Hands-on Session: Essentials of BGP, EBGP, IBGP

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Internet2 Technology Exchange

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Denver, Colorado

Border Gateway Protocol (BGP) Lab Series

Lab Series: Border Gateway Protocol

- Lab 1: Introduction to Mininet
- Lab 2: Introduction to Free Range Routing (FRR)
- Lab 3: Introduction to BGP
- Lab 4: Configure and verify EBGP
- Lab 5: BGP Authentication
- Lab 6: Configure BGP with Default Route
- Lab 7: Using AS_PATH BGP Attribute
- Lab 8: Configuring IBGP and EBGP Sessions, Local Preference, and MED
- Lab 8.1: Configuring OSPF, IBGP and EBGP Sessions, Local Preference, and MED
- Lab 9: IBGP, Next Hop and Full Mesh Topology
- Lab 10: BGP Route Reflection

Introduction to BGP

Lab activities are described in Lab 3, BGP Lab Series

Hands-on Labs on BGP

- Webpage with PowerPoint presentations:

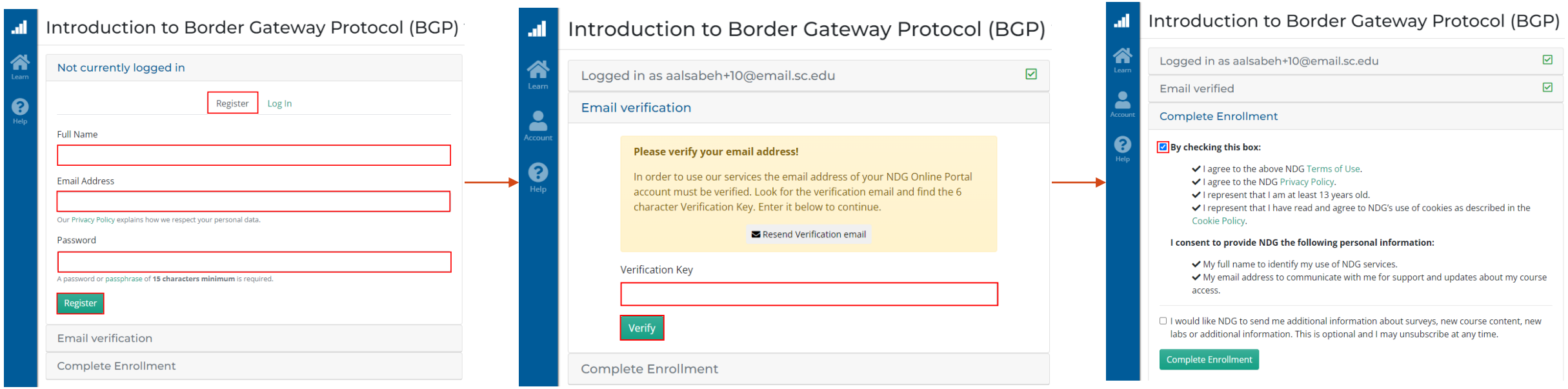
  http://ce.sc.edu/cyberinfra/workshop_2022_ie2_bgp.html

- Hands-on session 1 (9:00-9:45pm): to access labs for Session 1 (Essentials of BGP, EBGP, IBGP), register here:

