storage disk commands

ONTAP commands

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storage disk commands

storage disk assign

Assign ownership of a disk to a system

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

Description

The `storage disk assign` command is used to assign ownership of an unowned disk or array LUN to a specific node. You can also use this command to change the ownership of a disk or an array LUN to another node. You can designate disk ownership by specifying disk names, array LUN names, wildcards, or all (for all disks or array LUNs visible to the node). For disks, you can also set up disk ownership autoassignment. You can also assign disks to a particular pool. You can also assign disks by copying ownership from another disk.

Parameters

{ [-disk <disk path name>] - Disk Path

This specifies the disk or array LUN that is to be assigned. Disk names take one of the following forms:

- Disks are named in the form *<stack-id>.<shelf>.<bay>*
- Disks on multi-disk carriers are named in the form *<stack-id>.<shelf>.<bay>.<lun>*
- Virtual disks are named in the form <prefix>.<number>, where prefix is the storage array's prefix and number is a unique ascending number.

Disk names take one of the following forms on clusters that are not yet fully upgraded to Data ONTAP 8.3:

- Disks that are not attached to a switch are named in the form *<node>:<host_adapter>.<loop_ID>* . For disks with a LUN, the form is *<node>:<host_adapter>.<loop_ID>*L*<LUN>* . For instance, disk number 16 on host adapter 1a on a node named node0a is named node0a:1a.16. The same disk on LUN lun0 is named node0a:1a.16Llun0.
- Disks that are attached to a switch are named in the form *<node>:<switch_name>:<switch_port>.<loop_ID>* . For disks with a LUN, the form is *<node>:<switch_name>:<switch_port>.<loop_ID>*L*<LUN>* . For instance, disk number 08 on port 11 of switch fc1 on a node named node0a is named node0a:fc1:11.08. The same disk on LUN lun1 is named node0a:fc1:11.08Llun1.

Before the cluster is upgraded to Data ONTAP 8.3, the same disk can have multiple disk names, depending on how the disk is connected. For example, a disk known to a node named alpha as alpha:1a.19 can be known to a node named beta as beta:0b.37. All names are listed in the output of queries and are equally valid. To determine a disk's unique identity, run a detailed query and look for the disk's universal unique identifier (UUID) or serial number.

A subset of disks or array LUNs can be assigned using the wildcard character (*) in the `-disk` parameter. Either the `-owner` , the `-sysid` , or the `-copy-ownership-from` parameter must be specified with the `-disk` parameter. Do not use the `-node` parameter with the `-disk` parameter.

| -disklist <disk path name>,… - Disk list

This specifies the List of disks to be assigned.

| -all <true> - Assign All Disks

This optional parameter causes assignment of all visible unowned disks or array LUNs to the node specified in the `-node` parameter. The `-node` parameter must be specified with the `-all` parameter. When the `-copy-ownership-from` parameter is specified with the `-node` parameter, it assigns disk ownership based on the `-copy-ownership-from` parameter; otherwise it assigns ownership of the disks based on the `-node` parameter. Do not use the `-owner` or the `-sysid` parameter with the `-all` parameter.

| [-T, -type {ATA | BSAS | FCAL | FSAS | LUN | MSATA | SAS | SSD | VMDISK | SSD-NVM}] - Storage Type

This optional parameter assigns ownership of a specific type of disk or array LUN (or a set of disks/array LUNs) to a node. The `-count` parameter must be specified with the `-type` parameter.

-n, -count <integer> - Disk Count

This optional parameter assigns ownership of a number of disks or array LUNs specified in the `-count` parameter, to a node.

| -auto <true> - Auto Assign }

This optional parameter causes all visible disks eligible for autoassignment to be immediately assigned to the node specified in the `-node` parameter, regardless of the setting of the disk.auto_assign option. Only unowned disks on loops or stacks owned wholly by that system and which have the same pool information will be assigned. The `-node` parameter must be specified with the `-auto` parameter. Do not use the `-owner` , the `-sysid` , or the `-copy-ownership-from` parameter with the `-auto` parameter. When possible, use the `-auto` parameter rather than the `-all` parameter to conform to disk ownership best practices. The `-auto` parameter is ignored for array LUNs.

[-p, -pool <integer>] - Pool

This optional parameter specifies the pool to which a disk must be assigned. It can take values of Pool0 or Pool1.

{ [-o, -owner <nodename>] - Owner Name

This optional parameter specifies the node to which the disk or array LUN has to be assigned.

[-s, -sysid <nvramid>] - New Owner ID

This optional parameter specifies the serial number (NVRAM ID) of the node to which the disk or array LUN has to be assigned.

| [-copy-ownership-from <disk path name>] - Disk Name to Copy Ownership }

This optional parameter specifies the disk name from where the node needs to copy disk ownership information. You can use this parameter for disks to have the same ownership as the provided input disk.

[-c, -checksum {block|zoned|advanced_zoned}] - Checksum Compatibility

This optional parameter is used to set the checksum type for a disk or an array LUN. The possible values are *`block`* , *`zoned`* , and *`advanced_zoned`* . This operation will fail if the specified disk is incompatible with the specified checksum type. A newly created aggregate with zoned checksum array LUNs is assigned advanced zoned checksum (AZCS) checksum type. AZCS checksum type provides more functionality than the "version 1" zoned checksum type which has been supported in previous Data ONTAP releases. Zoned checksum spare array LUNs added to an existing zoned checksum aggregate continue to be zoned checksum. Zoned checksum spare array LUNs added to an AZCS checksum type aggregate use the AZCS checksum scheme for managing checksums. For some disks (e.g. FCAL, SSD, SAS disks), the checksum type cannot be modified. For more information on modifying the checksum type, refer to the "Physical Storage Management Guide".

[-f, -force <true>] - Force Flag

This optional parameter forces the assignment of ownership of an already owned disk to a node. This parameter could also be used to assign an array LUN with a redundancy error, for example, if the array LUN is available on only one path. For a disk which is part of a live aggregate, even specification of the `-force` parameter would not force the assignment, since it would be catastrophic.

[-N, -node <nodename>] - Node Name (For Auto Assign)

This optional parameter is used with either the `-auto` or the `-all` parameter. If used with the `-auto` parameter, all disks which are visible to the node specified in the `-node` parameter and which are eligible for autoassignment would be assigned to it. If used with the `-all` parameter, all unowned disks or array LUNs visible to the node would be assigned to it.

{ [-root <true>] - Root Partition of Root-Data or Root-Data1-Data2 Partitioned Disk (privilege: advanced)

This optional parameter assigns the root partition of a root-data/root-data1-data2 partitioned disk. You cannot use this parameter with disks that are part of a storage pool. The default value is *`false`* .

| [-data <true>] - Data Partition of Root-Data Partitioned Disk (privilege: advanced)

This optional parameter assigns the data partition of a root-data partitioned disk. You cannot use this parameter with disks that are part of a storage pool. The default value is *`false`* .

| [-data1 <true>] - Data1 Partition of Root-Data1-Data2 Partitioned Disk (privilege: advanced)

This optional parameter assigns the data1 partition of a root-data1-data2 partitioned disk. You cannot use this parameter with disks that are part of a storage pool. The default value is *`false`* .

| [-data2 <true>] - Data2 Partition of Root-Data1-Data2 Partitioned Disk (privilege: advanced) }

This optional parameter assigns the data2 partition of a root-data1-data2 partitioned disk. You cannot use this parameter with disks that are part of a storage pool. The default value is *`false`* .

Examples

```
The following example assigns ownership of an unowned disk named ``_1_``
.``_1_`` .``_16_`` to a node named ``_node1_`` :
```

```
cluster1::> storage disk assign -disk 1.1.16 -owner node1
```

The following example assigns all unowned disks or array LUNs visible to a node named *`node1`* to itself:

```
cluster1::> storage disk assign -all -node node1
```

The following example autoassigns all unowned disks (eligible for autoassignment) visible to a node named *`node1`* to itself:

```
cluster1::> storage disk assign -auto -node node1
```

The following two examples show the working of the `-force` parameter with a spare disk that is already owned by another system:

```
cluster1::> storage disk assign -disk 1.1.16 -owner node1
    Error: command failed: Failed to assign disks. Reason: Disk 1.1.16 is
    already owned.
```

```
cluster1::> storage disk assign -disk 1.1.16 -owner node1 -force
    Success.
```

The following example assigns ownership of the set of unowned disks on *<stack> 1* , to a node named *node1* :

```
cluster1::> storage disk assign -disk 1.* -owner node1
```

The following example assigns ownership of unowned disk *1 .1 .16* by copying ownership from disk *1 .1 .18* :

```
cluster1::> storage disk assign -disk 1.1.16
   -copy-ownership-from 1.1.18
```

```
The following example assigns all unowned disks visible to a node named
``_node1_`` by copying ownership from disk ``_1_`` .``_1_`` .``_18_`` :
```

```
cluster1::> storage disk assign -all -node node1
    -copy-ownership-from 1.1.18
```

storage disk fail

Fail the file system disk

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

Description

The `storage disk fail` command can be used to manually force a file system disk to fail. It is used to remove a file system disk that may be logging excessive errors and requires replacement. To unfail a disk, use the storage disk unfail command.

Parameters

-disk <disk path name> - Disk Name

This parameter specifies the disk to be failed.

[-i, -immediate <true>] - Fail immediately

This parameter optionally specifies whether the disk is to be failed immediately. It is used to avoid Rapid RAID Recovery and remove the disk from the RAID configuration immediately. Note that when a file system disk has been removed in this manner, the RAID group to which the disk belongs enters degraded mode (meaning a disk is missing from the RAID group). If a suitable spare disk is available, the contents of the disk being removed are reconstructed onto that spare disk.

Examples

The following example fails a disk named 1.1.16 immediately:

```
cluster1::> storage disk fail -disk 1.1.16 -i true
WARNING: The system will not prefail the disk and its contents will not be
copied to a replacement disk before being failed out. Do you want to
fail out the disk immediately? {y|n}: y
```

Related Links

- storage disk unfail

storage disk reassign

(DEPRECATED)-Change the default owner of all disks from one node to another

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

Description

The `storage disk reassign` is deprecated and may be removed in a future release of Data ONTAP. Disk reassignment is no longer required as part of a controller replacement procedure. For further information, see the latest controller or NVRAM FRU replacement flyer for your system. This command changes the ownership of all disks on a node to the ownership of another node. Use this command only when a node has a complete failure (for instance, a motherboard failure) and is replaced by another node. If the node's disks have already been taken over by its storage failover partner, use the `-force` parameter.

