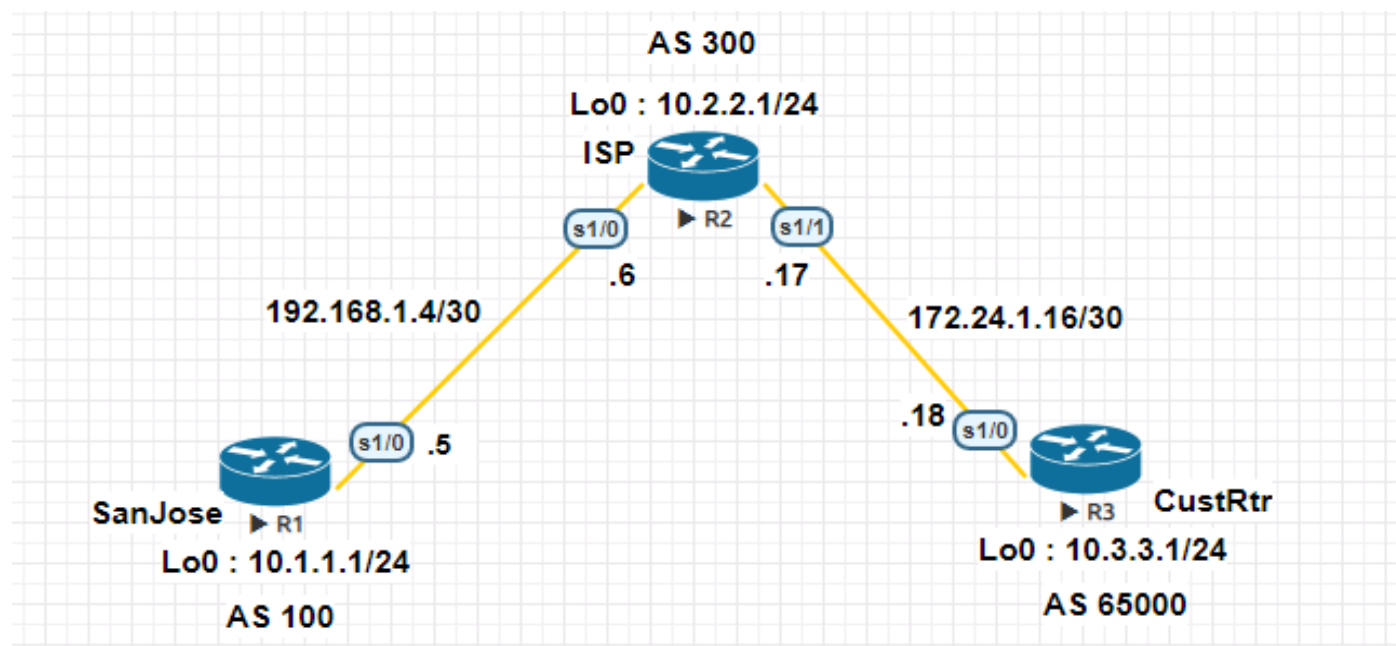


PRACTICAL NO 2: Using the AS_PATH Attribute

NETWORK TOPOLOGY



TASKS

- Use BGP commands to prevent private AS numbers from being advertised to the outside world.
- Use the AS_PATH attribute to filter BGP routes based on their source AS numbers.

SanJose

Router>enable

```
Router#conf t
Router(config)#hostname SanJose
SanJose(config)#interface Loopback0
SanJose(config-if)#ip address 10.1.1.1 255.255.255.0
SanJose(config-if)#exit
SanJose(config)#interface Serial1/0
SanJose(config-if)#ip address 192.168.1.5 255.255.255.252
SanJose(config-if)#no shutdown
SanJose(config-if)#end
SanJose(config)#router bgp 100
SanJose(config-router)#network 10.1.1.0 mask 255.255.255.0
SanJose(config-router)#neighbor 192.168.1.6 remote-as 300
SanJose(config-router)#exit
```

SanJose#sh ip route

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, I - LISP

a - application route

+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks

C 10.1.1.0/24 is directly connected, Loopback0

L 10.1.1.1/32 is directly connected, Loopback0

B 10.2.2.0/24 [20/0] via 192.168.1.6, 00:05:47

B 10.3.3.0/24 [20/0] via 192.168.1.6, 00:02:13

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.4/30 is directly connected, Serial1/0

