

## CSC358 Tutorial 10

### Question 1: Concept Review

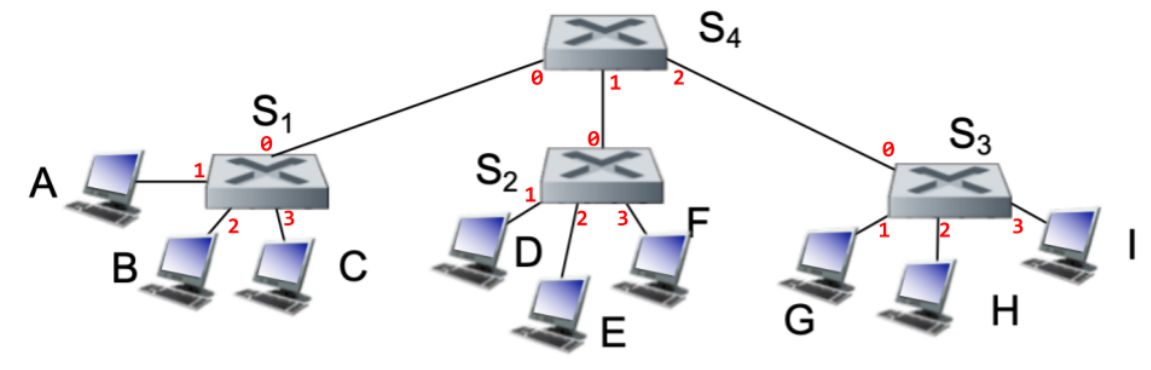
- (a) How big is the MAC address space? The IPv4 address space? The IPv6 address space?
- (b) What's the difference between a hub, a switch, and a router?
- (c) What's the difference between CSMA/CD and CSMA/CA?

### Question 2: Money vs Throughput

Consider the institutional network on Page 14 of Week 11 lecture slides. Suppose that all links are 100 Mbps, and any of the 13 hosts (the ones at the bottom) or the 2 servers (mail server and web server) can send to any other host or server.

- (a) What is the maximum total aggregate throughput that can be achieved among the 13 hosts and 2 servers in this network?
- (b) Now suppose that the institution wants to save money so the 4 switches at the bottom are replaced by hubs (much less expensive). Answer the above question again.
- (c) Now suppose that the institution wants to save more money therefore all switches are replaced by hubs. Answer the same question again.

### Question 3: Learning Switch



Consider the above network. Suppose that the switch tables at all switches are initially empty. Below is a sequence of events to happen among the switches. Discuss which entries are added to the switch tables after each event.

- (a) A sends a frame to G

- (b) G replies a frame to A
- (c) D sends a frame to F
- (d) F replies a frame to D
- (e) A send a frame to D
- (f) D replies a frame to A

## Question 4: Wi-Fi Speed

Suppose your apartment has a Tim Horton's *and* a Starbucks next door, which means that you've got two free Wi-Fi's to choose from (nice neighbourhood!). Suppose that the two coffee shops each operates its own AP and has its own IP address block. Consider the following two scenarios.

- (a) Suppose that, by accident, both coffee shops configured their AP to operate over channel 11 (recall that 802.11 divides the 2.4–2.485GHz spectrum into 11 channels). Will the 802.11 protocol complete break down in this situation, i.e., no more free Wi-Fi? Discuss what happens when two hosts (e.g., laptops), each associated with a different AP, attempts to transmit at the same time.
- (b) Now suppose that the Tim Horton's AP admin changed its channel from 11 to 1. What difference would you, the freeloader, observe?

A related life pro tip:

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