Parameters

-s, -homeid <nvramid> - Current Home ID (privilege: advanced)

This specifies the serial number of the failed node.

-d, -newhomeid <nvramid> - New Home ID (privilege: advanced)

This specifies the serial number of the node that is to take ownership of the failed node's disks.

[-f, -force <true>] - Force (privilege: advanced)

This optionally specifies whether to force the reassignment operation. The default setting is `false` .

Examples

In the following example, a node named node0 and having serial number 12345678 has failed. Its disks have not been taken over by its storage failover partner. A replacement node with serial number 23456789 was installed and connected to node0's disk shelves. To assign node0's disks to the new node, start the new node and run the following command:

```
cluster::*> storage disk reassign -homeid 12345678 -newhomeid 23456789
node0's disks 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 1.1.16, 1.1.23 and
1.1.24
were reassigned to new owner with serial number 23456789.
```

In the following example, a similar failure has occurred, except that node0's disks have been taken over by its storage failover partner, node1. A new node with serial number 23456789 has been installed and configured. To assign the disks that previously belonged to node0 to this new node, run the following command:

```
cluster::*> storage disk reassign -homeid 12345678 -newhomeid 23456789
-force true
node0's disks 1.1.11, 1.1.12, 1.1.13, 1.1.14, 1.1.15, 1.1.16, 1.1.23 and
1.1.24
were reassigned to new owner with serial number 23456789.
```

storage disk refresh-ownership

Refresh the disk ownership information on a node

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

Description

This command updates the disk ownership information for all the disks attached to a node to the latest view for all the nodes in the cluster. During normal operations, disk ownership is kept up to date automatically. In certain circumstances, however, disk ownership must be updated manually. If this is required, EMS messages will indicate that this command should be run. If the -node parameter is provided, the disk ownership information is updated only on the node specified.

Parameters

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

If this parameter is provided, the disk ownership information is updated only on the node specified.

Examples

The following example refreshes the disk ownership information for all the nodes in the cluster:

```
cluster1::> storage disk refresh-ownership
```

storage disk remove-reservation

Removes reservation from an array LUN marked as foreign.

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

Description

The `storage disk remove-reservation` command removes persistent reservation from a specified foreign array LUN.

Parameters

`-disk <disk path name>` - Disk Name (privilege: advanced)

This specifies the disk from which persistent reservation is to be removed.

Examples

The following example removes the persistent reservation from a disk named node1:switch01:port.126L1.

```
cluster1::> storage disk remove-reservation -disk
node1:switch01:port.126L1
```

storage disk remove

Remove a spare disk

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

Description

The `storage disk remove` command removes the specified spare disk from the RAID configuration, spinning the disk down when removal is complete.

This command does not remove disk ownership information from the disk. Therefore, if you plan to reuse the disk in a different storage system, you should use the storage disk removeowner command instead. See the "Physical Storage Management Guide" for the complete procedure.

For systems with multi-disk carriers, it is important to ensure that none of the disks in the carrier are filesystem disks before attempting removal. To convert a filesystem disk to a spare disk, see storage disk replace .

Parameters

`-disk <disk path name>` - Disk Name

This parameter specifies the disk to be removed.

Examples

The following example removes a spare disk named 1.1.16:

```
cluster1::> storage disk remove -disk 1.1.16
```

Related Links

- storage disk removeowner
- storage disk replace

storage disk removeowner

Remove disk ownership

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

Description

The `storage disk removeowner` command removes ownership from a specified disk. Then disk can then be reassigned to a new owner.

Parameters

`-disk <disk path name>` - Disk Name

This specifies the disk whose ownership is to be removed.

{ `[-root <true>]` - Root Partition of Root-Data/Root-Data1-Data2 Partitioned Disk (privilege: advanced)

This optional parameter removes ownership of the root partition of a root-data/root-data1-data2 partitioned disk. You cannot use this parameter with disks that are part of a storage pool. The default value is *`false`* .

| `[-data <true>]` - Data Partition of Root-Data Partitioned Disk (privilege: advanced)

This optional parameter removes ownership of the data partition of a root-data partitioned disk. You cannot use this parameter with a root-data1-data2 partitioned disk or disks that are part of a storage pool. The default value is *`false`* .

| `[-data1 <true>]` - Data1 Partition of a Root-Data1-Data2 Partitioned Disk (privilege: advanced)

This optional parameter removes ownership of the data1 partition of a root-data1-data2 partitioned disk. You cannot use this parameter with a root-data partitioned disk or disks that are part of a storage pool. The default value is *`false`* .

| [-data2 <true>] - Data2 Partition of a Root-Data1-Data2 Partitioned Disk (privilege: advanced) }

This optional parameter removes ownership of the data2 partition of a root-data1-data2 partitioned disk. You cannot use this parameter with a root-data partitioned disk or disks that are part of a storage pool. The default value is *false* .

Examples

The following example removes the ownership from a disk named 1.1.27.

```
cluster1::> storage disk removeowner -disk 1.1.27
```

storage disk replace

Initiate or stop replacing a file-system disk

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

Description

The `storage disk replace` command starts or stops the replacement of a file system disk with spare disk. When you start a replacement, Rapid RAID Recovery begins copying data from the specified file system disk to a spare disk. When the process is complete, the spare disk becomes the active file system disk and the file system disk becomes a spare disk. If you stop a replacement, the data copy is halted, and the file system disk and spare disk retain their initial roles.

Parameters

-disk <disk path name> - Disk Name

This specifies the file system disk that is to be replaced. Disk names take one of the following forms:

- Disks are named in the form *<stack-id>.<shelf>.<bay>*
- Disks on multi-disk carriers are named in the form *<stack-id>.<shelf>.<bay>.<lun>*
- Virtual disks are named in the form <prefix>.<number>, where prefix is the storage array's prefix and number is a unique ascending number.

Disk names take one of the following forms on clusters that are not yet fully upgraded to Data ONTAP 8.3:

- Disks that are not attached to a switch are named in the form *<node>*:*<host_adapter>*.*<loop_ID>* . For disks with a LUN, the form is *<node>*:*<host_adapter>*.*<loop_ID>*L*<LUN>* . For instance, disk number 16 on host adapter 1a on a node named node0a is named node0a:1a.16. The same disk on LUN lun0 is named node0a:1a.16Llun0.
- Disks that are attached to a switch are named in the form *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>* . For disks with a LUN, the form is *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>*L*<LUN>* . For instance, disk number 08 on port 11 of switch fc1 on a node named node0a is named node0a:fc1:11.08. The same disk on LUN lun1 is named node0a:fc1:11.08Llun1.

Before the cluster is upgraded to Data ONTAP 8.3, the same disk can have multiple disk names, depending on how the disk is connected. For example, a disk known to a node named alpha as alpha:1a.19 can be

known to a node named beta as beta:0b.37. All names are listed in the output of queries and are equally valid. To determine a disk's unique identity, run a detailed query and look for the disk's universal unique identifier (UUID) or serial number.

-action {start | stop} - Action

This specifies whether to start or stop the replacement process.

[-replacement <disk path name>] - Replacement

This specifies the spare disk that is to replace the file system disk.

[-allow-same-carrier <true>] - Allow Same RAID Group Within Carrier

This parameter can be used to allow two disks housed in the same carrier to be in the same RAID group when you replace a disk in an aggregate.

Having disks in the same carrier in the same RAID group is not desirable because a carrier failure can cause a simultaneous outage for two disks in the same RAID group. You can replace a disk in an aggregate with a disk that causes this situation, but when an alternate disk becomes available, Data ONTAP automatically initiates a series of disk copy operations to put the disks into different RAID groups. For this reason, you should use this parameter only when necessary. When possible, ensure that disks housed in the same carrier are in different RAID groups.

This parameter affects only the disk replace operation. It is not a persistent attribute of the aggregate.

[-m, -allow-mixing <true>] - Allow Mixing of Disks of Different RPM or Pool

This optional parameter specifies whether the disk can be replaced with another disk of different RPM or from different Pool. This parameter affects only the current disk replacement operation.

Examples

The following example begins replacing a file system disk named *1.0.16* with a spare disk named *1.1.14*.

```
cluster1::> storage disk replace -disk 1.0.16 -replacement 1.1.14 -action
start
```

storage disk set-foreign-lun

Sets or Unsets an array LUN as foreign

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

Description

The `storage disk set-foreign-lun` command sets or unsets a specified array LUN as foreign. This command will enable/disable the feature of importing the data from foreign LUN.

Parameters

-disk <disk path name> - Disk Name

This parameter specifies the array LUN which is to be set or unset as foreign.

-is-foreign-lun <true> - Is Foreign LUN

If the parameter value specified is *true* then array LUN is set as foreign. If the parameter value specified is *false* then array LUN foreignness is cleared.

Examples

The following example shows how to set an array LUN as foreign:

```
cluster1::> storage disk set-foreign-lun -disk EMC-1.1 -is-foreign-lun
true
```

The following example shows how to mark an array LUN as not foreign:

```
cluster1::> storage disk set-foreign-lun -disk EMC-1.1 -is-foreign-lun
false
```

storage disk set-led

Identify disks by turning on their LEDs

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

Description

The `storage disk set-led` command controls the LED of a specified disk.

You can turn an LED on or off, cause it to blink or stop blinking, or test it.

This command is useful for locating a disk in its shelf.

Parameters

-action {on|off|blink|blinkoff|testall|resetall} - Action

This parameter specifies the state to which the LED is to be set. Possible values include the following:

- on - The LED is lit steadily
- off - The LED is not lit
- blink - The LED blinks
- blinkoff - The LED stops blinking and is not lit
- testall - This tests the operation of every disk enclosure's hardware and drivers per node. Do not use this value in normal operation.
- resetall - This resets the LED of every disk on the node and lights up the LED of disks with faults.

{ [-disk <disk path name>] - Disk Name

This specifies the disk whose LED is to be set. Disk names take one of the following forms:

- Disks are named in the form *<stack-id>.<shelf>.<bay>*
- Disks on multi-disk carriers are named in the form *<stack-id>.<shelf>.<bay>.<lun>*
- Virtual disks are named in the form <prefix>.<number>, where prefix is the storage array's prefix and number is a unique ascending number.

