



FabricPath vPC+

« FabricPath | VXLAN Underlay Infrastructure Routing »

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Note:

For CCIE DCv2 Rack Rentals, the FabricPath feature-set has been pre-installed by our initialization scripts.

FabricPath vPC+

Objective

- Configure active/active layer 2 bridging connectivity between your jumpbox servers using FabricPath between the 5K Leafs and the 7K Spines.

Task

- Configure FabricPath on the links connecting your 7Ks to 5Ks, and the links between the 5Ks.
- Statically set the FabricPath Switch-ID to the device number, e.g. 5K1 should be 51.
- Configure VLAN 10 as a FabricPath VLAN.
- Configure the 5Ks & 7Ks with SVIs in VLAN 10 with IP addresses 10.0.0.X/24, where X is the device number.
- Configure a vPC Domain between your 5Ks as follows:
 - Use vPC Domain 5
 - Use the MGMT0 IP address for the Peer-Keepalive
 - Use Port-Channel5 as the Peer-Link
 - Use the shared vPC+ Switch-ID 555
- Configure LACP Port-Channels 1 & 2 in VLAN 10 as vPC 1 & vPC 2 from the 5Ks towards their attached servers.
- Configure the servers with IP addresses 10.0.0.Y/24 on their Team interfaces, where Y is the server number.
- Once complete, your 5Ks and 7Ks should establish IS-IS adjacencies for FabricPath, and your servers should have IP connectivity to each other, the 5Ks, and the 7Ks.
- Traffic from the 7Ks to the servers should be load balanced between both 5K Leafs.

Configuration [Click to collapse](#)

```
N5K1
feature-set fabricpath
feature interface-vlan
feature lacp
feature vpc
!
vlan 10
  mode fabricpath
!
vpc domain 5
  peer-keepalive destination 192.168.0.52
  fabricpath switch-id 555
!
interface Vlan10
  no shutdown
  ip address 10.0.0.52/24
!
interface port-channel1
  switchport access vlan 10
  spanning-tree port type edge
  speed 10000
  vpc 1
!
interface port-channel2
  switchport access vlan 10
  spanning-tree port type edge
  speed 10000
  vpc 2
!
interface port-channel5
  switchport mode fabricpath
  speed 10000
  vpc peer-link
!
interface Ethernet1/1
  switchport access vlan 10
  channel-group 1 mode active
!
interface Ethernet1/2
  switchport access vlan 10
  channel-group 2 mode active
!
interface Ethernet1/3
  switchport mode fabricpath
  channel-group 5 mode active
!
interface Ethernet1/4
  switchport mode fabricpath
  channel-group 5 mode active
!
interface Ethernet1/5
  switchport mode fabricpath
!
interface Ethernet1/6
  switchport mode fabricpath
!
fabricpath switch-id 51
```

N5K2

```

feature-set fabricpath
feature interface-vlan
feature lacp
feature vpc
!
vlan 10
  mode fabricpath
!
vpc domain 5
  peer-keepalive destination 192.168.0.51
  fabricpath switch-id 555
!
interface Vlan10
  no shutdown
  ip address 10.0.0.51/24
!
interface port-channel1
  switchport access vlan 10
  spanning-tree port type edge
  speed 10000
  vpc 1
!
interface port-channel2
  switchport access vlan 10
  spanning-tree port type edge
  speed 10000
  vpc 2
!
interface port-channel5
  switchport mode fabricpath
  speed 10000
  vpc peer-link
!
interface Ethernet1/1
  switchport access vlan 10
  channel-group 1 mode active
!
interface Ethernet1/2
  switchport access vlan 10
  channel-group 2 mode active

interface Ethernet1/3
  switchport mode fabricpath
  channel-group 5 mode active

interface Ethernet1/4
  switchport mode fabricpath
  channel-group 5 mode active

interface Ethernet1/5
  switchport mode fabricpath

interface Ethernet1/6
  switchport mode fabricpath
!
fabricpath switch-id 52

N7K1
feature-set fabricpath
feature interface-vlan

vlan 10
  mode fabricpath

interface Vlan10
  no shutdown
  ip address 10.0.0.71/24

system default switchport
no system default switchport shutdown
system default switchport fabricpath

N7K2
feature-set fabricpath
feature interface-vlan

vlan 10
  mode fabricpath

interface Vlan10
  no shutdown
  ip address 10.0.0.72/24

system default switchport
no system default switchport shutdown
system default switchport fabricpath

