



Migrate from a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches

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Migrate from a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches

You must be aware of certain configuration information, port connections, and cabling requirements when you migrate a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches.

The [Cisco Ethernet Switches](#) page has information about the ONTAP and NX-OS versions supported in this procedure.

You must have the following before you begin the migration process:

- Available ports for node connections

The cluster switches use the Inter-Switch Link (ISL) ports e1/31-32. -

- Appropriate cables for cluster connections:
 - The nodes with 10 GbE cluster connections require QSFP optical modules with breakout fiber cables or QSFP to SFP+ copper breakout cables.
 - The nodes with 40/100 GbE cluster connections require supported QSFP/ QSFP28 optical modules with fiber cables or QSFP/QSFP28 copper direct-attach cables.
 - The cluster switches require the appropriate ISL cabling: 2x QSFP28 fiber or copper direct-attach cables.



See the [Hardware Universe](#) for further information on cabling systems with Nexus 3232C switches.

How to migrate from a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches

If you have a two-node switchless cluster, you can migrate nondisruptively to a two-node switched cluster that includes Cisco Nexus 3232C cluster network switches.

Before you begin

- The configurations must be properly set up and functioning.

The two nodes must be connected and functioning in a two-node switchless cluster setting.

- All cluster ports must be in the `up` state.
- The Cisco Nexus 3232C cluster switch must be supported.
- The existing cluster network configuration must have the following:
 - A redundant and fully functional Nexus 3232C cluster infrastructure on both switches
 - The latest RCF and NX-OS versions on your switches
 - Management connectivity on both switches
 - Console access to both switches

- All cluster logical interfaces (LIFs) in the up state without having been migrated
- Initial customization of the switch
- All ISL ports enabled and cabled

About this task

Procedure summary

- I. Display and migrate physical and logical ports (Steps 1-10)
- II. Shut down the reassigned LIFs and disconnect the cables (Steps 11-14)
- III. Enable the cluster ports (Steps 15-20)
- IV. Enable the reassigned LIFs (Steps 21-33)

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

- Nexus 3232C cluster switches, C1 and C2.
- The nodes are n1 and n2.



The examples in this procedure use two nodes, each utilizing two 40 GbE cluster interconnect ports e4a and e4e. The [Hardware Universe](#) has details about the cluster ports on your platforms.

- n1_clus1 is the first cluster logical interface (LIF) to be connected to cluster switch C1 for node n1.
- n1_clus2 is the first cluster LIF to be connected to cluster switch C2 for node n1.
- n2_clus1 is the first cluster LIF to be connected to cluster switch C1 for node n2.
- n2_clus2 is the second cluster LIF to be connected to cluster switch C2 for node n2.
- The number of 10 GbE and 40/100 GbE ports are defined in the reference configuration files (RCFs) available on the [Cisco® Cluster Network Switch Reference Configuration File Download](#) page.



The procedure requires the use of both ONTAP commands and Cisco Nexus 3000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

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
```

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. Determine the administrative or operational status for each cluster interface:
 - a. Display the network port attributes:

```
network port show -role cluster
```

```

cluster::*> network port show -role cluster
(network port show)
Node: n1

Ignore
Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
-----
-----
e4a       Cluster      Cluster      up    9000 auto/40000  -
e4e       Cluster      Cluster      up    9000 auto/40000  -
-
Node: n2

Ignore
Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
-----
-----
e4a       Cluster      Cluster      up    9000 auto/40000  -
e4e       Cluster      Cluster      up    9000 auto/40000  -
4 entries were displayed.

```

b. Display information about the logical interfaces and their designated home nodes:

```
network interface show -role cluster
```

```
cluster::*> network interface show -role cluster
(network interface show)
Current Is
Vserver      Logical      Status      Network      Current
Port      Home
-----
Cluster
e4a      true      n1_clus1      up/up      10.10.0.1/24      n1
e4e      true      n1_clus2      up/up      10.10.0.2/24      n1
e4a      true      n2_clus1      up/up      10.10.0.3/24      n2
e4e      true      n2_clus2      up/up      10.10.0.4/24      n2