  https://portal.netdevgroup.com/learn/34b2cp/enroll/

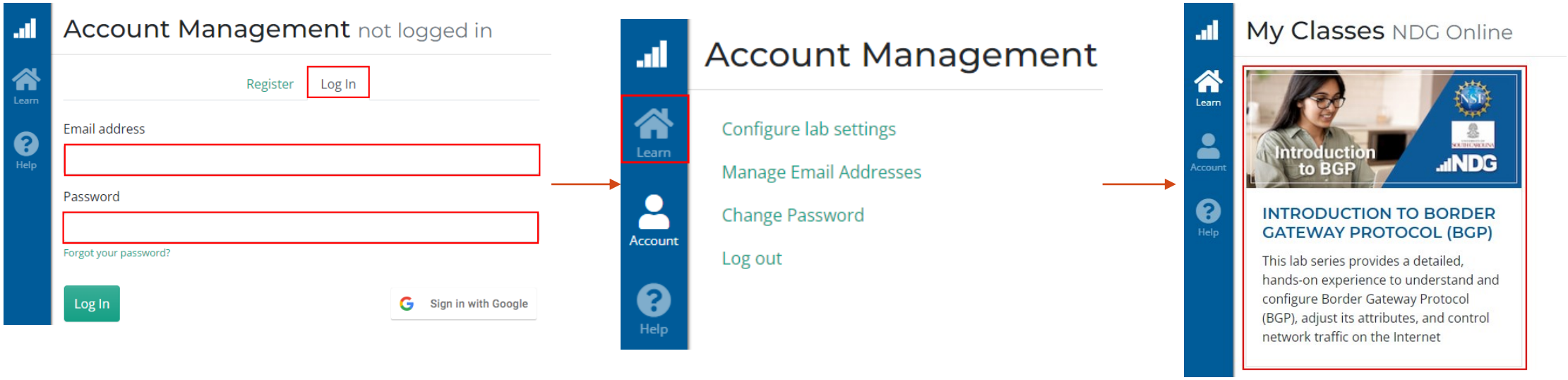
Registering to the Netlab Portal

- Click on the enrollment link: https://portal.netdevgroup.com/learn/34b2cp/enroll/
- Register and check your email for the verification key
- Finalize the registration by claiming your free access



Accessing the Virtual Labs

- If already registered, login to the portal: https://portal.netdevgroup.com/account/login
- Click on the course “Introduction to Border Gateway Protocol (BGP)”
- Select the lab you want to run (e.g., Lab 3)

