Lab– Identifying and Classifying 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.

1. Required Resources

* Device with Internet access
* Optional: IPv4 address calculator

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.

|  |  |  |
| --- | --- | --- |
| IP Address/Prefix | Subnet Mask | Network Address |
| 192.168.10.10/24 | 255.255.255.0 | 192.168.10.0 |
| 10.101.99.17/23 | 255.255.254.0 | 10.101.98.0 |
| 209.165.200.227/27 | 255.255.255.224 | 209.165.200.224 |
| 172.31.45.252/24 | 255.255.255.0 | 172.31.45.0 |
| 10.1.8.200/26 | 255.255.255.192 | 10.1.8.192 |
| 172.16.117.77/20 | 255.255.240.0 | 172.16.112.0 |
| 10.1.1.101/25 | 255.255.255.128 | 10.1.1.0.128 |
| 209.165.202.140/27 | 255.255.255.224 | 209.165.202.128 |
| 192.168.28.45/28 | 255.255.255.240 | 192.168.28.32 |

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

|  |  |  |  |
| --- | --- | --- | --- |
| 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 | 10.101.98.0 | 10.101.98.254 | 10.101.99.255 |
| 209.165.200.227/27 | 209.165.200.225 | 209.165.200.254 | 209.165.200.255 |
| 172.31.45.252/24 | 172.31.45.1 | 172.31.45.254 | 172.31.45.255 |
| 10.1.8.200/26 | 10.1.8.193 | 10.1.8.254 | 10.1.8.255 |
| 172.16.117.77/20 | 172.16.112.1 | 172.16.127.254 | 172.16.127.255 |
| 10.1.1.101/25 | 10.1.1.1 | 10.1.1.126 | 10.1.1.127 |
| 209.165.202.140/27 | 209.165.202.129 | 209.165.202.158 | 209.165.202.159 |
| 192.168.28.45/28 | 192.168.28.33 | 192.168.28.46 | 192.168.28.47 |

1. Classify IPv4 Addresses
   1. Analyze the table shown below and identify the type of address (network, host, or broadcast address).

|  |  |  |
| --- | --- | --- |
| IP Address | Subnet Mask | Address Type |
| 10.1.1.1 | 255.255.255.252 | host |
| 192.168.33.63 | 255.255.255.192 | broadcast |
| 172.25.12.52 | 255.255.255.0 | host |
| 10.255.0.0 | 255.0.0.0 | host |
| 172.16.128.48 | 255.255.255.240 | network |
| 209.165.202.159 | 255.255.255.224 | broadcast |
| 172.16.0.255 | 255.255.0.0 | host |

* 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 | invalid | loopback |
| 172.16.255.0/16 | valid | valid host address |
| 241.19.10.100/24 | invalid | reserved |
| 192.168.0.254/24 | valid | valid host address |
| 192.31.7.255/24 | invalid | broadcast |
| 64.102.255.255/14 | valid | valid host address |
| 224.0.0.5/16 | invalid | broadcast |
| 10.0.255.255/8 | valid | valid host address |
| 198.133.219.8/24 | valid | valid host address |