4 entries were displayed.
```

c. Verify that switchless cluster detection is enabled using the advanced privilege command:

```
network options detect-switchless-cluster show`
```

The output in the following example shows that switchless cluster detection is enabled:

```
cluster::*> network options detect-switchless-cluster show
Enable Switchless Cluster Detection: true
```

3. Verify that the appropriate RCFs and image are installed on the new 3232C switches and make any necessary site customizations such as adding users, passwords, and network addresses.

You must prepare both switches at this time. If you need to upgrade the RCF and image software, you must follow these steps:

- a. Go to the *Cisco Ethernet Switches* page on the NetApp Support Site.

[Cisco Ethernet Switches](#)

- b. Note your switch and the required software versions in the table on that page.
- c. Download the appropriate version of RCF.
- d. Click **CONTINUE** on the **Description** page, accept the license agreement, and then follow the instructions on the **Download** page to download the RCF.
- e. Download the appropriate version of the image software.

[Cisco Cluster and Management Network Switch Reference Configuration File download page](#)

4. Click **CONTINUE** on the **Description** page, accept the license agreement, and then follow the instructions on the **Download** page to download the RCF.
5. On Nexus 3232C switches C1 and C2, disable all node-facing ports C1 and C2, but do not disable the ISL ports e1/31-32.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

The following example shows ports 1 through 30 being disabled on Nexus 3232C cluster switches C1 and C2 using a configuration supported in RCF NX3232_RCF_v1.0_24p10g_24p100g.txt:

```
C1# copy running-config startup-config
[#####] 100% Copy complete.
C1# configure
C1(config)# int e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-4,e1/5/1-4,e1/6/1-4,e1/7-30
C1(config-if-range)# shutdown
C1(config-if-range)# exit
C1(config)# exit
C2# copy running-config startup-config
[#####] 100% Copy complete.
C2# configure
C2(config)# int e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-4,e1/5/1-4,e1/6/1-4,e1/7-30
C2(config-if-range)# shutdown
C2(config-if-range)# exit
C2(config)# exit
```

6. Connect ports 1/31 and 1/32 on C1 to the same ports on C2 using supported cabling.
7. Verify that the ISL ports are operational on C1 and C2:

```
show port-channel summary
```

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

The following example shows the Cisco `show port-channel summary` command being used to verify the ISL ports are operational on C1 and C2:

```

C1# 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
      S - Switched        R - Routed
      U - Up (port-channel)
      M - Not in use. Min-links not met
-----
-----
      Port-
Group Channel          Type   Protocol  Member Ports
-----
-----
1      Po1 (SU)         Eth    LACP      Eth1/31 (P)  Eth1/32 (P)

C2# 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
      S - Switched        R - Routed
      U - Up (port-channel)
      M - Not in use. Min-links not met
-----
-----
Group Port-          Type   Protocol  Member Ports
  Channel
-----
-----
1      Po1 (SU)         Eth    LACP      Eth1/31 (P)  Eth1/32 (P)

```

8. Display the list of neighboring devices on the switch.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

The following example shows the Cisco command `show cdp neighbors` being used to display the neighboring devices on the switch:


```

C1# 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
C2                  Eth1/31      174    R S I s          N3K-C3232C    Eth1/31
C2                  Eth1/32      174    R S I s          N3K-C3232C    Eth1/32
Total entries displayed: 2
C2# 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
C1                  Eth1/31      178    R S I s          N3K-C3232C    Eth1/31
C1                  Eth1/32      178    R S I s          N3K-C3232C    Eth1/32
Total entries displayed: 2

```

9. Display the cluster port connectivity on each node:

```
network device-discovery show
```

The following example shows the cluster port connectivity displayed for a two-node switchless cluster configuration:

```

cluster::*> network device-discovery show

```

Node	Local Port	Discovered Device	Interface	Platform
n1	/cdp			
	e4a	n2	e4a	FAS9000
	e4e	n2	e4e	FAS9000
n2	/cdp			
	e4a	n1	e4a	FAS9000
	e4e	n1	e4e	FAS9000

10. Migrate the n1_clus1 and n2_clus1 LIFs to the physical ports of their destination nodes:

