Disk and partition ownership

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Disk and partition ownership

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- **Remove ownership from a disk**

  ONTAP writes disk ownership information to the disk. Before you remove a spare disk or its shelf from a node, you should remove its ownership information so that it can be properly integrated into another node.

Display disk and partition ownership

You can view disk ownership to determine which node controls the storage. You can also view the partition ownership on systems that use shared disks.

Steps

1. Display the ownership of physical disks:

   ```
   storage disk show -ownership
   ```

```
cluster::> storage disk show -ownership
Disk     Aggregate Home     Owner    DR Home  Home ID     Owner ID   DR
Home ID  Reserver    Pool
-------- --------- -------- -------- -------- ---------- -----------
----------- ----------- ------
1.0.0    aggr0_2   node2    node2    -        2014941509 2014941509  -
2014941509  Pool0
1.0.1    aggr0_2   node2    node2    -        2014941509 2014941509  -
2014941509  Pool0
1.0.2    aggr0_1   node1    node1    -        2014941219 2014941219  -
2014941219  Pool0
1.0.3    -         node1    node1    -        2014941219 2014941219  -
2014941219  Pool0
```

2. If you have a system that uses shared disks, you can display the partition ownership:

   `storage disk show -partition-ownership`

```
cluster::> storage disk show -partition-ownership
                                Root                    Data
Container  Container
Disk     Aggregate Root Owner  Owner ID    Data Owner  Owner ID    Owner
Owner ID
-------- --------- ----------- ----------- ----------- -----------
---------- -----------
1.0.0    -         node1       1886742616  node1       1886742616  node1
1886742616
1.0.1    -         node1       1886742616  node1       1886742616  node1
1886742616
1.0.2    -         node2       1886742657  node2       1886742657  node2
1886742657
1.0.3    -         node2       1886742657  node2       1886742657  node2
1886742657
```

Manually assign disk ownership

Disks must be owned by a node before they can be used in a local tier (aggregate).

If your cluster is not configured to use automatic disk ownership assignment, you must assign ownership manually.

You cannot reassign ownership of a disk that is in use in a local tier.

Steps

1. Using the CLI, display all unowned disks:

   ```
   storage disk show -container-type unassigned
   ```

2. Assign each disk:

   ```
   storage disk assign -disk disk_name -owner owner_name
   ```

   You can use the wildcard character to assign more than one disk at once. If you are reassigning a spare disk that is already owned by a different node, you must use the “-force” option.

Manually assign ownership of partitioned disks overview

Using the CLI, you can set the ownership of the container disk or the partitions manually or by using auto-assignment—just as you do for unpartitioned disks.

> If a container disk fails in a half-populated shelf and is replaced, ONTAP will not auto-assign ownership. In this case, any assignment of new disks will need to be done manually. To make auto-assign work on half-populated shelves, place disks equally on lower half and 6 on far right bays to begin with. That is, 6 disks from bays 0-5 and 6 disks from bays 18-23. After the container disk is assigned in an ADP-configured system, ONTAP’s software will handle any partitioning and partition assignments that are required, without user intervention.

You can perform the following tasks in the CLI:

Manually assign disks with root-data partitioning

For root-data partitioning, there are three owned entities (the container disk and the two partitions) collectively owned by the HA pair.

The container disk and the two partitions do not all need to be owned by the same node in the HA pair as long as they are all owned by one of the nodes in the HA pair. However, when you use a partition in a local tier (aggregate), it must be owned by the same node that owns the local tier.

Steps

1. Use the CLI to display the current ownership for the partitioned disk:

   `storage disk show -disk disk_name -partition-ownership`

2. Set the CLI privilege level to advanced:

   `set -privilege advanced`

3. Enter the appropriate command, depending on which ownership entity you want to assign ownership for:

If you want to assign ownership for the…	Use this command…
Container disk	`storage disk assign -disk disk_name -owner owner_name`
Data partition	`storage disk assign -disk disk_name -owner owner_name -data true`
Root partition	`storage disk assign -disk disk_name -owner owner_name -root true`

   If any of the ownership entities are already owned, then you must include the “-force” option.

