampleville
               State Where Business Resides : New Example
                  2-Character Country Code : US
          Postal Code Where Business Resides : 99999
```

cluster controller-replacement commands

cluster controller-replacement network displaced-interface delete

Delete network interfaces displaced away from this node by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Delete references to logical interfaces that were displaced to another node due to a controller-replacement. A LIF that has been displaced to another node has had its home-node modified to another node because no network ports were available in the same broadcast domain on the original home-node. Deleting this entry does not delete the LIF, it only deletes the entry from the displaced-lifs table indicating that the LIF's current home-node is considered restored.

Parameters

-node <nodename> - Node

Selects the node from which the LIF was displaced.

-vserver <vserver> - Vserver

Selects the vserver on which the LIF resides.

-lif-name <text> - Lif Name

Selects the name of the LIF for which to display displaced information.

Examples

The following example deletes displaced LIF information.

```
cluster1::> cluster controller-replacement network displaced-interface
delete -vserver vs0 -lif lif1
```

cluster controller-replacement network displaced-interface restore-home-node

Restore home node for networked interfaces displaced by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Restore the original home node of logical interfaces that were displaced to another node due to a controller-replacement. A LIF that has been displaced to another node has had its home-node modified to another node because no network ports were available in the same broadcast domain on the original home-node. Restoring the home-node attempts to find a home-port on the original home node if a suitable port exists.

Parameters

`-node <nodename>` - Node

    Selects the node from which the LIF was displaced.

`-vserver <vserver>` - Vserver

    Selects the vserver on which the LIF resides.

`-lif-name <text>` - Lif Name

    Selects the name of the displaced LIF to be restored.

Examples

The following example restores the home-node of a displaced LIF.

```
cluster1::> cluster controller-replacement network displaced-interface
restore-home-node -vserver vs0 -lif lif1
```

cluster controller-replacement network displaced-interface show

Display network interfaces displaced away from this node by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Display logical interfaces that were displaced to another node due to a controller-replacement. A LIF that has been displaced to another node has had its home-node modified to another node because no network ports were available in the same broadcast domain on the original home-node.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node <nodename>] - Node

Selects the node from which the LIF was displaced.

[-vserver <vserver>] - Vserver

Selects the vserver on which the LIF resides.

[-lif-name <text>] - Lif Name

Selects the name of the LIF for which to display displaced information.

[-original-home-node <nodename>] - Original Home Node

The original home-node that was assigned to the LIF prior to controller-replacement.

[-current-home-node <nodename>] - Current Home Node

The current home-node assigned to the LIF after controller-replacement.

Examples

The following example displays the displaced LIF information.

```
cluster1::> cluster controller-replacement network displaced-interface
show
cluster controller-replacement network displaced-interface show)
riginal          Current
server          LIF Name                      Home Node           Home Node
--------------- --------------------- ------------------
-----------------
s0              lif1                          node1               node2
1 entry was displayed.
```

cluster controller-replacement network displaced-vlans delete

Remove VLANs displaces by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Delete VLAN tags that were displaced due to a controller-replacement. A VLAN tag that has been displaced is a tag that was based on a network port that either no longer exists, or was moved to a new broadcast domain.

Restoring the vlan-tags re-creates them on the specified network port.

Parameters

`-node <nodename>` - **Node**

Selects the node on which the displaced vlans reside.

`-port <netport>` - **Original Base Port**

The original base port where the vlans existed prior to controller-replacement.

Examples

The following example deletes the displaced vlan-tag information.

```
cluster1::> cluster controller-replacement network displaced-vlans delete
-node local -port e0c
```

cluster controller-replacement network displaced-vlans restore

Delete VLANs displaced by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Restore VLAN tags that were displaced due to a controller-replacement. A VLAN tag that has been displaced is a tag that was based on a network port that either no longer exists, or was moved to a new broadcast domain. Restoring the vlan-tags re-creates them on the specified network port.

Parameters

`-node <nodename>` - **Node**

Selects the node on which the displaced vlans reside.

`-port <netport>` - **Original Base Port**

The original base port where the vlans existed prior to controller-replacement.

`-destination-port <netport>` - **Destination Port**

The destination port where the vlan-tags will be restored.

Examples

The following example restores vlan-tags displaced from port e0c onto port e0d.

```
cluster1::> cluster controller-replacement network displaced-vlans restore
-node node1 -port e0c -destination-port e0d
```

cluster controller-replacement network displaced-vlans show

Display VLANs displaced by controller-replacement

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Display VLAN tags that were displaced due to a controller-replacement. A VLAN tag that has been displaced is a tag that was based on a network port that either no longer exists, or was moved to a new broadcast domain. Restoring the vlan-tags re-creates them on the specified network port.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>, …` parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node <nodename>] - Node

Selects the node on which the displaced vlans reside.

[-port <netport>] - Original Base Port

The original base port where the vlans existed prior to controller-replacement.

[-vlan-tags <integer>,…] - Displaced VLANs

The vlan-tags that were assigned to the network port prior to controller-replacement.

Examples

The following example displays the displaced vlan-tag information.

```
cluster1::> cluster controller-replacement network displaced-vlans show
cluster controller-replacement network displaced-vlans show)
riginal
ode     Base Port VLANs
-------- ---------
----------------------------------------------------------
ode1     e0c       100,110,120,300,310,320
1 entry was displayed.
```

cluster date commands

cluster date modify

Modify the current date and time for the nodes in the cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster date modify` command sets the time zone, date, and time on every node in the cluster.

Parameters

`[-timezone <Area/Location Timezone>]` - **Time Zone**

This parameter sets the timezone, specified in the Olson format.

`{ [-date {MM/DD/YYYY HH:MM:SS [{+|-}hh:mm]}]` - **Date and Time**

This parameter sets the date and time, in the format MM/DD/YYYY HH:MM:SS.

`| [-dateandtime <[[[[[cc]yy]mm]dd]hhmm[.ss]]>]` - **Date and Time**

This parameter sets the date and time information, in the format [[[[[cc]yy]mm]dd]hhmm[.ss]]. The argument for setting the date and time is interpreted as follows:

- cc First 2 digits of the year (e.g., 20 for 2011).
- yy Last 2 digits of year (e.g., 10 for 2010).
- mm Numeric month, a number from 01 to 12.
- dd Day, a number from 01 to 31.
- hh Hour, a number from 00 to 23.
- mm Minute, a number from 00 to 59.
- ss Second, a number from 00 to 59.

If the first two digits of the year are omitted, and the last two digits are greater than 68, a date in the 1900s is used. Otherwise, a date in the 2000s is used. If all four digits of the year are omitted, the default is the current year. If the month or day is omitted, the default is the current month or day, respectively. If the seconds are omitted, the default is set to 00. The system automatically handles the time changes for Daylight Saving and Standard time, and for leap seconds and years.

`| [-u, -utcdateandtime <[[[[[cc]yy]mm]dd]hhmm[.ss]]>]` - **UTC Date and Time }**

This parameter sets the date and time information in Coordinated Universal Time (UTC), in the format [[[[[cc]yy]mm]dd]hhmm[.ss]]. -u is an alias for -utcdateandtime. The argument for setting the date and time is interpreted as follows:

- cc First 2 digits of the year (e.g., 20 for 2011).
- yy Last 2 digits of year (e.g., 10 for 2010).
- mm Numeric month, a number from 01 to 12.
- dd Day, a number from 01 to 31.
- hh Hour, a number from 00 to 23.
- mm Minute, a number from 00 to 59.
- ss Second, a number from 00 to 59.

If the first two digits of the year are omitted, and the last two digits are greater than 68, a date in the 1900s is used. Otherwise, a date in the 2000s is used. If all four digits of the year are omitted, the default is the current year. If the month or day is omitted, the default is the current month or day, respectively. If the

seconds are omitted, the default is set to 00. Time changes for Daylight Saving and Standard time, and for leap seconds and years, are handled automatically.

Examples

The following example sets the date and time to January 1 2011, at 1:00 a.m.:

```
cluster1::> cluster date modify -date "01/01/2011 01:00:00"
```

The following example sets the date and time in the UTC format to May 22, 2011, at 09:25:00 a.m.:

```
cluster1::> cluster date modify -u 201105220925.00.
```

cluster date show

Display the current date and time for the nodes in the cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster date show` command displays the time zone, date, and time settings for one or more nodes in the cluster. By default, the command displays date and time settings for all nodes in the cluster.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-utc]

Displays date and time information in Coordinated Universal Time (UTC).

| [-utcdate]

Displays date and time information in UTC.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node {<nodename>|local}] - Node

Selects the nodes that match this parameter value.

[-timezone <Area/Location Timezone>] - Time Zone

Selects the nodes that match this parameter value (specified in the Olson format).

[-date {MM/DD/YYYY HH:MM:SS [{+|-}hh:mm]}] - Date and Time

Selects the nodes that match this parameter value.

`[-utc-date <MM/DD/YYYY HH:MM:SS>]` - UTC Date and Time

Selects the nodes that match this parameter value.

`[-dateandtime <[[[[[cc]yy]mm]dd]hhmm[.ss]]>]` - Date and Time

Selects the nodes that match this parameter value (interpreted as follows):

- cc First 2 digits of the year (e.g., 20 for 2011).
- yy Last 2 digits of year (e.g., 11 for 2011).
- mm Numeric month, a number from 01 to 12.
- dd Day, a number from 01 to 31.
- hh Hour, a number from 00 to 23.
- mm Minute, a number from 00 to 59.
- ss Second, a number from 00 to 59.

`[-u, -utcdateandtime <[[[[[cc]yy]mm]dd]hhmm[.ss]]>]` - UTC Date and Time

-u is used as an alias for -utcdateandtime. Selects the nodes that match this parameter value (interpreted as follows):

- cc First 2 digits of the year (e.g., 20 for 2011).
- yy Last 2 digits of year (e.g., 11 for 2011).
- mm Numeric month, a number from 01 to 12.
- dd Day, a number from 01 to 31.
- hh Hour, a number from 00 to 23.
- mm Minute, a number from 00 to 59.
- ss Second, a number from 00 to 59.

Examples

The following example displays the date and time settings for all nodes in the cluster:

```
cluster1::> cluster date show
Node      Date               Timezone
--------- ------------------ ----------------
node0     10/06/2011 09:35:15 America/New_York
node1     10/06/2011 09:35:15 America/New_York
node2     10/06/2011 09:35:15 America/New_York
node3     10/06/2011 09:35:15 America/New_York
4 entries were displayed.
```

cluster date zoneinfo load-from-uri

Load timezone zoneinfo data

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster date zoneinfo load-from-uri` command loads a new set of timezone zoneinfo data to replace the version installed in the cluster. Releases of ONTAP software contain the timezone data that is current at the time of release. If a change is made to the timezone between ONTAP releases, then an update can be made to the release data. For instance, if a change is made to when daylight saving time is observed for a country then an update to cluster zoneinfo data may be required.

Only zoneinfo files provided by NetApp for use in ONTAP should be used with this command.

To update the zoneinfo database do the following:

- Download the required zoneinfo file from the NetApp support website.
- Place the file on a local web server accessible without password from the cluster.
- Execute the `cluster date zoneinfo load-from-uri` command, passing the Universal Resource Identifier (URI) of the file as parameter.

> ⓘ The command need only be executed once for the cluster. The data will be distributed to each node of the cluster.

Parameters

-uri {scheme://(hostname|IPv4 Address|'['IPv6 Address']')…} - URI of Timezone Zoneinfo Data
　　URI of the new zoneinfo file.

Examples

The following example loads a new version of the timezone zoneinfo database to the cluster:

```
cluster1::> cluster date zoneinfo load-from-uri
http://www.example.com/ontap_zoneinfo.zip
```

cluster date zoneinfo show

Display cluster timezone zoneinfo information

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Display information about the current timezone zoneinfo data.

Examples

The following example shows the zoneinfo information for a cluster:

```
cluster1::> cluster date zoneinfo show
Cluster Zoneinfo Version: 2016f
```

cluster ha commands

cluster ha modify

Modify high-availability configuration of cluster management services

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster ha modify` command enables or disables cluster high availability in a two-node cluster. Enable high availability when performing some procedures, such as replacing hardware.

> (i) This command is required to enable high availability if the cluster only has two nodes. Do not run this command in a cluster that has three or more nodes.

> (i) Cluster high availability for two-node clusters differs from the storage failover technology used between two nodes for storage high availability.

Parameters

[-configured {true|false}] - HA Configured

Use this parameter with the value `true` to enable high availability mode in the cluster. Use this parameter with the value `false` to disable high availability mode in the cluster.

Examples

The following example enables cluster high availability in a cluster.

```
cluster1::> cluster ha modify -configured true
```

cluster ha show

Show high-availability configuration status for the cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster ha show` command displays the high-availability status of the cluster. Cluster high-availability mode applies only to two-node clusters.

Examples

The following example displays the high-availability status for a two-node cluster :

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

cluster identity commands

cluster identity modify

Modify the cluster's attributes

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster identity modify` command changes a cluster's identity information.

Parameters

`[-name <Cluster name>]` - Cluster Name
    Use this parameter to specify a new name for the cluster.

> • The name must contain only the following characters: A-Z, a-z, 0-9, "-" or "_".
> • The first character must be one of the following characters: A-Z or a-z.
> • The last character must be one of the following characters: A-Z, a-z or 0-9.
> • The maximum supported length is 44 characters.
> • The system reserves the following names: "all", "cluster", "local" and "localhost".

`[-location <text>]` - Cluster Location
    Use this parameter to specify the physical location of the cluster. For example, "Lab 5".

`[-contact <text>]` - Cluster Contact
    Use this parameter to specify contact information for the cluster, such as a name or e-mail address.

Examples

The following example renames the current cluster to *cluster2* :

```
cluster1::> cluster identity modify -name cluster2
```

cluster identity show

Display the cluster's attributes including Name, Serial Number, Cluster UUID, Location and Contact

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster identity show` command displays the identity information of the cluster.

Examples

The following example displays the cluster's UUID, name, serial number, location, and contact information:

```
cluster1::> cluster identity show
Cluster UUID: 1cd8a442-86d1-11e0-ae1c-123478563412
         Cluster Name: cluster1
 Cluster Serial Number: 1-80-123456
     Cluster Location: Lab2
      Cluster Contact: jsmith@example.com

cluster1::>
```

cluster image commands

cluster image cancel-update

Cancel an update

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image cancel-update` command is used to cancel an update that is in either paused-by-user or paused-on-error state. An update can only be canceled if it is in a paused state.

Examples

The following example displays a cancel-update operation:

```
cluster1::> cluster image cancel-update

Warning: The cancel operation can result in a mixed version
         cluster and/or mixed version HA pair. The cancel
         operation can take several minutes to complete.
Do you want to proceed with the cancel operation? {y|n}: y

Info: Canceling update. It may take a few minutes to finish canceling the
update
```

cluster image pause-update

Pause an update

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image pause-update` command is used to pause a currently running update. The update pauses at the next predefined pause point (for example, after validation, download to the boot device, takeover completion, or giveback completion) which might take some time to reach. When the update reaches the pause point, it transitions into the pause-by-user state.

Examples

The following example displays pause-update operation:

```
cluster1::> cluster image pause-update

Info: Pausing update. It may take a few minutes to finish pausing the
update
```

cluster image resume-update

Resume an update

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image resume-update` command is used to resume an update that is currently paused in paused-by-user or paused-on-error state. If the update is not paused then an error is returned.

Parameters

[-ignore-post-update-checks-failures {true|false}] - Ignore Post-update-checks Phase Failures (privilege: advanced)
  Specifies whether the post update checks phase warnings and/or errors should be ignored. The default value is false.

[-skip-firmware-update-checks {true|false}] - Skip Firmware Update Status Checks
  Specifies whether firmware update status check will be skipped or not. By default, firmware update status check will not be skipped.

Examples

The following example shows an resume-update operation:

```
cluster1::> cluster image resume-update

Info: Resuming update...
```

cluster image show-update-history

Display the update history

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image show-update-history` command displays the update history for each node. By default, the command displays the following information:

- Status
- Package version
- Start time
- Completion time
- Component ID
- Previous version
- Updated version

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-component-id <text>] - Component ID

Displays updates for the specified component.

[-start-time <MM/DD/YYYY HH:MM:SS>] - Start Time

Displays updates with the specified start time.

[-package-version <text>] - Package Version

Displays updates for the specified package version.

[-status {successful|canceled|back-out|skip-upgrade}] - Status

Displays updates that completed with the specified status.

[-completion-time <MM/DD/YYYY HH:MM:SS>] - Completion Time

Displays updates with the specified completion time.

`[-previous-version <text>]` - Previous Version

Displays updates with the specified previous version.

`[-updated-version <text>]` - Updated Version

Displays updates with the specified updated version.

Examples

The following example displays history of automated nondisruptive updates:

```
cluster1::> cluster image show-update-history
Package     Start       Completion                          Previous
Updated
Status      Version     Time        Time        Component ID  Version
Version
----------  ---------   ----------  ----------  ------------  ---------
---------
canceled    8.3         2/11/2014   2/11/2014   ssan-3240-    8.3         8.3
                        12:05:51    12:05:51    55a
successful  8.3         2/11/2014   2/11/2014   ssan-3240-    8.3         8.3
                        14:23:58    15:02:19    55a
successful  8.3         2/13/2014   2/18/2014   ssan-3240-    8.3         8.3
                        16:48:42    09:45:30    55a
successful  8.3         2/18/2014   2/18/2014   ssan-3240-    8.3         8.3
                        10:33:10    11:02:45    55a
canceled    8.3         2/11/2014   2/11/2014   ssan-3240-    8.3         8.3
                        12:05:51    12:05:51    55b
successful  8.3         2/11/2014   2/11/2014   ssan-3240-    8.3         8.3
                        14:23:58    15:54:43    55b
successful  8.3         2/13/2014   2/18/2014   ssan-3240-    8.3         8.3
                        16:48:42    10:05:02    55b
successful  8.3         2/18/2014   2/18/2014   ssan-3240-    8.3         8.3
                        10:33:10    11:22:02    55b
8 entries were displayed.
```

cluster image show-update-log-detail

Display detailed information about nondisruptive update events

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster image show-update-log-detail` command displays detailed information about the currently running and previously run nondisruptive update events. By default, the command displays the following information:

- Node

- Transaction ID

- Time stamp

- Destination node

- Task phase

- Task name

- Task status

- Message

Parameters

`[-fields <fieldname>,…]`

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

`| [-instance ]` (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

`[-node {<nodename>|local}]` - Node (privilege: advanced)

Displays information only for the specified node.

`[-task-id <integer>]` - Task Id (privilege: advanced)

Displays information only for the specified task ID.

`[-posted-time <MM/DD/YYYY HH:MM:SS>]` - Posted Time (privilege: advanced)

Displays information that occurred at the specified time.

`[-msg-seq-no <integer>]` - Message Sequence (privilege: advanced)

Displays information only for the specified message sequence number.

`[-current-pid <integer>]` - Process ID (privilege: advanced)

Displays information only for the specified process ID.

`[-destination <text>]` - Task Target node (privilege: advanced)

Displays information only for the specified destination node.

`[-ndu-phase {validation|prereq-updates|ontap-updates|package-management|default-phase|post-update-checks}]` - Update phase (privilege: advanced)

Displays information only for the specified phase.

`[-task-name {initialize|mount-image|restart-hm|get-health|run-scripts|unmount-image|clear-alert|post-restart-hm|cleanup-rd|synch-image|do-download-job|do-failover-job|do-giveback-job|check-progress|complete-validation|invalid-task|default-task|do-postupdate-checks-task}]` - Task Name (privilege: advanced)

Displays information only for the specified task name.

`[-status {created|ready-to-run|running|completed|failed|pause_req|paused-error|cancel_req|canceled|resume_req|default_status}]` - Status Of Task (privilege: advanced)

Displays information only for items with the specified status.

`[-message <text>]` - Update Log Message (privilege: advanced)

Displays information only for items with the specified message.

`[-msg-type <text>]` - Type of Message (privilege: advanced)

Displays information only for items with the specified message type.

`[-src-info <text>]` - Source Information (privilege: advanced)

Displays information only for items for the specified source.

Examples

The following example displays detailed information automated nondisruptive updates:

```
cluster1::*> cluster image show-update-log-detail
          Time      Dest     Task   Task   Task
Node   TID Stamp     Node     Phase  Name   Status Message
------ --- -------- -------- ------ ------ ------
--------------------------
node1  15  3/19/    MUM       ontap- initia ready- Created Task
           2014               update lize   to-run
           13:52:38           s
node1  15  3/19/    MUM       ontap- initia runnin Updated Task Status
           2014               update lize   g
           13:52:38           s
node1  16  3/19/    node1     ontap- do-    ready- Created Task
           2014               update downlo to-run
           13:52:38           s      ad-job
node1  16  3/19/    node1     ontap- do-    runnin Updated Task Status
           2014               update downlo g
           13:52:39           s      ad-job
node1  17  3/19/    node2     ontap- do-    ready- Created Task
           2014               update downlo to-run
           13:52:38           s      ad-job
node2  17  3/19/    node2     ontap- do-    runnin Updated Task Status
           2014               update downlo g
           13:52:38           s      ad-job
6 entries were displayed.
```

cluster image show-update-log

Display the update transaction log

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster image show-update-log` command displays detailed information about the currently running, or previously run nondisruptive updates. By default, the command displays the following information:

- Phase
- Transaction
- Transaction ID
- Component ID
- Time stamp
- Status

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>, …` parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-trans-id <integer>] - Transaction ID (privilege: advanced)

Displays information for the step associated with the specified transaction ID.

[-component-id {<nodename>|local}] - Component ID (privilege: advanced)

Displays information for steps associated with the specified component.

[-phase {validation|prereq-updates|ontap-updates|package-management|default-phase|post-update-checks}] - Transaction Phase (privilege: advanced)

Displays information for steps associated with the specified update phase.

[-trans-name {initialize|mount-image|restart-hm|get-health|run-scripts|unmount-image|clear-alert|post-restart-hm|cleanup-rd|synch-image|do-download-job|do-failover-job|do-giveback-job|check-progress|complete-validation|invalid-task|default-task|do-postupdate-checks-task}] - Transaction Name (privilege: advanced)

Displays information for steps associated with the specified transaction.

[-timestamp <MM/DD/YYYY HH:MM:SS>] - Timestamp (privilege: advanced)

Displays information for steps associated with the specified timestamp.

[-status {waiting|started|completed|paused-on-error|paused-by-user|pause-pending|cancel-pending|canceled|failed}] - Status (privilege: advanced)

Displays information for steps matching the specified status.

Examples

The following example displays information *about* automated nondisruptive update events:

```
cluster1::*> cluster image show-update-log
                           Trans
Phase          Transaction Id    Component Id       Time Stamp  Status
-------------- ----------- ----- ----------------- -----------
---------------
validation     initialize  50    MUM               2/18/2014   completed
                                                   10:32:57

validation     mount-image 51    node1             2/18/2014   completed
                                                   10:32:52

validation     mount-image 52    node2             2/18/2014   completed
                                                   10:32:53

validation     get-health  53    MUM               2/18/2014   completed
                                                   10:32:53

validation     run-scripts 54    node1             2/18/2014   completed
                                                   10:32:53

validation     run-scripts 55    node2             2/18/2014   completed
                                                   10:32:57

validation     unmount-    56    node1             2/18/2014   completed
               image                               10:32:57

validation     unmount-    57    node2             2/18/2014   completed
               image                               10:32:57

validation     complete-   58    MUM               2/18/2014   completed
               validation                          10:32:57

package-       cleanup-    66    node1             3/14/2014   completed
management     package                             09:11:51

package-       cleanup-    67    node2             3/14/2014   completed
management     package                             09:11:51

package-       process-    68    node1             3/14/2014   completed
management     package                             09:13:41

package-       synch-image 69    node2             3/14/2014   completed
management                                         09:14:25

13 entries were displayed.
```

cluster image show-update-progress

Display the update progress

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image show-update-progress` command displays information about the current state of an update. By default, the command displays the following information:

- Update phase
- Status
- Estimated Duration
- Elapsed Duration

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>, …` parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-ndu-phase {validation|prereq-updates|ontap-updates|package-management|default-phase|post-update-checks}] - Update Phase

Displays information about the specified update phase.

[-phase-status {in-progress|waiting|paused-by-user|paused-on-error|completed|canceled|failed|pause-pending|cancel-pending}] - Phase Status

Displays information about progress matching the specified phase status.

[-phase-duration <text>] - Phase Duration

Displays information about progress matching the specified phase duration.

[-phase-comments <text>] - Phase Comments

Displays information about progress matching the specified phase comments.

[-elapsed-duration {<seconds>|[<d> days] <hh>:<mm>[:<ss>]}] - Elapsed duration of the phase

Displays information about progress matching the specified elapsed duration.

[-estimated-duration {<seconds>|[<d> days] <hh>:<mm>[:<ss>]}] - Estimated duration of the phase

Displays information about progress matching the specified estimated duration.

[-phase-description <text>] - Phase Description

Displays information about progress matching the specified phase description.

`[-subsystem-name <text>]` - Subsystem Name

Displays information about progress matching the specified subsystem name.

`[-subsystem-status <text>]` - Subsystem Status

Displays information about progress matching the specified subsystem status.

`[-subsystem-details <text>]` - Subsystem Details

Displays information about progress matching the specified subsystem details.The "firmware update" status is reflected in the following states: - not started: The firmware update process has not been initiated. - no change: The firmware update was completed without any changes. - pending: The firmware update is pending. - in progress: The firmware update is currently in progress. - completed: The firmware update is completed with changes. - error: An error occurred during the firmware update process. - aborted: The firmware update process was aborted.

`[-subsystem-action <text>]` - Subsystem Action

Displays information about progress matching the specified subsystem action.

Examples

The following example shows the cluster image validate progress of two nodes, nodeA and nodeB after executing the cluster image validation command. On the first screen it shows when the pre-update check status is *in-progress* and on the second screen it shows the pre-update checks status changed to *completed*.

```
cluster1::> cluster image show-update-progress
                                       Estimated       Elapsed
pdate Phase          Status           Duration        Duration
------------------   ---------------- ---------------  ---------------
re-update checks     in-progress                 00:10:00         00:00:13

etails:

re-update Check      Status           Error-Action
------------------   ---------------- -----------------------------
```

```
cluster1::> cluster image show-update-progress
pdate Phase          Status                  Duration           Duration
------------------   ---------------- ---------------  ---------------
re-update checks     completed                   00:10:00         00:01:09

etails:

re-update Check      Status           Error-Action
------------------   -----------      --------------------------
oot Menu Status      Warning          Warning: bootarg.init.bootmenu is
                                      enabled on nodes: nodeA,
                                      nodeB. The boot process
```

```
                                   of the nodes will be delayed.
                                   Action: Set the bootarg.init.bootmenu
                                   bootarg to false before proceeding
                                   with the upgrade.
  anual checks          Warning    Warning: Manual validation checks
                                   need to be performed. Refer to the
                                   Upgrade Advisor Plan or the "What
                                   should I verify before I upgrade with
                                   or without Upgrade Advisor" section
                                   in the "Upgrade ONTAP" documentation
                                   for the remaining validation checks
                                   that need to be performed before
                                   update. Failing to do so can result
                                   in an update failure or an I/O
                                   disruption.
                                   Action: Refer to the Upgrade Advisor
                                   Plan or the "What should I verify
                                   before I upgrade with or without
                                   Upgrade Advisor" section in the
                                   "Upgrade ONTAP" documentation for the
                                   remaining validation checks that need
                                   to be performed before update.
  FS mounts             Warning    Warning: This cluster is serving NFS
                                   clients. If NFS soft mounts are used,
                                   there is a possibility of frequent
                                   NFS timeouts and race conditions that
                                   can lead to data corruption during
                                   the upgrade.
                                   Action: Use NFS hard mounts, if
                                   possible. To list Vservers running
                                   NFS, run the following command:
                                   vserver nfs show
  odes to update    list Warning   Warning: List of nodes to be
                                   upgraded: "nodeA,
                                   nodeB."
                                   Action: To upgrade all selected nodes,
                                   regardless of their current version,
                                   set the (privilege: advanced)
                                   "-skip-nodes-at-target-version"
                                   parameter to "false".
  entries were displayed.
```

The following example shows the cluster image validate progress of two nodes, nodeA and nodeB after executing the cluster image validation command along with option show-validation-details. On the first screen it shows when the pre-update check status is *in-progress* . On the second screen it shows the pre-update checks status changed to *completed* .

```
cluster1::> cluster image show-update-progress
                                         Estimated      Elapsed
pdate Phase          Status                Duration      Duration
------------------  ----------------  ---------------  ---------------
re-update checks     in-progress            00:10:00         00:00:13

etails:

re-update Check      Status          Error-Action
------------------  ----------------  ------------------------------
```

```
cluster1::> cluster image show-update-progress

stimated           Elapsed
pdate Phase          Status                Duration      Duration
------------------  ----------------  ---------------  ---------------
re-update checks     completed              00:10:00         00:01:08

etails:

re-update Check      Status          Error-Action
------------------  ----------------  ------------------------------
MPQ Router and       OK               N/A
roker Config
leanup
ggregate online      OK               N/A
tatus and parity
heck
ggregate plex        OK               N/A
esync status check
pplication           OK               N/A
rovisioning Cleanup
utoboot Bootargs     OK               N/A
tatus
ackend               OK               N/A
onfiguration Status
oot Menu Status      Warning          Warning: bootarg.init.bootmenu is
                                       enabled on nodes: nodeA,
                                       nodeB. The boot process
                                       of the nodes will be delayed.
                                       Action: Set the
                                       bootarg.init.bootmenu
                                       bootarg to false before
                                       proceeding with the upgrade.
```

roadcast Domain vailability and niqueness for HA air status	OK	N/A
IFS compatibility tatus check	OK	N/A
LAM quorum online tatus check	OK	N/A
PU Utilization tatus	OK	N/A
apacity licenses nstall status check	OK	N/A
heck For SP/BMC onnectivity To odes	OK	N/A
heck LDAP fastbind sers using nsecure connection.	OK	N/A
heck for unsecure ex algorithm onfigurations.	OK	N/A
heck for unsecure ac configurations.	OK	N/A
loud keymanager onnectivity check	OK	N/A
luster health and ligibility status	OK	N/A
luster quorum tatus check	OK	N/A
luster/management witch check	OK	N/A
ompatible New mage Check	OK	N/A
urrent system ersion check if it s susceptible to ossible outage uring NDU	OK	N/A
ata ONTAP Version nd Previous pgrade Status	OK	N/A
ata aggregates HA olicy check	OK	N/A
isk status check or failed, broken r non-compatibility	OK	N/A

uplicate Initiator heck	OK	N/A
ncryption key igration status heck	OK	N/A
xternal ey-manager with egacy KMIP client heck	OK	N/A
xternal keymanager ey server status heck	OK	N/A
abricpool Object tore Availability	OK	N/A
igh Availability onfiguration tatus check	OK	N/A
nfinite Volume vailibility check	OK	N/A
IF failover apability status heck	OK	N/A
IF health check	OK	N/A
IF load balancing tatus check	OK	N/A
IFs is on home ode status	OK	N/A
ogically over llocated DP olumes check	OK	N/A
anual checks that an be done using pgrade ONTAP ocumentation	Warning	Warning: Manual validation checks need to be performed. Refer to the Upgrade Advisor Plan or the "What should I verify before I upgrade with or without Upgrade Advisor" section in the "Upgrade ONTAP" documentation for the remaining validation checks that need to be performed before update. Failing to do so can result in an update failure or an I/O disruption. Action: Refer to the Upgrade Advisor Plan or the "What should I verify before I upgrade with or without Upgrade Advisor"

		section in the "Upgrade ONTAP" documentation for the remaining validation checks that need to be performed before update.
etroCluster onfiguration tatus check for ompatibility	OK	N/A
inimum number of ggregate disks heck	OK	N/A
ulti-Admin upgrade alidation checks	OK	N/A
AE Aggregate and VE Volume ncryption Check	OK	N/A
DMP sessions check	OK	N/A
FS mounts status heck	Warning	Warning: This cluster is serving NFS clients. If NFS soft mounts are used, there is a possibility of frequent NFS timeouts and race conditions that can lead to data corruption during the upgrade. Action: Use NFS hard mounts, if possible. To list Vservers running NFS, run the following command: vserver nfs show
ame Service onfiguration DNS heck	OK	N/A
ame Service onfiguration LDAP heck	OK	N/A
etwork port eachability check	OK	N/A
ode to SP/BMC onnectivity check	OK	N/A
odes to update list	Warning	Warning: List of nodes to be upgraded: "nodeA, nodeB." Action: To upgrade all selected nodes, regardless of their current version, set the (privilege: advanced) "-skip-nodes-at-target-version" parameter to "false".

KM/KMIP enabled ystems - Missing eys check	OK	N/A
NTAP API to REST ransition warning	OK	N/A
NTAP Image apability Status	OK	N/A
penSSL 3.0.x pgrade validation heck	OK	N/A
penssh 7.2 upgrade alidation check	OK	N/A
latform Health onitor check	OK	N/A
re-Update onfiguration erification	OK	N/A
DB Replica Health heck	OK	N/A
eplicated database chema consistency heck	OK	N/A
unning Jobs Status	OK	N/A
AN LIF association tatus check	OK	N/A
AN compatibility or manual onfigurability heck	OK	N/A
AN kernel agent tatus check	OK	N/A
ecure Purge peration Check	OK	N/A
helves and Sensors heck	OK	N/A
napLock Version heck	OK	N/A
napMirror ynchronous elationship status heck	OK	N/A
napMirror ompatibility tatus check	OK	N/A
upported platform heck	OK	N/A

```
arget ONTAP          OK                    N/A
elease support for
iberBridge 7500N
heck
pgrade Version       OK                    N/A
ompatibility Status
erify all bgp        OK                    N/A
eer-groups are in
he up state
erify if a cluster   OK                    N/A
anagement LIF
xists
erify that e0M is    OK                    N/A
ome to no LIFs
ith high speed
ervices.
olume Conversion     OK                    N/A
n Progress Check
olume move           OK                    N/A
rogress status
heck
olume online         OK                    N/A
tatus check
SCSI target portal   OK                    N/A
roups status check
verall Status        Warning               Warning
8 entries were displayed.
```

The following example shows the automated nondisruptive update of two nodes, nodeA and nodeB. In this case, nodeA's update is waiting, nodeB's update is in progress. nodeB's giveback operation is in progress.