```
network interface migrate -vserver cluster -lif lif-name source-node source-
node-name -destination-port destination-port-name
```

You must execute the command for each local node as shown in the following example:

```
cluster::*> network interface migrate -vserver cluster -lif n1_clus1
-source-node n1
-destination-node n1 -destination-port e4e
cluster::*> network interface migrate -vserver cluster -lif n2_clus1
-source-node n2
-destination-node n2 -destination-port e4e
```

11. Verify the cluster interfaces have successfully migrated:

```
network interface show -role cluster
```

The following example shows the "Is Home" status for the n1_clus1 and n2_clus1 LIFs has become "false" after the migration is completed:

```
cluster::*> network interface show -role cluster
(network interface show)
```

Current Is Home	Logical Interface	Status Admin/Oper	Network Address/Mask	Current Node	Port
Cluster	n1_clus1	up/up	10.10.0.1/24	n1	e4e
false	n1_clus2	up/up	10.10.0.2/24	n1	e4e
true	n2_clus1	up/up	10.10.0.3/24	n2	e4e
false	n2_clus2	up/up	10.10.0.4/24	n2	e4e
true					

4 entries were displayed.

12. Shut down cluster ports for the n1_clus1 and n2_clus1 LIFs, which were migrated in step 9:

```
network port modify -node node-name -port port-name -up-admin false
```

You must execute the command for each port as shown in the following example:

```
cluster::*> network port modify -node n1 -port e4a -up-admin false
cluster::*> network port modify -node n2 -port e4a -up-admin false
```

13. Ping the remote cluster interfaces and perform an RPC server check:

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

The following example shows node n1 being pinged and the RPC status indicated afterward:

```
cluster::*> cluster ping-cluster -node n1

Host is n1 Getting addresses from network interface table...
Cluster n1_clus1 n1          e4a    10.10.0.1
Cluster n1_clus2 n1          e4e    10.10.0.2
Cluster n2_clus1 n2          e4a    10.10.0.3
Cluster n2_clus2 n2          e4e    10.10.0.4
Local = 10.10.0.1 10.10.0.2
Remote = 10.10.0.3 10.10.0.4
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 32 path(s):
    Local 10.10.0.1 to Remote 10.10.0.3
    Local 10.10.0.1 to Remote 10.10.0.4
    Local 10.10.0.2 to Remote 10.10.0.3
    Local 10.10.0.2 to Remote 10.10.0.4
Larger than PMTU communication succeeds on 4 path(s) RPC status:
1 paths up, 0 paths down (tcp check)
1 paths up, 0 paths down (ucp check)
```

14. Disconnect the cable from e4a on node n1.

You can refer to the running configuration and connect the first 40 GbE port on the switch C1 (port 1/7 in this example) to e4a on n1 using cabling supported for Nexus 3232C switches.

15. Disconnect the cable from e4a on node n2.

You can refer to the running configuration and connect e4a to the next available 40 GbE port on C1, port 1/8, using supported cabling.

16. Enable all node-facing ports on C1.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

The following example shows ports 1 through 30 being enabled on Nexus 3232C cluster switches C1 and C2 using the configuration supported in RCF NX3232_RCF_v1.0_24p10g_26p100g.txt:

```
C1# configure
C1(config)# int e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-4,e1/5/1-4,e1/6/1-4,e1/7-30
C1(config-if-range)# no shutdown
C1(config-if-range)# exit
C1(config)# exit
```

17. Enable the first cluster port, e4a, on each node:

```
network port modify -node node-name -port port-name -up-admin true
```

```
cluster::*> network port modify -node n1 -port e4a -up-admin true
cluster::*> network port modify -node n2 -port e4a -up-admin true
```

18. Verify that the clusters are up on both nodes:

```
network port show -role cluster
```

```
cluster::*> network port show -role cluster
(network port show)
Node: n1

Ignore

Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU   Admin/Oper  Status
Status
-----
-----
e4a       Cluster      Cluster      up    9000 auto/40000 -
e4e       Cluster      Cluster      up    9000 auto/40000 -

