BASIC BGP - eBGP Peer

Like other routing protocols, BGP has neighbors, which are usually called "peers". Unlike a lot of Interior Gateway Protocols, such as OSPF and EIGRP, which can discover their neighbors, BGP peers must be manually identified by IP address. This is a good thing, not a disadvantage, as you don't want BGP peers suddenly appearing without proper planning.

Configuration

BGP supports two types of exchanges of routing information: exchanges between different ASs and exchanges within a single AS. When used between ASs, BGP is called external BGP (eBGP) and BGP sessions perform inter-AS routing. When used within an AS, BGP is called internal BGP (iBGP) and BGP sessions perform intra-AS routing.

BGP systems are arranged into peers. In eBGP peers, all peers in the group—called external peers—are in different ASes. eBGP peers can be anywhere in the internet but are usually directly connected to each other. eBGP peers use the directly connected subnet to resolve forwarding addresses. They also propagate external routes among all other eBGP peers, computing the next hop by taking the BGP next hop received with the route and resolving it using information from one of the interior gateway protocols.

eBGP sessions (BGP sessions outside your autonomous system) are identified by the neighbor's AS number being different to your AS number. While iBGP sessions are expected to be configured across the network, the eBGP sessions are usually established between directly-connected routers.

Routing Process

```
NetStepByStep-R1(config-router)# neighbor X.X.X.X remote-as Z
```

- Use to add an entry to the BGP or multiprotocol BGP neighbor table.
- Use this command in router configuration mode.
- To remove an entry from the table, use the **no** form of this command.
- The X.X.X.X stands for IP address of the neighbor.
- The Z stands for Number of an autonomous system to which the neighbor belongs in the range from 1 to 65535.
- By default, neighbors that are defined using the **neighbor remote-as** command in router configuration mode exchange only unicast address prefixes.
- To exchange other address prefix types, such as multicast and Virtual Private Network (VPN) Version 4, neighbors must also be activated in the appropriate address family configuration mode.

Verification

```
show ip bgp
```

- Use to display entries in the Border Gateway Protocol (BGP) routing table.
- Use this command in EXEC mode.
- The output can be filtered to display entries for a specific prefix, prefix length, and prefixes injected through a prefix list, route map, or conditional advertisement.
- BGP prefixes that are monitored and controlled by Optimized Edge Routing (OER) are displayed by entering the show ip bgp command with the oer-paths keyword.

```
NetStepByStep-R1# sh ip bgp
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
*> 11.11.11.0/25    0.0.0.0                  0          32768 i
*> 11.11.11.128/25  0.0.0.0                  0          32768 i
*> 22.22.22.0/24    12.12.12.2               0              0 1 i
```

```
show ip bgp summary
```

- Use to display the status of all Border Gateway Protocol (BGP) connections. In other words, this command is used to display BGP path, prefix, and attribute information for all connections to BGP neighbors.

- Use this command in EXEC mode.
- This command has no arguments or keywords.
- A prefix is an IP address and network mask. It can represent an entire network, a subset of a network, or a single host route. A path is a route to a given destination.
- By default, BGP will install only a single path for each destination. If multipath routes are configured, BGP will install a path entry for each multipath route, and only one multipath route will be marked as the bestpath.

```
NetStepByStep-R1# sh ip bgp summary
BGP router identifier 1.1.1.1, local AS number 2
BGP table version is 4, main routing table version 4
3 network entries using 351 bytes of memory
3 path entries using 156 bytes of memory
3/2 BGP path/bestpath attribute entries using 372 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 903 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
12.12.12.2   4     1     11      11        4    0    0 00:06:37          1
```

Troubleshoot

```
debug ip bgp X.X.X.X updates
```

- Use to display information related to updates of the Border Gateway Protocol (BGP).
- Use this command in privileged EXEC mode.
- To disable debugging output, use the no form of this command.
- X.X.X.X stands for BGP neighbor IP address.

Video Cheat Sheet

R1

```
router bgp 2
neighbor 12.12.12.2 remote-as 1
```

R2

```
router bgp 1
neighbor 12.12.12.1 remote-as 2
```