

Advanced Networking Topics: BGP, BGP Hijacking, MPLS, MPLS-based VPNs, Segment Routing, and others

Ali ALSabeh, Jorge Crichigno
University of South Carolina
<http://ce.sc.edu/cyberinfra>
aalsabeh@email.sc.edu, jcrichigno@cec.sc.edu

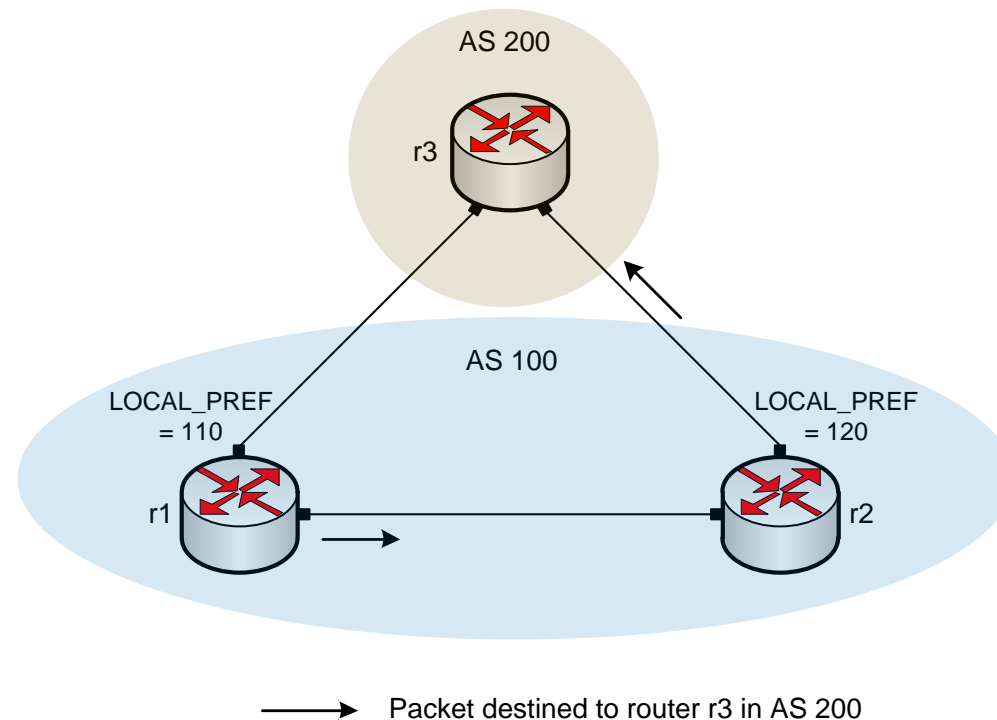
WASTC 2021 virtual Faculty Development Weeks (vFDW)
June 15, 2021