Disk names take one of the following forms on clusters that are not yet fully upgraded to Data ONTAP 8.3:

- Disks that are not attached to a switch are named in the form *<node>*:*<host_adapter>*.*<loop_ID>*. For disks with a LUN, the form is *<node>*:*<host_adapter>*.*<loop_ID>*L*<LUN>*. For instance, disk number 16 on host adapter 1a on a node named node0a is named node0a:1a.16. The same disk on LUN lun0 is named node0a:1a.16Llun0.
- Disks that are attached to a switch are named in the form *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>*. For disks with a LUN, the form is *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>*L*<LUN>*. For instance, disk number 08 on port 11 of switch fc1 on a node named node0a is named node0a:fc1:11.08. The same disk on LUN lun1 is named node0a:fc1:11.08Llun1.

Before the cluster is upgraded to Data ONTAP 8.3, the same disk can have multiple disk names, depending on how the disk is connected. For example, a disk known to a node named alpha as alpha:1a.19 can be known to a node named beta as beta:0b.37. All names are listed in the output of queries and are equally valid. To determine a disk's unique identity, run a detailed query and look for the disk's universal unique identifier (UUID) or serial number.

| [-adapter <text>] - Adapter Name

The name of the adapter to which the shelves of disks of interest are attached to.

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

The node for which action is to be taken.

[-duration <integer>] - Duration (minutes)

This specifies the duration, in minutes, that the LED is to remain in the specified state. Only actions "on" and "blink" are supported.

[-iteration <integer>] - Test iterations

This specifies the number of iterations to run the action for. Only action "test-all" is supported.

Examples

The following example causes the LEDs on all disks whose names match the pattern Cluster1* to turn on for 5 minutes:

```
Cluster1::> storage disk set-led -disk Cluster1* -action on -duration 5
```

The following example causes the LEDs on all disks attached to adapter 0b on Node2 to turn on for 1 minute:

```
Cluster1::> storage disk set-led -node Node2 -adapter 0b -action on
-duration 1
```

The following example resets the LEDs on all disks on the local node and causes the LEDs of disks with faults to turn on:

```
Cluster1::> storage disk set-led -action resetall
```

The following example causes the LEDs on all disks whose names match the pattern Cluster1* to turn on for 2 minutes:

```
Cluster1::> storage disk set-led -disk Cluster1* -action on -duration 2
```

The following example tests the LEDs on all disks owned by the local node for 3 iterations:

```
Cluster1::> storage disk set-led -action testall -iteration 3
```

storage disk show

Display a list of disk drives and array LUNs

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

Description

The `storage disk show` command displays information about disks and array LUNs. Where it appears in the remainder of this document "disk" may refer to either a disk or an array LUN. By default, the command displays the following information about all disks in column style output:

- Disk name
- Usable space on the disk, in human readable units
- Shelf number
- Bay number
- Container type (aggregate, broken, foreign, labelmaint, maintenance, mediator, remote, shared, spare, unassigned, unknown, volume, or unsupported)
- Position (copy, data, dparity, orphan, parity, pending, present, shared or tparity)
- Container name
- Owning node name

To display detailed information about a single disk, use the `-disk` parameter.

Parameters

{ [-fields <fieldname>,…]

Displays the specified fields for all disks, in column style output.

| **[-broken]**

Displays the following RAID-related information about broken disks:

- Original owning node name
- Checksum compatibility
- Disk name
- Outage reason
- Host bus adapter
- Shelf number
- Bay number
- Primary port / Channel
- Pool
- Disk type
- RPM (Revolutions per minute)
- Usable size in human readable units
- Physical size in human readable units
- Current owner node

| **[-errors]**

Displays the following disk information about the disks which have errors.

- Disk Name
- Error Type
- Error Description and corresponding corrective action

| **[-longop]**

Displays the following information about long-running disk operations, in column style output:

- Disk name
- Whether the disk is marked as prefailed
- Whether the disk is being replaced
- Whether the disk is zeroed
- Copy destination
- Percentage of copy complete
- Percentage of zeroing complete
- Percentage of reconstruction complete

| **[-maintenance]**

Displays the following RAID-related information about disks in the maintenance center:

- Original owning node name
- Checksum compatibility

- Disk name
- Outage Reason
- Host bus adapter
- Shelf number
- Bay number
- Primary port / Channel
- Pool
- Disk type
- RPM (Revolutions per minute)
- Usable size in human readable units
- Physical size in human readable units
- Current owner node

| [-ownership]

Displays the following ownership-related information:

- Disk name
- Aggregate name
- Home node name
- Owning node name
- Disaster recovery home node name
- Home node system id
- Owning node system id
- Disaster recovery home node system id
- Reservation node system id
- SyncMirror pool

| [-partition-ownership]

Displays the following ownership-related information for partitioned disks:

- Disk name
- Aggregate name
- Owner of root partition on a partitioned disk
- Owner system id of root partition on a partitioned disk
- Owner of data or data1 partition on a root-data or a root-data1-data2 partitioned disk respectively
- Owner system id of data or data1 partition on a root-data or a root-data1-data2 partitioned disk respectively
- Owner of data2 partition on a root-data1-data2 partitioned disk
- Owner system id of data2 partition on a root-data1-data2 partitioned disk
- Owner of the disk which is partitioned

- Owner system id of the disk which is partitioned

| **[-physical]**

Displays the following information about the disk's physical attributes, in column style output:

- Disk name
- Disk type
- Disk vendor
- Disk model
- Firmware revision level
- RPM (Revolutions per minute)
- BPS (Bytes per sector)

| **[-port]**

Displays the following path-related information:

- Disk name and disk port associated with disk primary path
- Disk name and disk port associated with the disk secondary path, for a multipath configuration
- Type, shelf, and bay information for the disks

| **[-raid]**

Displays the following RAID-related information:

- Disk name
- Container type (aggregate, broken, labelmaint, maintenance, mediator, remote, shared, spare, unassigned, unknown, or volume)
- Outage reason
- Position (copy, data, dparity, orphan, parity, pending, present, shared or tparity)
- RAID group name
- Aggregate name

| **[-raid-info-for-aggregate]**

Displays the following RAID-related information about the disks used in an aggregate:

- Owning node name
- Aggregate name
- Plex name
- RAID group name
- Position (copy, data, dparity, orphan, parity, pending, present, shared or tparity)
- Disk name
- Host bus adapter
- Shelf number
- Bay number

- Primary port / Channel
- Pool
- Disk type
- RPM (Revolutions per minute)
- Usable size in human readable units
- Physical size in human readable units

When this parameter is specified, RAID groups that use shared disks are not included. Use storage aggregate show-status to show information for all RAID groups and aggregates.

| **[-spare]**

Displays the following RAID-related information about available spare disks:

- Original owning node name
- Checksum compatibility
- Disk name
- Host bus adapter
- Shelf number
- Bay number
- Primary port / Channel
- Pool
- Disk type
- Disk class
- RPM (Revolutions per minute)
- Usable size in human readable units
- Physical size in human readable units
- Current owner node

| **[-ssd-wear]**

Displays the following wear life related information about solid state disks:

- Rated Life Used : An estimate of the percentage of device life that has been used, based on the actual device usage and the manufacturer's prediction of device life. A value greater than 99 indicates that the estimated endurance has been used, but this does not necessarily indicate a device failure. Omitted if value is unknown.
- Spare Blocks Consumed Limit : Spare blocks consumed percentage limit reported by the device. When the Spare Blocks Consumed percentage for the device reaches this read-only value, Data ONTAP initiates a disk copy operation to prepare to remove the device from service. Omitted if value is unknown.
- Spare Blocks Consumed : Percentage of device spare blocks that have been used. Each device has a number of spare blocks that will be used when a data block can no longer be used to store data. This value reports what percentage of the spares have already been consumed. Omitted if value is unknown.

| **[-virtual-machine-disk-info]**

Displays information about Data ONTAP virtual disks, their mapped datastores and their specific backing device attributes, such as: disk or LUN, adapter and initiator details (if applicable).

- Disk name.
- Name of the node.
- Data ONTAP-supplied serial number of the system disk.
- Size of the system disk.
- Name of the disk backing store. A backing store represents a storage location for virtual machine files. It can be a VMFS volume, a directory on network-attached storage, or a local file system path.
- File name of the virtual disk used by the hypervisor. Each Data ONTAP disk is mapped to a unique VM disk file.
- Type of the disk backing store. It can be a VMFS volume, a directory on network-attached storage, or a local file system path.
- Size of the disk backing store.
- Full path to the backing store for network-attached storage. This field is valid only for NAS connections.
- Backing adapter PCI device ID for the virtual disk, for example "50:00.0".
- Backing adapter device name, for example "vmhba32".
- Backing adapter model type, for example "LSI1064E".
- Backing adapter driver name of the initiator.
- The iSCSI name of the disk backing target. This field is valid only for iSCSI connections.
- The iSCSI IP address of the disk backing target. This field is valid only for iSCSI connections.
- SCSI device name for the backing disk. It takes the form target-id:lun-id, for example "2:1".
- Hypervisor-assigned unique ID of the backing device (disk or LUN).
- Backing disk partition number where the corresponding VM disk file resides.
- Size of the backing device (disk or LUN).
- Backing device manufacturer, for example "FUJITSU" or "IBM".
- Backing device model, for example "MBE2073RC" or "LUN".
- Storage account associated with the VM Disk.
- Container associated with the VM Disk.
- Page blob associated with the VM Disk.
- Error (if any) while retrieving virtual disk details.

| **[-vmdisk-backing-info]**

Displays information about the backing disks on certain Data ONTAP-v models:

- Disk name
- Backing disk vendor
- Backing disk model
- Backing disk serial number
- Backing disk device id

| **[-foreign] (privilege: advanced)**

Displays the following foreign LUN import related information about foreign disks:

- Disk name
- Array name
- Capacity in sectors
- Capacity in mb
- Serial Number

| **[-physical-location] (privilege: advanced)**

Displays the following information about disks:

- Disk name
- Container type
- Primary path
- Location
- Home node name
- Physical size in human readable units

| **[-primary-paths] (privilege: advanced)**

Displays the following information about disks:

- Disk Name
- Shelf
- Bay
- Container Type
- Primary Path

| **[-instance] }**

Displays detailed disk information. If no disk path name is specified, this parameter displays the same detailed information for all disks as does the -disk parameter. If a disk path name is specified, then this parameter displays the same detailed information for the specified disks as does the -disk parameter.

[-disk <disk path name>] - Disk Name

Displays detailed information about the specified disks. Disk names take one of the following forms:

- Disks are named in the form *<stack-id>.<shelf>.<bay>*
- Disks on multi-disk carriers are named in the form *<stack-id>.<shelf>.<bay>.<lun>*
- Virtual disks are named in the form <prefix>.<number>, where prefix is the storage array's prefix and number is a unique ascending number.

