Final Exam Context Document 1

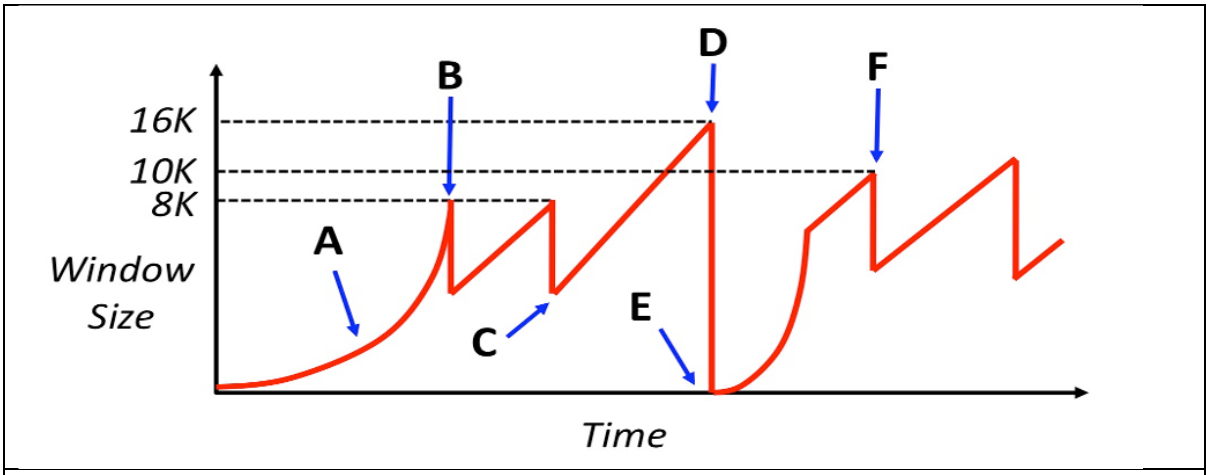

Figure 1: Congestion window size over time for TCP Reno. The y-axis describes the TCP congestion window size of the sender and the x-axis denotes time (but they are not drawn to exact scale).

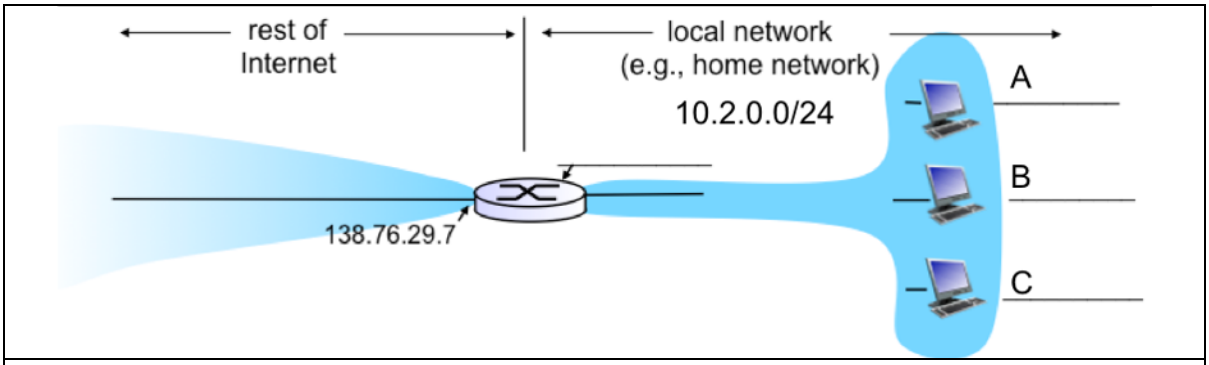

Figure 2: Example of a NAT. The private network (i.e. local network) behind the NAT router is using IP addresses in the range 10.2.0.0/24. The WAN-side address of the NAT router is 138.76.29.7.

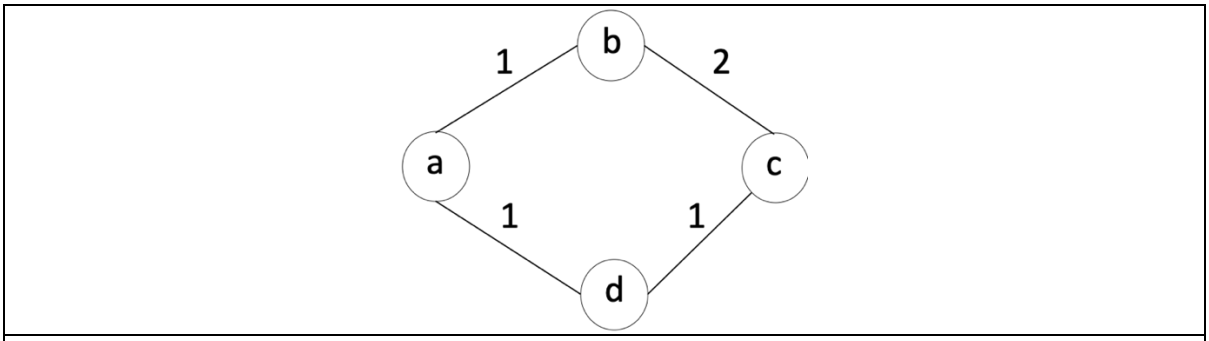

Figure 3: Example of a network which runs a link-state routing protocol that computes shortest paths as sum of link weights. The number on each link is the weight of the link in both directions, e.g., links b-c and c-b both have weight 2.