Lab 8.1: Configuring OSPF, IBGP and EBGP Sessions, Local Preference, and MED

Lab activities are described in Lab 8.1, BGP Lab Series

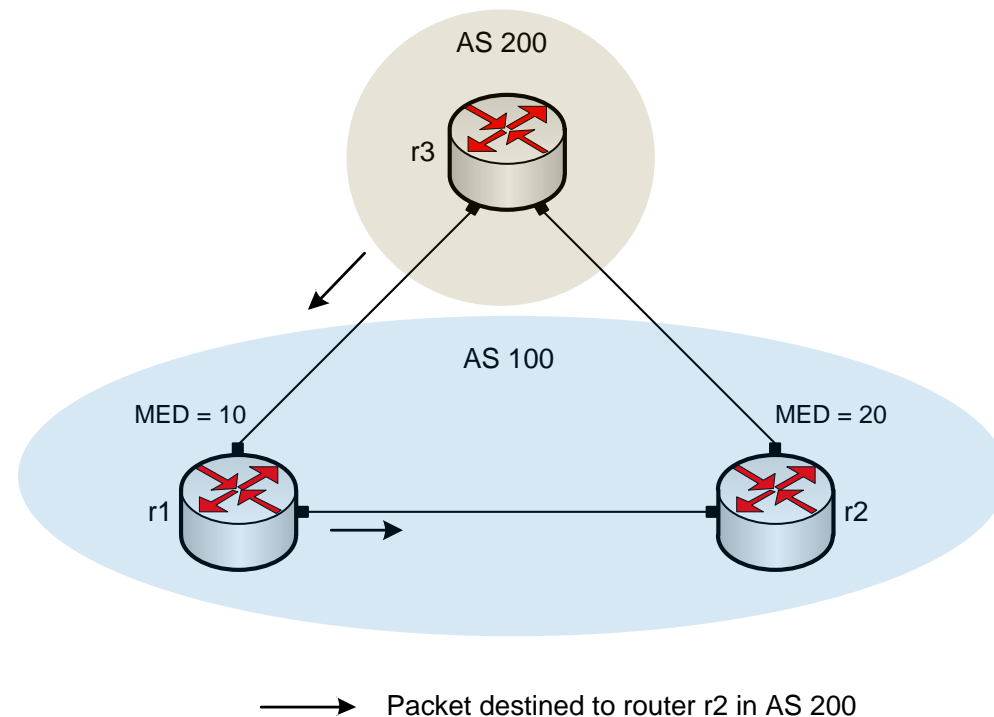
LOCAL_PREF Attribute

- The LOCAL_PREF attribute is advertised among Internal BGP (IBGP) routers
- It indicates the preferred path to external Autonomous Systems (ASes) when an AS has multiple routes to another AS
- The BGP route with the highest LOCAL_PREF value is preferred



