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

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Lab 4: Introduction to MPLS

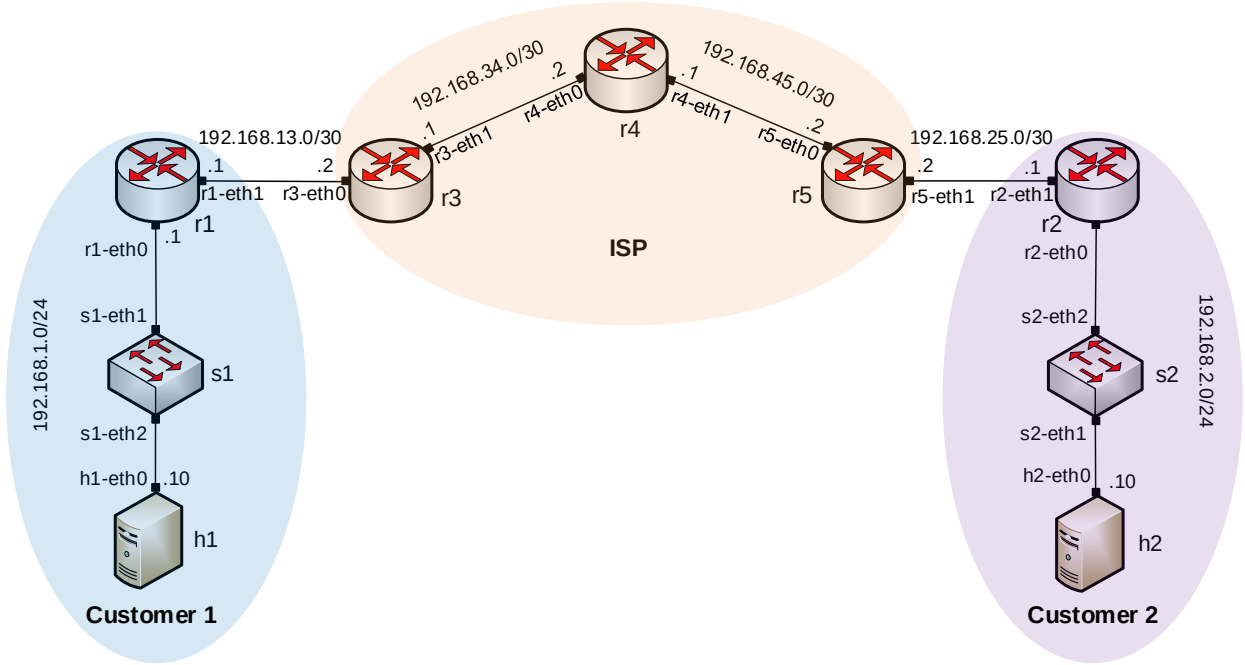
MPLS Overview

MPLS is:

- A protocol to establish an end-to-end path from the source to the destination
- A hop-by-hop forwarding mechanism that uses labels to set up the path

