SoX Virtual Training Workshop
Hands-on Session 2: Using Local Preference and AS_PATH attributes

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SoX Virtual Training Workshop

- Webpage with PowerPoint presentations:

  http://ce.sc.edu/cyberinfra/sox_workshop_2023.html

- Hands-on sessions: to access labs for the hands-on sessions, use the following link:
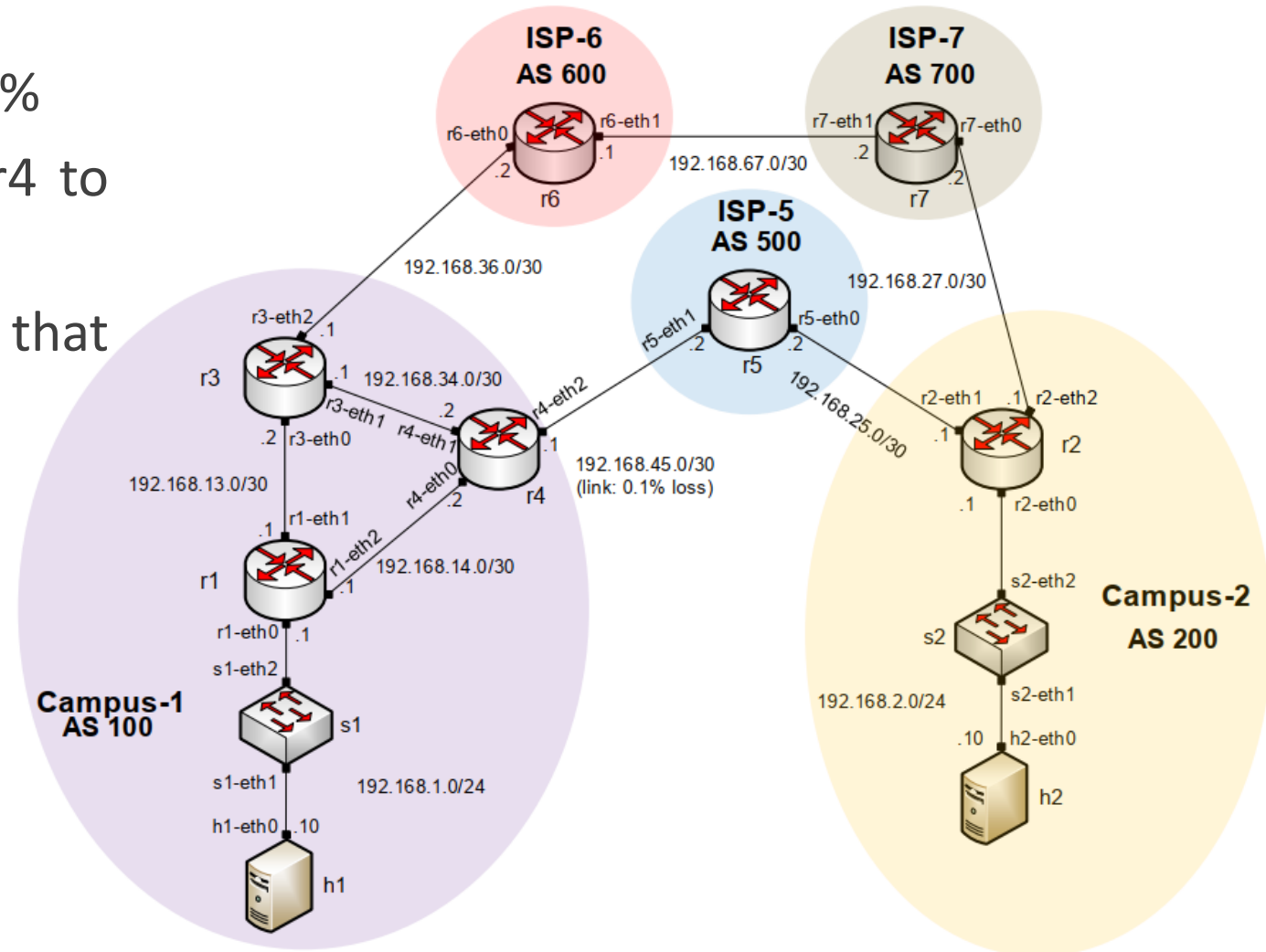
  https://netlab.cec.sc.edu/