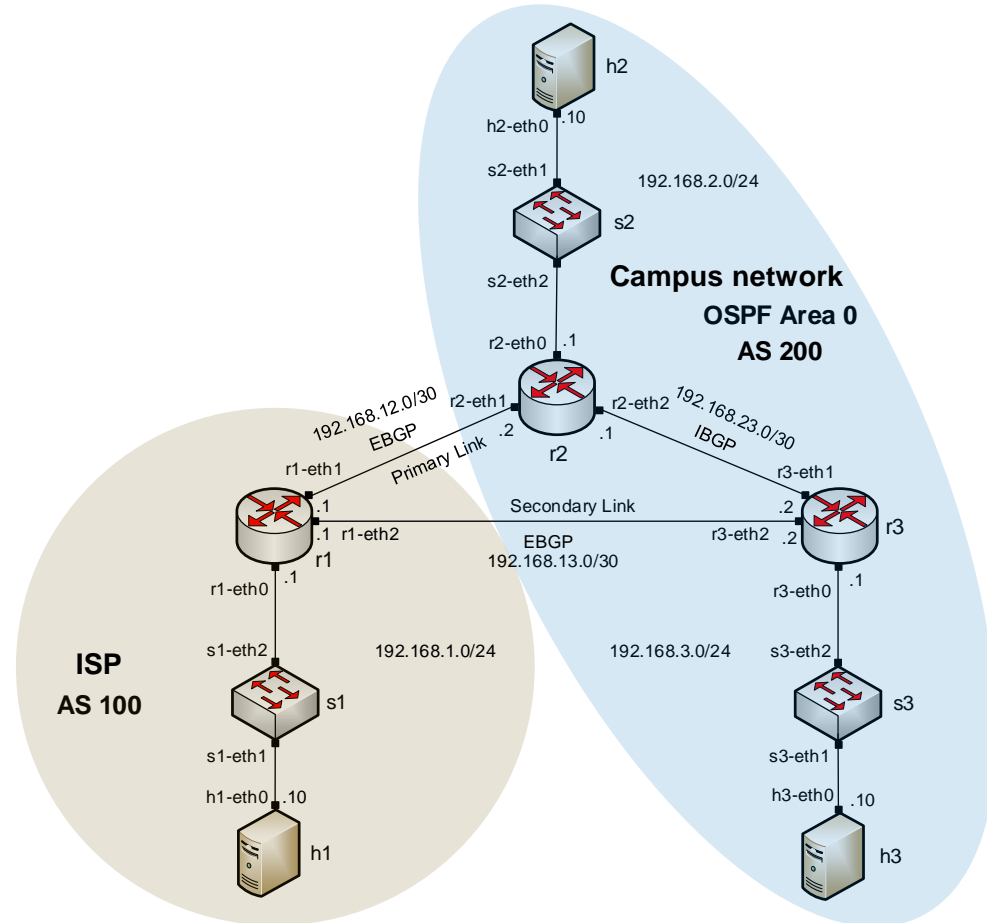
MED Attribute

- The MED attribute indicates to external neighbors the preferred path into an AS
- It is used when there are multiple entry points to the same AS
- The BGP route with the lowest MED value is preferred