Disk names take one of the following forms on clusters that are not yet fully upgraded to Data ONTAP 8.3:

- Disks that are not attached to a switch are named in the form *<node>*:*<host_adapter>*.*<loop_ID>*. For disks with a LUN, the form is *<node>*:*<host_adapter>*.*<loop_ID>*L*<LUN>*. For instance, disk number 16 on host adapter 1a on a node named node0a is named node0a:1a.16. The same disk

on LUN lun0 is named node0a:1a.16Llun0.

- Disks that are attached to a switch are named in the form *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>*. For disks with a LUN, the form is *<node>*:*<switch_name>*:*<switch_port>*.*<loop_ID>*L*<LUN>*. For instance, disk number 08 on port 11 of switch fc1 on a node named node0a is named node0a:fc1:11.08. The same disk on LUN lun1 is named node0a:fc1:11.08Llun1.

Before the cluster is upgraded to Data ONTAP 8.3, the same disk can have multiple disk names, depending on how the disk is connected. For example, a disk known to a node named alpha as alpha:1a.19 can be known to a node named beta as beta:0b.37. All names are listed in the output of queries and are equally valid. To determine a disk's unique identity, run a detailed query and look for the disk's universal unique identifier (UUID) or serial number.

[-owner {<nodename>|local}] - Owner

Selects information about disks that are owned by the specified node.

[-owner-id <nvramid>] - Owner System ID

Selects the disks that are owned by the node with the specified system ID.

[-is-foreign {true|false}] - Foreign LUN (privilege: advanced)

Selects information about array LUNs that have been declared to be foreign LUNs.

[-uid <text>] - Disk Unique ID

Selects the disks whose unique id matches this parameter value. A disk unique identifier has the form: `20000000:875D4C32:00000000:00000000:00000000:00000000:00000000:00000000:00000000`

[-aggregate <aggregate name>] - Aggregate

Selects information about disks that belong to the specified aggregate.

[-array-name <array name>] - Array Name

Selects information about the LUNs presented by the specified storage array.

[-average-latency <integer>] - Average I/O Latency Across All Active Paths

Selects information about disks that have the specified average latency.

[-bay <integer>] - Bay

Selects information about disks that are located in the carrier within the specified shelf bay.

[-bps <integer>] - Bytes Per Sector

Selects information about disks that have the specified number of bytes per sector. Possible settings are 512, 520, 4096, and 4160.

[-carrier-id <text>] - Carrier ID

Selects information about disks that are located within the specified multi-disk carrier.

[-checksum-compatibility {advanced_zoned | block | none}] - Checksum Compatibility

Selects information about disks that have the specified checksum compatibility.

[-class {capacity | performance | archive | solid-state | array | virtual}] - Disk Class

Selects information about disks that have the specified disk class.

- capacity = Capacity-oriented, near-line disk types. Includes disk types FSAS, BSAS and ATA.
- performance = Performance-oriented, enterprise class disk types. Includes disk types FCAL and SAS.
- archive = Archive class SATA disks in multi-disk carrier storage shelves. Includes disk type MSATA.
- solid-state = Solid-state drives. Includes disk type SSD and SSD-NVM.
- array = Logical storage devices backed by storage arrays and used by Data ONTAP as disks. Includes disk type LUN.
- virtual = Virtual disks that are formatted and managed by the hypervisor. Includes disk type VMDISK.

[-container-type {aggregate | broken | foreign | labelmaint | maintenance | mediator | remote | shared | spare | unassigned | unknown | unsupported}] - Container Type

Selects information about disks that have the specified container type.

- Aggregate = Disk is used as a physical disk in an aggregate.
- Broken = Disk is in broken pool.
- Foreign = Array LUN has been marked foreign.
- Labelmaint = Disk is in online label maintenance list.
- Maintenance = Disk is in maintenance center.
- Mediator = A mediator disk is a disk used on non-shared HA systems hosted by an external node which is used to communicate the viability of the storage failover between non-shared HA nodes.
- Remote = Disk belongs to the remote cluster.
- Shared = Disk is partitioned or in a storage pool.
- Spare = Disk is a spare disk.
- Unassigned = Disk ownership has not been assigned.
- Unknown = Container is currently unknown. This is the default setting.
- Unsupported = Disk is not supported.

[-container-name <text>] - Container Name

Selects information about disks that have the specified container name. + If a disk is in an aggregate or storage pool, the container name is the name of the aggregate or storage pool. + Spare disks show the SyncMirror Pool to which they belong. + Partitioned disks could return multiple aggregate names.

[-copy-destination <disk path name>] - Copy Destination Name

Selects information about disks whose contents are being copied (due to either Rapid RAID Recovery or disk replacement) to the specified spare disk.

[-copy-percent <integer>] - Percentage of Copy Complete

Selects information about disks that are involved as either a source or destination of a copy operation, (due to either disk replacement or Rapid RAID Recovery) and that have the specified percentage of the copy operation completed.

[-data-owner {<nodename>|local}] - Owner of Data Partition of Root-Data Partitioned Disk

Selects information about disks that have the specified data partition owner name. Used with root-data partitioned disks.

[-data1-owner {<nodename>|local}] - Owner of Data1 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data1 partition owner name. Used with root-data1-data2 partitioned disks.

[-data2-owner {<nodename>|local}] - Owner of Data2 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data2 partition owner name. Used with root-data1-data2 partitioned disks.

[-data-home {<nodename>|local}] - Home Owner of Data Partition of Root-Data Partitioned Disk

Selects information about disks that have the specified data partition home owner name. Used with root-data partitioned disks.

[-data1-home {<nodename>|local}] - Home Owner of Data1 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data1 partition home owner name. Used with root-data1-data2 partitioned disks.

[-data2-home {<nodename>|local}] - Home Owner of Data2 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data2 partition home owner name. Used with root-data1-data2 partitioned disks.

[-data-owner-id <nvramid>] - Owner System ID of Data Partition of Root-Data Partitioned Disk

Selects information about disks that have the specified data partition owner system ID. Used with root-data partitioned disks.

[-data1-owner-id <nvramid>] - Owner System ID of Data1 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data1 partition owner system ID. Used with root-data1-data2 partitioned disks.

[-data2-owner-id <nvramid>] - Owner System ID of Data2 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data2 partition owner system ID. Used with root-data1-data2 partitioned disks.

[-data-home-id <nvramid>] - Home Owner System ID of Data Partition of Root-Data Partitioned Disk

Selects information about disks that have the specified data partition home owner system ID. Used with root-data partitioned disks.

[-data1-home-id <nvramid>] - Home Owner System ID of Data1 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data1 partition home owner system ID. Used with root-data1-data2 partitioned disks.

[-data2-home-id <nvramid>] - Home Owner System ID of Data2 Partition of Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified data2 partition home owner system ID. Used with

root-data1-data2 partitioned disks.

[-disk-io-kbps-total <integer>] - Total Disk Throughput in KBPS Across All Active Paths

Selects information about disks that have attained the specified I/O throughput on all connected paths.

[-disk-iops-total <integer>] - Total Disk IOPs Across All Active Paths

Selects information about disks that have achieved the specified number of IOPs per second on all connected paths.

[-diskpathnames <disk path name>,…] - List of Path-Based Disk Names

Selects information about disks that have all of the specified path names.

[-effective-rpm <integer>] - Effective RPM

Selects information about disks with the specified effective rotational speed.

[-dr-home {<nodename>|local}] - Disaster Recovery Home

Selects information about disks that have the specified Disaster home node.

[-dr-home-id <nvramid>] - Disaster Recovery Home System ID

Selects information about disks whose Disaster home node has the specified system id.

[-drawer <integer>] - Drawer

Selects information about disks that are located in the specified drawer.

[-error-type {onepath|onedomain|control|foreign|toobig|toosmall|invalidblocksize|targetasymmap|deviceassymmap|failovermisconfig|unknown|netapp|fwdownrev|qualfail|diskfail|notallflashdisk}] - Error Type

Selects information about disks that have the specified error types.

- onepath = The array LUN is accessible only via a single path.
- onedomain = The array LUN is accessible only via a single fault domain.
- control = The array LUN cannot be used because it is a control device.
- foreign = The array LUN is marked as foreign and has some external SCSI reservations other than those from Data ONTAP.
- toobig = The array LUN exceeds the maximum array LUN size that Data ONTAP supports.
- toosmall = The array LUN is less than the minimum array LUN size that Data ONTAP supports.
- invalidblocksize = The array LUN is not a valid block size.
- targetasymmap = The array LUN is presented more than once on a single target port.
- deviceassymmap = The array LUN is presented with multiple IDs.
- failovermisconfig = The array LUN is configured with inconsistent failover methods.
- unknown = The array LUN from a storage array that is not supported by this version of Data ONTAP.
- netapp = A SAN front-end LUN from one Data ONTAP system that is presented as external storage to another Data ONTAP system.
- fwdownrev = The disk firmware is a down version.
- qualfail = The disk is not supported.

- diskfail = The disk is in a failed state.
- notallflashdisk = The disk does not match the All-Flash Optimized personality of the system.

[-firmware-revision <text>] - Firmware Revision

Selects information about disks that have the specified firmware revision level.

[-home {<nodename>|local}] - Home

Selects information about disks that have the specified home node.

[-home-id <nvramid>] - Home System ID

Selects information about disks whose home node has the specified system ID.

[-host-adapter <text>] - Primary Path Host Adapter

Selects information about disks that are currently using the specified Host Bus Adapter.

[-hw-minimum-os <text>] - Hardware Minimum Supported Data ONTAP Version

Selects information about disks that have the specified hardware minimum supported Data ONTAP version.

[-import-in-progress {true|false}] - Foreign LUN import in progress

Selects information about the array LUNs that are currently being imported

[-initiator <text>,…] - Initiator Port

Selects information about disks that are visible to the initiator specified. Disks that are not currently in use by that initiator are included.

[-initiator-iops <integer>,…] - Number of IOPS on Initiator (Rolling Average)

Selects information about disks that are visible to an initiator that has executed the specified number of IOPs.

[-initiator-io-kbps <integer>,…] - Kbytes of I/O per second on Initiator (Rolling Average)

Selects information about disks visible to an initiator that has executed I/O at the specified throughput.

[-initiator-lun-in-use-count <integer>,…] - Number of LUNs in the in-use state on this initiator

Selects information about disks with a path through an initiator that has the specified in-use-count.