```
cluster1::> cluster image show-update-progress
Estimated          Elapsed
Update Phase        Status               Duration          Duration
-------------------- ----------------- ---------------- ----------------
Pre-update checks    completed                  00:10:00          00:00:02
Data ONTAP updates   in-progress                01:23:00          00:32:07

Details:

Node name            Status             Status Description
-------------------- ----------------- -------------------------------
nodeA                waiting
nodeB                in-progress        Performing giveback operation.
3 entries were displayed.

cluster1::>
```

The following example shows the automated nondisruptive update of two nodes, nodeA and nodeB. In this case, automated nondisruptive update is paused-on-error in "Data ONTAP updates" phase. nodeA's update is waiting, nodeB's update is failed. "Status Description" show nodeB's error and action.

```
cluster1:> cluster image show-update-progress
Estimated          Elapsed
Update Phase        Status                       Duration        Duration
------------------- ----------------   ----------------   ----------------
Pre-update checks   completed                    00:10:00        00:00:02
Data ONTAP updates  paused-on-error              00:49:00        00:05:21

Details:

Node name           Status           Status Description
------------------- ----------------   ----------------------------------
nodeA               waiting
nodeB               failed           Error: Takeover of node
                                     "nodeB" is not possible.
                                     Action: Use the "storage failover
                                     show" command to view the cause of
                                     the failure.
2 entries were displayed.

Status: Paused - An error occurred in "Data ONTAP updates" phase. The
non-disruptive update cannot continue until the error has been resolved.
Resolve all issues, then use the "cluster image resume-update" command to
resume the update.

cluster1:>
```

The following example shows that the automated nondisruptive update is paused-on-error in "Post-update checks" update phase and "Status Description" shows the error and action.

```
cluster1::> cluster image show-update-progress
                      Estimated       Elapsed
Update Phase          Status                          Duration        Duration
-------------------- --------------- --------------- ---------------
Data ONTAP updates   completed                       02:19:00        00:00:03
Post-update checks   paused-on-error                 00:10:00        00:00:02

Details:

Post-update Check    Status          Error-Action
-------------------- -------------- -------------------------------------
Cluster Quorum       Error           Error: Cluster is not in quorum.
Status
                                     Action: Use the (privilege: advanced)
                                     "cluster ring show" command to verify
                                     all replication unit details.
5 entries were displayed.

Status: Paused - An error occurred in "Post-update checks" phase. The
non-disruptive update cannot continue until the error has been resolved.
Resolve all issues, then use the "cluster image resume-update" command
to resume the update.

cluster1::>
```

The following example shows that the automated nondisruptive update is completed on nodeA and nodeB.

```
cluster1::> cluster image show-update-progress
                      Estimated       Elapsed
Update Phase          Status                          Duration        Duration
-------------------- ---------------- --------------- ---------------
Pre-update checks    completed                       00:10:00        00:00:13
Data ONTAP updates   completed                       01:23:00        01:15:11
Post-update checks   completed                       00:10:00        00:00:02
3 entries were displayed.

Updated nodes: nodeA, nodeB.
cluster1:>
```

The following example shows the automated update of two-node MetroCluster configuration having clusters cluster_A and cluster_B. In this case, cluster_A's update is waiting and cluster_B's update is in progress. cluster_B's switchback operation is in progress.

```
cluster_A::> cluster image show-update-progress
Estimated        Elapsed
Cluster                                          Duration        Duration      Status
---------------------------- --------------- ----------------
----------------
cluster_A                                        00:00:00        00:00:00      waiting
cluster_B                                        00:00:00        00:06:42      in-
progress

Details: Switchback in progress.

Waiting for partner cluster "sti60-vsim-ucs134f_siteB" to be up.

cluster_A::>
```

The following example shows that the automated update is completed on both cluster_A and cluster_B in two-node MetroCluster configuration.

```
cluster_A::> cluster image show-update-progress
Estimated        Elapsed
Cluster                                          Duration        Duration      Status
---------------------------- --------------- ----------------
----------------
cluster_A                                        00:00:00        00:20:44
completed
cluster_B                                        00:00:00        00:10:43
completed

Details: MetroCluster updated successfully.
cluster_A::>
```

cluster image show

Display currently running image information

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image show` command displays information about the version of ONTAP that is running on each node and the date/time when it was installed. By default, the command displays the following information:

  • Node name
  • Current version
  • Installation date and time

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node {<nodename>|local}] - Node

Displays information about the specified node.

[-version <text>] - Current Version

Displays information about the nodes running the specified version.

[-date <MM/DD/YYYY HH:MM:SS>] - Date Installed

Displays information about the nodes with the specified installation date.

Examples

The following example displays information about currently running images on all nodes of the cluster:

```
cluster1::> cluster image show
                      Current                       Installation
Node                  Version                       Date
----------------      -----------------------       ------------
node1                 8.3                           -
node2                 8.3                           -
2 entries were displayed.
```

cluster image update

Manage an update

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image update` command is used to initiate a ONTAP update. The update is preceded by a validation of the cluster to ensure that any issues that might affect the update are identified. There are two types of updates of a cluster. A rolling update updates ONTAP one HA pair at a time. This type of update is performed for clusters with fewer than eight nodes or when the `-force-rolling` option is specified for clusters with eight or more nodes. A batch update is used for clusters of eight or more nodes, and performs updates of multiple HA pairs at the same time.

There are predefined points in the update when the update can be paused (either by the user or by an error). These pause points occur after validation, after download to the boot device, after takeover has completed, and after giveback has completed.

Parameters

`-version <text>` - Update Version

Specifies the ONTAP version to use to update the cluster.

`[-nodes {<nodename>|local}]` - Node

Specifies the nodes that are to be updated. This parameter is not supported for MetroCluster configurations updates or two-stage upgrades. The node upgrade sequence does not follow the node order entered in `cluster image update` command

`[-estimate-only <true>]` - Estimate Only

Creates a report of the steps that occur during the update without performing them precisely.

`[-pause-after {none|takeover-giveback|all}]` - Update Pause

Specifies that the update should pause at each predefined pause points (for example, after validation, after download to the boot device, after takeover, and after giveback) during the update.

`[-ignore-validation-warning {true|false}]` - Ignore Validation

Specifies that the update should proceed even if the validation reports warnings.

`[-skip-confirmation {true|false}]` - Skip Confirmation

Specifies that a validation that does not detect any error issues should not ask the user to confirm the update but simply proceed with the update.

`[-force-rolling <true>]` - Force Rolling Update

This option is used for clusters with eight or more nodes to specify that a rolling update (one HA pair at a time) should be done. This parameter is not supported for single-node cluster and two-node MetroCluster.

`[-stabilize-minutes <integer>]` - Minutes to stabilize

Specifies the number of minutes that the update should wait after a takeover or giveback is completed. This allows time for the clients to recover from the pause in I/O that occurs during takeover and giveback. This parameter is not supported for single-node cluster.

`[-show-validation-details <true>]` - Shows All Validation Details

Specify to display all validation details. Default: do not display all details.

`[-skip-nodes-at-target-version <true>]` - Skip Nodes at Target Version (privilege: advanced)

When this parameter is $true$, only the nodes which are not running the target version are upgraded. Nodes which are currently running the target version are skipped. The default value is $true$. This parameter cannot be set to true in MetroCluster configurations.

Examples

The following example shows the cluster image update operation. configuration having node nodeA and nodeB.

```
cluster1::> cluster image update -version 9.16.1

Starting validation for this update...
```

```
It can take several minutes to complete validation...

WARNING: There are additional manual upgrade validation checks that must
be performed after these automated validation checks have completed
successfully.
Refer to the Upgrade Advisor Plan or the "What should I verify before I
upgrade with or without Upgrade Advisor" section in the "Upgrade ONTAP"
documentation for the remaining manual validation checks that need to be
performed before update.
During ONTAP upgrade, the system firmware (BIOS and LOADER firmware)
in the boot media will be replaced with the system firmware in the target
ONTAP package, only if the ONTAP package contains later versions.
Prior to 9.17.1, system firmware in the boot media was always replaced
with the system firmware in the target ONTAP package.
Upgrade ONTAP documentation available at: https://docs.netapp.com/us-
en/ontap/upgrade/index.html
The list of checks are available at: https://docs.netapp.com/us-
en/ontap/upgrade/task_what_to_check_before_upgrade.html
Failing to do so can result in an update failure or an I/O disruption.
Please use Interoperability Matrix Tool (IMT
http://mysupport.netapp.com/matrix)
to verify host system supportability configuration information.


 Pre-update Check          Status          Error-Action
 ----------------------- --------      ——————————————————————————
 Boot Menu Status          Warning         Warning: bootarg.init.bootmenu
                                           is enabled on nodes:
                                           nodeA,
                                           nodeB. The boot
                                           process of the nodes will be
                                           delayed.
                                           Action: Set the
                                           bootarg.init.bootmenu bootarg
                                           to false before proceeding with
                                           the upgrade.
 Manual checks             Warning         Warning: Manual validation
                                           need to be performed.
                                           Refer to the Upgrade Advisor
                                           Plan or the "What should I
                                           verify before I upgrade with or
                                           without Upgrade Advisor"
                                           section in the "Upgrade ONTAP"
                                           documentation for the remaining
                                           validation checks that need to
                                           be performed before update.
                                           Failing to do so can result in
```

```
                                  an update failure or an I/O
                                  disruption.
                                  Action: Refer to the Upgrade
                                  Advisor Plan or the "What
                                  should I verify before I
                                  upgrade with or without Upgrade
                                  Advisor" section in the
                                  "Upgrade ONTAP" documentation
                                  for the remaining validation
                                  checks that need to be
                                  performed before update.
 NFS mounts               Warning  Warning: This cluster is
                                  serving NFS clients. If NFS
                                  soft mounts are used, there is
                                  a possibility of frequent NFS
                                  timeouts and race conditions
                                  that can lead to data
                                  corruption during the upgrade.
                                  Action: Use NFS hard mounts, if
                                  possible. To list Vservers
                                  running NFS, run the following
                                  command: vserver nfs show
 Nodes to update list     Warning  Warning: List of nodes to be
                                  upgraded: "nodeA,
                                  nodeB."
                                  Action: To upgrade all selected
                                  nodes, regardless of their
                                  current version, set the
                                  (privilege: advanced)
                                  "-skip-nodes-at-target-version"
                                  parameter to "false".
Overall Status            Warning
5 entries were displayed.
Warning: Validation has reported warnings.

Do you want to continue? {y|n}:
Starting update...
Info: Run the "cluster image show-update-progress" command to check update
status.
```

cluster image validate

Validates the cluster's update eligibility

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image validate` command checks for issues within the cluster that might lead to problems during the update.

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

[-version <text>] - Update Version

Specifies the ONTAP version to use to validate the cluster.

[-rolling <true>] - Rolling Update

Specify this optional parameter on a cluster with eight or more nodes to perform a rolling-update check. The default is to perform a batch-update check.

> (i) This parameter is only supported on a cluster with eight or more nodes, and is not supported for two-node MetroCluster.

[-nodes {<nodename>|local}] - Nodes

Specifies the nodes that are to be validated. This parameter is not supported for MetroCluster configurations and for two-stage upgrades.

[-show-validation-details <true>] - Shows All Validation Details

Specify to display all validation details. Default: do not display all details.

[-skip-nodes-at-target-version <true>] - Skip Nodes at Target Version (privilege: advanced)

Specifies that the validation will skip the nodes which are already running target version. Default: true.

Examples

The following example shows the validate operation:

```
cluster1::> cluster image validate -version 9.16.1

It can take several minutes to complete validation...

WARNING: There are additional manual upgrade validation checks that must
be performed after these automated validation checks have completed
successfully. Refer to the Upgrade Advisor Plan or the "What should I
verify before I upgrade with or without Upgrade Advisor" section in the
"Upgrade ONTAP" documentation for the remaining manual validation checks
that need to be performed before update.
Upgrade ONTAP documentation available at: https://docs.netapp.com/us-
en/ontap/upgrade/index.html
The list of checks are available at: https://docs.netapp.com/us-
en/ontap/upgrade/task_what_to_check_before_upgrade.html
Failing to do so can result in an update failure or an I/O disruption.
Please use Interoperability Matrix Tool
(IMT  http://mysupport.netapp.com/matrix) to verify host system
supportability configuration information.

Validation checks started. Run the "cluster image show-update-progress"
command to check validation status.
```

The following example shows the validate operation with validation details:

```
cluster1::> cluster image validate -version 9.16.1 -show-validation
-details

It can take several minutes to complete validation...

WARNING: There are additional manual upgrade validation checks that must
be performed after these automated validation checks have completed
successfully.
Refer to the Upgrade Advisor Plan or the "What should I verify before
I upgrade with or without Upgrade Advisor" section in the
"Upgrade ONTAP" documentation for the remaining manual validation
checks that need to be performed before update.
Upgrade ONTAP documentation available at: https://docs.netapp.com/us-
en/ontap/upgrade/index.html
The list of checks are available at: https://docs.netapp.com/us-
en/ontap/upgrade/task_what_to_check_before_upgrade.html
Failing to do so can result in an update failure or an I/O disruption.
Please use Interoperability Matrix Tool
(IMT  http://mysupport.netapp.com/matrix) to verify host system
supportability configuration information.