Manually assign disks with root-data-data partitioning

For root-data-data partitioning, there are four owned entities (the container disk and the three partitions) collectively owned by the HA pair.

Root-data-data partitioning creates one small partition as the root partition and two larger, equally sized partitions for data.

About this task

Parameters must be used with the `disk assign` command to assign the proper partition of a root-data-data partitioned disk. You cannot use these parameters with disks that are part of a storage pool. The default value is “false”.

- The `-data1 true` parameter assigns the “data1” partition of a root-data1-data2 partitioned disk.
- The `-data2 true` parameter assigns the “data2” partition of a root-data1-data2 partitioned disk.

Steps

1. Use the CLI to display the current ownership for the partitioned disk:

   `storage disk show -disk disk_name -partition-ownership`

2. Set the CLI privilege level to advanced:

   `set -privilege advanced`

3. Enter the appropriate command, depending on which ownership entity you want to assign ownership for:

If you want to assign ownership for the…	Use this command…
Container disk	`storage disk assign -disk disk_name -owner owner_name`
Data1 partition	`storage disk assign -disk disk_name -owner owner_name -data1 true`
Data2 partition	`storage disk assign -disk disk_name -owner owner_name -data2 true`
Root partition	`storage disk assign -disk disk_name -owner owner_name -root true`

If any of the ownership entities are already owned, then you must include the “-force” option.

Configure automatic assignment of disk ownership

You can use the CLI to configure ONTAP to automatically assign disk ownership according to a disk’s stack, shelf, or bay. If configured, automatic disk ownership

assignments occur 10 minutes after system initialization and every five minutes during normal system operation.

What you'll need

- Your system must adhere to the requirements for automatic disk ownership.
- If you have multiple stacks or shelves that must have different ownership, one disk must have been manually assigned on each stack or shelf so that automatic ownership assignment works on each stack or shelf.

Which disk auto-assignment policy to use

Use the "bay autoassign-policy" only for entry level platforms. If you try to use the "bay autoassign-policy" for a non-entry level platform, it will fail.

You can typically use the default auto-assignment policy, which is equivalent to the "stack" policy for most systems, and to the "bay" policy for entry-level systems (AFF A2xx, FAS2xxx). However, for some configurations, you might need to change the auto-assignment policy.

You must select the appropriate auto-assignment based on your configuration:

If you are using…	Then use this auto-assignment policy…
Stand-alone entry-level system	stack
Entry-level systems in an HA configuration with a single, shared shelf	bay
Entry-level systems in an HA configuration with one stack of two or more shelves	shelf
MetroCluster configurations with one stack per node, two or more shelves	shelf
All other configurations	stack

About this task

The behavior of the "default" automatic assignment policy depends on the system model. For entry level models, the "default" policy is equivalent to the "bay" policy. For all other systems, it is equivalent to the "stack" policy.

Steps

1. Configure automatic disk assignment:

   `storage disk option modify -autoassign-policy` *`autoassign_policy`* `-node` *`node_name`*

   - Use `stack` as the *`autoassign_policy`* to configure automatic ownership at the stack or loop level.
   - Use `shelf` as the *`autoassign_policy`* to configure automatic ownership at the shelf level.
   - Use `bay` as the *`autoassign_policy`* to configure automatic ownership at the bay level.
2. Verify the automatic assignment settings for the disks:

```
storage disk option show
```

```
cluster1::> storage disk option show

Node           BKg. FW. Upd.  Auto Copy     Auto Assign    Auto
                                                           Assign Policy
-------------  -------------  ------------  -------------  --------
cluster1-1     on             on            on             default
cluster1-2     on             on            on             default
```

Set up an active-passive configuration on nodes using root-data partitioning

When an HA pair is configured to use root-data partitioning by the factory, ownership of the data partitions is split between both nodes in the pair for use in an active-active configuration. If you want to use the HA pair in an active-passive configuration, you must update partition ownership before creating your data local tier (aggregate).

What you'll need

- You should have decided which node will be the active node and which node will be the passive node.
- Storage failover must be configured on the HA pair.

About this task

This task is performed on two nodes: Node A and Node B.