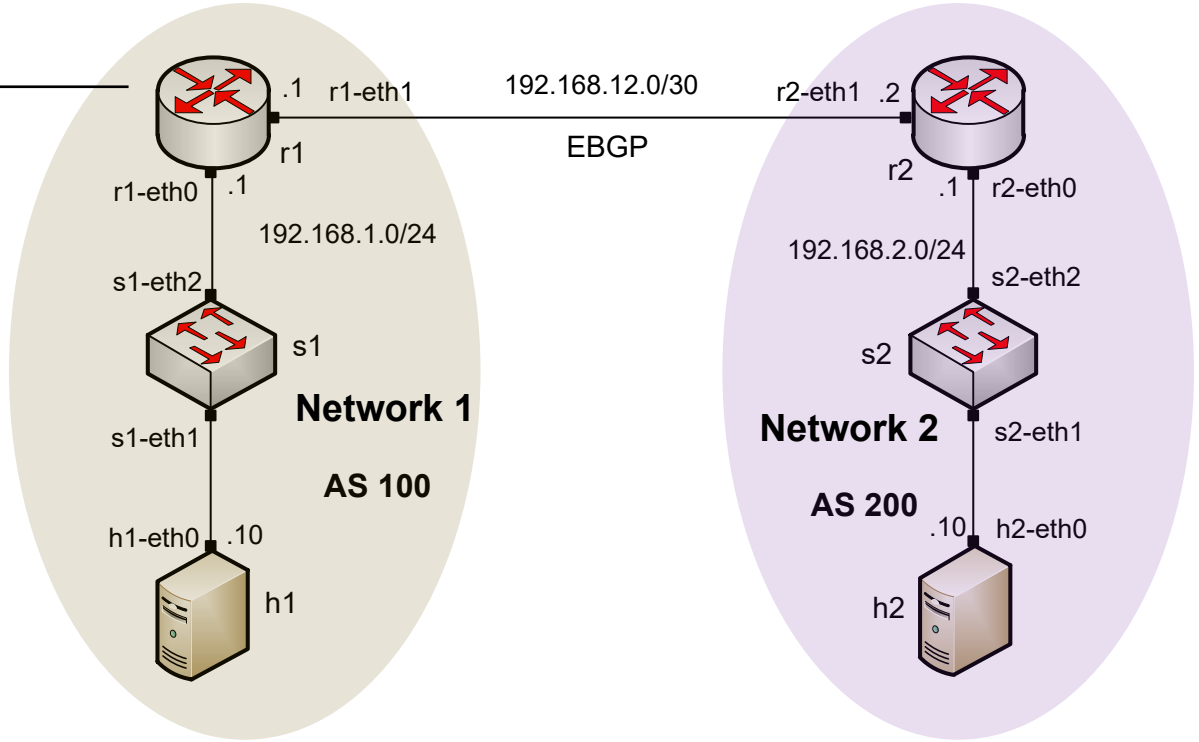


Lab Topology

- Establish BGP neighborhood

Router r1

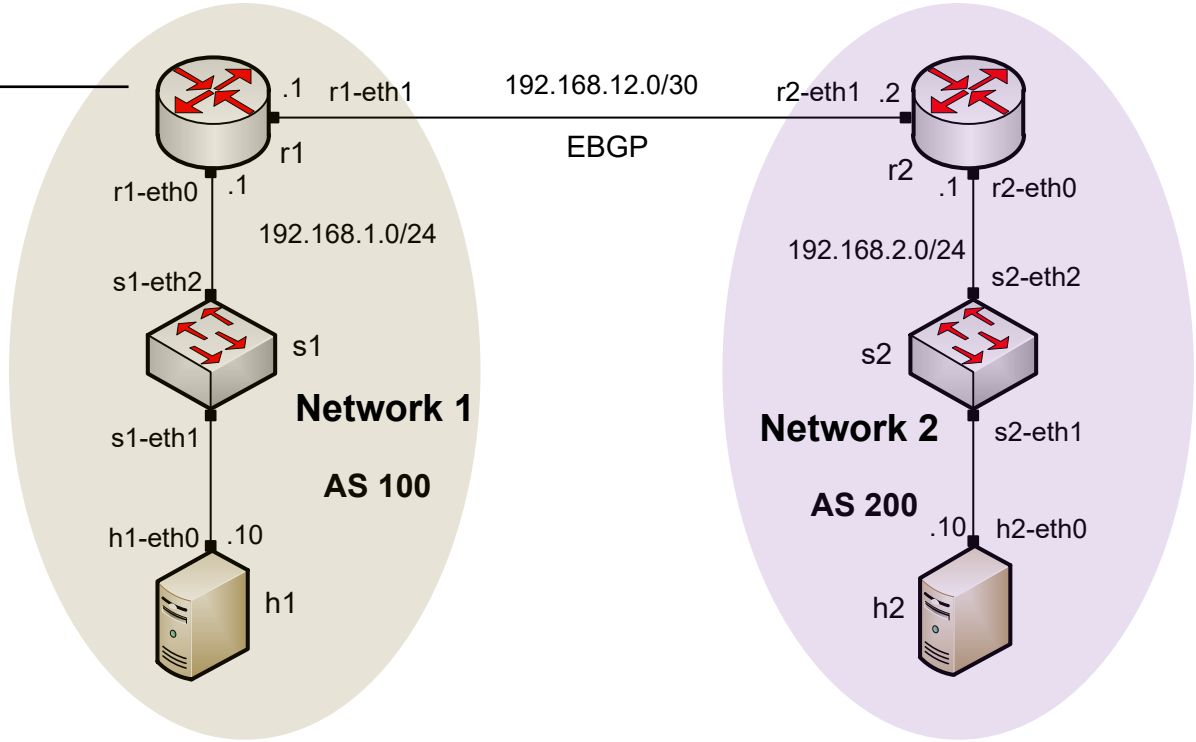
```
"Host: r1"
root@frr-pc:/etc/routers/r1# bgpd
root@frr-pc:/etc/routers/r1# vtysh

Hello, this is FRRouting (version 7.2-dev).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

frr-pc# configure terminal
frr-pc(config)# router bgp 100
frr-pc(config-router)# neighbor 192.168.12.2 remote-as 200
frr-pc(config-router)#
```