- Username: email used for registration
- Password: nsf2023

Lab 11: Configuring Local Preference and AS_PATH Prepending

Lab Topology

- All links have a capacity of 10Gbps
- Link r4-r5 has a packet loss rate = 0.1%
- Configure LOCAL_PREF on r3 and r4 to route traffic **out** of AS 100 via r3
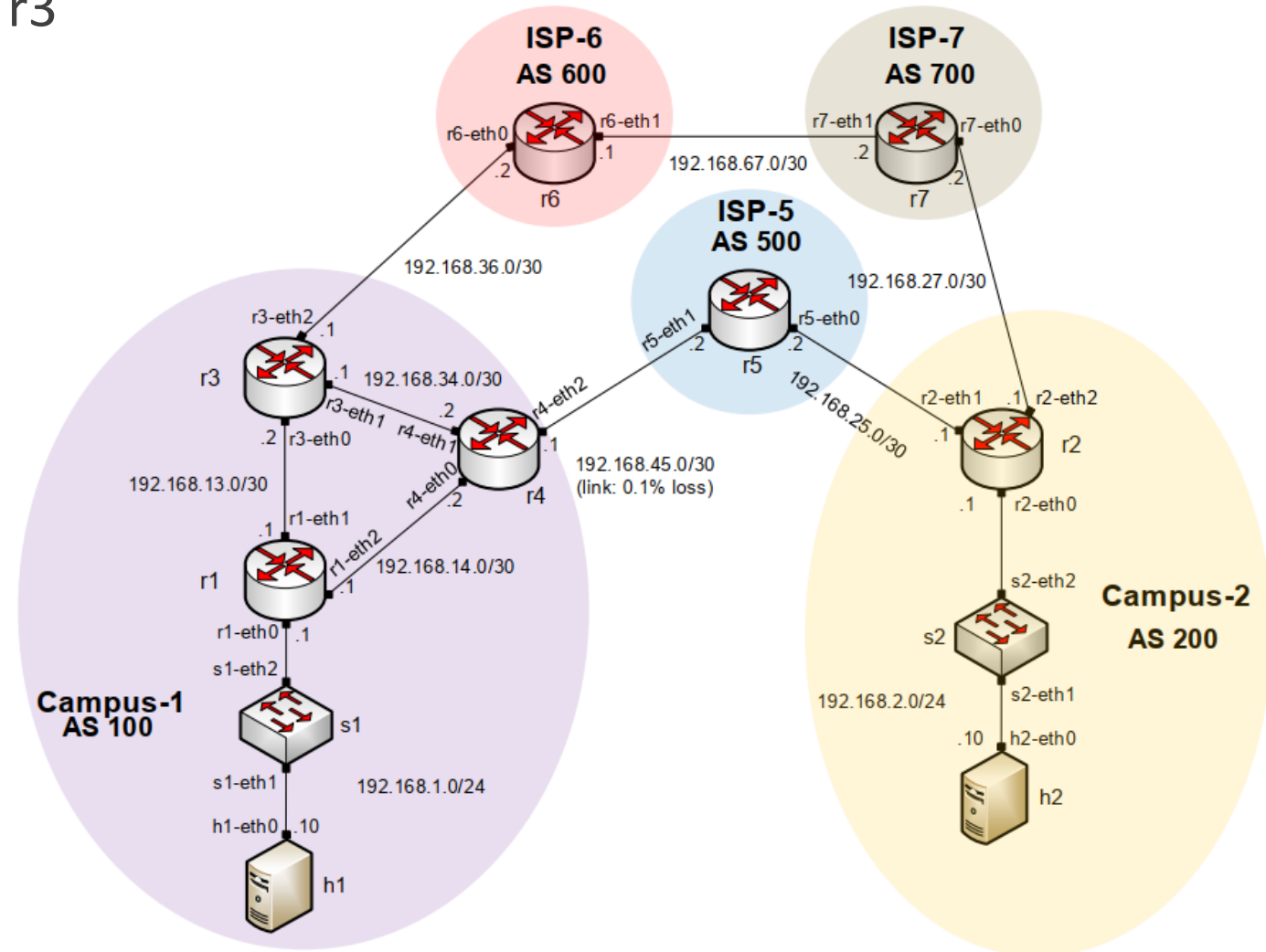- Set AS_PATH prepending on r4 so that traffic **into** AS 100 occurs via AS 600

