# 4.5.11 Practice Questions

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**Score: 90%**

Passing Score: 80%

Question 1.

Incorrect

Consider the following IPv6 address:

**FD01:0001:0001:005::7/64**

Drag the component parts of this address on the left to the corresponding descriptions on the right. Not all descriptions on the right have corresponding components on the left.

Global Routing Prefix

✓ FD01:0001:0001:005

Subnet ID

✓ :005

Interface ID

✓ ::7

Prefix Length

✓ /64

Global ID

Unique Local Unicast Prefix

✓ FD

**Explanation**

The IPv6 address FD01:0001:0001:005::7/64 is a unique local unicast address. As such, it is composed of the following component parts:

- Unique Local Unicast Prefix: FD
- Global Routing Prefix: FD01:0001:0001:005
- Subnet ID: 005
- Interface ID: ::7
- Prefix Length: /64

**References**

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resources\text\t_ipv6_addg_ccna7\q_ipv6_addg_01_ccna7.question.xml

Question 2. ✓ Correct

Consider the following IPv6 address:

FE80:0000:0000:0055:0000:0000:000A:AB00

Which of the following are valid shortened forms of this address? (Select two.)

- [ ] FE80::55::A:AB00
- [x] FE80::55:0000:0000:A:AB00
- [ ] FE80::55::A:AB
- [x] FE80:0000:0000:0055::000A:AB00
- [ ] FE80::0055::000A:AB

**Explanation**

Valid shortened forms are:

- FE80::55:0000:0000:A:AB00
- FE80:0000:0000:0055::000A:AB00 (FE80:0000:0000:55::A:AB00 could also be used)

Leading 0s within a quartet can be omitted. For example, 0055 can be shortened as 55. Addresses with consecutive zeros can be expressed more concisely by substituting a double-colon for the group of zeros. However, only one set of consecutive 0s can be omitted.

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resources\text\t_ipv6_addg_ccna7\q_ipv6_addg_02_ccna7.question.xml

Question 3. ✓ Correct

Based on the address prefix for each IPv6 address on the right, identify the address type from the list on the left. (Addresses used might not represent actual addresses used in production.)

2001:6789:9078::ABCE:AFFF:FE98:0001

✓ Global unicast

FD00::8907:FF:FE76:ABC

✓ Unique local

FEA0::AB89:9FF:FE77:1234

✓ Link-local

FF00:98BD:6532::1

✓ Multicast

FF02::1:2

✓ Multicast

**Explanation**

Based on previous standards, global unicast addresses start with 20, but can now include any prefix that is not reserved. Addresses beginning with FC or FD are unique local addresses. Addresses beginning with FE8, FE9, FEA, or FEB are link-local addresses. Addresses beginning with FF are multicast addresses. There are no broadcast addresses in IPv6.

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resources\text\t_ipv6_addt_ccna7\q_ipv6_addt_01_ccna7.question.xml

Question 4. ✓ Correct

Which of the following IPv6 addresses is equivalent to the IPv4 loopback address of 127.0.0.1?

- :: 
- FE80::1
- → ::1
- FF02::1

**Explanation**

The IPv6 loopback address is ::1. The local loopback address is not assigned to an interface. It can be used to verify that the TCP/IP protocol stack has been properly installed on the host.

:: is the unspecified address (also identified ::/128). The unspecified address is used when there is no IPv6 address. It is typically used during system startup, when the host has not yet configured its address. The unspecified address should not be assigned to an interface.

Multicast addresses have an FF00::/8 prefix. FF02::/8 is the multicast prefix for all nodes on the local link.

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resources\text\t_ipv6_addt_ccna7\q_ipv6_addt_02_ccna7.question.xml

Question 5. ✓ Correct

You need to design an IPv6 addressing scheme for your network. The following are key requirements for your design:

- Infrastructure hosts, such as routers and servers, are assigned static interface IDs, while workstations, notebooks, tablets, and phones are assigned interface IDs dynamically.
- Internet access must be available to all hosts through an ISP.
- Site-to-site WAN connections are created using leased lines.

