

eBGP LAB

Lab Activity: Configuring eBGP with Three Routers

The practical should be done on Real Cisco Devices

Scenario:

Three different organizations—Org A, Org B, and Org C—operate their own networks and rely on separate Autonomous Systems (AS) to manage their routing policies. These organizations need to establish interconnectivity for business operations, such as sharing resources and accessing common services. To achieve this, eBGP (External BGP) is implemented between routers R1, R2, and R3, each representing a different organization. Your task is to configure BGP on these routers so that all PCs connected to them can communicate with each other. Follow the steps below to complete the lab.

Topology Details:

R1 (AS 100) represents Org A and connects to R2 (AS 200) via a serial link

R2 (AS 200) represents Org B and connects to R3 (AS 300) via a serial link

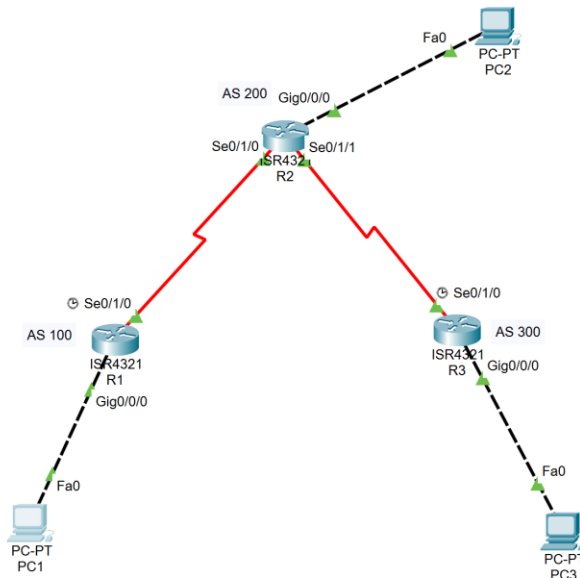
R3 (AS 300) represents Org C

PCs connected to each router should be able to ping each other

BGP will be used to share routes between ASes

PCs from different ASes should be able to ping each other

Topology



Device and IP Addressing

Device	Interface	IP address	AS Number
R1	Se0/1/0	192.168.12.1/30	100
	Gig 0/0/0	10.0.0.1/24	
R2	Se0/1/0	192.168.12.2/30	200
	Se0/1/1	192.168.23.1/30	
	Gi0/0/0	20.0.0.1/24	
R3	Se0/1/0	192.168.23.2/30	300
	Gi0/0/0	30.0.0.1/24	
PC1	NIC	Fill in	Fill in default gateway
PC2	NIC	Fill in	Fill in default gateway
PC3	NIC	Fill in	Fill in default gateway

R1(AS 100)

- Change the name of the Router to R1.
- Assign the IP address to Se 0/1/0 as per the addressing table.
- Assign the IP address to Gi0/0/0/0 as per the address table.

Router(config)# router bgp 100

Router(config-router)# neighbor 192.168.12.2 remote-as 200

Router(config-router)# network 10.0.0.0 mask 255.255.255.0

Meaning:

- **R1 forms eBGP session with R2**
- **R1 advertises 10.0.0.0/24**

R2(AS 200)

- Change the name of the Router to R2.
- Assign the IP address to Se 0/1/0 as per the addressing table.
- Assign the IP address to Se 0/1/1 as per the addressing table.
- Assign the IP address to Gi0/0/0 as per the address table.

Router(config)# router bgp 200

Router(config-router)# neighbor 192.168.12.1 remote-as 100

Router(config-router)# neighbor 192.168.23.2 remote-as 300

Router(config-router)# network 20.0.0.0 mask 255.255.255.0

Meaning:

- R2 connects two AS networks
- It forms **two eBGP sessions**
- R2 advertises **20.0.0.0/24**

This router acts as a **transit AS**.

R3(AS 300)

- Change the name of the Router to R3.
- Assign the IP address to Se 0/1/0 as per the addressing table.
- Assign the IP address to Gi0/0/0 as per the address table.
- Configure BGP on R3

Meaning:

- R3 forms **eBGP with R2**
- R3 advertises **30.0.0.0/24**

Configure IP addresses and default gateways on PC1,PC2, and PC3

Verification & Testing

Check BGP Neighbors

Show ip bgp summary - All routers should establish BGP neighbor relationships.

Expected Result

Neighbor	AS
192.168.12.2	200
192.168.23.2	300

Show ip bgp neighbours - the router prints **information about each BGP neighbor**,

Check BGP Table

Show ip bgp – Do it on **R1 and R3** This shows , prefixes, AS path

Network	Next Hop	Path
e.g 30.0.0.0 /24	192.168.12.2	200 300

Check the routing Table

Show ip route - The routing table should correctly display BGP learned routes.

You should see BGP routes marked with B.

Test Connectivity (Ping)

From PC1 , ping PC3 :- PCs in different networks should be able to communicate