Lab Topology

- Configure LOCAL_PREF in routers r3 (150) and r4 (125) (higher is better)
- Outbound traffic via r3


```
"Host: r3"
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 100
frr-pc(config-router)# neighbor 192.168.36.2 route-map primary_in in
frr-pc(config-router)# end
frr-pc#
```
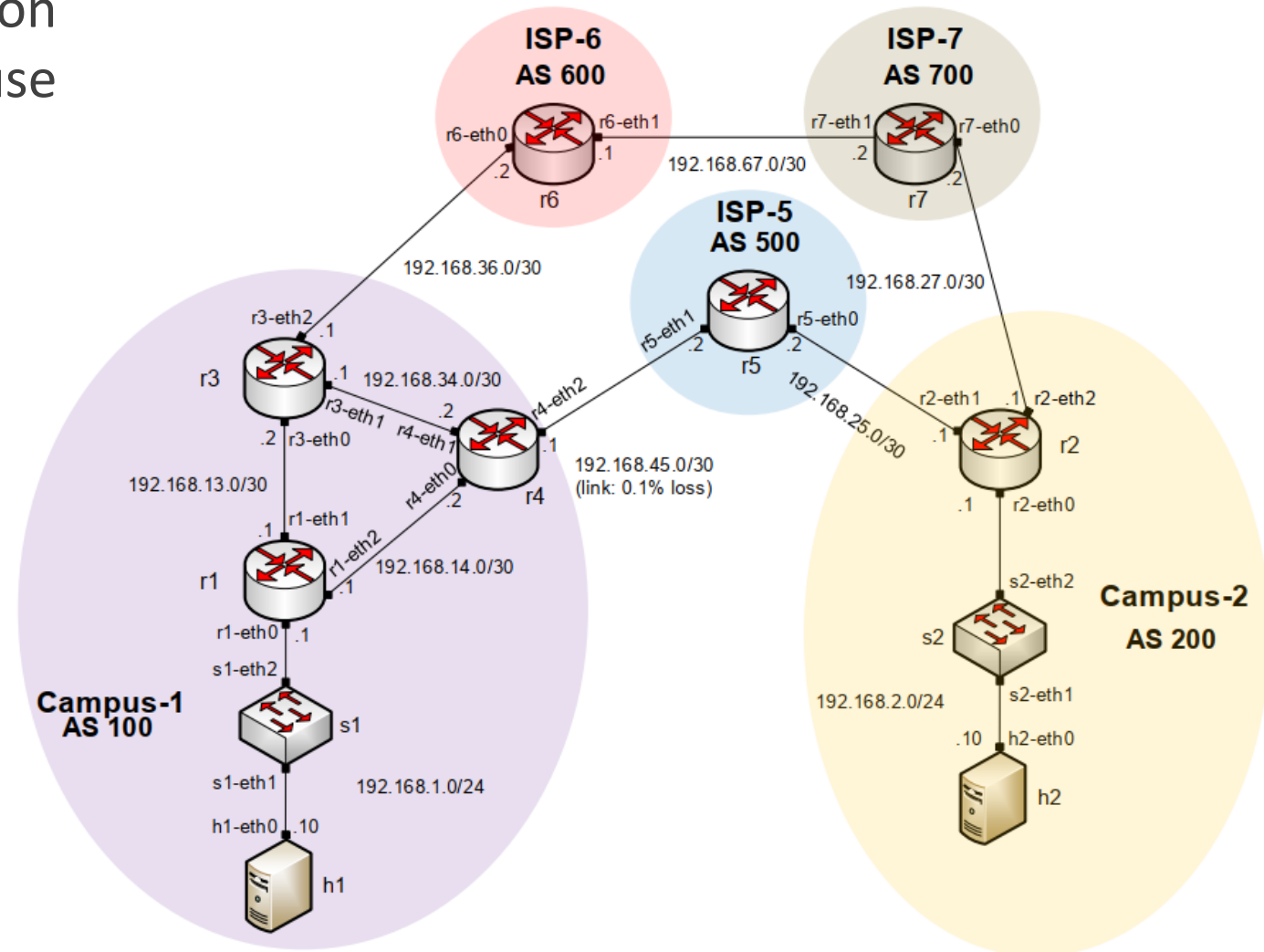
```
"Host: r4"
frr-pc# configure terminal
frr-pc(config)# route-map secondary_in permit 10
frr-pc(config-route-map)# set local-preference 125
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 100
frr-pc(config-router)# neighbor 192.168.45.2 route-map secondary_in in
frr-pc(config-router)# end
frr-pc#
```

