

# LAB2: BGP – IPv4

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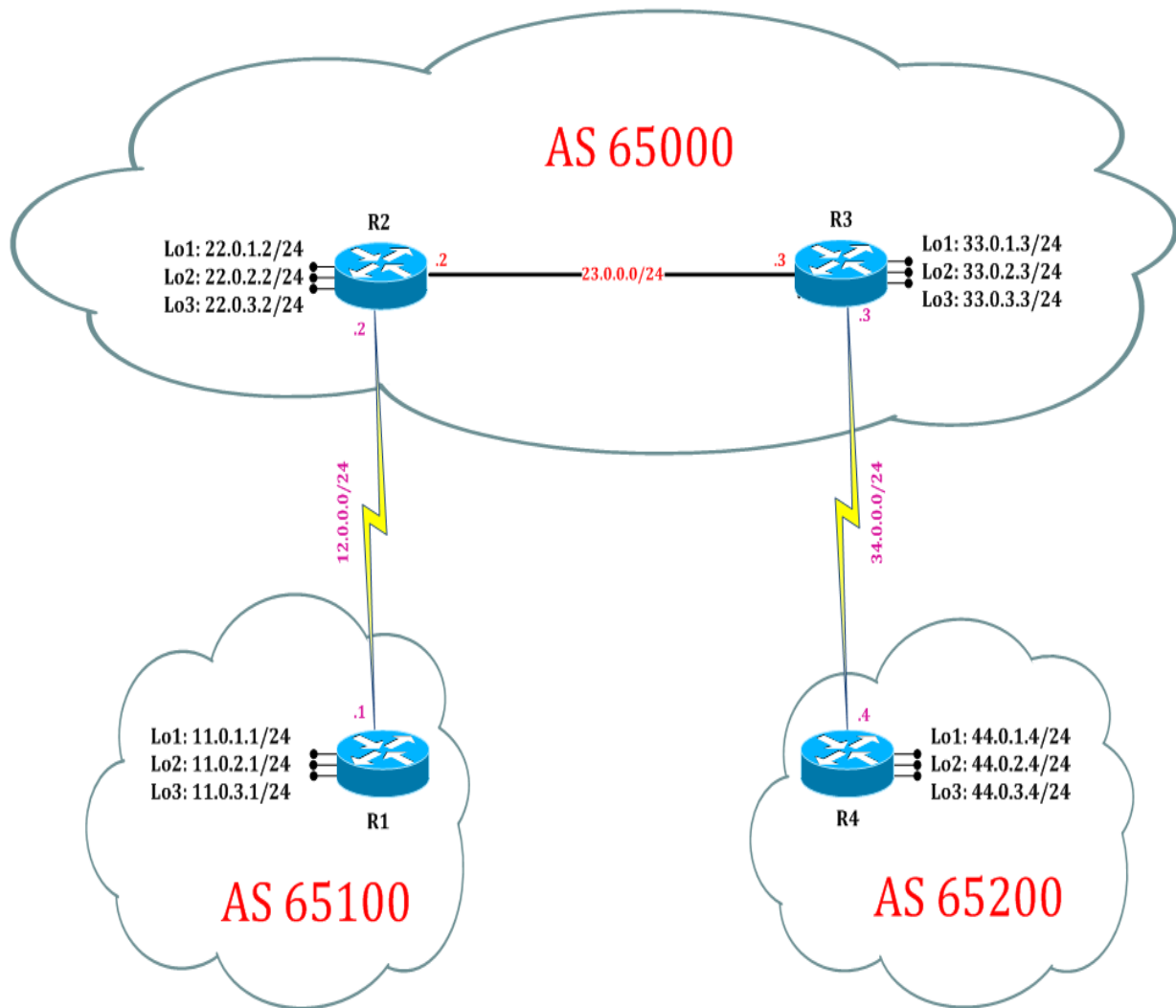
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**BGP: AS-Path Attributes**

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# LAB 2: Diagram

Note: This Lab was developed on Cisco IOS Version 15.2(4) M1 ADVENTERPRISEK9-M.



# LAB 2: Configure BGP AS-PATH Attributes:

## Task 1: Configure BGP AS-PATH Attributes for Autonomous

Step 1 In the configuration mode of router configure BGP AS-PATH Attributes by following command:

```
R1:
interface loopback 100
ip address 100.0.0.1 255.255.255.0
exit
router bgp 65100
address-family ipv4
network 100.0.0.0 mask 255.255.255.0
exit
```

```
R4:
interface loopback 100
ip address 100.0.0.4 255.255.255.0
exit
router bgp 65200
address-family ipv4
network 100.0.0.0 mask 255.255.255.0
exit
```

Step 2 Verify IPv4 BGP routes by following command:

```
R2#show ip bgp
!(Shows router's routing table and IPv4 routes entries)
```

```
BGP table version is 14, 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 i
* i 100.0.0.0/24 44.0.1.4 0 100 0 65200 i
*> 11.0.1.1 0 0 65100 i

```

(R2 can reach 100 network via next hop 11.0.1.1 through AS 65100 and via 44.0.1.4 through AS 65200. Best path for R2 to reach 100 network is via next hop 11.0.1.1 because 11.0.1.1 is EBGP neighbor with AD value 20 and 44.0.1.4 is received from IBGP neighbor with AD value 200.)

## Task 2: Configure BGP AS-PATH Manipulation for Autonomous

Step 1 Prepend AS for as-path manipulation

! (Router R2 wants to make via 44.0.1.4 as best path instead of 11.0.1.1)

R2:

```

router bgp 65000
address-family ipv4
neighbor 11.0.1.1 route-map abc in
exit
route-map abc permit 10
set as-path prepend 222 22
exit

```

(A policy is call on Router R2 that 100 network is prepended 222 22 via 11.0.1.1 through AS 65100 222 22 i.e. through 3 AS)

R1:

```

router bgp 65100
address-family ipv4
neighbor 22.0.1.2 route-map abc out
exit
route-map abc permit 10
set as-path prepend 111 11
exit

```

(A policy is call on Router R1 that 100 network is prepended 111 11 via 11.0.1.1 through AS 111 11 65100 i.e. through 3 AS)

Step 2 Verify IPv4 BGP routes by following command:

```
R2#show ip bgp
```

! (Shows router's routing table and IPv4 routes entries)

BGP table version is 21, 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	222 22 65100 111 11 i
*> 11.0.2.0/24	11.0.1.1	0		0	222 22 65100 111 11 i
*> 11.0.3.0/24	11.0.1.1	0		0	222 22 65100 111 11 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 i
* 100.0.0.0/24	11.0.1.1	0		0	222 22 65100 111 11 i
*>i	44.0.1.4	0	100	0	65200 i

(Router R2 now selects 44.0.1.4 as best path because it can reach 100 network through As 65200, where as to reach 100 network via 11.0.1.1 through AS 222 22 65100 111 11

Hence AS-PATH is manipulated.)