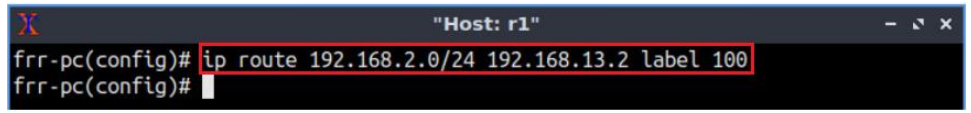
Lab Topology

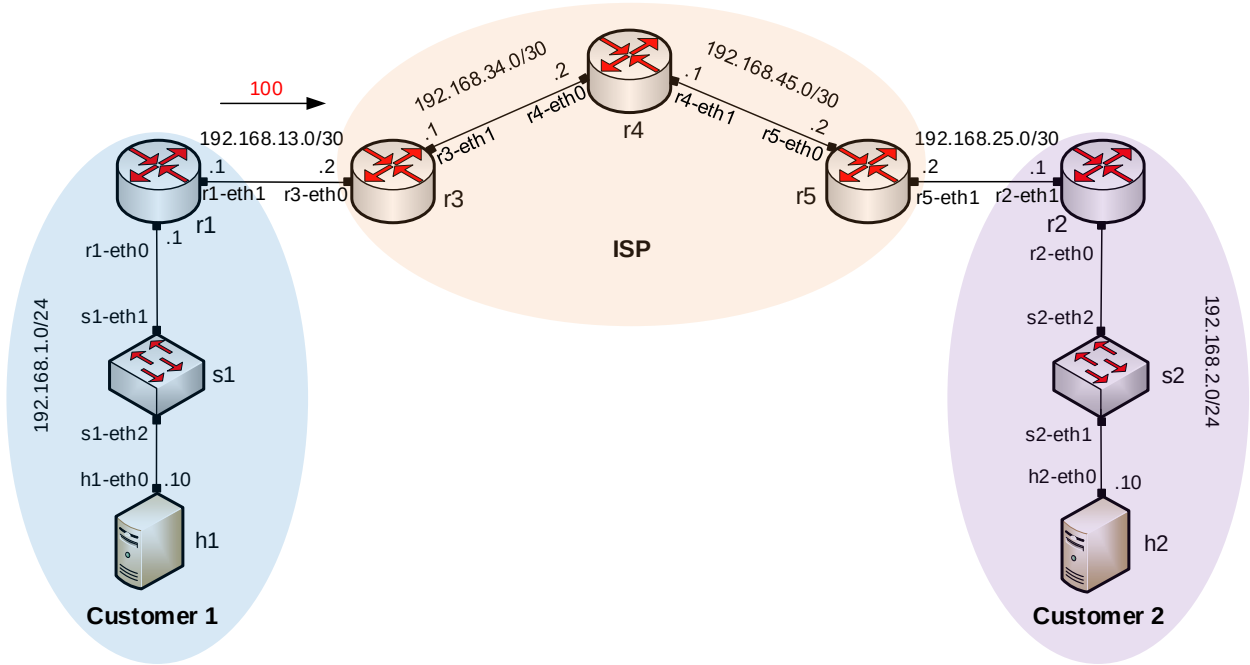
- The topology consists of three networks: Customer 1, ISP and Customer 2. Customer 1 and Customer 2 are allowed to exchange routes using static MPLS labels



Push Labels

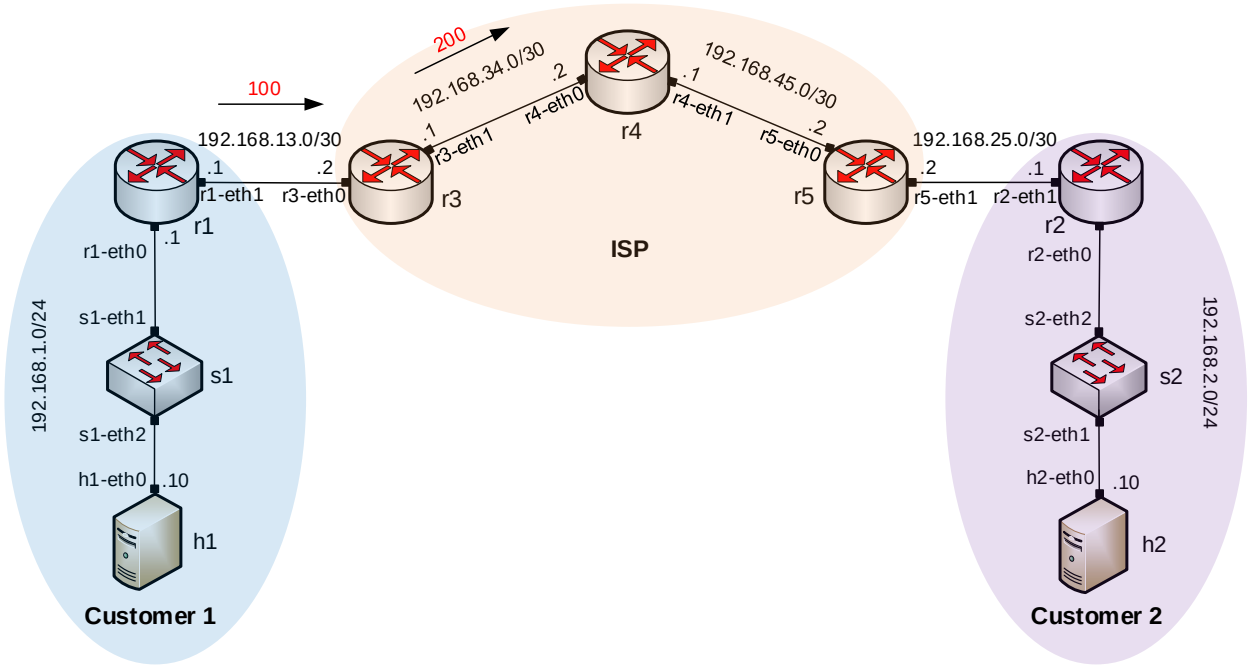
- A static route to the network 192.168.2.0/24 is added to router r1 with label 100
- Router r1 performs an IP lookup and inserts MPLS label 100

