

在Nexus上的vPC上实现eBGP对等

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简介

本文档介绍如何配置和验证vPC Nexus对与其他设备之间的e-Border Gateway Protocole(eBGP)对等。为清楚起见，外部设备上的配置显示为Cisco CLI NX-OS。

先决条件

要求

Cisco 建议您了解以下主题：

- vPC操作和配置的基本概念。供参考
：https://www.cisco.com/c/dam/en/us/td/docs/switches/datacenter/sw/design/vpc_design/vpc_best
- BGP操作和配置

使用的组件

本文档中的信息基于以下软件和硬件版本：

leaf1#	C93108TC-Fx	NXOS 9.3(3)
leaf2#	C93108TC-Fx	NXOS 9.3(3)
外部设备	N9K-C9396PX	NXOS : 版本9.2(3)

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

vPC对和外部设备之间的路由协议(OSPF、ISIS、RIP、EIGRP、BGP)对等。支持此功能，具体如下：<https://www.cisco.com/c/en/us/support/docs/ip/ip-routing/118997-technote-nexus-00.html>。本文介绍eBGP作为路由协议的其他说明和配置示例。

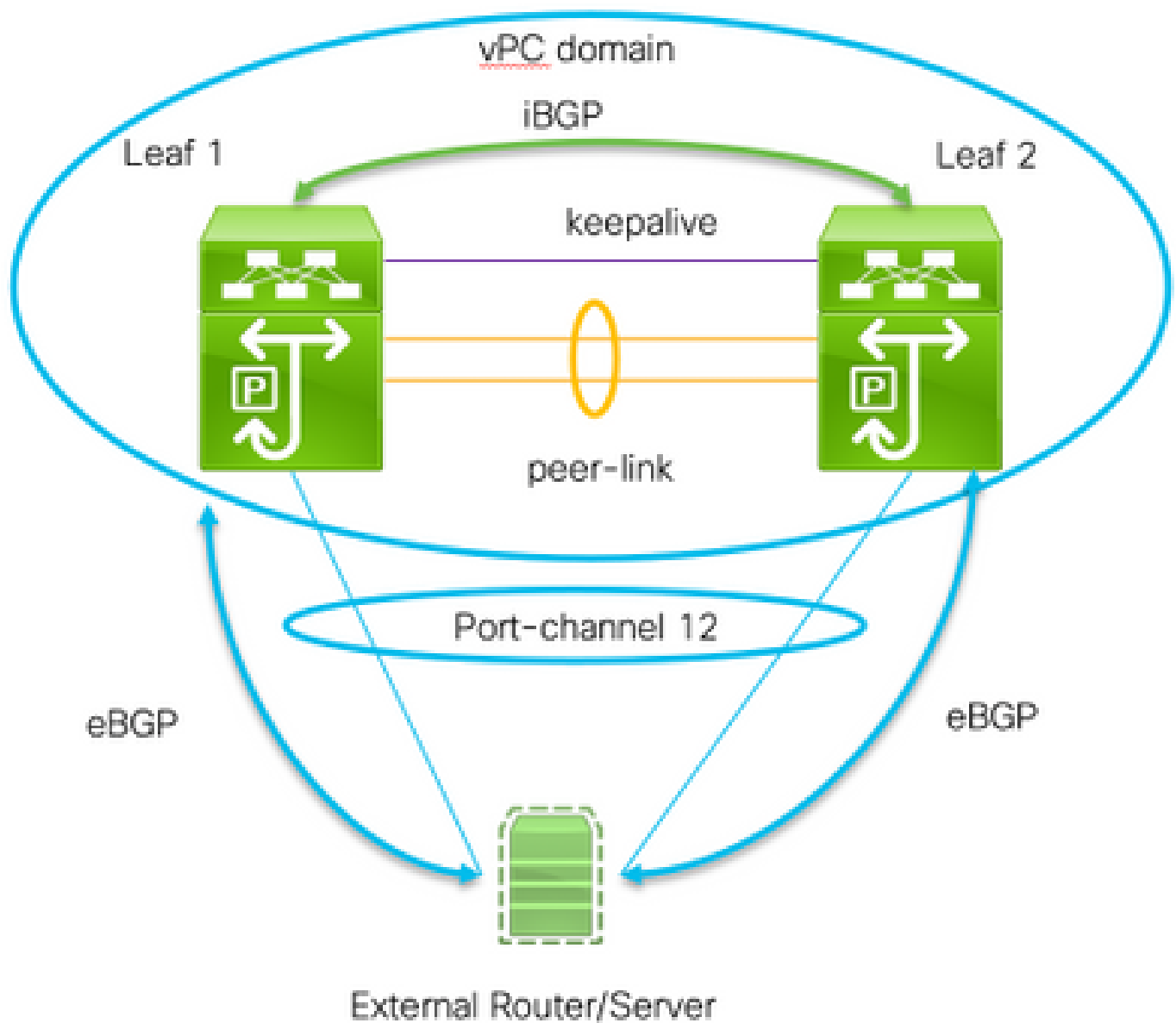
尝试在vPC上启用路由协议对等时会产生一些问题，使用时不存在这些问题

标准端口通道：

1. 无法确定外部设备将用来为每个MAC地址转发流量的端口通道成员。外部设备可能会通过链路将枝叶1的BGP数据包发送到枝叶1。当枝叶1收到它时，它会将其传送到CPU并丢弃它（不是自己的ip地址），因此BGP（单播）或其他协议（组播）将不断摆动。此处帮助命令peer-gateway。
2. 即使使用peer-gateway命令，此类数据包的TTL也将减少。NX-OS中的新命令 — layer3 peer-router会禁用此功能。
3. 两个vPC成员之间的iBGP需要遵循所有邻居之间的iBGP的BGP规则。我们在vPC端的vrf中运行，因此只有这两个成员需要运行iBGP。如果链路故障至NX-OS网络的其余部分（VXlan或其他）并提供冗余，则也需要TH。

配置

网络图



启用此对等需要两个重要命令：

- 对等网关 - vPC对等网关功能允许vPC交换机充当发送到vPC对等体的路由器MAC地址的数据包的活动网关
- 第3层对等路由器 — 对于发往对等体的数据包，外部设备从层路由协议对等角度将vPC域视为单个物理实体。

配置

Leaf 1:

```
! Form the vPC domain:
```

```
vpc domain 1
```

```
peer-switch
```

```
role priority 10 peer-keepalive destination 192.0.2.2 source 192.0.2.1 peer-gateway layer3 peer-router
```

```

!
!vPC peer-link interface members
