Back to Back vPC

« vPC and HSRP | Fabric Extenders (FEX) »

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Back to Back vPC

Objective

- Establish active/active connectivity between the dual-homed servers via all links between the 5Ks and 7Ks.

Task

- Configure a vPC Domain between your 5Ks as follows:
  - Use vPC Domain 5.
  - Use the mgmt0 ports for the vPC Peer Keepalive Link.
  - Use Port-Channel 5 between the 5Ks for the the vPC Peer Link.
  - The vPC Peer Link should use LACP negotiation, be an 802.1q trunk link, and be an STP Network Port.
- Configure a vPC Domain between your 7Ks as follows:
  - Use vPC Domain 7.
  - Use the mgmt0 ports for the vPC Peer Keepalive Link.
  - Use Port-Channel 7 between the 7Ks for the the vPC Peer Link.
  - The vPC Peer Link should use LACP negotiation, be an 802.1q trunk link, and be an STP Network Port.
- Configure the vPC Member Ports on your 5Ks to the servers as follows:
  - The links to your first Server should be in Port-Channel 1, an access port in VLAN 10, and be vPC 1.
  - The links to your second Server should be in Port-Channel 2, an access port in VLAN 20, and be vPC 2.
  - Both vPCs should use LACP negotiation and be STP Edge Ports.
- Configure your Servers as follows:
  - Configure the links on the Servers going to the 5Ks as a NIC Team using LACP.
  - The first server should use the IP address 10.0.0.1***X***/24 on the Team interface, where ***X*** is the Server number, with a default gateway of 10.0.0.254.
  - The second server should use the IP address 20.0.0.1***X***/24 on the Team interface, where ***X*** is the Server number, with a default gateway of 20.0.0.254.
- Configure layer 3 connectivity on the 5Ks and 7Ks as follows:
  - Configure interface VLAN 10 on all four switches with IP addresses 10.0.0.***X***/24, where ***X*** is the device number.
  - Configure interface VLAN 20 on all four switches with IP addresses 20.0.0.***X***/24, where ***X*** is the device number.
  - Enable HSRPv2 on VLANs 10 & 20 of the 7Ks, with virtual IPs of 10.0.0.254 and 20.0.0.254 respectively.
- Configure a Back-to-Back vPC between the 5Ks and 7Ks as follows:
  - All ports between these switches should be in Port-Channel 57, and be vPC 57.
  - Port-Channel 57 should use LACP negotiation and be an 802.1q trunk link.
- Once complete, you should have IP reachability between the 5Ks, 7Ks, and the servers.
- Verify that traffic between the Servers does not forward over either of the vPC Peer Links unless one of the vPC Member Ports is down.

Configuration Click to *collapse*

Note:

For Server configuration see the Intel support document Setting up NIC teaming for Windows Server 2012/2012 R2/2016

N5K1:

```
feature lacp
feature vpc
feature interface-vlan
!
vlan 10,20
!
interface Vlan10
 ip address 10.0.0.51/24
 no shutdown
!
interface Vlan20
 ip address 20.0.0.51/24
 no shutdown
!
vpc domain 5
  peer-keepalive destination 192.168.0.52
!
interface Ethernet1/3 - 4
  switchport
  switchport mode trunk
  spanning-tree port type network
  channel-group 5 mode active
  no shutdown
!
interface port-channel5
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link
  no shutdown
!
interface Ethernet1/1
  switchport
  switchport mode access
  switchport access vlan 10
  spanning-tree port type edge
  channel-group 1 mode active
  no shutdown
!
interface port-channel1
  switchport
  switchport mode access
  switchport access vlan 10
  spanning-tree port type edge
```

```
  spanning-tree port type edge
  vpc 1
  no shutdown
!
interface Ethernet1/2
  switchport
  switchport mode access
  switchport access vlan 20
  spanning-tree port type edge
  channel-group 2 mode active
  no shutdown
!
interface port-channel2
  switchport
  switchport mode access
  switchport access vlan 20
  spanning-tree port type edge
  vpc 2
  no shutdown
!
interface Ethernet1/5 - 6
  switchport
  switchport mode trunk
  channel-group 57 mode active
  no shutdown
!
interface port-channel57
  switchport
  switchport mode trunk
  vpc 57
  no shutdown
```

