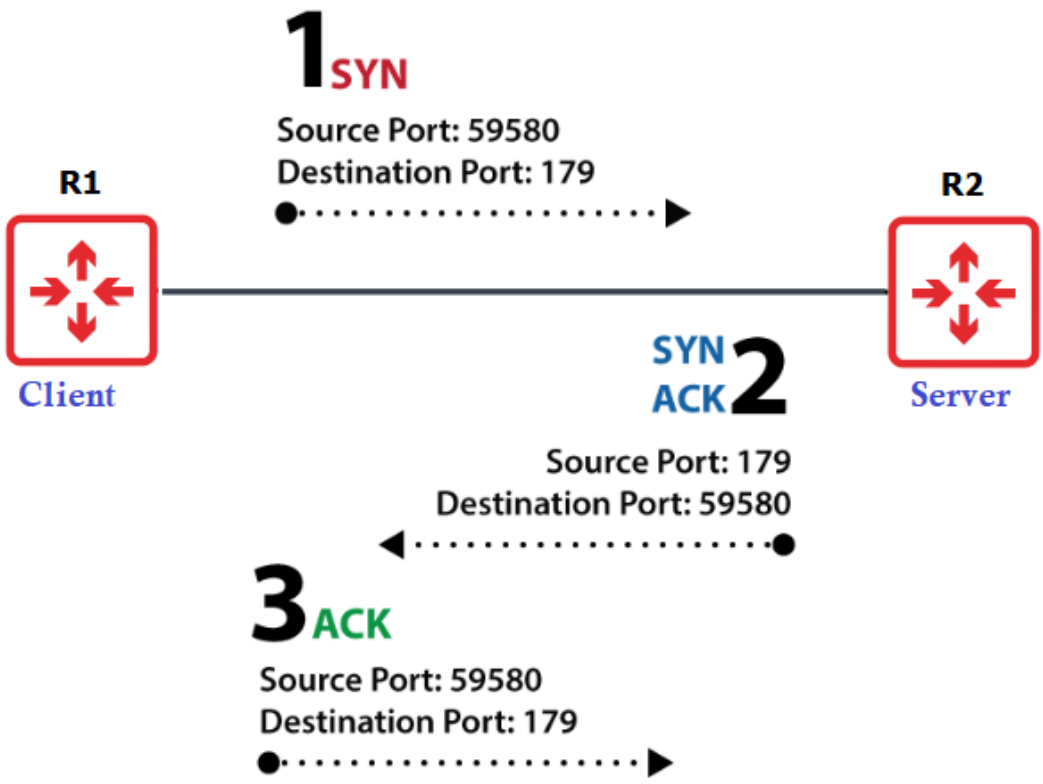
BGP Neighbor States:

- Like OSPF or EIGRP, BGP establishes a neighbor adjacency with other BGP routers.
- To create a neighbor relationship, BGP router first tries to establish TCP connection.
- When the connection is established, the cisco router will send a BGP open message.
- BGP open message is similar to hello message like in OSPF or EIGRP routing protocol.
- Then the parameters are matched, & routers become Border Gateway Protocol peers.
- BGP protocol does not use broadcast or multicast to "Discover" other BGP neighbors.
- Border Gateway Protocol (BGP) neighbors have to be configured manually or statically.
- Border Gateway Protocol (BGP) uses TCP port number 179 for the connection to peer.
- During BGP this process, the peers will go through the various stages as mention follows.



1. Idle:

- The BGP process is administratively down.
- The BGP process is awaiting the next retry attempt.
- BGP is just configure on new neighbor.
- Already established BGP peering is reset.

2. Connect:

- The BGP process is waiting for the TCP connect to be established.
- BGP is waiting for the TCP three-way handshake to complete.
- If successful, it will continue to the OpenSent State.
- If fails, it will continue to the Active State.
- If BGP reset is, send it will move back to the Idle State.