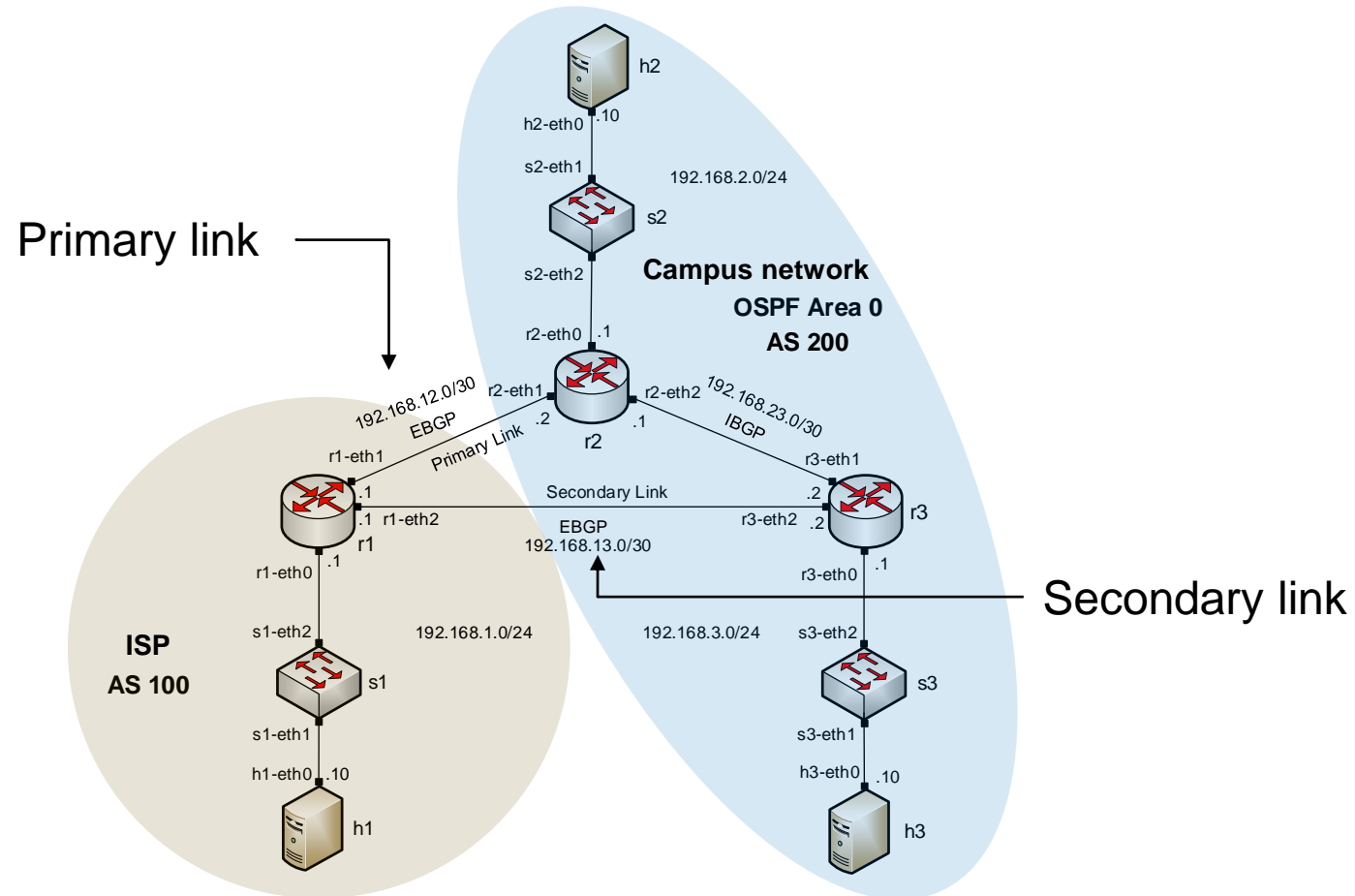
Lab Topology

- Configure OSPF as IGP in AS 200
- Configure BGP as EGP between AS 100 and AS 200



Lab Topology

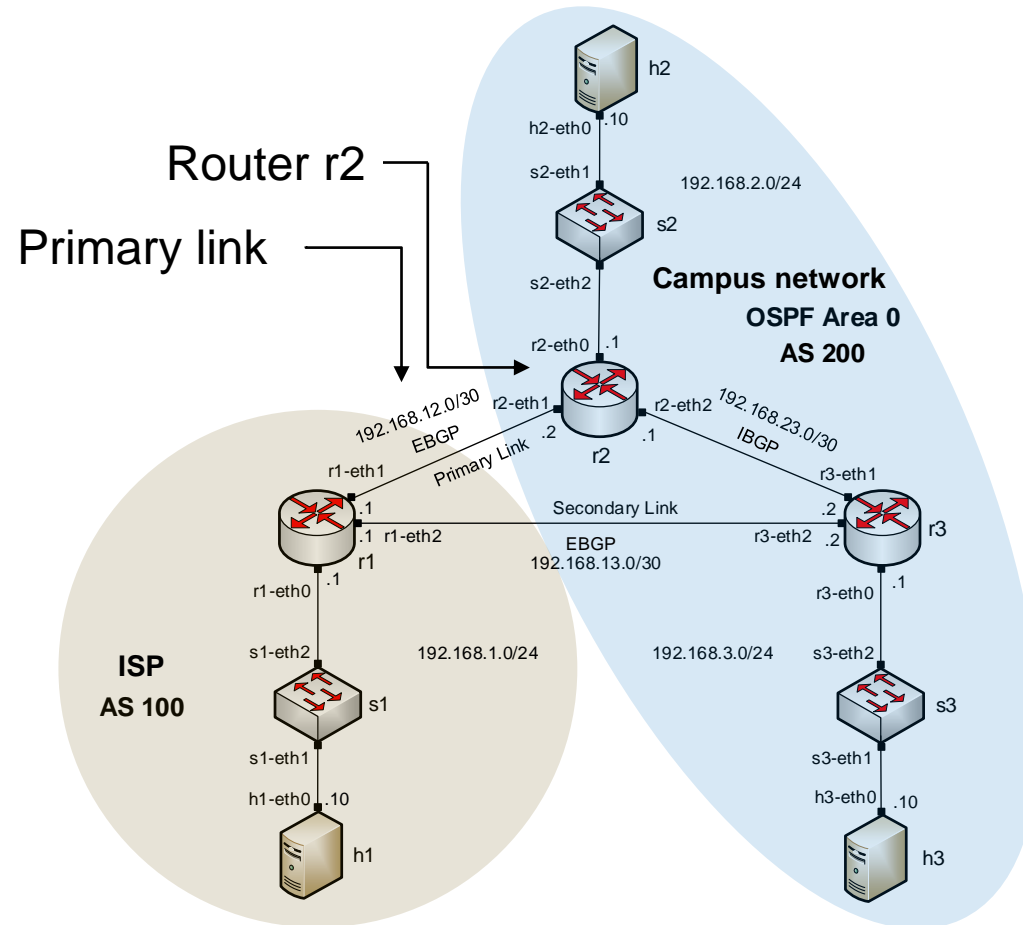
- Configure LOCAL_PREF and MED attributes to favor the primary link over the secondary one