[-initiator-side-switch-port <text>,…] - Initiator Side Switch Port

Selects information about disks that are visible to an initiator connected to the specified switch port.

[-is-multidisk-carrier {true|false}] - Multi Disk Carrier?

Selects information about disks that are located within a multi-disk carrier.

[-is-local-attach {true|false}] - Indicates If the Disk Is Local to This Cluster

Selects information about disks attached to the local(true) or remote(false) MetroCluster site.

[-location {<nodename>|local}] - Physical Location

Selects information about disks attached to the specified node.

[-location-id <nvramid>] - The system ID of the node where the disk is attached

Selects information about disks attached to the node with the specified system ID.

[-lun <integer>,…] - LUN ID

Selects information about the specified LUNs.

[-lun-iops <integer>,…] - Number IOPS per second on disk (Rolling Average)

Selects information about the LUNs that have reached the specified number of IOPs.

[-lun-io-kbps <integer>,…] - Kbytes/sec on Disk (Rolling Average)

Selects information about the LUNs that have reached the specified I/O throughput.

[-lun-path-use-state <text>,…] - The Use State of the LUN on this path

Selects information about LUNs reporting the specified in-use state.

[-model <text>] - Model

Selects information about disks of the specified model.

[-nodelist {<nodename>|local}] - Controller name

Selects information about disks that are visible to all of the specified nodes .

[-outage-reason <text>] - Outage Reason

Selects information about disks that are not in service for the specified reason. Possible values are: admin failed, admin removed, admin testing, evacuated, bad label, bypassed, failed, init failed, label version, labeled broken, labelmaint, LUN resized, missing, not responding, predict failure, rawsize shrank, recovering, sanitizing, sanitized, SnapLock Disk, testing, unassigned, unknown.

[-path-error-count <integer>] - Path Error Count

Selects information about disks that are visible on a path that has incurred the specified number of errors.

[-path-iops <integer>,…] - Number of IOPS on Path (Rolling Average)

Selects information about disks on those paths that have reached the specified number of IOPs.

[-path-io-kbps <integer>,…] - Kbytes of I/O per second on Path (Rolling Average)

Selects information about disk with paths that have reached the specified I/O throughput

[-path-link-errors <integer>,…] - Link Error count on path

Selects information about disks with paths that have incurred the specified number of FC link errors.

[-path-lun-in-use-count <integer>,…] - Number of LUNs in the in-use state on this path

Selects information about disks with paths that have the specified in-use-count.

[-path-quality <integer>,…] - Percentage of weighted error threshold

Selects information about disks on paths that have incurred the specified number of errors. The value displayed is a measure of the health of a path expressed as a percentage of an error threshold. Once a path has reached or surpassed the error threshold, another path will be selected for I/O transfer, if there is one available.

[-physical-size-mb <integer>] - Physical Size (MB)

Selects information about disks that have the specified physical capacity, in megabytes.

[-physical-size {<integer>[KB|MB|GB|TB|PB]}] - Physical Size

Selects information about disks that have the specified physical capacity, in human readable units.

[-physical-size-512b <integer>] - Physical Size in Units of 512 Bytes

Selects information about disks that have the specified physical capacity, in 512-byte chunks. This parameter is present only for backwards compatibility with Data ONTAP 8.0.

[-plex <text>] - Plex Name

Selects information about disks that belong to the specified RAID plex.

[-pool <text>] - Assigned Pool

Selects information about disks that belong to the specified SyncMirror pool (pool0 or pool1).

[-port-speed <text>,…] - Port Speed

Selects information about disks that are served by a Host Bus Adapter that is running at the specified port speed.

[-position <diskPositionType>] - Disk Position

Selects information about disks that have the specified position within their disk container.

[-power-on-hours <integer>] - Hours Powered On

Selects information about disks that have the specified number of hours being powered up.

[-prefailed {true|false}] - Marked for Rapid RAID Recovery?

Selects information about disks that match the specified parameter value indicating whether the disk is either awaiting or is in process of Rapid RAID Recovery.

[-preferred-target-port {true|false}] - Whether or not target port group is preferred (privilege: advanced)

Selects information about disks that match the specified parameter value indicating whether the backing storage is ALUA (Asymmetric Logical Unit Access) capable and has specified the array target port on this path to be a preferred target port for I/O.

[-primary-port <text>] - Primary Path Disk Port

Selects information about disks that use the specified primary port.

[-raid-group <text>] - Raid Group Name

Selects information about disks that belong to the specified RAID group.

[-reconstruction-percent <integer>] - Percentage of Reconstruction Complete

Selects information about disks that are being reconstructed and that have the specified percentage of the reconstruction operation completed.

[-replacing {true|false}] - Being Replaced?

Selects information about disks that match the specified boolean value indicating whether the disk is either awaiting or in process of disk replacement.

[-reservation-key <text>] - Reservation Key

If this parameter is specified, the command displays information only about the disk or disks that have the specified persistent reservation key.

[-reservation-type {rs|we|re|ea|sa|wero|earo|wear|eaar|none}] - Reservation Type

If this parameter is specified, the command displays information only about the disk or disks that have the specified persistent reservation type. Possible values are: rs, we, re, ea, sa, wero, earo, wear, eaar, or none.

[-reserver-id <integer>] - Reservation System ID

Selects information about disks that are reserved by the node with the specified system ID.

[-root-owner {<nodename>|local}] - Owner of Root Partition of Root-Data/Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified root partition owner name. Used with root-data/root-data1-data2 partitioned disks.

[-root-owner-id <nvramid>] - Owner System ID of Root Partition of Root-Data/Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified root partition owner system ID. Used with root-data/root-data1-data2 partitioned disks.

[-root-home {<nodename>|local}] - Home Owner of Root Partition of Root-Data/Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified root partition home owner name. Used with root-data/root-data1-data2 partitioned disks.

[-root-home-id <nvramid>] - Home Owner System ID of Root Partition of Root-Data/Root-Data1-Data2 Partitioned Disk

Selects information about disks that have the specified root partition home owner system ID. Used with root-data/root-data1-data2 partitioned disks.

[-rpm <integer>] - Revolutions Per Minute

Selects information about disks that have the specified rotational speed.

[-secondary-name <disk path name>] - Secondary Path Name

Selects information about disks that use the specified secondary path name, for multipath configuration.

[-secondary-port <text>] - Secondary Path Disk Port

Selects information about disks that use the specified secondary port.

[-serial-number <text>] - Serial Number

Selects information about the disk that has the specified serial number.

[-storage-pool <text>] - Storage Pool Name

Selects information about disks that belong to the specified SSD storage pool.

[-shelf <integer>] - Shelf

Selects information about disks that are located within the specified shelf.

[-shelf-uid <text>] - Shelf UID

Selects information about disks that are located within a shelf with the specified Shelf UID.

[-slot <integer>] - Slot

Selects information about disks that are located in a drawer with the specified slot.

[-stack-id <integer>] - Stack ID

A cluster unique id for a collection of one or more interconnected shelves.

[-target-iops <integer>,…] - Number of IOPS to Target (Rolling Average)

Selects information about disks that are visible on target ports that have performed the specified number of IOPs.

[-target-io-kbps <integer>,…] - Kbytes of I/O per second to Target (Rolling Average)

Selects information about disks that are visible on target ports that have reached the specified I/O throughput.

[-target-lun-in-use-count <integer>,…] - Number of LUNs in the in-use state on this target

Selects information about disks with a path through a target port that has the specified in-use-count.

[-target-port-access-state <text>,…] - Failover optimization type

Selects information about disks that are visible on target ports that have the specified access state.

[-target-side-switch-port <text>,…] - Target Side Switch Port

Selects information about disks that are visible on target ports identified by the switch port to which they are connected.

[-target-wwpn <text>,…] - Target Port

Selects information about disks that are visible on target ports identified by their World Wide Port Name.

[-tpgn <integer>,…] - Target Port Group Number

Selects information about disks that belong to the specified Target Port Group Number.

[-type {ATA | BSAS | FCAL | FSAS | LUN | MSATA | SAS | SSD | VMDISK | SSD-NVM}] - Disk Type

Selects information about disks that have the specified disk type.

[-usable-size-mb <integer>] - Usable Size (MB)

Selects information about disks that have the specified usable space, in megabytes.

[-usable-size {<integer>[KB|MB|GB|TB|PB]}] - Usable Size

Selects information about disks that have the specified usable space, in human readable units.

[-vendor <text>] - Vendor Name

Selects information about disks that have the specified vendor.

[-vmdisk-device-id <integer>,…] - Virtual Disk Device ID

Selects information about disks that have the specified virtual disk device ID.

[-zeroed {true|false}] - Zeroed?

Selects information about disks that have (true) or have not (false) been fully pre-zeroed.

[-zeroing-percent <integer>] - Percentage of Zeroing Complete

Selects information about disks that are zeroing and have the specified percentage complete.

[-carrier-serialno <text>] - Carrier Serial Number

Selects information about disks that are located within the multi-disk carrier specified by the serial number.

[-vmdisk-target-address <text>] - Target Address of the VM Disk

Displays the VM Disk's target address either in the form of bus target lun or bus unit.