L 192.168.1.5/32 is directly connected, Serial1/0

SanJose#sh ip bgp

BGP table version is 4, local router ID is 10.1.1.1

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
*> 10.1.1.0/24	0.0.0.0	0	32768	i	
*> 10.2.2.0/24	192.168.1.6	0	0	300	i
*> 10.3.3.0/24	192.168.1.6		0	300	65000 i

SanJose#sh ip bgp

BGP table version is 5, local router ID is 10.1.1.1

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
*> 10.1.1.0/24	0.0.0.0	0	32768	i	
*> 10.2.2.0/24	192.168.1.6	0	0	300	i
*> 10.3.3.0/24	192.168.1.6		0	300	i

ISP

Router>enable

Router#conf t

Router(config)#hostname ISP

ISP(config)#interface Loopback0

ISP(config-if)#ip address 10.2.2.1 255.255.255.0

ISP(config-if)#exit

ISP(config)#interface Serial1/0

ISP(config-if)#ip address 192.168.1.6 255.255.255.252

ISP(config-if)#no shutdown

ISP(config-if)#exit

ISP(config)#interface Serial1/1

ISP(config-if)#ip address 172.24.1.17 255.255.255.252

ISP(config-if)#no shutdown

ISP(config-if)#end

ISP(config)#router bgp 300

```
ISP(config-router)#network 10.2.2.0 mask 255.255.255.0
ISP(config-router)#neighbor 192.168.1.5 remote-as 100
ISP(config-router)#neighbor 172.24.1.18 remote-as 65000
ISP(config)#router bgp 300
ISP(config-router)#neighbor 192.168.1.5 remove-private-as
ISP(config-router)#end
ISP#clear ip bgp * soft
```

```
ISP(config)#ip as-path access-list 1 deny ^100$
ISP(config)#ip as-path access-list 1 permit .*
ISP(config)#router bgp 300
ISP(config-router)#neighbor 172.24.1.18 filter-list 1 out
ISP(config-router)#end
```

ISP#sh ip route

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, I - LISP

a - application route

+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks

B 10.1.1.0/24 [20/0] via 192.168.1.5, 00:46:41

C 10.2.2.0/24 is directly connected, Loopback0

L 10.2.2.1/32 is directly connected, Loopback0

B 10.3.3.0/24 [20/0] via 172.24.1.18, 00:43:07

172.24.0.0/16 is variably subnetted, 2 subnets, 2 masks

C 172.24.1.16/30 is directly connected, Serial1/1

L 172.24.1.17/32 is directly connected, Serial1/1

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.4/30 is directly connected, Serial1/0

L 192.168.1.6/32 is directly connected, Serial1/0

ISP#show ip bgp regexp ^100\$

BGP table version is 4, local router ID is 10.2.2.1

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
*> 10.1.1.0/24	192.168.1.5	0	0	100	i

CustRtr

Router>enable

Router#conf t

Router(config)#hostname CustRtr

CustRtr(config)#interface Loopback0

CustRtr(config-if)#ip address 10.3.3.1 255.255.255.0

CustRtr(config-if)#exit

CustRtr(config)#interface Serial1/0

CustRtr(config-if)#ip address 172.24.1.18 255.255.255.252

CustRtr(config-if)#no shutdown

CustRtr(config-if)#end

CustRtr(config)#router bgp 65000

CustRtr(config-router)#network 10.3.3.0 mask 255.255.255.0

CustRtr(config-router)#neighbor 172.24.1.17 remote-as 300

CustRtr(config-router)#end

CustRtr#sh ip route

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, I - LISP

a - application route

+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks

- B 10.2.2.0/24 [20/0] via 172.24.1.17, 00:45:59**
- C 10.3.3.0/24 is directly connected, Loopback0**
- L 10.3.3.1/32 is directly connected, Loopback0**

172.24.0.0/16 is variably subnetted, 2 subnets, 2 masks

- C 172.24.1.16/30 is directly connected, Serial1/0**
- L 172.24.1.18/32 is directly connected, Serial1/0**