N5K2:

```
feature lacp
feature vpc
feature interface-vlan
!
vlan 10,20
!
interface Vlan10
 ip address 10.0.0.52/24
 no shutdown
!
interface Vlan20
 ip address 20.0.0.52/24
 no shutdown
!
vpc domain 5
  peer-keepalive destination 192.168.0.51
!
interface Ethernet1/3 - 4
  switchport
  switchport mode trunk
  spanning-tree port type network
  channel-group 5 mode active
  no shutdown
!
interface port-channel5
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link
  no shutdown
!
interface Ethernet1/1
  switchport
  switchport mode access
  switchport access vlan 10
  spanning-tree port type edge
  channel-group 1 mode active
  no shutdown
!
interface port-channel1
  switchport
  switchport mode access
  switchport access vlan 10
  spanning-tree port type edge
  vpc 1
  no shutdown
!
interface Ethernet1/2
  switchport
  switchport mode access
  switchport access vlan 20
  spanning-tree port type edge
  channel-group 2 mode active
  no shutdown
!
interface port-channel2
  switchport
  switchport mode access
  switchport access vlan 20
  spanning-tree port type edge
  vpc 2
  no shutdown
!
interface Ethernet1/5 - 6
  switchport
  switchport mode trunk
  channel-group 57 mode active
  no shutdown
!
```

```
interface port-channel57
  switchport
  switchport mode trunk
  vpc 57
  no shutdown
```

N7K1

```
feature lacp
feature vpc
feature interface-vlan
feature hsrp
!
vlan 10,20
!
interface Vlan10
  no shutdown
  ip address 10.0.0.71/24
  hsrp version 2
  hsrp 10
    ip 10.0.0.254
!
interface Vlan20
  no shutdown
  ip address 20.0.0.71/24
  hsrp version 2
  hsrp 20
    ip 20.0.0.254
!
vpc domain 7
  peer-keepalive destination 192.168.0.72
!
interface Ethernet1/1 - 2
  switchport
  switchport mode trunk
  spanning-tree port type network
  channel-group 7 mode active
  no shutdown
!
interface port-channel7
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link
  no shutdown
!
interface Ethernet1/3 - 4
  switchport
  switchport mode trunk
  channel-group 57 mode active
  no shutdown
!
interface port-channel57
  switchport
  switchport mode trunk
  vpc 57
  no shutdown
```

N7K2

```
feature lacp
feature vpc
feature interface-vlan
feature hsrp
!
vlan 10,20
!
interface Vlan10
  no shutdown
  ip address 10.0.0.72/24
  hsrp version 2
  hsrp 10
    ip 10.0.0.254
!
interface Vlan20
  no shutdown
  ip address 20.0.0.72/24
  hsrp version 2
  hsrp 20
    ip 20.0.0.254
!
vpc domain 7
  peer-keepalive destination 192.168.0.71
!
interface Ethernet1/1 - 2
  switchport
  switchport mode trunk
  spanning-tree port type network
  channel-group 7 mode active
  no shutdown
!
interface port-channel7
  switchport
  switchport mode trunk
  spanning-tree port type network
  vpc peer-link
  no shutdown
!
interface Ethernet1/3 - 4
  switchport
  switchport mode trunk
  channel-group 57 mode active
  no shutdown
!
```

```
interface port-channel57
  switchport
  switchport mode trunk
  vpc 57
  no shutdown
```