interface Ethernet1/53 - 54
  description vPC-Peerlink member
  switchport
  switchport mode trunk
  channel-group 11 mode active
  no shutdown
!
! vPC peer-link port-channel
interface port-channel11
  description vPC-peerlink
  switchport
  switchport mode trunk
  spanning-tree port type network
  no shutdown
  vpc peer-link
!
! vPC port-channel member to External Device
interface Ethernet1/52
  description ExternalDevice Eth2/13
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 203,205
  mtu 9216
  channel-group 12 mode active
  no shutdown
!
! vPC port-channel to External Device
interface port-channel12
  description vPC port-channel to External Device
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 203,205
  mtu 9216
  vpc 12
!
! Layer 3 interface to the Eternal device:
interface Vlan205
  no shutdown
  vrf member Customer
! BFD for eBGP
bfd interval 500 min_rx 500 multiplier 3
! Disable bfd echo, as it is not supported over vPC
no bfd echo
no ip redirects
! We use /29 as we need 3 ip address, one per each member of the ! vPC domain and 3rd for the External Device
ip address 198.51.100.1/29 tag 800204
! Disable redirects - this is needed to enable BFD
no ipv6 redirects
!
router bgp 65535
router bgp 65535
  router-id 203.0.113.1
  log-neighbor-changes
  address-family ipv4 unicast
    Customer router-id 198.51.100.1 address-family ipv4 unicast neighbor 198.51.100.2 description Leaf-2 remote-as 65535 address-family ipv4 unicast soft
! Form the vPC domain:
vpc domain 1