Examples

The following example displays information about all disks:

```
cluster1::> storage disk show
                     Usable           Container
Disk                   Size Shelf Bay Type        Position   Aggregate
Owner
---------------- ---------- ----- --- ----------- ---------- ---------
--------
1.1.1                  10GB     1   1 spare       present    -
node1
1.1.4                78.59GB     1   4 spare       present    -
node1
1.1.12                 10GB     1  12 spare       present    -
node1
1.2.12                 10GB     2  12 broken      present    -
node1
1.3.7                78.59GB     3   7 aggregate   parity     aggr0_u23
node1
1.1.6                78.59GB     1   6 broken      present    -
node1
1.2.10               78.59GB     2  10 aggregate   dparity    aggr0_u23
node1
1.4.9                78.59GB     4   9 aggregate   data       aggr0_u23
node1
1.1.0                  10GB     1   0 aggregate   dparity    aggr0_u22
node2
1.4.1                  10GB     4   1 aggregate   data       dp_degraded
node2
1.1.2                  10GB     1   2 spare       present    -
node2
1.1.3                  20GB     1   3 spare       present    -
node2
1.4.4                  20GB     4   4 spare       present    -
node2
1.4.6                  10GB     4   6 aggregate   data       dp_sdc
node2
1.1.5                268.0GB     1   5 maintenance present    -
node2
1.3.0                  10GB     3   0 aggregate   parity     aggr0_u22
node2
1.4.11                 10GB     4  11 spare       present    -
node2
1.4.13                 20GB     4  13 broken      present    -
node2
[...]
```

The following example displays detailed information about a disk named 1.0.75

```
cluster1::> storage disk show -disk 1.0.75
                  Disk: 1.0.75
        Container Type: spare
            Owner/Home: node2 / node2
               DR Home: -
    Stack ID/Shelf/Bay: 1 / 0 / 75
                   LUN: 0
                 Array: N/A
                Vendor: NETAPP
                 Model: X267_HKURO500SSX
         Serial Number: ZAKAS0GH
                   UID:
1FF17846:0A419201:9325845A:3ABD5075:00000000:00000000:00000000:00000000:00
000000:00000000
                   BPS: 512
         Physical Size: 10.15GB
              Position: present
Checksum Compatibility: block
             Aggregate: -
                  Plex: -
Paths:
                                LUN  Initiator Side        Target Side
Link
Controller         Initiator     ID  Switch Port           Switch Port
Acc Use  Target Port                TPGN    Speed      I/O KB/s
IOPS
------------------ ---------  -----  --------------------
--------------------  --- ---  ------------------------  ------  -------
------------  ------------
node1              0d             0  N/A                   N/A
AO  INU  220a000a3384e4d2             21   2 Gb/S             0
0
node1              0c             0  N/A                   N/A
AO  RDY  2209000a3384e4d2             62   2 Gb/S             0
0
node2              0d             0  N/A                   N/A
AO  INU  2209000a3384e4d2             62   2 Gb/S             3
0

Errors:
-
```

The following example displays RAID-related information about disks used in an aggregate:

```
cluster1::> storage disk show -raid-info-for-aggregate
```

```
Owner Node: node1
   Aggregate: aggr0_node1_0
      Plex: plex0
        RAID Group: rg0

Usable Physical
          Position Disk                  HA Shelf Bay Chan Pool   Type
RPM     Size     Size
          -------- --------------------- ------------ ---- ------ -----
------ -------- --------
          data     2.11.2                2d    11   2 B    Pool0  SAS
15000   9.77GB   9.93GB
          dparity  2.11.0                2d    11   0 B    Pool0  SAS
15000   9.77GB   9.93GB
          parity   2.11.1                2d    11   1 B    Pool0  SAS
15000   9.77GB   9.93GB
Owner Node: node2
   Aggregate: a1
      Plex: plex0
        RAID Group: rg0

Usable Physical
          Position Disk                  HA Shelf Bay Chan Pool   Type
RPM     Size     Size
          -------- --------------------- ------------ ---- ------ -----
------ -------- --------
          data     2.1.8                 2a     1   8 B    Pool0  BSAS
7200    9.77GB   9.91GB
          dparity  2.1.6                 2a     1   6 B    Pool0  BSAS
7200    9.77GB   9.91GB
          parity   2.1.7                 2a     1   7 B    Pool0  BSAS
7200    9.77GB   9.91GB
Owner Node: node2
   Aggregate: a1
      Plex: plex0
        RAID Group: rg1

Usable Physical
          Position Disk                  HA Shelf Bay Chan Pool   Type
RPM     Size     Size
          -------- --------------------- ------------ ---- ------ -----
------ -------- --------
          data     2.1.11                2a     1  11 B    Pool0  BSAS
7200    9.77GB   9.91GB
          dparity  2.1.9                 2a     1   9 B    Pool0  BSAS
7200    9.77GB   9.91GB
```

```
          parity   2.1.10                2a     1  10 B    Pool0  BSAS
7200   9.77GB   9.91GB
Owner Node: node2
   Aggregate: aggr0
      Plex: plex0
        RAID Group: rg0

Usable Physical
          Position Disk                  HA Shelf Bay Chan Pool   Type
RPM     Size     Size
          -------- --------------------- ------------ ---- ------ -----
------ -------- --------
          data     2.1.5                 2a     1   5 B    Pool0  BSAS
7200   9.71GB  10.03GB
          dparity  2.1.2                 2a     1   2 B    Pool0  BSAS
7200   9.71GB  10.03GB
          parity   2.1.4                 2a     1   4 B    Pool0  BSAS
7200   9.71GB  10.03GB
12 entries were displayed.
```

The following example displays RAID-related information about spares:

```
cluster1::> storage disk show -spare
Original Owner: node1
  Checksum Compatibility: block
                                                                  Usable
Physical
    Disk            HA Shelf Bay Chan   Pool  Type    RPM     Size
Size Owner
    --------------- ------------ ---- ------ ----- ------ --------
-------- --------
    1.1.23          0b     1  23    A  Pool0  FCAL  10000  132.8GB
134.2GB node1
    1.1.25          0b     1  25    A  Pool0  FCAL  10000  132.8GB
133.9GB node1
    1.1.26          0b     1  26    A  Pool1  FCAL  10000  132.8GB
133.9GB node1
    1.1.27          0b     1  27    A  Pool1  FCAL  10000  132.8GB
134.2GB node1
Home Owner: node2
  Checksum Compatibility: block
                                                                  Usable
Physical
    Disk            HA Shelf Bay Chan   Pool  Type    RPM     Size
Size Owner
    --------------- ------------ ---- ------ ----- ------ --------
-------- --------
    1.1.19          0a     1  19    B  Pool1  FCAL  10000  132.8GB
133.9GB node2
    1.1.20          0a     1  20    B  Pool0  FCAL  10000  132.8GB
133.9GB node2
    1.1.21          0a     1  21    B  Pool0  FCAL  10000  132.8GB
133.9GB node2
[...]
```

The following example displays RAID-related information about broken disks:

```
cluster1::> storage disk show -broken
Original Owner: node1
  Checksum Compatibility: block

Usable Physical
    Disk            Outage Reason HA Shelf Bay Chan   Pool  Type    RPM
Size     Size
    --------------- ------------- ------------ ---- ------ ----- ------
-------- --------
    1.1.0           admin failed  0b     1   0    A  Pool0  FCAL  10000
132.8GB  133.9GB
    1.2.6           admin removed 0b     2   6    A  Pool1  FCAL  10000
132.8GB  134.2GB
Original Owner: node2
  Checksum Compatibility: block

Usable Physical
    Disk            Outage Reason HA Shelf Bay Chan   Pool  Type    RPM
Size     Size
    --------------- ------------- ------------ ---- ------ ----- ------
-------- --------
    1.1.0           admin failed  0a     1   0    B  Pool0  FCAL  10000
132.8GB  133.9GB
    1.1.13          admin removed 0a     1  13    B  Pool0  FCAL  10000
132.8GB  133.9GB
4 entries were displayed.
```

The following example displays RAID-related information about disks in maintenance center:

```
cluster1::> storage disk show -maintenance
Original Owner: node1
  Checksum Compatibility: block

Usable Physical
    Disk            Outage Reason HA Shelf Bay Chan   Pool  Type    RPM
Size     Size
    --------------- ------------- ------------ ---- ------ ----- ------
-------- --------
    1.1.8           admin testing 0b     1   8    A  Pool0  FCAL  10000
132.8GB  133.9GB
    1.2.11          admin testing 0b     2  11    A  Pool1  FCAL  10000
132.8GB  134.2GB
Original Owner: node2
  Checksum Compatibility: block

Usable Physical
    Disk            Outage Reason HA Shelf Bay Chan   Pool  Type    RPM
Size     Size
    --------------- ------------- ------------ ---- ------ ----- ------
-------- --------
    1.2.10          admin testing 0a     2  10    B  Pool1  FCAL  10000
132.8GB  133.9GB
    1.2.13          admin testing 0a     2  13    B  Pool1  FCAL  10000
132.8GB  134.2GB
4 entries were displayed.
```

The following example displays partition-related information about disks:

```
cluster1::> storage disk show -partition-ownership
Disk     Partition Home              Owner             Home ID     Owner
ID
-------- --------- ----------------- ----------------- ----------
----------
VMw-1.13 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.14 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.15 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Root      pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Data      pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.16 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Root      pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Data1     pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Data2     pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.17 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.18 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Root      -                 -                 -          -
         Data      pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
VMw-1.19 Container pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Root      pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
         Data1     -                 -                 -          -
         Data2     pvaruncluster-2-01 pvaruncluster-2-01 4087518786
4087518786
```

Related Links

- storage aggregate show-status

storage disk unfail

Unfail a broken disk

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

Description

The `storage disk unfail` command can be used to unfail a broken disk.

If the attempt to unfail the disk is unsuccessful, the disk remains in the broken state.

The disk unfail command prompts for confirmation unless you specify the "-quiet" parameter.

Parameters

`-disk <disk path name>` - Disk Name (privilege: advanced)

This parameter specifies the disk to be unfailed.

`[-s, -spare <true>]` - Make the Disk Spare (privilege: advanced)

This parameter specifies whether the unfailed disk will be made a spare disk. The disk is forced to become a spare disk if this parameter is specified.

If this parameter is not specified, the disk is brought back into its parent aggregate. Setting this parameter might result in the aggregate coming back online if it is not complete or online. The default value is false.

`[-q, -quiet <true>]` - Confirmations off (privilege: advanced)

You can set this parameter to true to suppress the confirmation messages. However, before proceeding with the command, you should be aware that the confirmation message contains important information about the effect of unfailing a disk. This command cannot be reversed once it is invoked. The default value is false.

Examples

The following example unfails a disk named 1.1.16 to become a spare disk:

```
cluster1::*> storage disk unfail -disk 1.1.16 -spare
```

Warning: Failed disk "1.1.16" may have aggregate labels and file system data present. In that case use of this command to release this disk as a spare disk, will lead to permanent loss of any file system data that may be on this disk, and may prevent recovery of a failed aggregate. Are you sure you want to continue with disk unfail? {y|n}:

storage disk updatefirmware

(DEPRECATED) - Update disk firmware

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

Description

This command is deprecated and may be removed in a future release of Data ONTAP. Use the "storage disk firmware update " command.

The `storage disk updatefirmware` command updates the firmware on one or more disks.

You can download the latest firmware by using the storage firmware download command.

You can specify a list of one or more disks whose firmware is to be updated by using the `-disk` parameter, or you can update the firmware on all local disks by omitting the `-disk` parameter.

Parameters

`[-disk <disk path name>,…]` - Disk

This specifies the disk or disks whose firmware is to be updated.

If you do not specify this option, all local disks' firmware is updated.

