Faculty of Computing



**[Computer Communications & Network]**

**Lab No 5 Tasks**

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**Task 1: Use the IP address chart and your knowledge of IP address classes to answer the following questions:**

1. **What is the decimal and binary range of the first octet of all possible Class B IP addresses?**

* Decimal: From: 128 To: 191
* Binary: From: 10000000 To: 10111111

1. **Which octet(s) represent the network portion of a Class C IP address?**

Class C uses the first **3 octets** as the network portion (octets 1, 2, and 3)

1. **Which octet(s) represent the host portion of a Class A IP address?**

Class A uses the **last 3 octets** (octets 2, 3, and 4) as the host portion.

1. **What is the maximum number of useable hosts with a Class C network address?**

Hosts per Class C network = 2^8 - 2 = **254** hosts

1. **How many Class B networks are there?**

Class B has 14 bits for network

Number of networks = 2^14 = **16,384**

1. **How many hosts can each Class B network have?**

Host bits in Class B = 16 bits

1. **How many octets are there in an IP address?**

**4 octets**

**How many bits per octet?**

8 bits

**Task 2: Determine the host and network portions of the IP address**

With the following IP host addresses, indicate the following:

* Class of each address
* Network address or ID
* Host portion
* Default subnet mask

The host portion will be all zeros for the network ID. Enter just the octets that make up the host. The host portion will be all ones for a broadcast. The network portion of the address will be all ones for the subnet mask. Fill in the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Host IP Address | **Address Class** | **Network Address** | **Host Address** | **Default Subnet Mask** |
| **216.14.55.137** | Class C | |  | | --- | |  |  |  | | --- | | 216.14.55.0 | | .137 | 255.255.255.0 |
| **123.1.1.15** | Class A | 123.0.0.0 | .1.1.15 | 255.0.0.0 |
| **150.127.221.244** | Class B | 150.127.0.0 | |  | | --- | |  |  |  | | --- | | .221.244 | | |  | | --- | |  |  |  | | --- | | 255.255.0.0 | |
| **194.125.35.199** | Class C | 194.125.35.0 | .199 | 255.255.255.0 |
| **175.12.239.244** | Class B | 175.12.0.0 | |  | | --- | |  |  |  | | --- | | .239.244 | | 255.255.0.0 |

**Task 3: Given an IP address of 142.226.0.15, answer the following questions:**

**What is the binary equivalent of the second octet?** 226 in binary = 11100010

**What is the class ofthe address?** First octet 142 is between 128 and 191 **Class B**

**What is the network address of this IPaddress?** Class B default mask is 255.255.0.0, so network address is the first two octets + zeros: **142.226.0.0**

**Is this a valid IP host address (Y/N)? Why or why not?**

It is neither the network address nor the broadcast address ,so it is a valid host IP.

**Task 4: Determine which IP host addresses are valid for commercial networks**

|  |  |  |
| --- | --- | --- |
| IP Host Address | Valid Address? (Yes/No) | Why or Why Not |
| 150.100.255.255 | NO | This is a **broadcast address** for the network 150.100.255.0. Broadcast addresses are used to send data to all devices on the network, not to individual hosts. |
| 175.100.255.18 | YES | |  | | --- | |  |   This is a normal and usable **host IP address** in a Class B network. Nothing wrong with it. |
| 195.234.253.0 | NO | |  | | --- | |  |  |  | | --- | | This is a **network address**. It identifies the whole network and cannot be assigned to a host. | |
| 100.0.0.23 | YES | This is a valid **host address** in a Class A range. It is not a reserved or special address. |
| 188.258.221.176 | NO | This is an **invalid IP** because one of the numbers (258) is more than 255. IP octets must be between 0 and 255. |
| 127.34.25.189 | NO | |  | | --- | |  |  |  | | --- | | This is a **loopback address**, used for internal testing in your computer. It is not used on networks. | |
| 224.156.217.73 | NO | This is a **Class D (multicast)** address. These are used for special purposes, not for regular devices in commercial networks. |