Plan and prepare phase procedures

ONTAP FLI

NetApp
February 11, 2024

Table of Contents

Plan and prepare phase procedures

Plan and prepare phase procedures

The FLI planning phase focuses on the tasks required to create detailed migration plans and prepare the customer environment for the actual migration. One or more test migrations are performed during this phase to verify the installation and setup of the foreign LUN import.

The following are tasks to complete during the plan phase:

- Create a mapping of source and destination LUNs by entering the storage mapping information for each storage array in the LUN Details section of your Site Survey and Planning worksheet.
- Wire the source storage into the fabric based on the planning information.
- Configure the switch zones.
- Perform one or more test migrations to verify the installation and setup.

Wiring best practices for FLI migration

To configure ONTAP storage for FLI migration, you should wire the source storage into the fabric based on your planning information and recommended best practices.

The following wiring best practices are recommended when configuring ONTAP storage for FLI migration.

- Use dual fabrics for redundancy.
- Use at least two initiators and two target ports from each destination storage for FLI migration.
- Do not zone destination storage initiator ports with the host. Initiator ports of ONTAP are used to zone with target ports of source storage.

The following is an example of wiring for source storage and destination storage in a production fabric.

Source Storage / Destination Storage

Target Port
Initiator Port
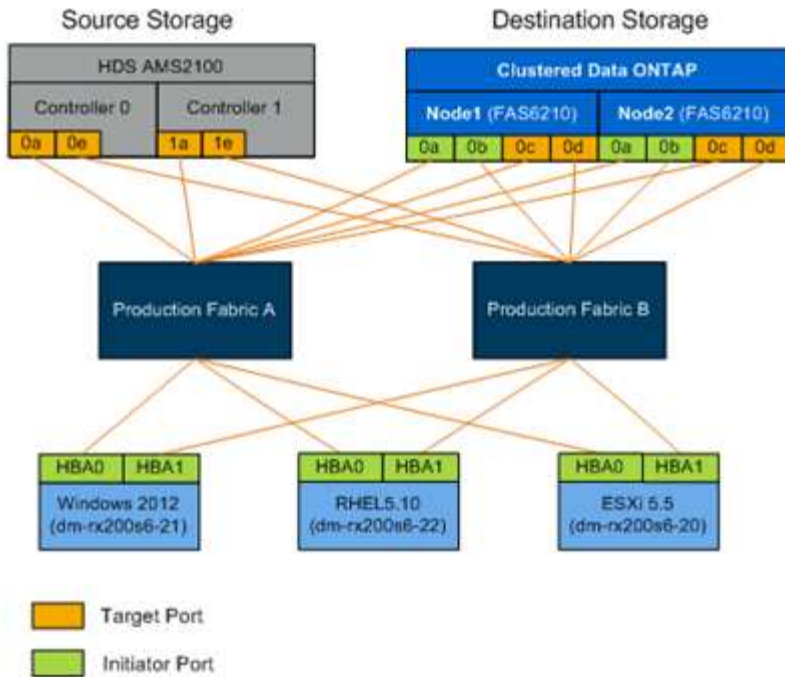
Configuring switch zones

You must create required zones on the SAN switches for connecting the source storage to the destination storage.

Steps

1. Back up the existing zonesets on each switch in the production and migration fabric.
2. Zone the source storage and destination storage as shown below.

Target Port
Initiator Port
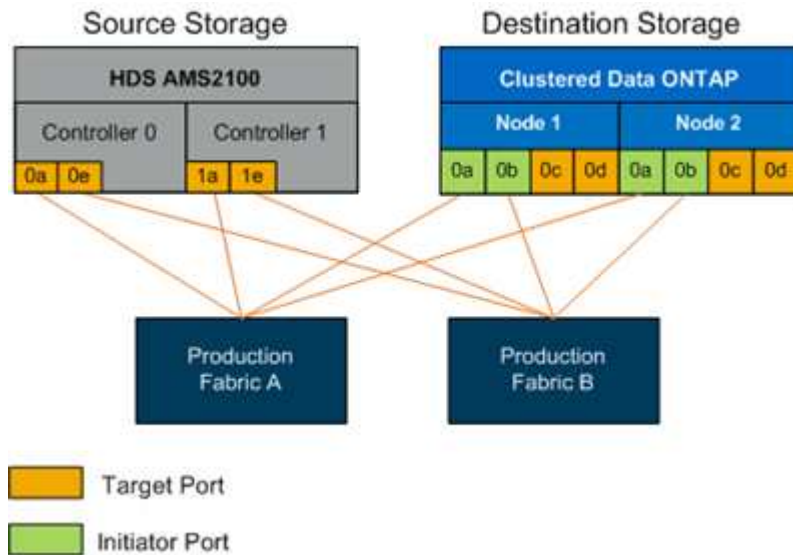
3. Create the zone and add it to the zoneset in production fabric A.