3. Active:

- The TCP connection failed, and the Connect-Retry timer is running.
- BGP will try another TCP three-way handshake to establish a connection.
- BGP is listening for an incoming TCP connection.
- If it is successful, it will move to the OpenSent State.
- If BGP reset is, send it will move back to the Idle State.

4. OpenSent:

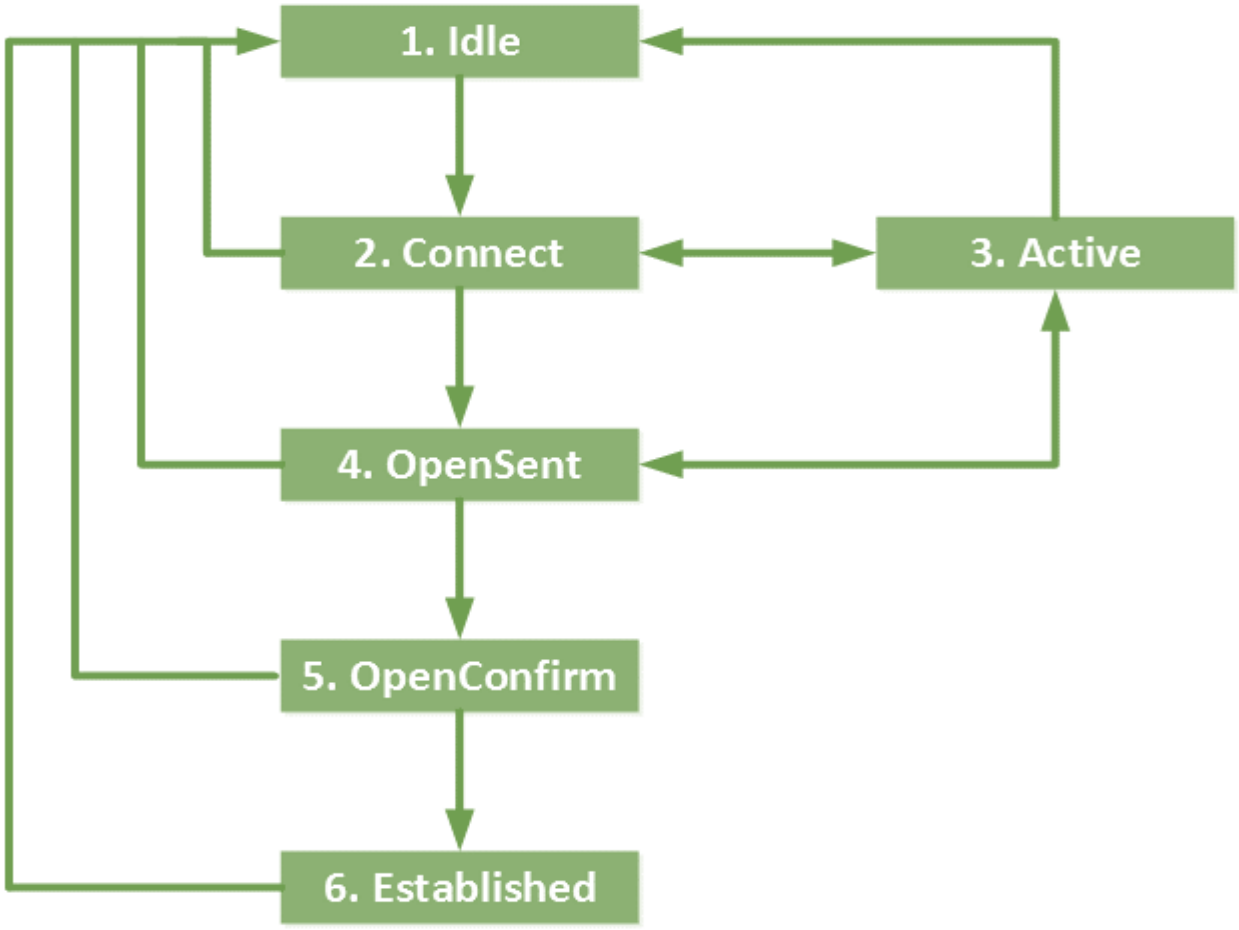
- The TCP connection exists, and the router has sent a BGP Open Message.
- The matching Open Message has not been received from peer.
- BGP will be waiting for an Open message from the remote BGP neighbor.