Validation checks started.  Run the "cluster image show-update-progress"
command to check validation status.
```

cluster image package delete

Remove a package from the cluster image package repository

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image package delete` command deletes the specified version of the package from the package repository. The associated information about the package is also deleted from the update database.

Parameters

`-version <text>` **- Version To Be Deleted**
   Specifies the package version that is to be deleted.

Examples

The following example deletes the package with version 8.3:

```
cluster1::> cluster image package delete -version 8.3

Package Delete Operation Completed Successfully
```

cluster image package get

Fetch a package file from a URL into the cluster image package repository

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image package get` command fetches an ONTAP package file specified by the URL into the cluster. The package is stored in the cluster package repository and the information from the package is stored in the update database.

Parameters

-url <text> - Package URL

    Specifies the URL from which to get the package.

Examples

The following example displays how to get a package from a URL:

```
cluster1::> cluster image package get -url http://example.com/image.tgz
```

cluster image package show-repository

Display information about packages available in the cluster image package repository

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster image package show-repository` command displays the package versions that are in the cluster package repository. By default, the command displays the following information:

  • Package version

Parameters

{ [-fields <fieldname>,…]

    If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-detail]

    This parameter specifies that detailed information should be displayed.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-download-ver <text>] - Downloaded Version

Displays packages with the specified download version.

[-component-name <text>,…] - Component Name

Displays packages for the specified component.

[-component-version <text>,…] - Component Version

Displays packages with the specified component version.

[-package-build-time <MM/DD/YYYY HH:MM:SS>] - Package Build Time

Displays packages with the specified build time.

Examples

The following example displays the packages in the cluster package repository:

```
cluster1::> cluster image package show-repository
Package Version Package Build Time
--------------- ------------------
8.3             9/12/2014 10:27:33
```

cluster kernel-service commands

cluster kernel-service show

Display cluster service state in the kernel

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

```
The `cluster kernel-service show` command displays the following
information from the master node for each node in the cluster:
```

- Node name
- The quorum status of that node
- The availability status of that node
- The operational status of that node

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-master-node {<nodename>|local}] - Node (privilege: advanced)

The node in the cluster where the information be being reported from. If this parameter is not specified, the command displays information about all nodes in the cluster.

[-cluster-node <text>] - Cluster Node (privilege: advanced)

The node in the cluster that the information listed is regarding. If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-status-quorum {out-of-quorum|in-quorum}] - Quorum Status (privilege: advanced)

The quorum status of the node specified by `-cluster-node` . If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-status-avail {false|true|unknown}] - Availability Status (privilege: advanced)

The availability status of the node specified by `-cluster-node` . If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-status-oper {unknown|operational|not-operational}] - Operational Status (privilege: advanced)

The operational status of the node specified by `-cluster-node` . If this parameter is specified, the command displays information only about the nodes with the specified state value.

Examples

The following example displays information about all nodes in the cluster:

```
cluster1::*> cluster kernel-service show
Master               Cluster            Quorum          Availability
Operational
Node                 Node               Status          Status          Status
-----------------    -----------------  -------------   -------------
-------------
cluster1-01          cluster1-01        in-quorum       true
operational
                     cluster1-02        in-quorum       true
operational
2 entries were displayed.

cluster1::*> cluster kernel-service show -instance
Master Node: cluster1-01
        Cluster Node: cluster1-01
      Quorum Status: in-quorum
Availability Status: true
 Operational Status: operational
Master Node: cluster1-01
        Cluster Node: cluster1-02
      Quorum Status: in-quorum
Availability Status: true
 Operational Status: operational
2 entries were displayed.
```

cluster kernel-service config modify

Modify cluster service state in the kernel

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster kernel-service config modify` used to manage the cluster kernel-service subsystem for a node.

Parameters

`-node {<nodename>|local}` - Node (privilege: advanced)

   The node in the cluster where the configuration is being modified.

`[-kcs-enable-takeover {true|false}]` - Initiated Takeover Enabled (privilege: advanced)

   This indicates whether the kernel service subsystem for this node will initiate a takeover of any node determined to be *out of quorum* if allowed by the HA subsystem.

```
cluster1::*> cluster kernel-service config modify -node cluster1-01 -kcs
-enable-core false
```

cluster kernel-service config show

Display cluster service state in the kernel

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster kernel-service config show` is used to display the configuration of the cluster kernel service subsystem for one or more nodes.

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node {<nodename>|local}] - Node (privilege: advanced)

The node in the cluster where the information be being reported from. If this parameter is not specified, the command displays information about all nodes in the cluster.

[-clam-master-id <integer>] - CLAM Master Node ID (privilege: advanced)

The node ID of the master node for the cluster. If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-kcs-enable-takeover {true|false}] - Initiated Takeover Enabled (privilege: advanced)

Indicates if the distributed kernel service subsystem will initiate a takeover of any node determined to be *out of quorum* if the HA subsystem allows it. If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-kcs-enabled {true|false}] - KCS Enabled (privilege: advanced)

The state of the kernel service subsystem on the specified node. If this parameter is specified, the command displays information only about the nodes with the specified state value.

[-quorum-epoch <integer>] - Quorum Epoch (privilege: advanced)

The number of quorum changes for this node.

Examples

```
cluster1::*> cluster kernel-service config show
Node                              Failover Core     Master              FSM
                     Enabled  Enabled  Enabled Node                State
---------------- -------- -------- ------- -----------------
------------------------
cluster1-01         true     false    false   cluster1-01         Master:
Waiting for heartbeat timeout
cluster1-02         true     false    false   cluster1-01         Non-Master:
Waiting for backoff timeout
2 entries were displayed.

cluster1::*> cluster kernel-service config show -instance
Node: cluster1-01
                      Master Node: cluster1-01
                   Master Node ID: 1000
                          Enabled: true
        Initiated Takeover Enabled: false
Initiated Core on Takeover Enabled: false
                Current FSM State: Master: Waiting for heartbeat timeout
                  Running Version: 1
                     Quorum Epoch: 115
                    Voting Status: false
                    CHAAQ Enabled: true
Node: cluster1-02
                      Master Node: cluster1-01
                   Master Node ID: 1000
                          Enabled: true
        Initiated Takeover Enabled: false
Initiated Core on Takeover Enabled: false
                Current FSM State: Non-Master: Waiting for backoff
timeout
                  Running Version: 1
                     Quorum Epoch: 115
                    Voting Status: false
                    CHAAQ Enabled: true

2 entries were displayed.
```

cluster log-forwarding commands

cluster log-forwarding create

Create a log forwarding destination

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster log-forwarding create` command creates log forwarding destinations for remote logging.

Parameters

`-destination <Remote InetAddress>` - Destination Host

Host name or IPv4 or IPv6 address of the server to forward the logs to.

`[-port <integer>]` - Destination Port

The port that the destination server listen on.

`[-protocol {udp-unencrypted|tcp-unencrypted|tcp-encrypted}]` - Log Forwarding Protocol

The protocols are used for sending messages to the destination. The protocols can be one of the following values:

- *`udp-unencrypted`* - User Datagram Protocol with no security

- *`tcp-unencrypted`* - Transmission Control Protocol with no security

- *`tcp-encrypted`* - Transmission Control Protocol with Transport Layer Security (TLS)

`[-ipspace <IPspace>]` - IPspace of Destination

The IPspace of the destination server.

`[-verify-server {true|false}]` - Verify Destination Server Identity

When this parameter is set to `true` , the identity of the log forwarding destination is verified by validating its certificate. The value can be set to `true` only when the *`tcp-encrypted`* value is selected in the protocol field. When this value is `true` the remote server might be validated by OCSP. The OCSP validation for cluster logs is controlled with the security config ocsp enable -app audit_log and security config ocsp disable -app audit_log .

`[-facility <Syslog Facility>]` - Syslog Facility

The Syslog facility to use for the forwarded logs.

`[-force <true>]` - Skip the Connectivity Test

Normally, the `cluster log-forwarding create` command checks that the destination is reachable via an ICMP ping, and fails if it is not reachable. Setting this value to `true` bypasses the ping check so that the destination can be configured when it is unreachable.

`[-message-format {legacy-netapp|rfc-5424}]` - Syslog Message Format

Use this parameter to specify the message format to be used for Syslog messages.

The `message-format` can be one of the following values:

- *`legacy-netapp`* - A variation of the RFC-3164 Syslog format (format: <PRIVAL>TIMESTAMP HOSTNAME: MSG)

- *`rfc-5424`* - Syslog format as per RFC-5424 (format: <PRIVAL>VERSION TIMESTAMP HOSTNAME: MSG)

Refer to the respective RFCs for detailed information regarding the Syslog message formats. + The default message format is *`legacy-netapp`* .

`[-timestamp-format-override {no-override|rfc-3164|iso-8601-utc|iso-8601-local-time}]` - Syslog Timestamp Format Override

Use this parameter to override the default timestamp format (based on the `message-format` parameter) used for Syslog messages.

The `timestamp-format-override` can be one of the following values:

- *`no-override`* - Timestamp format based on the `message-format` parameter (*`rfc-3164`* if the message format is *`legacy-netapp`*, *`iso-8601-local-time`* if message format is *`rfc-5424`*)

- *`rfc-3164`* - Timestamp format as per RFC-3164 (format: Mmm dd hh:mm:ss)

- *`iso-8601-utc`* - Timestamp format as per ISO-8601 in UTC (format: YYYY-MM-DDThh:mm:ssZ)

- *`iso-8601-local-time`* - Timestamp format as per ISO-8601 in local time (format: YYYY-MM-DDThh:mm:ss+/-hh:mm)

The default value is *`no-override`*. When this parameter is modified, its value persists even when `message-format` is updated. +

`[-hostname-format-override {no-override|fqdn|hostname-only}]` - Syslog Hostname Format Override

Use this parameter to override the default hostname format (based on the `message-format` parameter) used for Syslog messages.

The `hostname-format-override` can be one of the following values:

- *`no-override`* - Hostname format based on the `message-format` parameter (*`fqdn`* if the message format is *`rfc-5424`*, *`hostname-only`* if message format is *`legacy-netapp`*)

- *`fqdn`* - Fully Qualified Domain Name (e.g., myhost.example.com)

- *`hostname-only`* - Hostname only, without the domain name (e.g., myhost)

The default value is *`no-override`*. When this parameter is modified, its value persists even when `message-format` is updated. +

Examples

This example causes audit logs to be forwarded to a server at address 192.168.0.1, port 514 with USER facility.

```
cluster1::> cluster log-forwarding create -destination 192.168.0.1 -port
514 -facility user
```

Related Links

- security config ocsp enable
- security config ocsp disable

cluster log-forwarding delete

Delete a log forwarding destination

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster log-forwarding delete` command deletes log forwarding destinations for remote logging.

Parameters

`-destination <Remote InetAddress>` - Destination Host
    Host name or IPv4 or IPv6 address of the server to delete the forwarding entry for.

`-port <integer>` - Destination Port
    The port that the destination server listen on.

Examples

This example deletes the forwarding of all logs to the server at address 1.1.1.1, port 514.

```
cluster1::> cluster log-forwarding delete -destination 1.1.1.1 -port 514
```

cluster log-forwarding modify

Modify log forwarding destination settings

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster log-forwarding modify` command modifies log forwarding destinations for remote logging.

Parameters

`-destination <Remote InetAddress>` - Destination Host
    The host name or IPv4 or IPv6 address of the server to be modified.

`-port <integer>` - Destination Port
    The port that the destinations servers listen on.

`[-ipspace <IPspace>]` - IPspace of Destination
    The IPspace of the destination server.

`[-verify-server {true|false}]` - Verify Destination Server Identity
    When this parameter is set to `true` , the identity of the log forwarding destination is verified by validating its certificate. The value can be set to `true` only when the `tcp-encrypted` value is selected in the protocol field. When this value is `true` the remote server might be validated by OCSP. The OCSP validation for

cluster logs is controlled with the security config ocsp enable -app audit_log and security config ocsp disable -app audit_log .

`[-facility <Syslog Facility>]` - Syslog Facility

The Syslog facility to use for the forwarded logs.

`[-message-format {legacy-netapp|rfc-5424}]` - Syslog Message Format

Use this parameter to specify a new Syslog message format to replace the current message format.

`[-timestamp-format-override {no-override|rfc-3164|iso-8601-utc|iso-8601-local-time}]` - Syslog Timestamp Format Override

Use this parameter to override the default Syslog timestamp format (based on the `message-format` parameter).

`[-hostname-format-override {no-override|fqdn|hostname-only}]` - Syslog Hostname Format Override

Use this parameter to override the default Syslog hostname format (based on the `message-format` parameter).

Examples

This example modifies the facility of audit logs that are forwarded to the destination server at address 192.168.0.1, port 514.

```
cluster1::> cluster log-forwarding modify -destination 192.168.0.1 -port
514 -facility local1
```

Related Links

- security config ocsp enable
- security config ocsp disable

cluster log-forwarding show

Display log forwarding destinations

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster log-forwarding show` command displays log forwarding information:

- Destination (IPv4/IPv6/hostname)
- Port number
- List of log classes
- Facility

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,` … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-destination <Remote InetAddress>] - Destination Host

If this optional parameter is specified, the command displays information about the forwarding destinations with the specified host name, IPv4 or IPv6 address.

[-port <integer>] - Destination Port

If this optional parameter is specified, the command displays information about the forwarding destinations with the specified ports.

[-protocol {udp-unencrypted|tcp-unencrypted|tcp-encrypted}] - Log Forwarding Protocol

If this optional parameter is specified, the command displays information about the forwarding destinations with the specified protocols.

[-ipspace <IPspace>] - IPspace of Destination

If this optional parameter is specified, the command displays information about the IPspace to which the forwarding destinations belong.

[-verify-server {true|false}] - Verify Destination Server Identity

If this optional parameter is specified, the command displays information about the forwarding destinations with the specified verify-server values.

[-facility <Syslog Facility>] - Syslog Facility

If this optional parameter is specified, the command displays information about the forwarding destinations with the specified facility.

[-message-format {legacy-netapp|rfc-5424}] - Syslog Message Format

Use this optional parameter to display information about the Syslog destination that has the specified Syslog message format.

[-timestamp-format-override {no-override|rfc-3164|iso-8601-utc|iso-8601-local-time}] - Syslog Timestamp Format Override

Use this optional parameter to display information about the Syslog destination that has the specified Syslog timestamp format override.

[-hostname-format-override {no-override|fqdn|hostname-only}] - Syslog Hostname Format Override

Use this optional parameter to display information about the Syslog destination that has the specified Syslog hostname format override.

Examples

```
The following example displays information about the log forwarding
cluster-1::> cluster log-forwarding show
Verify  Syslog
Destination Host          Port   Protocol        Server  Facility
----------------------- ------ --------------- ------ --------
192.168.0.1               514    udp-unencrypted false   user


cluster-1::> cluster log-forwarding show -instance
Destination Host: 192.168.0.1
                    Destination Port: 514
          Log Forwarding Protocol: udp-unencrypted
            IPspace of Destination: Default
 Verify Destination Server Identity: false
                  Syslog Facility: user
            Syslog Message Format: legacy-netapp
   Syslog Timestamp Format Override: no-override
     Syslog Hostname Format Override: no-override
```

cluster peer commands

cluster peer create

Create a new cluster peer relationship

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer create` command establishes a peer relationship between two clusters. Cluster peering enables independent clusters to coordinate and exchange data.

Before creating a new cluster peer relationship, make sure that both clusters are individually healthy and that there are no other peer relationships between the two clusters that might interfere with the new relationship.

You can create a cluster peer relationship using the IPv4 or IPv6 protocol. You may not use both protocols within a single relationship.

Use the cluster show and cluster peer show commands on each cluster to display health, peering eligibility, and peering information about the two clusters.

Parameters

[-peer-addrs <Remote InetAddress>,…] - Remote Intercluster Addresses

Use this parameter to specify the names or IP addresses of the logical interfaces used for intercluster communication. Separate the addresses with commas.

The addresses you provide here are associated with the remote cluster until you modify or delete the relationship, regardless of whether the addresses are valid. Make sure to provide addresses which you

know will remain available on the remote cluster. You can use the hostnames of the remote cluster's intercluster addresses, the IP addresses of the remote cluster's intercluster LIFs or both.

`[-username <text>]` - Remote User Name

Use this optional parameter to specify a username that runs a reciprocal `cluster peer create` command on the peered cluster. If you choose not to use the reciprocal creation option, by not supplying a username for reciprocal creation, you must run `cluster peer create` again on the remote cluster to complete the peering relationship.

If you specify the username for the remote cluster, you will be prompted to enter the associated remote password. These credentials are not stored, they are used only during creation to authenticate with the remote cluster and to enable the remote cluster to authorize the peering request. The provided username's profile must have access to the console application in the remote cluster.

Use the security login role show and security login show commands on each cluster to find user names and their privilege levels.

`[-no-authentication <true>]` - Do Not Use Authentication

Use this optional parameter when omitting the `-username` parameter to indicate that you will create an unauthenticated peering relationship.

`[-timeout <integer>]` - Operation Timeout (seconds) (privilege: advanced)

Use this optional parameter to specify a timeout value for peer communications. Specify the value in seconds. The default timeout value is 60 seconds.

`[-address-family {ipv4|ipv6}]` - Address Family of Relationship

Use this optional parameter to specify the address family of the cluster peer relationship. The default is based on existing relationships, existing local intercluster LIFs belonging to a particular address-family, and the addresses supplied to the `cluster peer create` command.

`[-offer-expiration {MM/DD/YYYY HH:MM:SS | {1..7}days | {1..168}hours | PnDTnHnMnS | PnW}]` - Passphrase Match Deadline

Specifying `cluster peer create` normally creates an offer to establish authentication with a cluster that is a potential cluster peer to this cluster. Such offers expire unless they are accepted within some definite time. Use this optional parameter to specify the date and time at which this offer should expire, the time after which the offer will no longer be accepted.

`[-rpc-connect-timeout <integer>]` - Timeout for RPC Connect (seconds) (privilege: advanced)

Use this optional parameter to specify a timeout value for the RPC connect during peer communications. Specify the value in seconds. The default timeout value is 10 seconds.

`[-update-ping-timeout <integer>]` - Timeout for Update Pings (seconds) (privilege: advanced)

Use this optional parameter to specify a timeout value for pings while updating remote cluster information. Specify the value in seconds. The default timeout value is 5 seconds. This parameter applies only to cluster peer relationships using the IPv4 protocol.

`[-ipspace <IPspace>]` - IPspace for the Relationship

Use this optional parameter to specify the IPspace within which the cluster peering relationship is to operate. The default is to use the 'Default' IPspace.

`[-local-name <Cluster name>]` - Peer Cluster Local Name

Use this optional parameter to specify a unique local name to identify the remote cluster that is being peered. The local name must conform to the same rules as a cluster name. The default value is the remote cluster name.

`[-generate-passphrase <true>]` - Use System-Generated passphrase

Use this optional parameter alone to create cluster peer offer for the unidentified clusters or use it along with `-peer-addrs` option to automatically generate the passphrase for the cluster peer operation with the peer cluster.

`[-initial-allowed-vserver-peers <Vserver Name>,…]` - Vservers allowed for auto peering

Use this optional parameter to specify the list of Vservers for which reciprocal Vserver peering with peer cluster should be enabled. Upon the time of successful peering, Vserver peer permission entries will be created for the peer cluster for the specified list of Vservers.

`[-encryption-protocol-proposed {none|tls-psk}]` - Encryption Protocol To Be Used In Inter-Cluster Communication

Use this optional parameter to specify how this cluster should use encryption in data connections to the other cluster. Specify 'tls-psk' to specify that TLS should be used with a Pre-Shared Key. Specify 'none' to use no encryption. Where authentication is used, the default is 'tls-psk'. Where authentication is not used, the default is 'none'.

`[-applications {snapmirror|flexcache}]` - Peering Applications

List of peering applications for initially allowed vservers.

Examples

This example creates a peer relationship between cluster1 and cluster2. This reciprocal create executes the create command on both the local cluster and the remote cluster. The cluster peer create command can use the hostnames of cluster2's intercluster addresses, the IP addresses of cluster2's intercluster LIFs, or both. Note that the admin user's password was typed at the prompt, but was not displayed.