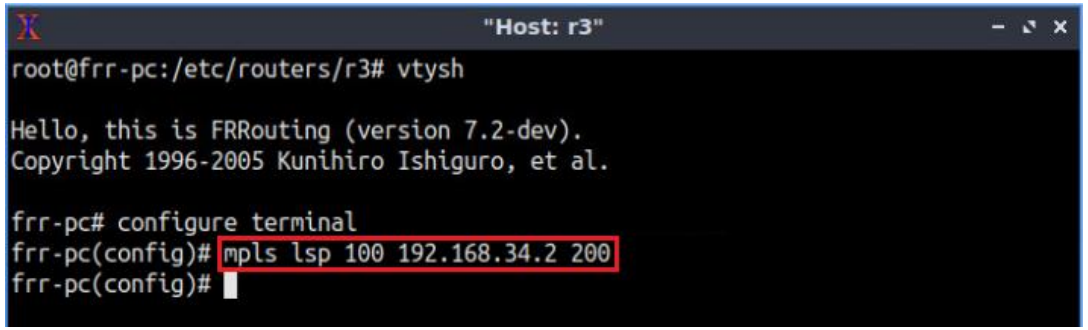




Swap Labels

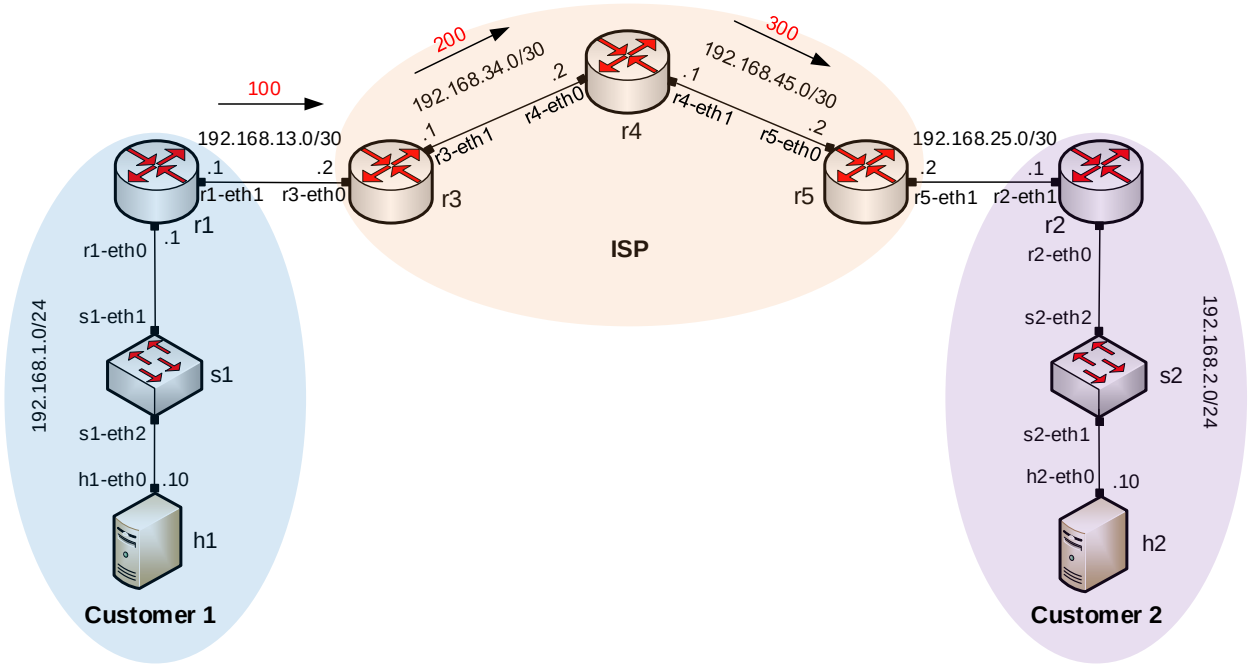
- Router r3 receives a packet with label 100 and swaps it with label 200