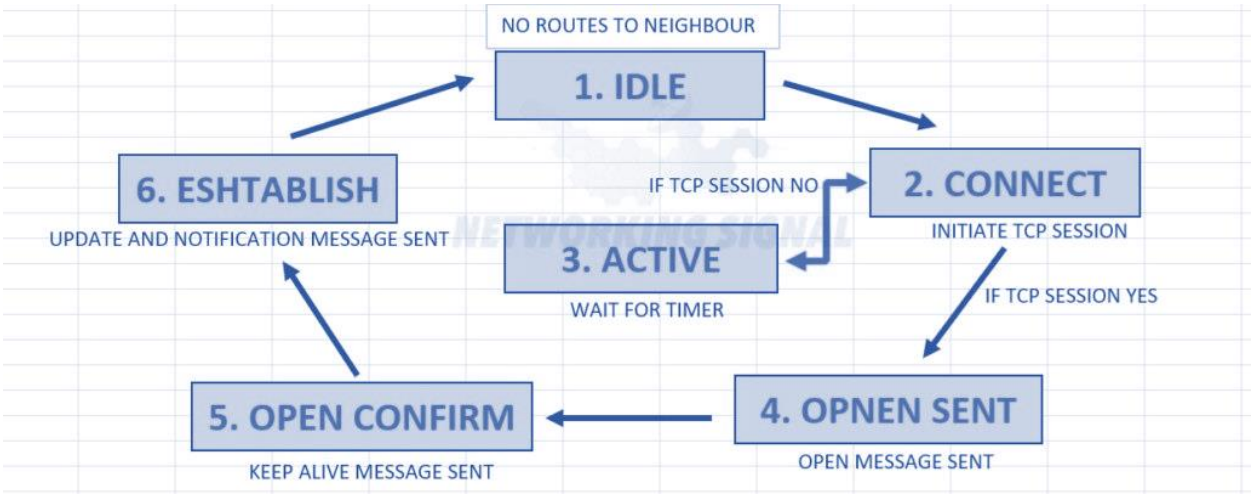
5. OpenConfirm:

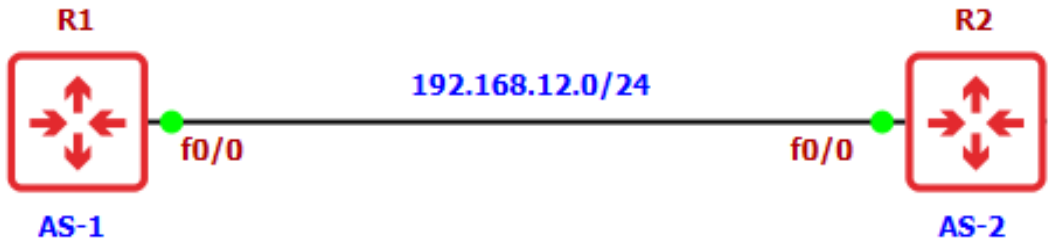
- Both routers have sent & received an Open Message.
- BGP waits for a Keepalive message from the remote BGP neighbor.
- If Keepalive message is received, it move to the Established State.
- BGP will keep sending Keepalive messages.

6. Established:

- All neighbor parameters match.
- The peers can now exchange Updates.
- The BGP neighbor adjacency is complete.
- BGP routers send update packets to exchange routing information.
- BGP reset hold timer every time receive a Keepalive message.
- BGP reset hold timer every time receive update message.
- If receive a notification message it jump back to the Idle state.