```

```
peer-switch
role priority 10
peer-keepalive destination 192.0.2.1 source 192.0.2.2
peer-gateway
layer3 peer-router
ipv6 nd synchronize
ip arp synchronize
!
!vPC peer-link interface members
interface Ethernet1/53 - 54
description vPC-Peerlink member
switchport
switchport mode trunk
channel-group 11 mode active
no shutdown
!
! vPC peer-link port-channel
interface port-channel11
description vPC-peerlink
switchport
switchport mode trunk
spanning-tree port type network
no shutdown
vpc peer-link
!
! vPC port-channel member to External Device
interface Ethernet1/52
description ExternalDevice Eth2/13
switchport
switchport mode trunk
switchport trunk allowed vlan 203,205
mtu 9216
channel-group 12 mode active
no shutdown
!
! vPC port-channel to External Device
interface port-channel12
description vPC port-channel to External Device
switchport
switchport mode trunk
switchport trunk allowed vlan 203,205
mtu 9216
vpc 12
!
! Layer 3 interface to the External device:
interface Vlan205
no shutdown
vrf member Customer
! BFD for eBGP
bfd interval 500 min_rx 500 multiplier 3
! Disable bfd echo, as it is not supported over vPC
no bfd echo
no ip redirects
! We use/29 as we need 3 ip address, one per each member of the ! vPC domain and 3rd for the External Device
ip address 198.51.100.2/29 tag 800204
! Disable redirects - this is needed to enable BFD
no ipv6 redirects
!
router bgp 65535
```

```
router bgp 65535
  router-id 203.0.113.2
  log-neighbor-changes
  address-family ipv4 unicast
vrf Customer
  router-id 198.51.100.2
  address-family ipv4 unicast
  neighbor 198.51.100.1
    description Leaf-2
    remote-as 65535
  address-family ipv4 unicast
    soft-reconfiguration inbound always
  neighbor 198.51.100.3
    description to External Device
    bfd
    remote-as 65000
    update-source Vlan205
  address-family ipv4 unicast
    soft-reconfiguration inbound always
```

!

External Device (NX-OS style CLI):

```
interface Ethernet2/13 - 14
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 203,205
  mtu 9216
  channel-group 12 mode active
  no shutdown
```

!

```
interface port-channel12
  switchport
  switchport mode trunk
  switchport trunk allowed vlan 203,205
  mtu 9216
  no shutdown
```

!

```
interface Vlan205
  no shutdown
  mtu 9216
```

```
! See notes in Leaf-1 and Leaf 2 for BFD
bfd interval 500 min_rx 500 multiplier 3
no bfd echo
no ip redirects
ip address 198.51.100.3/29
no ipv6 redirects
```

!

```
router bgp 65000
  log-neighbor-changes
  address-family ipv4 unicast
  neighbor 198.51.100.1 remote-as 65535
    description to Leaf-1
    update-source Vlan205
    bfd
  neighbor 198.51.100.2 remote-as 65535
    description to Leaf-2
    update-source Vlan205
    bfd
```

end

!

验证

以下是show bgp ipv4 unicast neighbors的输出。它验证了：

1. BGP邻居关系已建立且稳定
2. 已在外部邻居之间启用BFD

```
Leaf 1/2: show bgp ipv4 unicast neighbors vrf Customer BGP neighbor is 203.0.113.2, remote AS 65535,
ibgp link, Peer index 4 BGP version 4, remote router ID 203.0.113.2 Neighbor previous state =
OpenConfirm BGP state = Established, up for 6d22h Neighbor vrf: Customer Peer is directly attached,
interface Vlan205 Last read 00:00:14, hold time = 180, keepalive interval is 60 seconds Last written
00:00:03, keepalive timer expiry due 00:00:56 Received 10012 messages, 0 notifications, 0 bytes in queue ...
BGP neighbor is 203.0.113.2.3, remote AS 65000, ebgp link, Peer index 3 BGP version 4, remote router ID
203.0.113.2 Neighbor previous state = OpenConfirm BGP state = Established, up for 1d00h Neighbor vrf:
Customer Using Vlan205 as update source for this peer Peer is directly attached, interface Vlan205 BFD
live-detection is configured and enabled, state is Up Last read 00:00:22, hold time = 180, keepalive interval
is 60 seconds Last written 00:00:56, keepalive timer expiry due 00:00:03 ! External Device: show bgp ipv4
unicast neighbors BGP neighbor is 203.0.113.1, remote AS 65535, ebgp link, Peer index 3 Inherits peer
configuration from peer-template Cust_BGP_Peer BGP version 4, remote router ID 203.0.113.1 BGP state
= Established, up for 1d00h Peer is directly attached, interface Vlan205 Enable logging neighbor events
BFD live-detection is configured and enabled, state is Up Last read 0.660288, hold time = 180, keepalive
interval is 60 seconds Last written 00:00:26, keepalive timer expiry due 00:00:33 Received 10122 messages,
1 notifications, 0 bytes in queue Sent 10086 messages, 1 notifications, 0(0) bytes in queue Connections
established 14, dropped 13 Last reset by us 1d00h, due to bfd session down Last reset by peer 6d22h, due to
other configuration change ....
```

故障排除

以下命令有助于验证操作：

```
show vpc show vpc consistency-parameters global show vpc consistency-parameters interface
```

```
show bgp ipv4 unicast neighbors show bgp ipv4 unicast summary
```

关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

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