

Brief Cisco-Centric Tutorial on IPv6 Peering

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Just Like IPv4 Peering, Sort Of...

Groups of routers form an AS

You set up peering between routers

You use “**neighbor**” configuration statements under a “**router bgp *ASN***” configuration statement

...But You Do It On An IPv6 Network.

You need “`ipv6 routing`” configured on your router

Any interfaces forwarding IPv6 traffic need IPv6 interface addresses

Routing tables are maintained separately

Entirely new set of peering sessions

...But You Do It On An IPv6 Network.

Running IPv4 and IPv6 on the same routers and circuits does not mean that your IPv4 and IPv6 networks can talk to each other. They can't.

If you turn on IPv6 on your hosts, and something they're trying to reach has an IPv6 DNS entry, your hosts will try to use it. Be very careful if your IPv6 connectivity isn't as full and robust as your IPv4 connectivity.

Configuration Syntax

There Are a Few Syntactic Differences

Configuration statements must be preceded by **“address-family ipv6”**

This messes up your IPv4 config syntax as well

Word-order of configuration changes

“show ip bgp” becomes **“show bgp ipv6”**

Except, that doesn't work either. You need **“show bgp ipv6 unicast”**. Why? Who knows?

You're All Familiar With IPv4 Peering...

```
router bgp 65534
  neighbor PEER peer-group
  neighbor PEER route-map PEER-IN in
  neighbor PEER route-map PEER-OUT out

  neighbor 192.168.0.1 remote-as 65535
  neighbor 192.168.0.1 peer-group PEER
  neighbor 192.168.0.1 password PASSWORD
  neighbor 192.168.0.1 description Sample peer
end
```

...Which Changes a Bit...

```
router bgp 65534
  neighbor PEER peer-group

  neighbor 192.168.0.1 peer-group PEER
  neighbor 192.168.0.1 description Sample peer
  neighbor 192.168.0.1 password PASSWORD

  address-family ipv4
  neighbor PEER activate
  neighbor PEER route-map PEER-IN in
  neighbor PEER route-map PEER-OUT out

  neighbor 192.168.0.1 peer-group PEER
```


...And Adds IPv6 Configuration.

```
router bgp 65534
  neighbor V6-PEER peer-group

  neighbor 2001:418:0:5000::31 remote-as 65535
  neighbor 2001:418:0:5000::31 description Sample
  neighbor 2001:418:0:5000::31 password PASSWORD

  address-family ipv6
  neighbor V6-PEER activate
  neighbor V6-PEER route-map V6-PEER-IN in
  neighbor V6-PEER route-map V6-PEER-OUT out

  neighbor 2001:418:0:5000::31 activate
```

Route-Maps and Prefix Lists

```
ipv6 prefix-list OUR-SPACE seq 5 permit 2001:478:9200::/48
ipv6 prefix-list OUR-SPACE seq 15 permit 2001:503:8028::/48
ipv6 prefix-list OUR-SPACE seq 20 permit 2001:503:D1AE::/48
ipv6 prefix-list OUR-SPACE seq 25 permit 2001:503:A124::/48
```

```
route-map V6-PEER-OUT permit 10
match ipv6 address OUR-SPACE
set community 65535:12345
```

Note that they only change their identifier from “ip” to “**ipv6**”.

Diagnostic Syntax

Commands Look Familiar

```
show bgp ipv6 unicast summary
show bgp ipv6 unicast xxx:xxx::/xx
show bgp ipv6 unicast neighbor xxx:xxx:xxx::x
show bgp ipv6 unicast neighbor xxx:xxx:xxx::x advertised
show bgp ipv6 unicast neighbor xxx:xxx:xxx::x received
```


Output Looks Similar Too

```
router# sh bgp ipv6 unicast neigh 2001:478:9200:51::8 routes
```

```
BGP table version is 13079261, local router ID is 204.61.209.254
```

```
Status codes: s suppressed, d damped, h history, * valid, > best
```

```
Origin codes: i - IGP, e - EGP, ? - incomplete
```

	Network	Next Hop	Metric	LocPrf	Weight	Path
*	2001:5EF:8028::/48	2001:478:92FF:51::8	0		0	65535 i
*	2001:5EF:A124::/48	2001:478:92FF:51::8	0		0	65535 i

```
Total number of prefixes 2
```

But This is All Technical...

The Hard Part is Negotiating Agreements

Fortunately, this is kind of like IPv4 too.

You call or email potential peers and ask them to peer.

They say yes or no.

Or maybe they ask “what’s peering?”

Depending how important it is, you might try to convince them.

Except:

There isn't much IPv6 traffic.

Traffic analysis won't tell you much (yet?).

Nobody has any short-term financial incentive to make this work well.

So don't expect the sort of response you get when talking about IPv4 peering.

There's a Good Side to This

As long as there's no money in it, even the big networks are just playing.

Since the big networks want connectivity to play with, they'll peer with smaller networks, for now.

Thanks, and Questions?

Copies of this presentation can be found
in Keynote, PDF, and QuickTime formats at:

<http://www.pch.net/resources/tutorials/ipv6-peering>

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