

BGP Unnumbered

In the original BGP configuration, it needs to specify a peer IPv4 address to establish peer connections.

For CLOS deployment in the data center, the IP interfaces grow dramatically due to the full connection between spines and LEAFs.

(each peer connection needs IPv4 addresses on it). To eliminate this situation, we need the unnumbered interface to establish peer connections. BGP unnumbered establishes the BGP session with the IPv6 link-local address, so the route learned by BGP unnumbered, the next hop, will be the neighbor's link-local IP.

Establish BGP unnumbered session
mceclip0.png

Procedure:

Step 1. Initialize FRR configuration. Please refer to FRRouting and config initialization tutorial.

Step 2. Enable the IPv6 link local, please refer the restriction.

Step 3. Enter Vty shell.

```
admin@sonic:~$ vtysh
Hello, this is FRRouting (version 7.2.1-sonic).
Copyright 1996-2005 Kunihiro Ishiguro, et al.
```

```
sonic#
Note.
```

"vtysh" provides a combined frontend to all FRR daemons in a single combined session.

Step 4. Configuring BGP Neighbor Session with unnumbered. Replaces the IP configuration of the original neighbor with the locally connected interface. (refer to Establish BGP session)

```
Switch#1's setting.
sonic# configure terminal
sonic(config)# router bgp 65000
sonic(config-router)#bgp router-id 3.3.3.3
sonic(config-router)# neighbor Ethernet8 interface remote 65001
```

```
Switch#2's setting.
sonic# configure terminal
sonic(config)# router bgp 65001
sonic(config-router)#bgp router-id 4.4.4.4
sonic(config-router)# neighbor Ethernet48 interface remote 65000
Note.
```

The AS number of neighbors, you could assign the AS number of neighbors. The "external" is to eBGP and the "internal" is to iBGP.

```
eBGP:
sonic(config-router)# neighbor Ethernet8 interface remote-as external
iBGP:
sonic(config-router)# neighbor Ethernet8 interface remote-as internal
```

Step 5. Checking the BGP connection and neighbor status.

On the AS7726-32X (Switch1)

sonic# show bgp summary

IPv4 Unicast Summary:

BGP router identifier 3.3.3.3, local AS number 65000 vrf-id 0

BGP table version 0

RIB entries 0, using 0 bytes of memory

Peers 1, using 727 KiB of memory

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down
State/PfxRcd	PfxSnt	Desc						
Ethernet8	4	65001	3	3	0	0	0	00:00:14
0	0	N/A						

Total number of neighbors 1

sonic# show bgp neighbors

BGP neighbor on Ethernet8: fe80::36ef:b6ff:fe95:2000, remote AS 65001, local AS 65000, external link

Hostname: sonic

BGP version 4, remote router ID 4.4.4.4, local router ID 3.3.3.3

BGP state = Established, up for 00:00:27

Last read 00:00:26, Last write 00:00:26

Hold time is 180, keepalive interval is 60 seconds

Neighbor capabilities:

4 Byte AS: advertised and received

Extended Message: advertised and received

AddPath:

IPv4 Unicast: RX advertised IPv4 Unicast and received

Extended nexthop: advertised and received

Address families by peer:

IPv4 Unicast

Route refresh: advertised and received(old & new)

Enhanced Route Refresh: advertised and received

Address Family IPv4 Unicast: advertised and received

Hostname Capability: advertised (name: sonic, domain name: n/a) received

(name: sonic, domain name: n/a)

Graceful Restart Capability: advertised and received

Remote Restart timer is 120 seconds

Address families by peer:

none

Graceful restart information:

End-of-RIB send: IPv4 Unicast

End-of-RIB received: IPv4 Unicast

Local GR Mode: Helper*

Remote GR Mode: Helper

R bit: True

Timers:

Configured Restart Time(sec): 120

Received Restart Time(sec): 120

IPv4 Unicast:

F bit: False

End-of-RIB sent: Yes

End-of-RIB sent after update: Yes

End-of-RIB received: Yes

Timers:

Configured Stale Path Time(sec): 360

Message statistics:

Inq depth is 0

Outq depth is 0

	Sent	Rcvd
Opens:	1	1
Notifications:	0	0
Updates:	1	1

```
Keepalives:          1          1
Route Refresh:       0          0
Capability:          0          0
Total:               3          3
```