Lab Configuration

- Create a route map to set the LOCAL_PREF attribute of the primary link

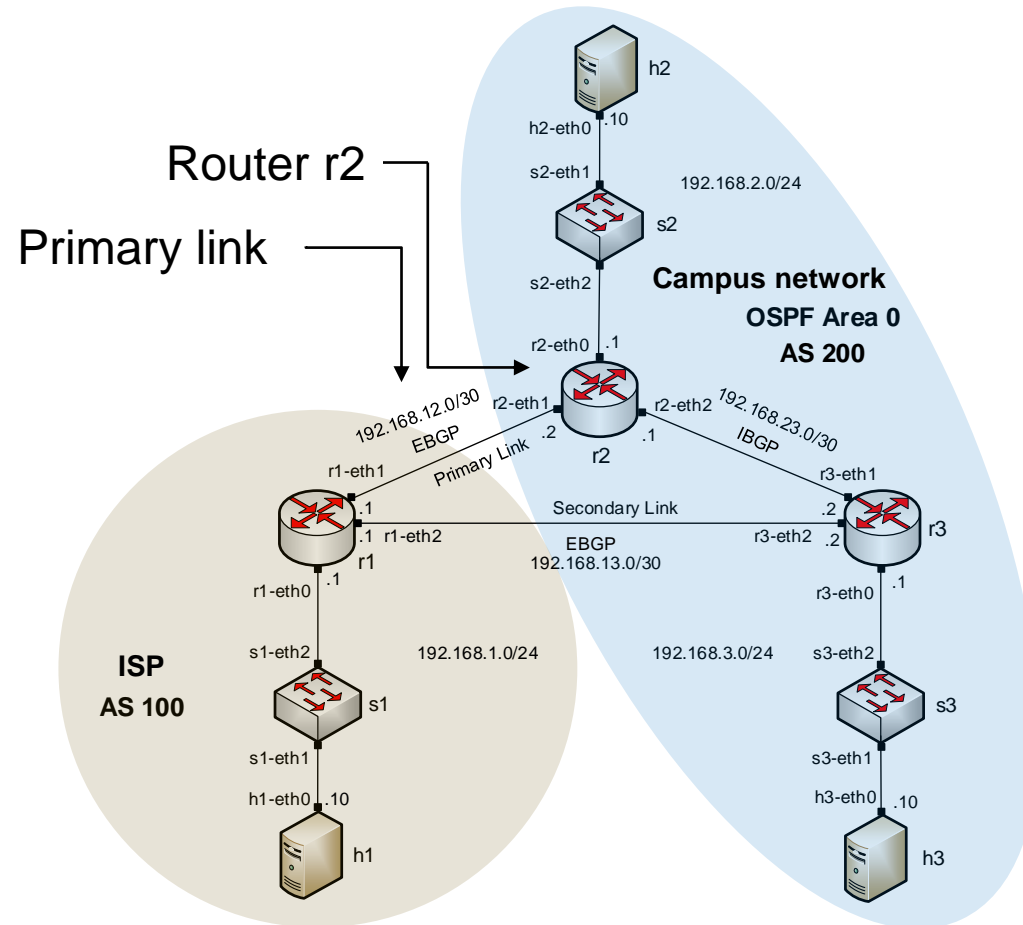
```
Host: r2
frr-pc# configure terminal
frr-pc(config)# route-map primary_in permit 10
frr-pc(config-route-map)#
```



