Enhanced vPC (EvPC)

« FEX Active/Active Fabric vPC | FabricPath »

Last updated: January 27, 2017

Enhanced vPC (EvPC)

Note:

For information connecting to the KVM see Managing UCS C-Series Server Using CIMC

Objective

- Configure connectivity between the Nexus 5Ks and the dual attached UCS C series server via dual attached FEXes.

Task

- The UCS C server is pre-configured to use an LACP based NIC Team, and with the IP address 10.0.0.20**X**/24, where ***X*** is the server number (i.e. C200-1 is 10.0.0.201).
  - The GUI of the UCS C server can be accessed through the CIMC KVM and Windows RDP via the links on the jumpbox desktop link to "Z:\UCS C Servers". Both the CIMC and Windows credentials are cisco/cisco.
- Configure your 5Ks to communicate with the server as follows:
  - Configure the 5Ks in vPC domain 5.
  - Use the mgmt0 port as the vPC Peer Keepalive link.
  - Configure the links between the 5Ks as Port-Channel 5, and use this as the vPC Peer Link.
  - Configure the links from both 5Ks to the first 2K as Port-Channel 101, FEX number 101, and vPC 101.
  - Configure the links from both 5Ks to the second 2K as Port-Channel 102, FEX number 102, and vPC 102.
  - Configure the links from the FEXes to the server as Port-Channel 10 and an access port in VLAN 10.
  - Configure the links from your 5Ks to their directly attached servers as Port-Channel 1 & 2, and vPC 1 & 2 respectively; these Port-Channels should be access ports in VLAN 20.
- Configure layer 3 connectivity between the servers as follows:
  - Configure VLAN 10 & 20 SVIs on both your 5Ks with IP addresses 10.0.0.5**X**/24 and 20.0.0.5**X**/24 respectively, where ***X*** is the device number.
  - Configure HSRPv2 groups 10 & 20 on the SVIs using a VIP with the configured subnet and a host address of .254.
  - Configure the directly attached servers with an LACP NIC Team, and use the IP addresses 20.0.0.1**X**/24, where ***X*** is the server number, with a gateway address of the HSRP VIP.
- When complete, verify that you have IP connectivity to the UCS C server from both of your 5Ks and their directly attached servers.
- IP connectivity should be maintained between these three hosts in the event of any link failures from a FEX southbound to the UCS C server, northbound to the vPC Peers, or any combined node loss of a FEX or parent switch.

Configuration Click to *collapse*

N5K1:

```
feature interface-vlan
feature hsrp
feature lacp
feature vpc
feature fex
!
vlan 10,20
!
interface Vlan10
  no shutdown
  ip address 10.0.0.51/24
  hsrp version 2
  hsrp 10
    ip 10.0.0.254
!
interface Vlan20
  no shutdown
  ip address 20.0.0.51/24
  hsrp version 2
  hsrp 20
    ip 20.0.0.254
!
vpc domain 5
  peer-keepalive destination 192.168.0.52
!
interface port-channel5
  switchport mode trunk
  spanning-tree port type network
  speed 10000
  vpc peer-link
!
interface port-channel1
  switchport mode access
  spanning-tree port type edge
  switchport access vlan 20
  speed 10000
  vpc 1
!
interface port-channel2
  switchport mode access
  spanning-tree port type edge
  switchport access vlan 20
  speed 10000
  vpc 2
!
interface port-channel10
  switchport mode access
  switchport access vlan 10
  speed 10000
!
interface port-channel101
  switchport mode fex-fabric
  fex associate 101
```

```
  vpc 101
!
interface port-channel102
  switchport mode fex-fabric
  fex associate 102
  vpc 102
!
interface Ethernet1/1
  switchport access vlan 20
  channel-group 1 mode active
!
interface Ethernet1/2
  switchport access vlan 20
  channel-group 2 mode active
!
interface Ethernet1/3
  switchport mode trunk
  channel-group 5 mode active
!
interface Ethernet1/4
  switchport mode trunk
  channel-group 5 mode active
!
interface Ethernet1/21
  switchport mode fex-fabric
  fex associate 101
  channel-group 101
!
interface Ethernet1/22
  switchport mode fex-fabric
  fex associate 101
  channel-group 101
!
interface Ethernet1/23
  switchport mode fex-fabric
  fex associate 102
  channel-group 102
!
interface Ethernet1/24
  switchport mode fex-fabric
  fex associate 102
  channel-group 102
!
interface Ethernet101/1/1
  switchport access vlan 10
  channel-group 10 mode active
!
interface Ethernet102/1/1
  switchport access vlan 10
  channel-group 10 mode active
```