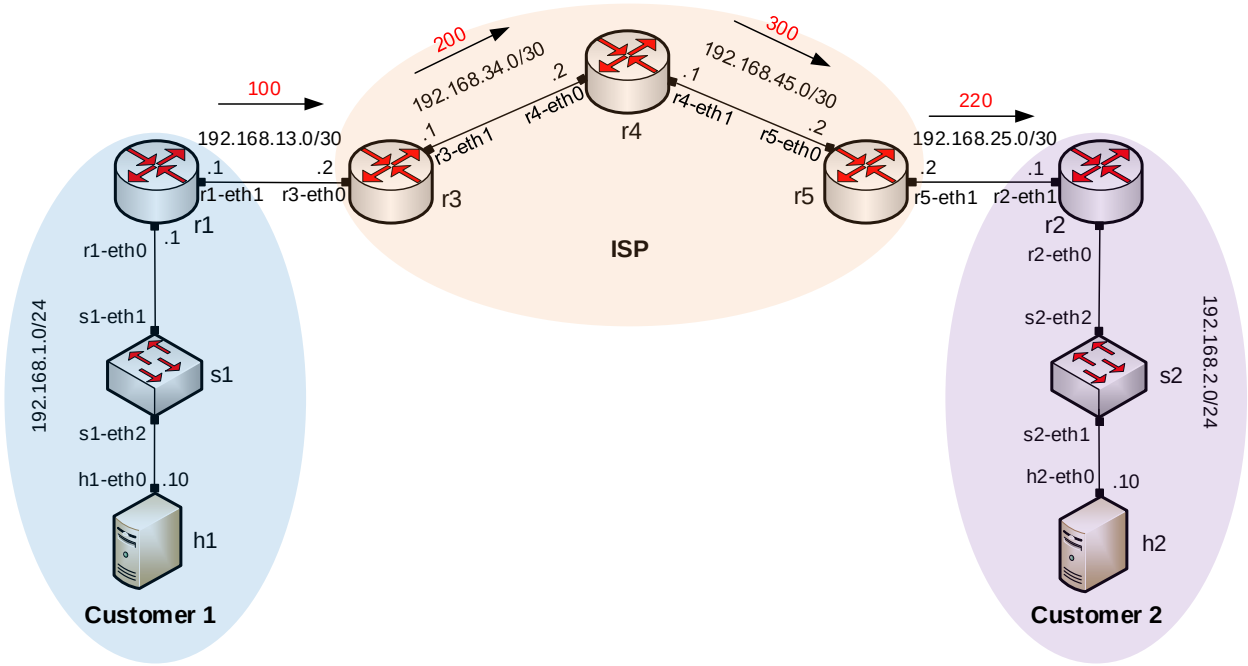
Swap Labels

- Router r4 receives a packet with label 200 and swaps it with label 300



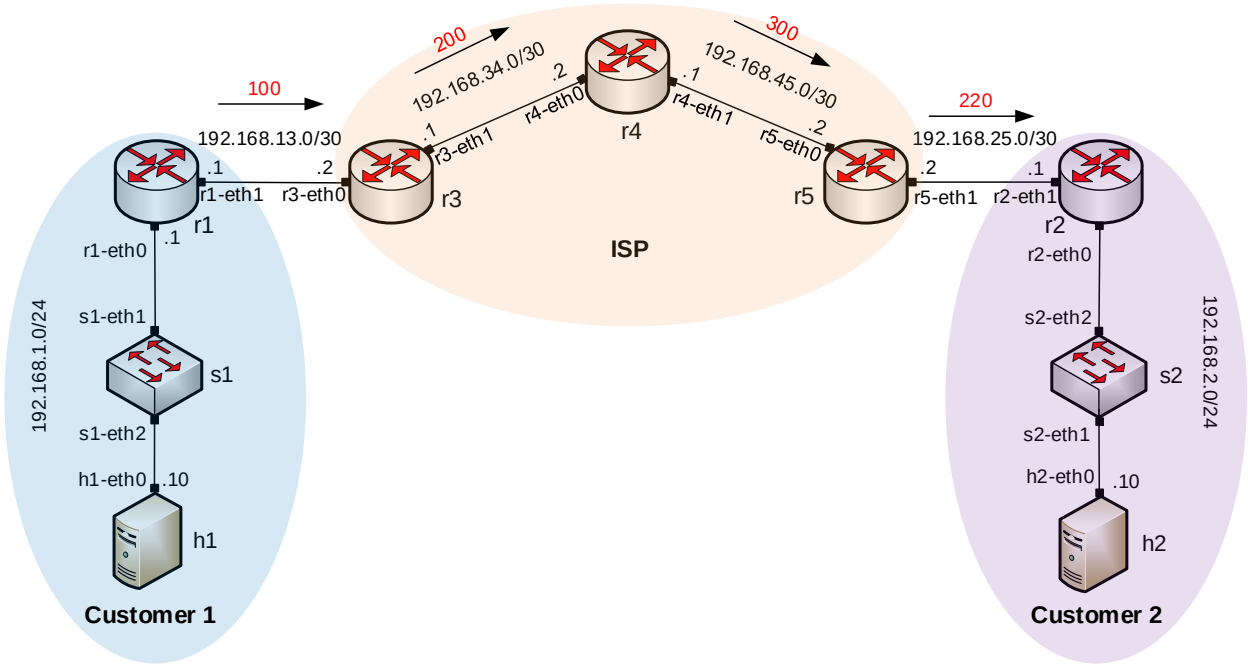
Swap Labels

