# Hands-on Open vSwitch and Software-defined Networking

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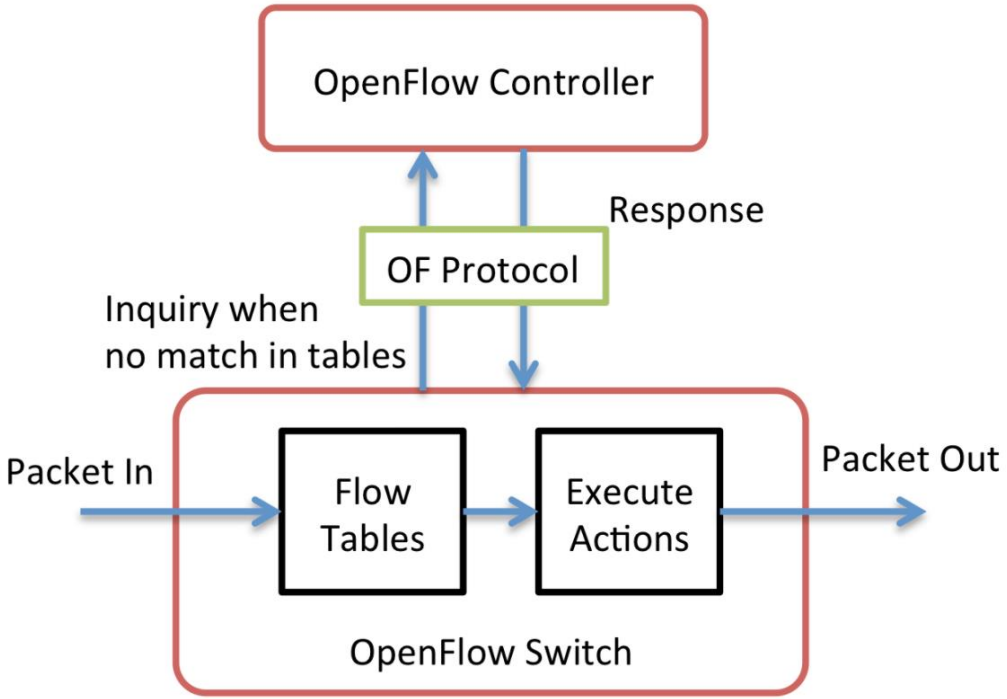
# Lab 4: Open vSwitch Flow Table

# OpenFlow overview

- OpenFlow is a protocol specification that describes the communication between OpenFlow switches and an OpenFlow controller
- OpenFlow consists of three components
  - OpenFlow controller
  - OpenFlow protocol
  - OpenFlow switch



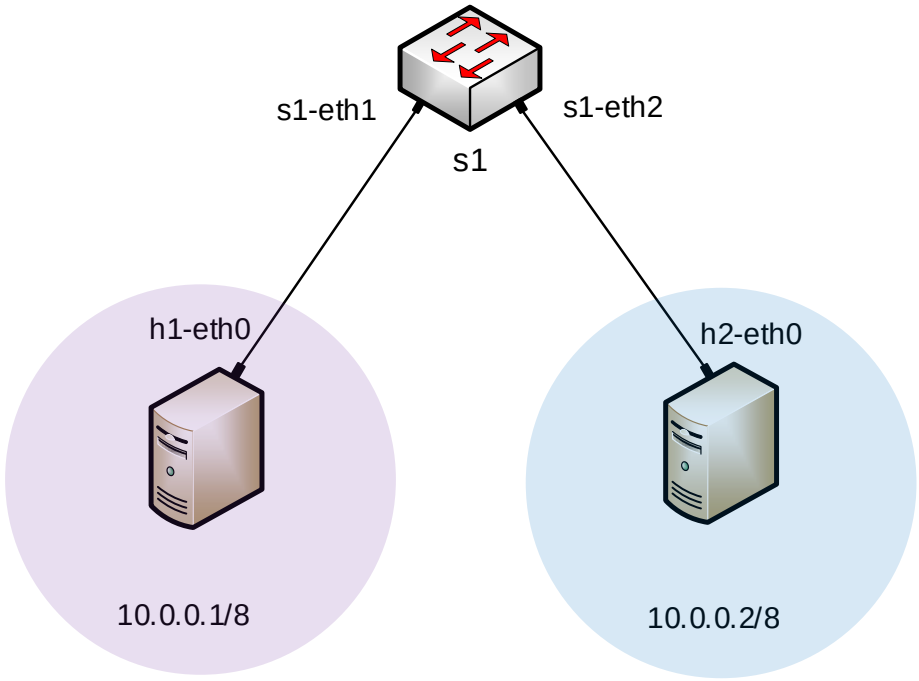
# Flow Table

- A flow table consists of flow entries
- A flow entry consists of header fields, counters, and actions associated with that entry