N5K2:

```
feature interface-vlan
feature hsrp
feature lacp
feature vpc
feature fex
!
vlan 10,20
!
interface Vlan10
  no shutdown
  ip address 10.0.0.52/24
  hsrp version 2
  hsrp 10
    ip 10.0.0.254
!
interface Vlan20
  no shutdown
  ip address 20.0.0.52/24
  hsrp version 2
  hsrp 20
    ip 20.0.0.254
!
vpc domain 5
  peer-keepalive destination 192.168.0.51
!
interface port-channel5
  switchport mode trunk
  spanning-tree port type network
  speed 10000
  vpc peer-link
!
interface port-channel1
  switchport mode access
  spanning-tree port type edge
  switchport access vlan 20
  speed 10000
  vpc 1
!
interface port-channel2
  switchport mode access
  spanning-tree port type edge
  switchport access vlan 20
  speed 10000
  vpc 2
!
interface port-channel10
  switchport mode access
  switchport access vlan 10
  speed 10000
```

```
!
interface port-channel101
  switchport mode fex-fabric
  fex associate 101
  vpc 101
!
interface port-channel102
  switchport mode fex-fabric
  fex associate 102
  vpc 102
!
interface Ethernet1/1
  switchport access vlan 20
  channel-group 1 mode active
!
interface Ethernet1/2
  switchport access vlan 20
  channel-group 2 mode active
!
interface Ethernet1/3
  switchport mode trunk
  channel-group 5 mode active
!
interface Ethernet1/4
  switchport mode trunk
  channel-group 5 mode active
!
interface Ethernet1/21
  switchport mode fex-fabric
  fex associate 101
  channel-group 101
!
interface Ethernet1/22
  switchport mode fex-fabric
  fex associate 101
  channel-group 101
!
interface Ethernet1/23
  switchport mode fex-fabric
  fex associate 102
  channel-group 102
!
interface Ethernet1/24
  switchport mode fex-fabric
  fex associate 102
  channel-group 102
!
interface Ethernet101/1/1
  switchport access vlan 10
  channel-group 10 mode active
!
interface Ethernet102/1/1
  switchport access vlan 10
  channel-group 10 mode active
```

Verification

Fabric Extender (FEX) and vPC topologies come in three forms. The first is a Host vPC, which has two FEXes connected straight-through to two parent switches, the FEXes dual homed to the server, and the vPC configured from the FEXes southbound to the server.

The second is a Fabric vPC, which has a single FEX dual homed to two parent switches, the FEX single homed to the server, and the vPC configured from the FEXes northbound to the parent switches.

The third is an Enhanced vPC (EvPC), which has two FEXes dual homed to two parent switches, the FEXes dual homed to the server, and the vPC configured from the FEXes both northbound to the parent switches and southbound to the server.

This example uses an Enhanced vPC, which first starts with both parent switches pairing to both FEXes via a vPC.

```
N5K1# show fex
  FEX         FEX           FEX              FEX             Fex
Number    Description      State            Model           Serial
----------------------------------------------------------------------
101        FEX0101               Online    N2K-C2232PP-10GE   SSI15030C1R
102        FEX0102               Online    N2K-C2232PP-10GE   SSI16330GT8

N5K2# show fex
  FEX         FEX           FEX              FEX             Fex
Number    Description      State            Model           Serial
----------------------------------------------------------------------
101        FEX0101               Online    N2K-C2232PP-10GE   SSI15030C1R
102        FEX0102               Online    N2K-C2232PP-10GE   SSI16330GT8
```