Lab Topology

- Advertise a network in BGP

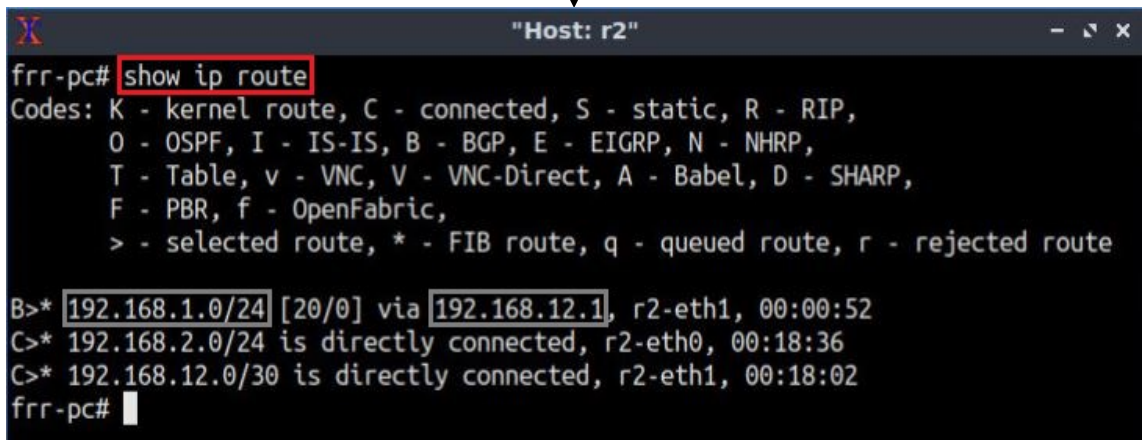
Router r1

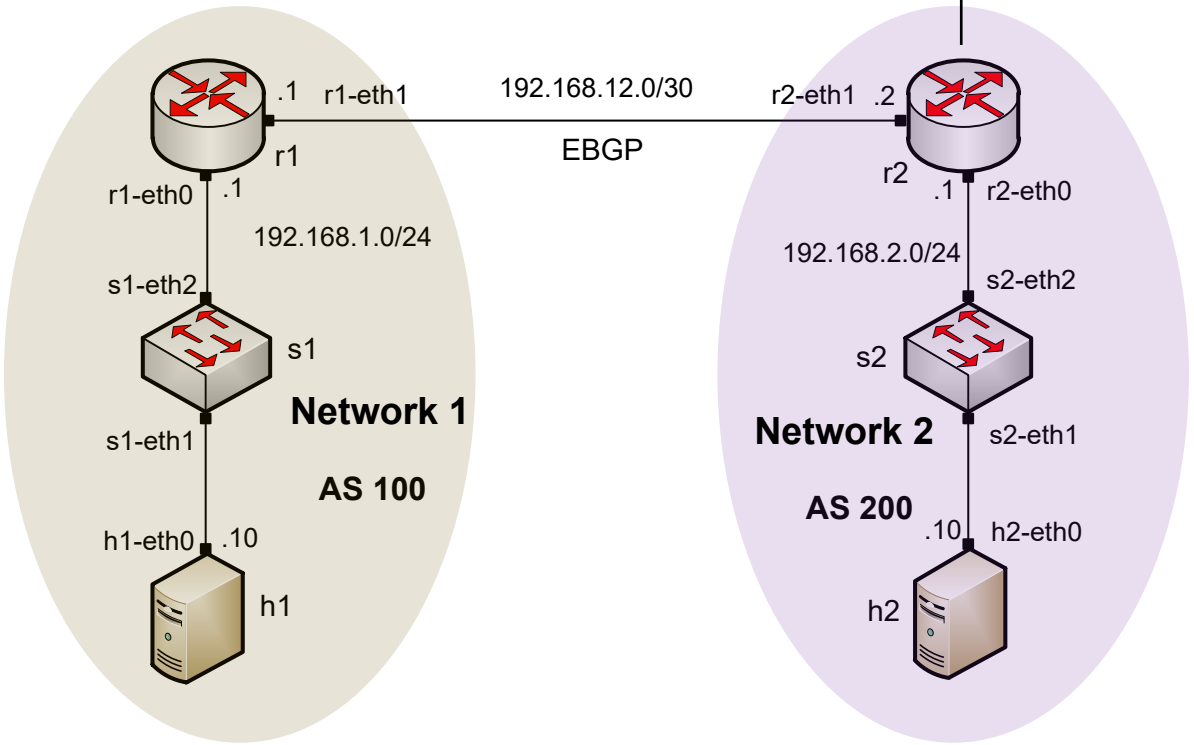


Lab Topology

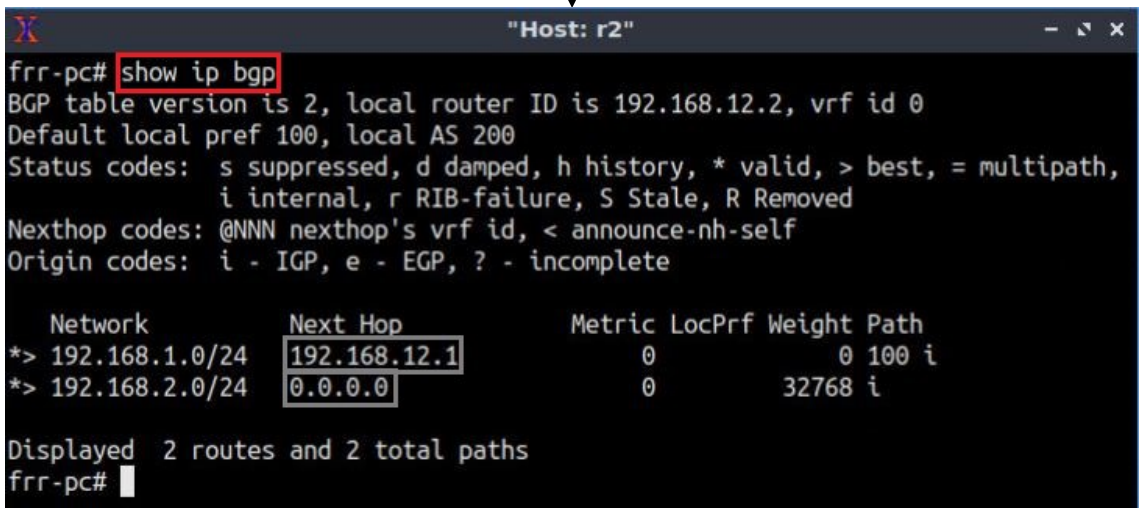