This procedure is designed for nodes for which no data local tier (aggregate) has been created from the partitioned disks.

Steps

All commands are inputted at the cluster shell.

1. View the current ownership of the data partitions:

   ```
   storage aggregate show-spare-disks
   ```

   The output shows that half of the data partitions are owned by one node and half are owned by the other node. All of the data partitions should be spare.

```
cluster1::> storage aggregate show-spare-disks

Original Owner: cluster1-01
 Pool0
  Partitioned Spares
                                                              Local
Local
                                                               Data
```

```
Root Physical
 Disk                        Type     RPM Checksum         Usable
Usable     Size
 --------------------------- ----- ------ -------------- --------
-------- --------
 1.0.0                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.1                       BSAS    7200 block           753.8GB
73.89GB  828.0GB
 1.0.5                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.6                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.10                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.11                      BSAS    7200 block           753.8GB
0B  828.0GB

Original Owner: cluster1-02
 Pool0
  Partitioned Spares
                                                           Local
Local
                                                            Data
Root Physical
 Disk                        Type     RPM Checksum         Usable
Usable     Size
 --------------------------- ----- ------ -------------- --------
-------- --------
 1.0.2                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.3                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.4                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.7                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.8                       BSAS    7200 block           753.8GB
73.89GB  828.0GB
 1.0.9                       BSAS    7200 block           753.8GB
0B  828.0GB
12 entries were displayed.
```

2. Enter the advanced privilege level:

```
set advanced
```

3. For each data partition owned by the node that will be the passive node, assign it to the active node:

   `storage disk assign -force -data true -owner active_node_name -disk disk_name`

   You do not need to include the partition as part of the disk name.

   You would enter a command similar to the following example for each data partition you need to reassign:

   `storage disk assign -force -data true -owner cluster1-01 -disk 1.0.3`

4. Confirm that all of the partitions are assigned to the active node.

```
cluster1::*> storage aggregate show-spare-disks

Original Owner: cluster1-01
 Pool0
  Partitioned Spares
                                                                 Local
Local
                                                                  Data
Root Physical
 Disk                       Type     RPM Checksum         Usable
Usable     Size
 -------------------------- ----- ------ -------------- --------
-------- --------
 1.0.0                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.1                      BSAS    7200 block           753.8GB
73.89GB  828.0GB
 1.0.2                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.3                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.4                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.5                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.6                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.7                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.8                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.9                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.10                     BSAS    7200 block           753.8GB
0B  828.0GB
```

```
 1.0.11                    BSAS    7200 block           753.8GB
0B  828.0GB

Original Owner: cluster1-02
 Pool0
  Partitioned Spares
                                                        Local
Local
                                                         Data
Root Physical
 Disk                      Type     RPM Checksum         Usable
Usable     Size
 ------------------------- ----- ------ -------------- --------
-------- --------
 1.0.8                     BSAS    7200 block                0B
73.89GB  828.0GB
13 entries were displayed.
```

Note that cluster1-02 still owns a spare root partition.

5. Return to administrative privilege:

   `set admin`

6. Create your data aggregate, leaving at least one data partition as spare:

   `storage aggregate create` *`new_aggr_name`* `-diskcount` *`number_of_partitions`* `-node` *`active_node_name`*

   The data aggregate is created and is owned by the active node.

Set up an active-passive configuration on nodes using root-data-data partitioning

When an HA pair is configured to use root-data-data partitioning by the factory, ownership of the data partitions is split between both nodes in the pair for use in an active-active configuration. If you want to use the HA pair in an active-passive configuration, you must update partition ownership before creating your data local tier (aggregate).

What you'll need

- You should have decided which node will be the active node and which node will be the passive node.
- Storage failover must be configured on the HA pair.

About this task

This task is performed on two nodes: Node A and Node B.

This procedure is designed for nodes for which no data local tier (aggregate) has been created from the

partitioned disks.

Steps

All commands are input at the cluster shell.

1. View the current ownership of the data partitions:

   `storage aggregate show-spare-disks -original-owner` *`passive_node_name`* `-fields local-usable-data1-size, local-usable-data2-size`

   The output shows that half of the data partitions are owned by one node and half are owned by the other node. All of the data partitions should be spare.

