



# CS 640 Introduction to Computer Networks

## Lab 2 Overview

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Due: Tuesday Oct 19 2021 11:59PM

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*Office Hours: #3209*

*WF 1:00PM - 2:00PM*

*or by appointment*

# 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