

# **IPv6 BGPv4 hands-on laboratory**

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This document provides guidelines for executing in the BGPv4 lab during the 6NET/SEEREN IPv6 workshop, 03 March 2005

Written by János Mohácsi NIIF/HUNGARNET, 25 February, 2005

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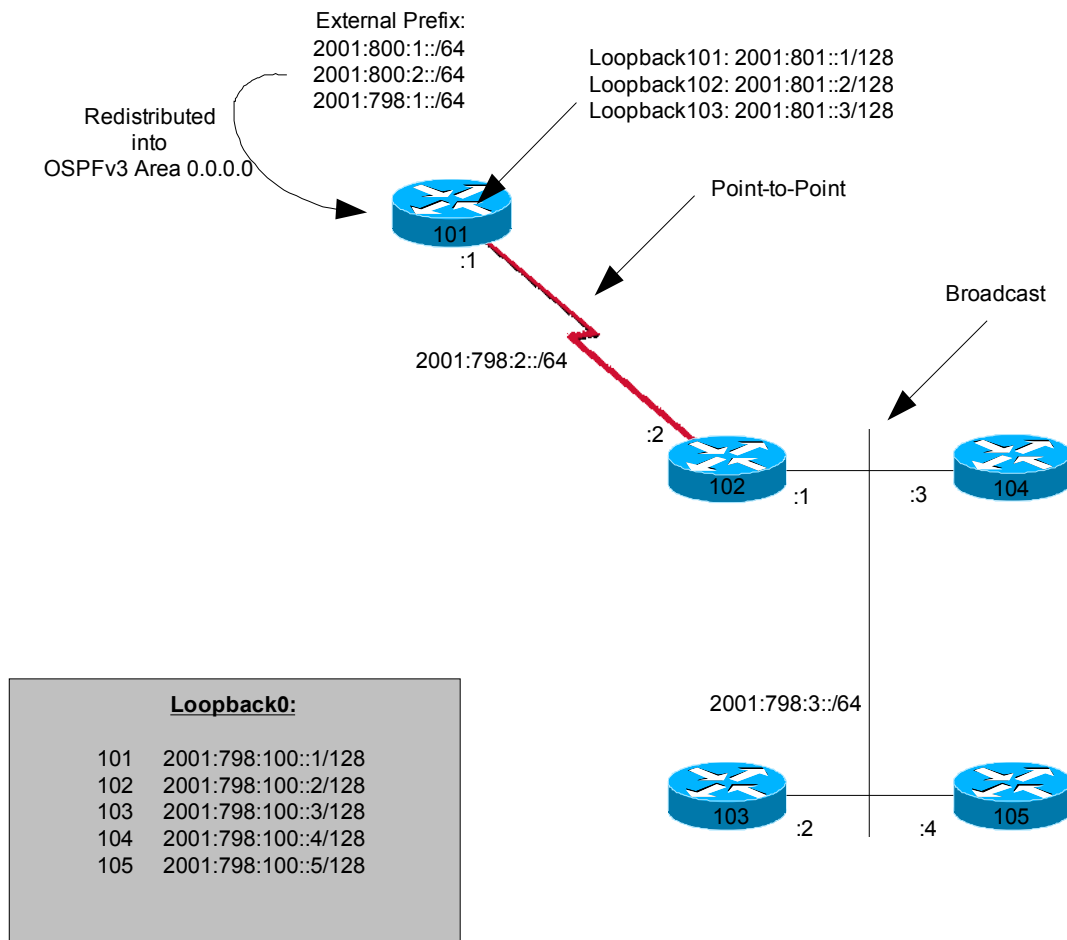
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# Lab Setup