Case Study 1: *Address allocation for a growing company*

An ISP that has authority to assign addresses from a /16 prefix (an old class B address) is working with a new company to allocate it a portion of address space based on CIDR. The new company needs IP addresses for machines in three divisions of its corporate network: (i) Engineering, (ii) Marketing, and (iii) Sales. These divisions plan to grow as follows: Engineering has 5 machines as of the start of year 1 and intends to add 1 machine every week. Marketing will never need more than 16 machines, and Sales needs 1 machine for every 2 clients. As of the start of year 1, the company has no clients, but the sales model indicates that, by the start of year 2, the company will have 6 clients and each week thereafter will get one new client with probability 60%, will lose one client with probability 20%, or will maintain the same number with probability 20%.

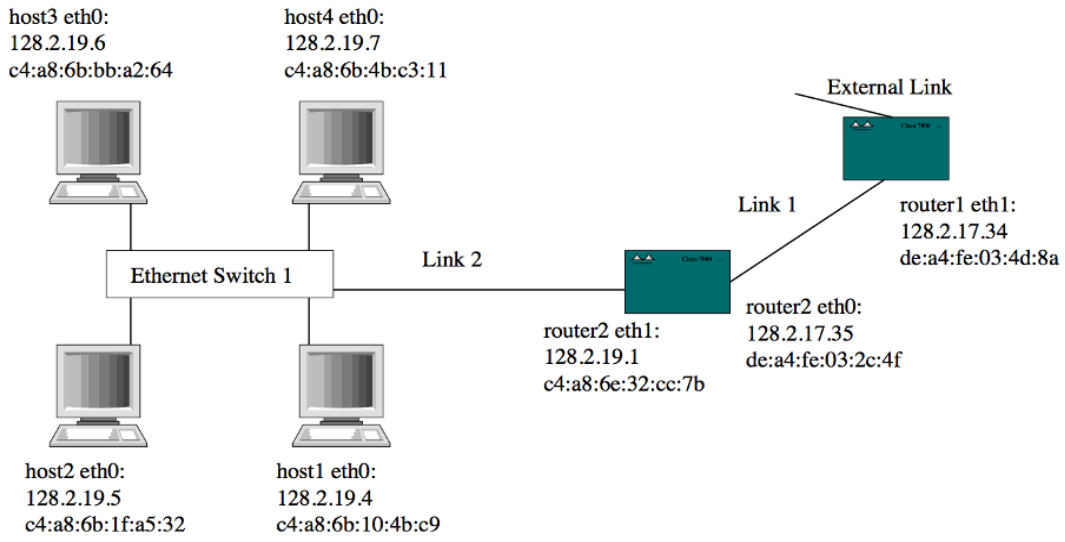

Figure 4: A partial network topology involving Ethernet switches and IP routers. The hosts (host1 through host4) and router2 on the Ethernet subnet are connected to the self-learning switch in a star topology. Link 1 and Link 2 use the subnets 128.2.17.34/31 and 128.2.19.0/25, respectively.

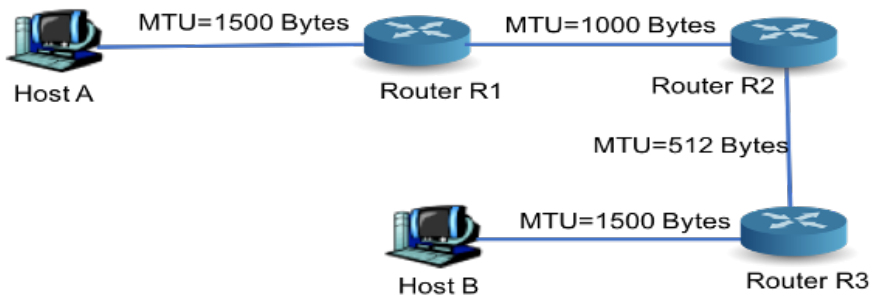

Figure 5: A network topology with different MTU sizes for different links.

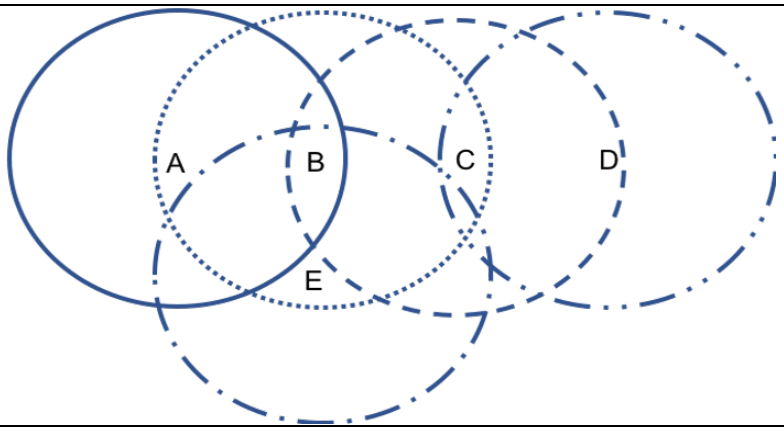

Figure 6: An example of a wireless LAN topology comprised of 5 nodes marked A through E sharing the same frequency. Circles around each node illustrate their transmission range, e.g. A's range is shown by circle drawn in solid line. Assume that the transmissions from two nodes will interfere (or collide) at a location if and only if both nodes transmit at the same time and their transmission ranges overlap. In this network, we assume that packet losses only occur due to collisions.

End of Context Document 1