```

Verification

```

N7K3# ping 10.0.0.13
PING 10.0.0.13 (10.0.0.13): 56 data bytes
36 bytes from 10.0.0.73: Destination Host Unreachable
Request 0 timed out
64 bytes from 10.0.0.13: icmp_seq=1 ttl=127 time=1.418 ms
64 bytes from 10.0.0.13: icmp_seq=2 ttl=127 time=0.776 ms
64 bytes from 10.0.0.13: icmp_seq=3 ttl=127 time=0.708 ms
64 bytes from 10.0.0.13: icmp_seq=4 ttl=127 time=0.744 ms

--- 10.0.0.13 ping statistics ---

```

```
5 packets transmitted, 4 packets received, 20.00% packet loss
round-trip min/avg/max = 0.708/0.911/1.418 ms
```

N7K3# ping 10.0.0.14

```
PING 10.0.0.14 (10.0.0.14): 56 data bytes
36 bytes from 10.0.0.73: Destination Host Unreachable
Request 0 timed out
64 bytes from 10.0.0.14: icmp_seq=1 ttl=127 time=1.46 ms
64 bytes from 10.0.0.14: icmp_seq=2 ttl=127 time=0.83 ms
64 bytes from 10.0.0.14: icmp_seq=3 ttl=127 time=0.87 ms
64 bytes from 10.0.0.14: icmp_seq=4 ttl=127 time=0.877 ms

--- 10.0.0.14 ping statistics ---
5 packets transmitted, 4 packets received, 20.00% packet loss
round-trip min/avg/max = 0.83/1.009/1.46 ms
```

N7K3# show ip arp

```
Flags: * - Adjacencies learnt on non-active FHRP router
+ - Adjacencies synced via CFSOE
# - Adjacencies Throttled for Glean
D - Static Adjacencies attached to down interface
```

IP ARP Table for context default

Total number of entries: 2

Address	Age	MAC Address	Interface
10.0.0.13	00:00:07	001b.2196.7679	Vlan10
10.0.0.14	0.370944	001b.2197.d7c5	Vlan10

N7K3# show mac address-table

Note: MAC table entries displayed are getting read from software.
Use the 'hardware-age' keyword to get information related to 'Age'

Legend:

* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
age - seconds since last seen, + - primary entry using vPC Peer-Link, E - EVPN entry
(T) - True, (F) - False, ~~~ - use 'hardware-age' keyword to retrieve age info

VLAN/BD	MAC Address	Type	age	Secure	NTFY	Ports/SWID.SSID.LID
G -	68bd.abd7.6047	static	-	F	F	sup-eth1(R)
G 10	68bd.abd7.6047	static	-	F	F	sup-eth1(R)
10	001b.2196.7679	dynamic	~~~	F	F	555.0.0
10	001b.2197.d7c5	dynamic	~~~	F	F	555.0.0

N7K3# show fabricpath route

FabricPath Unicast Route Table

'a/b/c' denotes ftag/switch-id/subswitch-id

'[x/y]' denotes [admin distance/metric]

ftag 0 is local ftag

subswitch-id 0 is default subswitch-id

FabricPath Unicast Route Table for Topology-Default

```
0/73/0, number of next-hops: 0
via ----, [60/0], 0 day/s 00:05:50, local
0/73/3, number of next-hops: 1
via sup-eth1, [81/0], 0 day/s 00:05:50, fpoam
1/53/0, number of next-hops: 1
via Eth1/11, [115/40], 0 day/s 00:11:42, isis_fabricpath-default
1/54/0, number of next-hops: 1
via Eth1/12, [115/40], 0 day/s 00:06:17, isis_fabricpath-default
1/74/0, number of next-hops: 2
via Eth1/9, [115/40], 0 day/s 00:05:44, isis_fabricpath-default
via Eth1/10, [115/40], 0 day/s 00:05:44, isis_fabricpath-default
1/555/0, number of next-hops: 2
via Eth1/11, [115/40], 0 day/s 00:05:54, isis_fabricpath-default
via Eth1/12, [115/40], 0 day/s 00:05:54, isis_fabricpath-default
```

N7K3# 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
DC1-Nexus-MGMT-SW	mgmt0	178	R S I	WS-C3750G-48T	Gig1/0/3
N7K4(TBM14311481)	Eth1/9	140	R S I s	N7K-C7010	Eth1/9
N7K4(TBM14311481)	Eth1/10	140	R S I s	N7K-C7010	Eth1/10
N5K3(FOC2021R1VX)	Eth1/11	159	R S I s	N5K-C5672UP	Eth1/5
N5K4(FOC2021R1W9)	Eth1/12	142	R S I s	N5K-C5672UP	Eth1/5