## The Lab Topology

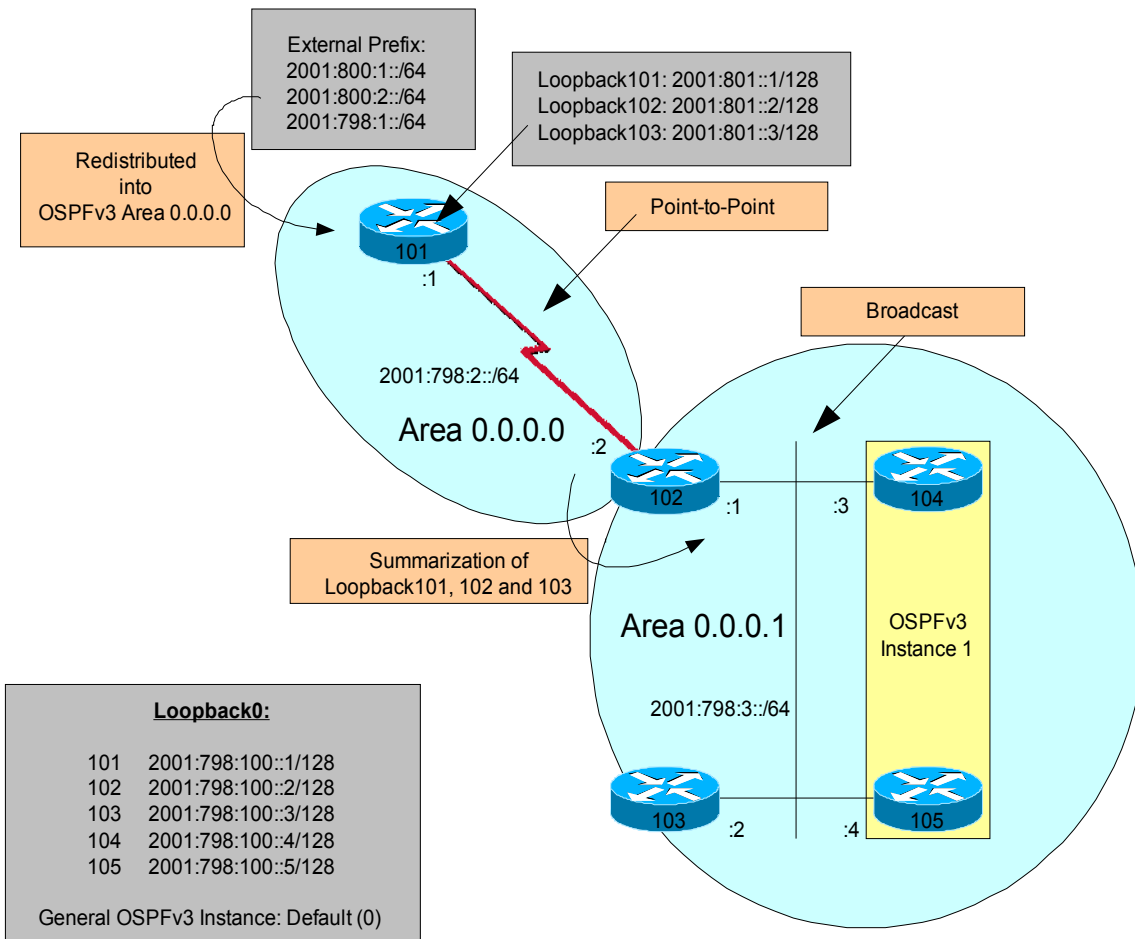
The lab used for the BGPv4 practical is shown below. All IPv6 addresses have been configured.

There is telnet access to the console ports prepared (see later for connection details). It is possible to telnet from each router to any other router by means of the loopback0 address of the equipment. Please note that there is no IPv4 address configured on any of the routers.

