Assignment 6

Started: Dec 14 at 9:27pm

Quiz Instructions

While working on this assignment, you certify that you have neither given help to nor received help from any other person.

Question 1 — 1 pts

[True or False] The count-to-infinity problem refers to a problem of link state routing. The problem means that it takes a long time for the routing algorithm to converge when there is a link cost increase.

- (•) False
- ( ) True

Question 2 — 1 pts

[True or False] The ability of a routing algorithm and its data structures to scale to handle routing to/among large numbers of networks is a critical issue in inter-AS routing. Within an AS, scalability is less of a concern. For one thing, if a single administrative domain becomes too large, it is always possible to divide it into two ASs and perform inter-AS routing between the two new ASs.

- ( ) False
- (•) True

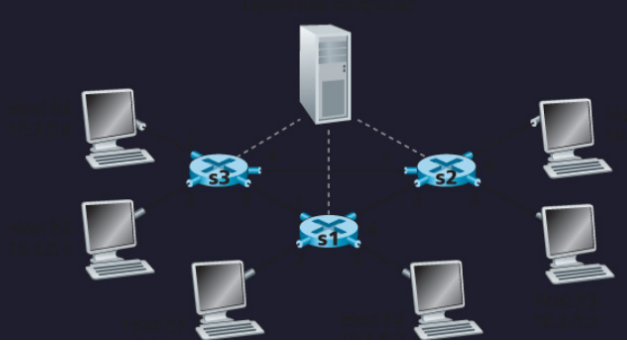
Question 3 — 1 pts

Suppose a peer with username Arnold discovers through querying that a peer with username Bernard has a file it wants to download. Also suppose that Bernard and Arnold are both behind a NAT. Is it possible for Arnold to establish a TCP connection with Bernard without application-specific NAT configuration?

- (•) No
- ( ) Yes

Question 4 — 1 pts

Consider the SDN OpenFlow network shown in the following figure. Suppose that the desired forwarding behavior for datagrams arriving at s2 is as follows: any datagrams arriving on input port 1 from hosts h5 or h6 that are destined to hosts h1 or h2 should be forwarded over output port 2; Then the flow table entry in s2 that implements this forwarding behavior is given by:



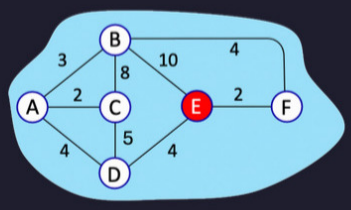
Questions
Question 8
Question 9
Question 10
Question 11
Question 12
Question 13
Question 14
Question 15

Time Elapsed: Hide Time
Attempt due: Dec 14 at 10:59am
25 Minutes, 12 Seconds

- ○ Ingress Port = 1; IP Dst = 10.2.0.3, Forward (2)
- ◉ Ingress Port = 1; IP Src = 10.3.*.*; IP Dst = 10.1.*.*, Forward (2)
- ○ Ingress Port = 1; IP Src = 10.1.*.*; IP Dst = 10.3.*.*, Forward (2)

Question 5 — 1 pts

Consider the network shown below, and Dijkstra's link-state algorithm. Here, we are interested in computing the least cost path from node *E* to all other nodes. Using the Dijkstra algorithm, complete the rows at steps 0,1 and 2 in the table below showing the link state algorithm's execution by matching the table entries (a), (b), (c), (d) and (e) with their values.



Step	N'	A D(A),p(A)	B D(B),p(B)	C D(C),p(C)	D D(D),p(D)	F D(F),p(F)
0	E	*	*	∞	*	*
1	*	*	*	∞	*	*
2	(a)	(b)	(c)	(d)	(e)	2,E

(a) EFD

(b) 8,D

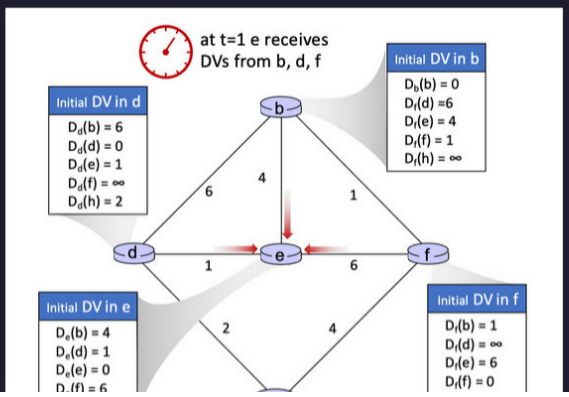
(c) 6,F

(d) 9,D

(e) 4,E

Question 6 — 1 pts

`Consider the scenario shown below, where at t=1, node e receives distance vectors (DVs) from neighboring nodes b, d, and f. The (old) DV at e (before receiving the new DVs from its neighbors) is also shown, as well as the DVs being sent from b, d, and f. Select the new distance vector components at e, below by matching one of e's new DV entries to its value.

