Broadcom®-supported Switches

Migrating to a Two-node Switched Cluster with Broadcom-supported BES-53248 Cluster Switches

For Broadcom-supported BES-53248 switches

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Migrating to a two-node switched cluster with Broadcom-supported BES-53248 cluster switches

If you have a two-node switchless cluster, you can migrate, non-disruptively, to a two-node switched cluster that includes Broadcom-supported BES-53248 cluster switches. The procedure you use depends on whether you have two dedicated cluster-network ports on each controller or a single cluster port on each controller. The process documented works for all nodes using optical or twinax ports but is not supported on this switch if nodes are using onboard 10Gb BASE-T RJ45 ports for the cluster-network ports.

About this task

Most systems require two dedicated cluster-network ports on each controller.

Ensure that the BES-53248 cluster switch is set up as described in the *Switch Setup and Configuration Guide for Broadcom-supported BES-53248 switches* before starting this migration process.

Setting up and configuring

Note: After your migration completes, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for BES-53248 cluster switches.

See *Installing the Cluster Switch Health Monitor (CSHM) configuration file* in the *Setting up and configuring* guide.

Migrating to a switched NetApp cluster environment using Broadcom-supported BES-53248 cluster switches

If you have an existing two-node switchless cluster environment, you can migrate to a two-node switched cluster environment using Broadcom-supported BES-53248 cluster switches to enable you to scale beyond two nodes in the cluster.

Before you begin

Two-node switchless configuration:

- The two-node switchless configuration must be properly set up and functioning.
- The nodes must be running ONTAP 9.6 and later.
- All cluster ports must be in the **up** state.
- All cluster logical interfaces (LIFs) must be in the **up** state and on their home ports.

Broadcom-supported BES-53248 cluster switch configuration:

- The BES-53248 cluster switch must be fully functional on both switches.
- Both switches must have management network connectivity.
- There must be console access to the cluster switches.
- BES-53248 node-to-node switch and switch-to-switch connections must use twinax or fiber cables.
  The *NetApp Hardware Universe* contains more information about cabling.
  Hardware Universe - Switches

- Inter-Switch Link (ISL) cables must be connected to ports 0/55 and 0/56 on both BES-53248 switches.
- Initial customization of both the BES-53248 switches must be completed. So that the:
  - BES-53248 switches are running the latest version of software
  - BES-53248 switches have optional licenses installed, if purchased
  - Reference Configuration Files (RCFs) have been applied to the switches

  Any site customization, such as SMTP, SNMP, and SSH must be configured on the new switches.

About this task

The examples in this procedure use the following cluster switch and node nomenclature:

- The names of the BES-53248 switches are *cs1* and *cs2*.
- The names of the cluster SVMs are *node1* and *node2*.
- The names of the LIFs are *node1_clus*1 and *node1_clus2* on node 1, and *node2_clus1* and *node2_clus2* on node 2 respectively.
- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports used in this procedure are *e0a* and *e0b*.
  The *Hardware Universe* contains the latest information about the actual cluster ports for your platforms.
  Hardware Universe

Steps

1. Change the privilege level to advanced, entering **y** when prompted to continue:

   `set -privilege advanced`

   The advanced prompt (`*>`) appears.

2. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message:

   `system node autosupport invoke -node * -type all -message MAINT=`*`x`***`h`**

   where *x* is the duration of the maintenance window in hours.

   Note: The AutoSupport message notifies technical support of this maintenance task so that automatic case creation is suppressed during the maintenance window.

   #### Example

   The following command suppresses automatic case creation for two hours:

   ```
   cluster1::*> system node autosupport invoke -node * -type all -message MAINT=2h
   ```

3. Disable all node-facing ports (not ISL ports) on both the new cluster switches cs1 and cs2.

   Note: You must not disable the ISL ports.

