

CS 640 Introduction to Computer Networks

Lab 2 Overview

Agenda

1. Objectives
2. Implementation
3. Grading Rubrics

Objectives

1. Switch:
 1. Construct a switch that optimally forwards packets based on link layer headers.
2. Router:
 1. Determine the matching route table entry for a given IP address.
 2. Develop a router that updates and forwards packets based on network layer headers.

Implementation

1. Setup

1. Install the required packages.
2. Run Mininet Emulator, POX and VirtualNetwork.jar
3. Test the setup on a provided topology by pinging h1 and h2.

2. Code

1. In Part 2 – Modify `Switch.java` in ``edu.wisc.cs.sdn.vnet.sw``
2. In Part 3 – Modify `RouteTable.java` and `Router.java` in `'edu.wisc.cs.sdn.vnet.rt'`

3. Test

1. Use the provided topologies to test your implementation.
2. See Lab 2 document (pg-10) for details regarding running multiple VirtualNetwork.jar. Need to run this for each switch and router in the topology.

Grading Rubrics

SI No	Test case	Points	Topo
1	Switch broadcasts packet destined for a new MAC entry	3	single_sw
2	Switch sends packet out a specific port for a previously seen MAC	3	single_sw
3	Switch broadcasts packet destined for previously seen MAC after timeout period	3	single_sw
4	Ping between all hosts on different switches succeeds	6	inclass_sw
5	IP packet with wrong checksum is dropped	3	single_rt
6	IP packet with expired TTL is dropped	3	single_rt
7	UDP packet is forwarded to destination	3	single_rt
8	Forwarded UDP packet has correct src MAC	3	single_rt
9	Forwarded UDP packet has correct dst MAC	3	single_rt
10	Forwarded UDP packet has correct src/dst IP	3	single_rt

Grading Rubrics (contd.)

SI No	Test case	Points	Topo
11	Forwarded UDP packet has decreased TTL	3	single_rt
12	Forwarded UDP packet has correct checksum	3	single_rt
13	Ping between all hosts on same router succeeds	3	single_rt
14	Packets are forwarded to the gateway	3	linear5_rt
15	Packets sent to the gateway have the correct src/dst MAC	3	linear5_rt
16	Packets sent to the gateway have the correct src/dst IP	3	linear5_rt
17	Ping between all hosts on different routers succeeds	3	linear5_rt
18	Route lookups perform a longest prefix match	3	single_rt
19	Ping between all hosts in a network with routers and switches succeeds	3	triangle_with_sw

Keep the Rubric handy during implementation.



Thank You

Use Piazza or Office Hours for any doubts