Lab Topology

- Configure AS_PATH prepending on router r4 to influence router r2 to use the long path
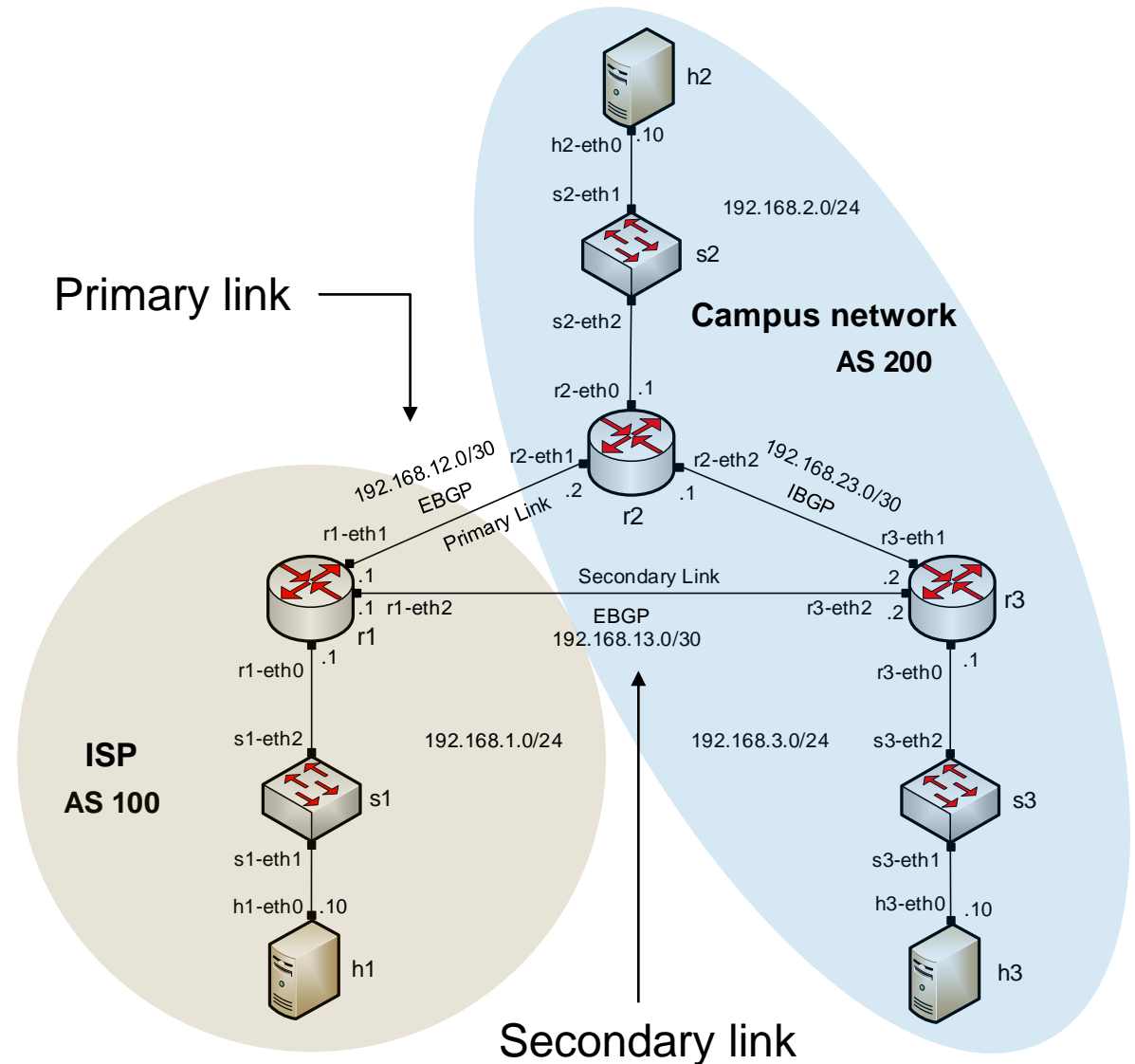- Inbound traffic from AS 200 via r3


```
                              "Host: r4"
frr-pc# configure terminal
frr-pc(config)# route-map prepend_out permit 10
frr-pc(config-route-map)# set as-path prepend 100 100
frr-pc(config-route-map)# exit
frr-pc(config)# router bgp 100
frr-pc(config-router)# neighbor 192.168.45.2 route-map prepend_out out
frr-pc(config-router)# end
frr-pc#
```

