CCST Networking – Module 7 Quiz

Questions

1. What is the decimal equivalent of the hexadecimal number 0x1E?

   a. 28
   b. 32
   c. 30
   d. 31

2. Determine the best abbreviation of the IPv6 address:

   25A7:0B01:00B2:0000:0000:0000:0400:0001/64

   a. 25A7:B01:B2::400:1/64
   b. 25A7:B01:B2:0:0:0:400:1/64
   c. 25A7:0B01:00B2::04:1/64
   d. 25A7:B01:B2:0:400:1/64

3. Identify the EUI-64 address that would be generated from a MAC address of:

   0015.2BF9.2760

   a. 2015:2BFF:FEF9.2760
   b. 0215:2BFF:FEF9.2760
   c. 0015:2BFF:FEF9.2760
   d. 0215:2BFE:FFF9.2760

4. When a client is using Stateless DHCPv6, which of the following pieces of information is most likely to be learned from a DHCPv6 server?

   a. Host ID
   b. Prefix Length
   c. DNS Server
   d. Prefix

5. Which of the following is a "one-to-nearest" traffic flow supported by IPv6?

   a. Broadcast
   b. Multicast
   c. Unicast
   d. Anycast

Questions and Answers

1. What is the decimal equivalent of the hexadecimal number 0x1E?

   a. 28
   b. 32
   c. 30
   d. 31

   Answer: c

   Explanation: To convert 0x1E to decimal, we take each hexadecimal digit and convert it into its 4-digit binary (i.e., "nibble") equivalent.

   A "1" in hex is a "1" in decimal and is therefore represented by the nibble "0001"

   An "E" in hex is a "14" in decimal and is therefore represented by the nibble "1110"

   Next, we join together (i.e., "concatenate") these two nibbles to construct an 8-bit Byte:

   0001 1110

   Converting that binary Byte to decimal yields a decimal value of 30 (i.e., 16 + 8 + 4 + 2 = 30).

   Video Reference: Hexadecimal Numbering

2. Determine the best abbreviation of the IPv6 address:

   25A7:0B01:00B2:0000:0000:0000:0400:0001/64

   a. 25A7:B01:B2::400:1/64
   b. 25A7:B01:B2:0:0:0:400:1/64
   c. 25A7:0B01:00B2::04:1/64
   d. 25A7:B01:B2:0:400:1/64

   Answer: a

   Explanation: We can use two rules to summarize IPv6 addresses:

   (1) We can omit leading zeros in a quartet (i.e., a grouping of four hexadecimal digits).

   (2) We can represent contiguous all-zero quartets with a double colon. However, this can only be done once per IPv6 address.

In the first quartet, there is no leading zero. So, there is no abbreviation there, resulting in the first quartet staying the same: 25A7

The second quartet begins with one leading zero, which can be dropped, leaving: B01

The third quartet begins with two leading zeros, which can be dropped, leaving B2

The fourth, fifth, and sixth quartets are all zeros, and they are contiguous (i.e., adjacent). Therefore, these three quartets can be abbreviated as a double colon.

The seventh quartet begins with one leading zero, which can be dropped, leaving: 400

The eighth quartet begins with three leading zeros, which can be dropped, leaving: 1

Combining all the resulting quartets gives us an abbreviated IPv6 address of:

25A7:B01:B2::400:1/64

Video Reference: Shortening an IPv6 Address

3. Identify the EUI-64 address that would be generated from a MAC address of:

   0015.2BF9.2760

   a. 2015:2BFF:FEF9:2760
   b. 0215:2BFF:FEF9:2760
   c. 0015:2BFF:FEF9:2760
   d. 0215:2BFE:FFF9:2760

Answer: b

Explanation: The EUI-64 process lets us create a 64-bit Host ID from a 48-bit MAC address. First we insert "FF:FE" in the middle of the MAC address and replace the dot delimiter with a colon delimiter, giving us:

0015:2BFF:FEF9:2760

Then, we convert the first two hexadecimal digits to binary:

0000 0000

Next, we flip the seventh bit (to indicate this is a locally administered address):

0000 0010

Then we convert the two nibbles back into hexadecimal digits (i.e., a "0" and a "2"), yielding an EUI-64 address of:

0215:2BFF:FEF9:2760

Video Reference: EUI-64 Address

4. When a client is using Stateless DHCPv6, which of the following pieces of information is most likely to be learned from a DHCPv6 server?

    a. Host ID
    b. Prefix Length
    c. DNS Server
    d. Prefix

Answer: c

Explanation: With Stateful DHCPv6, a client typically learns all IPv6 address information from a DHCPv6 server, similar to the operation of DHCPv4.

However, with Stateless DHCPv6, a client can learn its Prefix/Length information from a local router.

Also, the client can generate its own 64-bit Host ID using the EUI-64 process.

Then, any additional IPv6 address information, such as the IPv6 address of a DNS server, could be supplied by a DHCPv6 server.

Video Reference: IPv6 Autoconfiguration

5. Which of the following is a "one-to-nearest" traffic flow supported by IPv6?

    a. Broadcast
    b. Multicast
    c. Unicast
    d. Anycast

Answer: d

Explanation: Unicast is one-to-one communication and is supported by both IPv4 and IPv6.

Multicast is one-to-many communication and is supported by both IPv4 and IPv6. Specifically, "many" refers to members of a multicast group.

Broadcast is one-to-all communication and is supported by IPv4 but not by IPv6. Specifically, "all" refers to all devices on a subnet.

Anycast is one-to-nearest communication and is not supported by IPv4. However, IPv6 does support Anycast, which allows multiple servers on the Internet to have the same IPv6 address, and a client's request can be directed to the "nearest" server using that shared IP address. The nearness of a server is determined by a router's IP routing table.

Video Reference: IPv6 Traffic Flows