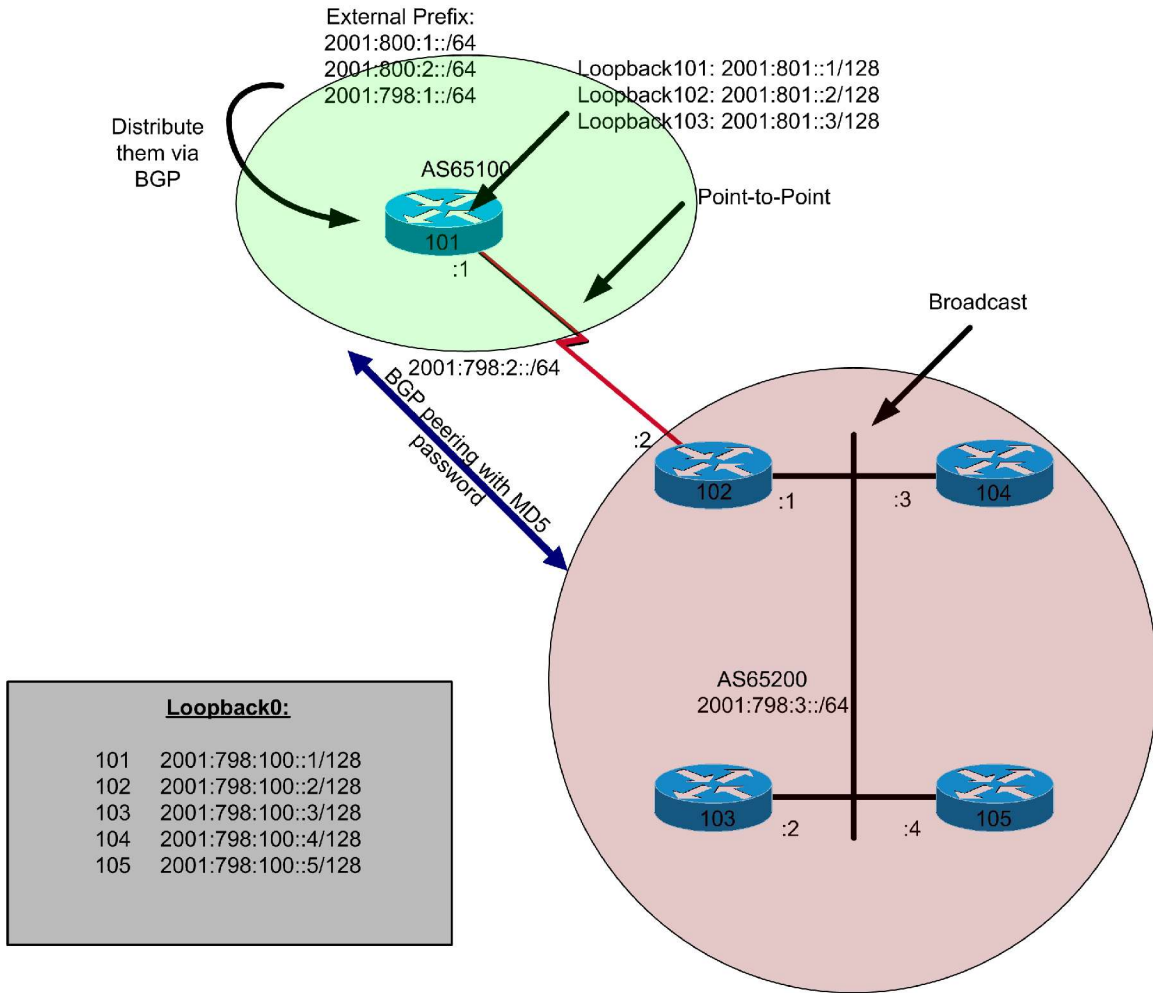


The External prefixes on '**Router101**' have been configured as Static routes to the NULL interfaces configured previously to be redistributed into the OSPFv3 process

The topology described above is how the OSPFv3 practical started. After configuration of the OSPFv3 protocol the following topology achieved.



The final topology will be the following. The Lab notes will guide through the session on how the final topology can be achieved. The lab user is invited to check the BGP database and debugging the protocol.



**How to achieve access to the lab equipment:**

**Login-id: Cisco**  
**Password: Cisco**

Lab Group 1	
Router 101	telnet 147.91.4.145 port 2001
Router 102	telnet 147.91.4.145 port 2002
Router 103	Not important
Router 104	Not important
Router 105	Not important

