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Homework 4

Computer Networking

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1. What is the assignable range of values for the first octet for Class A, Class B, Class C, Class D, and Class E IPv4 networks?
   1. Class A = 1 - 127
   2. Class B = 128 - 191
   3. Class C = 192 - 223
   4. Class D = 224 - 239
   5. Class E = 240 - 255
2. Provide valid Class A/B/C/D/E IP address for each of the following IP addresses and explain your answers.

* 128.64.12.12 Class B because the first octet is between 128 and 191
* 224.1.1.1 Class D because the first octet is between 224 and 239
* Class A because the first octet is between 1 and 127
* 200.1.1.1Class C because the first octet is between 192 and 223

1. What is the prefix for address 255.255.255.252?

* /30

1. How many subnet (S) bits do I need to number 128 subnets? Explain your answer

You need 15 bits in class A, 23 bits  in class B, 0 in class C. Each class contains goes up to a certain number of subnets that is why class C has 0 because it only goes up to 64.

1. How many host (H) bits do I need to number 128 hosts per subnet?

If you use log base 2 128to get 7. You need 7 host bits to have 128 hosts and subnets.

1. Use private Class B network 172.16.0.0. What is the subnet mask?

The subnet mask for 172.16.0.0 is 255.255.0.0. This is because it is in class B and there is 16 bits in the MSB forms the network id bits.

1. Complete the table below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Ip Address | Class | # of Octets | # of Host Octets | Network ID | Broadcast Address |
| 1.12.1.1 | A | 4 | 3 | 1.0.0.0 | 1.255.255.255 |
| 128.16.6.1 | B | 4 | 2 | 128.16.0.0 | 128.16.255.255 |
| 200.31.2.19 | C | 4 | 1 | 200.31.2.0 | 200.31.2.255 |
| 192.11.1.12 | C | 4 | 1 | 192.11.1.0 | 192.11.1.255 |
| 126.5.7.9 | A | 4 | 3 | 192.11.1.0 | 126.255.255.255 |

1. What is the main difference between classful and classless addressing?

Difference between classful and classless addressing is it is divided into 3 parts

* Network
* Subnets
* Hosts

While classless addresses can only be 2 parts

* Subnets
* Hosts

​​9. Consider the case of IP address 192.2.1.61with mask 255.255.255.0. Answer the following questions:

* 1. Convert the mask to prefix format (/P) as needed.
  2. Determine N based on the class.
  3. Calculate S (Subnet) and H (Host).
  4. Calculate hosts per subnet.
  5. Calculate number of subnet

1. a. 11111111.11111111.11111111.0 /24
2. Since this IP address is in class C it will be the first three octets and N = 24.
3. S = 8, H = 0
4. 6 hosts per subnet
5. Number of subnets = S = 256
6. My network address is 192.168.18.0. Answer the following questions:
   1. How many subnet (S) bits do I need to number 32 subnets?
   2. How many host (H) bits do I need to number 8 hosts per subnet?
   3. What is my classful subnet mask?
   4. What is my CIDR?
   5. What are the ranges of my hosts per subnet?
7. S = 6 subnet bits
8. H = 16,382 bits
9. 255.255.255.0
10. /7
11. Ranges from 1 - 126