Examples

The following example updates the firmware on all disks:

```
cluster1::> storage disk updatefirmware
```

Related Links

- storage disk firmware update
- storage firmware download

storage disk zerospares

Zero non-zeroed spare disks

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

Description

The `storage disk zerospares` command zeroes all non-zeroed spare disks in all nodes or a specified node in the cluster. A node must be online to zero disks. This operation must be done before a disk can be reused in another aggregate. This version of ONTAP uses fast zeroing, which converts a spare disk from non-zeroed to zeroed without the long wait times required when physically zeroing a disk.

Parameters

`[-owner {<nodename>|local}]` - Owner

If this parameter is specified, only non-zeroed spares assigned to the specified node will be zeroed. Otherwise, all non-zeroed spares in the cluster will be zeroed.

Examples

The following example zeroes all non-zeroed spares owned by a node named node4, using fast zeroing:

```
cluster1::> storage disk zerospares -owner node4
```

storage disk error show

Display disk component and array LUN configuration errors.

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

Description

The `storage disk error show` command displays disk component and array LUN configuration errors.

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.

[-uid <text>] - UID

Displays the error information of the disk whose unique ID matches the value you specify. A disk unique identifier has the form: `20000000:875D4C32:00000000:00000000:00000000:00000000:00000000:00000000:00000000`

[-array-name <array name>] - Array Name

Displays the errors of the storage array whose name you specified.

[-node {<nodename>|local}] - Controller Name

Displays the error information for the disks on the clustered node whose name you specified.

[-disk <disk path name>] - Disk

Displays detailed error information about the disk you specified.

[-serial-number <text>] - Serial Number

Displays the error information for the disk whose serial number you specified.

[-error-id <integer>,…] - Error ID

Displays the error information for the disks whose Error IDs match IDs you specified.

[-error-type {onepath|onedomain|control|foreign|toobig|toosmall|invalidblocksize|targetasymmap|deviceassymmap|failovermisconfig|unknown|netapp|fwdownrev|qualfail|diskfail|notallflashdisk}] - Error Type

Displays all disk errors of the error types you specified, grouped by type.

- onepath = The array LUN is accessible only via a single path.
- onedomain = The array LUN is accessible only via a single fault domain.
- control = The array LUN cannot be used because it is a control device.
- foreign = The array LUN is marked as foreign and has some external SCSI reservations other than those from Data ONTAP.
- toobig = The array LUN exceeds the maximum array LUN size that Data ONTAP supports.
- toosmall = The array LUN is less than the minimum array LUN size that Data ONTAP supports.
- invalidblocksize = The array LUN is not a valid block size.
- targetasymmap = The array LUN is presented more than once on a single target port.
- deviceassymmap = The array LUN is presented with multiple IDs.
- failovermisconfig = The array LUN is configured with inconsistent failover methods.
- unknown = The array LUN from a storage array that is not supported by this version of Data ONTAP.
- netapp = A SAN front-end LUN from one Data ONTAP system that is presented as external storage to another Data ONTAP system.
- fwdownrev = The disk firmware is a down version.
- qualfail = The disk is not supported.
- diskfail = The disk is in a failed state.
- notallflashdisk = The disk does not match the All-Flash Optimized personality of the system.

Examples

The following example displays configuration errors seen in the system:

```
cluster1::> storage disk error show
Disk             Error Type        Error Text
---------------- -----------------
-------------------------------------------
1.02.0           qualfail          This disk failed dynamic disk
qualification. Update the Disk Qaulification Package.
```

storage disk firmware revert

Revert disk firmware

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

Description

The `storage disk firmware revert` command reverts firmware on all disks or a specified list of disks on a node.

You can specify a list of one or more disks whose firmware is to be reverted by using the `-disk` parameter.

You can revert the firmware on all the disks owned by a node by using the `-node` parameter.

This command can make the disks inaccessible for up to five minutes after the start of its execution. Therefore, the network sessions that use the concerned node must be terminated before running the `storage disk firmware revert` command. This is particularly true for CIFS sessions that might be terminated when this command is executed.

If you need to view the current firmware versions, use the storage disk show`-fields` *`firmware-revision`* command. The following example displays partial output from the storage disk show`-fields` *`firmware-revision`* command, where the firmware version for the disks is NA02:

```
cluster1::> storage disk show -fields firmware-revision
    disk     firmware-revision
    -------- -----------------
    1.0.0    NA02
    1.0.1    NA02
    1.0.2    NA02
    1.0.3    NA02
    1.0.4    NA02
    1.0.5    NA02
```

The firmware files are stored in the /mroot/etc/disk_fw directory on the node. The firmware file name is in the form of "product-ID.revision.LOD". For example, if the firmware file is for Seagate disks with product ID X225_ST336704FC and the firmware version is NA01, the file name is X225_ST336704FC.NA01.LOD. If the node in this example contains disks with firmware version NA02, the /mroot/etc/disk_fw/X225_ST336704FC.NA01.LOD file is downloaded to every disk when you execute this command.

How to Revert the Firmware for an HA Pair in a Cluster

Use the following procedure to perform a revert on the disks in an HA environment:

- Make sure that the nodes are not in takeover or giveback mode.
- Download the latest firmware on both nodes by using the storage firmware download command.
- Revert the disk firmware on Node A's disks by entering the `storage disk firmware revert-node` *`node-A`*`` command.
- Wait until the `storage disk firmware revert` command completes on Node A, and then revert the firmware on Node B's disks by entering the `storage disk firmware revert-node` *`node-B`*`` command.

Parameters

{ `-disk <disk path name>,…` - Disk Name (privilege: advanced)

Specifies the disk or disks whose firmware is to be reverted.

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

Specifies the node name. The disk firmware will be reverted on all the disks owned by the node specified by this parameter.

Examples

- The following example reverts the firmware on all disks owned by cluster-node-01:

```
cluster1::*> storage disk firmware revert -node cluster-node-01

Warning: Disk firmware reverts can be disruptive to the system. Reverts
involve
        power cycling all of the affected disks, as well as suspending
disk
        I/O to the disks being reverted. This delay can cause client
        disruption. Takeover/giveback operations on a high-availability
(HA)
        group will be delayed until the firmware revert process is
complete.
        Disk firmware reverts should only be done one node at a time. Disk
        firmware reverts can only be performed when the HA group is
healthy;
        they cannot be performed if the group is in takeover mode.

Do you want to continue with disk firmware reverts? {y|n}: y

Info: Reverting disk firmware for disks on cluster-node-01.
```

- The following example reverts the firmware on disk 1.5.0 which is owned by node cluster-node-04:

```
cluster1::*> storage disk firmware revert -disk 1.5.0

Warning: Disk firmware reverts can be disruptive to the system. Reverts
involve
        power cycling all of the affected disks, as well as suspending
disk
        I/O to the disks being reverted. This delay can cause client
        disruption. Takeover/giveback operations on a high-availability
(HA)
        group will be delayed until the firmware revert process is
complete.
        Disk firmware reverts should only be done one node at a time. Disk
        firmware reverts can only be performed when the HA group is
healthy;
        they cannot be performed if the group is in takeover mode.

Do you want to continue with disk firmware reverts? {y|n}: y

Info: Reverting disk firmware for disks on cluster-node-04.
```

Related Links

- storage disk show
- storage firmware download

storage disk firmware show-update-status

Display disk firmware update status.

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

Description

The `storage disk firmware show-update-status` command displays the state of the background disk firmware update process.

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 (privilege: advanced)

Selects the node that matches this parameter value.

[-num-waiting-download <integer>] - The Number of Disks Waiting to Download (privilege: advanced)

Selects the nodes whose number of disks waiting to download by the BDFU process matches this parameter value.

[-total-completion-estimate <integer>] - Estimated Duration to Completion (mins) (privilege: advanced)

Selects the nodes whose Background Disk Firmware Update (BDFU) completion time estimate matches this parameter value. This indicates the amount of estimated time required for BDFU to complete the firmware update cycle.

[-average-duration-per-disk <integer>] - Average Firmware Update Duration per Disk (secs) (privilege: advanced)

Selects the nodes whose BDFU reports the average time required to update a single disk matches this parameter value. This indicates the average amount of time required by each disk drive.

[-unable-to-update <disk path name>,…] - List of Disks with a Failed Update (privilege: advanced)

Selects the nodes whose unable to update disk list matches this parameter value. This is a list of disks that failed to update the firmware.

`[-update-status {off|running|idle}]` - Background Disk Firmware Update Status (privilege: advanced)

Selects the nodes whose BDFU process status matches this parameter value. Possible values are:

- off - The BDFU process is off.
- running - The BDFU process is on and currently running.
- idle - The BDFU process is on and is currently idle.

Examples

```
cluster1::*> storage disk firmware show-update-status
                             Number     Average      Total
                     Update   Waiting    Duration Completion
Node                 State   Download /Disk (Sec) Est. (Min) Unable to
Update
-------------------- ------- -------- ----------- ----------
--------------------
node1                running        2         120          4 1.3.3
node2                idle           0         120          0 -
node3                off            0         120          0 -
```

storage disk firmware update

Update disk firmware

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

Description

Use the `storage disk firmware update` command to manually update firmware on all disks or a specified list of disks on a node. However, the recommended way to update disk firmware in a cluster is to enable automatic background firmware update by enabling the `-bkg-firmware-update` parameter for all of the nodes in the cluster. You can do this by entering the storage disk option modify`-node *-bkg-firmware-update` *on* command.

You can download the latest firmware on the node by using the storage firmware download command.

You can specify a list of one or more disks whose firmware is to be updated by using the `-disk` parameter.

You can update the firmware on all the disks owned by a node by using the `-node` parameter.

This command can make the disks inaccessible for up to five minutes after the start of its execution. Therefore, the network sessions that use the concerned node must be terminated before running the `storage disk firmware update` command. This is particularly true for CIFS sessions that might be terminated when this command is executed.

The firmware is automatically downloaded to disks, which report previous versions of the firmware. For information on automatic firmware update downloads, see "Automatic versus Manual Firmware Download".

If you need to view the current firmware versions, use the storage disk show`-fields` *`firmware-revision`* command. The following example displays partial output from the storage disk show`-fields` *`firmware-revision`* command, where the firmware version for the disks is NA01:

```
cluster1::> storage disk show -fields firmware-revision
    disk     firmware-revision
    -------- -----------------
    1.0.0    NA01
    1.0.1    NA01
    1.0.2    NA01
    1.0.3    NA01
    1.0.4    NA01
    1.0.5    NA01
```

The firmware files are stored in the /mroot/etc/disk_fw directory on the node. The firmware file name is in the form of "product-ID.revision.LOD". For example, if the firmware file is for Seagate disks with product ID X225_ST336704FC and the firmware version is NA02, the filename is X225_ST336704FC.NA02.LOD. The revision part of the file name is the number against which the node compares each disk's current firmware version. If the node in this example contains disks with firmware version NA01, the /mroot/etc/disk_fw/X225_ST336704FC.NA02.LOD file is used to update every eligible disk when you execute this command.