# Lab Guidelines

## Enabling BGPv4 peering between router 101 and router 102

### Router101

```
101#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
101(config)#router bgp 65100
101(config-router)#address-family ipv6
101(config-router-af)#neighbor 2001:798:2::2 remote-as 65200
101(config-router-af)#neighbor 2001:798:2::2 description peering 102
101(config-router-af)#neighbor 2001:798:2::2 send-community both
101(config-router-af)#^Z
*Apr 12 21:41:38 UTC: %SYS-5-CONFIG_I: Configured from console by
console bgp even#
101#debug bgp all events
BGP events debugging is on
101#
*Apr 12 21:41:58 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:42:13 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:42:28 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:42:43 UTC: BGP: Performing BGP general scanning
*Apr 12 21:42:43 UTC: BGP(0): scanning IPv4 Unicast routing tables
*Apr 12 21:42:43 UTC: BGP(1): scanning IPv6 Unicast routing tables
*Apr 12 21:42:43 UTC: BGP(2): scanning VPNv4 Unicast routing tables
*Apr 12 21:42:43 UTC: BGP(3): scanning IPv4 Multicast routing tables
*Apr 12 21:42:43 UTC: BGP(4): scanning IPv6 Multicast routing tables
*Apr 12 21:42:58 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:43:13 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:43:28 UTC: BGP: Import timer expired. Walking from 1 to 1
*Apr 12 21:43:43 UTC: BGP: Performing BGP general scanning
*Apr 12 21:43:43 UTC: BGP(0): scanning IPv4 Unicast routing tables
*Apr 12 21:43:43 UTC: BGP(1): scanning IPv6 Unicast routing tables
*Apr 12 21:43:43 UTC: BGP(2): scanning VPNv4 Unicast routing tables
*Apr 12 21:43:43 UTC: BGP(3): scanning IPv4 Multicast routing tables
*Apr 12 21:43:43 UTC: BGP(4): scanning IPv6 Multicast routing tables
*Apr 12 21:43:58 UTC: BGP: Import timer expired. Walking from 1 to 1
```

### Repeat for router 102

```
102(config)#router bgp 65200
102(config-router)#add
102(config-router)#address-family ipv6
102(config-router-af)#neighbor 2001:798:2::1 remote-as 65100
102(config-router-af)#neighbor 2001:798:2::1 description peering 101
102(config-router-af)#neighbor 2001:798:2::1 description peering 101
102(config-router-af)#neighbor 2001:798:2::1 send-community both
102(config-router-af)#exit
102(config-router)#exit
102(config)#exit
102#show
15:49:00: %SYS-5-CONFIG_I: Configured from console by console bgp all su
102#show bgp all summary
For address family: IPv6 Unicast
BGP router identifier 0.0.0.0, local AS number 65200
```

BGP table version is 1, main routing table version 1

```
Neighbor      V    AS MsgRcvd MsgSent   TblVer  InQ  OutQ  Up/Down
State/PfxRcd
2001:798:2::1 4 65100      0      0       0    0    0 never   Idle
102#
102#
```

Peering did not come up. Why?

The router id is 0.0.0.0. This is wrong. We have to configure.

Note: the router id is configured only for OSPFv3, you also have to configure for BGP

Configure router id for 101:

```
101(config)#router bgp 65100
101(config-router)#bgp router-id 1.1.1.1
*Apr 12 21:44:28 UTC: BGP: Import timer expired. Walking from 1 to 1
101(config-router)#
*Apr 12 21:44:31 UTC: BGP: reset all neighbors due to Router ID changed
101(config-router)#exit
101(config)#exit
```

Repeat for router 102,

The Router-id has to be configured respectively 2.2.2.2

```
102(config)#router bgp 65200
102(config-router)#bgp router-id 2.2.2.2
102(config-router)#exit
102(config)#exit
102#show bgp all summary
For address family: IPv6 Unicast
BGP router identifier 2.2.2.2, local AS number 65200
BGP table version is 1, main routing table version 1
```

```
Neighbor      V    AS MsgRcvd MsgSent   TblVer  InQ  OutQ  Up/Down
State/PfxRcd
2001:798:2::1 4 65100      0      0       0    0    0 never   Idle
102#
```

15:49:45: %SYS-5-CONFIG\_I: Configured from console by console

15:50:20: %BGP-5-ADJCHANGE: neighbor 2001:798:2::1 Up

```
102#show bgp all summary
```