Verification

```
N5K1# show int e1/1 - 6 | include "Ethernet1/|output rate"
Ethernet1/1 is up
  30 seconds output rate 2659968 bits/sec, 5177 packets/sec
    input rate 1.19 Gbps, 97.72 Kpps; output rate 2.66 Mbps, 5.18 Kpps
    input rate 1.19 Gbps, 97.72 Kpps; output rate 2.66 Mbps, 5.18 Kpps
Ethernet1/2 is up
  30 seconds output rate 1246154920 bits/sec, 102619 packets/sec
    input rate 1.60 Mbps, 3.11 Kpps; output rate 1.25 Gbps, 102.62 Kpps
    input rate 1.60 Mbps, 3.11 Kpps; output rate 1.25 Gbps, 102.62 Kpps
Ethernet1/3 is up
  30 seconds output rate 4432 bits/sec, 3 packets/sec
    input rate 1.36 Kbps, 1 pps; output rate 4.43 Kbps, 3 pps
    input rate 1.36 Kbps, 1 pps; output rate 4.43 Kbps, 3 pps
Ethernet1/4 is up
  30 seconds output rate 400 bits/sec, 0 packets/sec
    input rate 80 bps, 0 pps; output rate 400 bps, 0 pps
    input rate 80 bps, 0 pps; output rate 400 bps, 0 pps
Ethernet1/5 is up
  30 seconds output rate 1164886248 bits/sec, 96837 packets/sec
    input rate 688.98 Mbps, 58.30 Kpps; output rate 713.56 Mbps, 60.18 Kpps
Ethernet1/6 is up
  30 seconds output rate 26697336 bits/sec, 4001 packets/sec
    input rate 522.47 Mbps, 45.62 Kpps; output rate 254.15 Mbps, 22.30 Kpps


N5K2# show int e1/1 - 6 | include "Ethernet1/|output rate"
Ethernet1/1 is up
  30 seconds output rate 466152 bits/sec, 904 packets/sec
    input rate 1.14 Gbps, 94.30 Kpps; output rate 466.15 Kbps, 904 pps
    input rate 1.14 Gbps, 94.30 Kpps; output rate 466.15 Kbps, 904 pps
Ethernet1/2 is up
  30 seconds output rate 1111545672 bits/sec, 91529 packets/sec
    input rate 1.59 Mbps, 3.08 Kpps; output rate 1.11 Gbps, 91.53 Kpps
    input rate 1.59 Mbps, 3.08 Kpps; output rate 1.11 Gbps, 91.53 Kpps
Ethernet1/3 is up
  30 seconds output rate 1400 bits/sec, 1 packets/sec
    input rate 4.41 Kbps, 3 pps; output rate 1.40 Kbps, 1 pps
    input rate 4.41 Kbps, 3 pps; output rate 1.40 Kbps, 1 pps
Ethernet1/4 is up
  30 seconds output rate 40 bits/sec, 0 packets/sec
    input rate 424 bps, 0 pps; output rate 40 bps, 0 pps
    input rate 424 bps, 0 pps; output rate 40 bps, 0 pps
Ethernet1/5 is up
  30 seconds output rate 1123144840 bits/sec, 93285 packets/sec
    input rate 689.43 Mbps, 57.93 Kpps; output rate 665.00 Mbps, 56.06 Kpps
Ethernet1/6 is up
  30 seconds output rate 26747152 bits/sec, 4096 packets/sec
    input rate 64 bps, 0 pps; output rate 263.04 Mbps, 22.86 Kpps

N7K1# show int e1/1 - 6 | include "Ethernet1/|output rate"
Ethernet1/1 is up
    30 seconds output rate 1648 bits/sec, 2 packets/sec
    input rate 1.65 Kbps, 1 pps; output rate 1.65 Kbps, 2 pps
    300 seconds output rate 1480 bits/sec, 2 packets/sec
    input rate 1.42 Kbps, 1 pps; output rate 1.48 Kbps, 2 pps
Ethernet1/2 is up
    30 seconds output rate 32 bits/sec, 0 packets/sec
    input rate 32 bps, 0 pps; output rate 32 bps, 0 pps
    300 seconds output rate 64 bits/sec, 0 packets/sec
    input rate 72 bps, 0 pps; output rate 64 bps, 0 pps
Ethernet1/3 is up
    30 seconds output rate 1121183560 bits/sec, 92900 packets/sec
    input rate 1.16 Gbps, 96.51 Kpps; output rate 1.12 Gbps, 92.90 Kpps
    300 seconds output rate 728005152 bits/sec, 61737 packets/sec
    input rate 757.78 Mbps, 64.06 Kpps; output rate 728.01 Mbps, 61.74 Kpps
Ethernet1/4 is up
    30 seconds output rate 1170626424 bits/sec, 97005 packets/sec
    input rate 1.13 Gbps, 93.37 Kpps; output rate 1.17 Gbps, 97.00 Kpps
    300 seconds output rate 687281984 bits/sec, 57759 packets/sec
    input rate 657.54 Mbps, 55.42 Kpps; output rate 687.28 Mbps, 57.76 Kpps
Ethernet1/5 is down (Administratively down)
    30 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
    300 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
Ethernet1/6 is down (Administratively down)
    30 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
    300 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps

N7K2# show int e1/1 - 6 | include "Ethernet1/|output rate"
