COMP90007 Internet Technologies

Week 8 Workshop

Semester 2, 2020

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

A router has the following entries in its routing table:

Prefix	Next hop
151.46.184.0/22	Interface 0
151.46.188.0/22	Interface 1
151.53.40.0/23	Router 1
default	Router 2

For each of the following IP addresses, what does the router do If a packet with that address arrives?

(a) 151.46.191.10

⇒ Interface 1

(b) 151.46.187.2

⇒ Interface 0

Question 3

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

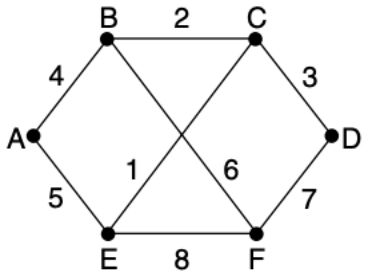
Answer: Routing algos are needed to help decide on which output line an incoming packet should be transmitted.

Key Categories:

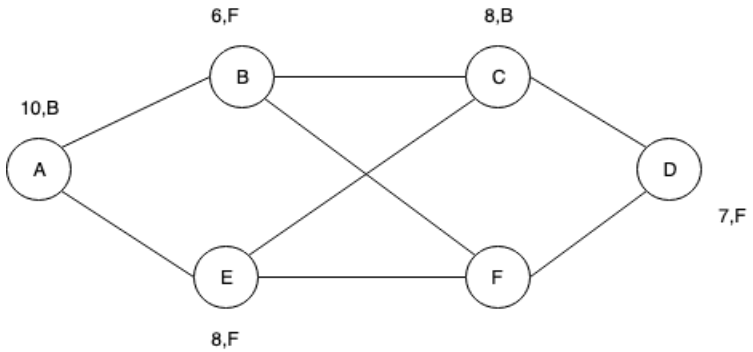
- Non-Adaptive Algorithms
- Adaptive Algorithms

Question 4

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

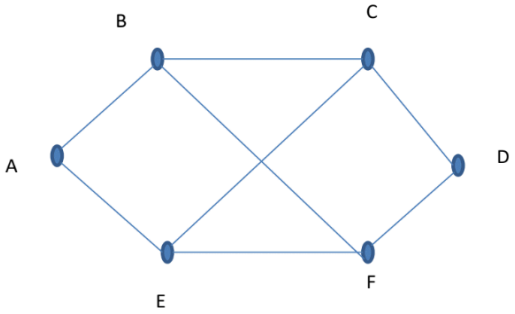


Ans. Refer to Dijkstra's algorithm on the Slides 49-51 of Network Layer



Question 5

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