Introduction to Networks and Distributed Computing

CECS 327

Spring 2022

Due Date: Friday, April 3, 2022 @ 10:00 PM PST

**Assignment 3: Subnetting**

**Instructions** For all problems:

* This is individual assignment
* Use the Subnetting Worksheet to show and record all work for each problem.
* You must explain your conversion below each table. Failure to explain your results will make you lose points.

**Problem 1**

|  |  |
| --- | --- |
| **Host IP Address** | **172.30.1.33** |
| **Major Network Mask** | **255.255.0.0** |
|  |  |
| Major (Base) Network Address | 172.30.0.0 |
| Major Network Broadcast Address | 172.30.255.255 |
| Total Number of Host Bits Number of Hosts | 16  65534 |
|  |  |
| **Subnet Mask** | **255.255.255.0** |
| Number of Subnet Mask Bits  Number of Usable Subnets Bits Maximum Subnets | 24  8  256 |
| Number of Host Bits per Subnet  Number of Usable Hosts per Subnet | 8  254 |
|  |  |
| Subnet Address for this IP Address | 172.30.1.0 |
| IP Address of First Host on this Subnet | 172.30.1.0 |
| IP Address of Last Host on this Subnet | 172.30.1.254 |
| Broadcast Address for this Subnet | 172.30.1.255 |

**I used the calculation of**usable subnet bits = (total # bits subnet mask) - (# of bits in network mask)

number of hosts = 2^(usable subnet bits) – 2 as seen in a youtube video for the calculation of the subnet bits and the number of hosts

From there I subtracted the number of possible IP’s 256 – the number of subnet bits in decimal form to get the number of hosts

This allows me to get a range of IP addresses to get the subnet mask address, broadcast address which is the last IP in the range and the first and last host on the subnet.

**Problem 2**

|  |  |
| --- | --- |
| **Host IP Address** | **172.30.1.33** |
| **Major Network Mask** | **255.255.255.0** |
|  |  |
| Major (Base) Network Address | 172.30.1.0 |
| Major Network Broadcast Address | 172.30.1.255 |
| Total Number of Host Bits Number of Hosts | 8  254 |
|  |  |
| **Subnet Mask** | **255.255.255.252** |
| Number of Subnet Mask Bits  Number of Usable Subnets Bits Maximum Subnets | 30  6  64 |
| Number of Host Bits per Subnet  Number of Usable Hosts per Subnet | 2  2 |
|  |  |
| Subnet Address for this IP Address | 172.30.1.32 |
| IP Address of First Host on this Subnet | 172.30.1.33 |
| IP Address of Last Host on this Subnet | 172.30.1.34 |
| Broadcast Address for this Subnet | 172.30.1.35 |

|  |  |
| --- | --- |
| **Host IP Address** | **192.192.10.234** |
| **Major Network Mask** | **255.255.255.0** |
|  |  |
| Major (Base) Network Address | 192.192.10.0 |
| Major Network Broadcast Address | 192.192.10.255 |
| Total Number of Host Bits Number of Hosts | 8  254 |
|  |  |
| **Subnet Mask** | **255.255.255.248** |
| Number of Subnet Bits  Number of Usable Subnets (zero subnet used) | 5  31 |
| Number of Host Bits per Subnet  Number of Usable Hosts per Subnet | 3  6 |
|  |  |
| Subnet Address for this IP Address | 192.192.10.232 |
| IP Address of First Host on this Subnet | 192.192.10.233 |
| IP Address of Last Host on this Subnet | 192.192.10.238 |
| Broadcast Address for this Subnet | 192.192.10.239 |

**Problem 3**

**Problem 4**

|  |  |
| --- | --- |
| **Host IP Address** | **171.68.99.71** |
| **Major Network Mask** | **255.255.0.0** |
|  |  |
| Major (Base) Network Address | 171.68.0.0 |
| Major Network Broadcast Address | 171.68.255.255 |
| Total Number of Host Bits Number of Hosts | 16  65,536 -2 |
|  |  |
| **Subnet Mask** | **255.255.240.0** |
| Number of Subnet Mask Bits  Number of Usable Subnets Bits Maximum Subnets | 20  4    16 |
| Number of Host Bits per Subnet  Number of Usable Hosts per Subnet | 12  4,096 -2 = 4094 |
|  |  |
| Subnet Address for this IP Address | **171.68.96.0** |
| IP Address of First Host on this Subnet | 171.168.96.1 |
| IP Address of Last Host on this Subnet | 171.68.111.254 |
| Broadcast Address for this Subnet | 171.68.111.255 |

**Problem 5**

|  |  |
| --- | --- |
| **Host IP Address** | **217.200.3.219** |
| **Major Network Mask** | **255.255.255.0** |
|  |  |
| Major (Base) Network Address | 217.200.3.0 |
| Major Network Broadcast Address | 217.200.3.255 |
| Total Number of Host Bits Number of Hosts | 8  254 |
|  |  |
| **Subnet Mask** | **255.255.255.224** |
| Number of Subnet Mask Bits  Number of Usable Subnets Bits Maximum Subnets | 27  3  8 |
| Number of Host Bits per Subnet  Number of Usable Hosts per Subnet | 5  30 |
|  |  |
| Subnet Address for this IP Address | 217.200.3.192 |
| IP Address of First Host on this Subnet | 217.200.3.193 |
| IP Address of Last Host on this Subnet | 217.200.3.222 |
| Broadcast Address for this Subnet | 217.200.3.223 |