Ethernet1/1 is up
    30 seconds output rate 1624 bits/sec, 1 packets/sec
    input rate 1.68 Kbps, 2 pps; output rate 1.62 Kbps, 1 pps
    300 seconds output rate 1424 bits/sec, 1 packets/sec
    input rate 1.48 Kbps, 2 pps; output rate 1.42 Kbps, 1 pps
Ethernet1/2 is up
    30 seconds output rate 32 bits/sec, 0 packets/sec
    input rate 32 bps, 0 pps; output rate 32 bps, 0 pps
```

```
    300 seconds output rate 72 bits/sec, 0 packets/sec
    input rate 64 bps, 0 pps; output rate 72 bps, 0 pps
Ethernet1/3 is up
    30 seconds output rate 50719896 bits/sec, 8071 packets/sec
    input rate 25.34 Mbps, 4.00 Kpps; output rate 50.72 Mbps, 8.07 Kpps
    300 seconds output rate 510017376 bits/sec, 44639 packets/sec
    input rate 248.27 Mbps, 21.84 Kpps; output rate 510.02 Mbps, 44.64 Kpps
Ethernet1/4 is up
    30 seconds output rate 16 bits/sec, 0 packets/sec
    input rate 25.37 Mbps, 4.06 Kpps; output rate 16 bps, 0 pps
    300 seconds output rate 56 bits/sec, 0 packets/sec
    input rate 261.74 Mbps, 22.74 Kpps; output rate 56 bps, 0 pps
Ethernet1/5 is down (Administratively down)
    30 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
    300 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
Ethernet1/6 is down (Administratively down)
    30 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
    300 seconds output rate 0 bits/sec, 0 packets/sec
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps


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         : 3
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                   10
2      Po2         up     success     success                   20
57     Po57        up     success     success                   1,10,20


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         : 3
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                   10
2      Po2         up     success     success                   20
57     Po57        up     success     success                   1,10,20

N7K1# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                     : 7
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         : 1
Peer Gateway                      : Disabled
```

```
Dual-active excluded VLANs and BDs     : -
Graceful Consistency Check             : Enabled
Auto-recovery status                   : Enabled (timeout = 240 seconds)
Operational Layer3 Peer-router         : Disabled
Self-isolation                         : Disabled

vPC Peer-link status
---------------------------------------------------------------------------
id   Port   Status Active vlans                  Active BDs
--   ----   ------ ---------------------------------------------------------
1    Po7    up     1,10,20                      -


vPC status
Id                : 57
  Port            : Po57
  Status          : up
  Consistency     : success
  Reason          : success
  Active Vlans    : 1,10,20

N7K2# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                          : 7
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              : 1
Peer Gateway                           : Disabled
Dual-active excluded VLANs and BDs     : -
Graceful Consistency Check             : Enabled
Auto-recovery status                   : Enabled (timeout = 240 seconds)
Operational Layer3 Peer-router         : Disabled
Self-isolation                         : Disabled

vPC Peer-link status
---------------------------------------------------------------------------
id   Port   Status Active vlans                  Active BDs
--   ----   ------ ---------------------------------------------------------
1    Po7    up     1,10,20                      -


vPC status
Id                : 57
  Port            : Po57
  Status          : up
  Consistency     : success
  Reason          : success
  Active Vlans    : 1,10,20
```

« vPC and HSRP | Fabric Extenders (FEX) »

^ back to top