| Flow Entry 0 | | Flow Entry 1 | | ... | Flow Entry F | | ... | Flow Entry M | |
|---|---|---|---|---|---|---|---|---|---|
| Header Fields | Inport 12 192.32.10.1, Port 1012 | Header Fields | Inport * 209.*.*.*, Port * | | Header Fields | Inport 2 192.32.20.1, Port 995 | | Header Fields | Inport 2 192.32.30.1, Port 995 |
| Counters | val | Counters | val | | Counters | val | | Counters | val |
| Actions | val | Actions | val | | Actions | val | | Actions | val |

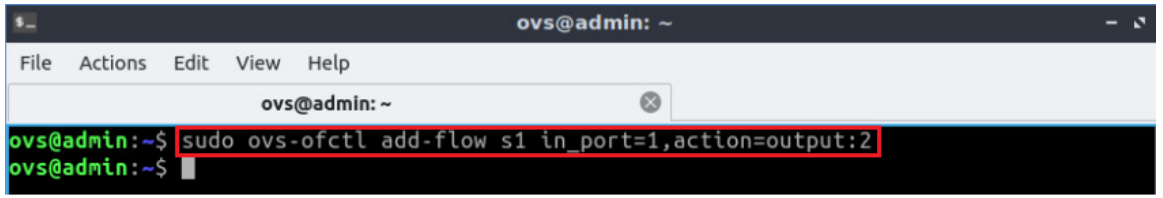
# Lab Topology

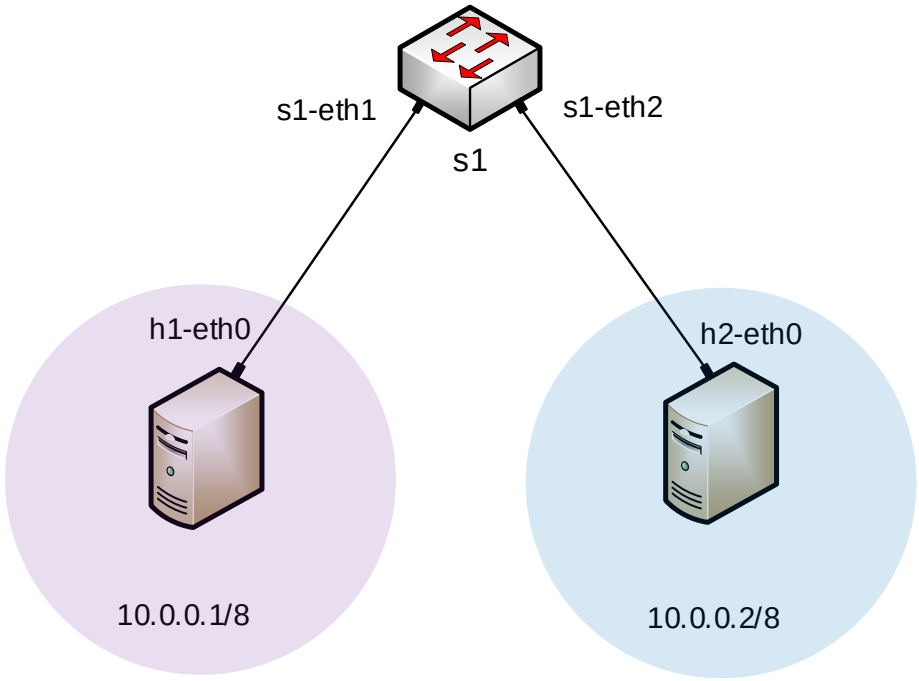
- Switch s1 connected to hosts h1 and h2
- Hosts h1 and h2 belong to network 10.0.0.0/8
- The lab aims to demonstrate how to manage flows manually in the switch s1



