

Routing
Switching
Tigers
Forum

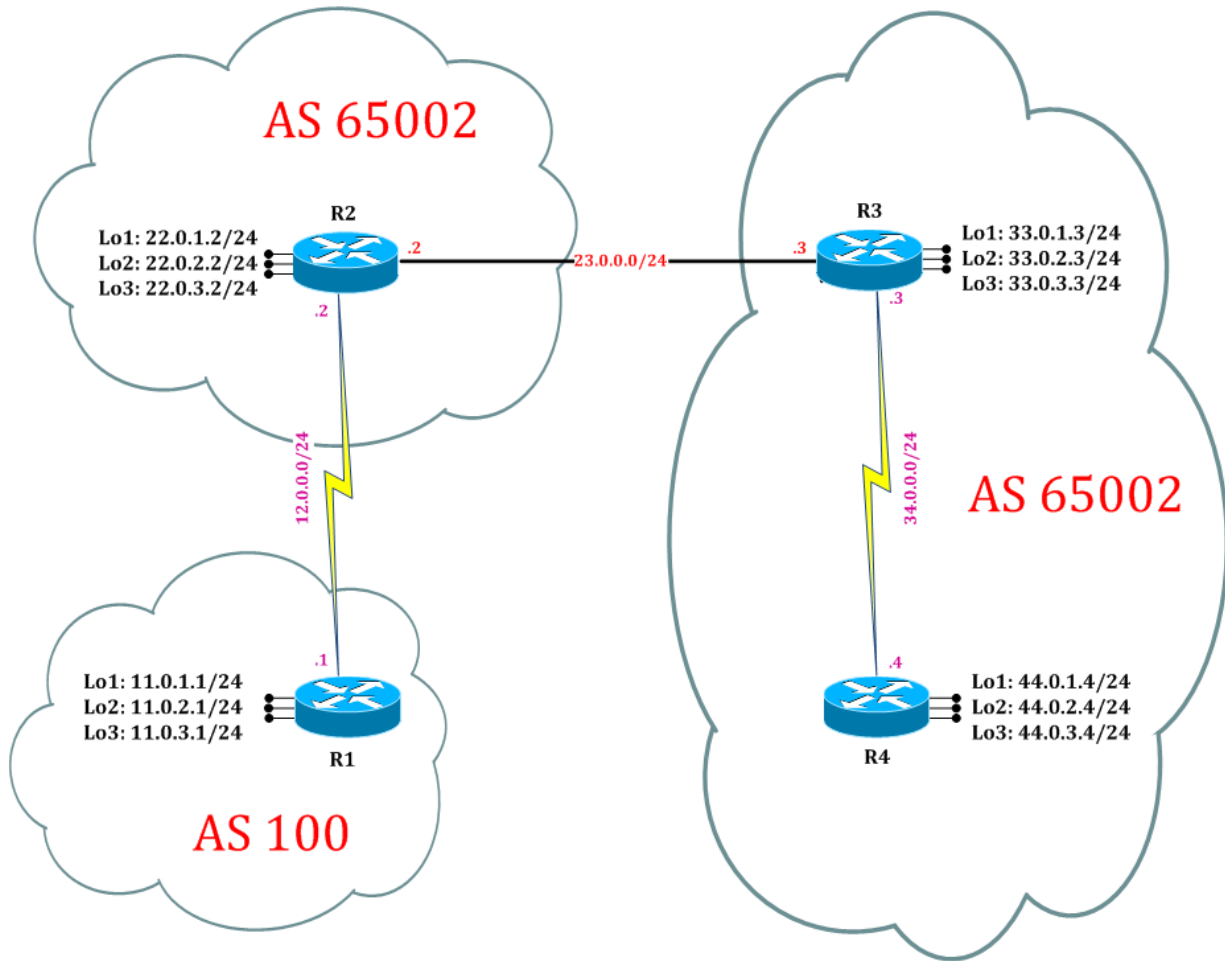


BGP



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BGP Topology



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LAB 9: Configure BGP Confederation