Lab Configuration

- Set the LOCAL_PREF value of the primary link to 150

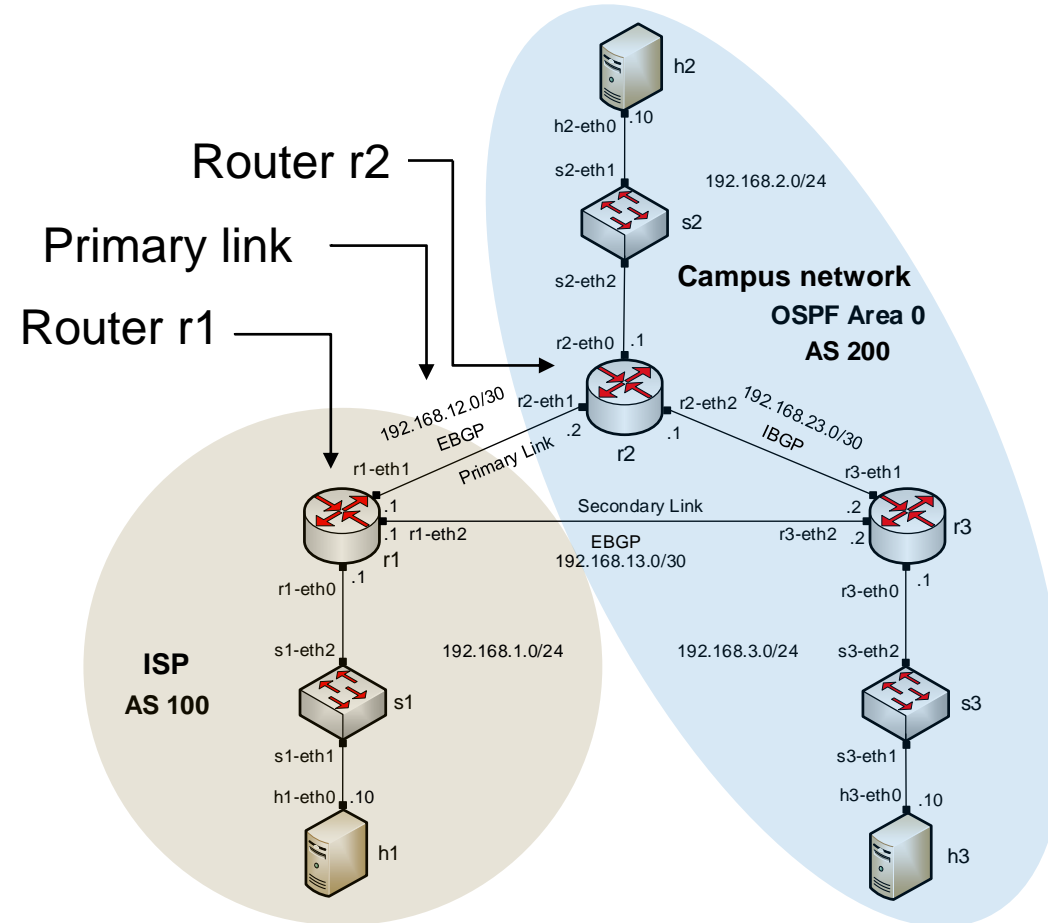
```
Host: r2
frr-pc# configure terminal
frr-pc(config)# route-map primary_in permit 10
frr-pc(config-route-map)# set local-preference 150
frr-pc(config-route-map)#
```



Lab Configuration

- Assign the route-map to the BGP neighbor (router r1)

