Lab– Identifying IPv4 Addresses

Objectives

Part 1: Identify IPv4 Addresses

- Identify the network and host portion of an IP address.
- Identify the range of host addresses given a network/prefix mask pair.

Part 2: Classify IPv4 Addresses

- Identify the type of address (network, host, multicast, or broadcast).
- Identify whether an address is public or private.
- Determine if an address assignment is a valid host address.

Background / Scenario

Addressing is an important function of network layer protocols because it enables data communication between hosts on the same network, or on different networks. 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 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	

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?