For address family: IPv6 Unicast

BGP router identifier 2.2.2.2, local AS number 65200

BGP table version is 1, main routing table version 1

```
Neighbor      V    AS MsgRcvd MsgSent   TblVer  InQ  OutQ  Up/Down
State/PfxRcd
2001:798:2::1 4 65100      4      4       1    0    0 00:00:14
0
102#
```

Check BGP peering:

```
show bgp ipv6 unicast summary
```

```
show bgp ipv6 unicast neighbor <address>
```

## Distribute the hipotetical networks via BGP

### Router 101

```
101#conf t
Enter configuration commands, one per line. End with CNTL/Z.
101(config)#router bgp 65100
101(config-router)#address-family ipv6
101(config-router-af)#network 2001:800:1::/64
101(config-router-af)#network 2001:800:1::/64
101(config-router-af)#network 2001:798:2::/64
101(config-router-af)#exit
101(config-router)#exit
101(config)#exit
101#show
101#show bgp ipv6 unicast neighbors 2001:798:2::2 advertised-routes
BGP table version is 4, local router ID is 1.1.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
                r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop           Metric LocPrf Weight Path
*> 2001:798:1::/64  ::                0      32768 i
*> 2001:800:1::/64  ::                0      32768 i
*> 2001:800:2::/64  ::                0      32768 i
101#
```

### Router 102:

```
102#show bgp all summary
For address family: IPv6 Unicast
BGP router identifier 2.2.2.2, local AS number 65200
BGP table version is 4, main routing table version 4
3 network entries using 399 bytes of memory
3 path entries using 216 bytes of memory
1 BGP path attribute entries using 56 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 695 total bytes of memory
BGP activity 3/0 prefixes, 3/0 paths, scan interval 60 secs
```

```
Neighbor    V  AS MsgRcvd MsgSent  TblVer  InQ OutQ Up/Down State/PfxRcd
2001:798:2::1 4 65100    9    8    4    0  00:04:30    3
```

```
102#conf t
Enter configuration commands, one per line. End with CNTL/Z.
102(config)#router bgp 65200
102(config-router)#add
102(config-router)#address-family ipv6
102(config-router-af)#network 2001:798:3::/64
102(config-router-af)#exit
102(config-router)#exit
```

```
102(config)#exit
102#show bgp ipv6 unicast neighbors 2001:798:2::1 advertised-routes
BGP table version is 5, local router ID is 2.2.2.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
```

```
   Network      Next Hop      Metric LocPrf Weight Path
*> 2001:798:3::/64 ::      0      32768 i
102#
```

## Disable OSPFv3 between router 101 and 102

### Router 101

```
101#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
101(config)#interface Serial 1/0
101(config-if)#no ipv6 ospf 100 area 0
101(config-if)#
*Apr 12 21:58:12 UTC: %OSPFv3-5-ADJCHG: Process 100, Nbr 2.2.2.2 on
Serial1/0 from FULL to DOWN, Neighbor Down: Interface down or detached
101(config-if)#exit
101(config)#exit
```

### Check the routes are still there and no OSPF is configured with external AS.

```
101#show ipv6 route
IPv6 Routing Table - 12 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext
       2
         ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
S   2001:798:1::/64 [1/0]
    via ::, Null0
C   2001:798:2::/64 [0/0]
    via ::, Serial1/0
L   2001:798:2::1/128 [0/0]
    via ::, Serial1/0
B   2001:798:3::/64 [20/0]
    via FE80::203:E4FF:FE4F:8800, Serial1/0
LC  2001:798:100::1/128 [0/0]
    via ::, Loopback0
S   2001:800:1::/64 [1/0]
    via ::, Null0
S   2001:800:2::/64 [1/0]
    via ::, Null0
LC  2001:801::1/128 [0/0]
    via ::, Loopback101
LC  2001:801::2/128 [0/0]
    via ::, Loopback102
```

```

LC 2001:801::3/128 [0/0]
    via ::, Loopback103
L FE80::/10 [0/0]
    via ::, Null0
L FF00::/8 [0/0]
    via ::, Null0
101#show bgp all sum
For address family: IPv6 Unicast
BGP router identifier 1.1.1.1, local AS number 65100
BGP table version is 5, main routing table version 5
4 network entries using 580 bytes of memory
4 path entries using 288 bytes of memory
3/2 BGP path/bestpath attribute entries using 348 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 1240 total bytes of memory
BGP activity 4/0 prefixes, 4/0 paths, scan interval 60 secs

Neighbor      V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
2001:798:2::2  4 65200     19     19       5    0   0 00:14:56
1
101#show ipv6 ospf interface
Loopback103 is up, line protocol is up
  Link Local Address FE80::206:53FF:FEBE:7D10, Interface ID 9
  Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
  Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback102 is up, line protocol is up
  Link Local Address FE80::206:53FF:FEBE:7D10, Interface ID 8
  Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
  Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback101 is up, line protocol is up
  Link Local Address FE80::206:53FF:FEBE:7D10, Interface ID 7
  Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
  Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback0 is up, line protocol is up
  Link Local Address FE80::206:53FF:FEBE:7D10, Interface ID 6
  Area 0, Process ID 100, Instance ID 0, Router ID 1.1.1.1
  Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
101#

