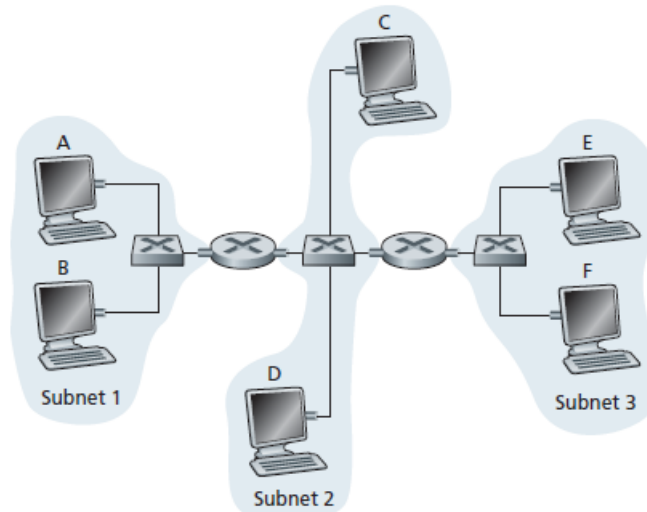


Principles of Computer Networks Tutorial 11

Part 1.

Problem 1: Switch vs Router

Suppose that the leftmost router in the following figure is replaced by a switch.

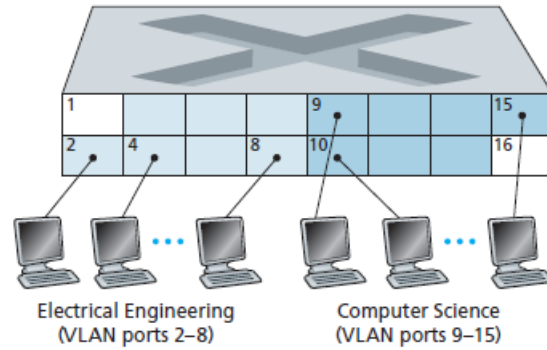


Hosts A, B, C, and D and the right router are all star-connected into this switch. Give the source and destination MAC addresses in the frame encapsulating this IP datagram as the frame is transmitted

- i. from A to the switch,
- ii. from the switch to the right router,
- iii. from the right router to F. Also give the source and destination IP addresses in the IP datagram encapsulated within the frame at each of these points in time.

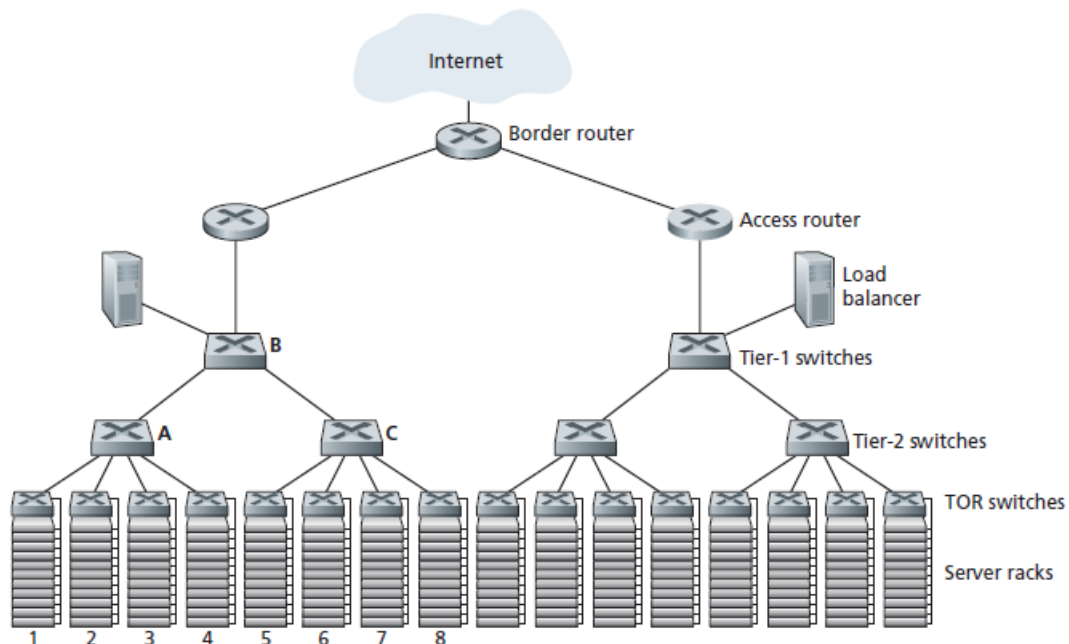
Problem 2: VLAN

Consider the single switch VLAN in the following figure, and assume an external router is connected to switch port 1. Assign IP addresses to the EE and CS hosts and router interface. Trace the steps taken at both the network layer and the link layer to transfer an IP datagram from an EE host to a CS host.



Problem 3: Data Centre

Consider the data center network with hierarchical topology in the following figure.



Suppose now there are 80 pairs of flows, with ten flows between the first and ninth rack, ten flows between the second and tenth rack, and so on. Further suppose that all links in the network are 10 Gbps, except for the links between hosts and TOR switches, which are 1 Gbps.

- Each flow has the same data rate; determine the maximum rate of a flow.
- For the same traffic pattern, determine the maximum rate of a flow for the highly interconnected topology.
- Now suppose there is a similar traffic pattern, but involving 20 hosts on each hosts and 160 pairs of flows. Determine the maximum flow rates for the two topologies.

Part 2. Putting Protocols Together: Review (Chapters 1-5)

Refer to slides.