Minimum time between advertisement runs is 0 seconds

For address family: IPv4 Unicast

Update group 1, subgroup 1

Packet Queue length 0

Community attribute sent to this neighbor(all)

0 accepted prefixes

Connections established 1; dropped 0

Last reset 00:00:43, No AFI/SAFI activated for peer

Local host: fe80::6f8:f8ff:fe6a:f691, Local port: 179

Foreign host: fe80::36ef:b6ff:fe95:2000, Foreign port: 41428

Nexthop: 3.3.3.3

Nexthop global: fe80::6f8:f8ff:fe6a:f691

Nexthop local: fe80::6f8:f8ff:fe6a:f691

BGP connection: shared network

BGP Connect Retry Timer in Seconds: 120

Read thread: on Write thread: on FD used: 30

On the AS5835-54X (Switch2)

sonic# show bgp summary

IPv4 Unicast Summary:

BGP router identifier 4.4.4.4, local AS number 65001 vrf-id 0

BGP table version 0

RIB entries 0, using 0 bytes of memory

Peers 1, using 727 KiB of memory

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down
State/PfxRcd	PfxSnt	Desc						
Ethernet48	4	65000	3	3	0	0	0	00:00:21
0	0 N/A							

Total number of neighbors 1

sonic# show bgp neighbors

BGP neighbor on Ethernet48: fe80::6f8:f8ff:fe6a:f691, remote AS 65000, local AS 65001, external link

Hostname: sonic

BGP version 4, remote router ID 3.3.3.3, local router ID 4.4.4.4

BGP state = Established, up for 00:00:35

Last read 00:00:34, Last write 00:00:34

Hold time is 180, keepalive interval is 60 seconds

Neighbor capabilities:

4 Byte AS: advertised and received

Extended Message: advertised and received

AddPath:

IPv4 Unicast: RX advertised IPv4 Unicast and received

Extended nexthop: advertised and received

Address families by peer:

IPv4 Unicast

Route refresh: advertised and received(old & new)

Enhanced Route Refresh: advertised and received

Address Family IPv4 Unicast: advertised and received

Hostname Capability: advertised (name: sonic, domain name: n/a) received
(name: sonic, domain name: n/a)

Graceful Restart Capability: advertised and received

Remote Restart timer is 120 seconds

Address families by peer:

```

    none
Graceful restart information:
  End-of-RIB send: IPv4 Unicast
  End-of-RIB received: IPv4 Unicast
  Local GR Mode: Helper*
  Remote GR Mode: Helper
  R bit: True
  Timers:
    Configured Restart Time(sec): 120
    Received Restart Time(sec): 120
  IPv4 Unicast:
    F bit: False
    End-of-RIB sent: Yes
    End-of-RIB sent after update: Yes
    End-of-RIB received: Yes
    Timers:
      Configured Stale Path Time(sec): 360
Message statistics:
  Inq depth is 0
  Outq depth is 0

```

	Sent	Rcvd
Opens:	1	1
Notifications:	0	0
Updates:	1	1
Keepalives:	1	1
Route Refresh:	0	0
Capability:	0	0
Total:	3	3

```

Minimum time between advertisement runs is 0 seconds

For address family: IPv4 Unicast
  Update group 1, subgroup 1
  Packet Queue length 0
  Community attribute sent to this neighbor(all)
  0 accepted prefixes

Connections established 1; dropped 0
Last reset 00:00:35, Waiting for peer OPEN
Local host: fe80::36ef:b6ff:fe95:2000, Local port: 41428
Foreign host: fe80::6f8:f8ff:fe6a:f691, Foreign port: 179
Nexthop: 4.4.4.4
Nexthop global: fe80::36ef:b6ff:fe95:2000
Nexthop local: fe80::36ef:b6ff:fe95:2000
BGP connection: shared network
BGP Connect Retry Timer in Seconds: 120
Read thread: on Write thread: on FD used: 30

```

Step 6. Save the routing setting.

```
sonic# write
```

```

Note: this version of vtysh never writes vtysh.conf
Building Configuration...
Integrated configuration saved to /etc/frr/frr.conf
[OK]

```