1. [1 point] What is the *subnet mask* in dotted decimal notation for the following:
   134.177.78.180 / 28

134.177.78.180/28

28 1's for prefix

32 − 28 = 4 ← 4 Bits for Host

Total Bits in address

24 4 4 = 255.255.255.240

prefix

$2^8 - 2^4 = 240$

2. [3 points] Consider the IP address / subnet mask pair 65.64.32.8 / 255.255.255.192
   The network id is __ bits long.
   The subnet id is __ bits long.
   The host id is ___ bits long.

Class ? A = 255.0.0.0

8 Bits

Subnet ID = 255.255.255.192

Network

8+8=16 Bits

Subnet

* So Subnet is 18 Bits $2^8 - 192 = 64 = 6$ Bits

-6

$= 2$

Host = 6 Bits Long $= 2^6 - 2 = 62$ Hosts

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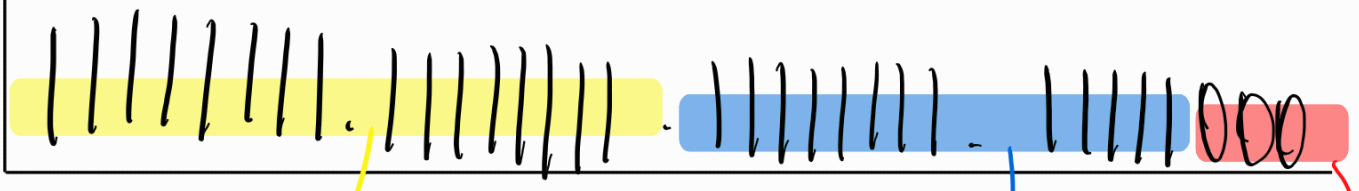
3. [2 points] Your IP address and subnet mask are 132.245.156.201 / 255.255.255.248. You want to send a packet to 132.245.156.214. Is the destination address on the same subnet as you? Explain.

IP: 132.245.156.201 / 255.255.255.248

Class: B / 255.255.00/16

Bit Boundary: $2^8 - 248 = 8 = 2^3$ So 3 Bit for Host



Network

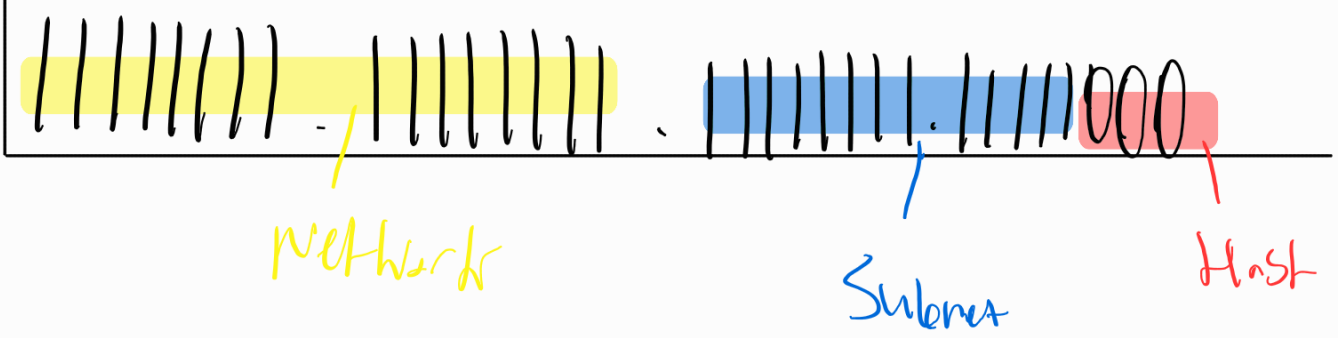
Subnet

Host

IP: 132.245.156.214

Class: B / 255.255.00/16

Bit Boundary: $2^8 - 214 = 42 = 2^5 = 63$



* Remote Because the Subnet address Does Not match

4. [1 points] Using the proper default mask, is 172.16.1.0 a valid host IP address? That is, can this address be assigned to a computer? Explain.

172.16.1.0 = 10101100.00001000.00000001.00000000

Class B So Subnet = 255.255.0.0

Network prefix

Host

The host address in this example is 16 bits Long, I know this because the first octet in the IP indicates that it is a Class b Address

So the Network prefix is 255.255.0.0
Subnet mask ←→ 8 8

16 bits Long leaving a remain 16 for Host

So therfore Host address is

0000 0001.0000 0000 ← Not all Zeros
Not all ones
and is in range

172.16.1.0

* Yes Valid address

5. [2 points] The IP address/subnet mask pair 165.32.6.4 / 255.255.255.0 is a _____ (subnetted/natural) class ___ address.

Address is class b Because it starts with 165 in the first octet.

Subnet mask = 255.255.0.0

When Compared to the Provided Subnet mask the third 3rd octet was also being take up in the Network prefix.

255.255.255.0

Network id

Subnet

network id

6. [6 points] Subnetting a class C address:

Scenario: Your company has been assigned a single Class C IP address of 192.168.10.0. Due to expansion and the hiring of new employees, the CIO has asked you what can be done to allow the following departments their own IP subnet:

- Marketing with 5 PCs
- Human Resources with 5 PCs
- Accounting with 15 PCs
- Information Systems with 11 PCs
- Field Operations with 25 PCs

Design a subnetting scheme for this network. Do not use VLSM, create equal size subnets.

a) What subnet mask would you use?
b) How many subnets would your design provide?
c) How many hosts per subnet will you have?
d) For each subnet, list the network address, broadcast address, and range of host IP addresses.

(use table below)

Subnet	Network address	First host address	Last host address	Broadcast address	Subnet mask
Marketing					
HR					
Admin, Acct, Payroll					
Info Systems					
Field Operations					

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- Michael Nolk

and the hiring of new employees, the CIO has asked you what can be done to allow the following departments their own IP subnet:

- Marketing with 5 PCs
- Human Resources with 5 PCs
- Accounting with 15 PCs
- Information Systems with 11 PCs
- Field Operations with 25 PCs

Design a subnetting scheme for this network. Do not use VLSM, create equal size subnets.

a) What subnet mask would you use? 255.255.255.254
b) How many subnets would your design provide? $6(2^3-2)$
c) How many hosts per subnet will you have? $30(2^5-2)$
d) For each subnet, list the network address, broadcast address, and range of host IP addresses. (use table below)

Subnet	Network address	First host address	Last host address	Broadcast address	Subnet mask
Marketing	192.168.10.32	.33	.62	192.169.10.63	255.255.255.254 /27
HR	.64	.65	.94	192.168.10.94	255.255.255.254 /27
Admin, Acct, Payroll	.96	.97	.126	192.168.10.126	255.255.255.254 /27
Info Systems	.129	.129	.158	192.168.10.158	255.255.255.254 /27
Field Operations	.160	.161	.190	192.169.10.190	255.255.255.254 /27