   #### Example

   The following example shows that node-facing ports 1 through 16 are disabled on switch cs1:

```
(cs1)# configure
(cs1)(Config)#   interface 0/1-0/16
(cs1)(Interface 0/1-0/16)# shutdown
(cs1)(Interface 0/1-0/16)# exit
(cs1)(Config)# exit
```

4. Verify that the ISL and the physical ports on the ISL between the two BES-53248 switches cs1 and cs2 are **up**:

   `show port-channel`

   Example

   The following example shows that the ISL ports are **up** on switch cs1:

```
(cs1)# show port-channel 1/1
Local Interface............................... 1/1
Channel Name.................................. Cluster-ISL
Link State.................................... Up
Admin Mode.................................... Enabled
Type.......................................... Dynamic
Port channel Min-links........................ 1
Load Balance Option........................... 7
(Enhanced hashing mode)

Mbr    Device/       Port       Port
Ports  Timeout       Speed      Active
------ ------------- ---------  -------
0/55   actor/long    100G Full  True
       partner/long
0/56   actor/long    100G Full  True
       partner/long
(cs1) #
```

   The following example shows that the ISL ports are **up** on switch cs2 :

```
(cs2)# show port-channel 1/1
Local Interface............................... 1/1
Channel Name.................................. Cluster-ISL
Link State.................................... Up
Admin Mode.................................... Enabled
Type.......................................... Dynamic
Port channel Min-links........................ 1
Load Balance Option........................... 7
(Enhanced hashing mode)

Mbr    Device/       Port       Port
Ports  Timeout       Speed      Active
------ ------------- ---------  -------
0/55   actor/long    100G Full  True
       partner/long
0/56   actor/long    100G Full  True
       partner/long
(cs2) #
```

5. Display the list of neighboring devices:

   `show isdp neighbors`

   This command provides information about the devices that are connected to the system.

   Example

   The following example lists the neighboring devices on switch cs1:

```
(cs1)# show isdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge,
                  S - Switch, H - Host, I - IGMP, r - Repeater
Device ID      Intf     Holdtime  Capability   Platform    Port ID
-------------- -------- --------- ------------ ----------- ---------
cs2            0/55     176       R            BES-53248   0/55
cs2            0/56     176       R            BES-53248   0/56
```

The following example lists the neighboring devices on switch cs2:

```
(cs2)# show isdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge,
                  S - Switch, H - Host, I - IGMP, r - Repeater
Device ID      Intf     Holdtime  Capability   Platform    Port ID
-------------- -------- --------- ------------ ----------- ---------
cs2            0/55     176       R            BES-53248   0/55
cs2            0/56     176       R            BES-53248   0/56
```

6. Verify that all cluster ports are **up**:

   `network port show -ipspace Cluster`

   Each port should display **up** for `Link` and **healthy** for `Health Status`.

   Example

```
cluster1::*> network port show -ipspace Cluster

Node: node1

                                                  Speed(Mbps) Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
--------- ------------ ---------------- ---- ---- ----------- --------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy
e0b       Cluster      Cluster          up   9000  auto/10000 healthy

Node: node2

                                                  Speed(Mbps) Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
--------- ------------ ---------------- ---- ---- ----------- --------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy
e0b       Cluster      Cluster          up   9000  auto/10000 healthy

4 entries were displayed.
```

7. Verify that all cluster LIFs are **up** and operational:

   `network interface show -vserver Cluster`

   Each cluster LIF should display **`true`** for `Is Home` and have a `Status Admin/Oper` of **`up/up`**

   Example

```
cluster1::*> network interface show -vserver Cluster

            Logical    Status     Network            Current       Current Is
Vserver     Interface  Admin/Oper Address/Mask       Node          Port    Home
----------- ---------- ---------- ------------------ ------------- ------- -----
Cluster
            node1_clus1  up/up    169.254.209.69/16  node1         e0a     true
            node1_clus2  up/up    169.254.49.125/16  node1         e0b     true
            node2_clus1  up/up    169.254.47.194/16  node2         e0a     true
            node2_clus2  up/up    169.254.19.183/16  node2         e0b     true
4 entries were displayed.
```