Port-Channels from the parent switches to the FEXes are static on (i.e. no LACP), while the channels that pass through the FEXes to the server run LACP negotiation.

```
N5K1# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(P)  Eth102/1/1(P)
101   Po101(SU)   Eth      NONE      Eth1/21(P)   Eth1/22(P)
```

```
101   Po101(SU)   Eth      NONE      Eth1/21(P)   Eth1/22(P)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)

N5K2# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(P)  Eth102/1/1(P)
101   Po101(SU)   Eth      NONE      Eth1/21(P)   Eth1/22(P)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)
```

Two vPCs are formed to the FEXes manually from each parent, and a vPC is automatically formed from the FEXes southbound to the server when the `channel-group 10` command is applied to the FEXs' server facing ports. In the below output vPC numbers 101 & 102 are configured, while number 262153 is auto-generated.

```
N5K1# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                     : 5
Peer status                       : peer adjacency formed ok
vPC keep-alive status             : peer is alive
Configuration consistency status  : success
Per-vlan consistency status       : success
Type-2 consistency status         : success
vPC role                          : secondary
Number of vPCs configured         : 69
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     1,10,20

vPC status
----------------------------------------------------------------------------
id     Port        Status Consistency Reason                     Active vlans
------ ----------- ------ ----------- -------------------------- -----------
1      Po1         up     success     success                    20
2      Po2         up     success     success                    20
101    Po101       up     success     success                    -
102    Po102       up     success     success                    -
102401 Eth101/1/2  down*  Not         Consistency Check Not      -
                         Applicable  Performed
<snip>
103455 Eth102/1/32 down*  Not         Consistency Check Not      -
                         Applicable  Performed
262153 Po10        up     success     success                    10


N5K2# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                     : 5
Peer status                       : peer adjacency formed ok
vPC keep-alive status             : peer is alive
Configuration consistency status  : success
Per-vlan consistency status       : success
Type-2 consistency status         : success
vPC role                          : primary
Number of vPCs configured         : 69
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     1,10,20

vPC status
----------------------------------------------------------------------------
id     Port        Status Consistency Reason                     Active vlans
------ ----------- ------ ----------- -------------------------- -----------
1      Po1         up     success     success                    20
2      Po2         up     success     success                    20
101    Po101       up     success     success                    -
102    Po102       up     success     success                    -
102401 Eth101/1/2  down*  Not         Consistency Check Not      -
                         Applicable  Performed
<snip>
103455 Eth102/1/32 down*  Not         Consistency Check Not      -
```

```
                          Applicable  Performed
262153 Po10          up    success     success                   10
```

Spanning-Tree is actively forwarding on all port channels, and all member interface details are hidden from the STP calculation. Port-Channel 10 through the FEXes is automatically an STP Edge Port, while the directly attached servers' port channels are manually configured as edge to avoid STP convergence issues.

```
N5K1# show spanning-tree vlan 10

VLAN0010
  Spanning tree enabled protocol rstp
  Root ID    Priority    32778
             Address     00de.fb12.1a01
             Cost        1
             Port        4100 (port-channel5)
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
             Address     00de.fb12.1a7c
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po5              Root FWD 1         128.4100 (vPC peer-link) P2p
Po10             Desg FWD 1         128.4105 (vPC) Edge P2p

N5K1# show spanning-tree vlan 20

VLAN0020
  Spanning tree enabled protocol rstp
  Root ID    Priority    32788
             Address     00de.fb12.1a01
             Cost        1
             Port        4100 (port-channel5)
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32788  (priority 32768 sys-id-ext 20)
             Address     00de.fb12.1a7c
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po1              Desg FWD 1         128.4096 (vPC) Edge P2p
Po2              Desg FWD 1         128.4097 (vPC) Edge P2p
Po5              Root FWD 1         128.4100 (vPC peer-link) P2p

N5K2# show spanning-tree vlan 10

VLAN0010
  Spanning tree enabled protocol rstp
  Root ID    Priority    32778
             Address     00de.fb12.1a01
             This bridge is the root
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
             Address     00de.fb12.1a01
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po5              Desg FWD 1         128.4100 (vPC peer-link) P2p
Po10             Desg FWD 1         128.4105 (vPC) Edge P2p

N5K2# show spanning-tree vlan 20

VLAN0020
  Spanning tree enabled protocol rstp
  Root ID    Priority    32788
             Address     00de.fb12.1a01
             This bridge is the root
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32788  (priority 32768 sys-id-ext 20)
             Address     00de.fb12.1a01
             Hello Time  2  sec  Max Age 20 sec  Forward Delay 15 sec

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po1              Desg FWD 1         128.4096 (vPC) Edge P2p
Po2              Desg FWD 1         128.4097 (vPC) Edge P2p
Po5              Desg FWD 1         128.4100 (vPC peer-link) P2p
```

