Week 9 Tutorial Solution

Introduction to Programming (Central Queensland University)

Week 9 Tutorial Solution

Questions

1.From the textbook section, 26.9 PRACTICE SET, on page 783, attempt questions; 1, 2, 3, 4, 5, 6 and 15.

2.From the textbook section, 27.7 PRACTICE SET, on page 799, attempt question 1.

3.From the textbook section, 28.9 PRACTICE SET, on page 813, attempt question 1.

1. From the textbook section, *26.9 PRACTICE SET*, on page 783, attempt questions; 1, 2, 3, 4, 5, 6 and 15

    1.

        a. 0000:0000:0000:0000:5555:5555:5555:5555
        b. 0000:0000:0000:0000:AAAA:AAAA:AAAA:AAAA
        c. 5555:5555:5555:5555:5555:5555:5555:5555
        d. 7777:7777:7777:7777:7777:7777:7777:7777

    2.

        a. ::5555:5555:5555:5555
        b. ::AAAA:AAAA:AAAA:AAAA
        c. 5555:5555:5555:5555:5555:5555:5555:5555 (no compression)
        d. 7777:7777:7777:7777:7777:7777:7777:7777 (no compression)

    3.

        a. 0:FFFF:FFFF::
        b. 1234:2346:3456::FFFF
        c. 0:1:: FFFF:1200:1000
        d. ::FFFF:FFFF:24.123.12.6

    4.

        a. 0000:0000:0000:0000:0000:0000:0000:2222
        b. 1111:0000:0000:0000:0000:0000:0000:0000
        c. 0000:0001:0002:0000:0000:0000:0000:0000
        d. 000B:000A:00CC:0000:0000:0000:1234:000A

    5.

        a. 0000:0000:0000:0000:0000:0000:0000:0002
        b. 0000:0023:0000:0000:0000:0000:0000:0000
        c. 0000:000A:0000:0000:0000:0000:0000:0003
        d. 0123:0000:0000:0000:0000:0000:0012:0023

    6. The best way is to apply different masks (starting from the longest one) to each address to find a match with the beginning address in a block. The prefix lengths are 10, 9, 8, 7, 6, 5, 4, and 3 as shown in Table 26.1. In other words, in each case, we need to only 1 to 8 tests.

a. (FE80::12) AND (/10) = FE80::/10 → Link local address
b. (FEC0::24A2) AND (/10) = FEC0::/10 → Reserved

c. (FF02::0) AND (/10) = FF00:/10 → Not a defined block
(FF02::0) AND (/9) = FF00://9 → Not a defined block
(FF02::0) AND (/8) = FF00://8 → Multicast address

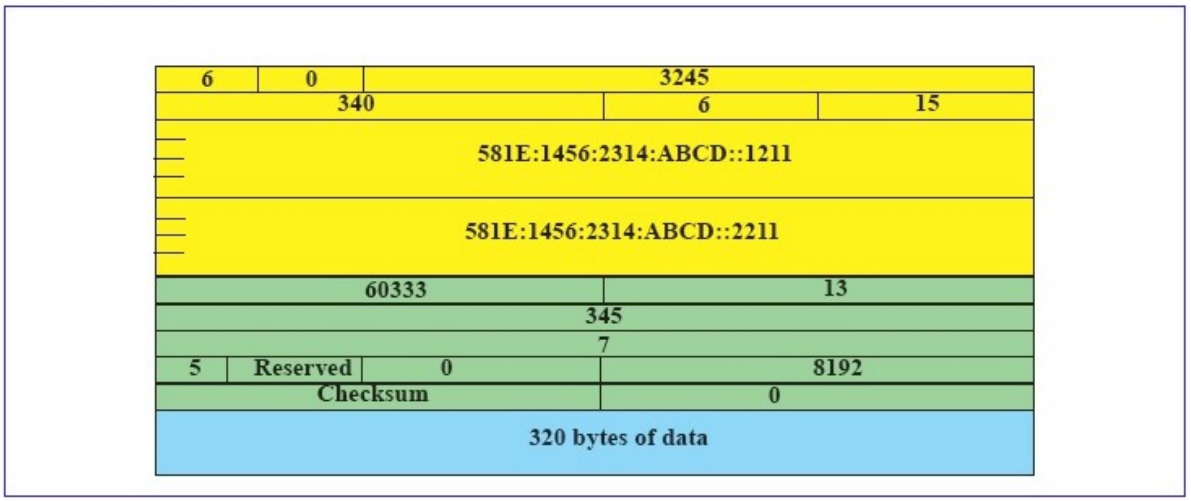
d. (0::01) AND (/10) = 0000::/10 → Not a defined block
(0::01) AND (/9) = 0000::/9 → Not a defined block
(0::01) AND (/8) = 0000::/8 → IPv4 Compatible
In this case, since the last bit is 1, the address is a loopback address.

15. The information given cannot belong to a link local address because the address starts with 0's instead of 1's.

2. From the textbook section, *27.7 PRACTICE SET*, on page 799, attempt question 1

1. See Figure 27.E1 below:

Figure 27.E1 *Solution to Exercise 1*



3. From the textbook section, *28.9 PRACTICE SET*, on page 813, attempt question 1
   1. Error-reporting messages contain part of the IP datagram for which the error message has be created. This is needed to let the sender of the datagram to identify which datagram has been discarded due to the error. See Chapter 9 for more information.

1. Show the unabbreviated colon hex notation for the following IPv6 addresses:
a. An address with 64 0s followed by 32 two-bit (01)s.
b. An address with 64 0s followed by 32 two-bit (10)s.
c. An address with 64 two-bit (01)s.
d. An address with 32 four-bit (0111)s.
2. Show the zero contraction version of addresses in Exercise 1.
3. Show abbreviations for the following addresses:
a. 0000:FFFF:FFFF:0000:0000:0000:0000:0000
b. 1234:2346:3456:0000:0000:0000:0000:FFFF
c. 0000:0001:0000:0000:0000:FFFF:1200:1000
d. 0000:0000:0000:0000:FFFF:FFFF:24.123.12.6
4. Decompress the following addresses and show the complete unabbreviated IPv6 address:
a. ::2222

b. **1111::**
c. **0:1:2::**
d. **B:A:CC::1234:A**

5. Show the original (unabbreviated) form of the following addresses:
a. 0::2
b. 0:23::0
c. 0:A::3
d. 123::12:23

6. What is the corresponding block or subblock associated with each of the following addresses based on Table 26.1:
a. FE80::12
b. FEC0::24A2
c. FF02::0
d. 0::01

15. Using the CIDR notation, show the link local address in which the node identifier is 0::123/48.

1. An IPv6 packet consists of the base header and a TCP segment. The length of data is 320 bytes. Show the packet and enter a value for each field.

1. Which ICMP messages contain part of the IP datagram? Why is this needed?