Total entries displayed: 5

N5K3# show vpc

Legend:

(*) - local vPC is down, forwarding via vPC peer-link

```
vPC domain id : 5
vPC+ switch id : 555
Peer status : peer adjacency formed ok
vPC keep-alive status : peer is alive
vPC fabricpath status : peer is reachable through fabricpath
Configuration consistency status : success
Per-vlan consistency status : success
Type-2 consistency status : success
vPC role : secondary
Number of vPCs configured : 2
Peer Gateway : Disabled
Dual-active excluded VLANs : -
Graceful Consistency Check : Enabled
```

Operational Layer3 Peer-router : Disabled
Auto-recovery status : Enabled (timeout = 240 seconds)

vPC Peer-link status

```
-----  
id  Port  Status Active vlans  
--  ---  -----  
1   Po5   up     10
```

vPC status

```
-----  
id  Port  Status Consistency Reason Active vlans vPC+ Attrib  
--  ---  -----  
1   Po1   up     success success 10 DF: Partial,  
FP MAC:  
555.0.0  
2   Po2   up     success success 10 DF: Partial,  
FP MAC:  
555.0.0
```

N5K3# show fabricpath switch-id

FABRICPATH SWITCH-ID TABLE

Legend: '*' - this system
'[E]' - local Emulated Switch-id
'[A]' - local Anycast Switch-id

Total Switch-ids: 6

```
=====
```

SWITCH-ID	SYSTEM-ID	FLAGS	STATE	STATIC	EMULATED/ ANYCAST
* 53	00de.fb12.1a3c	Primary	Confirmed	Yes	No
54	00de.fb06.f241	Primary	Confirmed	Yes	No
73	68bd.abd7.6047	Primary	Confirmed	Yes	No
74	0026.980c.2147	Primary	Confirmed	Yes	No
[E] 555	00de.fb12.1a3c	Primary	Confirmed	No	Yes
555	00de.fb06.f241	Primary	Confirmed	No	Yes

N5K4# show fabricpath switch-id

FABRICPATH SWITCH-ID TABLE

Legend: '*' - this system
'[E]' - local Emulated Switch-id
'[A]' - local Anycast Switch-id

Total Switch-ids: 6

```
=====
```

SWITCH-ID	SYSTEM-ID	FLAGS	STATE	STATIC	EMULATED/ ANYCAST
53	00de.fb12.1a3c	Primary	Confirmed	Yes	No
* 54	00de.fb06.f241	Primary	Confirmed	Yes	No
73	68bd.abd7.6047	Primary	Confirmed	Yes	No
74	0026.980c.2147	Primary	Confirmed	Yes	No
[E] 555	00de.fb06.f241	Primary	Confirmed	No	Yes
555	00de.fb12.1a3c	Primary	Confirmed	No	Yes

N7K3# show fabricpath switch-id

FABRICPATH SWITCH-ID TABLE

Legend: '*' - this system
'[E]' - local Emulated Switch-id
'[A]' - local Anycast Switch-id

Total Switch-ids: 6

```
=====
```

SWITCH-ID	SYSTEM-ID	FLAGS	STATE	STATIC	EMULATED/ ANYCAST
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54	00de.fb06.f241	Primary	Confirmed	Yes	No
* 73	68bd.abd7.6047	Primary	Confirmed	Yes	No
74	0026.980c.2147	Primary	Confirmed	Yes	No
555	00de.fb06.f241	Primary	Confirmed	No	Yes
555	00de.fb12.1a3c	Primary	Confirmed	No	Yes

N7K4# show fabricpath switch-id

FABRICPATH SWITCH-ID TABLE

Legend: '*' - this system
'[E]' - local Emulated Switch-id
'[A]' - local Anycast Switch-id

Total Switch-ids: 6

```
=====
```

SWITCH-ID	SYSTEM-ID	FLAGS	STATE	STATIC	EMULATED/ ANYCAST
53	00de.fb12.1a3c	Primary	Confirmed	Yes	No
54	00de.fb06.f241	Primary	Confirmed	Yes	No
73	68bd.abd7.6047	Primary	Confirmed	Yes	No
* 74	0026.980c.2147	Primary	Confirmed	Yes	No
555	00de.fb06.f241	Primary	Confirmed	No	Yes
555	00de.fb12.1a3c	Primary	Confirmed	No	Yes