NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

Course Name: ETHICAL HACKING

Assignment- Week 2

TYPE OF QUESTION: MCQ/MSQ/SA

Number of questions: 10 **Total mark: 10 x 1 = 10**

QUESTION 1:

An IP packet arrives at a router with the first eight bits as 01001101. How many bytes are there in the OPTIONS field?

a. 4
b. 8
c. 12
d. 16
e. None of these

Correct Answer: e

Detail Solution: The first four bits (0100) is the IP version, and the next four bits (1101 = 13) is the header length. The header length of 13 indicates 13 x 4 = 52 bytes of header. The basic IP header is 20 bytes long. Hence, the size of the OPTIONS field will be 52 – 20 = 32 bytes. The correct option is (e).

QUESTION 2:

In an IP packet, the value of HLEN is 8, and the value of the TOTAL LENGTH field is 1500 (in decimal). The number of data bytes in the packet will be _____

Correct Answer: 1450 to 1475

Detail Solution: Since HLEN = 8, the size of the IP header will be 8 x 4 = 32 bytes. The total size of the IP packet is given as 1500 bytes. Hence, the number of data bytes = 1500 – 32 = 1468 bytes.

QUESTION 3:

An IP packet arrives at the final destination with the M flag set as 1. Which of the following statement(s) is/are true about the packet?

a. The packet represents a fragment of a larger packet.
b. The packet will be fragmented by the next router.
c. The packet is the first of multiple fragments.
d. None of these.

Correct Answer: a

Detail Solution: When the Mode (M) flag in a packet is 1, this indicates that the original packet has definitely been fragmented. Also, this is not the last fragment … there are more fragments after this. Hence, option (a) is true.

QUESTION 4:

Which address classes do the IP addresses 144.16.75.12 and 10.10.85.120 belong to?

a. Class C and Class A
b. Class B and Class C
c. Class B and Class A
d. Class B and Class D

Correct Answer: c

Detail Solution: Class A addresses start with "0", class B addresses start with "10", class C addresses start with "110", and class D addresses start with "1110". For the IP address 144.16.75.12, the first byte 144 = **10**010000 in binary; for the IP address 10.10.85.120, the first byte 10 = **0**000 1010 in binary. Clearly, the first one in Class B, and the second one is Class A. Hence. The correct option is (c).

QUESTION 5:

Which of the following IP addresses represent broadcast address?

a. 144.16.255.255
b. 144.16.0.255
c. 202.0.255.0
d. 202.0.255.255

Correct Answer: a, d

Detail Solution: In a broadcast address, all the bits in the "host" part of the IP address will be 1. (a) and (b) are class B addresses, where the last 16 bits indicate the host. (c) and (d) are class C addresses, where the last 8 bits indicate the host. Hence, the correct options are (a) and (d).

QUESTION 6:

What happens when an IP packet gets fragmented?

a. The total number of bits transmitted over the network decreases.
b. The total number of bits transmitted over the network increases.
c. The total number of bits transmitted over the network remains the same as compared to the non-fragmented case.
d. None of these.

Correct Answer: b

Detail Solution: Each IP fragment will have a header of 20 bytes. Thus more the number of fragments, the overhead of the IP headers will increase. Hence, the total number of bits transmitted will increase. The correct option is (b).

QUESTION 7:

The maximum number of hosts that are possible in a class B network is _____

Correct Answer: 65534

Detail Solution: For a class B network, 16 bits are provided to specify the host. The all-0 and all-1 combinations cannot be used as host addresses. Therefore, the maximum number of hosts possible is $2^{16} - 2 = 65534$.

QUESTION 8:

What is the purpose of the port number field in the TCP header?

a. It indicates the sequence number of the message.
b. In indicates the hardware port of the destination host.
c. It indicates the hardware port of the source host.
d. None of these.

Correct Answer: d

Detail Solution: In the TCP and UDP protocols, the 16-bit port number uniquely identifies an application running on the host. Two port numbers are specified, source port and destination port. Hence, the correct option is (d).

QUESTION 9:

What is the subnet address if the destination IP address is 144.16.75.105 and the subnet mask is 255.255.240.0?

a. 144.16.32.0
b. 144.16.75.0
c. 144.16.16.0
d. None of these

Correct Answer: a

Detail Solution: Let us express the two numbers in binary:

```
144.16.75.105   =  10010000 00010000 00101011 01101001
255.255.240.0   =  11111111 11111111 11110000 00000000
```

If we take bit-by-bit AND, we shall get the subnet address as

```
10010000 00010000 00100000 00000000 = 144.16.32.0
```

QUESTION 10:

What is a TCP half-open connection in the context of connection establishment using 3-way handshake?

a. The first transaction does not complete.
b. The second transaction does not complete.
c. The first transaction does not complete but the second transaction completes.
d. The last transaction does not complete.
e. None of these.

Correct Answer: d

Detail Solution: In the TCP protocol, connection establishment is carried out using a 3-way handshake protocol. When the third transaction in the 3-way handshake does not complete, it is referred to as a half-open connection. The correct option is (d).

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