



Setting up ONTAP to work with array LUNs

ONTAP FlexArray

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Setting up ONTAP to work with array LUNs

The process of setting up an ONTAP system to work with array LUNs differs on the basis of whether ONTAP systems are ordered with or without disks.

If an ONTAP system is ordered with disk shelves, ONTAP software is installed by the factory. In such a configuration, you do not need to create the root volume and install licenses and ONTAP software.

You can install ONTAP software on systems ordered without disk shelves. On these systems, you must first install ONTAP and then set up a cluster.

Configuring ONTAP on a system that uses only array LUNs

If you want to configure ONTAP for use with array LUNs, you must configure the root aggregate and root volume, reserve space for diagnostics and recovery operations, and set up the cluster.

What you'll need

- The ONTAP system must be connected to the storage array.
- The storage array administrator must have created LUNs and presented them to ONTAP.
- The storage array administrator must have configured the LUN security.

You must configure each node that you want to use with array LUNs. If the node is in an HA pair, then you must complete the configuration process on one node before proceeding with the configuration on the partner node.

Steps

1. Power on the primary node and interrupt the boot process by pressing Ctrl-C when you see the following message on the console: `Press CTRL-C for special boot menu.`
2. Select option 4 (Clean configuration and initialize all disks) on the boot menu.

The list of array LUNs made available to ONTAP is displayed. In addition, the array LUN size required for root volume creation is also specified. The size required for root volume creation differs from one ONTAP system to another.

- If no array LUNs were previously assigned, ONTAP detects and displays the available array LUNs, as shown in the following example:

```

mcc8040-ams1:> disk show NET-1.6 -instance
          Disk: NET-1.6
    Container Type: aggregate
      Owner/Home: mcc8040-ams1-01 / mcc8040-ams1-01
        DR Home: -
Stack ID/Shelf/Bay: - / - / -
          LUN: 0
        Array: NETAPP_INF_1
        Vendor: NETAPP
        Model: INF-01-00
      Serial Number: 60080E50004317B40000003B158E35974
        UID:
60080E50:004317B4:0000003B1:58E35974:00000000:00000000:00000000:000000
00:00000000:00000000
          BPS: 512
    Physical Size: 87.50GB
      Position: data
Checksum Compatibility: block
      Aggregate: eseries
        Plex: plex0

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
-----
-----
-----
mcc8040-ams1-01      2c              0  mccb6505-ams1:16      mccb6505-
ams1:18      AO  INU  20330080e54317b4      1  4 Gb/S
0              0
mcc8040-ams1-01      2a              0  mccb6505-ams1:17      mccb6505-
ams1:19      ANO RDY  20320080e54317b4      0  4 Gb/S
0              0

Errors:
-
```

- If array LUNs were previously assigned, for example, through the maintenance mode, they are either marked `local` or `partner` in the list of the available array LUNs, depending on whether the array LUNs were selected from the node on which you are installing ONTAP or its HA partner:

In this example, array LUNs with index numbers 3 and 6 are marked `local` because they had been previously assigned from this particular node:

0	vgci9710s202:2-24.0L19	RAID5	DGC	217.3 GB	
Block	6006016083402B0048E576D7				
1	vgbr6510s203:30.126L20	RAID5	DGC	217.3 GB	
Block	6006016083402B0049E576D7				
2	vgci9710s202:2-24.0L21	RAID5	DGC	217.3 GB	
Block	6006016083402B004AE576D7				
3	vgbr6510s203:30.126L22	RAID5	DGC	405.4 GB	local
Block	6006016083402B004BE576D7				
4	vgci9710s202:2-24.0L23	RAID5	DGC	217.3 GB	
Block	6006016083402B004CE576D7				
5	vgbr6510s203:30.126L24	RAID5	DGC	217.3 GB	
Block	6006016083402B004DE576D7				
6	vgbr6510s203:30.126L25	RAID5	DGC	423.5 GB	local
Block	6006016083402B003CF93694				
7	vgci9710s202:2-24.0L26	RAID5	DGC	423.5 GB	
Block	6006016083402B003DF93694				

3. Select the index number corresponding to the array LUN you want to assign as the root volume.

The array LUN must be of sufficient size to create the root volume.

The array LUN selected for root volume creation is marked `local (root)`.

In the following example, the array LUN with index number 3 is marked for root volume creation:

The root volume will be created on switch 0:5.183L33.

ONTAP requires that 11.0 GB of space be reserved for use in diagnostic and recovery operations. Select one array LUN to be used as spare for diagnostic and recovery operations.

