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**BSCS – 6TH**

**Computer Network – Lab 5**

**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?** 
   * First 3 octets
2. **Which octet(s) represent the host portion of a Class A IP address?** 
   * Last 3 octets
3. **What is the maximum number of useable hosts with a Class C network address?**
   * 2^n-2 = 2^8-2 = 256-2 = 254 hosts
4. **How many Class B networks are there?** 
   * 2^N = 2^16 = 65,536 networks
5. **How many hosts can each Class B network have?** 
   * 2^n-2 = 2^16-2 = 65,536-2 = 65,534 hosts
6. **How many octets are there in an IP address?** 4 octets
7. **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** | C | 216.14.55.0 | 0.0.0137 | 255.255.255.0 |
| **123.1.1.15** | A | 123.0.0.0 | 0.1.1.15 | 255.0.0.0 |
| **150.127.221.244** | B | 150.127.0.0 | 0.0.221.244 | 255.255.0.0 |
| **194.125.35.199** | C | 194.125.35.0 | 0.0.0.199 | 255.255.255.0 |
| **175.12.239.244** | B | 175.12.0.0 | 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?**

* 11100010

**What is the class of the address?**

* Class B

**What is the network address of this IP Address?**

* 142.226.0.0

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

* Yes, this is a valid IP host address because we discussed that if all the bits are 1 or 0 in the end then it is not an IP address. Here there is no any case like this so This is a valid IP Address. Also, this neither a network address i.e. 142.266.0.0 or broadcast address i.e. 142.266.255.255 so it is a valid Host address as it is not reserved.

**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 | All 1 bits in end |
| 175.100.255.18 | Yes | In range and no 1s or 0s bits in end |
| 195.234.253.0 | No | All 0 bits in end |
| 100.0.0.23 | Yes | In range and no 1s or 0s bits in end |
| 188.258.221.176 | No | Second octet is greater than 255 meaning out of range |
| 127.34.25.189 | No | Invalid because it is a loopback address |
| 224.156.217.73 | No | Reserved for multicast groups |