Additional Slides - Lab 8: Configuring IBGP and EBGP Sessions, Local Preference, and MED

Lab Topology

- Configure IBGP within AS 200
- Configure EBGP between AS 100 and AS 200
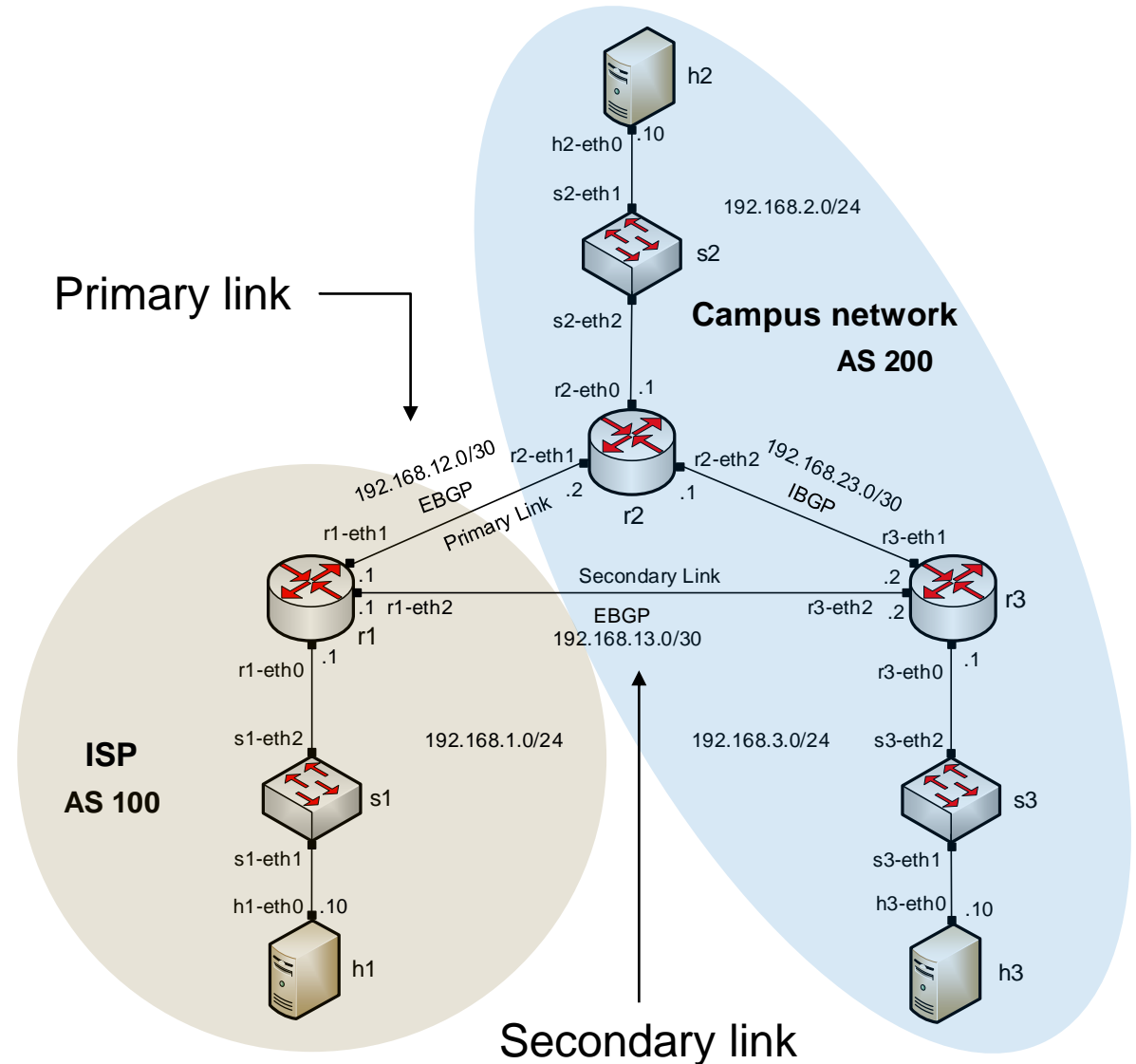- Configure LOCAL_PREF and MED attributes to favor the primary link over the secondary one

