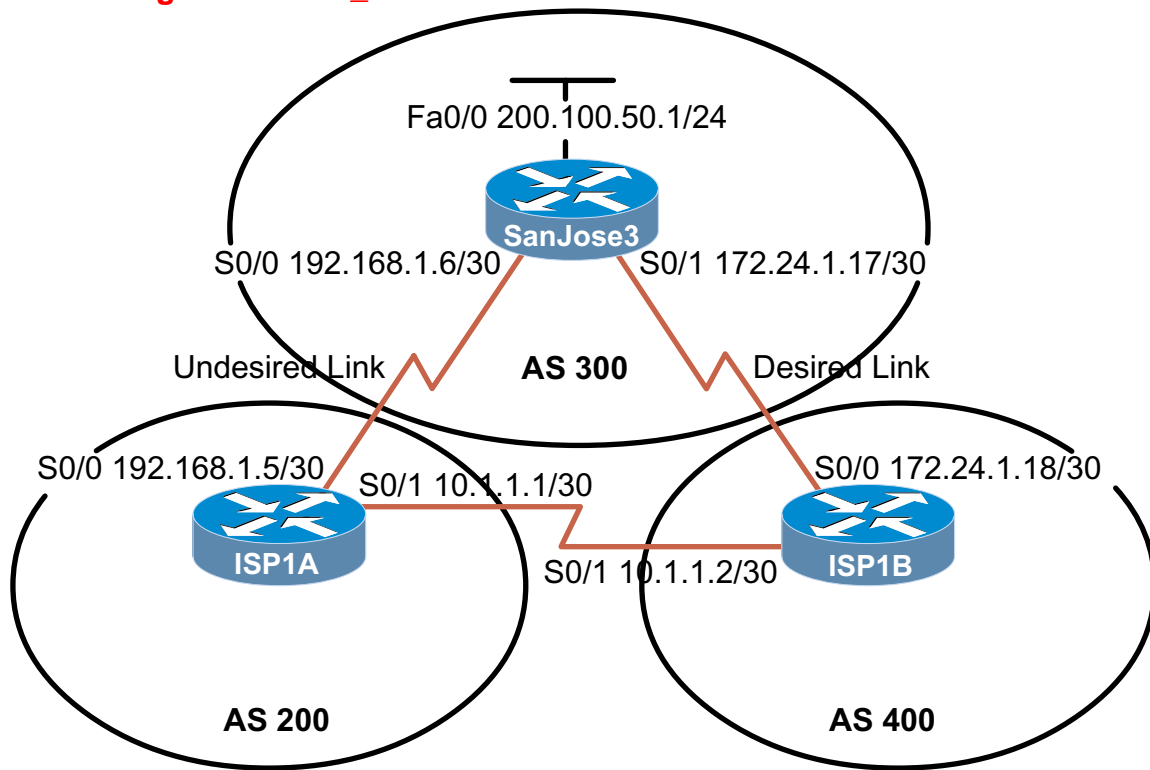


### 8.8.4 Using the LOCAL\_PREF and MED Attributes



#### Objective

In this lab, you use the LOCAL\_PREF and MED attributes to modify BGP's behavior and implement routing policy.

#### Scenario

You are asked by International Travel Agency's Internet service provider to configure BGP routing policies for its autonomous systems. This high-tier provider makes use of two different AS numbers. They asked you to configure BGP so that traffic always uses a designated path to reach networks in International Travel Agency's AS 100.

First, they would like you to configure the LOCAL\_PREF attributes on routers ISP1A and ISP1B so that they always use this path to reach AS 100. Second, the ISP wants you to use the MED attribute to influence SanJose3's BGP routing decisions. By configuring the MED, you must force SanJose3 to always use the desired path to reach the 10.0.0.0 network.

#### Step 1

Build and configure the network according to the diagram, but do not configure a routing protocol.

Use **ping** to test connectivity between the directly connected routers.