```

## Router 102:

### 102#conf t

```

Enter configuration commands, one per line.  End with CNTL/Z.
102(config)#interface Serial 1/0
102(config-if)#no ipv6 ospf 100 area 0
102(config-if)#
16:04:09: %OSPFv3-5-ADJCHG: Process 100, Nbr 1.1.1.1 on Serial1/0 from
FULL to DOWN, Neighbor Down: Interface down or detached
102(config-if)#

```

```

102(config-if)#
102(config-if)#exit
102(config)#exi
102#
16:04:21: %SYS-5-CONFIG_I: Configured from console by console
102#show ipv6 route
IPv6 Routing Table - 10 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext
2
B 2001:798:1::/64 [20/0]
  via FE80::206:53FF:FEBE:7D10, Serial1/0
C 2001:798:2::/64 [0/0]
  via ::, Serial1/0
L 2001:798:2::2/128 [0/0]
  via ::, Serial1/0
S 2001:798:3::/64 [1/0]
  via ::, Null0
LC 2001:798:100::2/128 [0/0]
  via ::, Loopback0
B 2001:800:1::/64 [20/0]
  via FE80::206:53FF:FEBE:7D10, Serial1/0
B 2001:800:2::/64 [20/0]
  via FE80::206:53FF:FEBE:7D10, Serial1/0
S 2001:DB8:1::/48 [1/0]
  via ::, Null0
L FE80::/10 [0/0]
  via ::, Null0
  FF00::/8 [0/0]
  via ::, Null0
102#

```

## Configure MD5 password on BGP peering

Router101

Configure md5 password to a neighbor

```

101#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
101(config)#router bgp 65100
101(config-router)#address-family ipv6
101(config-router-af)#neighbor 2001:798:2::2 password test
101(config-router-af)#^Z
101#
*Apr 12 22:13:40 UTC: %SYS-5-CONFIG_I: Configured from console by console

```

Check if we are using MD5

```

101#show bgp all summary
For address family: IPv6 Unicast
BGP router identifier 1.1.1.1, local AS number 65100
BGP table version is 5, main routing table version 5

```

4 network entries using 580 bytes of memory  
4 path entries using 288 bytes of memory  
3/2 BGP path/bestpath attribute entries using 348 bytes of memory  
1 BGP AS-PATH entries using 24 bytes of memory  
0 BGP route-map cache entries using 0 bytes of memory  
0 BGP filter-list cache entries using 0 bytes of memory  
BGP using 1240 total bytes of memory  
BGP activity 4/0 prefixes, 4/0 paths, scan interval 60 secs

Neighbor State/PfxRcd	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down
2001:798:2::2	4	65200	34	34	5	0	0	00:29:04

1  
101#show bgp all neighbors 2001:798:2::2  
For address family: IPv4 Unicast

For address family: IPv6 Unicast  
BGP neighbor is 2001:798:2::2, remote AS 65200, external link  
Description: peering 102  
BGP version 4, remote router ID 2.2.2.2  
BGP state = Established, up for 00:29:20  
Last read 00:00:20, hold time is 180, keepalive interval is 60 seconds