The MAC address tables are synchronized between the vPC Peers, and the UCS C server's MAC addresses are learned via the port channel through the FEXes.

```
N5K1# show mac address-table vlan 10
Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link
   VLAN     MAC Address      Type      age     Secure NTFY   Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 10       0000.0c9f.f00a    static    0          F    F  sup-eth2
* 10       00de.fb12.1a01    static    0          F    F  Po5
* 10       d48c.b5bd.460c    dynamic   10         F    F  Po10
* 10       d48c.b5bd.460e    dynamic   10         F    F  Po10
* 10       d48c.b5bd.460f    dynamic   10         F    F  Po10

N5K1# show mac address-table vlan 20
Legend:
```

```
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link
   VLAN     MAC Address      Type      age     Secure NTFY   Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 20       0000.0c9f.f014    static    0          F    F  sup-eth2
* 20       001b.2188.8075    dynamic   200        F    F  Po2
* 20       001b.218d.3d99    dynamic   0          F    F  Po1
* 20       00de.fb12.1a01    static    0          F    F  Po5

N5K2# show mac address-table vlan 10
Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link
   VLAN     MAC Address      Type      age     Secure NTFY   Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 10       0000.0c9f.f00a    static    0          F    F  Po5
* 10       00de.fb12.1a7c    static    0          F    F  Po5
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10
* 10       d48c.b5bd.460e    dynamic   1800       F    F  Po10
* 10       d48c.b5bd.460f    dynamic   1800       F    F  Po10

N5K2# show mac address-table vlan 20
Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since last seen,+ - primary entry using vPC Peer-Link
   VLAN     MAC Address      Type      age     Secure NTFY   Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 20       0000.0c9f.f014    static    0          F    F  Po5
* 20       001b.2188.8075    dynamic   10         F    F  Po2
* 20       001b.218d.3d99    dynamic   0          F    F  Po1
* 20       00de.fb12.1a7c    static    10         F    F  Po5
```

For connectivity testing, the UCS C series server is set to listen for TCP sessions via iperf.

```
UCS C Server:
C:\Users\Administrator\Desktop\iperf3>iperf3.exe -s
-----------------------------------------------------------
Server listening on 5201
-----------------------------------------------------------
```