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 100
neighbor 12.0.0.2 remote-as 65002
neighbor 12.0.0.2 soft-reconfiguration inbound
address-family ipv4
network 11.0.1.0 mask 255.255.255.0
network 11.0.2.0 mask 255.255.255.0
network 11.0.3.0 mask 255.255.255.0
exit
```

R2:

```
router bgp 65002
neighbor 23.0.0.3 remote-as 65001
neighbor 23.0.0.3 soft-reconfiguration inbound
neighbor 12.0.0.1 remote-as 100
neighbor 12.0.0.1 soft-reconfiguration inbound
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 65001
neighbor 23.0.0.2 remote-as 65002
neighbor 23.0.0.2 soft-reconfiguration inbound
neighbor 34.0.0.4 remote-as 65001
neighbor 34.0.0.4 soft-reconfiguration inbound
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 65001
neighbor 34.0.0.3 remote-as 65001
neighbor 34.0.0.3 soft-reconfiguration inbound
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
```

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

```
R1:
router ospf 1
network 0.0.0.0 0.0.0.0 area 0
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
```

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Step 3. Verify IPv4 BGP routes by following command:

```
R1#show ip bgp
BGP table version is 13, local router ID is 11.0.3.1
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	0.0.0.0	0		32768	i
*> 11.0.2.0/24	0.0.0.0	0		32768	i
*> 11.0.3.0/24	0.0.0.0	0		32768	i
*> 22.0.1.0/24	12.0.0.2	0		0	65002 i
*> 22.0.2.0/24	12.0.0.2	0		0	65002 i
*> 22.0.3.0/24	12.0.0.2	0		0	65002 i
*> 33.0.1.0/24	12.0.0.2	0		0	65002 65001 i
*> 33.0.2.0/24	12.0.0.2	0		0	65002 65001 i
*> 33.0.3.0/24	12.0.0.2	0		0	65002 65001 i
*> 44.0.1.0/24	12.0.0.2	0		0	65002 65001 i
*> 44.0.2.0/24	12.0.0.2	0		0	65002 65001 i
*> 44.0.3.0/24	12.0.0.2	0		0	65002 65001 i

```
R2#show ip bgp
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	12.0.0.1	0		0	100 i
*> 11.0.2.0/24	12.0.0.1	0		0	100 i
*> 11.0.3.0/24	12.0.0.1	0		0	100 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
*> 33.0.1.0/24	23.0.0.3	0		0	65001 i
*> 33.0.2.0/24	23.0.0.3	0		0	65001 i
*> 33.0.3.0/24	23.0.0.3	0		0	65001 i
*> 44.0.1.0/24	23.0.0.3	0		0	65001 i
*> 44.0.2.0/24	23.0.0.3	0		0	65001 i
*> 44.0.3.0/24	23.0.0.3	0		0	65001 i