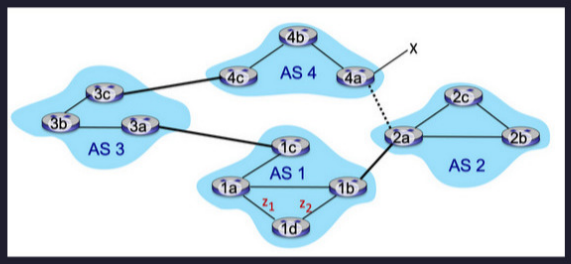


D_e(b)	4
D_e(d)	1
D_e(e)	0
D_e(f)	5
D_e(h)	3

Question 7

1 pts

Consider the network shown below. Suppose AS1, AS2, AS3, and AS4 are running OSPF for their intra-AS routing protocol. Suppose eBGP and iBGP are used for the inter-AS routing protocol. Initially suppose there is no link between AS2 and AS4. Indicate the protocol by which a router learns about the network prefix x, which is attached to AS4.

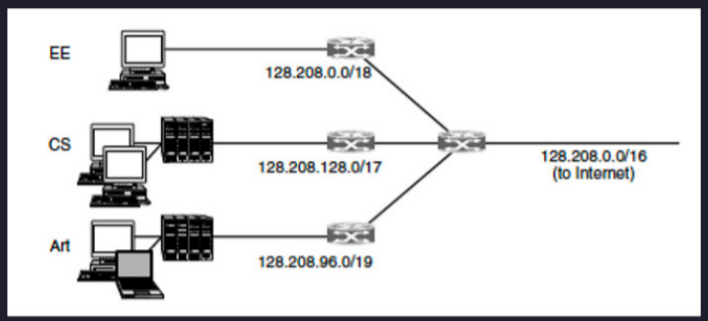


Router 3c learns about prefix x from which protocol?	eBGP
Router 3a learns about prefix x from which protocol?	iBGP

Question 8

1 pts

Consider the following subnetting network with EE, CS, and Art departments. To which router (department network) will a packet destined for IP address 128.208.2.151, will be forwarded?

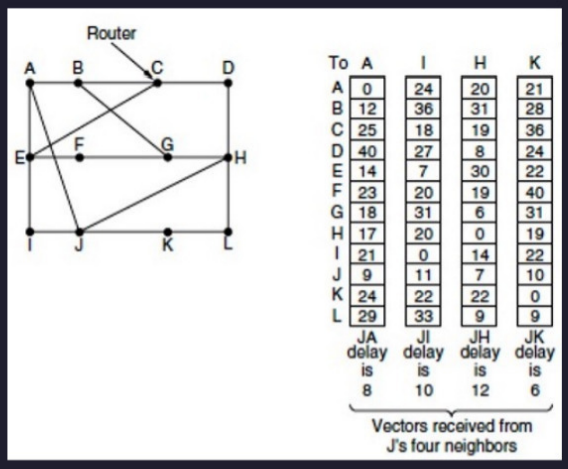


- ○ Art
- ◉ EE
- ○ CS

Question 9

1 pts

Consider the following figure of a sample network and its four columns showing the delay (distance) vectors received from the neighbors of router J. A, for instance, claims to have a 12 msec delay to B, a 25 msec delay to C, a 40 msec delay to D, etc. Suppose that J has measured or estimated its delay to its neighbors, A, I, H, and K, as 8, 10, 12, and 6 msec, respectively. Consider how J computes its new route to router G. It knows that it can get to A in 8 msec, and furthermore A claims to be able to get to G in 18 msec, so J knows it can count on a delay of 26 msec to G if it forwards packets bound for G to A. Similarly, it computes the delay to G via I, H, and K as 41 (31 + 10), 18 (6 + 12), and 37 (31 + 6) msec, respectively. The best of these values is 18, so it makes an entry in its routing table that the delay to G is 18 msec and that the route to use is via H.



Perform the same calculation for all the other destinations and give the cost as values of the new routing table (distance vector) of router J to the destinations (A - L) by matching them below to their entry values.

A	8
B	20
C	28
D	20
E	17
F	30
H	10
I	10
K	6
L	15

Question 10

1 pts

For each of the actions below, select those actions below that are primarily in the network-layer data plane. The other actions that you don't select below then correspond to control-plane actions.

- [x] Looking up address bits in an arriving datagram header in the forwarding table.
- [x] Moving an arriving datagram from a router's input port to output port
- [ ] Monitoring and managing the configuration and performance of an network device.
- [x] Dropping a datagram due to a congested (full) output buffer.
- [ ] Computing the contents of the forwarding table.

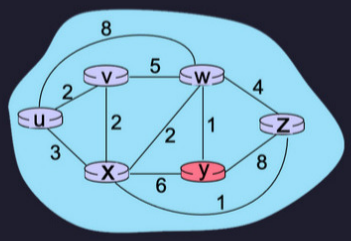
Question 11 — 1 pts

What is the purpose of the Dynamic Host Configuration Protocol?