One of the directly attached servers generates 8 simultaneous flows to the C server with unique 5-tuple flow information.

```
Server 1:
C:\Users\Administrator\Desktop\iperf3>iperf3.exe -c 10.0.0.201 -P 8 -t 0
Connecting to host 10.0.0.201, port 5201
[  4] local 20.0.0.11 port 49834 connected to 10.0.0.201 port 5201
[  6] local 20.0.0.11 port 49835 connected to 10.0.0.201 port 5201
[  8] local 20.0.0.11 port 49836 connected to 10.0.0.201 port 5201
[ 10] local 20.0.0.11 port 49837 connected to 10.0.0.201 port 5201
[ 12] local 20.0.0.11 port 49838 connected to 10.0.0.201 port 5201
[ 14] local 20.0.0.11 port 49839 connected to 10.0.0.201 port 5201
[ 16] local 20.0.0.11 port 49840 connected to 10.0.0.201 port 5201
[ 18] local 20.0.0.11 port 49841 connected to 10.0.0.201 port 5201
[ ID] Interval           Transfer     Bandwidth
[  4]   0.00-1.00   sec  95.6 MBytes   801 Mbits/sec
[  6]   0.00-1.00   sec  95.2 MBytes   798 Mbits/sec
[  8]   0.00-1.00   sec  96.1 MBytes   806 Mbits/sec
[ 10]   0.00-1.00   sec  62.0 MBytes   520 Mbits/sec
[ 12]   0.00-1.00   sec  91.8 MBytes   769 Mbits/sec
[ 14]   0.00-1.00   sec  94.9 MBytes   795 Mbits/sec
[ 16]   0.00-1.00   sec  95.6 MBytes   801 Mbits/sec
[ 18]   0.00-1.00   sec  91.5 MBytes   767 Mbits/sec
[SUM]   0.00-1.00   sec   723 MBytes  6.06 Gbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4]  54.00-55.00  sec   101 MBytes   848 Mbits/sec
[  6]  54.00-55.00  sec   100 MBytes   843 Mbits/sec
[  8]  54.00-55.00  sec   101 MBytes   849 Mbits/sec
[ 10]  54.00-55.00  sec   100 MBytes   842 Mbits/sec
[ 12]  54.00-55.00  sec  99.4 MBytes   833 Mbits/sec
[ 14]  54.00-55.00  sec   101 MBytes   849 Mbits/sec
[ 16]  54.00-55.00  sec   101 MBytes   846 Mbits/sec
[ 18]  54.00-55.00  sec   101 MBytes   847 Mbits/sec
[SUM]  54.00-55.00  sec   806 MBytes  6.76 Gbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
<snip>
```

Data plane traffic only flows via the vPC member port channel interfaces, and not via the vPC Peer Link. Note that Port-Channel5, the vPC Peer Link, has little to no traffic being forwarded across it.

```
N5K1# show int po10 | in rate
  30 seconds input rate 17743568 bits/sec, 33910 packets/sec
  30 seconds output rate 5188019624 bits/sec, 428036 packets/sec
    input rate 23.04 Mbps, 43.93 Kpps; output rate 6.60 Gbps, 544.30 Kpps

N5K1# show int po5 | in rate
  30 seconds input rate 2584 bits/sec, 1 packets/sec
  30 seconds output rate 3296 bits/sec, 2 packets/sec
    input rate 1.77 Kbps, 1 pps; output rate 2.40 Kbps, 2 pps

N5K1# show ip arp | in 10.0.0.201
10.0.0.201      00:09:26  d48c.b5bd.460c  Vlan10

N5K1# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10
```

```
N5K2# show int po10 | in rate
  30 seconds input rate 25175672 bits/sec, 48021 packets/sec
  30 seconds output rate 7198997608 bits/sec, 593989 packets/sec
    input rate 23.41 Mbps, 44.66 Kpps; output rate 6.76 Gbps, 557.76 Kpps

N5K2# show int po5 | in rate
  30 seconds input rate 2904 bits/sec, 2 packets/sec
  30 seconds output rate 2280 bits/sec, 1 packets/sec
    input rate 2.40 Kbps, 2 pps; output rate 1.66 Kbps, 1 pps

N5K2# show ip arp | in 10.0.0.201
10.0.0.201      00:10:48  d48c.b5bd.460c  Vlan10          *

N5K2# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10
```