Automatic versus Manual Firmware Download

The firmware is automatically downloaded to those disks that report previous versions of firmware following a system boot or disk insertion. Note that:

- A manual download is a disruptive operation that makes disks inaccessible for up to five minutes after the download is started. Network sessions that use the node must be terminated before running the `storage disk firmware update` command.
- The firmware is not automatically downloaded to the node's partner node in an HA pair.
- The firmware is not automatically downloaded to unowned disks on nodes configured to use software-based disk ownership.
- The bkg-firmware-update parameter controls how the automatic firmware download feature works:
- If the bkg-firmware-update parameter is set to off, then the `storage disk firmware update` will update the firmware on the drives in parallel.
- If the bkg-firmware-update parameter is set to on, then the `storage disk firmware update` will update spares and filesystem disks in a nondisruptive manner in the background after boot. Firmware downloads for these disks will be done sequentially by temporarily taking them offline one at a time for the duration of the download. After the firmware is updated, the disk will be brought back online and restored to its normal operation.

During an automatic download to an HA environment, the firmware is not downloaded to the disks owned by the HA partner.

When you use the `storage disk firmware update` command, the firmware is:

- Updated on every disk regardless of whether it is on the A-loop, the B-loop, or in an HA environment.

- If the node is configured in a software-based disk ownership system, only disks owned by this node are updated.

During an automatic firmware download in a MetroCluster™ environment, the firmware is not downloaded to the disks owned by the partner cluster. During both manual and automatic firmware download in a MetroCluster-over-IP environment, the firmware is not downloaded to any remote disks located at the partner cluster while Disaster Recovery is in progress.

Follow the instructions in "How to Update the Firmware for an HA Pair in a Cluster" to ensure that the updating process is successful. Data ONTAP supports redundant path configurations for disks in a non-HA configuration. The firmware is automatically downloaded to disks on the A-loop or B-loop of redundant configurations that are not configured in an HA pair and are not configured to use software-based disk ownership.

Automatic Backgroud Firmware Update

The firmware can be updated in the background so that the firmware update process does not impact the clients. This functionality is controlled with the bkg-firmware-update parameter. You can modify the parameter by using the CLI storage disk option modify`-node` *`node_name`*`-bkg-firmware-update` *`on|off`* command. The default value for this parameter is "on".

When disabled or set to "off", `storage disk firmware update` will update the firmware in automated mode. This means that all disks which had older firmware revision will be updated regardless of whether they are spare or filesystem disks.

When enabled or set to "on", the background `storage disk firmware update` will update firmware in automated mode only on disks that can be successfully taken offline from active filesystem RAID groups and from the spare pool. To ensure a faster boot process, the firmware is not downloaded to spares and filesystem disks at boot time.

This provides the highest degree of safety available, without the cost of copying data from each disk in the system twice. Disks are taken offline one at a time and then the firmware is updated on them. The disk is brought online after the firmware update and a mini/optimized reconstruct happens for any writes, which occurred while the disk was offline. Background disk firmware update will not occur for a disk if its containing RAID group or the volume is not in a normal state (for example, if the volume/plex is offline or the RAID group is degraded). However, due to the continuous polling nature of background disk firmware update, firmware updates will resume after the RAID group/plex/volume is restored to a normal mode. Similarly, background disk firmware updates are suspended for the duration of any reconstruction within the system.

How to Update the Firmware for an HA Pair in a Cluster

The best way to update the firmware in a cluster with HA pairs is to use automatic background firmware update by enabling the option bkg-firmware-update parameter for each node. Enable the `-bkg-firmware-update` parameter on all the nodes by entering the storage disk option modify`-node` *`node_name`*`-bkg-firmware-update` *`on`* command. Alternatively, use the following procedure to successfully perform a manual update on the disks in an HA environment:

- Make sure that the nodes are not in takeover or giveback mode.
- Download the latest firmware on both the nodes by using the storage firmware download command.
- Install the new disk firmware on Node A's disks by entering the `storage disk firmware update -node` *node-A*`` command.
- Wait until the `storage disk firmware update` command completes on Node A, and then install the new disk firmware on Node B's disks by entering the `storage disk firmware update-node` *node-*

*B`` command.

Parameters

{ -disk <disk path name>,… - Disk (privilege: advanced)

Specifies the disk or disks whose firmware is to be updated.

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

Specifies the node name. The disk firmware will be updated on all the disks owned by the node specified by this parameter.

Examples

- The following example updates the firmware on all disks owned by cluster-node-01:

```
cluster1::*> storage disk firmware update -node cluster-node-01

Warning: Disk firmware updates can be disruptive to the system. Updates
involve
         power cycling all of the affected disks, as well as suspending
disk
         I/O to the disks being updated. This delay can cause client
         disruption. Takeover/giveback operations on a high-availability
(HA)
         group will be delayed until the firmware update process is
complete.
         Disk firmware updates should only be done one node at a time.
Disk
         firmware updates can only be performed when the HA group is
healthy;
         they cannot be performed if the group is in takeover mode.

Do you want to continue with disk firmware updates? {y|n}: y

Info: Updating disk firmware for disks on cluster-node-01.
```

- The following example updates the firmware on disk 1.5.0 which is owned by node cluster-node-04:

```
cluster1::*> storage disk firmware update -disk 1.5.0

Warning: Disk firmware updates can be disruptive to the system. Updates
involve
         power cycling all of the affected disks, as well as suspending
disk
         I/O to the disks being updated. This delay can cause client
         disruption. Takeover/giveback operations on a high-availability
(HA)
         group will be delayed until the firmware update process is
complete.
         Disk firmware updates should only be done one node at a time.
Disk
         firmware updates can only be performed when the HA group is
healthy;
         they cannot be performed if the group is in takeover mode.

Do you want to continue with disk firmware updates? {y|n}: y

Info: Updating disk firmware for disks on cluster-node-04.
```

Related Links

- storage disk option modify
- storage firmware download
- storage disk show

storage disk option modify

Modify disk options

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

Description

The `storage disk option modify` command modifies the background firmware update setting, automatic copy setting, controls automatic disk assignment of all disks assigned to a specified node, or modifies the policy of automatic disk assignment of unowned disks.

Parameters

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

This parameter specifies the node that owns the disks whose options are to be modified.

[-bkg-firmware-update {on|off}] - Background Firmware Update

This parameter specifies whether firmware updates run as a background process. The default setting is `on`, which specifies that firmware updates to spare disks and file system disks is performed nondisruptively via a background process. If the option is turned off, automatic firmware updates occur at system startup or during disk insertion.

[-autocopy {on|off}] - Auto Copy

This parameter specifies whether data is to be automatically copied from a failing disk to a spare disk in the event of a predictive failure. The default setting is `on`. It is sometimes possible to predict a disk failure based on a pattern of recovered errors that have occurred. In such cases, the disk reports a predictive failure. If this option is set to on, the system initiates Rapid RAID Recovery to copy data from the failing disk to an available spare disk. When data is copied, the disk is marked as failed and placed in the pool of broken disks. If a spare is not available, the node continues to use the disk until it fails. If the option is set to off, the disk is immediately marked as failed and placed in the pool of broken disks. A spare is selected and data from the missing disk is reconstructed from other disks in the RAID group. The disk does not fail if the RAID group is already degraded or is being reconstructed. This ensures that a disk failure does not lead to the failure of the entire RAID group.

[-autoassign {on|off}] - Auto Assign

This parameter specifies whether automatic assignment of unowned disks is enabled or disabled. The default setting is `on`. This parameter is used to set both a node-specific and a cluster-wide disk option.

[-autoassign-policy {default|bay|shelf|stack}] - Auto Assignment Policy

This parameter defines the granularity at which auto assign should work. This option is ignored if the -autoassign option is off. Auto assignment can be done at the stack/loop, shelf, or bay level. The possible values for the option are default, stack, shelf, and bay. The default value is platform dependent. It is stack for all non-entry platforms and single-node systems, whereas it is bay for entry-level platforms.

Examples

The following example sets the background firmware update setting to on for all disks belonging to a node named node0:

```
cluster1::> storage disk option modify -node node0 -bkg-firmware-update on
```

The following example shows how to enable auto assignment for the disks on node1:

```
cluster1::> storage disk option modify -node node1 -autoassign on
cluster1::> storage disk option show
Node           BKg. FW. Upd.  Auto Copy     Auto Assign    Auto Assign
Policy
-------------  -------------  ------------  -------------
-----------------
node1          on             on            on             default
node2          on             on            off            default
2 entries were displayed.
```

The following example shows how to modify the auto assignment policy on node1:

```
cluster1::> storage disk option modify -node node1 -autoassign-policy bay
cluster1::> storage disk option show
Node           BKg. FW. Upd.  Auto Copy     Auto Assign    Auto Assign
Policy
-------------  -------------  ------------  -------------
-----------------
node1          on             on            on             bay
node2          on             on            off            default
2 entries were displayed.
```

storage disk option show

Display a list of disk options

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

Description

The `storage disk option show` command displays the settings of the following disk options:

- Background firmware update
- Automatic copying of data to a spare disk in the event of a predictive failure
- Automatic assignment of disks
- Policy that governs automatic assignment of unowned disks

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 node that owns the disks. If this parameter is not specified, the command displays information about the disk options on all the nodes.

[-bkg-firmware-update {on|off}] - Background Firmware Update

Selects the disks that match this parameter value.

[-autocopy {on|off}] - Auto Copy

Selects the disks that match this parameter value.

[-autoassign {on|off}] - Auto Assign

Displays the auto assignment status of unowned disks. The default value is `on` .

[-autoassign-policy {default|bay|shelf|stack}] - Auto Assignment Policy

Selects the disks that match the automatic assignment policy value:

- Default
- Stack/loop
- Shelf
- Bay

Examples

The following example displays disk-option settings for disks owned by all nodes in the cluster:

```
cluster1::> storage disk option show
Node            BKg. FW. Upd.  Auto Copy     Auto Assign   Auto Assign
Policy
-------------  -------------  ------------  -------------
------------------
node0           on             on            on      default
node1           on             on            on      stack
node2           on             on            on      bay
node3           on             on            on      bay
4 entries were displayed.
```

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