# Forwarding Using Layer 1

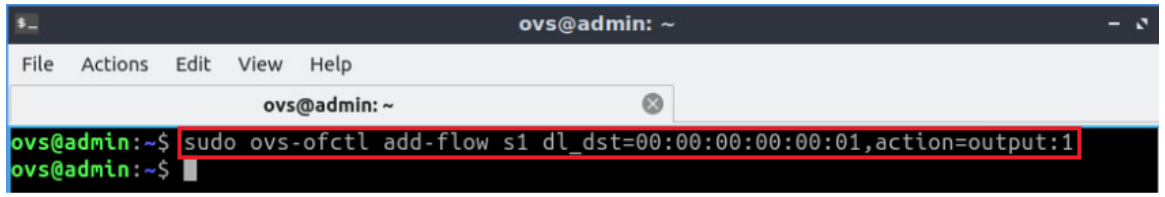
- Everything that comes from s1-eth1 is sent out to s1-eth2
- Everything that comes from s1-eth2 is sent out to s1-eth1

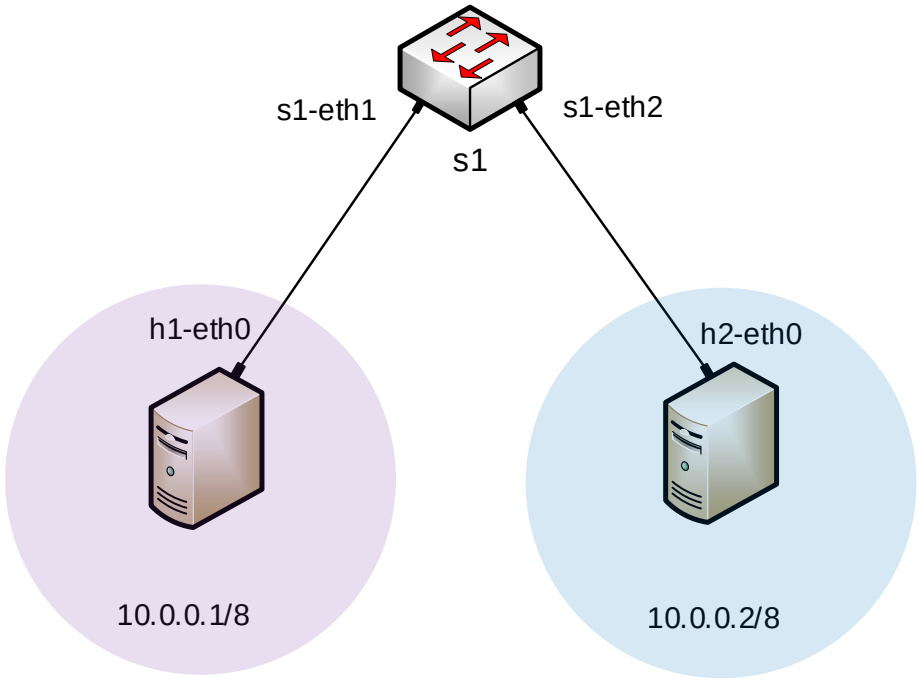


# Forwarding Using Layer 2

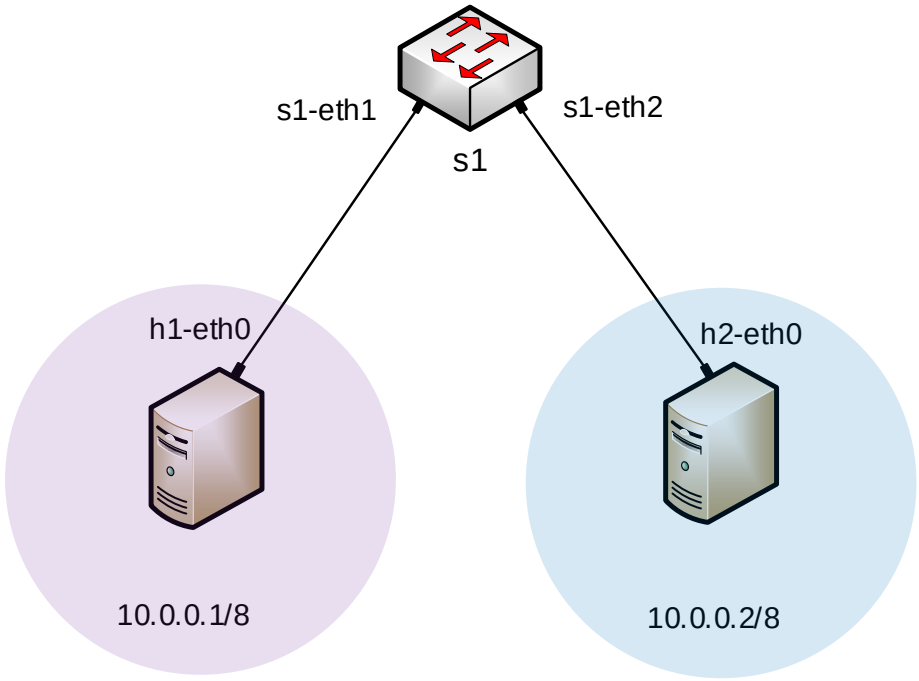
- Flow entries based on MAC addresses of the hosts



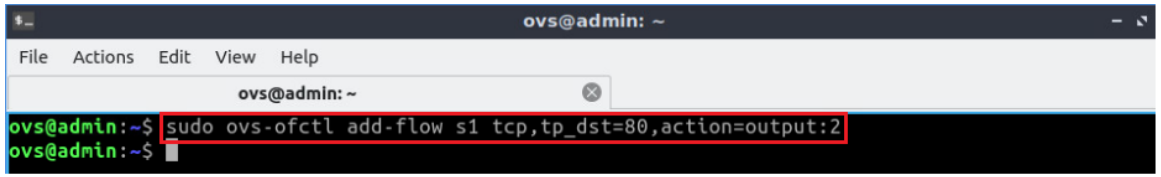
