
COMP90007 Internet Technologies

Week 6 Workshop

Semester 2, 2018

Question 1

If there are n independent paths between two nodes in a network, and the probability that an individual path is working is p , what is the probability of these two nodes being connected? Assume path failures are independent.

Hint: first try to calculate what is the probability that all paths have failed

Question 2

Give two example computer applications for which connection-oriented service is appropriate, and two examples for which connectionless service is best.

Question 3

Assuming that all routers and hosts are working properly and that all software in both is free of all errors, is there any chance, however small, that a packet will be delivered to the wrong destination?

Question 4

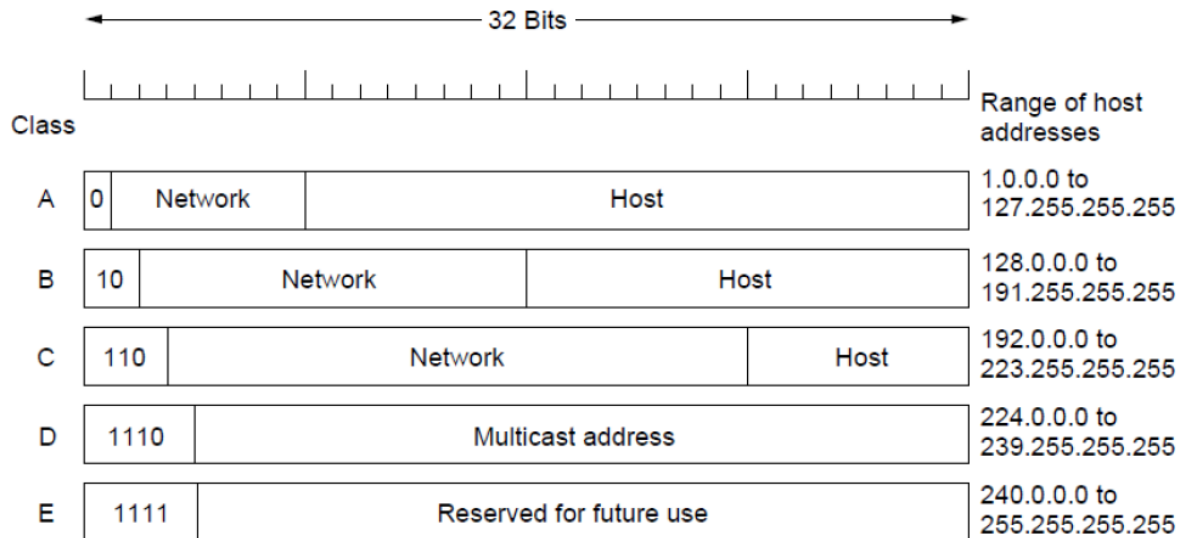
Is fragmentation needed in concatenated virtual-circuit internet or only in datagram systems?

Question 5

A router blasting out IP packets whose total length (header plus data) is 1024 bytes. Assuming that packets live for 10 sec, what is the maximum line speed the router can operate at without danger of cycling through the IP datagram ID number space (*identification* field – 16 bits)?

Question 6

Suppose that instead of using 16 bits for the network part of a class B address originally, 20 bits had been used. How many class B networks would there have been?



Question 7

Convert the IP address 11000001, 01010010, 11010010, 00001111 to dotted decimal notation.

Question 8

Convert the IP address 240.68.10.10 to binary format

Use the following key:

10000000	2^7	128
01000000	2^6	64
00100000	2^5	32
00010000	2^4	16
00001000	2^3	8
00000100	2^2	4
00000010	2^1	2
00000001	2^0	1

Question 9

A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts that it can handle?

Question 10

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?

Question 11

A router has the following (CIDR) entries in its routing table:

<u>Address/mask</u>	<u>Next hop</u>
135.46.56.0/22	Interface 0
135.46.60.0/22	Interface 1
135.46.0.0/16	Router 0
192.53.40.0/23	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) 135.46.63.10 | b) 135.46.57.14 | c) 135.46.52.2 |
| d) 192.53.40.7 | e) 192.53.56.7 | f) 135.46.22.35 |

Question 12

IPv6 uses 16 bytes addresses. If a block of 1 million addresses is allocated every picosecond, how long will the addresses last?

Additional Questions

Question 1

A router has an entry in its table that can be represented with mask as 135.46.56.0/21. What is the maximum number of hosts that this network can represent?

Question 2

A router has the following (CIDR) entries in its routing table:

<u>Address/mask</u>	<u>Next hop</u>
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
- (b) 151.46.187.2
- (c) 192.53.40.7