
Routing
Switching
Tigers
Forum
BGP
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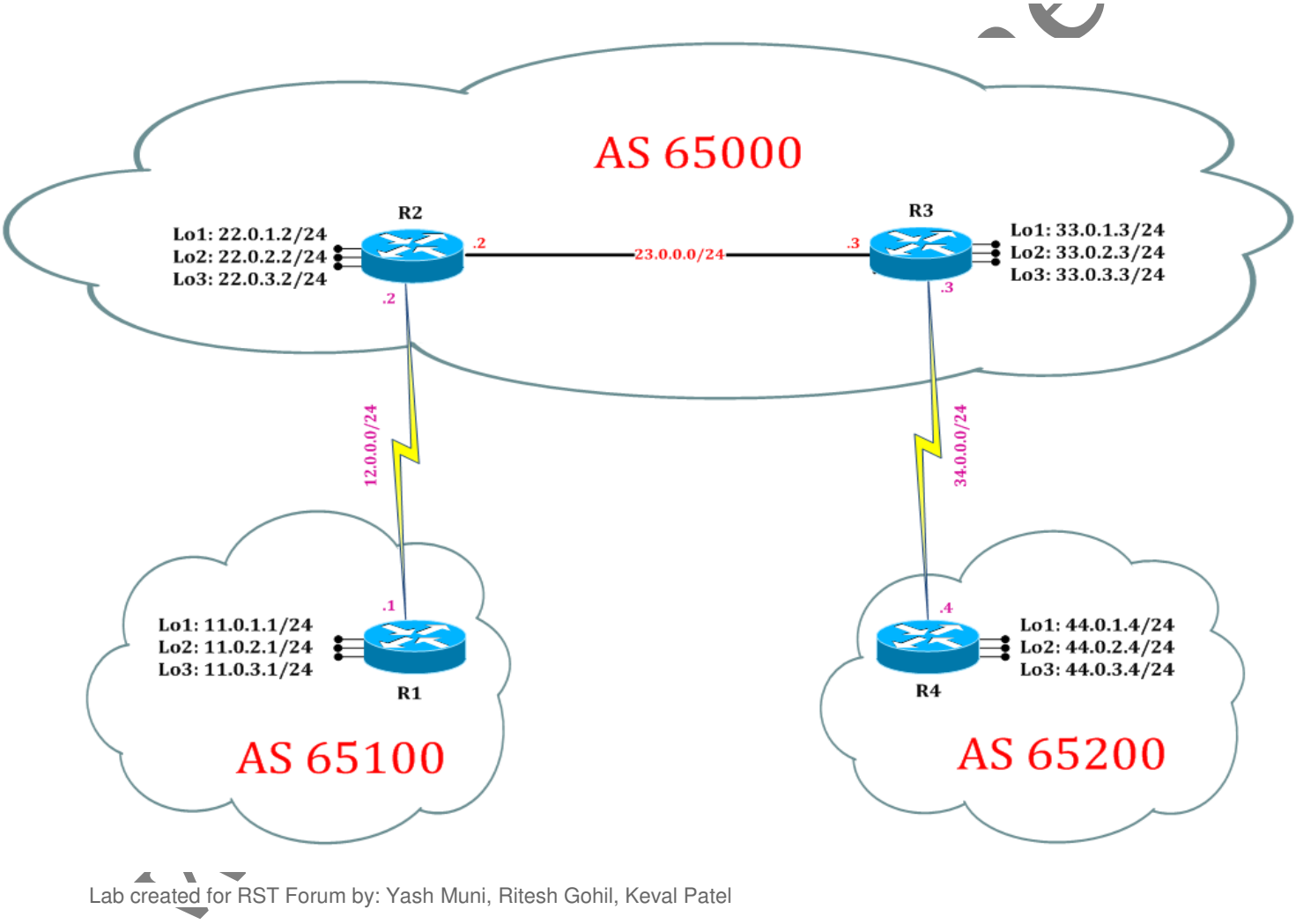
Cisco IOS Software, Linux Software (I86BI_LINUX-ADVENTERPRISEK9-M), Version 15.2(4)M1, DEVELOPMENT TEST SOFTWARE



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LAB 1: Configure BGP FOR IPv4:

Task 1: Configure IPv4 BGP process for Autonomous

Step 1 In the configuration mode of router configure IPv4 BGP Process by following command:

R1:

```
router bgp 65100                                    //initiate BGP process for AS 65100
neighbor 22.0.1.2 remote-as 65000                   //creates a BGP peer group
neighbor 22.0.1.2 ebgp-multihop 5
neighbor 22.0.1.2 update-source loopback 1          //to form loopback to loopback indirect peering
neighbor 22.0.1.2 soft-reconfiguration inbound      //to store fresh incoming updated from neighbor
exit
```

R2:

```
router bgp 65000
neighbor 11.0.1.1 remote-as 65100
neighbor 11.0.1.1 ebgp-multihop 5                   //BGP connections to external peers residing
neighbor 11.0.1.1 update-source loopback 1          on networks that are not directly connected
neighbor 11.0.1.1 soft-reconfiguration inbound
neighbor 33.0.1.3 remote-as 65000
neighbor 33.0.1.3 update-source loopback 1
neighbor 33.0.1.3 soft-reconfiguration inbound
exit
```

R3:

```
router bgp 65000
neighbor 22.0.1.2 remote-as 65000
neighbor 22.0.1.2 update-source loopback 1
neighbor 22.0.1.2 soft-reconfiguration inbound
neighbor 44.0.1.4 remote-as 65200
neighbor 44.0.1.4 ebgp-multihop 5
neighbor 44.0.1.4 update-source loopback 1
neighbor 44.0.1.4 soft-reconfiguration inbound
exit
```

R4:

```
router bgp 65200
neighbor 33.0.1.3 remote-as 65000
neighbor 33.0.1.3 ebgp-multihop 5
neighbor 33.0.1.3 update-source loopback 1
neighbor 33.0.1.3 soft-reconfiguration inbound
exit
```

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Step 2 In the configuration mode of router configure IPv4 OSPF Process by following command:

R1:
```
router ospf 1                          //initiate OSPF process with process id 1
network 0.0.0.0 0.0.0.0 area 0         //send updates on any ip with any mask
exit
```

R2:
```
router ospf 1
network 0.0.0.0 0.0.0.0 area 0
exit
```

R3:
```
router ospf 1
network 0.0.0.0 0.0.0.0 area 0
exit
```

R4:
```
router ospf 1
network 0.0.0.0 0.0.0.0 area 0
exit
```

Step 3 Announce the network in BGP Process

R1:
```
router bgp 65100
address-family ipv4                    //enable address family for IPv4 BGP
network 11.0.1.0 mask 255.255.255.0    //announce the network in BGP process
network 11.0.2.0 mask 255.255.255.0
network 11.0.3.0 mask 255.255.255.0
exit
```

R2:
```
router bgp 65000
address-family ipv4
network 22.0.1.0 mask 255.255.255.0
network 22.0.2.0 mask 255.255.255.0
network 22.0.3.0 mask 255.255.255.0
exit
```

R3:
```
router bgp 65000
address-family ipv4
network 33.0.1.0 mask 255.255.255.0
network 33.0.2.0 mask 255.255.255.0
network 33.0.3.0 mask 255.255.255.0
exit
```

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R4:
router bgp 65200
address-family ipv4
network 44.0.1.0 mask 255.255.255.0
network 44.0.2.0 mask 255.255.255.0
network 44.0.3.0 mask 255.255.255.0
exit

Task 2: Verification:

Step 1 Verify IPv4 routes in routing table by following command:

R2#show ip route
//shows router's routing table and IPv4 routes entries
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