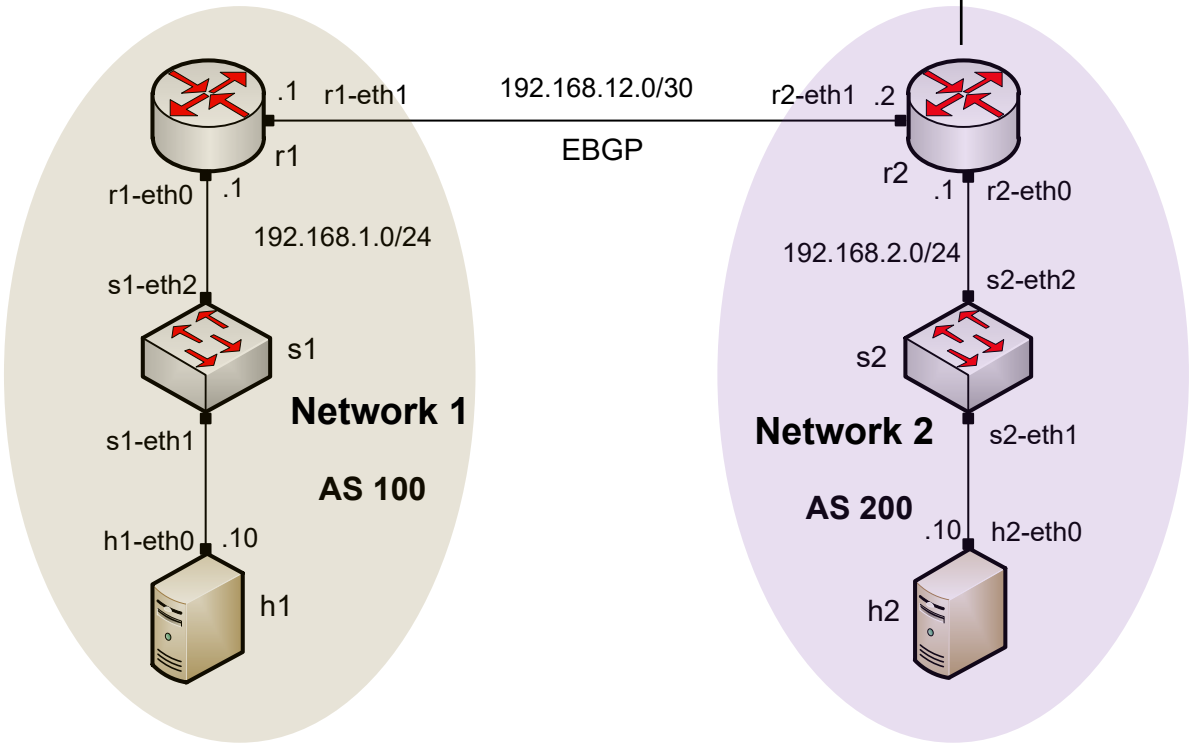
- Routing table: lists the routes learned from different routing protocols

Router r2





Lab Topology

- BGP table: lists the routes learned from BGP routing protocol

Router r2