```
cluster1::> cluster peer create -peer-addrs cluster2-d2,10.98.234.246
-username admin

Remote Password:

cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
              Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
         Availability of the Remote Cluster: Available
                         Remote Cluster Name: cluster2
                         Active IP Addresses: 10.98.234.246, 10.98.234.243
                      Cluster Serial Number: 1-80-123456
            Address Family of Relationship: ipv4
       Authentication Status Administrative: no-authentication
          Authentication Status Operational: absent
                          Last Update Time: 02/05 21:05:41
               IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows coordinated peer creation. The `cluster peer create` command was issued locally on each cluster. This does not require you to provide the username and password for the remote cluster. There is a password prompt, but if you are logged in as the admin user, you may simply press enter.

```
cluster1::> cluster peer create -peer-addrs cluster2-d2, 10.98.234.246 -no
-authentication

Remote Password:
NOTICE: Addition of the local cluster information to the remote cluster
has
failed with the following error: not authorized for that command. You may
need to repeat this command on the remote cluster.

cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster2                 1-80-123456           Available     absent
```

```
cluster2::> cluster peer create -peer-addrs cluster1-d2 -no-authentication

Remote Password:
NOTICE: Addition of the local cluster information to the remote cluster
has
failed with the following error: not authorized for that command. You may
need to repeat this command on the remote cluster.

cluster2::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster1                 1-80-654321           Available      absent
```

This example shows a reciprocal cluster peer create over IPv6 addresses, that establishes a cluster peer relationship with an IPv6 address family.

```
cluster1::> cluster peer create -peer-addrs
FD20:8B1E:B255:C222:6A17:0BBD:E92C:4523 -username admin

Remote Password:

cluster1::> cluster peer show -instance
Address Family of Relationship: ipv6
                         Peer Cluster Name: cluster2
               Remote Intercluster Addresses:
FD20:8B1E:B255:C222:6A17:0BBD:E92C:4523
           Availability of the Remote Cluster: Available
                        Remote Cluster Name: cluster2
                        Active IP Addresses:
FD20:8B1E:B255:C222:6A17:0BBD:E92C:4523
                       Cluster Serial Number: 1-80-123456
               Address Family of Relationship: ipv6
       Authentication Status Administrative: no-authentication
       Authentication Status Operational: absent
                         Last Update Time: 02/05 21:05:41
               IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows creation of an authenticated peering relationship. It is an example of using the coordinated method to create a cluster peer relationship. The `cluster peer create` command is issued locally on each cluster. Before executing this pair of commands, a passphrase to be used with the commands is chosen and given at the prompts. The passphrase can be any text; it is prompted for twice on each cluster, and all four copies of the passphrase must agree. The passphrase does not echo on the screen. The

passphrase must be longer than the minimum length as specified by the `cluster peer policy` on both clusters.

```
cluster1::> cluster peer create -peer-addrs cluster2-d2, 10.98.234.246

Enter the passphrase:
Enter the passphrase again:

Notice: Now use the same passphrase in the "cluster peer create" command
in the
        other cluster.

cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster2                 -                                  Unavailable    pending

cluster2::> cluster peer create -peer-addrs cluster1-d2

Enter the passphrase:
Enter the passphrase again:

cluster2::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster1                 1-80-654321           Available      ok
```

This example creates a peer relationship between cluster1 and cluster2. This reciprocal create executes the create command on both the local cluster and the remote cluster. The cluster peer create command can use the hostnames of cluster2's intercluster addresses, the IP addresses of cluster2's intercluster LIFs or both. Note that the admin user's password was typed at the prompt, but was not displayed. The `-local-name` parameter is specified to create a local name used to identify the peer cluster in cases where the name of the peer cluster is not unique or not descriptive.

```
cluster1::> create -peer-addrs 10.98.191.193 -username admin -local-name
locallyUniqueName

cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
locallyUniqueName                 1-80-000011           Available
absent

cluster1::> cluster peer show -instance
Peer Cluster Name: locallyUniqueName
                Remote Intercluster Addresses: 10.98.191.193
          Availability of the Remote Cluster: Available
                          Remote Cluster Name: cluster2
                          Active IP Addresses: 10.98.191.193
                        Cluster Serial Number: 1-80-000011
             Address Family of Relationship: ipv4
        Authentication Status Administrative: no-authentication
           Authentication Status Operational: absent
                             Last Update Time: 02/05 21:05:41
               IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

The following example create a peer relationship between cluster1 and cluster2 using system-generated passphrases:

```
cluster1::> cluster peer create -peer-addrs 10.98.191.193 -generate
-passphrase
Passphrase: UCa+6lRVICXeL/gq1WrK7ShR
            Peer Cluster Name: cluster2
            Initial Allowed Vserver Peers: -
            Expiration Time: 6/7/2017 09:16:10 +5:30
            Intercluster LIF IP: 10.140.106.185
Warning: make a note of the passphrase - it cannot be displayed again.

cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster2                 -                     Unavailable    pending

cluster2::> cluster peer create -peer-addrs 10.140.106.185

Enter the passphrase:

Clusters cluster1 and cluster2 are peered.

cluster2::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster1                 1-80-654321           Available      ok
```

The following example creates a cluster peer offer from cluster1 for an anonymous cluster using system-generated passphrase with offer expiration period of two days and the cluster2 uses the offer from cluster2 with the system-generated passphrase:

```
cluster1::> cluster peer create -generate-passphrase -offer-expiration
2days
Passphrase: UCa+6lRVICXeL/gq1WrK7ShR
            Peer Cluster Name: Clus_7ShR (temporary generated)
            Initial Allowed Vserver Peers: -
            Expiration Time: 6/9/2017 08:16:10 +5:30
            Intercluster LIF IP: 10.140.106.185
Warning: make a note of the passphrase - it cannot be displayed again.

cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
Clus_7ShR                -                     Unidentified   pending
cluster2::> cluster peer create -peer-addrs 10.140.106.185

Enter the passphrase:

Clusters cluster1 and cluster2 are peered.

cluster2::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster1                 1-80-654321           Available      ok
```

Cluster "cluster1" creates an offer with `initial-allowed-vserver-peers` option set to Vservers "vs1" and "vs2". And the peer cluster "cluster2" uses the offer and creates peer relationship with cluster1, upon the successful peer relationship establishment, Vserver peer permission entries are created for the Vservers "vs1" and "vs2" in cluster "cluster1" for the peer cluster "cluster2". The following example describes the usage of `initial-allowed-vserver-peers` option in the cluster peer creation workflow:

```
cluster1::> cluster peer create -generate-passphrase -initial-allowed
-vserver-peers vs1,vs2
Passphrase: UCa+6lRVICXeL/gq1WrK7ShR
             Peer Cluster Name: Clus_7ShR (temporary generated)
             Initial Allowed Vserver Peers: vs1,vs2
             Expiration Time: 6/7/2017 09:16:10 +5:30
             Intercluster LIF IP: 10.140.106.185
Warning: make a note of the passphrase - it cannot be displayed again.

cluster1::> cluster peer show
Peer Cluster Name       Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
Clus_7ShR                      -                    Unidentified   pending
cluster2::> cluster peer create -peer-addrs 10.140.106.185

Enter the passphrase:

Clusters cluster1 and cluster2 are peered.

cluster2::> cluster peer show
Peer Cluster Name       Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
--------------
cluster1                 1-80-654321          Available      ok
cluster1::> vserver peer permission show

Peer Cluster        Vserver              Applications
------------------  -------------------  -------------------
cluster2
                    vs1                  snapmirror
                    vs2                  snapmirror
2 entries were displayed.
```

Related Links

- cluster show
- cluster peer show
- security login role show
- security login show

cluster peer delete

Delete a cluster peer relationship

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer delete` command removes a peering relationship. It removes the relationship records, state data, and all associated jobs.

Before removing the relationship, the command verifies that no resources depend on the relationship. For example, if any SnapMirror relationships exist, the command denies the request to delete the peering relationship. You must remove all dependencies for the deletion to succeed. The `cluster peer delete` command removes only the local instance of the peer relationship. An administrator in the peer cluster must use the `cluster peer delete` command there as well to completely remove the relationship.

Parameters

`-cluster <text>` - **Peer Cluster Name**

Use this parameter to specify the peering relationship to delete by specifying the name of the peered cluster.

Examples

This example shows a failed deletion due to a SnapMirror dependency.

```
cluster2::> cluster peer delete -cluster cluster1
Error: command failed: Unable to delete peer relationship.  Reason: A
       SnapMirror source exists in this cluster
```

cluster peer modify-local-name

Modify the local name for a cluster peer

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer modify-local-name` command modifies the local name for a remote cluster. The new local name must be unique among all the local names for the remote clusters with which this cluster is peered.

Parameters

`-name <text>` - **Cluster Peer Name**

Use this parameter to specify the existing local name for a peer cluster.

`-new-name <Cluster name>` - **Cluster Peer Local Name**

Use this parameter to specify the new local name of the peer cluster. The new local name must conform to the same rules as a cluster name.

Examples

```
cluster2::> cluster peer modify-local-name -name cluster1 -new-name
cluster1A
```

cluster peer modify

Modify cluster peer relationships

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer modify` command modifies the attributes of a peering relationship. When you modify a peer relationship and specify `-peer-addrs` , all of the remote addresses must respond, must be intercluster addresses, and must belong to the remote cluster that is being modified; or the modification request is denied.

Parameters

`-cluster <text>` - Peer Cluster Name

Use this parameter to specify the peering relationship to modify by specifying the name of the peered cluster.

`[-peer-addrs <Remote InetAddress>,…]` - Remote Intercluster Addresses

Use this parameter to specify the names or IP addresses of the logical interfaces used for intercluster communication. Separate the addresses with commas. The list of addresses you provide replaces the existing list of addresses.

`[-address-family {ipv4|ipv6}]` - Address Family of Relationship

Use this parameter to specify the address family of the names specified with the peer-addrs parameter.

`[-timeout <integer>]` - Operation Timeout (seconds) (privilege: advanced)

Use this parameter to specify a timeout value for peer communications. Specify the value in seconds.

`[-auth-status-admin {no-authentication|revoked|use-authentication}]` - Authentication Status Administrative

Use this parameter to adjust the authentication in use for the peer relationship. The defined values for this field are as follows.

- no-authentication - The cluster peer relationship uses no authentication.

- use-authentication - The cluster peer relationship is to be authenticated. After you use this value, you will be prompted for a passphrase to be used in determining a new authentication key, just as in the authenticated cluster peer create command or you can use the option generate-passphrase to automatically generate the passphrase.

- revoked - The cluster peer relationship is no longer to be trusted. Peering communication with this cluster peer is suspended until the two clusters set their `auth-status-admin` attributes either both to `no-authentication` or both to `use-authentication` .

Changes should be reflected on both clusters involved in a peering relationship.

[-rpc-connect-timeout <integer>] - Timeout for RPC Connect (seconds) (privilege: advanced)

Use this optional parameter to specify a timeout value for the RPC connect during peer communications. Specify the value in seconds.

[-update-ping-timeout <integer>] - Timeout for Update Pings (seconds) (privilege: advanced)

Use this optional parameter to specify a timeout value for pings while updating remote cluster information. Specify the value in seconds. This parameter applies only to cluster peer relationships using the IPv4 protocol.

[-ipspace <IPspace>] - IPspace for the Relationship

Use this optional parameter to specify that cluster peering communication for this remote cluster is to be done using local intercluster LIFs that are on ports in the named IPspace.

[-generate-passphrase <true>] - Use System-Generated passphrase

Use this optional parameter along with `-auth-status-admin` option's `use-authentication` to automatically generate the passphrase which can be used for cluster peer operation.

[-encryption-protocol-proposed {none|tls-psk}] - Encryption For Inter-Cluster Communication

Use this parameter to adjust the encryption of connections in use for the peer relationship. The defined values for this field are as follows.

- tls-psk - Use TLS with a Pre-Shared Key.

- none - Use no encryption.

Examples

This example modifies the peering relationship to use a new IP address in the remote cluster for intercluster communications and revoke authentication.

View existing cluster peer configuration using following command :

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
            Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
        Availability of the Remote Cluster: Available
                    Remote Cluster Name: cluster2
                    Active IP Addresses: 10.98.234.246, 10.98.234.243
                Cluster Serial Number: 1-80-123456
                 Remote Cluster Nodes: cluster2-01, cluster2-02
                 Remote Cluster Health: true
              Unreachable Local Nodes: -
        Address Family of Relationship: ipv4
    Authentication Status Administrative: use-authentication
        Authentication Status Operational: ok
                        Last Update Time: 02/05 21:05:41
            IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: tls-psk
```

Modify the cluster peer configuration using following command :

```
cluster1::> cluster peer modify -cluster cluster2 -peer-addrs cluster2-
d2,10.98.234.264 -auth-status-admin revoked
Warning: This will discard the authentication key.

Warning: You are removing authentication from the peering relationship
with
   cluster "cluster2". Use the "cluster peer modify" command on
   cluster "cluster2" with the "-auth-status-admin
   no-authentication" parameter to complete authentication removal from
   the peering relationship.

Do you want to continue?{y|n}:y
```

The following example modifies the peering relationship to use authentication with `-generate-passphrase` option.

```
cluster1::> cluster peer modify -cluster cluster2
   -auth-status-admin use-authentication -generate-passphrase

Notice: Use the below system-generated passphrase in the "cluster peer
modify"
command in the other cluster.
Passphrase: UCa+6lRVICXeL/gq1WrK7ShR
          Expiration Time: 6/7/2017 09:16:10 +5:30
          Peer Cluster Name: cluster2

Warning: make a note of the passphrase - it cannot be displayed again.

Until then, the operational authentication state of the relationship
remains as "pending".

cluster1::> cluster peer offer show

Allowed
Peer Cluster Name     Authentication Creation         Expiration
Vserver Peers
-------------------- ------------- -------------------
------------------- --------------
cluster2              ok-and-offer   6/7/2017 08:16:10   6/7/2017 09:16:10
-

Modify cluster peer relationship in cluster2 with use-authentication
option and use the auto-generated passphrase.

cluster2::> cluster peer modify -cluster cluster2 -auth-status-admin use-
authentication

Notice: Use a auto-generated passphrase or choose a passphrase of 8 or
more characters.
          To ensure the authenticity of the peering relationship, use a
phrase or sequence
          of characters that would be hard to guess.