Node: n2

Ignore

Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU   Admin/Oper  Status
Status
-----
-----
e4a       Cluster      Cluster      up    9000 auto/40000 -
e4e       Cluster      Cluster      up    9000 auto/40000 -

4 entries were displayed.
```

19. For each node, revert all of the migrated cluster interconnect LIFs:

```
network interface revert -vserver cluster -lif lif-name
```

You must revert each LIF to its home port individually as shown in the following example:

```
cluster::*> network interface revert -vserver cluster -lif n1_clus1
cluster::*> network interface revert -vserver cluster -lif n2_clus1
```

20. Verify that all the LIFs are now reverted to their home ports:

```
network interface show -role cluster
```

The `Is Home` column should display a value of `true` for all of the ports listed in the `Current Port` column. If the displayed value is `false`, the port has not been reverted.

```
cluster::*> network interface show -role cluster
(network interface show)
Current Is
Vserver    Logical    Status    Network    Current
Home       Interface Admin/Oper Address/Mask Node        Port
-----
Cluster
true       n1_clus1   up/up     10.10.0.1/24 n1          e4a
true       n1_clus2   up/up     10.10.0.2/24 n1          e4e
true       n2_clus1   up/up     10.10.0.3/24 n2          e4a
true       n2_clus2   up/up     10.10.0.4/24 n2          e4e
true
4 entries were displayed.
```

21. Display the cluster port connectivity on each node:

```
network device-discovery show
```

```
cluster::*> network device-discovery show
Local   Discovered
Node    Port    Device    Interface    Platform
-----
n1      /cdp
        e4a     C1        Ethernet1/7   N3K-C3232C
        e4e     n2        e4e          FAS9000
n2      /cdp
        e4a     C1        Ethernet1/8   N3K-C3232C
        e4e     n1        e4e          FAS9000
```

22. Migrate clus2 to port e4a on the console of each node:

```
network interface migrate cluster -lif lif-name -source-node source-node-name
-destination-node destination-node-name -destination-port destination-port-
name
```

You must migrate each LIF to its home port individually as shown in the following example:

```
cluster::*> network interface migrate -vserver cluster -lif n1_clus2
-source-node n1
-destination-node n1 -destination-port e4a
cluster::*> network interface migrate -vserver cluster -lif n2_clus2
-source-node n2 -destination-node n2 -destination-port e4a
```

23. Shut down cluster ports clus2 LIF on both nodes:

```
network port modify
```

The following example shows the specified ports being set to `false`, shutting the ports down on both nodes:

```
cluster::*> network port modify -node n1 -port e4e -up-admin false
cluster::*> network port modify -node n2 -port e4e -up-admin false
```

24. Verify the cluster LIF status:

```
network interface show
```

```
cluster::*> network interface show -role cluster
(network interface show)
```

Current Is	Logical	Status	Network	Current	
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
-----	-----	-----	-----	-----	
-----	-----				
Cluster					
	n1_clus1	up/up	10.10.0.1/24	n1	e4a
true					
	n1_clus2	up/up	10.10.0.2/24	n1	e4a
false					
	n2_clus1	up/up	10.10.0.3/24	n2	e4a
true					
	n2_clus2	up/up	10.10.0.4/24	n2	e4a
false					

4 entries were displayed.

25. Disconnect the cable from e4e on node n1.

You can refer to the running configuration and connect the first 40 GbE port on switch C2 (port 1/7 in this example) to e4e on node n1, using the appropriate cabling for the Nexus 3232C switch model.

26. Disconnect the cable from e4e on node n2.

You can refer to the running configuration and connect e4e to the next available 40 GbE port on C2, port 1/8, using the appropriate cabling for the Nexus 3232C switch model.

27. Enable all node-facing ports on C2.

The following example shows ports 1 through 30 being enabled on Nexus 3132Q-V cluster switches C1 and C2 using a configuration supported in RCF NX3232C_RCF_v1.0_24p10g_26p100g.txt:

```
C2# configure
C2(config)# int e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-4,e1/5/1-4,e1/6/1-4,e1/7-30
C2(config-if-range)# no shutdown
C2(config-if-range)# exit
C2(config)# exit
```

28. Enable the second cluster port, e4e, on each node:

```
network port modify
```

The following example shows the second cluster port e4e being brought up on each node:

```
cluster::*> network port modify -node n1 -port e4e -up-admin true
cluster::*> network port modify -node n2 -port e4e -up-admin true
```

29. For each node, revert all of the migrated cluster interconnect LIFs: `network interface revert`

The following example shows the migrated LIFs being reverted to their home ports.

