

vPC and HSRP

« Active Active NIC Teaming with vPC | Back to Back vPC »

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vPC and HSRP

Objective

- Establish connectivity between the dual-homed servers using active/active HSRP default gateways.

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 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 10.0.0.1X/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 20.0.0.1X/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 as follows:
 - Configure interface VLAN 10 on the 5Ks with IP addresses 10.0.0.X/24, where X is the device number.
 - Configure interface VLAN 20 on the 5Ks with IP addresses 20.0.0.X/24, where X is the device number.
 - Enable HSRPv2 on VLANs 10 & 20, with virtual IPs of 10.0.0.254 and 20.0.0.254 respectively.
- Once complete, you should have IP reachability between the 5Ks and the servers.
- Verify that traffic between the Servers does not forward over the vPC Peer Link 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
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 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

N5K2:
feature lacp
feature vpc
feature interface-vlan
!
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 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

```

Verification

```

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

```

<https://t.me/learningnets>

```
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    1,10,20
```

vPC status

```
-----
id  Port      Status Consistency Reason          Active vlans
-----
1   Po1       up    success  success                    10
2   Po2       up    success  success                    20
```

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)
```

N5K1# 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
-----
10.0.0.11    00:04:20 001b.218d.3d99  Vlan10      *
20.0.0.12    00:03:54 001b.2188.8075  Vlan20
```

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   Po5
* 10   001b.218d.3d99    dynamic   0         F   F   Po1
* 10   00de.fb12.1a01    static    0         F   F   Po5
```

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   Po5
* 20   001b.2188.8075    dynamic   10        F   F   Po2
* 20   00de.fb12.1a01    static    0         F   F   Po5
```

N5K1# show hsrp

```
Vlan10 - Group 10 (HSRP-V2) (IPv4)
Local state is Standby, priority 100 (Cfged 100)
Forwarding threshold(for vPC), lower: 1 upper: 100
Hellotime 3 sec, holdtime 10 sec
Next hello sent in 0.870000 sec(s)
Virtual IP address is 10.0.0.254 (Cfged)
Active router is 10.0.0.52, priority 100 expires in 9.131000 sec(s)
Standby router is local
Authentication text "cisco"
Virtual mac address is 0000.0c9f.f00a (Default MAC)
5 state changes, last state change 00:04:01
IP redundancy name is hsrp-Vlan10-10 (default)
```

```
Vlan20 - Group 20 (HSRP-V2) (IPv4)
Local state is Standby, priority 100 (Cfged 100)
Forwarding threshold(for vPC), lower: 1 upper: 100
Hellotime 3 sec, holdtime 10 sec
Next hello sent in 0.808000 sec(s)
Virtual IP address is 20.0.0.254 (Cfged)
Active router is 20.0.0.52, priority 100 expires in 6.250000 sec(s)
Standby router is local
Authentication text "cisco"
Virtual mac address is 0000.0c9f.f014 (Default MAC)
5 state changes, last state change 00:03:53
IP redundancy name is hsrp-Vlan20-20 (default)
```

N5K1# show interface e1/1 - 4 | include "Ethernet1/output rate"

```

Ethernet1/1 is up
  30 seconds output rate 3722360 bits/sec, 7260 packets/sec
    input rate 1.85 Gbps, 153.00 Kpps; output rate 3.72 Mbps, 7.26 Kpps
    input rate 1.85 Gbps, 153.00 Kpps; output rate 3.72 Mbps, 7.26 Kpps
Ethernet1/2 is up
  30 seconds output rate 1853649048 bits/sec, 152999 packets/sec
    input rate 3.72 Mbps, 7.26 Kpps; output rate 1.85 Gbps, 153.00 Kpps
    input rate 3.72 Mbps, 7.26 Kpps; output rate 1.85 Gbps, 153.00 Kpps
Ethernet1/3 is up
  30 seconds output rate 1720 bits/sec, 1 packets/sec
    input rate 1.42 Kbps, 1 pps; output rate 1.72 Kbps, 1 pps
    input rate 1.42 Kbps, 1 pps; output rate 1.72 Kbps, 1 pps
Ethernet1/4 is up
  30 seconds output rate 472 bits/sec, 0 packets/sec
    input rate 904 bps, 0 pps; output rate 472 bps, 0 pps
    input rate 904 bps, 0 pps; output rate 472 bps, 0 pps
N5K1#

```

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 : 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    1,10,20

