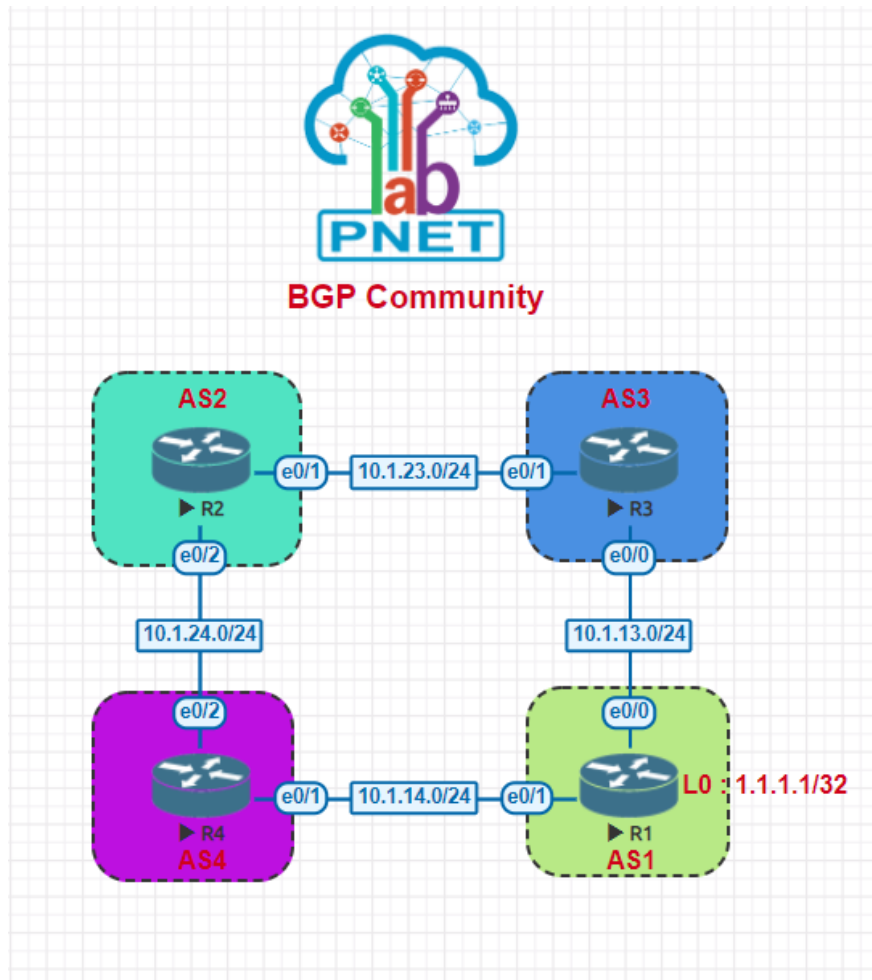


BGP Community

Lab Topology:

Please use the following topology to complete this lab exercise:



Lab Objective:

The objective of this lab exercise is for you to learn and understand how can you configure BGP Community.

Task list:

Task 1: Configure the hostname and IP address for the interface for Routers as topo. Check the reachability between Routers.

Task 2: Configure EBGP at all Router. R1 advertise L0 interface to BGP. Check the status of 1.1.1.1/32 at the others Router.



Task 3: Config Community BGP at R1 and R3 so that R2 will choose the R4 is the next hop to reach 1.1.1.1/32

Task 4: Check BGP Table on R3 and R2 to verify the configuration at Task 3.

SOLUTION:

Task 1: Configure the hostname and IP address for the interface for Routers as topo. Check the reachability between Routers.

On R1

```
!  
interface Loopback0  
  ip address 1.1.1.1 255.255.255.255  
!  
interface Ethernet0/0  
  ip address 10.1.13.1 255.255.255.0  
!  
interface Ethernet0/1  
  ip address 10.1.14.1 255.255.255.0  
!
```

On R2

```
!  
interface Loopback0  
  ip address 2.2.2.2 255.255.255.255  
!  
interface Ethernet0/1  
  ip address 10.1.23.2 255.255.255.0  
!  
interface Ethernet0/2  
  ip address 10.1.24.2 255.255.255.0  
!
```

On R3

```
!  
interface Loopback0  
  ip address 3.3.3.3 255.255.255.255  
!  
interface Ethernet0/0  
  ip address 10.1.13.3 255.255.255.0  
!  
interface Ethernet0/1  
  ip address 10.1.23.3 255.255.255.0  
!
```

On R4

```
!
```





```
interface Loopback0
 ip address 4.4.4.4 255.255.255.255
!
interface Ethernet0/1
 ip address 10.1.14.4 255.255.255.0
!
interface Ethernet0/2
 ip address 10.1.24.4 255.255.255.0
!
```

Task 2: Configure EBGp at all Router. R1 advertise L0 interface to BGP. Check the status of 1.1.1.1/32 at the others Router.