Lab Topology

- Local_PREF attribute configuration on routers r2 and r3
  - Configure a route-map
  - Set the LOCAL_PREF attribute
  - Assign the route-map to the BGP neighbor

```
                          "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)#
```

```
                          "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
```
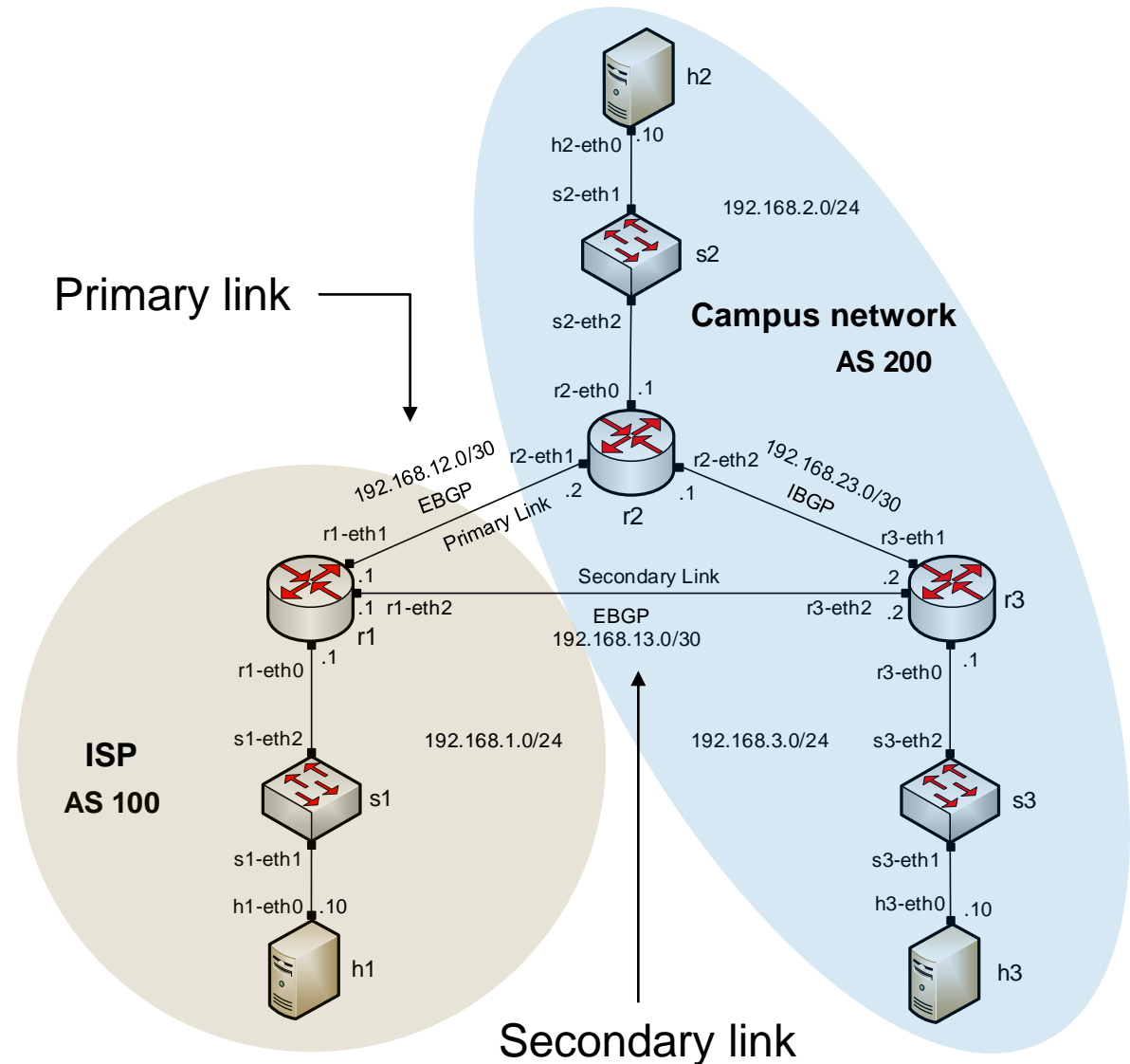

