COMP90007 Internet Technologies

Week 8 Workshop

Semester 2, 2021

Suggested solutions

Question 1

A router has just received the following IP addresses: 57.6.96.0/21, 57.6.104.0/21, 57.6.112.0/21 and 57.6.120.0/21. If all of them use the same outgoing line, can they be aggregated? If so, to what? If not, why not?

Answer:
They can be aggregated to 57.6.96.0/19

Question 2

Why do we need routing algorithms in the Network layer?
What are the key categories of routing algorithms?

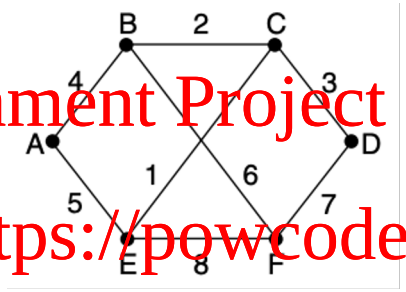
Answer: Routing algos are needed to help decide on which output line an incoming packet should be transmitted.

Key Categories:

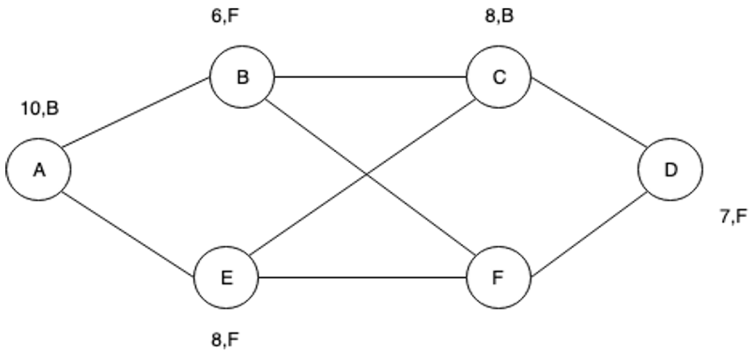
- Non-Adaptive Algorithms
- Adaptive Algorithms

Question 3

Compute the sink tree for Node F in the graph below:

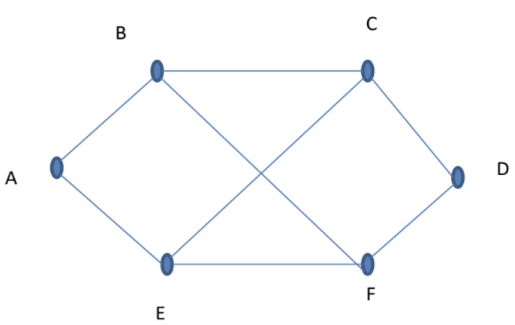


Ans. Refer to Dijkstra's algorithm on the slides 53-55 of Network Layer



Question 4

Distance vector routing is used for the diagram shown below, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the expected delay.



Answer: Using the delays 6, 3, and 5 for B, D, and E, the vectors will be written as:

All Routers	Via B	Via D	Via E
A	**11**	19	12
B	**6**	15	11
C	14	9	8
D	18	**3**	14
E	12	12	**5**
F	**8**	13	9

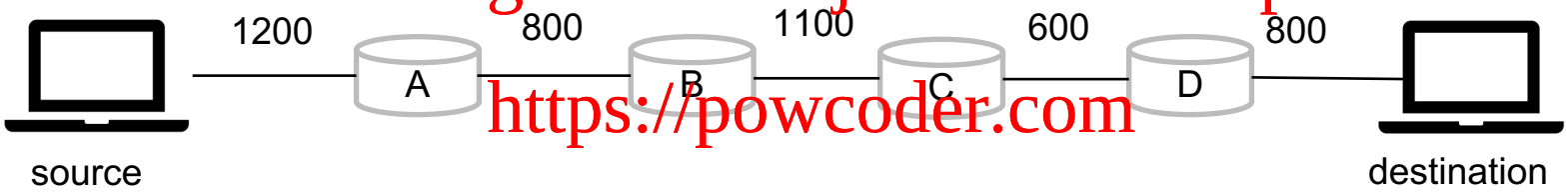
→

All Routers	Outgoing Line	Expected Delay
A	B	11
B	B	6
C	-	0
D	D	3
E	E	5
F	B	8

Question 5

If the Path MTU Discovery is used to send a packet of 1200 bytes from the source to the destination as shown in Figure. The maximum packet size for each network on the path is labelled on the link.

- How many trials does the source machine need to send this packet?
- Which routers on the path send ICMP messages to the source?



Answer: (1) The packet can be delivered after 2 trials

(2) routers A, and C will send ICMP messages "Destination Unreachable" to the source.

- The initial message is 1200 bytes, and router A will send ICMP message.
- After processing, the packet will be 800 bytes, and router C will send ICMP message, as the MTU of the following network is 600 bytes. After this trial, the packet can be sent to the destination