Enter the passphrase:
Confirm the passphrase:
```

Related Links

- cluster peer create

cluster peer ping

Initiate intercluster connectivity test

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer ping` command displays the status of the network mesh used by the peering relationship. The command checks the network connection to each remote IP address known by the cluster. This includes all intercluster addresses. It is possible for a known address to be not present during the ping. These addresses are not checked, but the absence is temporary.

The most useful parameters for diagnosing problems are `-count` and `-packet-size`. Use the `-count` and `-packet-size` parameters to diagnose problems similarly to how you use them with the standard ping utility.

To display network connection status within a cluster, use the network ping command.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-originating-node {<nodename>|local}] - Node that Initiates Ping

Use this parameter to send the ping from the node you specify.

[-destination-cluster <Cluster name>] - Cluster to Ping

Use this parameter to specify the peer cluster you want to ping.

[-destination-node <Peer Node Name>] - Node to Ping in Destination Cluster

Use this parameter to specify a specific node in the destination cluster to ping.

[-ip-address <IP Address>] - Active IP Address

Use this parameter to specify the active IP address you want to ping.

[-count <integer>] - Ping Count

Use this parameter to specify the number of requests to be sent to the destination.

[-status {unknown_node|internal_error|unreachable|session_reachable|interface_reachable}] - Status of Ping Operation

Use this parameter to display only ping results that have the status you specify.

[-timeout <integer>] - Ping Timeout in Seconds

Use this parameter to specify a timeout value in seconds for the ping operation.

`[-packet-size <integer>]` - Size of Packet

Use this parameter to specify the number of data bytes to be sent in the ping packet.

`[-ttl <integer>]` - Time to Live/ Number of Hops

Use this parameter to specify the maximum number of network hops a packet may make before it is considered a failure.

`[-response-time <double>]` - Response Time (ms)

Use this parameter to display only nodes that have the response time (in milliseconds) that you specify. This parameter is most useful when specified with a range of values, such as `>500`

`[-destination-node-uuid <UUID>]` - Node to Ping in Destination Cluster

Use this parameter to specify a specific node's dblade UUID in the destination cluster to ping.

Examples

This example shows a ping of cluster1 and cluster2 from cluster2. All nodes are reachable.

```
cluster2::> cluster peer ping
Node: node1                     Destination Cluster: cluster2
Destination Node IP Address        Count  TTL RTT(ms) Status
--------------- --------------- ----- ---- -------
------------------------
node1           10.98.228.230       1  255   0.209 interface_reachable
node2           10.98.228.234       1  255    0.42 interface_reachable
Node: node2                     Destination Cluster: cluster2
Destination Node IP Address        Count  TTL RTT(ms) Status
--------------- --------------- ----- ---- -------
------------------------
node1           10.98.228.230       1  255   0.358 interface_reachable
node2           10.98.228.234       1  255    0.17 interface_reachable
Node: node1                     Destination Cluster: cluster1
Destination Node IP Address        Count  TTL RTT(ms) Status
--------------- --------------- ----- ---- -------
------------------------
node3           10.98.229.22        1  255   0.336 interface_reachable
node4           10.98.229.29        1  255   0.354 interface_reachable
Node: node2                     Destination Cluster: cluster1
Destination Node IP Address        Count  TTL RTT(ms) Status
--------------- --------------- ----- ---- -------
------------------------
node3           10.98.229.22        1  255   0.354 interface_reachable
node4           10.98.229.29        1  255   0.336 interface_reachable
6 entries were displayed.
```

Related Links

-

cluster peer show

Display peer cluster information

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer show` command displays information about the peering relationships between the current cluster and other clusters. Cluster peering enables independent clusters to coordinate and exchange data.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-cluster <text>] - Peer Cluster Name

Selects the peered clusters that match this parameter value.

[-cluster-uuid <UUID>] - Cluster UUID (privilege: advanced)

Selects the peered clusters that match this parameter value.

[-peer-addrs <Remote InetAddress>,…] - Remote Intercluster Addresses

Selects the peered clusters that match this parameter value (remote-host name or IP address).

[-availability <availability>] - Availability of the Remote Cluster

Selects the peered clusters that match this parameter value. This parameter can have four different values:

- Available - The peer cluster availability status will be `Available` only if all the nodes in the local cluster are able to contact all the nodes in the remote cluster.

- Partial - The peer cluster availability status will be `Partial` only if some nodes in the local cluster are not able to contact some or all nodes in the peer cluster.

- Unavailable - The peer cluster availability status will be `Unavailable` only if all the nodes in the local cluster are not able to contact any node in the peer cluster.

- Pending - The peer cluster availability status will be `Pending` while the system is creating in-memory health data.

- Unidentified - The peer cluster availability status will be Unidentified if the cluster peer offer is created for an anonymous cluster and is unused. When the offer is used, then the availability will get changed to any of the above mentioned status.

Note: If one or more nodes in the local cluster are offline or unreachable, then those nodes are not used to determine the availability status for the remote nodes.

[-rcluster <text>] - Remote Cluster Name

Selects the peered clusters that match this parameter value.

[-ip-addrs <Remote InetAddress>,…] - Active IP Addresses

Selects the peered clusters that match this parameter value.

[-serialnumber <Cluster Serial Number>] - Cluster Serial Number

Selects the peered clusters that match this parameter value.

[-remote-cluster-nodes <text>,…] - Remote Cluster Nodes

Selects the peered clusters that match this parameter value.

[-remote-cluster-health {true|false}] - Remote Cluster Health

Selects the peered clusters that match this parameter value.

- true - This means that there is cluster quorum in the peer cluster.
- false - This means that there is no cluster quorum in the peer cluster.

[-unreachable-local-nodes <text>,…] - Unreachable Local Nodes

Selects the peered clusters that match this parameter value.

[-timeout <integer>] - Operation Timeout (seconds) (privilege: advanced)

Selects the peered clusters that match this parameter value.

[-address-family {ipv4|ipv6}] - Address Family of Relationship

Selects the peered clusters that have a relationship established using this protocol.

[-auth-status-admin {no-authentication|revoked|use-authentication}] - Authentication Status Administrative

Selects the peered clusters that match this parameter value, which must be chosen from the following values.

- no-authentication - The cluster peer relationship uses no authentication.
- use-authentication - The cluster peer relationship is authenticated.
- revoked - The cluster peer relationship is revoked until agreement can be reached.

[-auth-status-operational {ok|absent|pending|expired|revoked|declined|refused|ok-and-offer|absent-but-offer|revoked-but-offer|key-mismatch|intent-mismatch|incapable}] - Authentication Status Operational

Selects the peered clusters that match this parameter value, which must be one of the following values.

- ok - The clusters both use authentication and they have agreed on an authentication key.
- absent - The clusters agree not to use authentication.
- pending - This cluster has made an outstanding offer to authenticate with the other cluster, but agreement has not yet been reached.
- expired - This cluster's offer to authenticate with the other cluster expired before agreement was reached.
- revoked - This cluster has revoked any prior authentication agreement.

- declined - The other cluster has revoked the authentication agreement and is declining to communicate with this cluster.

- refused - The other cluster actively refuses the communication attempts, perhaps because its part of the peering relationship has been deleted.

- ok-and-offer - The clusters agree on an authentication key and are using it. In addition, this cluster has made an outstanding offer to re-authenticate with the other cluster.

- absent-but-offer - The clusters currently agree that neither side requires authentication of the other, but this cluster has made an outstanding offer to authenticate.

- revoked-but-offer - This cluster has revoked any authentication agreement, but it has made an outstanding offer to authenticate.

- intent-mismatch - The two clusters disagree on whether authentication is required.

- key-mismatch - The two clusters both believe that they are authenticated, but one of the shared secrets has become corrupted.

- incapable - The other cluster is no longer running a version of ONTAP that supports authenticated cluster peering.

`[-rpc-connect-timeout <integer>]` - Timeout for RPC Connect (privilege: advanced)

Selects the peered clusters that match this parameter value.

`[-update-ping-timeout <integer>]` - Timeout for Update Pings (privilege: advanced)

Selects the peered clusters that match this parameter value.

`[-last-updated <MM/DD/YYYY HH:MM:SS>]` - Last Update Time

Selects the peered clusters that match this parameter value.

`[-ipspace <IPspace>]` - IPspace for the Relationship

Selects the peered clusters whose relationships are to cross the named local IPspace. The default value is the IPspace name "Default". In relationships created before ONTAP 8.3.1, the initial value is "-" and is not updated to "Default" until an action is taken on a cluster peer relationship, such as creating, modifying, or deleting a relationship.

`[-encryption-protocol-proposed {none|tls-psk}]` - Proposed Setting for Encryption of Inter-Cluster Communication

Selects the peered clusters that match the value of this parameter, that is, whether they are proposing to encrypt their cross-cluster communication or not.

`[-encryption-protocol {none|tls-psk}]` - Encryption Protocol For Inter-Cluster Communication

Selects the peered clusters that match the value of this parameter, that is, whether they are encrypting their cross-cluster communication or not.

`[-psk-algorithm {akep2|jpake}]` - Algorithm By Which the PSK Was Derived

Selects the peered clusters that match the value of this parameter, that is, which of the following algorithms was used to derive the Pre-Shared Key between the clusters.

- akep2 - The key was obtained through the AKEP2-and-PBKDF2 algorithm.

- jpake - The key was obtained through the J-PAKE algorithm.

Examples

This example shows the output of the cluster peer show command when all nodes in the local cluster are able to contact all nodes in the remote peer cluster. Additionally, the peer relationship is authenticated and operating correctly.

```
cluster1::> cluster peer show
Peer Cluster Name         Cluster Serial Number Availability
Authentication
------------------------ -------------------- --------------
--------------
cluster2                  1-80-123456          Available    ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
              Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
         Availability of the Remote Cluster: Available
                       Remote Cluster Name: cluster2
                        Active IP Addresses: 10.98.234.246, 10.98.234.243
                      Cluster Serial Number: 1-80-123456
                       Remote Cluster Nodes: cluster2-01, cluster2-02
                      Remote Cluster Health: true
                    Unreachable Local Nodes: -
             Address Family of Relationship: ipv4
        Authentication Status Administrative: use-authentication
          Authentication Status Operational: ok
                           Last Update Time: 02/05 21:05:41
               IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows the output of the cluster peer show command when some nodes in the local cluster are not able to contact some or all of the nodes in the remote peer cluster.

```
cluster1::> cluster peer show
Peer Cluster Name         Cluster Serial Number Availability
Authentication
------------------------ -------------------- --------------
--------------
cluster2                  1-80-123456          Available    ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
               Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
          Availability of the Remote Cluster: Partial
                          Remote Cluster Name: cluster2
                          Active IP Addresses: 10.98.234.246, 10.98.234.243
                        Cluster Serial Number: 1-80-123456
                          Remote Cluster Nodes: cluster2-01, cluster2-02
                        Remote Cluster Health: false
                       Unreachable Local Nodes: -
             Address Family of Relationship: ipv4
         Authentication Status Administrative: use-authentication
            Authentication Status Operational: ok
                             Last Update Time: 02/05 21:05:41
                  IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows the output of the cluster peer show command when some nodes in the local cluster cannot be contacted from the node where the command is executed, but all the other nodes including node on which command is executed are able to contact all nodes in the remote peer cluster.

```
cluster1::> cluster peer show
Peer Cluster Name          Cluster Serial Number Availability
Authentication
------------------------- -------------------- --------------
-------------
cluster2                  1-80-123456          Available      ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
                          Peer Cluster Name: cluster2
              Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
          Availability of the Remote Cluster: Available
                        Remote Cluster Name: cluster2
                        Active IP Addresses: 10.98.234.246, 10.98.234.243
                      Cluster Serial Number: 1-80-123456
                        Remote Cluster Nodes: cluster2-01, cluster2-02
                      Remote Cluster Health: true
                      Unreachable Local Nodes: cluster1-01
            Address Family of Relationship: ipv4
        Authentication Status Administrative: use-authentication
          Authentication Status Operational: ok
                            Last Update Time: 02/05 21:05:41
                IPspace for the Relationship: Default
  Encryption for Inter-Cluster Communication: none
```

This example shows the output of the cluster peer show command when some nodes in the local cluster cannot be contacted from the node where the command is executed, and the node on which command is executed is also not able to contact the remote peer cluster.

```
cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ --------------------- --------------
-------------
cluster2                 1-80-123456           Unavailable    ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
                 Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
            Availability of the Remote Cluster: Unavailable
                          Remote Cluster Name: cluster2
                          Active IP Addresses: 10.98.234.246, 10.98.234.243
                       Cluster Serial Number: 1-80-123456
                         Remote Cluster Nodes: cluster2-01, cluster2-02
                       Remote Cluster Health: -
                     Unreachable Local Nodes: cluster1-01
            Address Family of Relationship: ipv4
        Authentication Status Administrative: use-authentication
           Authentication Status Operational: ok
                             Last Update Time: 02/05 21:05:41
                 IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows the output of the cluster peer show command when all the nodes in the local cluster are not able to contact any nodes in the remote peer cluster.

```
cluster1::> cluster peer show
Peer Cluster Name          Cluster Serial Number Availability
Authentication
------------------------- -------------------- --------------
-------------
cluster2                   1-80-123456          Unavailable   ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
               Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
          Availability of the Remote Cluster: Unavailable
                         Remote Cluster Name: cluster2
                         Active IP Addresses: 10.98.234.246, 10.98.234.243
                       Cluster Serial Number: 1-80-123456
                        Remote Cluster Nodes: cluster2-01, cluster2-02
                       Remote Cluster Health: -
                      Unreachable Local Nodes: -
                Address Family of Relationship: ipv4
          Authentication Status Administrative: use-authentication
             Authentication Status Operational: ok
                             Last Update Time: 02/05 21:05:41
                 IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

This example shows the output of the `cluster peer show` command while the system is creating in-memory health data.

```
cluster1::> cluster peer show
Peer Cluster Name        Cluster Serial Number Availability
Authentication
------------------------ -------------------- --------------
--------------
cluster2                 1-80-123456          Pending        ok
```

Detailed information for this scenario is shown below.

```
cluster1::> cluster peer show -instance
Peer Cluster Name: cluster2
              Remote Intercluster Addresses: cluster2-d2, 10.98.234.246
         Availability of the Remote Cluster: Pending
                         Remote Cluster Name: cluster2
                         Active IP Addresses: 10.98.234.246, 10.98.234.243
                        Cluster Serial Number: 1-80-123456
                         Remote Cluster Nodes: -
                        Remote Cluster Health: -
                       Unreachable Local Nodes: -
             Address Family of Relationship: ipv4
       Authentication Status Administrative: use-authentication
          Authentication Status Operational: ok
                             Last Update Time: 02/05 21:05:41
                 IPspace for the Relationship: Default
  Encryption for Inter-Cluster Communication: none
```

This example shows the output of the `cluster peer show` command for the offer created for an anonymous cluster:

```
cluster1::> cluster peer show
Peer Cluster Name          Cluster Serial Number Availability
Authentication
------------------------- --------------------- --------------
--------------
Clus_4gHR                         -                      Unidentified   pending


Detailed information for this scenario is shown below.

cluster1::> cluster peer show -instance
Peer Cluster Name: Clus_4gHR
              Remote Intercluster Addresses: -
        Availability of the Remote Cluster: Unidentified
                         Remote Cluster Name: Clus_4gHR
                         Active IP Addresses: 10.98.234.246, 10.98.234.243
                       Cluster Serial Number: -
                        Remote Cluster Nodes: -
                       Remote Cluster Health: -
                     Unreachable Local Nodes: -
            Address Family of Relationship: ipv4
        Authentication Status Administrative: use-authentication
          Authentication Status Operational: ok
                            Last Update Time: 02/05 21:05:41
               IPspace for the Relationship: Default
 Encryption for Inter-Cluster Communication: none
```

cluster peer connection show

Show current peering connections for a cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer connection show` command displays information about the current TCP connections and how they are supporting the set of peering relationships.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-cluster-name <text>] - Remote Cluster

Selects the connections associated with the named peered cluster.

[-node {<nodename>|local}] - Node

Selects the connections hosted by the given node.

[-connection-type {mgmt-client|mgmt-server|data}] - Cluster Peering Connection Type

Selects the connections of the named type. This parameter can have one of three different values:

- Mgmt-client - Management-plane client connections, created so that this node may make management-plane requests of other nodes.
- Mgmt-server - Management-plane server connections, over which this node services requests made by other nodes' mgmt-client connections.
- Data - Connections made between data-planes of different nodes.

[-index <integer>] - Index of Connection

Selects the connections with the given index value.

[-cluster-uuid <UUID>] - Cluster UUID (privilege: advanced)

Selects the connections to the cluster with the given cluster UUID.

[-auth-status-admin {no-authentication|revoked|use-authentication}] - Authentication Status Administrative

Selects connections to the peered clusters whose intended authentication matches this parameter value.

[-auth-status-operational {ok|absent|pending|expired|revoked|declined|refused|ok-and-offer|absent-but-offer|revoked-but-offer|key-mismatch|intent-mismatch|incapable}] - Authentication Status Operational

Selects connections to the peered clusters whose authentication state matches this parameter value.

[-authenticated {true|false}] - Authenticated

Selects connections that have been authenticated, or not, according to this parameter value.

[-port <integer>] - Network Port

Selects the connections whose port matches this parameter value.

[-idle <[<integer>d][<integer>h][<integer>m][<integer>s]>] - Idle Time

Selects the connections whose idle times match this parameter value.

[-address <IP Address>] - Remote Network Address

Selects the connections that have this parameter value as the remote network address.

[-psk-algorithm {akep2|jpake}] - PSK Algorithm

Selects the connections for clusters whose PSKs were generated by the named algorithm. This parameter can have one of two different values:

- akep2 - The original algorithm, PBKDF2 followed by AKEP2.
- jpake - Newer algorithm: J-PAKE.

Examples

This example shows the output of the cluster peer connection show command.