   The following is an example of the production zone, production fabric A for zone ZONE_AMS2100_cDOT_Initiator_fabA.

WWPN	Zone Members
50:06:0e:80:10:46:b9:60	AMS2100 Ctrl 0 Port 0a
50:06:0e:80:10:46:b9:68	AMS2100 Ctrl 1 Port 1a
50:0a:09:80:00:d3:51:59	ONTAP Node 1 Port 0a
50:0a:09:80:00:e7:81:04	ONTAP Node 2 Port 0a

4. Activate the zoneset in fabric A.

5. Create the zone and add it to the zoneset in production fabric B.

   The following is an example of the production zone, production fabric A for zone ZONE_AMS2100_cDOT_Initiator_fabB.

WWPN	Zone Members
50:06:0e:80:10:46:b9:64	AMS2100 Ctrl 0 Port 0e
50:06:0e:80:10:46:b9:6c	AMS2100 Ctrl 1 Port 1e
50:0a:09:80:00:d3:51:59	ONTAP Node 1 Port 0b
50:0a:09:80:00:e7:81:04	ONTAP Node 2 Port 0b

6. Activate the zoneset in production fabric B.

How to configure source arrays

Consult the array documentation for the source array in order to add a host entry for the initiator ports (LUN masking, igroup in NetApp parlance). This information can be retrieved from the Storage Groups section of your Site Survey and Planning worksheet.

Migration tests

You should perform one or more test migrations in order to verify that your arrays, switches, and hosts are properly configured and also in order to get several samples that can be extrapolated from to determine migration durations and levels of effort.

Test migration example using Hitachi AMS2100

The following is an example test migration using a Hitachi AMS2100 as the foreign array. Depending on the arrays involved, host operating systems, and other variables, your steps may be different.

You can use the following example as a general guide to the steps required to perform test migrations. NetApp recommends performing test migrations as early as possible in order to find and have as much time as possible to resolve any issues brought to light by the tests. A test migration should be performed on all combinations of source and destination arrays before proceeding with the production migrations.

To perform a test migration, complete the following steps:

Steps

1. Create a 2 GB test LUN on the source array.
2. Log in to Hitachi Storage Navigator Modular as system.
3. Select AMS 2100 array.
4. Click **Show and Configure Array**.
5. Log in using root.
6. Expand **Groups** and select **Logical Units**.
7. Select **Create LU** to create the test LUN.
8. Create a test LUN of 2 GB.
9. Click **OK**.
10. Skip the LUN assignment here and proceed by clicking **Close**.
11. Verify LUN 0026 is created.
12. Expand **Groups**and select **Logical Units**.
13. Select **Host Groups** to map the test LUN to the cDOT_FLI host group.
14. Select host group cDOT_FLI created in the previous step and click **Edit Host Group**.
15. Choose the ports for the host group. In this example we choose 0a, 0e, 1a, 1e. Select the Forced Set to All Selected Ports option.

HSNM2

Edit Host Group - PortOA:012

Host Group Property

Enter the information for the host group to be created.

Host Group No.: 012

* Name: cDOT_FLI

32 characters or less (alphanumeric characters,
'!', '#', '$', '%', '&', '`', '+', '-', '.', '=',
'@', '^', '_', '{', '}', '~', '(', ')', '[', ']' or
' ').

* Edit to: **Available Ports**

	Port
☐	Port
☑	OA
☐	OB
☑	OE
☐	OF

Options:

Platform: Linux

Middleware: not specified

☑ Forced set to all selected ports

16. Click **Logical Units** and add the test LUN LUN0026.

17. Click **OK** to map the LUN.

18. Select **Yes, I Have Read the Above Warning and Want to Edit Host Group** and click **Confirm**.

19. Verify host group creation and click **Close**.

20. Verify the test LUN and mapping from the source storage to destination storage and perform Foreign LUN Import (FLI) import.

