Lab 7.1.4.9 Identifying IPv4 Addresses

1. Objectives

Part 1: Identify IPv4 Addresses

Part 2: Classify IPv4 Addresses

1. Background / Scenario

In this lab, you will examine the structure of Internet Protocol version 4 (IPv4) addresses. You will identify the various types of IPv4 addresses and the components that help comprise the address, such as network portion, host portion, and subnet mask. Types of addresses covered include public, private, unicast, and multicast.

1. Identify IPv4 Addresses

In Part 1, you will be given several examples of IPv4 addresses and will complete tables with appropriate information.

* 1. Analyze the table shown below and identify the network portion and host portion of the given IPv4 addresses.

The first two rows show examples of how the table should be completed.

**Key for table**:

N = all 8 bits for an octet are in the network portion of the address

n = a bit in the network portion of the address

H = all 8 bits for an octet are in the host portion of the address

h = a bit in the host portion of the address

|  |  |  |  |
| --- | --- | --- | --- |
| IP Address/Prefix | Network/Host  N,n = Network, H,h = Host | Subnet Mask | Network Address |
| 192.168.10.10/24 | **N.N.N.H** | **255.255.255.0** | **192.168.10.0** |
| 10.101.99.17/23  255.255.254.0  10.101. 98.0  0110 0011  1111 1110  0110 0010 | **N.N.nnnnnnnh.H** | **255.255.254.0**  **10.101.0110 0010.00000000**  **10.101.0110 0011.11111111** | **10.101.98.0**  **subred**  **10.101.99.255**  **broadcast** |
| 209.165.200.227/27  255.255.255.224  209.165.200.224  1110 0000 224  1110 0011 227  1110 0000 224 | N.N.N.nnnh hhhh | 255.255.255.1110 0000  255.255.255.224  209.165.200.1110 0000 sub  209.165.200.1111 1111 bro | 209.165.200.224 subred  209.165.200.255  broadcast |
| 172.31.45.252/24  255.255.255.0  172.31.45.0000 0000 s  .1111 1111 b | N.N.N.H | 255.255.255.0 | 172.31.45.0 subred  172.31.45.255  broadcast |
| 10.1.8.200/26  255.255.255.192  10.1.8.192  1100 0000 192  1100 1000 200  1100 0000 192 | N.N.N.nnhh hhhh | 255.255.255.1100 0000  255.255.255.192  10.1.8.1100 0000 s  10.1.8.1111 1111 b | 10.1.8.192  Subred  10.1.8.255  broacast |
| 172.16.117.77/20  255.255.240.0  172.16. 112 .0  1111 0000 240  0111 0101 117  0111 0000 112 | N.N.nnnnhhhh. H | 255.255.11110000.00000000  255.255.240.0  172.16.0111 0000.00000000s  172.16.0111 1111.11111111b | 172.16.112.0  Subred  172.16.127.255  broadcast |

* 1. Analyze the table below and list the range of host and broadcast addresses given a network/prefix mask pair.

The first row shows an example of how the table should be completed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IP Address/Prefix | Network Address | First Host Address | Last Host Address | Broadcast Address |
| **192.168.10.10/24** | **192.168.10.0** | **192.168.10.1** | **192.168.10.254** | **192.168.10.255** |
| **10.101. 99. 17 /23**  **255.255.254.0**  **10.101. 98 .0** | **10.101.98.0** | **10.101.98.1** | **10.101.99.254** | **10.101.99.255** |
| **209.165.200.227/27** | 209.165.200.224 | 209.165.200.225 | 209.165.200.254 | 209.165.200.255 |
| **172.31.45.252/24** | 172.31.45.0 | 172.31.45.1 | 172.31.45.254 | 172.31.45.255 |
| **10.1.8.200/26** | 10.1.8.192 | 10.1.8.193 | 10.1.8.254 | 10.1.8.255 |
| **172.16.117.77/20** | 172.16.112.0 | 172.16.112.1 | 172.16.127.254 | 172.16.127.255 |
|  |  |  |  |  |

1. Classify IPv4 Addresses

In Part 2, you will identify and classify several examples of IPv4 addresses.

* 1. Analyze the table shown below and identify the type of address (network, host, multicast, or broadcast address).

The first row shows an example of how the table should be completed.

|  |  |  |
| --- | --- | --- |
| IP Address | Subnet Mask | Address Type |
| 10.1.1.1  255.255.255.252  10.1.1.0 | 255.255.255.252 | Host |
| 192.168.33.63  255.255.255.192  192.168.33.  1100 0000 192  **0011 1111 63**  0000 0000 | 255.255.255.192 | Broadcast  255.255.255.1100 0000 mascara  192.168.33.0000 0000 subred  00 0001 host  11 1110 host .62  192.168.33.0011 1111 broadc |
| 239.192.1.100 | 255.252.0.0 | Multicast |
| 172.25.12.52  172.25.12.0  .255 | 255.255.255.0 | host |
| 10.255.0.0  10.0.0.0  10.255.255.255 | 255.0.0.0 | Host |
| 172.16.128.48  255.255.255.240  172.16.128.48  1111 0000 240  0011 0000 48  0011 0000 48 | 255.255.255.240 | Network |
| 209.165.202.159  255.255.255.224  209.165.202.  1110 0000  1001 1111  1000 0000 | 255.255.255.224 | Broadcast  255.255.255.1110 0000 m  209.165.202.1000 0000 s 128  1001 1111 b .159 |
| 172.16.0.255 | 255.255.0.0 | Host  172.16.0.0 s  172.16.255.255 b |
| 224.10.1.11 | 255.255.255.0 | Multicast |

* 1. Analyze the table shown below and identify the address as public or private.

|  |  |
| --- | --- |
| IP Address/Prefix | Public or Private |
| 209.165.201.30/27 | Public |
| 192.168.255.253/24 | Private |
| 10.100.11.103/16 | Private |
| 172.30.1.100/28 | Private |
| 192.31.7.11/24 | Public |
| 172.20.18.150/22 | Private |
| 128.107.10.1/16 | Public |
| 192.135.250.10/24 | Public |
| 64.104.0.11/16 | Public |

* 1. Analyze the table shown below and identify whether the address/prefix pair is a valid host address.

|  |  |  |
| --- | --- | --- |
| IP Address/Prefix | Valid Host Address? | Reason |
| 127.1.0.10/24 | no | Loopback |
| 172.16.255.0/16 | si | Host |
| 241.19.10.100/24 | no | Clase E  Investigación |
| 192.168.0.254/24 | si | Host |
| 192.31.7.255/24 | no | Broadcast |
| 64.102.255.255/14  255.11111100.0.0  64. 100 .0.0  1111 1100 252  0110 0110 102  0110 0100 100 | Si | Host  255.11111100.0.0  64.0110 0100. 0.0  11.255.255  64.100.0.0 subred  64.103 .255.255 broad |
| 224.0.0.5/16 | no | Multicast |
| 10.0.255.255/8 | si | Host |
| 198.133.219.8/24 | si | Host |