Neighbor capabilities:

Route refresh: advertised and received(old & new)  
Address family IPv6 Unicast: advertised and received

Message statistics:

InQ depth is 0  
OutQ depth is 0

	Sent	Rcvd
Opens:	1	1
Notifications:	0	0
Updates:	1	1
Keepalives:	32	32
Route Refresh:	0	0
Total:	34	34

Default minimum time between advertisement runs is 30 seconds

Connections established 1; dropped 0

Last reset never

Connection state is ESTAB, I/O status: 1, unread input bytes: 0

Connection is ECN Disabled

Local host: 2001:798:2::1, Local port: 179

Foreign host: 2001:798:2::2, Foreign port: 11000

Enqueued packets for retransmit: 0, input: 0 mis-ordered: 0 (0 bytes)

Event Timers (current time is 0x3821E7C):

Timer	Starts	Wakeups	Next
Retrans	33	0	0x0
TimeWait	0	0	0x0
AckHold	34	19	0x0
SendWnd	0	0	0x0
KeepAlive	0	0	0x0
GiveUp	0	0	0x0
PmtuAger	0	0	0x0
DeadWait	0	0	0x0

```
iss: 303261394  snduna: 303262156  sndnxt: 303262156      sndwnd:
15623
irs: 4107284231  rcvnxt: 4107284975  rcvwnd:      15641  delrcwnd:
743
```

```
SRTT: 296 ms, RTTO: 327 ms, RTV: 31 ms, KRTT: 0 ms
minRTT: 0 ms, maxRTT: 300 ms, ACK hold: 200 ms
Flags: passive open, nagle, gen tcbs, md5
IP Precedence value : 0
```

```
Datagrams (max data segment is 1440 bytes):
Rcvd: 50 (out of order: 0), with data: 34, total data bytes: 743
Sent: 54 (retransmit: 0, fastretransmit: 0, partialack: 0, Second
Congestion: 0), with data: 54, total data bytes: 3009
```

```
For address family: VPNv4 Unicast
```

```
For address family: IPv4 Multicast
```

```
For address family: IPv6 Multicast
101#
```

## Router 102

```
102#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
102(config)#router bgp 65200
102(config-router)#address-family ipv6
102(config-router-af)#neighbor 2001:798:2::1 password test
102(config-router-af)#
```

## Filtering routes

### Router102

#### Configure prefix lists:

```
102(config)#ipv6 prefix-list EIGHTHUN permit 2001:800:1::/64
102(config)#ipv6 prefix-list EIGHTHUN permit 2001:800:2::/64
```

#### Configure route map:

```
102(config)#route-map 101in permit 10
102(config-route-map)#description allow EIGHTHUN prefix
102(config-route-map)# match ipv6 address prefix-list EIGHTHUN
102(config-route-map)#set community 65200:800
102(config-route-map)#route-map 101in deny 20
102(config-route-map)#description deny everything else
102(config-route-map)#exit
```

#### Apply route-map to BGP peering:

```
102(config-route-map)#router bgp 65200
102(config-router)#address-family ipv6
```

```
102(config-router-af)#neighbor 2001:798:2::1 route-map 101in in
102(config-router-af)#exit
102(config-router)#exit
102(config)#exit
```

### Clear BGP peering to apply this changes:

```
102#clear bgp ipv6 unicast 2001:798:2::1 soft in
```

### Check the received routes:

```
102#show bgp all summary
For address family: IPv6 Unicast
BGP router identifier 2.2.2.2, local AS number 65200
BGP table version is 18, main routing table version 18
4 network entries using 532 bytes of memory
3 path entries using 216 bytes of memory
3 BGP path attribute entries using 168 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
1 BGP community entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 964 total bytes of memory
BGP activity 7/3 prefixes, 10/7 paths, scan interval 60 secs

Neighbor          V    AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
2001:798:2::1    4 65100     151     153     18   0   0 01:45:48
2
102#show ipv6 route bgp
IPv6 Routing Table - 9 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext
2
B   2001:800:1::/64 [20/0]
    via FE80::206:53FF:FEBE:7D10, Serial1/0
B   2001:800:2::/64 [20/0]
    via FE80::206:53FF:FEBE:7D10, Serial1/0
102#exit
```

