

Routing/Switching Software

[New Attempt](#)

Due Friday by 11:59pm **Points** 100 **Submitting** a file upload

You will write two programs. `router.cpp` and `switch.cpp` (this can. These programs will simulate receiving a packet, processing it, looking up the output interface in the table, and forwarding it. In each of these programs you will need to do the following:

1. Create a struct that will hold an IPv6 packet (for the router) and an Ethernet frame (for the switch).
2. You will need functionality to do the following. This can either be done as functions that operate on your struct or as a class:
 1. Create the packet/frame. All fields must be populated correctly with exception of the CRC32 checksum, you may give an arbitrary value for it. You can give arbitrary values (eg, payload, flow label, etc.) to fields that aren't used in this assignment. The payload doesn't have to be in any particular format.
 2. Retrieve the addresses of the packet/frame.
 3. Update the HopLimit field of the packet.
3. Write a function for each program that reads the necessary header information for the respective packet type and looks up what output port to send the packet out on and returns that value. For the router, make sure you are using principle of longest match. You may hard code the table for demonstration purposes, but make sure that you have at least one case where principle of longest match is necessary. For the switch, make sure that you are learning your table from the packets that travel through the switch. The router and switch should each have at least 4 network interfaces.
4. Write a main driver function that will generate packets that you can use to test your routing/switching functionality and output the results in the format "Packet from IP to IP was routed on interface X" for the router and "Frame from MAC to MAC was

switched onto interface(s) X". This will demonstrate that your code works. Make sure there is a test case for each output interface and a dropped packet. If a packet is to be dropped because of an expired Hop Limit, output "Packet from IP was Dropped due to Hop Limit expiration"

Submit your code and a screenshot or textfile showing the output of your demo.