**SDNFV Lab2**

**Part1**

1. How many OpenFlow headers with type “OFPT\_FLOW\_MOD” and command “OFPFC\_ADD” are there among all the packets? What are the match fields and the corresponding actions in each “OFPT\_FLOW\_MOD” message? What are the Idle Timeout values for all flow rules on s1 in GUI?

There are 2 distinct “OFPT\_FLOW\_MOD” headers during the experiment.

|  |  |  |
| --- | --- | --- |
| Match fields | Actions | Timout values |
| In packets | | |
| IN\_PORT = 1  ETH\_DST = da:ad:c8:9a:37:40  ETH\_SRC = 1e:30:5f:0e:ab:65 | Output port = 2 | 10 |
| IN\_PORT = 2  ETH\_DST = 1e:30:5f:0e:ab:65  ETH\_SRC = da:ad:c8:9a:37:40 | Output port = 1 | 10 |
| Other rules | | |
| ETH\_TYPE = lldp | Output port = CONTROLLER | 0 |
| ETH\_TYPE = bddp | Output port = CONTROLLER | 0 |
| ETH\_TYPE = ipv4 | Output port = CONTROLLER | 0 |
| ETH\_TYPE = arp | Output port = CONTROLLER | 0 |

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自動產生的描述

**Part 2**

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自動產生的描述**

**一張含有 文字, 螢幕擷取畫面, 字型 的圖片

自動產生的描述**

**Part 3**

I created the following topology. I created a rule that send all packets with ETH\_TYPE = ARP to all the other ports. Once all the switches have this rule and a packet is sent, the swithes will endless sending packets to each other in a cycle, creating a broadcast storm.

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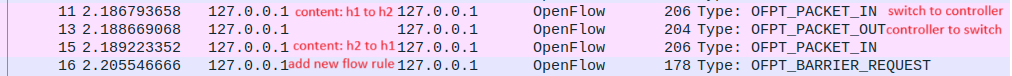
自動產生的描述一張含有 文字, 螢幕擷取畫面, 字型 的圖片

自動產生的描述

**Part 4**

1. In data plane, h1 send an ICMP packet to the s1
2. In the control plane, the packet meets the selector ETH\_TYPE = ipv4 on the switch, hence forwarded to the controller.
3. The fwd app handles the packet, creating a rule using flowObjectiveService, and forward the packet to the destination host. (There are several steps in the app, such as detecting whether to drop the packet, or checking it is the edge…)

In the source code, the app calls the function to install the flow rule first, then forward packet to the destination. However, wireshark captures the packet received from h2 before capturing the request to add the flow rule. This is because the action of making new flow rules are asychronous, and the packet forwarding is slightly faster than adding new flow rules.



**Part 5**

In this lab,

1. I learned how to install flow rules with json files using curl and GUI
2. I learned how to capture and inspect packets using wireshark
3. I traced the code the reactive forwarding app.
4. I observed how the controller and switch interacts.