8. Verify that `auto-revert` is enabled on all cluster LIFs:

   `network interface show -vserver Cluster -fields auto-revert`

   Example

```
cluster1::*> network interface show -vserver Cluster -fields auto-revert

          Logical
Vserver   Interface     Auto-revert
--------- ------------- ------------
Cluster
          node1_clus1   true
          node1_clus2   true
```

```
          node2_clus1   true
          node2_clus2   true

4 entries were displayed.
```

9. Disconnect the cable from cluster port e0a on node1, and then connect e0a to port 1 on cluster switch cs1, using the appropriate cabling supported by the BES-53248 switches.

   The *NetApp Hardware Universe* contains more information about cabling.

   Hardware Universe - Switches

10. Disconnect the cable from cluster port e0a on node2, and then connect e0a to port 2 on cluster switch cs1, using the appropriate cabling supported by the BES-53248 switches.

11. Enable all node-facing ports on cluster switch cs1.

    Example

    The following example shows that ports 1 through 16 are enabled on switch cs1:

```
(cs1)#  configure
(cs1)(Config)#  interface 0/1-0/16
(cs1)(Interface 0/1-0/16)# no shutdown
(cs1)(Interface 0/1-0/16)# exit
(cs1)(Config)# exit
```

12. Verify that all cluster LIFs are **up**, operational, and display as **true** for `Is Home`:

    `network interface show -vserver Cluster`

    Example

    The following example shows that all of the LIFs are **up** on node1 and node2 and that `Is Home` results are **true**:

```
cluster1::*> network interface show -vserver Cluster

         Logical      Status     Network            Current     Current Is
Vserver  Interface    Admin/Oper Address/Mask       Node        Port    Home
-------- ------------ ---------- ------------------ ----------- ------- ----
Cluster
         node1_clus1  up/up      169.254.209.69/16  node1       e0a     true
         node1_clus2  up/up      169.254.49.125/16  node1       e0b     true
         node2_clus1  up/up      169.254.47.194/16  node2       e0a     true
         node2_clus2  up/up      169.254.19.183/16  node2       e0b     true

4 entries were displayed.
```

13. Display information about the status of the nodes in the cluster:

    `cluster show`

    Example

    The following example displays information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show

Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------  ------------
node1                true    true          false
node2                true    true          false

2 entries were displayed.
```

14. Disconnect the cable from cluster port e0b on node1, and then connect e0b to port 1 on cluster switch cs2, using the appropriate cabling supported by the BES-53248 switches.
15. Disconnect the cable from cluster port e0b on node2, and then connect e0b to port 2 on cluster switch cs2, using the appropriate cabling supported by the BES-53248 switches.
16. Enable all node-facing ports on cluster switch cs2.

    Example

    The following example shows that ports 1 through 16 are enabled on switch cs2:

```
(cs2)# configure
(cs2)(Config)#  interface 0/1-0/16
(cs2)(Interface 0/1-0/16)# no shutdown
(cs2)(Interface 0/1-0/16)# exit
(cs2)(Config)# exit
```

17. Verify that all cluster ports are **up**:

    network port show -ipspace Cluster

    Example

    The following example shows that all of the cluster ports are **up** on node1 and node2:

```
cluster1::*> network port show -ipspace Cluster

Node: node1
                                                                        Ignore
                                                  Speed(Mbps) Health    Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status    Status
--------- ------------ ---------------- ---- ---- ----------- --------- ------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000 healthy  false

Node: node2
                                                                        Ignore
                                                  Speed(Mbps) Health    Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status    Status
--------- ------------ ---------------- ---- ---- ----------- --------- ------
e0a       Cluster      Cluster          up   9000  auto/10000 healthy  false
e0b       Cluster      Cluster          up   9000  auto/10000 healthy  false

4 entries were displayed.
```

18. Verify that all interfaces display **true** for `Is Home`:

    network interface show -vserver Cluster

    Note: This might take several minutes to complete.

    Example

    The following example shows that all LIFs are **up** on node1 and node2 and that `Is Home` results are **true**:

```
cluster1::*> network interface show -vserver Cluster

          Logical      Status     Network            Current    Current Is
Vserver   Interface    Admin/Oper Address/Mask       Node       Port    Home
--------- ------------ ---------- ------------------ ---------- ------- ----
Cluster
          node1_clus1  up/up      169.254.209.69/16  node1      e0a     true
          node1_clus2  up/up      169.254.49.125/16  node1      e0b     true
          node2_clus1  up/up      169.254.47.194/16  node2      e0a     true
          node2_clus2  up/up      169.254.19.183/16  node2      e0b     true

4 entries were displayed.
```

19. Verify that both nodes each have one connection to each switch:

`show isdp neighbors`

Example

The following example shows the appropriate results for both switches:

```
(cs1)# show isdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge,
                  S - Switch, H - Host, I - IGMP, r - Repeater
Device ID      Intf         Holdtime  Capability   Platform -- Port ID
-------------- ------------ --------- ------------ ----------- ----------
node1          0/1          175       H            FAS2750     e0a
node2          0/2          157       H            FAS2750     e0a
cs2            0/55         178       R            BES-53248   0/55
cs2            0/56         178       R            BES-53248   0/56


(cs2)# show isdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge,
                  S - Switch, H - Host, I - IGMP, r - Repeater
Device ID      Intf         Holdtime  Capability   Platform    Port ID
-------------- ------------ --------- ------------ ----------- ------------
node1          0/1          137       H            FAS2750     e0b
node2          0/2          179       H            FAS2750     e0b
cs1            0/55         175       R            BES-53248   0/55
cs1            0/56         175       R            BES-53248   0/56
```

20. Display information about the discovered network devices in your cluster:

`network device-discovery show -protocol cdp`

Example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface         Platform
----------- ------ ------------------------- ----------------  ----------------
node2      /cdp
            e0a    cs1                       0/2               BES-53248
            e0b    cs2                       0/2               BES-53248
node1      /cdp
            e0a    cs1                       0/1               BES-53248
            e0b    cs2                       0/1               BES-53248

4 entries were displayed.
```

21. Verify that the settings are disabled:

`network options switchless-cluster show`

Note: It might take several minutes for the command to complete. Wait for the '3 minute lifetime to expire' announcement.

Example

The `false` output in the following example shows that the configuration settings are disabled:

```
cluster1::*> network options switchless-cluster show
Enable Switchless Cluster: false
```

22. Verify the status of the node members in the cluster:

`cluster show`

Example

The following example shows information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show

Node                 Health  Eligibility   Epsilon
-------------------- ------- ------------  --------
node1                true    true          false
node2                true    true          false
```

23. Ensure that the cluster network has full connectivity using the command:

`cluster ping-cluster -node node-name`

Example

```
cluster1::*> cluster ping-cluster -node local

Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 192.168.168.26 node1 e0a
Cluster node1_clus2 192.168.168.27 node1 e0b
Cluster node2_clus1 192.168.168.28 node2 e0a
Cluster node2_clus2 192.168.168.29 node2 e0b
Local = 192.168.168.28 192.168.168.29
Remote = 192.168.168.26 192.168.168.27
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 1500 byte MTU on 4 path(s):
    Local 192.168.168.28 to Remote 192.168.168.26
    Local 192.168.168.28 to Remote 192.168.168.27
    Local 192.168.168.29 to Remote 192.168.168.26
    Local 192.168.168.29 to Remote 192.168.168.27
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

24. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message:

`system node autosupport invoke -node * -type all -message MAINT=END`

Example

```
cluster1::*> system node autosupport invoke -node * -type all -message MAINT=END
```

25. Change the privilege level back to admin:

`set -privilege admin`

Related information

Hardware Universe

Setting up and configuring

NetApp KB Article 1000275: How to suppress automatic case creation during scheduled maintenance windows

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