## Filtering Notes

### Some common aspects to all filters

- 3FFE::/16 (6bone) treat according to the 6bone rules
- 2002::/16 only permits the /16, no more-specifics
- 0000::/8 is denied (loopback, unspecified, v4-mapped)

- FE00::/9 and FF00::/8 are denied (multicast ranges, RFC3513)
- all the rest of the IPv6 unicast address space (0::0/0) is permitted up to reasonable sizes

## Liberal IPv6 prefix filtering list

Deny document prefix: 2001:db8::/32. Deny based on rules above. Accept more specific routes up to a /48 from RIR (2000::/3) ranges.

Cisco prefix list:

```
ipv6 prefix-list ipv6-ebgp-liberal deny 2001:db8::/32 le 128
ipv6 prefix-list ipv6-ebgp-liberal permit 2002::/16
ipv6 prefix-list ipv6-ebgp-liberal deny 2002::/16 le 128
ipv6 prefix-list ipv6-ebgp-liberal deny 0000::/8 le 128
ipv6 prefix-list ipv6-ebgp-liberal deny fe00::/9 le 128
ipv6 prefix-list ipv6-ebgp-liberal deny ff00::/8 le 128
ipv6 prefix-list ipv6-ebgp-liberal permit 0::/0 le 48
ipv6 prefix-list ipv6-ebgp-liberal deny 0::/0 le 128
```

Juniper policy:

```
policy-statement ipv6-ebgp-liberal {
  from {
    family inet6;
    route-filter ::/8 orlonger reject;
    route-filter 2001:db8::/32 orlonger reject;
    route-filter 2002::/16 longer reject;
    route-filter fe00::/9 orlonger reject;
    route-filter ff00::/8 orlonger reject;
    route-filter ::/0 upto /48 next policy;
  }
  then reject;
}
```

## Very strict prefix filtering list

Allow 6bone prefixes based on allocation. Allow 2001:500:xxx:/48 ARIN critical internet infrastructure microallocation. Deny document prefix. Allow 2001:yyyy:/19-32 and 2001:zzzz:/35 based on allocation and 2003:www:/19-32.

Cisco prefix list:

```
ipv6 prefix-list ipv6-ebgp-strict permit 3ffe::/18 ge 24 le 24
ipv6 prefix-list ipv6-ebgp-strict permit 3ffe:4000::/18 ge 32 le 32
ipv6 prefix-list ipv6-ebgp-strict permit 3ffe:8000::/22 ge 28 le 28
ipv6 prefix-list ipv6-ebgp-strict permit 2001:500::/30 ge 48 le 48
ipv6 prefix-list ipv6-ebgp-strict deny 2001:db8::/32 le 128
ipv6 prefix-list ipv6-ebgp-strict permit 2001::/16 ge 35 le 35
ipv6 prefix-list ipv6-ebgp-strict permit 2001::/16 ge 19 le 32
ipv6 prefix-list ipv6-ebgp-strict permit 2002::/16
```

```
ipv6 prefix-list ipv6-ebgp-strict permit 2003::/16 ge 19 le 32
ipv6 prefix-list ipv6-ebgp-strict deny 0::/0 le 128
```

### Juniper policy:

```
policy-statement ipv6-ebgp-strict {
  term pass-some {
    from {
      family inet6;
      route-filter 3ffe::/18 prefix-length-range /24-/24;
      route-filter 3ffe:4000::/18 prefix-length-range /32-/32;
      route-filter 3ffe:8000::/22 prefix-length-range /28-/28;
      route-filter 2001:500::/30 prefix-length-range /48-/48;
      route-filter 2001:db8::/32 orlonger reject;
      route-filter 2001::/16 prefix-length-range /35-/35;
      route-filter 2001::/16 prefix-length-range /19-/32;
      route-filter 2002::/16 exact;
      route-filter 2003::/16 prefix-length-range /19-/32;
    }
    then next policy;
  }
  term reject-rest {
    from family inet6;
    then reject;
  }
}
```