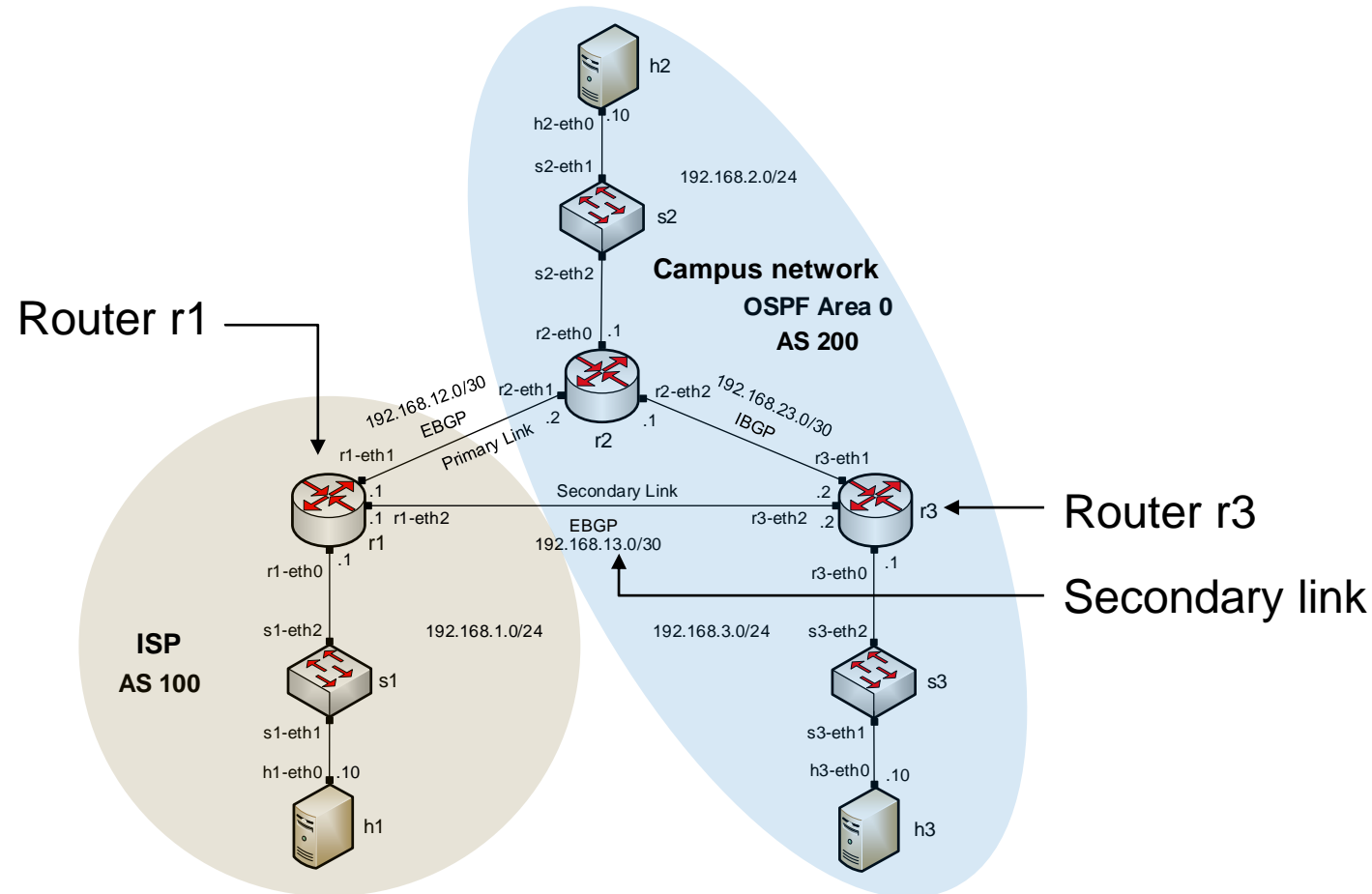
```
Host: r2
frr-pc# configure terminal
frr-pc(config)# route-map primary_in permit 10
frr-pc(config-route-map)# set local-preference 150
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.12.1 route-map primary_in in
frr-pc(config-router)#
```