```
cluster1::> cluster peer connection show
Cluster Node                Connection Type  Auth  Encrypt Idle  Remote
Address
------- ----------------    --------------   ----- ------- ----
--------------
cluster2                    Authentication: ok
        node1
                                    data  true  true   6s
10.10.10.100
                                    data  true  true   7s
10.10.10.100
                                    data  true  true   20s
10.10.10.100
                                    data  true  true   11s
10.10.10.100
                                    data  true  true   7s
10.10.10.100
                                    data  true  true   7s
10.10.10.100
                                    data  true  true   11s
10.10.10.200
                                    data  true  true   11s
10.10.10.200
                                    data  true  true   48s
10.10.10.200
                                    data  true  true   48s
10.10.10.200
                                    data  true  true   37s
10.10.10.200
                                    data  true  true   37s
10.10.10.200
12 entries were displayed.
```

cluster peer health show

Check peer cluster health

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer health show` command displays information about the health of the nodes in peer clusters from the perspective of the nodes in the local cluster. The command obtains health information by

performing connectivity and status probes of each peer cluster's nodes from each node in the local cluster.

To enable quick access to remote cluster health information, remote cluster health status is periodically checked and cached. These cached results enable users and system features to quickly assess the availability of remote resources. By default, this command accesses cached results. Use the `-bypass-cache true` option to force a current, non-cached check of remote cluster health.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-originating-node {<nodename>|local}] - Local Node

Selects the node that matches this parameter value.

[-destination-cluster <Cluster name>] - Peer Cluster

Selects the cluster that matches this parameter value.

[-destination-node <Peer Node Name>] - Peer Node

Selects the node that matches this parameter value.

[-destination-cluster-uuid <UUID>] - Peer UUID

Selects the cluster that matches this parameter value.

[-data-ping {unknown_node|internal_error|unreachable|session_reachable|interface_reachable}] - Status of Data Ping Operation

Selects the nodes that match this parameter value.

[-icmp-ping {unknown_node|internal_error|unreachable|session_reachable|interface_reachable}] - Status of ICMP Ping Operation

Selects the nodes that match this parameter value.

[-node-health {true|false}] - RDB Health of the Node

Selects the nodes that match this parameter value (`true` means healthy).

[-cluster-health {true|false}] - Cluster Health

Selects the nodes that match this parameter value (`true` means healthy).

[-availability {true|false}] - Communication Indicator

Selects the nodes that match this parameter value (`true` means communicating).

[-bypass-cache {true|false}] - Bypass Cache and Determine Health

Bypasses cached results to determine current cluster health (`true` means bypass the cache). Cached results may not be current, but they are displayed more quickly.

`[-last-updated <MM/DD/YYYY HH:MM:SS>]` - Last Update Time

Selects the nodes that match this parameter value.

Examples

The following example shows typical output for this command in a cluster of two nodes that has a peer cluster of two nodes.

```
cluster1::> cluster peer health show
Node       Cluster-Name                   Node-Name
           Ping-Status                    RDB-Health Cluster-Health
Availability
---------- -------------------------- --------- ---------------
------------
node1
           cluster2                       node3
             Data: interface_reachable
             ICMP: -                      true      true              true
                                          node4
             Data: interface_reachable
             ICMP: -                      true      true              true
node2
           cluster2                       node3
             Data: interface_reachable
             ICMP: -                      true      true              true
                                          node4
             Data: interface_reachable
             ICMP: -                      true      true              true
4 entries were displayed.
```

The following example shows detailed health information for node3 in cluster2 from the perspective of node1 in cluster1.

```
cluster1::> cluster peer health show -originating-node node1 -destination
-cluster cluster2 -destination-node node3 -instance
Local Node: node1
                Peer Cluster: cluster2
                   Peer Node: node3
                   Peer UUID: 5e4befb2-1f36-11d0-98c9-123476563412
Status of Data Ping Operation: interface_reachable
Status of ICMP Ping Operation: -
        RDB health of the node: true
                Cluster Health: true
        Communication Indicator: true
               Last Update Time: 02/06 18:58:38
```

cluster peer offer cancel

Cancel the outstanding offer to authenticate with a peer cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer offer cancel` command cancels an outstanding offer to authenticate with a potentially peered cluster. After the command completes, the given cluster can no longer establish authentication using the given authentication offer.

Parameters

`-cluster <text>` - Peer Cluster Name

Use this parameter to specify which offer should be cancelled, by specifying the name of the cluster to which the offer is extended.

Examples

The following example cancels the authentication offer to cluster2.

```
cluster1::> cluster peer offer cancel -cluster cluster2
```

cluster peer offer modify

Modify an outstanding offer to authenticate with a peer cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer offer modify` command modifies the outstanding offer to authenticate with a potentially peered cluster. Every authentication offer has an expiration time, after which the offer will no longer be honored. This command is used to change that expiration time. To cancel the offer outright, use the cluster peer offer cancel command instead.

Parameters

`-cluster <text>` - Peer Cluster Name

Use this parameter to specify the offer to be modified by indicating the name of the cluster to which it has been extended.

`[-offer-expiration {MM/DD/YYYY HH:MM:SS | {1..7}days | {1..168}hours | PnDTnHnMnS | PnW}]` - Authentication Offer Expiration Time

Use this parameter to specify the new expiration time for the offer.

`[-initial-allowed-vserver-peers <Vserver Name>,…]` - Vservers Initially Allowed for Peering

Use this optional parameter to specify the list of Vservers for which reciprocal Vserver peering with peer cluster should be enabled.

Examples

This example modifies the expiration time for the authentication offer to push it out by an hour.

```
cluster1::> cluster peer offer show
Peer Cluster Name       Authentication Creation          Expiration
---------------------- -------------- --------------------
------------------
cluster2               absent_but_offer
                                       7/23/2013 14:45:47  7/23/2013
15:45:47

cluster1::> cluster peer offer modify -cluster cluster2 -offer-expiration
"7/23/2013 16:45:47"

cluster1::> cluster peer offer show
Peer Cluster Name       Authentication Creation          Expiration
---------------------- -------------- --------------------
------------------
cluster2               absent_but_offer
                                       7/23/2013 14:45:47  7/23/2013
16:45:47
```

Related Links

- cluster peer offer cancel

cluster peer offer show

Display outstanding offers to authenticate with a peer cluster

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer offer show` command displays information about authentication offers still pending with potential peer clusters. By default, the command displays information about all unexpired offers made by the local cluster.

To display detailed information about a specific offer, run the command with the `-cluster` parameter.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

`|[-instance ]}`

If you specify the `-instance` parameter, the command displays detailed information about all fields.

`[-cluster <text>]` - **Peer Cluster Name**

Selects the offer that matches this parameter value.

`[-auth-status-operational {ok|absent|pending|expired|revoked|declined|refused|ok-and-offer|absent-but-offer|revoked-but-offer|key-mismatch|intent-mismatch|incapable}]` - **Authentication Status Operational**

Selects the offers that match this parameter value.

`[-offer-creation <MM/DD/YYYY HH:MM:SS>]` - **Authentication Offer Creation Time**

Selects the offers that match this parameter value.

`[-offer-expiration {MM/DD/YYYY HH:MM:SS | {1..7}days | {1..168}hours | PnDTnHnMnS | PnW}]` - **Authentication Offer Expiration Time**

Selects the offers that match this parameter value.

`[-initial-allowed-vserver-peers <Vserver Name>,…]` - **Vservers Initially Allowed for Peering**

Selects the offers that match this parameter value.

`[-offer-creator <text>]` - **Authentication Offer Creator**

Selects the offers that match this parameter value.

`[-encryption-protocol-proposed {none|tls-psk}]` - **Encryption Protocol to Be Used For the Relationship**

Selects the offers that match this parameter value.

Examples

The following example displays information about the outstanding authentication offers:

```
cluster1::> cluster peer offer show

Allowed
Peer Cluster Name       Authentication Creation           Expiration
Vserver Peers
---------------------- -------------- -------------------
------------------- --------------
cluster2               absent_but_offer 7/11/2013 22:22:52 7/11/2013
23:22:52 vs1,vs2
```

cluster peer policy modify

Modify the policy configuration for the cluster peering service

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer policy modify` command modifies the prevailing policy settings. One setting governs whether unauthenticated cluster peer relationships can exist. The other setting specifies a minimum length for passphrases.

Parameters

[-is-unauthenticated-access-permitted {true|false}] - Is Unauthenticated Cluster Peer Access Permitted

Use this parameter to specify whether unauthenticated peering relationships are allowed to exist. Setting the parameter value to *true* allows such relationships to exist. Setting the value to *false* prevents both the creation of unauthenticated peering relationships as well as the modification of existing peering relationships to be unauthenticated. Setting the value to *false* is not possible if the cluster currently is in any unauthenticated relationships.

[-passphrase-minlength <integer>] - Passphrase Length Minimum

Use this parameter to specify a minimum length for passphrases as given to the cluster peer create or cluster peer modify commands in the future. The default value for this parameter is 8.

[-is-unencrypted-access-permitted {true|false}] - Is Unencrypted Cluster Peer Access Permitted

Use this parameter to specify whether peering relationships that do not use encryption are allowed to exist. Setting the parameter value to *true* allows such relationships to exist. Setting the value to *false* prevents the creation of unauthenticated peering relationships and the modification of existing peering relationships to be unauthenticated, as well as preventing unencrypted peering relationships from being created and the modification of existing peering relationships to be unencrypted. Setting the value to *false* is not possible if the cluster currently is in any unauthenticated or unencrypted relationships.

Examples

This example modifies the peering policy to disallow unauthenticated intercluster communications.

```
cluster1::> cluster peer policy show
Is Unauthenticated Cluster Peer Communication Permitted:   true
                        Minimum Length for a Passphrase:   8

cluster1::> cluster peer policy modify -is-unauthenticated-access
-permitted false

cluster1::> cluster peer policy show
Is Unauthenticated Cluster Peer Communication Permitted:   false
                        Minimum Length for a Passphrase:   8
```

Related Links

- cluster peer create
- cluster peer modify

cluster peer policy show

Display the policy configuration for the cluster peering service

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster peer policy show` command displays the prevailing cluster peer authentication policy. There are two policies at present: one to control whether any cluster peer relationships can be unauthenticated, and one to control the minimum length for a passphrase. If the policy is set to preclude unauthenticated peering relationships, then unauthenticated relationships cannot be created inadvertently. Passphrases of less than the minimum length may not be used. By default, this minimum length is set to 8, so passphrases must be 8 characters long or longer.

Examples

This example shows the cluster peer policy when unauthenticated relationships may not be created inadvertently.

```
cluster1::> cluster peer policy show
Is Unauthenticated Cluster Peer Communication Permitted:  false
                      Minimum Length for a Passphrase:  9
    Is Unencrypted Cluster Peer Communication Permitted: true
```

cluster quorum-service commands

cluster quorum-service options modify

Modify the settings for cluster quorum-service

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster quorum-service options modify` command modifies the values of cluster quorum services options.

Parameters

[-ignore-quorum-warning-confirmations {true|false}] - Whether or Not Warnings Are Enabled (privilege: advanced)

Specifies whether cluster quorum warnings and confirmations should be ignored when cluster operations could negatively impact cluster quorum:

- Halting a node (system node halt)
- Rebooting a node (system node reboot)
- Issuing a planned takeover (storage failover takeover)

The default setting is false.

Examples

The following example shows the usage of this command:

```
cluster1::> set advanced

Warning: These advanced commands are potentially dangerous; use them only
when
        directed to do so by NetApp personnel.
        Do you want to continue? {y|n}: y

cluster1::*> cluster quorum-service options modify -ignore-quorum-warning
-confirmations true
```

Related Links

- system node halt
- system node reboot
- storage failover takeover

cluster quorum-service options show

Display the settings for cluster quorum-service

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster quorum-service options show` command displays the values of cluster quorum services options.

Examples

The following example demonstrates showing the state of ignore-quorum-warning-confirmations when it is false and true.

```
cluster1::*> set advanced

Warning: These advanced commands are potentially dangerous; use them only
when
          directed to do so by NetApp personnel.
          Do you want to continue? {y|n}: y

cluster1::*> cluster quorum-service options show
Ignore Quorum Warning Confirmations
 ----------------------------------
false
```

cluster ring commands

cluster ring show

Display cluster node member's replication rings

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster ring show` command displays a cluster's ring-replication status. Support personnel might ask you to run this command to assist with troubleshooting.

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-node {<nodename>|local}] - Node (privilege: advanced)

Selects the rings that match this parameter value.

[-unitname {mgmt|vldb|vifmgr|bcomd|crs|availd}] - Unit Name (privilege: advanced)

Selects the rings that match this parameter value. Possible values are:

  - `mgmt` - The management application

  - `vldb` - The volume location database

  - `vifmgr` - The virtual-interface manager

  - `bcomd` - The SAN management daemon

  - `crs` - The configuration replication service

[-online {master|secondary|offline}] - Status (privilege: advanced)

Selects the rings that match this parameter value.

[-epoch <integer>] - Epoch (privilege: advanced)

Selects the rings that match this parameter value.

[-master <nodename>] - Master Node (privilege: advanced)

Selects the rings that match this parameter value.

[-local <nodename>] - Local Node (privilege: advanced)

Selects the rings that match this parameter value.

[-db-epoch <integer>] - DB Epoch (privilege: advanced)

Selects the rings that match this parameter value.

[-db-trnxs <integer>] - DB Transaction (privilege: advanced)

Selects the rings that match this parameter value.

[-num-online <integer>] - Number Online (privilege: advanced)

Selects the rings that match this parameter value.

[-rdb-uuid <UUID>] - RDB UUID (privilege: advanced)

Selects the rings that match this parameter value.

Examples

The following example displays information about all replication rings in a two-node cluster:

```
cluster1::*> cluster ring show
Node       UnitName Epoch    DB Epoch DB Trnxs Master    Online
---------  -------- -------- -------- -------- --------- ---------
node0      mgmt     1        1        1068     node0     master
node0      vldb     1        1        98       node0     master
node0      vifmgr   1        1        350      node0     master
node0      bcomd    1        1        56       node0     master
node0      crs      1        1        88       node0     master
node1      mgmt     1        1        1068     node0     secondary
node1      vldb     1        1        98       node0     secondary
node1      vifmgr   1        1        350      node0     secondary
node1      bcomd    1        1        56       node0     secondary
node1      crs      1        1        88       node0     secondary
10 entries were displayed.
```

cluster statistics commands

cluster statistics show

Display cluster-wide statistics

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster statistics show` command displays the following information. Each item lists the current value and; if applicable, the change (delta) from the previous reported value.

- CPU busy percentage
- Average of CPU busy percentage (advanced privilege level only)
- Total number of NFS and CIFS operations
- Number of NFS operations
- Number of CIFS operations
- Number of cache operations (advanced privilege level only)
- Total amount of network data received (advanced privilege level only)
- Total amount of network data sent (advanced privilege level only)
- Number of packets received (advanced privilege level only)
- Number of packets sent (advanced privilege level only)
- Busy percentage for the data network
- Amount of data received on the data network
- Amount of data sent on the data network
- Busy percentage for the cluster network
- Amount of data received on the cluster network
- Amount of data sent on the cluster network
- Amount of data read from disk
- Amount of data written to disk

At the diagnostic privilege level, the command displays the following information:

- Average of CPU busy percentage
- CPU busy percentage
- Total number of operations
- Number of NFS operations
- Number of CIFS operations
- Number of 7M Fcache operations
- Number of SpinFS operations
- Total amount of network traffic received
- Total amount of network traffic sent
- Percentage of data-network utilization

- Amount of data-network traffic received

- Amount of data-network traffic sent

- Percentage of cluster-network utilization

- Amount of cluster-network traffic received

- Amount of cluster-network traffic sent

- Amount of data read from disk

- Amount of data written to disk

- Number of packets received

- Number of packets sent

Examples

The following example displays cluster statistics:

```
cluster1::> cluster statistics show
      Counter          Value          Delta
------------- ------------- -------------
    CPU Busy:            84%            +27
  Operations:
       Total:      951471448      7210/s:11s
         NFS:    12957951479     13759/s:11s
        CIFS:      342195460       230/s:11s
 Data Network:
        Busy:             0%             -
    Received:         1.98TB   3.18MB/s:11s
        Sent:         6.20TB    903KB/s:11s
 Cluster Network:
        Busy:             0%             -
    Received:         6.33TB   1.34MB/s:11s
        Sent:         6.24TB   3.54MB/s:11s
  Storage Disk:
        Read:          207TB   82.7MB/s:11s
       Write:         53.3TB   53.5MB/s:11s
```

cluster time-service commands

cluster time-service ntp key create

Create an NTP symmetric authentication key

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp key create` command creates a cryptographic key that can be used to verify that Network Time Protocol (NTP) packets are coming from a configured NTP server.

To use the created key it must be assigned to the required NTP server configuration using the cluster time-service ntp server create or cluster time-service ntp server modify commands.

> ⓘ The id, key-type and value must all be configured identically on both the ONTAP cluster and the external NTP time server for the cluster to be able to synchronize time to that server.

Parameters

`-id <integer>` - NTP Symmetric Authentication Key ID

Uniquely identifies this key in the cluster. Must be an integer between 1 and 65535.

`-type <sha1>` - NTP Symmetric Authentication Key Type

The cryptographic algorithm that this key is used with. Only SHA1 is currently supported.

`-value <text>` - NTP Symmetric Authentication Key Value

A 40 character hexadecimal digit string that represents a cryptographic key that is shared with the NTP server.

Examples

The following example creates a new SHA-1 NTP symmetric authentication key.

