ITS 323 – QUIZ 6 ANSWERS

First name: _____   Last name: _____

ID: _____   Total Marks: _____

out of 10

Question 1 [2 marks]

Assume Classful Addressing is used.

    a) Computer A has IP address 129.64.130.12. What class is it?

    b) Computer B has IP address 129.64.131.12. Are A and B on the same network?

                YES   NO

    c) What IP address identifies the network of Computer A? (answer in dotted decimal notation)

Answers

Computer A	129.64.130.12	Computer B	129.64.131.12
Class	B		B
Network Address	129.64.0.0		129.64.0.0 Same network

Computer A	233.131.16.5	Computer B	233.131.91.5
Class	D (multicast)		D (multicast)
Network Address	not applicable		not applicable

Computer A	126.64.130.12	Computer B	126.64.131.12
Class	A		A
Network Address	126.0.0.0		126.0.0.0 Same network

Computer A	223.131.16.5	Computer B	223.131.91.5
Class	C		C
Network Address	223.131.16.0		223.131.91.0 Different network

Question 2 [3 marks]

Assume Classless Addressing is used.

a) Computer A has the IP address 63.19.125.5/13. If computer B is outside of computer A's network, then what address would B send to in order to reach all computers on A's network? (answer must be in dotted decimal notation)

b) What is the maximum number of hosts that can be attached to computer A's network (including computer A)?

c) A company IP network currently as 200 hosts attached. The company plans to double the number of hosts attached to the network in the next year, however the company realised their current IP subnet mask would not support that many hosts. What is the company's current subnet mask? (answer must be in dotted decimal notation)

d) If computer C does not know its own IP address, but wants to send an IP datagram, what value can it use for a source address? (answer in dotted decimal notation)

Answers

a and b) Since B is outside A's network, then the directed broadcast address for A's network must be used. You must use the subnet mask to determine where the split between network and host portion is, and then set the host portion to all 1's.

IP address	63.19.125.5/13	63.19.125.5/17
Broadcast	63.23.255.255	63.19.127.255
# hosts	2^{19} - 2	2^{15} – 2

c) 200 hosts can be supported with a subnet mask of /24 (8 bits host portion gives 254 hosts). 400 hosts cannot be supported on subnet /24, therefore /24 is subnet mask. 255.255.255.0

|				
300 hosts;	/23	9 bits	510 hosts	255.255.254.0
100 hosts;	/25	7 bits	126 hosts	255.255.255.128

d) 0.0.0.0

Question 3 [5 marks]

Multiple choice. Select the (one) answer that is most accurate.

  a) A router:

      i. Has two or more IP addresses

      ii. Only has a single IP address

      iii. Cannot be a source of an IP datagram

  b) A host:

      i. Will not forward IP datagrams

      ii. Does not have a routing table

      iii. Does not implement IP software

  c) The Time To Live field in a IP datagram header:

      i. Is used for flow control in IP

      ii. Is decremented by each router that forwards a datagram

      iii. Is used to measure the throughput between source and destination hosts

  d) Which of the following destination IP addresses would result in a datagram being delivered to all computers on your network:

      i. 01111111 00000000 00000000 00000001

      ii. 11111111 11111111 11111111 11111111

      iii. 00000000 00000000 00000000 00000000

  e) What protocol is used to map IP addresses to physical addresses?

      i. ICMP

      ii. ARP

      iii. IP

  f) An IP datagram is sent from host S to host D, via routers A then B. If the subnet between A and B is Ethernet then:

      i. The header of the IP datagram from A to B contains the IP address of B as destination

      ii. The header of the Ethernet frame from A to B contains the MAC address of B as destination

      iii. The header of the Ethernet frame from A to B contains the MAC address of D as destination

  g) IP supports the following protocol functions:

      i. Flow control, addressing and multiplexing

      ii. Addressing, retransmissions and fragmentation/re-assembly

      iii. Fragmentation/re-assembly, addressing and multiplexing

  h) ICMP includes features for:

      i. Checking the status of network connectivity

      ii. Converting IP addresses to physical addresses

      iii. Providing retransmissions in IP

i) If IP fragmentation and re-assembly is used in the following network, where Source has 4000 Bytes of data to send, what is the size of the fragments (or datagrams) sent over subnet3? (You may ignore headers)

      i. All 1000 Bytes

      ii. All 2000 Bytes

      iii. One is 3000 Bytes and one is 1000 Bytes

      iv. All 4000 Bytes
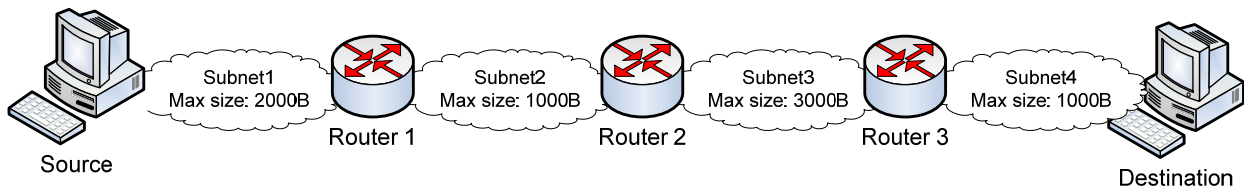
Answer

IP fragmentation/re-assembly fragments at source and routers, and only re-assembles at destination.

4000 B data: 2000 B fragments over subnet1; 1000 B fragments over subnet2; 1000B fragments over subnet3

3000 B data: 1 x 2000 B fragment and 1 x 1000 B fragment over subnet1; 1000 B fragments over subnet2; 1000 B fragments over subnet3

In fact, since subnet2 will fragment into 1000 B fragments, there will always be 1000 B fragments sent over subnet3