21. Log in to the ONTAP storage through SSH using admin user.

22. Change the mode to Advanced. `DataMig-cmode::> set -privilege advanced`

23. Enter y when asked if you want to continue with advanced commands.

24. Discover the source array on ONTAP. Wait for a few minutes and retry to detect the source array.`storage array show`

    a. When the storage array is discovered for the first time, ONTAP might not show the array by discovering automatically. Use the following instructions to reset the switch port where ONTAP initiator ports are connected.

    For example, the DataMig-cmode cluster initiator ports 0a and 0b of ONTAP are connected to Cisco ports 4/9 and 4/11. To reset port 4/9 on the Cisco switch:

    ```
    conf t
    interface fc4/9
    shutdown
    no shutdown
    exit
    exit
    ```

    Resetting one port is usually enough. Check the array list and LUN paths after resetting one port.

25. Verify the source array is discovered through all the initiator ports: `storage array config show -array-name HITACHI_DF600F_1`

```
               LUN    LUN
Node           Group  Count     Array Name          Array Target Port
Initiator
-----------    -----  -----  ----------------------------
----------------------
DataMig-cmode-01 0      1     HITACHI_DF600F_1      50060e801046b960
0a
                                                    50060e801046b964
0b
                                                    50060e801046b968
0a
                                                    50060e801046b96c
0b
DataMig-cmode-02 0      1     HITACHI_DF600F_1      50060e801046b960
0a
                                                    50060e801046b964
0b
                                                    50060e801046b968
0a
                                                    50060e801046b96c
0b
```

26. List the test LUN mapped from Hitachi storage and verify the disk properties and paths: `storage disk show -array-name HITACHI_DF600F_1 -instance`

```
                    Disk: HIT-1.1
          Container Type: unassigned
              Owner/Home: -   / -
                 DR Home: -
       Stack ID/Shelf/Bay: -   / -   / -
                     LUN: 0
                   Array: HITACHI_DF600F_1
                  Vendor: HITACHI
                   Model: DF600F
           Serial Number: 83017542001A
                     UID:
48495441:43484920:38333031:37353432:30303236:00000000:00000000:00000000:
00000000:00000000
                     BPS: 512
           Physical Size: -
                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
------------------ ---------  -----  --------------------
------------------ --- ---  ---------------------- ------  -------
------------  ------------
DataMig-cmode-01   0a             0  DM-Cisco9506-1:4-9    DM-Cisco9506-
1:2-24   AO  INU  50060e801046b968           2   2 Gb/S            0
0
DataMig-cmode-01   0b             0  DM-Cisco9506-2:4-9    DM-Cisco9506-
2:2-24   AO  INU  50060e801046b96c           2   2 Gb/S            0
0
DataMig-cmode-01   0b             0  DM-Cisco9506-2:4-9    DM-Cisco9506-
2:1-14   AO  INU  50060e801046b964           1   2 Gb/S            0
0
DataMig-cmode-01   0a             0  DM-Cisco9506-1:4-9    DM-Cisco9506-
1:1-14   AO  INU  50060e801046b960           1   2 Gb/S            0
0
DataMig-cmode-02   0a             0  DM-Cisco9506-1:4-11   DM-Cisco9506-
1:2-24   AO  INU  50060e801046b968           2   2 Gb/S            0
0
DataMig-cmode-02   0b             0  DM-Cisco9506-2:4-11   DM-Cisco9506-
2:2-24   AO  INU  50060e801046b96c           2   2 Gb/S            0
0
DataMig-cmode-02   0b             0  DM-Cisco9506-2:4-11   DM-Cisco9506-
2:1-14   AO  INU  50060e801046b964           1   2 Gb/S            0
0
DataMig-cmode-02   0a             0  DM-Cisco9506-1:4-11   DM-Cisco9506-
1:1-14   AO  INU  50060e801046b960           1   2 Gb/S            0
0

Errors:
-

DataMig-cmode::*>
```

27. Mark the source LUN as foreign using the serial number: `storage disk set-foreign-lun { -serial-number 83017542001A } -is-foreign true`

28. Verify the source LUN is marked as foreign: `storage disk show -array-name HITACHI_DF600F_1`

29. List all foreign arrays and their serial numbers: `storage disk show -container-type foreign`

```
-fields serial-number
```

> (i) The LUN create command detects the size and alignment based on partition offset and creates the LUN accordingly with the foreign-disk argument.