Which type of IPv6 addressing is most appropriate for hosts in this network?

- ○ Unique local unicast addressing
- ○ Anycast addressing
- → ◉ Global unicast addressing
- ○ Link-local addressing

**Explanation**

*Global unicast addressing* should be used in this scenario because internet access is required by network hosts. Global unicast addressing uses registered addresses and is equivalent to public addressing in IPv4. Because the addresses are registered with IANA, no other organization can use them on any public network, including the internet.

*Unique local unicast* addresses are private addresses used for communication within a site or between a limited number of sites. These addresses are not registered with IANA and cannot be used on a public network without address translation.

*Link-local addresses* are assigned to all IPv6 interfaces on the network by default, but they can only be used on the local subnet. Routers never forward packets destined for local link addresses to other subnets. Anycast addresses are used to locate the nearest server of a specific type, for example, the nearest DNS or network time server.

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resources\text\t_ipv6_addt_ccna7\q_ipv6_addt_03_ccna7.question.xml

Question 6. ✓ Correct

Your organization has decided to implement unique local unicast IPv6 addressing. A global ID of FD01:A001:0001::/48 has been selected for the organization's IPv6 addressing scheme. The next 16 bits beyond the global ID have been used to define the following subnets:

- FD01:A001:0001:0001::/64
- FD01:A001:0001:0002::/64
- FD01:A001:0001:0003::/64
- FD01:A001:0001:0004::/64

You need to statically assign an interface ID to a router interface connected to the FD01:A001:0001:0003::/64 subnet. To ensure uniqueness, the interface ID should be constructed using the MAC address of the router interface.

Which interface configuration command would you use to do this?

→ ◉ **ipv6 address FD01:A001:0001:0003::/64 eui-64**

○ **ipv6 address FD01:A001:0001:0002::1/64**

○ **ipv6 address FD01:A001:0001:0003::/48 eui-64**

○ **ipv6 address FD01:A001:0001:0002::/64 eui-64**

○ **ipv6 address FD01:A001:0001:0003::1/64**

**Explanation**

The **ipv6 address FD01:A001:0001:0003::/64 eui-64** command statically assigns an interface ID to a router interface connected to the FD01:A001:0001:0003::/64 subnet using the MAC address of the router interface. When you use the **eu-64** option with the ipv6 address command, only the 64-bit network prefix for the address needs to be specified. The last 64 bits are automatically computed from the interface's MAC address.

The **ipv6 address FD01:A001:0001:0003::1/64** command statically assigns an interface ID of 0000:0000:0000:0001 to the router interface. This is a valid interface ID for the subnet, but it does not use the MAC address of the router interface. The **ipv6 address FD01:A001:0001:0002::1/64**, **ipv6 address FD01:A001:0001:0002::/64 eui-64**, and **ipv6 address FD01:A001:0001:0003::/48 eui-64** commands specify the wrong subnet for the scenario.

**References**

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resources\text\t_eui64_ccna7\q_eui64_01_ccna7.question.xml

Question 7. ✓ Correct

You are working on a workstation with the following MAC address:

10-01-64-AB-78-96

Which of the following will be the link-local address using the modified EUI-64 format?

- FC00::1001:64FF:FEAB:7896
- FE80::1001:64AB:7896:FFFF
- → FE80::1201:64FF:FEAB:7896
- FC00::1001:64AB:7896:FFFF
- FE80::1001:64AB:7896
- FC00::1001:64AB:7896

**Explanation**

Link-local addresses have a prefix of FE80::/10, meaning that they begin with FE80, FE90, FEA0, or FEB0. On Ethernet networks, the modified EUI-64 format interface ID can be automatically derived from the MAC address using the following process:

1. The MAC address is split into 24-bit halves.
2. The hex constant FFFE is inserted between the two halves to complete the 64-bit address.
   For example, 10-01-64-AB-78-96 becomes 1001:64**FF:FE**AB:7896 .
3. The seventh bit of the MAC address (reading from left to right) is set to binary 1. This bit is called the universal/local (U/L) bit.