```
cluster::*> network interface revert -vserver Cluster -lif n1_clus2
cluster::*> network interface revert -vserver Cluster -lif n2_clus2
```

30. Verify that all of the cluster interconnect ports are now reverted to their home ports:

```
network interface show -role cluster
```

The `Is Home` column should display a value of `true` for all of the ports listed in the `Current Port` column. If the displayed value is `false`, the port has not been reverted.


```
cluster::*> network interface show -role cluster
(network interface show)
```

	Logical	Status	Network	Current	
Current Is					
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
-----	-----	-----	-----	-----	
-----	-----				
Cluster					
	n1_clus1	up/up	10.10.0.1/24	n1	e4a
true					
	n1_clus2	up/up	10.10.0.2/24	n1	e4e
true					
	n2_clus1	up/up	10.10.0.3/24	n2	e4a
true					
	n2_clus2	up/up	10.10.0.4/24	n2	e4e
true					
4 entries were displayed.					

31. Verify that all of the cluster interconnect ports are in the up state:

```
network port show -role cluster
```

32. Display the cluster switch port numbers through which each cluster port is connected to each node:

```
network device-discovery show
```

```
cluster::*> network device-discovery show
```

	Local	Discovered		
Node	Port	Device	Interface	Platform
-----	-----	-----	-----	-----
n1	/cdp			
	e4a	C1	Ethernet1/7	N3K-C3232C
	e4e	C2	Ethernet1/7	N3K-C3232C
n2	/cdp			
	e4a	C1	Ethernet1/8	N3K-C3232C
	e4e	C2	Ethernet1/8	N3K-C3232C

33. Display discovered and monitored cluster switches:

```
system cluster-switch show
```

```
cluster::*> system cluster-switch show
```

Switch	Type	Address	Model

C1	cluster-network	10.10.1.101	NX3232CV
Serial Number: FOX000001			
Is Monitored: true			
Reason:			
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1)			
Version Source: CDP			
C2	cluster-network	10.10.1.102	NX3232CV
Serial Number: FOX000002			
Is Monitored: true			
Reason:			
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1)			
Version Source: CDP 2 entries were displayed.			

34. Verify that switchless cluster detection changed the switchless cluster option to disabled:

```
network options switchless-cluster show`
```

35. Ping the remote cluster interfaces and perform an RPC server check:

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

```

cluster::*> cluster ping-cluster -node n1
Host is n1 Getting addresses from network interface table...
Cluster n1_clus1 n1      e4a    10.10.0.1
Cluster n1_clus2 n1      e4e    10.10.0.2
Cluster n2_clus1 n2      e4a    10.10.0.3
Cluster n2_clus2 n2      e4e    10.10.0.4
Local = 10.10.0.1 10.10.0.2
Remote = 10.10.0.3 10.10.0.4
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 32 path(s):
    Local 10.10.0.1 to Remote 10.10.0.3
    Local 10.10.0.1 to Remote 10.10.0.4
    Local 10.10.0.2 to Remote 10.10.0.3
    Local 10.10.0.2 to Remote 10.10.0.4
Larger than PMTU communication succeeds on 4 path(s) RPC status:
1 paths up, 0 paths down (tcp check)
1 paths up, 0 paths down (ucp check)

```

36. Enable the cluster switch health monitor log collection feature for collecting switch-related log files:

```
+system cluster-switch log setup-password
```

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

```

cluster::*> system cluster-switch log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
C1
C2

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

Enter the switch name: C1
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>

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

Enter the switch name: C2
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>

cluster::*> 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.

cluster::*>

```



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

37. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message:

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

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