## Step 2

Configure BGP for normal operation. Enter the appropriate BGP commands so that SanJose3 advertises its Ethernet network and the other routers advertise the 10.0.0.0 network:

```
ISP1A(config)#router bgp 200
ISP1A(config-router)#neighbor 192.168.1.6 remote-as 300
ISP1A(config-router)#neighbor 10.1.1.2 remote-as 400
ISP1A(config-router)#network 10.0.0.0

SanJose3(config)#router bgp 100
SanJose3(config-router)#neighbor 192.168.1.5 remote-as 200
SanJose3(config-router)#neighbor 172.24.1.18 remote-as 400
SanJose3(config-router)#network 200.100.50.0

ISP1B(config)#router bgp 400
ISP1B(config-router)#neighbor 172.24.1.17 remote-as 100
ISP1B(config-router)#neighbor 10.1.1.1 remote-as 200
ISP1B(config-router)#network 10.0.0.0
```

Verify that these routers have established the appropriate neighbor relationships by issuing the **show ip bgp neighbor** command at each router.

## Step 3

Check ISP1A's routing table. According to ISP1A's routing table, SanJose3 (192.168.1.6) should be used to reach 200.100.50.0 /24.

Check ISP1A's BGP table. Note that ISP1A has learned about two paths to 200.100.50.0 /24.

1. Which path is better?

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At ISP1A's console, issue the command **show ip bgp 200.100.50.0**.

2. Based on the output of this command, what is the local preference value of paths 1 and 2?

---

Your task is to configure ISP1A to apply a local preference value so that the router will use the other path to 200.100.50.0 (via ISP1B).

Start by configuring a route map on ISP1A that will set the local preference value to 150, which is higher (and thus, better) than 100:

```
ISP1A(config)#route-map viaAS400
ISP1A(config-route-map)#set local-preference 150
ISP1A(config)#router bgp 200
ISP1A(config-router)#neighbor 10.1.1.2 route-map viaAS400 in
```

After you complete this configuration, issue the **clear ip bgp \*** command on ISP1A. Wait several seconds, and then use the **show ip bgp** command to view ISP1A's BGP table. Both paths should again be present in the table, but the best path should now be the route via ISP1B (10.1.1.2).

3. According to the output of this command, what is the local preference value of the route to 200.100.50.0 via 10.1.1.2?

Note that no local preference value is displayed for the route via 192.168.1.6, because this route has a default local preference value of 100, and default values are not listed in the BGP table.

Check ISP1A's routing table.

4. Is the route to 200.100.50.0/24 via 10.1.1.2 installed?
- 

#### Step 4

Finally, you configure ISP1A and ISP1B so that they send different metrics to SanJose3 about the network 10.0.0.0. This method allows you to influence the path selection of a router that is not necessarily under your administrative control.

SanJose3 should have two paths to the 10.0.0.0 network. As currently configured, SanJose3 will install the first path it learns about in the routing table as the best path. You will alter the MED values sent to SanJose3 in order to force the router to always choose the path via ISP1B.

First, configure ISP1A to advertise a relatively high metric in updates to SanJose3:

```
ISP1A(config)#route-map badmetric
ISP1A(config-route-map)#set metric 150
ISP1A(config-route-map)#router bgp 200
ISP1A(config-router)#neighbor 192.168.1.6 route-map badmetric out
```

Next, configure ISP1B to advertise a relatively low metric in updates to SanJose3:

```
ISP1B(config)#route-map goodmetric
ISP1B(config-route-map)#set metric 50
ISP1B(config-route-map)#router bgp 400
ISP1B(config-router)#neighbor 172.24.1.17 route-map goodmetric out
```

After you configure these two routers to advertise different metrics to SanJose3, you must also configure SanJose3 so that it compares metrics from different autonomous systems:

```
SanJose3(config)#router bgp 100
SanJose3(config-router)#bgp always-compare-med
```

Issue the `clear ip bgp *` command on SanJose3, wait several seconds, and then check SanJose3's BGP table with the command `show ip bgp`. SanJose3 should have two paths to the 10.0.0.0 network, but each path will have a different metric.

Check SanJose3's BGP table. The best next hop to 10.0.0.0/8 should be 172.24.1.18.

1. What is the metric value of this route to 10.0.0.0/8?
- 

2. What is the default metric value of BGP routes?
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