- (•) To obtain an IP address for a host attaching to an IP network.
- ( ) To configure the interface speed to be used, for hardware like Ethernet, which can be used at different speeds.
- ( ) To configure the set of available open ports (and hence well-known services) for a server.
- ( ) To get the 48-bit link-layer MAC address associated with a network-layer IP address.

Question 12 — 1 pts

Consider the network shown below, and Dijkstra's link-state algorithm. Here, we are interested in computing the least cost path from node *y* (note: *not* node u!) to all other nodes using Dijkstra's algorithm. Using the algorithm statement used in the textbook and its visual representation, complete the first row in the table below showing the link state algorithm's execution by matching the table entries (a), (b), (c), and (d) with their values.



Step	N'	u D(u),p(u)	v D(v),p(v)	w D(w),p(w)	x D(x),p(x)	z D(z),p(z)
0	y	∞	(a)	(b)	(c)	(d)

(a) infinity

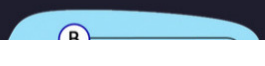
(b) 1,y

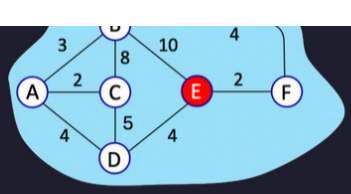
(c) 6,y

(d) 8,y

Question 13 — 1 pts

Consider the network shown below, and Dijkstra's link-state algorithm. Here, we are interested in computing the least cost path from node *E* to all other nodes using Dijkstra's algorithm. Using the algorithm statement used in the textbook and its visual representation, complete the first row in the table below showing the link state algorithm's execution by matching the table entries (a), (b), (c), (d) and (e) with their values.





Step	N'	A D(A),p(A)	B D(B),p(B)	C D(C),p(C)	D D(D),p(D)	F D(F),p(F)
0	E	*	*	∞	*	*
1	(a)	(b)	(c)	∞	(d)	(e)

(a) EF

(b) infinity

(c) 6,F

(d) 4,E

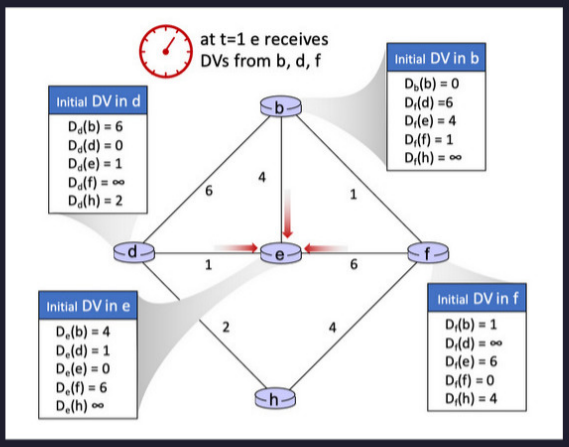
(e) 2,E

Question 14

1 pts

Consider the scenario shown below. The figure below shows the (old) DV at e (before receiving the new DVs from its neighbors) as well as the DVs being sent from b, d, and f. Now suppose that all network nodes have iterated and completed all of the DV calculations, i.e, that the algorithm has converged and quiesced.

Suppose now that sometime after the algorithm has converged, the link between e and f goes down. Will node e send out a new DV to its neighbors? Pick a response below that best answers this question.



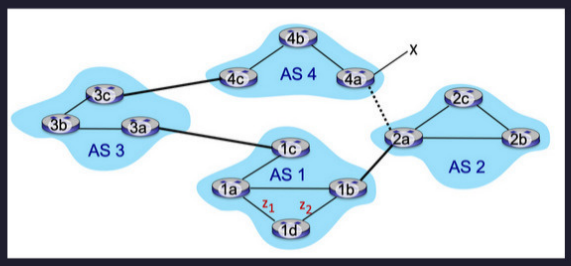
- ○ Yes. Node 2 always needs to update all of its neighbors if a alink goes down, since all nodes need to know the network topology.
- ○ No. Node e's distance vector does not change when the link between e and f goes down (since e's shortest path to f did not use this direct link between e and f), so e will not send out a new DV.
- ◉ Yes. Since node e's distance vector changes when the link between e and f goes down, it will send out a new DV.

Question 15

1 pts

Consider the network shown below. Suppose AS1, AS2, AS3, and AS4 are running OSPF

Consider the network shown below. Suppose AS1, AS2, AS3, and AS4 are running OSPF for their intra-AS routing protocol and that all links have a weight of 1. Initially suppose there is no link between AS2 and AS4. Once router 1d learns about destination x, it will need to install a forwarding table entry to x. Indicate which one of the statements below are true.



- (●) 1d will forward along z1 since OSPF has computed the path to 1c is via z1.
- ( ) 1d will forward along z2 since BGP has computed the path to 1c is via z2.
- ( ) 1d will forward along z1 since BGP has computed the path to 1c is via z1.
- ( ) 1d will forward along z1 since hot potato routing forwards clockwise.
- ( ) 1d will forward along z2 since OSPF has computed the path to 1c is via z2.

Quiz saved at 9:52pm

Submit Quiz