30. Create a destination volume: `vol create -vserver datamig flivol aggr1 -size 10g`

31. Create a test LUN using a foreign LUN: `lun create -vserver datamig -path /vol/flivol/testlun1 -ostype linux -foreign-disk 83017542001A`

32. List the test LUN and verify the size of the LUN with the source LUN: `lun show`

> (i) For FLI offline migration, the LUN must be online to map it to an igroup and then must be offline before creating the LUN import relationship.

33. Create test igroup of protocol FCP without adding any initiators: `lun igroup create -vserver datamig -igroup testig1 -protocol fcp -ostype linux`

34. Map the test LUN to the test igroup: `lun map -vserver datamig -path /vol/flivol/testlun1 -igroup testig1`

35. Offline the test LUN: `lun offline -vserver datamig -path /vol/flivol/testlun1`

36. Create import relationship with test LUN and foreign LUN: `lun import create -vserver datamig -path /vol/flivol/testlun1 -foreign-disk 83017542001A`

37. Start the migration (import): `lun import start -vserver datamig -path /vol/flivol/testlun1`

38. Monitor the import progress: `lun import show -vserver datamig -path /vol/flivol/testlun1`

39. Check the import job is completed successfully: `lun import show -vserver datamig -path /vol/flivol/testlun1`

```
vserver foreign-disk    path                      operation admin operational
percent
                                                  in progress state state
complete
--------------------------------------------------------------------------
-------
datamig 83017542001A    /vol/flivol/testlun1
                                                  import     started
                                                                completed
100
```

40. Start the verify job to compare source and destination LUNs. Monitor the verify progress: `lun import verify start -vserver datamig -path /vol/flivol/testlun1`

```
DataMig-cmode::*> lun import show -vserver datamig -path
/vol/flivol/testlun1
vserver foreign-disk    path                    operation admin operational
percent
                                                in progress state state
complete
--------------------------------------------------------------------
-------
datamig 83017542001A    /vol/flivol/testlun1
                                                verify    started
                                                          in_progress
44
```

41. Check the verify job is complete without any errors: `lun import show -vserver datamig -path /vol/flivol/testlun1`

```
vserver foreign-disk    path                    operation admin operational
percent
                                                in progress state state
complete
--------------------------------------------------------------------
-------
datamig 83017542001A    /vol/flivol/testlun1
                                                verify    started
                                                          completed
100
```

42. Delete the import relationship to remove the migration job: `lun import delete -vserver datamig -path /vol/flivol/testlun1``lun import show -vserver datamig -path /vol/flivol/testlun1`

43. Unmap the test LUN from the test igroup: `lun unmap -vserver datamig -path /vol/flivol/testlun1 -igroup testig1`

44. Online the test LUN: `lun online -vserver datamig -path /vol/flivol/testlun1`

45. Mark the foreign LUN attribute to false: `storage disk modify { -serial-number 83017542001A } -is-foreign false`

> (i) Do not remove the host group created on source storage with ONTAP initiator ports. The same host group is reused during migrations from that source array.

46. Remove test LUN from source storage.

    a. Log in to Hitachi Storage Navigator Modular as a system.

    b. Select AMS 2100 array and click **Show and Configure Array**.

    c. Log in using root.

d. Select **Groups**, then select **Host Groups**.

e. Select *cDOT_FLI Igroup* and click **Edit Host Group**.

f. In the **Edit Host Group** window, select all target ports chosen to map the test LUN and select **Forced Set to All Selected Ports**.

g. Select the **Logical Units** tab.

h. Select the test LUN from the **Assigned Logical Units** window.

i. Select **Remove** to remove the LUN mapping.

j. Click OK.

k. Do not remove the host group and continue deleting the test LUN.

l. Select Logical Units.

m. Select the test LUN created in the previous step (LUN0026).

n. Click **Delete LUN**.

o. Click **Confirm** to delete the test LUN.

47. Delete the test LUN on the destination storage.

a. Log in to the ONTAP storage through SSH using admin user.

b. Offline the test LUN on the NetApp storage system: `lun offline -vserver datamig -path /vol/flivol/testlun1`

> (i) Make sure you do not select another host LUN.

c. Destroy the test LUN on the NetApp storage system: `lun destroy -vserver datamig -path /vol/flivol/testlun1`

d. Offline the test volume on the NetApp storage system: `vol offline -vserver datamig -volume flivol`

e. Destroy the test volume on the NetApp storage system: `vol destroy -vserver datamig -volume flivol`