```

R3#show ip bgp
BGP table version is 13, local router ID is 33.0.3.3
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	23.0.0.2			0	65002 100 i
*> 11.0.2.0/24	23.0.0.2			0	65002 100 i
*> 11.0.3.0/24	23.0.0.2			0	65002 100 i
*> 22.0.1.0/24	23.0.0.2	0		0	65002 i
*> 22.0.2.0/24	23.0.0.2	0		0	65002 i
*> 22.0.3.0/24	23.0.0.2	0		0	65002 i
*> 33.0.1.0/24	0.0.0.0	0		32768	i
*> 33.0.2.0/24	0.0.0.0	0		32768	i
*> 33.0.3.0/24	0.0.0.0	0		32768	i
*>i 44.0.1.0/24	34.0.0.4	0	100	0	i
*>i 44.0.2.0/24	34.0.0.4	0	100	0	i
*>i 44.0.3.0/24	34.0.0.4	0	100	0	i

```

R4#show ip bgp
BGP table version is 13, local router ID is 44.0.3.4
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
*>i 11.0.1.0/24	23.0.0.2	0	100	0	65002 100 i
*>i 11.0.2.0/24	23.0.0.2	0	100	0	65002 100 i
*>i 11.0.3.0/24	23.0.0.2	0	100	0	65002 100 i
*>i 22.0.1.0/24	23.0.0.2	0	100	0	65002 i
*>i 22.0.2.0/24	23.0.0.2	0	100	0	65002 i
*>i 22.0.3.0/24	23.0.0.2	0	100	0	65002 i
*>i 33.0.1.0/24	34.0.0.3	0	100	0	i
*>i 33.0.2.0/24	34.0.0.3	0	100	0	i
*>i 33.0.3.0/24	34.0.0.3	0	100	0	i
*> 44.0.1.0/24	0.0.0.0	0		32768	i
*> 44.0.2.0/24	0.0.0.0	0		32768	i
*> 44.0.3.0/24	0.0.0.0	0		32768	i

Task 2: Configure IPv4 BGP Confederation

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

R1:

```
router bgp 100
neighbor 12.0.0.2 remote-as 200
exit
```

R2:

```
router bgp 65002
bgp confederation identifier 200
bgp confederation peers 65001
exit
```

R3:

```
router bgp 65001
bgp confederation identifier 200
bgp confederation peers 65002
exit
```

R4:

```
router bgp 65001
bgp confederation identifier 200
exit
```

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Step 2. Verify IPv4 BGP routes by following command:

```
R1#show ip bgp
BGP table version is 13, local router ID is 11.0.3.1
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	0.0.0.0	0		32768	i
*> 11.0.2.0/24	0.0.0.0	0		32768	i
*> 11.0.3.0/24	0.0.0.0	0		32768	i
*> 22.0.1.0/24	12.0.0.2	0	0	200	i
*> 22.0.2.0/24	12.0.0.2	0	0	200	i
*> 22.0.3.0/24	12.0.0.2	0	0	200	i
*> 33.0.1.0/24	12.0.0.2	0	0	200	i
*> 33.0.2.0/24	12.0.0.2	0	0	200	i
*> 33.0.3.0/24	12.0.0.2	0	0	200	i
*> 44.0.1.0/24	12.0.0.2	0	0	200	i
*> 44.0.2.0/24	12.0.0.2	0	0	200	i
*> 44.0.3.0/24	12.0.0.2	0	0	200	i

```
R2#show ip bgp
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	12.0.0.1	0	0	100	i
*> 11.0.2.0/24	12.0.0.1	0	0	100	i
*> 11.0.3.0/24	12.0.0.1	0	0	100	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
*> 33.0.1.0/24	23.0.0.3	0	100	0	(65001) i
*> 33.0.2.0/24	23.0.0.3	0	100	0	(65001) i
*> 33.0.3.0/24	23.0.0.3	0	100	0	(65001) i
*> 44.0.1.0/24	34.0.0.4	0	100	0	(65001) i
*> 44.0.2.0/24	34.0.0.4	0	100	0	(65001) i
*> 44.0.3.0/24	34.0.0.4	0	100	0	(65001) i

R3#show ip bgp

BGP table version is 25, local router ID is 33.0.3.3

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	12.0.0.1	0	100	0	(65002) 100 i
*> 11.0.2.0/24	12.0.0.1	0	100	0	(65002) 100 i
*> 11.0.3.0/24	12.0.0.1	0	100	0	(65002) 100 i
*> 22.0.1.0/24	23.0.0.2	0	100	0	(65002) i
*> 22.0.2.0/24	23.0.0.2	0	100	0	(65002) i
*> 22.0.3.0/24	23.0.0.2	0	100	0	(65002) i
*> 33.0.1.0/24	0.0.0.0	0		32768	i
*> 33.0.2.0/24	0.0.0.0	0		32768	i
*> 33.0.3.0/24	0.0.0.0	0		32768	i
*>i 44.0.1.0/24	34.0.0.4	0	100	0	i
*>i 44.0.2.0/24	34.0.0.4	0	100	0	i
*>i 44.0.3.0/24	34.0.0.4	0	100	0	i

R4#show ip bgp

BGP table version is 25, local router ID is 44.0.3.4

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
*>i 11.0.1.0/24	12.0.0.1	0	100	0	(65002) 100 i
*>i 11.0.2.0/24	12.0.0.1	0	100	0	(65002) 100 i
*>i 11.0.3.0/24	12.0.0.1	0	100	0	(65002) 100 i
*>i 22.0.1.0/24	23.0.0.2	0	100	0	(65002) i
*>i 22.0.2.0/24	23.0.0.2	0	100	0	(65002) i
*>i 22.0.3.0/24	23.0.0.2	0	100	0	(65002) i
*>i 33.0.1.0/24	34.0.0.3	0	100	0	i
*>i 33.0.2.0/24	34.0.0.3	0	100	0	i
*>i 33.0.3.0/24	34.0.0.3	0	100	0	i
*> 44.0.1.0/24	0.0.0.0	0		32768	i
*> 44.0.2.0/24	0.0.0.0	0		32768	i
*> 44.0.3.0/24	0.0.0.0	0		32768	i

Task 3: Verify BGP Path Selection in BGP confederation

Step 1. In the configuration mode of router configure redundant path by following command:

R1:

```
interface ethernet 0/0  
ip address 14.0.0.1 255.255.255.0  
no shutdown  
exit
```

```
router bgp 100  
neighbor 14.0.0.4 remote-as 200  
neighbor 14.0.0.4 soft-reconfiguration inbound  
exit
```

R4:

```
interface ethernet 0/0  
ip address 14.0.0.4 255.255.255.0  
no shutdown  
exit
```

```
router bgp 65001  
neighbor 14.0.0.1 remote-as 100  
neighbor 14.0.0.1 soft-reconfiguration inbound  
exit
```

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Step 2. Verify IPv4 BGP routes by following command:

```
R1#show ip bgp
BGP table version is 37, local router ID is 11.0.3.1
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	0.0.0.0	0		32768	i
*> 11.0.2.0/24	0.0.0.0	0		32768	i
*> 11.0.3.0/24	0.0.0.0	0		32768	i
* 22.0.1.0/24	14.0.0.4			0	200 i
*>	12.0.0.2	0		0	200 i
* 22.0.2.0/24	14.0.0.4			0	200 i
*>	12.0.0.2	0		0	200 i
* 22.0.3.0/24	14.0.0.4			0	200 i
*>	12.0.0.2	0		0	200 i
* 33.0.1.0/24	14.0.0.4			0	200 i
*>	12.0.0.2			0	200 i
* 33.0.2.0/24	14.0.0.4			0	200 i
*>	12.0.0.2			0	200 i
* 33.0.3.0/24	14.0.0.4			0	200 i
*>	12.0.0.2			0	200 i
* 44.0.1.0/24	14.0.0.4	0		0	200 i
*>	12.0.0.2			0	200 i
* 44.0.2.0/24	14.0.0.4	0		0	200 i
*>	12.0.0.2			0	200 i
* 44.0.3.0/24	14.0.0.4	0		0	200 i
*>	12.0.0.2			0	200 i

R1 is choosing 12.0.0.2 via R2 as best path instead of 14.0.0.4 to R4, R1 is choosing longest path as best path instead of choosing shortest path.

```
R1#traceroute 44.0.3.0
Type escape sequence to abort.
Tracing the route to 44.0.3.0
VRF info: (vrf in name/id, vrf out name/id)
 1 12.0.0.2 8 msec 8 msec 9 msec
 2 23.0.0.3 8 msec 9 msec 8 msec
```