Problems #4

Chapter 4

Sam Quinn

CS372

02/27/2016

1)

a)

MIT - 65.211.82.0 - 65.211.82.255

University of Colorado - 204.12.83.0 - 204.12.83.255

University of Florida - 65.196.142.0 - 65.196.142.31

b)

Yes you can use an IP address to find physical locations of these universities.

c)

MIT - Manhattan New York

University of Colorado - Boulder Colorado

University of Florida - Palmetto Florida

2)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Step | N’ | D(G),p(G) | D(F),p(F) | D(E),p(E) | D(D),p(D) | D(B),p(B) | D(A),p(A) |
| 0 | C |  |  | 3,C | 6,C |  | 8,C |
| 1 | CE | 4,E | 3,E | 0 | 4,E | 8,E | 8,C |
| 2 | CEF | 2,F |  | 3,F | 3,F | 8,E | 8,C |
| 3 | CEFG | 0 | 2,G | 4,G |  | 7,G |  |
| 4 | CEFD |  | 3,F | 4,F | 0 |  |  |
| 5 | CEFDBG |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |

4)

Yes, routers have their own IP addresses. Usually routers have two IP addresses, one is for the routing functionality for reading and sending packets and the other is optional as a way to connect to the router itself for configuration and what have you.

5)

a)

128.119.40.180

b)

128.119.40.0/26

128.119.40.64/26

128.119.40.128/26

128.119.40.192/26

6)

**Subnet:** A subnet is smaller chunk of the over all IP space allocated.

**Prefix:** The prefix is the number of the bits in the IP that is not allocated to you, meaning you cannot change.

**BGP route:** Distributes routing and availability information amongst autonomous systems.

7)

a)

No, a property of a shared bus is that it can only transmit one packet at a time.

b)

No, Crowbar needs the entire bus clear for it to work, so if there are two packets trying to be forwarded through the same output port at the same time this would not work.

c)

Crowbar switching allows for packets to be transmitted in parallel if and only if the the input and output busses are different for each packet. So yes this would work with the Crowbar switching.

8)

BGP can detect loops, every AS that it passes through gets appended to the AS PATH. This is very similar to Dijkstra's algorithm. If a router sees itself in the AS PATH then the router assumes that the BGP route is in a loop and will ignore it.

9)

223.1.3.27

1101 1111 . 0000 0001 . 0000 0011 . 0001 1011

10)

Datagrams < 1500 bits, IP header = 160 bits, TCP header = 160 bits, file = 40000000 bits

1500 - IP - TCP = 1180 of transmittable data per each datagram. 40000000 / 1180 = 33898.3

The amount of datagrams needed to transmit the whole file would be **33899**.

11)

**Memory** The switching logic was done with the CPU. Each input was stored and then handled with the processor to determine which output it will send it through. This system will not allow for parallel packet handling.

**Crossbar** Is as matrix of busses that that switch from multiple inputs and output lines. This switching fabric allows parallel switching if both the input and output lines are unique.

**Bus** Within a bus the packet is directly transmitted from the input port to the output port. The shared bus must be clear for this to work so no parallel packet handling is available here.

12)

Yes, the two computers would still be able to establish a TCP connection as normal even if both are behind NATs. The download application would not need to have any specific configuration for the NAT as that is taken care of at the router. So the download application and the server are unaware of the network address translation.