- Router r5 receives a packet with label 300 and swaps it with label 220

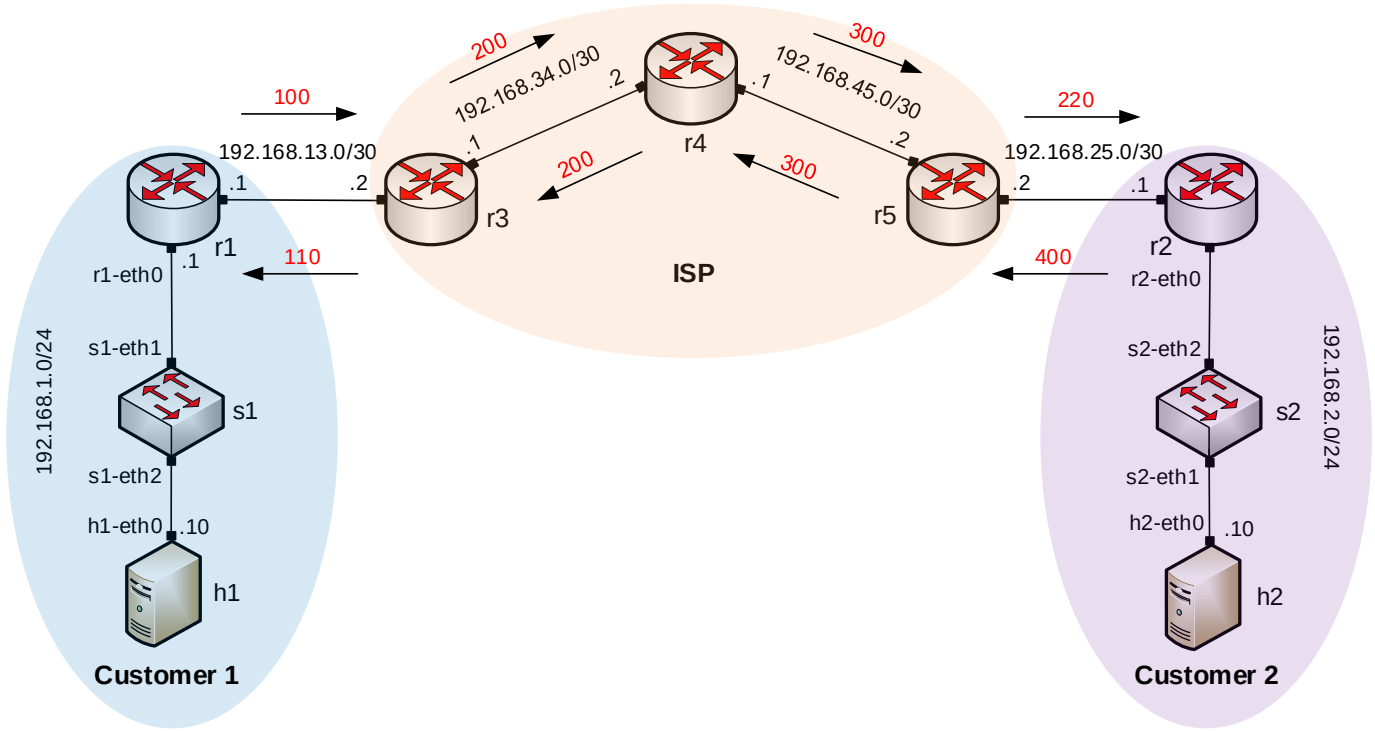


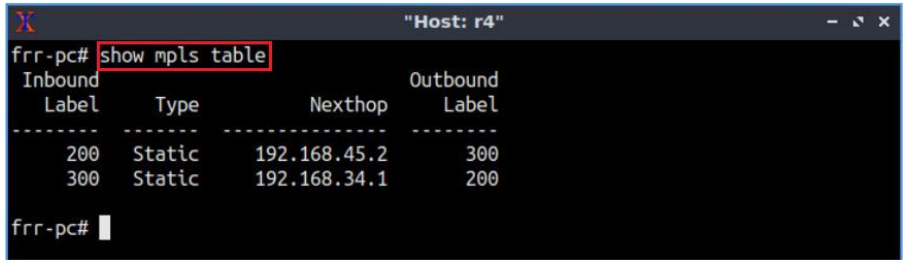
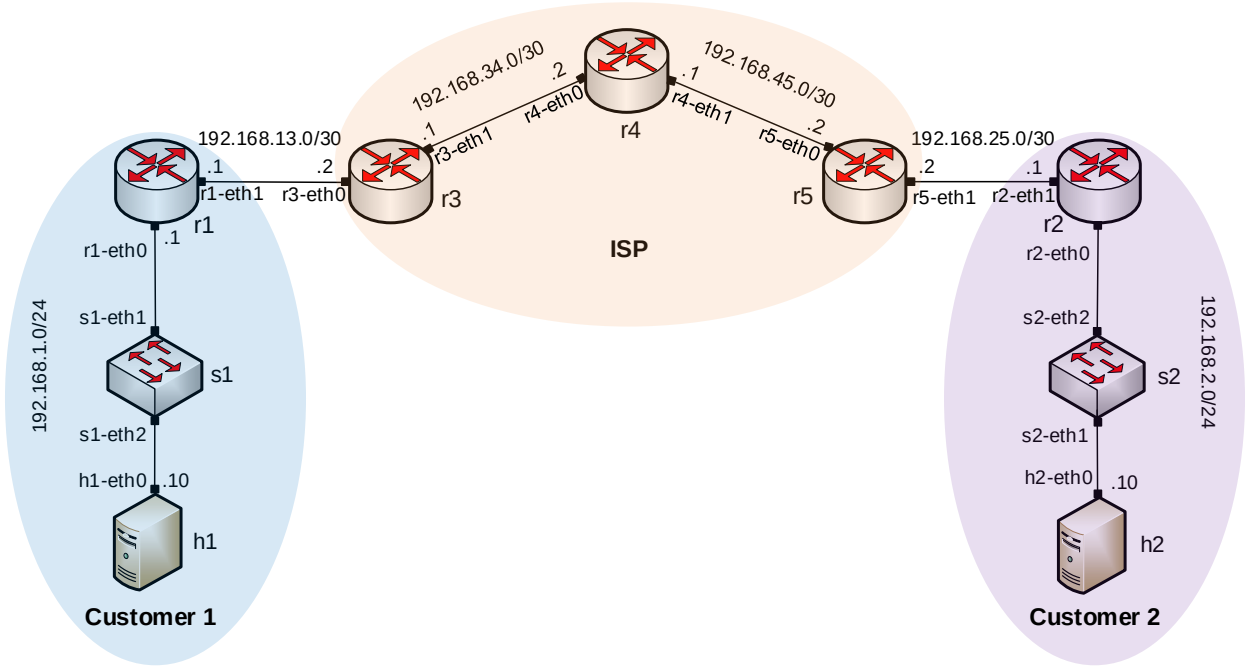
Pop Labels

- Router r2 receives a packet with label 220 and pops the label
- Router r2 delivers the IP packet to the destination 192.168.2.10



Static MPLS from Router r2 to Router r1



MPLS Table

- Routers forward traffic based on labels