Primary link

Secondary link

Lab Topology

- BGP table of router r3 after configuring the LOCAL_PREF attribute
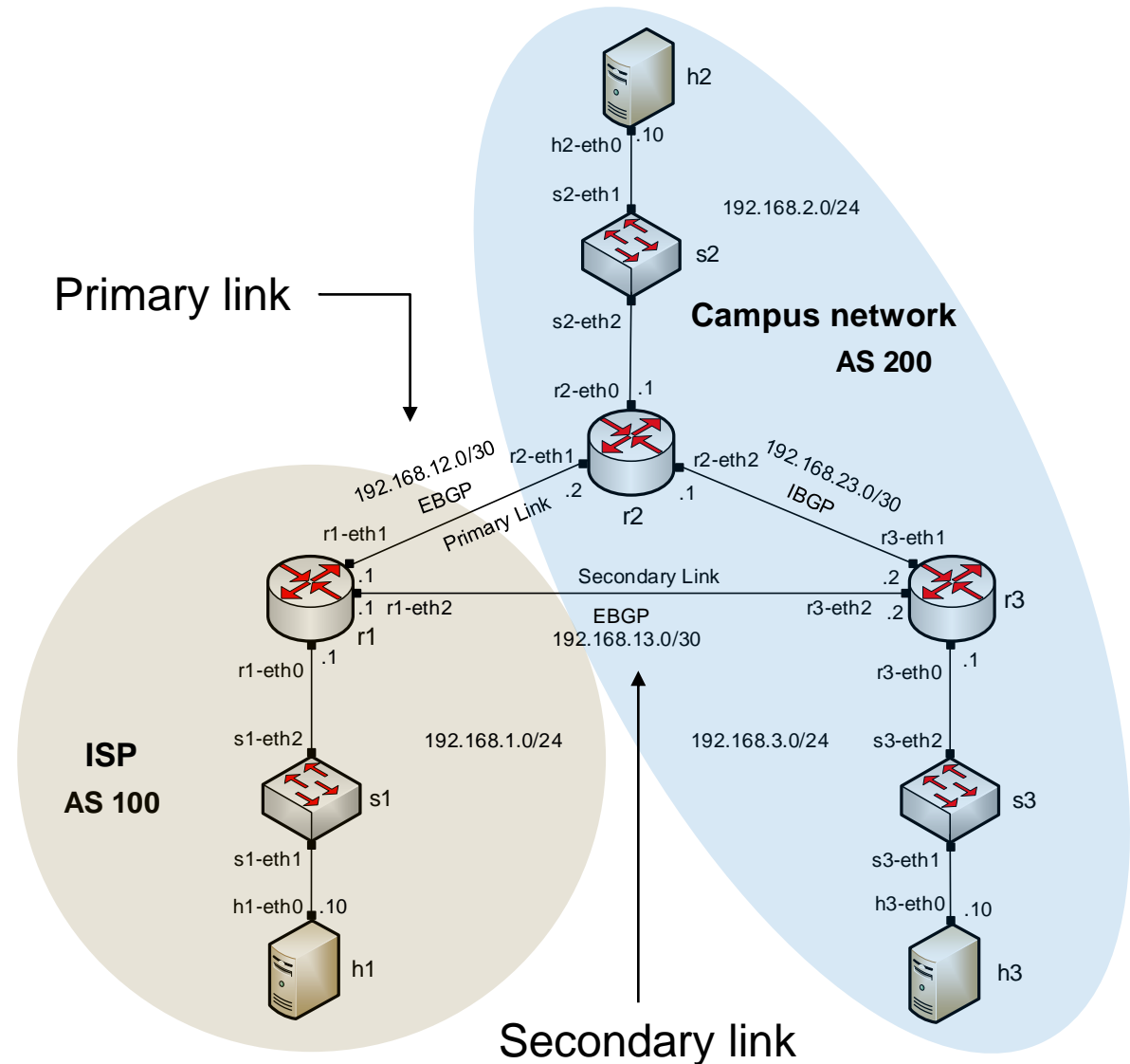
Lab Topology

- MED attribute configuration on routers r2 and r3
  - Configure a route-map
  - Set the MED attribute
  - Assign the route-map to the BGP neighbor


```
                        "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)# ▮
```

```
                        "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# ▮
```

Lab Topology

- BGP table of router r1 after configuring the MED attribute