



# **Migrate to a two-node switched cluster with Cisco Nexus 9336C-FX2 cluster switches**

## ONTAP Systems Switches

NetApp  
November 18, 2021

This PDF was generated from <https://docs.netapp.com/us-en/ontap-systems-switches/switch-cisco-9336/migrate-to-2n-switched-overview.html> on November 18, 2021. Always check docs.netapp.com for the latest.

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# Migrate to a two-node switched cluster with Cisco Nexus 9336C-FX2 cluster switches

## Migrate to a two-node switched cluster with Cisco Nexus 9336C-FX2 cluster 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 9336C-FX2 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. See [Cisco Ethernet switches](#)

## How to migrate to a switched NetApp cluster environment with Cisco Nexus 9336C-FX2 cluster switches

If you have an existing two-node switchless cluster environment, you can migrate to a two-node switched cluster environment using Cisco Nexus 9336C-FX2 switches to enable you to scale beyond two nodes in the cluster.

Two-node switchless configuration:

- The two-node switchless configuration must be properly set up and functioning.
- The nodes must be running ONTAP 9.8 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 9336C-FX2 switch configuration:

- Both switches must have management network connectivity.
- There must be console access to the cluster switches.
- Nexus 9336C-FX2 node-to-node switch and switch-to-switch connections must use Twinax or fiber cables.

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

[Hardware Universe - Switches](#)

- Inter-Switch Link (ISL) cables must be connected to ports 1/35 and 1/36 on both 9336C-FX2 switches.
- Initial customization of both the 9336C-FX2 switches must be completed. So that the:
  - 9336C-FX2 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.

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

- The names of the 9336C-FX2 switches are cs1 and cs2.
- The names of the cluster SVMs are node1 and node2.
- The names of the LIFs are node1\_clus1 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

1. 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=xh`

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



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

2. Change the privilege level to advanced, entering y when prompted to continue: `set -privilege advanced`

The advanced prompt (`*>`) appears.

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.

The following example shows that node-facing ports 1 through 34 are disabled on switch cs1:

```
cs1# **config**
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# **interface e/1-34**
cs1(config-if-range)# **shutdown**
```

4. Verify that the ISL and the physical ports on the ISL between the two 9336C-FX2 switches cs1 and cs2 are up on ports 1/35 and 1/36: `show port-channel summary`

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      Eth1/35(P)  Eth1/36(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      Eth1/35(P)  Eth1/36(P)

```

5. Display the list of neighboring devices: show cdp neighbors

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

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                Eth1/35        175     R S I s     N9K-C9336C
Eth1/35
cs2                Eth1/36        175     R S I s     N9K-C9336C
Eth1/36

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                Eth1/35        177     R S I s     N9K-C9336C
Eth1/35
cs1                ) Eth1/36        177     R S I s     N9K-C9336C
Eth1/36

Total entries displayed: 2

```

6. Verify that all cluster ports are up: `network port show -ip space Cluster`

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

```

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

Node: node1

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

Node: node2

Port          IPspace      Broadcast  Domain  Link  MTU  Speed(Mbps)  Health
-----
-----
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`

```

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

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

4 entries were displayed.

```

- Verify that auto-revert is enabled on all cluster LIFs: `network interface show -vserver Cluster -fields auto-revert`

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

Vserver	Logical Interface	Auto-revert
Cluster	node1_clus1	true
	node1_clus2	true
	node2_clus1	true
	node2_clus2	true

```
4 entries were displayed.
```

- 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 9336C-FX2 switches.

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

#### [Hardware Universe - Switches](#)

- 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 9336C-FX2 switches.
- Enable all node-facing ports on cluster switch cs1.

The following example shows that ports 1/1 through 1/34 are enabled on switch cs1:

```
cs1# **config**
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# **interface e1/1-34**
cs1(config-if-range)# **no shutdown**
```

- Verify that all cluster LIFs are up, operational, and display as true for `Is Home:network interface show -vserver Cluster`

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
true     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

4 entries were displayed.

```

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

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 9336C-FX2 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 9336C-FX2 switches.
16. Enable all node-facing ports on cluster switch cs2.

The following example shows that ports 1/1 through 1/34 are enabled on switch cs2:

```

cs2# **config**
Enter configuration commands, one per line. End with CNTL/Z.
cs2(config)# **interface e1/1-34**
cs2(config-if-range)# **no shutdown**

```

17. Verify that all cluster ports are up: `network port show -ipSPACE Cluster`

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

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

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`



This might take several minutes to complete.

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**
```

Current Is	Logical	Status	Network	Current	
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
	-----	-----	-----	-----	
Cluster					
true	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

4 entries were displayed.

19. Verify that both nodes each have one connection to each switch: `show cdp neighbors`

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                Eth1/35        175    R S I s        N9K-C9336C
Eth1/35
cs2                Eth1/36        175    R S I s        N9K-C9336C
Eth1/36

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                Eth1/35        175    R S I s        N9K-C9336C
Eth1/35
cs1                Eth1/36        175    R S I s        N9K-C9336C
Eth1/36

Total entries displayed: 4
```

20. Display information about the discovered network devices in your cluster: network device-discovery show -protocol cdp

```

cluster1::*> **network device-discovery show -protocol cdp**
Node/          Local  Discovered
Protocol      Port   Device (LLDP: ChassisID)  Interface
Platform
-----
node2         /cdp
              e0a   cs1                       0/2           N9K-
C9336C
              e0b   cs2                       0/2           N9K-
C9336C
node1         /cdp
              e0a   cs1                       0/1           N9K-
C9336C
              e0b   cs2                       0/1           N9K-
C9336C

4 entries were displayed.

```

21. Verify that the settings are disabled: `network options switchless-cluster show`



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

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`

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`

```
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. Change the privilege level back to admin: `set -privilege admin`
25. For ONTAP 9.8 and later, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system switch ethernet log setup-password`system switch ethernet log enable-collection`

```

cluster1::*> **system switch ethernet log setup-password**
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> **system switch ethernet log setup-password**

Enter the switch name: **cs1**
RSA key fingerprint is
e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system switch ethernet log setup-password**

Enter the switch name: **cs2**
RSA key fingerprint is
57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system switch ethernet log enable-collection**

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] **y**

Enabling cluster switch log collection.

cluster1::*>

```



If any of these commands return an error, contact NetApp support.

26. For ONTAP releases 9.5P16, 9.6P12, and 9.7P10 and later patch releases, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands:
 

```

system cluster-switch log setup-password`system cluster-switch log enable-collection

```

```

cluster1::*> **system cluster-switch log setup-password**
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> **system cluster-switch log setup-password**

Enter the switch name: **cs1**
RSA key fingerprint is
e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system cluster-switch log setup-password**

Enter the switch name: **cs2**
RSA key fingerprint is
57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] **y**

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster1::*> **system cluster-switch log enable-collection**

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] **y**

Enabling cluster switch log collection.

cluster1::*>

```



If any of these commands return an error, contact NetApp support.

27. If you suppressed automatic case creation, reenale it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`



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