



# Lab—Identifying IPv4 Addresses

## Objectives

Part 1: Identify IPv4 Addresses

Part 2: Classify IPv4 Addresses

## 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.

## Required Resources

- Device with Internet access
- Optional: IPv4 address calculator

## Part 1: Identify IPv4 Addresses

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

### Step 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<br>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    | N.N.nnnnnnnh.H                            | 255.255.254.0 | 10.101.98.0     |
| 209.165.200.227/27 |   |               |                 |
| 172.31.45.252/24   |   |               |                 |
| 10.1.8.200/26      |   |               |                 |
| 172.16.117.77/20   |   |               |                 |
| 10.1.1.101/25      |   |               |                 |
| 209.165.202.140/27 |   |               |                 |
| 192.168.28.45/28   |   |               |                 |

**Step 2: 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  | First Host Address | Last Host Address | Broadcast Address |
|--------------------|--------------------|-------------------|-------------------|
| 192.168.10.10/24   | 192.168.10.1       | 192.168.10.254    | 192.168.10.255    |
| 10.101.99.17/23    |                    |                   |                   |
| 209.165.200.227/27 |                    |                   |                   |
| 172.31.45.252/24   |                    |                   |                   |
| 10.1.8.200/26      |                    |                   |                   |
| 172.16.117.77/20   |                    |                   |                   |
| 10.1.1.101/25      |                    |                   |                   |
| 209.165.202.140/27 |                    |                   |                   |
| 192.168.28.45/28   |                    |                   |                   |

**Part 2: Classify IPv4 Addresses**

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

**Step 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 | host         |
| 192.168.33.63   | 255.255.255.192 |              |
| 239.192.1.100   | 255.252.0.0     |              |
| 172.25.12.52    | 255.255.255.0   |              |
| 10.255.0.0      | 255.0.0.0       |              |
| 172.16.128.48   | 255.255.255.240 |              |
| 209.165.202.159 | 255.255.255.224 |              |
| 172.16.0.255    | 255.255.0.0     |              |
| 224.10.1.11     | 255.255.255.0   |              |

## Lab– Identifying IPv4 Addresses

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**Step 2:** Analyze the table shown below and identify the address as public or private.

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

**Step 3:** 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     |                     |        |
| 172.16.255.0/16   |                     |        |
| 241.19.10.100/24  |                     |        |
| 192.168.0.254/24  |                     |        |
| 192.31.7.255/24   |                     |        |
| 64.102.255.255/14 |                     |        |
| 224.0.0.5/16      |                     |        |
| 10.0.255.255/8    |                     |        |
| 198.133.219.8/24  |                     |        |

### Reflection

Why should we continue to study and learn about IPv4 addressing if the available IPv4 address space is depleted?