```

vPC status

```

-----
id  Port  Status Consistency Reason Active vlans
-----
1   Po1   up    success success 10
2   Po2   up    success success 20

```

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)

```

N5K2# 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: 4

```

Address      Age      MAC Address Interface
10.0.0.11    00:04:14 001b.218d.3d99 Vlan10
20.0.0.12    00:04:17 001b.2188.8075 Vlan20
10.0.0.254   -        0000.0c9f.f00a Vlan10
20.0.0.254   -        0000.0c9f.f014 Vlan20

```

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  sup-eth2
* 10  001b.218d.3d99  dynamic 10    F  F  Po1
* 10  00de.fb12.1a7c  static  0    F  F  Po5

```

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  sup-eth2
* 20  001b.2188.8075  dynamic  0    F  F  Po2
* 20  00de.fb12.1a7c  static  0    F  F  Po5

```

N5K2# show hsrp

```
Vlan10 - Group 10 (HSRP-V2) (IPv4)
  Local state is Active, priority 100 (Cfged 100)
  Forwarding threshold(for vPC), lower: 1 upper: 100
  Hello time 3 sec, holdtime 10 sec
  Next hello sent in 1.121000 sec(s)
  Virtual IP address is 10.0.0.254 (Cfged)
  Active router is local
  Standby router is 10.0.0.51 , priority 100 expires in 0.382000 sec(s)
  Authentication text "cisco"
  Virtual mac address is 0000.0c9f.f00a (Default MAC)
  2 state changes, last state change 00:04:32
  IP redundancy name is hsrp-Vlan10-10 (default)
```

```
Vlan20 - Group 20 (HSRP-V2) (IPv4)
  Local state is Active, priority 100 (Cfged 100)
  Forwarding threshold(for vPC), lower: 1 upper: 100
  Hello time 3 sec, holdtime 10 sec
  Next hello sent in 0.505000 sec(s)
  Virtual IP address is 20.0.0.254 (Cfged)
  Active router is local
  Standby router is 20.0.0.51 , priority 100 expires in 7.983000 sec(s)
  Authentication text "cisco"
  Virtual mac address is 0000.0c9f.f014 (Default MAC)
  2 state changes, last state change 00:04:25
  IP redundancy name is hsrp-Vlan20-20 (default)
```

```
N5K2# show interface e1/1 - 4 | include "Ethernet1/|output rate"
Ethernet1/1 is up
  30 seconds output rate 3753560 bits/sec, 7323 packets/sec
  input rate 1.93 Gbps, 159.00 Kpps; output rate 3.75 Mbps, 7.32 Kpps
  input rate 1.93 Gbps, 159.00 Kpps; output rate 3.75 Mbps, 7.32 Kpps
Ethernet1/2 is up
  30 seconds output rate 1926321952 bits/sec, 159000 packets/sec
  input rate 3.75 Mbps, 7.32 Kpps; output rate 1.93 Gbps, 159.00 Kpps
  input rate 3.75 Mbps, 7.32 Kpps; output rate 1.93 Gbps, 159.00 Kpps
Ethernet1/3 is up
  30 seconds output rate 1368 bits/sec, 1 packets/sec
  input rate 1.74 Kbps, 2 pps; output rate 1.37 Kbps, 1 pps
  input rate 1.74 Kbps, 2 pps; output rate 1.37 Kbps, 1 pps
Ethernet1/4 is up
  30 seconds output rate 840 bits/sec, 0 packets/sec
  input rate 408 bps, 0 pps; output rate 840 bps, 0 pps
  input rate 408 bps, 0 pps; output rate 840 bps, 0 pps
N5K2#
```



« Active Active NIC Teaming with vPC | Back to Back vPC »

[^ back to top](#)