Lab Configuration

- Similarly, configure LOCAL_PREF on router r3 for the secondary link

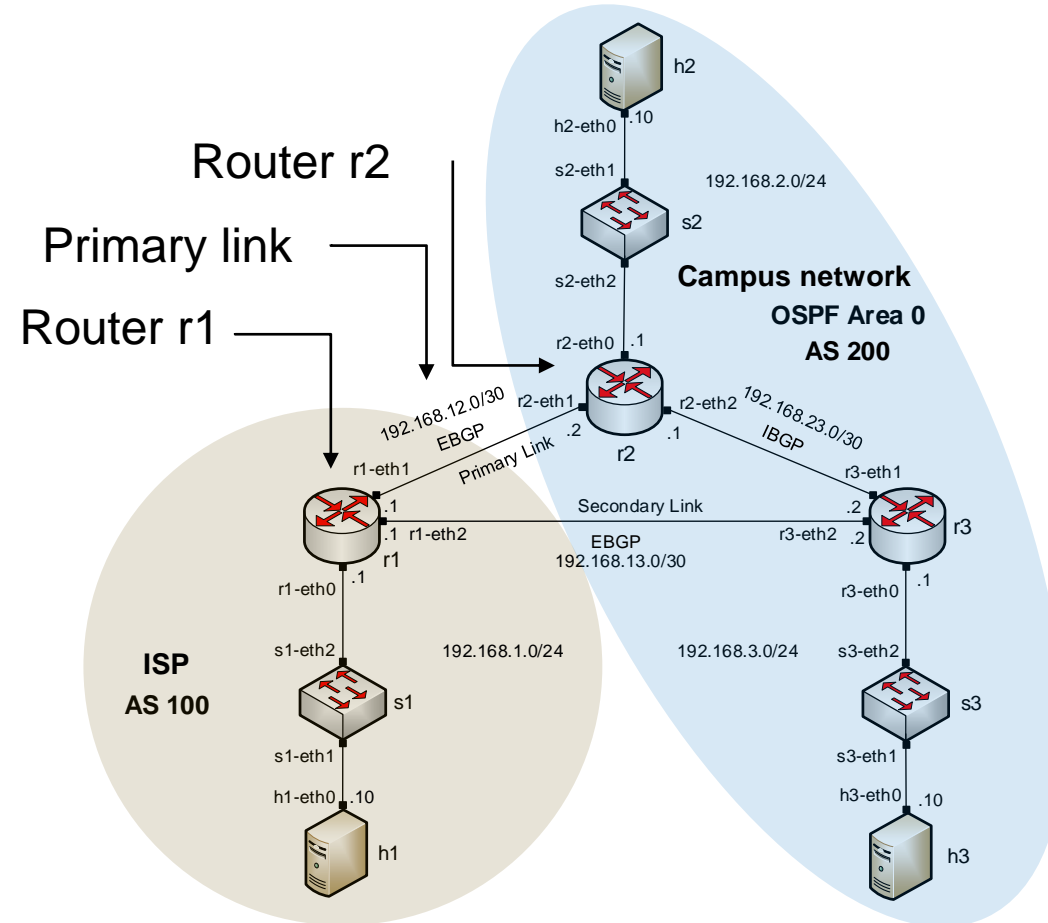
```
Host: r3
frr-pc# configure terminal
frr-pc(config)# route-map secondary_in permit 10
frr-pc(config-route-map)# set local-preference 125
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.13.1 route-map secondary_in in
frr-pc(config-router)# end
```



Lab Configuration

- Similarly, configure MED on router r2

```
Host: r2
frr-pc# configure terminal
frr-pc(config)# route-map primary_med_out permit 10
frr-pc(config-route-map)# set metric 50
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.12.1 route-map primary_med_out out
frr-pc(config-router)# end
frr-pc#
```



Lab Configuration

- Similarly, configure MED on router r3

```
Host: r3
frr-pc# configure terminal
frr-pc(config)# route-map secondary_med_out permit 10
frr-pc(config-route-map)# set metric 75
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 200
frr-pc(config-router)# neighbor 192.168.13.1 route-map secondary_med_out out
frr-pc(config-router)# end
frr-pc#
```