# Forwarding Using Layer 3

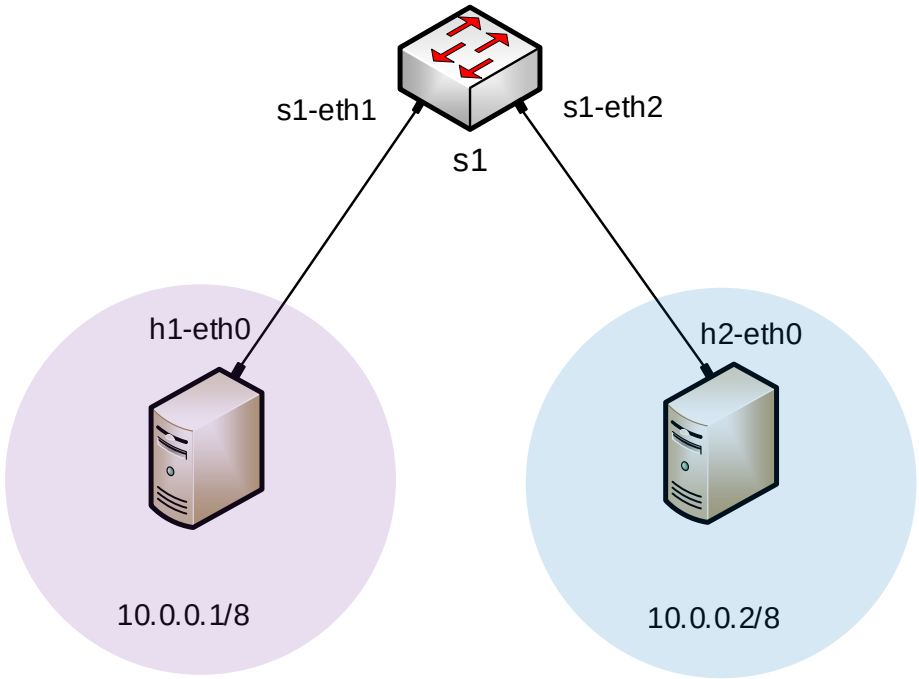
- Flow entries based on IP addresses of the hosts

# Forwarding Using Layer 4

- Flow entries based on TCP
- A simple python web server is running in host h2
- Host h1 can connect to the server using port 80



# Setting Match Priority

- Packets are matched against flow entries based on prioritization