11.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
B 11.0.1.0/24 [20/0] via 11.0.1.1, 00:08:54
O 11.0.1.1/32 [110/65] via 12.0.0.1, 00:11:20, Serial2/0
B 11.0.2.0/24 [20/0] via 11.0.1.1, 00:08:25
O 11.0.2.1/32 [110/65] via 12.0.0.1, 00:11:20, Serial2/0
B 11.0.3.0/24 [20/0] via 11.0.1.1, 00:08:25
O 11.0.3.1/32 [110/65] via 12.0.0.1, 00:11:20, Serial2/0
12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 12.0.0.0/24 is directly connected, Serial2/0
L 12.0.0.2/32 is directly connected, Serial2/0
22.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C 22.0.1.0/24 is directly connected, Loopback1
L 22.0.1.2/32 is directly connected, Loopback1
C 22.0.2.0/24 is directly connected, Loopback2
L 22.0.2.2/32 is directly connected, Loopback2
C 22.0.3.0/24 is directly connected, Loopback3
L 22.0.3.2/32 is directly connected, Loopback3
23.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 23.0.0.0/24 is directly connected, Ethernet0/0
L 23.0.0.2/32 is directly connected, Ethernet0/0
33.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
B 33.0.1.0/24 [200/0] via 33.0.1.3, 00:06:10

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```
O       33.0.1.3/32 [110/11] via 23.0.0.3, 00:10:14, Ethernet0/0
B       33.0.2.0/24 [200/0] via 33.0.1.3, 00:06:05
O       33.0.2.3/32 [110/11] via 23.0.0.3, 00:10:14, Ethernet0/0
B       33.0.3.0/24 [200/0] via 33.0.1.3, 00:05:57
O       33.0.3.3/32 [110/11] via 23.0.0.3, 00:10:14, Ethernet0/0
    34.0.0.0/24 is subnetted, 1 subnets
O       34.0.0.0 [110/74] via 23.0.0.3, 00:10:14, Ethernet0/0
    44.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
B       44.0.1.0/24 [200/0] via 44.0.1.4, 00:04:48
O       44.0.1.4/32 [110/75] via 23.0.0.3, 00:10:14, Ethernet0/0
B       44.0.2.0/24 [200/0] via 44.0.1.4, 00:04:17
O       44.0.2.4/32 [110/75] via 23.0.0.3, 00:10:14, Ethernet0/0
B       44.0.3.0/24 [200/0] via 44.0.1.4, 00:03:47
O       44.0.3.4/32 [110/75] via 23.0.0.3, 00:10:14, Ethernet0/0
```

Step 2 Verify IPv4 BGP neighborship and its details by following command:

BGP neighbor states:

1. Idle – TCP connectivity issue
2. Active – Command configuration issue
3. Established – TCP connectivity established

```
R2# show bgp ipv4 unicast neighbor
//shows details of IPv4 BGP neighbor
BGP neighbor is 11.0.1.1, remote AS 65100, external link
BGP version 4, remote router ID 11.0.3.1
BGP state = Established, up for 01:27:42
Last read 00:00:20, last write 00:00:20, hold time is 180, keepalive interval
is 60 seconds
Neighbor sessions:
1 active, is not multisession capable (disabled)
----------Output Omitted----------

BGP neighbor is 33.0.1.3, remote AS 65000, internal link
BGP version 4, remote router ID 33.0.3.3
BGP state = Established, up for 01:27:52
Last read 00:00:49, last write 00:00:24, hold time is 180, keepalive interval is 60
seconds
Neighbor sessions:
1 active, is not multisession capable (disabled)
----------Output Omitted----------
```

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Step 3 Verify IPv4 BGP routes and its details by following command:

```
R2#show ip bgp
//shows IPv4 BGP table where ">" shows best path.
BGP table version is 13, local router ID is 22.0.3.2
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
 *>  11.0.1.0/24     11.0.1.1                 0             0 65100 i
 *>  11.0.2.0/24     11.0.1.1                 0             0 65100 i
 *>  11.0.3.0/24     11.0.1.1                 0             0 65100 i
 *>  22.0.1.0/24     0.0.0.0                  0         32768 i
 *>  22.0.2.0/24     0.0.0.0                  0         32768 i
 *>  22.0.3.0/24     0.0.0.0                  0         32768 i
 *>i 33.0.1.0/24     33.0.1.3                 0    100      0 i
 *>i 33.0.2.0/24     33.0.1.3                 0    100      0 i
 *>i 33.0.3.0/24     33.0.1.3                 0    100      0 i
 *>i 44.0.1.0/24     44.0.1.4                 0    100      0 65200 i
 *>i 44.0.2.0/24     44.0.1.4                 0    100      0 65200 i
 *>i 44.0.3.0/24     44.0.1.4                 0    100      0 65200
```

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