A like failure between the UCS C server and FEX are now simulated.

```
N5K1# config t ; int e101/1/1 ; shut ; end
Enter configuration commands, one per line.  End with CNTL/Z.
N5K1#
2017 Jan 19 03:24:07 N5K1 %ETH_PORT_CHANNEL-5-PORT_DOWN: port-channel10: Ethernet101/1/1 is down
2017 Jan 19 03:24:07 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet101/1/1 is down(Config change)
2017 Jan 19 03:24:15 N5K1 %LLDP-FEX101-5-SERVER_REMOVED: Server with Chassis ID d48c.b5bd.4609 Port ID d48c.b5bd.4609 on local port Eth101/1/1 has b
een removed
2017 Jan 19 03:24:08 N5K1 %ETHPORT-5-IF_DOWN_ADMIN_DOWN: Interface Ethernet101/1/1 is down (Administratively down)

N5K2# config t ; int e101/1/1 ; shut ; end
Enter configuration commands, one per line.  End with CNTL/Z.
N5K2# 2017 Jan 19 03:24:15 N5K2 %ETH_PORT_CHANNEL-5-PORT_DOWN: port-channel10: Ethernet101/1/1 is down
2017 Jan 19 03:24:15 N5K2 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet101/1/1 is down(Config change)
2017 Jan 19 03:24:15 N5K2 %LLDP-FEX101-5-SERVER_REMOVED: Server with Chassis ID d48c.b5bd.4609 Port ID d48c.b5bd.4609 on local port Eth101/1/1 has b
een removed
2017 Jan 19 03:24:16 N5K2 %ETHPORT-5-IF_DOWN_ADMIN_DOWN: Interface Ethernet101/1/1 is down (Administratively down

N5K1# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(D)  Eth102/1/1(P)
101   Po101(SU)   Eth      NONE      Eth1/21(P)   Eth1/22(P)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)

N5K2# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(D)  Eth102/1/1(P)
101   Po101(SU)   Eth      NONE      Eth1/21(P)   Eth1/22(P)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)
```

Traffic forwarding transparently continues via the link to the other FEX:

```
N5K1# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10

N5K2# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10
```

An entire node failure of the FEX is simulated.

```
N5K1# config t ; int e1/21 - 22 ; shut ; end

N5K2# config t ; int e1/21 - 22 ; shut ; end
Enter configuration commands, one per line.  End with CNTL/Z.
2017 Jan 19 03:27:30 N5K1 %ETH_PORT_CHANNEL-5-PORT_DOWN: port-channel101: Ethernet1/22 is down
2017 Jan 19 03:27:30 N5K1 %FEX-5-FEX_PORT_STATUS_NOTI: Uplink-ID 2 of Fex 101 that is connected with Ethernet1/22 changed its status from Active to
Disconnected
2017 Jan 19 03:27:30 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet1/22 is down(Config change)
2017 Jan 19 03:27:30 N5K1 %ETH_PORT_CHANNEL-5-PORT_DOWN: port-channel101: Ethernet1/21 is down
2017 Jan 19 03:27:30 N5K1 %ETH_PORT_CHANNEL-5-PORT_DOWN: port-channel101: port-channel101 is down
2017 Jan 19 03:27:30 N5K1 %ETH_PORT_CHANNEL-5-FOP_CHANGED: port-channel101: first operational port changed from Ethernet1/21 to none
2017 Jan 19 03:27:30 N5K1 %FEX-5-FEX_PORT_STATUS_NOTI: Uplink-ID 1 of Fex 101 that is connected with Ethernet1/21 changed its status from Active to
Disconnected
2017 Jan 19 03:27:30 N5K1 %NOHMS-2-NOHMS_ENV_FEX_OFFLINE: FEX101 (Serial Number: SSI15030C1R)
2017 Jan 19 03:27:30 N5K1 dstats: <{eth_dstats}>dstats_handle_lc_offline: dstats_handle_lc_offline: Processing LC_OFFLINE msg: slot - 33
```

```
2017 Jan 19 03:27:30 N5K1 dstats: <{eth_dstats}>dstats_clear_slot_delta: dstats_clear_slot_delta: entry
2017 Jan 19 03:27:30 N5K1 %ETHPORT-5-IF_DOWN_PORT_CHANNEL_MEMBERS_DOWN: Interface port-channel101 is down (No operational members)
2017 Jan 19 03:27:30 N5K1 %PFMA-2-FEX_STATUS: Fex 101 is offline
<snip>

N5K1# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(r)  Eth102/1/1(P)
101   Po101(SD)   Eth      NONE      Eth1/21(D)   Eth1/22(D)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)

N5K2# 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      Eth1/1(P)
2     Po2(SU)     Eth      LACP      Eth1/2(P)
5     Po5(SU)     Eth      LACP      Eth1/3(P)    Eth1/4(P)
10    Po10(SU)    Eth      LACP      Eth101/1/1(r)  Eth102/1/1(P)
101   Po101(SD)   Eth      NONE      Eth1/21(D)   Eth1/22(D)
102   Po102(SU)   Eth      NONE      Eth1/23(P)   Eth1/24(P)
```