```
cluster1::> cluster time-service ntp key create 1 sha1
2e874852e7d41cda65b23915aa5544838b366c51
```

Related Links

- cluster time-service ntp server create
- cluster time-service ntp server modify

cluster time-service ntp key delete

Delete an NTP symmetric authentication key

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

Delete an NTP symmetric authentication key.

> ⓘ It is not possible to delete a key that is referenced in an existing NTP server configuration. Remove all references to this key using the cluster time-service ntp server modify or cluster time-service ntp server delete commands before attempting to delete the key using this command.

Parameters

`-id <integer>` - NTP Symmetric Authentication Key ID

Unique identifier of this key in the cluster.

Examples

The following example deletes the NTP key with ID 1.

```
cluster1::> cluster time-service ntp key delete 1
```

Related Links

- cluster time-service ntp server modify
- cluster time-service ntp server delete

cluster time-service ntp key modify

Modify an NTP symmetric authentication key

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp key modify` command modifies a Network Time Protocol (NTP) symmetric authentication key.

Parameters

`-id <integer>` - NTP Symmetric Authentication Key ID

Unique identifier of this key in the cluster.

`[-type <sha1>]` - NTP Symmetric Authentication Key Type

The cryptographic algorithm that this key is used with. Only SHA1 is currently supported.

`[-value <text>]` - NTP Symmetric Authentication Key Value

A 40 character hexadecimal digit string that represents a cryptographic key that is shared with the NTP server.

Examples

The following example modifies the NTP key with ID 1 to have a new value.

```
cluster1::> cluster time-service ntp key modify 1 -value
2e874852e7d41cda65b23915aa5544838b366c51
```

cluster time-service ntp key show

Display NTP symmetric authentication keys

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp key show` command displays the configured Network Time Protocol (NTP) symmetric authentication keys.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,` … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

[-id <integer>] - NTP Symmetric Authentication Key ID

If this parameter is specified, the command displays the keys that match the specified key ID.

[-type <sha1>] - NTP Symmetric Authentication Key Type

If this parameter is specified, the command displays the keys that match the specified key type.

[-value <text>] - NTP Symmetric Authentication Key Value

If this parameter is specified, the command displays the keys that match the specified value.

Examples

The following example displays information about the NTP authentication keys in the cluster:

```
cluster1::> cluster time-service ntp key show
ID      Type        Value
------  ---------   ----------------------------------------
2       sha1        5a01120580b5a6ade6ebcd5bad7673fdd6db0113
10      sha1        1f48d2e6f02f17e3f8fa8798cc77af101df29642
2 entries were displayed.
```

cluster time-service ntp security modify

Modify NTP security settings

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster time-service ntp security modify` command allows setting of security parameters

related to the Network Time Protocol (NTP) subsystem.

Parameters

`[-is-query-enabled {true|false}]` - **Is Querying of NTP Server Enabled? (privilege: advanced)**

Setting this parameter to `true` allows querying of the NTP subsystem from systems external to the cluster. For example, querying a node using the standard "ntpq" command can be enabled by this command. The default setting is `false` to protect against possible security vulnerabilities. If querying of the NTP subsystem is disabled, the cluster time-service ntp status show command can be used to obtain similar information. Although querying of the NTP subsystem from external hosts can be disabled with this command, executing a local query to the localhost address is always enabled.

Examples

The following example enables the querying of the NTP subsystem from clients external to the cluster:

```
cluster-1::> cluster time-service ntp security modify -is-query-enabled
true
```

Related Links

* cluster time-service ntp status show

cluster time-service ntp security show

Display NTP security settings

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster time-service ntp security show` command displays the configuration of security features related to the Network Time Protocol (NTP) subsystem.

Examples

The following example displays the NTP security configuration of the cluster:

```
cluster1::> cluster time-service ntp security show
External queries enabled?: true
```

cluster time-service ntp server create

Add a NTP Server

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp server create` command associates the cluster with an external network time server for time correction and adjustment by using the Network Time Protocol (NTP).

The command resolves the time server host name to an IP address and performs several validation checks. If an error is detected during validation, it is reported.

The validation checks performed by this command include the following:

- The NTP replies to an NTP query with the specified protocol version.
- The NTP reply indicates that the external time server is synchronized to another time server.
- The distance and dispersion of the NTP reply from the "root" or source clock are within the required limits.

Parameters

`-server <text>` - NTP Server Host Name, IPv4 or IPv6 Address

This parameter specifies the host name or IP address of the external NTP server that is to be associated with the cluster for time correction and adjustment.

`[-version {3|4|auto}]` - NTP Version for Server (default: auto)

Use this parameter to optionally specify the NTP protocol version that should be used for communicating with the external NTP server. If the external NTP server does not support the specified protocol version, time exchange cannot take place.

The supported values for this parameter include the following:

- `3` - Use NTP protocol version 3, which is based on Internet Standard request for comments (RFC) #1305.
- `4` - Use NTP protocol version 4, which is based on Internet Standard RFC #5905.
- `auto` - Have ONTAP select the NTP protocol version.

The default setting is `auto` .

`[-is-preferred {true|false}]` - Is Preferred NTP Server (default: false) (privilege: advanced)

Use this parameter to optionally specify whether the external NTP server is the primary time source for correcting and adjusting the cluster time. The responses from this source are used unless its time is outside the accepted selection range.

The default setting is `false` .

You use this parameter when a high quality radio (or GPS) based time server is being used with a set of non-radio based backup time servers.

`[-key-id <integer>]` - NTP Symmetric Authentication Key ID

Use this parameter to optionally enable NTP symmetric authentication key for communication with the specified time server. The ID must refer to a key created by the cluster time-service ntp key create command and must be a key with the same ID and value as one configured on the specified time server.

Examples

The following example associates the cluster with an NTP server named ntp1.example.com.

```
cluster1::> cluster time-service ntp server create -server
ntp1.example.com
```

Related Links

- cluster time-service ntp key create

cluster time-service ntp server delete

Delete a NTP Server

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp server delete` command removes the association between the cluster and an external network time server that uses the Network Time Protocol (NTP).

Parameters

`-server <text>` - NTP Server Host Name, IPv4 or IPv6 Address
   This specifies the host name or IP address of an existing external NTP server that the cluster will disassociate from.

Examples

The following example disassociates an NTP server named ntp2.example.com from the cluster:

```
cluster1::> cluster time-service ntp server delete -server
ntp2.example.com
```

cluster time-service ntp server modify

Modify NTP Server Options

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp server modify` command modifies the configuration of an existing external network time server that uses the Network Time Protocol (NTP) for time correction and adjustment.

Parameters

`-server <text>` - NTP Server Host Name, IPv4 or IPv6 Address

This parameter specifies the host name or IP address of an existing external NTP server that is to be modified.

`[-version {3|4|auto}]` - NTP Version for Server (default: auto)

Use this parameter to optionally specify the NTP protocol version that should be used for communicating with the external NTP server. If the external NTP server does not support the specified protocol version, time exchange cannot take place.

The supported values for this parameter include the following:

* `3` - Use NTP protocol version 3, which is based on Internet Standard request for comments (RFC) #1305.

* `4` - Use NTP protocol version 4, which is based on Internet Standard RFC #5905.

* `auto` - Have ONTAP select the NTP protocol version.

The default setting is auto.

`[-is-preferred {true|false}]` - Is Preferred NTP Server (default: false) (privilege: advanced)

Use this parameter to optionally specify whether the external NTP server is the primary time source for correcting and adjusting the cluster time. The responses from this source are used unless its time is outside the accepted selection range

The default setting is `false` .

You use this parameter when a high quality radio (or GPS) based time server is being used with a set of non-radio based backup time servers.

This parameter is available only at the advanced privilege level and higher.

`[-is-authentication-enabled {true|false}]` - Is NTP Symmetric Key Authentication Enabled

Use this parameter to optionally disable NTP symmetric key authentication for communication with the specified time server. Using this parameter and selecting `false` disables the NTP symmetric key authentication and clears the `key-id` parameter for the specified server. This parameter is not required to enable NTP symmetric key authentication, but if specified as `true` the NTP symmetric authentication key must also be specified using the `key-id` parameter.

`[-key-id <integer>]` - NTP Symmetric Authentication Key ID

Use this parameter to optionally enable NTP symmetric authentication key for communication with the specified time server. The ID must refer to a key created by the cluster time-service ntp key create command and must be a key with the same ID and value as one configured on the specified time server.

Examples

The following example modifies the NTP version of an NTP server named ntp1.example.com. The NTP version is changed to 4.

```
cluster1::> cluster time-service ntp server modify -server
ntp1.example.com -version 4
```

Related Links

-

cluster time-service ntp server reset

Reset NTP server list to a default selection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster time-service ntp server reset` command replaces the current configuration with one of the selected configurations.

If none or more than one time service configuration is selected, the command will fail.

Parameters

[-use-public {true|false}] - Reset Server List to Public Identified Defaults (default: false) (privilege: advanced)

When set to true, this specifies that the public NTP server list used by ONTAP should replace the current configuration.

The default setting is `false` .

Examples

The following example replaces the current time service configuration with the default public NTP server list that is used by ONTAP.

```
cluster1::> cluster time-service ntp server reset -use-public true
```

cluster time-service ntp server show

Display a list of NTP Servers

Availability: This command is available to *cluster* administrators at the *admin* privilege level.

Description

The `cluster time-service ntp server show` command displays the association between the cluster and external network time servers that use the Network Time Protocol (NTP).

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command only displays the fields that you specify. For example: `-fields server, version` .

`| [-instance ] }`

If this parameter is specified, the command displays all the available field information.

`[-server <text>]` - NTP Server Host Name, IPv4 or IPv6 Address

If this parameter is specified, the command displays the external NTP servers that match the specified server name or IP address.

`[-version {3|4|auto}]` - NTP Version for Server (default: auto)

If this parameter is specified, the command displays the external NTP servers that use the specified NTP version.

`[-is-preferred {true|false}]` - Is Preferred NTP Server (default: false) (privilege: advanced)

If this parameter is specified, the command displays the external NTP server or servers that match the specified preferred server status.

`[-is-public {true|false}]` - Is Public NTP Server Default (privilege: advanced)

If this parameter is specified, the command displays the information for the external NTP servers that are either on the NTP server list defined by ONTAP (`true` ') or not on the list (`false` ').

`[-is-authentication-enabled {true|false}]` - Is NTP Symmetric Key Authentication Enabled

If this parameter is specified, the command displays the external NTP server or servers that require NTP symmetric key authentication for communication.

`[-key-id <integer>]` - NTP Symmetric Authentication Key ID

If this parameter is specified, the command displays the external NTP server or servers that match the specified symmetric authentication key ID.

Examples

The following example displays information about all external NTP time servers that are associated with the cluster:

```
cluster1::> cluster time-service ntp server show
                                 Is
                                 Authentication
Server                       Version Enabled       Key ID
---------------------------- ------- ------------- ------
ntp1.example.com             auto    false         -
ntp2.example.com             auto    true          10
```

cluster time-service ntp status show

Display status of the node's NTP client

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `cluster time-service ntp status show` command displays the status of the associations between the cluster and external network time servers that use the Network Time Protocol (NTP).

Parameters

[-fields <fieldname>,…]

If you specify the `-fields <fieldname>`, … parameter, the command output also includes the specified field or fields. You can use '-fields ?' to display the fields to specify.

| [-instance] (privilege: advanced) }

If this parameter is specified, the command displays detailed information about all entries.

[-node {<nodename>|local}] - Node (privilege: advanced)

If this parameter is specified, the command displays information related to associations on the specified node.

[-server <text>] - NTP Server Host Name, IPv4 or IPv6 Address (privilege: advanced)

If this parameter is specified, the command displays information about the associations related to the specified NTP server. The server should be specified as it is configured in the cluster time-service ntp server show command.

[-server-address <IP Address>] - Server IP Address (privilege: advanced)

If this parameter is specified, the command displays information about the associations related to the NTP server with the specified IP address.

[-is-peer-reachable {true|false}] - Is Peer Reachable and Responding to Polls? (privilege: advanced)

If this parameter is specified as *true* , the command displays information about associations with the NTP servers that have been successfully polled.

[-is-peer-selected {true|false}] - Is Peer Selected as Clock Source? (privilege: advanced)

If this parameter is specified as *true* , the command displays information about associations with the NTP servers that have been selected as the current clock source.

[-selection-state <State of NTP Peer Selection>] - State of Server Selection (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified selection state.

[-selection-state-text <text>] - Description of Server Selection State (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified selection state description.

[-poll-interval <integer>] - Poll Interval (secs) (privilege: advanced)

If this parameter is specified, the command displays information about associations that have the specified polling interval.

[-time-last-poll <integer>] - Time from Last Poll (secs) (privilege: advanced)

If this parameter is specified, the command displays information about associations that are polled at the specified time.

[-offset <double hundredths>] - Offset from Server Time (ms) (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified offset from the NTP server.

[-delay <double hundredths>] - Delay Time to Server (ms) (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified travelling time to the NTP server.

[-jitter <double hundredths>] - Maximum Offset Error (ms) (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified offset error from the NTP server.

[-reachability <Hex String>] - Reachability of Server (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified reachability to the NTP server. Reachability is specified as a hexbyte that has a bit to represent the success of each of the last eight polls of the specified server. A set bit represents a successful poll. The least significant bit represents the most recent poll, the next most significant bit the poll before that, and so on.

[-server-stratum <integer>] - Stratum of Server Clock (privilege: advanced)

If this parameter is specified, the command displays information about associations with NTP servers with the specified clock stratum.

[-server-reference <text>] - Reference Clock at Server (privilege: advanced)

If this parameter is specified, the command displays information about associations with NTP servers using the specified clock as reference.

[-reported-errors <NTP Peer and Packet Errors>,…] - Reported Packet and Peer Errors (privilege: advanced)

If this parameter is specified, the command displays information about associations with the specified errors.

Examples

The following example displays the status of the NTP associations of the cluster:

```
cluster-1::*>cluster time-service ntp status show
Node: node-1
Server                        Reachable  Selection State              Offset
 (ms)
---------------------- ---------  -----------------------------
------------
ntp1.eng.netapp.com           true  Currently Selected Server
39.122
ntp2.eng.netapp.com           true  Candidate Server
37.786
2 entries were displayed.
```

The following example displays the status of the association with the specified external NTP server:

```
cluster-1::*>cluster time-service ntp status show -instance -server
ntp1.example.com
Node: node-1
NTP Server Host Name, IPv4 or IPv6 Address: ntp1.example.com
                        Server IP Address: 10.56.32.33
Is Peer Reachable and Responding to Polls?: true
        Is Peer Selected as Clock Source?: true
              State of Server Selection: sys_peer
    Description of Server Selection State: Currently Selected Server
                    Poll Interval (secs): 64
            Time from Last Poll (secs): 1
          Offset from Server Time (ms): 26.736
              Delay Time to Server (ms): 61.772
              Maximum Offset Error (ms): 3.064
                  Reachability of Server: 01
                Stratum of Server Clock: 2
              Reference Clock at Server: 10.56.68.21
          Reported Packet and Peer Errors: -
```

Related Links

• cluster time-service ntp server show