2. Enter the advanced privilege level:

   `set advanced`

3. For each data1 partition owned by the node that will be the passive node, assign it to the active node:

   `storage disk assign -force -data1 -owner` *`active_node_name`* `-disk` *`disk_name`*

   You do not need to include the partition as part of the disk name

4. For each data2 partition owned by the node that will be the passive node, assign it to the active node:

   `storage disk assign -force -data2 -owner` *`active_node_name`* `-disk` *`disk_name`*

   You do not need to include the partition as part of the disk name

5. Confirm that all of the partitions are assigned to the active node:

   `storage aggregate show-spare-disks`

```
cluster1::*> storage aggregate show-spare-disks

Original Owner: cluster1-01
 Pool0
  Partitioned Spares
                                                                 Local
Local
                                                                  Data
Root Physical
 Disk                       Type     RPM Checksum         Usable
Usable     Size
 -------------------------- ----- ------ -------------- --------
-------- --------
 1.0.0                      BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.1                      BSAS    7200 block           753.8GB
73.89GB  828.0GB
 1.0.2                      BSAS    7200 block           753.8GB
```

```
0B  828.0GB
 1.0.3                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.4                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.5                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.6                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.7                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.8                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.9                        BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.10                       BSAS    7200 block           753.8GB
0B  828.0GB
 1.0.11                       BSAS    7200 block           753.8GB
0B  828.0GB

Original Owner: cluster1-02
 Pool0
  Partitioned Spares
                                                            Local
Local
                                                             Data
Root Physical
 Disk                        Type     RPM Checksum         Usable
Usable     Size
 --------------------------- ----- ------ -------------- --------
-------- --------
 1.0.8                       BSAS    7200 block                0B
73.89GB  828.0GB
13 entries were displayed.
```

Note that cluster1-02 still owns a spare root partition.

6. Return to administrative privilege:

   ```
   set admin
   ```

7. Create your data aggregate, leaving at least one data partition as spare:

   ```
   storage aggregate create new_aggr_name -diskcount number_of_partitions -node
   active_node_name
   ```

   The data aggregate is created and is owned by the active node.

8. Alternatively, you can use ONTAP's recommend aggregate layout which includes best practices for RAID group layout and spare counts:

   ```
   storage aggregate auto-provision
   ```

Remove ownership from a disk

ONTAP writes disk ownership information to the disk. Before you remove a spare disk or its shelf from a node, you should remove its ownership information so that it can be properly integrated into another node.

What you'll need

The disk you want to remove ownership from must meet the following requirements:

- It must be a spare disk.

  You cannot remove ownership from a disk that is being used in an local tier (aggregate).

- It cannot be in the maintenance center.
- It cannot be undergoing sanitization.
- It cannot have failed.

  It is not necessary to remove ownership from a failed disk.

About this task

If you have automatic disk assignment enabled, ONTAP could automatically reassign ownership before you remove the disk from the node. For this reason, you disable the automatic ownership assignment until the disk is removed, and then you re-enable it.

Steps

1. If disk ownership automatic assignment is on, use the CLI to turn it off:

   ```
   storage disk option modify -node node_name -autoassign off
   ```

2. If needed, repeat the previous step for the node's HA partner.
3. Remove the software ownership information from the disk:

   ```
   storage disk removeowner disk_name
   ```

   To remove ownership information from multiple disks, use a comma-separated list.

   Example:

   ```
   storage disk removeowner sys1:0a.23,sys1:0a.24,sys1:0a.25
   ```

4. If the disk is partitioned for root-data partitioning, remove ownership from the partitions by entering both of the following commands:

   ```
   storage disk removeowner -disk disk_name -root true
   ```

```
storage disk removeowner -disk disk_name -data true
```

Both partitions are no longer owned by any node.

5. If you previously turned off automatic assignment of disk ownership, turn it on after the disk has been removed or reassigned:

```
storage disk option modify -node node_name -autoassign on
```

6. If needed, repeat the previous step for the node's HA partner.

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