R1 Configuration
R1# debug ip bgp all R1(config)#router bgp 1 R1(config-router)#neighbor 192.168.12.2 remote-as 2
R2 Configuration
R2# debug ip bgp all R2(config)#router bgp 2 R2(config-router)#neighbor 192.168.12.1 remote-as 1

R1# debug ip bgp all

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R1(config-router)#
*Feb 24 15:00:37.983: BGP: 192.168.12.2 active went from Idle to Active
*Feb 24 15:00:37.983: BGP: 192.168.12.2 open active, local address 192.168.12.1
*Feb 24 15:00:38.011: BGP: ses global 192.168.12.2 (0x686D2894:0) act Adding topology IPv4 Unicast:base
*Feb 24 15:00:38.011: BGP: ses global 192.168.12.2 (0x686D2894:0) act Send OPEN
*Feb 24 15:00:38.015: BGP: 192.168.12.2 active went from Active to OpenSent
*Feb 24 15:00:38.015: BGP: 192.168.12.2 active sending OPEN, version 4, my as: 1, holdtime 180 seconds, ID B0B0B0B
*Feb 24 15:00:38.043: BGP: 192.168.12.2 active rcv message type 1, length (excl. header) 39
*Feb 24 15:00:38.043: BGP: ses global 192.168.12.2 (0x686D2894:0) act Receive OPEN
*Feb 24 15:00:38.047: BGP: 192.168.12.2 active rcv OPEN, version 4, holdtime 180 seconds
*Feb 24 15:00:38.047: BGP: 192.168.12.2 active rcv OPEN w/ OPTION parameter len: 29
*Feb 24 15:00:38.047: BGP: 192.168.12.2 active rcvd OPEN w/ optional parameter type 2 (Capability) len 6
*Feb 2
R1(config-router)#4 15:00:38.047: BGP: 192.168.12.2 active OPEN has CAPABILITY code: 1, length 4
*Feb 24 15:00:38.051: BGP: 192.168.12.2 active OPEN has MP_EXT CAP for afi/safi: 1/1
*Feb 24 15:00:38.051: BGP: 192.168.12.2 active rcvd OPEN w/ optional parameter type 2 (Capability) len 2
*Feb 24 15:00:38.051: BGP: 192.168.12.2 active OPEN has CAPABILITY code: 128, length 0
*Feb 24 15:00:38.051: BGP: 192.168.12.2 active OPEN has ROUTE-REFRESH capability(old) for all address-families
*Feb 24 15:00:38.051: BGP: 192.168.12.2 active rcvd OPEN w/ optional parameter type 2 (Capability) len 2
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active OPEN has CAPABILITY code: 2, length 0
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active OPEN has ROUTE-REFRESH capability(new) for all address-families
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active rcvd OPEN w/ optional parameter type 2 (Capability) len 3
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active OPEN has CAPABILITY code: 131, length 1
*Feb 24 15:00:38.055: BGP: 19
R1(config-router)#2.168.12.2 active OPEN has MULTISESSION capability, without grouping
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active rcvd OPEN w/ optional parameter type 2 (Capability) len 6
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active OPEN has CAPABILITY code: 65, length 4
*Feb 24 15:00:38.055: BGP: 192.168.12.2 active OPEN has 4-byte ASN CAP for: 2
*Feb 24 15:00:38.055: BGP: nbr global 192.168.12.2 neighbor does not have IPv4 MDT topology activated
*Feb 24 15:00:38.059: BGP: 192.168.12.2 active rcvd OPEN w/ remote AS 2, 4-byte remote AS 2
*Feb 24 15:00:38.059: BGP: 192.168.12.2 active went from OpenSent to OpenConfirm
*Feb 24 15:00:38.059: BGP: 192.168.12.2 active went from OpenConfirm to Established
*Feb 24 15:00:38.059: BGP: ses global 192.168.12.2 (0x686D2894:1) act Assigned ID
*Feb 24 15:00:38.059: BGP: ses global 192.168.12.2 (0x686D2894:1) Up
```