Traffic forwarding still continues via the link to the other FEX:

```
N5K1# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10

N5K2# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10
```

A node failure of a parent switch is simulated:

```
N5K1# config t ; int e1/1 - 48 ; shut ; end
Enter configuration commands, one per line.  End with CNTL/Z.
2017 Jan 19 03:30:44 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet1/15 is down(Config change)
2017 Jan 19 03:30:44 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet1/15 is down(Config change)
2017 Jan 19 03:30:44 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet1/6 is down(Config change)
2017 Jan 19 03:30:44 N5K1 %ETHPORT-5-IF_DOWN_CFG_CHANGE: Interface Ethernet1/6 is down(Config change)
<snip>
```

Forwarding still continues via the other available parent switch:

```
N5K2# ping 10.0.0.201
PING 10.0.0.201 (10.0.0.201): 56 data bytes
64 bytes from 10.0.0.201: icmp_seq=0 ttl=127 time=0.811 ms
64 bytes from 10.0.0.201: icmp_seq=1 ttl=127 time=0.539 ms
64 bytes from 10.0.0.201: icmp_seq=2 ttl=127 time=0.608 ms
64 bytes from 10.0.0.201: icmp_seq=3 ttl=127 time=0.472 ms
64 bytes from 10.0.0.201: icmp_seq=4 ttl=127 time=0.501 ms
^C
--- 10.0.0.201 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.472/0.586/0.811 ms

N5K2# show ip arp | in 10.0.0.201
10.0.0.201      00:00:12  d48c.b5bd.460c  Vlan10

N5K2# show mac address-table | in d48c.b5bd.460c
* 10       d48c.b5bd.460c    dynamic   0          F    F  Po10

Server 1:
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4] 1958.00-1959.00 sec   116 MBytes   974 Mbits/sec
[  6] 1958.00-1959.00 sec   116 MBytes   976 Mbits/sec
[  8] 1958.00-1959.00 sec   116 MBytes   976 Mbits/sec
[ 10] 1958.00-1959.00 sec   116 MBytes   974 Mbits/sec
[ 12] 1958.00-1959.00 sec   116 MBytes   974 Mbits/sec
[ 14] 1958.00-1959.00 sec   116 MBytes   973 Mbits/sec
[ 16] 1958.00-1959.00 sec   116 MBytes   973 Mbits/sec
[ 18] 1958.00-1959.00 sec   116 MBytes   971 Mbits/sec
[SUM] 1958.00-1959.00 sec   927 MBytes  7.79 Gbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[  4] 1959.00-1960.00 sec   118 MBytes   991 Mbits/sec
[  6] 1959.00-1960.00 sec   118 MBytes   991 Mbits/sec
[  8] 1959.00-1960.00 sec   118 MBytes   990 Mbits/sec
[ 10] 1959.00-1960.00 sec   118 MBytes   989 Mbits/sec
[ 12] 1959.00-1960.00 sec   118 MBytes   989 Mbits/sec
```

```
[ 14] 1959.00-1960.00 sec   118 MBytes   988 Mbits/sec
[ 16] 1959.00-1960.00 sec   117 MBytes   983 Mbits/sec
[ 18] 1959.00-1960.00 sec   117 MBytes   982 Mbits/sec
[SUM] 1959.00-1960.00 sec   942 MBytes  7.90 Gbits/sec
```

« FEX Active/Active Fabric vPC | FabricPath »

^ back to top