   - Modifying the seventh binary bit modifies the second hex value in the address.
   - For a MAC address of 10-01-64-AB-78-96, the first two hex values translate to the binary number of 0001 0000.
   - Setting the seventh bit to 1 yields 0001 0010, which translates into 12 hex.

   In this example, the MAC address of 10-01-64-AB-78-96 in modified EUI-64 format becomes 1**2**01:64**FF:FE**AB:7896.

   Addresses with a FC00::/7 prefix are unique local addresses.

**References**

**4.5.6 EUI-64 and Auto-Configuration**

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resources\text\t_eui64_ccna7\q_eui64_02_ccna7.question.xml

Question 8. ✓ Correct

Which of the following are characteristics of 6-to-4 tunneling? (Select three.)

- [ ] Manually-configured tunnel endpoints
- [x] Dual stack routers
- [x] Works through NAT
- [ ] IPv4-only hosts communicate with IPv6-only hosts
- [ ] Dual stack hosts
- [x] Tunnel endpoints configured on routers
- [ ] Does not work through NAT

**Explanation**

With 6-to-4 tunneling, tunneling endpoints are configured automatically between devices. 6-to-4 tunneling:

- Is configured between routers at different sites.
- Requires dual-stack routers as the tunnel endpoints. Hosts can be IPv6-only hosts.
- Works through NAT.
- Uses a dynamic association of an IPv6 site prefix to the IPv4 address of the destination tunnel endpoint.
- Automatically generates an IPv6 address for the site using the 2002::/16 prefix followed by the public IPv4 address of the tunnel endpoint router.

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resources\text\t_ipv6impl_ccna7\q_ipv6impl_01_ccna7.question.xml

Question 9. ✓ Correct

Your company has just started contracting with the government. As part of the contract, you have configured a special server for running a custom application. Contract terms dictate that this server use only IPv6.

You have several hosts that need to communicate with this server. These hosts only run IPv4 and cannot be configured to run IPv6.

Which solution would you use to allow the IPv4 clients to communicate with the IPv6 server?

→ ◉ NAT-PT

○ Dual stack

○ 6-to-4

○ ISATAP

○ Teredo

**Explanation**

The only solution that allows IPv4 hosts to communicate with the IPv6 server without running IPv6 on the client systems is Network Address Translation-Protocol Translation (NAT-PT). NAT-PT converts the IPv6 packet header into an IPv4 packet header, and vice versa. The device references a translation table as it converts the headers to ensure the packet is sent to the correct host.

A dual stack client is a host that runs both IPv4 and IPv6. In this scenario, it is not possible to run IPv4 on the server, and it is not possible to run IPv6 on the clients, so a dual stack configuration is not possible.

Teredo, 6-to-4, and Intra-site Automatic Tunnel Addressing Protocol (ISATAP) are all tunneling protocols that allow an IPv6 host to communicate with another IPv6 host through an IPv4 network. None of the tunneling protocols enable an IPv4 host to communicate with an IPv6 host.

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resources\text\t_ipv6impl_ccna7\q_ipv6impl_02_ccna7.question.xml

Question 10. ✓ Correct

Which of the following IPv6 addresses is used by a host to contact a DHCP server?

- FF02::2
- → FF02::1:2
- FE80::2
- FF02::1
- FE80::1:2
- FE80::1

**Explanation**

FF02::1:2 is the IPv6 address used to contact a DHCP server.

All addresses with the FF00::/8 prefix are multicast addresses.

IPv6 uses multicasts instead of broadcasts.

FF02::2 is the multicast address for all routers on the local link; FF02::1 is for all hosts on the link.

FE80::/10 is the prefix for link-local unicast addresses.

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resources\text\t_ipv6_config_ccna7\q_ipv6_config_01_ccna7.question.xml