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# Module 3 – iBGP Config



***Lab Tasks:***

So far (after completing Module-2), you should be able to reach all routers within your network (loopbacks/PtPs).

We generally carry customers prefixes in BGP (could be your downstream customers, or retail customers – Wired Broadband, Wireless Broadband, etc).

In this lab, we will configure iBGP on top of the working OSPFv3 network.

Take note of the following for iBGP:

1. BGP relies on TCP (port 179), which means BGP routers need to first establish a TCP session/connection before any BGP session can be initiated.
2. By rule, iBGP routers are not allowed to announce routes/prefixes learned from an iBGP peer to its other iBGP peers to prevent routing loops. Which means, iBGP neighbours need to be fully meshed. To scale the iBGP full-mesh problem, we will use “**peer-groups**” in this lab. Route reflection is one more way to scale iBGP, but we won’t cover that under this lab.
3. Since IGP carries all networks within an AS, for iBGP, neighbour relationships can be established using loopback interfaces (reachable through IGP).
4. By default, a router uses its exit interface address as the source address for all locally originated packets (including BGP update messages). Hence, it is important that the BGP TCP connection is established using the correct addresses between peers. Therefore, if you use the loopback interfaces to establish iBGP sessions, you need to force the router to use the loopback address as the source for all BGP messages using “**update-source loopback**” command
5. We will carry the following 8 Customer WAN prefixes in iBGP (for ICMP reachability - monitoring).

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| --- |
| **Customer Side P-2-P** |
| R1=> 2406:6400:10::/48 |
| R3=> 2406:6400:14::/48 |
| R4=> 2406:6400:18::/48 |
| R6=> 2406:6400:1c::/48 |
| R7=> 2406:6400:20::/48 |
| R9=> 2406:6400:24::/48 |
| R10=> 2406:6400:28::/48 |
| R12=> 2406:6400:2c::/48 |

## ***Lab Exercise***

1. **iBGP Peering Configuration:**

We need to establish iBGP relationship with all routers within our AS (17821).

**Example Config on a R1:**

config t

router bgp 17821

no bgp default ipv4-unicast ! IOS assumes that all iBGP peers will be IPv4 only

bgp log-neighbor-changes ! Log neighbor changes (notification)

address-family ipv6 unicast ! Please do the same for IPv4 as well

neighbor iBGP-v6 peer-group ! Create peer-group to scale iBGP

neighbor iBGP-v6 remote-as 17821

neighbor iBGP-v6 update-source loopback 0 ! Force Lo0 as source for BGP messages

neighbor 2406:6400::2 peer-group iBGP-v6 ! Add neighbors to peer-group

neighbor 2406:6400::2 activate ! Enable advertising routes to the neighbor

neighbor 2406:6400::3 peer-group iBGP-v6

neighbor 2406:6400::3 activate

neighbor 2406:6400::4 peer-group iBGP-v6

neighbor 2406:6400::4 activate

neighbor 2406:6400::5 peer-group iBGP-v6

neighbor 2406:6400::5 activate

neighbor 2406:6400::6 peer-group iBGP-v6

neighbor 2406:6400::6 activate

neighbor 2406:6400::7 peer-group iBGP-v6

neighbor 2406:6400::7 activate

neighbor 2406:6400::8 peer-group iBGP-v6

neighbor 2406:6400::8 activate

neighbor 2406:6400::9 peer-group iBGP-v6

neighbor 2406:6400::9 activate

neighbor 2406:6400::10 peer-group iBGP-v6

neighbor 2406:6400::10 activate

neighbor 2406:6400::11 peer-group iBGP-v6

neighbor 2406:6400::11 activate

neighbor 2406:6400::12 peer-group iBGP-v6

neighbor 2406:6400::12 activate

exit

exit

exit

wr

1. **Network Advertisement:**

We will announce the aggregate customer WAN prefixes (Ex: R1-2406:6400:10::/48) in iBGP.

**Example Config on R1:**

config t

router bgp 17821

address-family ipv6 unicast

network 2406:6400:10::/48 ! For IPv4, you need to use the mask command instead of prefix length

exit

exit

The BGP network command requires a route to already exist in the routing table before advertising the route into BGP. Hence, we need a static route of the aggregate prefix pointing to the Null0 (forces it to exist in the routing table, albeit towards the Null interface, so that BGP can announce it).

ipv6 route 2406:6400:10::/48 null 0

exit

wr

1. **Verify iBGP Configuration:**

sh bgp ipv4/ipv6 unicast summary ! List your peers

sh bgp ipv4/ipv6 unicast ! List routes in your BGP Table

sh bgp ipv4/ipv6 unicast <prefix/length> ! List specific routes

sh ip/ipv6 route bgp ! Check routes learned via BGP

sh ip/ipv6 route ! Check your routing table (best paths)

sh bgp ipv6 unicast neighbors <neighbour-address> advertised-routes

! Check routes advertised to your neighbour

sh bgp ipv6 unicast neighbors <neighbour-address> routes

! Check routes learned from your neighbour