Index	Array LUN Name	Model	Vendor	Size	Owner
Checksum	Serial Number				
-----	-----	-----	-----	-----	-----
0	switch0:5.183L1	SYMMETRIX	EMC	266.1 GB	
Block	600604803436313734316631				
1	switch0:5.183L3	SYMMETRIX	EMC	266.1 GB	
Block	600604803436316333353837				
2	switch0:5.183L31	SYMMETRIX	EMC	266.1 GB	
Block	600604803436313237643666				
3	switch0:5.183L33	SYMMETRIX	EMC	658.3 GB	local (root)
Block	600604803436316263613066				
4	switch0:7.183L0	SYMMETRIX	EMC	173.6 GB	
Block	600604803436313261356235				
5	switch0:7.183L2	SYMMETRIX	EMC	173.6 GB	
Block	600604803436313438396431				
6	switch0:7.183L4	SYMMETRIX	EMC	658.3 GB	
Block	600604803436313161663031				
7	switch0:7.183L30	SYMMETRIX	EMC	173.6 GB	
Block	600604803436316538353834				
8	switch0:7.183L32	SYMMETRIX	EMC	266.1 GB	
Block	600604803436313237353738				
9	switch0:7.183L34	SYMMETRIX	EMC	658.3 GB	
Block	600604803436313737333662				

4. Select the index number corresponding to the array LUN you want to assign for use in diagnostic and recovery options.

The array LUN must be of sufficient size for use in diagnostic and recovery options. If required, you can also select multiple array LUNs with a combined size greater than or equal to the specified size. To select multiple entries, you must enter the comma-separated values of all of the index numbers corresponding to the array LUNs you want to select for diagnostic and recovery options.

The following example shows a list of array LUNs selected for root volume creation and for diagnostic and recovery options:

Here is a list of the selected array LUNs

Index	Array LUN Name	Model	Vendor	Size	Owner
Checksum	Serial Number				
-----	-----	-----	-----	-----	-----
2	switch0:5.183L31	SYMMETRIX	EMC	266.1 GB	local
Block	600604803436313237643666				
3	switch0:5.183L33	SYMMETRIX	EMC	658.3 GB	local (root)
Block	600604803436316263613066				
4	switch0:7.183L0	SYMMETRIX	EMC	173.6 GB	local
Block	600604803436313261356235				
5	switch0:7.183L2	SYMMETRIX	EMC	173.6 GB	local
Block	600604803436313438396431				

Do you want to continue (yes|no)?



Selecting “no” clears the LUN selection.

5. Enter **y** when prompted by the system to continue with the installation process.

The root aggregate and the root volume are created and the rest of the installation process continues.

6. Enter the required details to create the node management interface.

The following example shows the node management interface screen with a message confirming the creation of the node management interface:

Welcome to node setup.

You can enter the following commands at any time:

"help" or "?" - if you want to have a question clarified,
"back" - if you want to change previously answered questions, and
"exit" or "quit" - if you want to quit the setup wizard.
Any changes you made before quitting will be saved.

To accept a default or omit a question, do not enter a value.

Enter the node management interface port [e0M]:

Enter the node management interface IP address: 192.0.2.66

Enter the node management interface netmask: 255.255.255.192

Enter the node management interface default gateway: 192.0.2.7

A node management interface on port e0M with IP address 192.0.2.66 has been created.

This node has its management address assigned and is ready for cluster setup.

After configuring ONTAP on all of the nodes that you want to use with array LUNs, you should complete the cluster setup process.

Software setup

Installing the license for using array LUNs

The V_StorageAttach license must be installed on each ONTAP node that you want to use with array LUNs. It is *not* a single license for the cluster. Array LUNs cannot be used in aggregates until a license is installed.

What you'll need

- The cluster must be installed.
- You must have the license key for the V_StorageAttach license.

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You need not perform this procedure if the license key for the V_StorageAttach package is already installed. If the ONTAP system is ordered with disks, the factory typically installs the license package for you. Alternatively, many customers install all necessary licenses early in the installation process.

Steps

1. For each ONTAP node in the cluster for use with array LUNs, enter the following command on the node:
`system license add license key`

```
vgv3170f41a> license
Serial Number: nnnnnnnnn
Owner: mysystemla
Package          Type      Description          Expiration
-----
V_StorageAttach  license Virtual Attached Storage
```

2. Look at the output to confirm that the V_StorageAttach package is shown.

Assigning ownership of array LUNs

On an ONTAP system where the root volume resides on disk shelves, you must assign the ownership of array LUNs to a node before adding them to an aggregate for using them as storage.

What you'll need

- Back-end configuration testing (testing of the connectivity and configuration of devices behind the ONTAP systems) must be completed.
- Array LUNs that you want to assign must be presented to the ONTAP systems.

You can assign ownership of array LUNs that have the following characteristics:

- They are unowned.
- They have no storage array configuration errors, such as the following:
 - The array LUN is smaller than or larger than the size that ONTAP supports.
 - The LDEV is mapped on only one port.
 - The LDEV has inconsistent LUN IDs assigned to it.
 - The LUN is available on only one path.

ONTAP issues an error message if you try to assign ownership of an array LUN with back-end configuration errors that would interfere with the ONTAP system and the storage array operating together. You must fix such errors before you can proceed with array LUN assignment.

ONTAP alerts you if you try to assign an array LUN with a redundancy error: for example, all paths to this array LUN are connected to the same controller or only one path to the array LUN. You can fix a redundancy error before or after assigning ownership of the LUN.

Steps

1. Enter the following command to see the array LUNs that have not yet been assigned to a node:


```
storage disk show -container-type unassigned
```
2. Enter the following command to assign an array LUN to this node:


```
storage disk assign -disk arrayLUNname -owner nodename
```

If you want to fix a redundancy error after disk assignment instead of before, you must use the `-force` parameter with the `storage disk assign` command.

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