On R1

```
!
router bgp 1
 bgp log-neighbor-changes
 network 1.1.1.1 mask 255.255.255.255
 neighbor 10.1.13.3 remote-as 3
 neighbor 10.1.14.4 remote-as 4
!
```

On R2

```
!
router bgp 2
 bgp log-neighbor-changes
 neighbor 10.1.23.3 remote-as 3
 neighbor 10.1.24.4 remote-as 4
!
```

On R3

```
!
router bgp 3
 bgp log-neighbor-changes
 neighbor 10.1.13.1 remote-as 1
 neighbor 10.1.23.2 remote-as 2
!
```

On R4

```
!
router bgp 4
 bgp log-neighbor-changes
 neighbor 10.1.14.1 remote-as 1
 neighbor 10.1.24.2 remote-as 2
!
```

Verification:

R2#**show ip bgp**

BGP table version is 2, local router ID is 2.2.2.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,





r RIB-failure, S Stale, m multipath, b backup-path, f
 RT-Filter,
 x best-external, a additional-path, c RIB-compressed,
 Origin codes: i - IGP, e - EGP, ? - incomplete
 RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*	1.1.1.1/32	10.1.24.4				0 4 1 i
*>		10.1.23.3				0 3 1 i

// So everything is normal, R2 will choose to learn 1.1.1.1/32 via 10.1.23.3

Task 3: Config Community BGP at R1 and R3 so that R2 will choose the R4 is the next hop to reach 1.1.1.1/32

On R1

```

!
ip bgp-community new-format
!
ip prefix-list NETWORK seq 5 permit 1.1.1.1/32
!
route-map SET_COMMUNITY_NETWORK permit 10
  match ip address prefix-list NETWORK
  set community 12345:1
!
route-map SET_COMMUNITY_NETWORK permit 20
!
router bgp 1
  neighbor 10.1.13.3 send-community
  neighbor 10.1.13.3 route-map SET_COMMUNITY_NETWORK out
!
//Create Route-map to set community 12345:1 for ip prefix-list 1.
//Configure bgp neighbor with R3 but specify note that will add one community based on
Route-map.

```

On R3

```

!
ip bgp-community new-format
ip community-list 1 permit 12345:1
!
route-map COMMUNITY permit 10
  match community 1
  set as-path prepend 1 1 1 1 1
!
router bgp 3
  neighbor 10.1.23.2 send-community
  neighbor 10.1.23.2 route-map COMMUNITY out
!

```





```
//Config community-list 1 for create Route-map to match community with value 12345:1
//In Route-map, we set as-path prepend to 1 1 1 1 and set neighbor with R2 based on Route-
map.
//After configuration, please use command "clear ip bgp * soft" in both R1 and R3.
```

Task 4: Check BGP Table on R3 and R2 to verify the configuration at Task 3.

On R3

```
R3#show ip bgp 1.1.1.1
```

BGP routing table entry for 1.1.1.1/32, version 2

Paths: (2 available, best #2, table default)

Advertised to update-groups:

1

Refresh Epoch 1

2 4 1

10.1.23.2 from 10.1.23.2 (2.2.2.2)

Origin IGP, localpref 100, valid, external

rx pathid: 0, tx pathid: 0

Refresh Epoch 1

1

10.1.13.1 from 10.1.13.1 (1.1.1.1)

Origin IGP, metric 0, localpref 100, valid, external, best

Community: 12345:1

rx pathid: 0, tx pathid: 0x0

```
R2#show ip bgp 1.1.1.1
```

BGP routing table entry for 1.1.1.1/32, version 3

Paths: (2 available, best #1, table default)

Advertised to update-groups:

1

Refresh Epoch 1

4 1

10.1.24.4 from 10.1.24.4 (4.4.4.4)

Origin IGP, localpref 100, valid, external, best

rx pathid: 0, tx pathid: 0x0

Refresh Epoch 1

3 1 1 1 1 1 1

10.1.23.3 from 10.1.23.3 (3.3.3.3)

Origin IGP, localpref 100, valid, external

Community: 12345:1

rx pathid: 0, tx pathid: 0

```
R2#show ip bgp
```

BGP table version is 3, local router ID is 2.2.2.2

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,





RT-Filter, r RIB-failure, S Stale, m multipath, b backup-path, f

x best-external, a additional-path, c RIB-compressed,

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

RPKI validation codes: V valid, I invalid, N Not found

	Network	Next Hop	Metric	LocPrf	Weight	Path
*>	1.1.1.1/32	10.1.24.4	0	4	1	i
*		10.1.23.3	0	3	1	1
	1 1 1 i					

R2#show ip cef 1.1.1.1/32

1.1.1.1/32

nexthop 10.1.24.4 Ethernet0/2

//So we will recognize that, in R2, it will choose R4 is next hop to reach prefix 1.1.1.1/32 because of changing as-path from R3 via community.

