Subnetting

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Objective

- **To demonstrate a method of quickly calculating subnets in a TCP/IP environment.**

- **A method of learning subnetting in five minutes**

Introduction

- **In order to make this demonstration as easy as possible, assume that we're dealing with a Class C address.**

- **Also assume that we're using a subnet mask of 255.255.255.240**

Available Subnets

- **The only usable subnet masks are:**
- **255.255.255.192 Binary 1100 0000**
- **255.255.255.224 Binary 1110 0000**
- **255.255.255.240 Binary 1111 0000**
- **255.255.255.248 Binary 1111 1000**
- **255.255.255.252 Binary 1111 1100**
- **255.255.255.254 Binary 1111 1110**

Figure 1

240 decimal is 1111 0000 in binary

128	64	32	16	8	4	2	1
|	|	|	|	|	|	|	|
1	1	1	1	0	0	0	0

Figure 2

Count from the rightmost "1" position

128	64	32	16	8	4	2	1
|	|	|	|	|	|	|	|
1	1	1	1	0	0	0	0

Double the value with each value counted to the left as below.

(1 – 2 – 4 – 8)

Calculating

Double this amount (8 in this example) equals 16 and subtract 2. The result is the number of subnets available (in this case, 14)

Repeat the exact same procedure for the "0" values to obtain the number of hosts available (also 14 in this case)

Figure 3

To calculate for 255.255.255.224

128	64	32	16	8	4	2	1
|	|	|	|	|	|	|	|
1	1	1	0	0	0	0	0

This results in 6 subnets (2n-2) and 30 hosts per subnet (same formula)

Calculating a Class B Address

Calculate the subnets for 255.255.240.0 in the same way.

For hosts, you need to count all of the "0" values from both the third and fourth octet.

(14 subnets, 4094 hosts/subnet)

Calculating a Class B Address

A class B address requires you to count the "0" values in the 3rd and 4th octets (255.255.240.0 is below):

11111111.11111111.11110000.00000000

Count these "0" values ^^^^ ^^^^^^^^

(2048*2=4096-2=4094 available hosts)