Cisco® Nexus Switches

Migrating to a Two-Node Switched Cluster

For Cisco Nexus 92300YC switches

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Contents

Migrating to a two-node switched cluster with Cisco Nexus 92300YC switches

You must be aware of certain configuration information, port connections, and cabling requirements when you migrate a two-node switchless cluster, non-disruptively, to a cluster with Cisco Nexus 92300YC 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.

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

Note: After your migration completes, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for 92300YC cluster switches. See *Installing the Cluster Switch Health Monitor (CSHM) configuration file for 92300YC switches* in the *Setting up* guide.

Migrating to a switched NetApp cluster environment using Cisco Nexus 92300YC switches

If you have an existing two-node switchless cluster environment, you can migrate to a two-node switched cluster environment using Cisco Nexus 92300YC 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.

Cisco Nexus 92300YC switch configuration:

- Both switches must have management network connectivity.
- There must be console access to the cluster switches.
- Nexus 92300YC 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 1/65 and 1/66 on both 92300YC switches.
- Initial customization of both the 92300YC switches must be completed. So that the:
  - 92300YC switches are running the latest version of software
  - 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 92300YC 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.

   You must not disable the ISL ports.

   #### Example

   The following example shows that node-facing ports 1 through 64 are disabled on switch cs1:

   ```
   cs1# config
   Enter configuration commands, one per line. End with CNTL/Z.
   cs1(config)# interface e/1-64
   cs1(config-if-range)# shutdown
   ```

4. Verify that the ISL and the physical ports on the ISL between the two 92300YC switches cs1 and cs2 are **up** on ports 1/65 and 1/66:

   show port-channel summary

   #### Example

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

```
cs1# show port-channel summary

Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------------
Group Port-       Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
1     Po1(SU)     Eth      LACP      Eth1/65(P)   Eth1/66(P)
```

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

```
(cs2)# show port-channel summary

Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------------
Group Port-       Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
1     Po1(SU)     Eth      LACP      Eth1/65(P)   Eth1/66(P)
```

5. Display the list of neighboring devices:

   `show cdp 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 cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform      Port ID
cs2(FDO220329V5)    Eth1/65        175    R S I s   N9K-C92300YC  Eth1/65
cs2(FDO220329V5)    Eth1/66        175    R S I s   N9K-C92300YC  Eth1/66

Total entries displayed: 2
```

   The following example lists the neighboring devices on switch cs2:

```
cs2# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform      Port ID
cs1(FDO220329KU)    Eth1/65        177    R S I s   N9K-C92300YC  Eth1/65
cs1(FDO220329KU)    Eth1/66        177    R S I s   N9K-C92300YC  Eth1/66

Total entries displayed: 2
```

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 92300YC 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 92300YC switches.

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

Example

The following example shows that ports 1/1 through 1/64 are enabled on switch cs1:

```
cs1# config
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/1-64
cs1(config-if-range)# no shutdown
```

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 92300YC 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 92300YC switches.

16. Enable all node-facing ports on cluster switch cs2.

Example

The following example shows that ports 1/1 through 1/64 are enabled on switch cs2:

```
cs2# config
Enter configuration commands, one per line. End with CNTL/Z.
cs2(config)# interface e1/1-64
cs2(config-if-range)# no shutdown
```

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 cdp neighbors`

Example

The following example shows the appropriate results for both switches:

```
(cs1)# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform      Port ID
node1               Eth1/1         133    H         FAS2980       e0a
node2               Eth1/2         133    H         FAS2980       e0a
cs2(FDO220329V5)    Eth1/65        175    R S I s   N9K-C92300YC  Eth1/65
cs2(FDO220329V5)    Eth1/66        175    R S I s   N9K-C92300YC  Eth1/66

Total entries displayed: 4
```

```
(cs2)# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform      Port ID
node1               Eth1/1         133    H         FAS2980       e0b
node2               Eth1/2         133    H         FAS2980       e0b
cs1(FDO220329KU)
                    Eth1/65        175    R S I s   N9K-C92300YC  Eth1/65
cs1(FDO220329KU)
                    Eth1/66        175    R S I s   N9K-C92300YC  Eth1/66

Total entries displayed: 4
```

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               N9K-C92300YC
            e0b    cs2                       0/2               N9K-C92300YC
node1      /cdp
            e0a    cs1                       0/1               N9K-C92300YC
            e0b    cs2                       0/1               N9K-C92300YC

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:

`cluster ping-cluster -node` *`node-name`*

Example

```
cluster1::*> cluster ping-cluster -node node2
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 e0b
Local = 169.254.47.194 169.254.19.183
Remote = 169.254.209.69 169.254.49.125
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 9000 byte MTU on 4 path(s):
Local 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
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`

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