

6 Questions

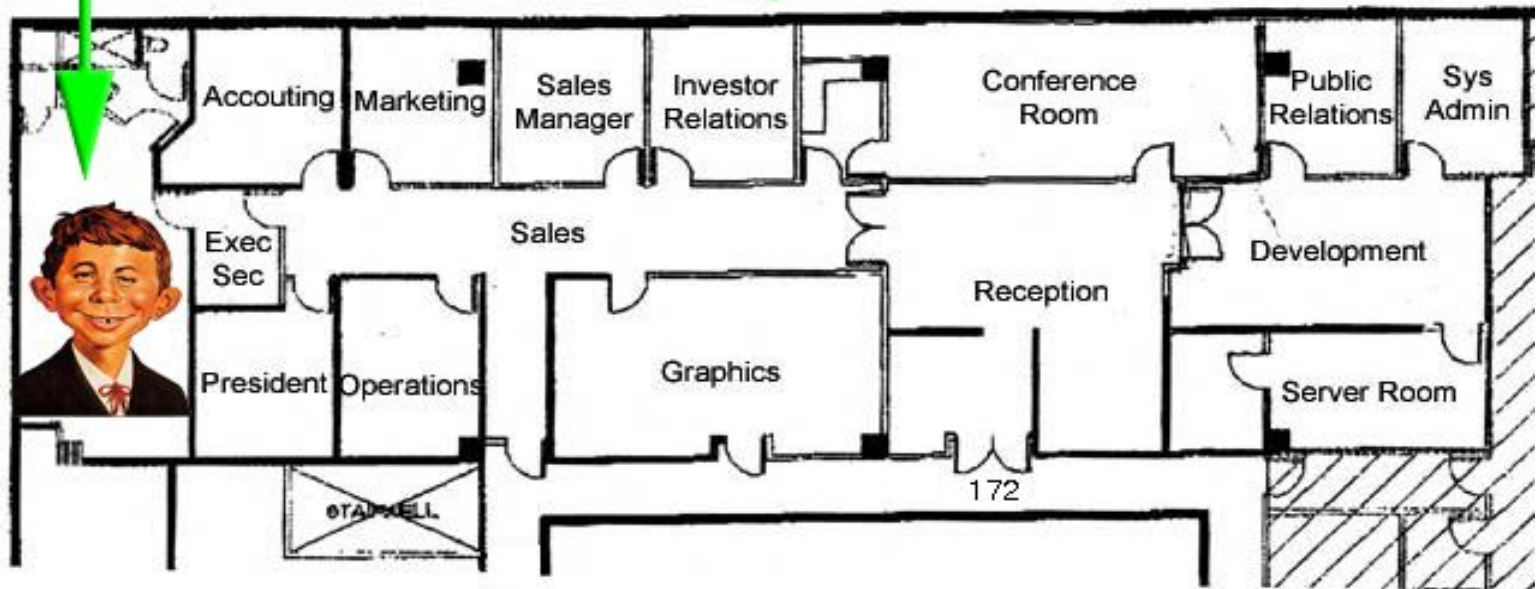
Basic Subnetting

- 1) How Many Sub-Networks Do You Need?
- 2) How Many Bits Did You Have To Use?
- 3) What Is Your Subnet Mask?
- 4) What Is Your Block-Size?
- 5) What Are Your Subnets?
- 6) What Are The Number Of Hosts And IP Ranges For Each Subnet?

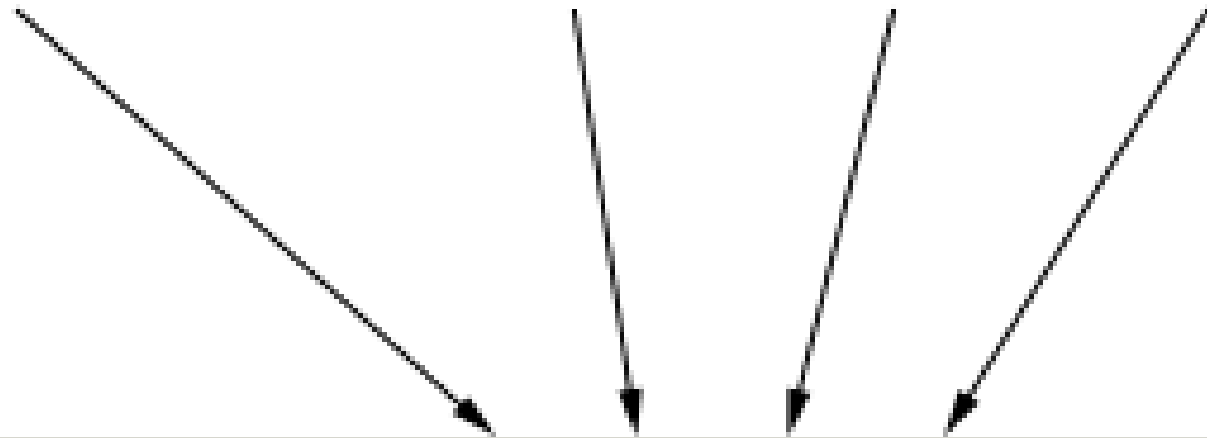
Attn: Alfred E. Newman
Mad Magazine
208 Mad St.
Bldg #2, Ste #172
Mad City, CA 94563



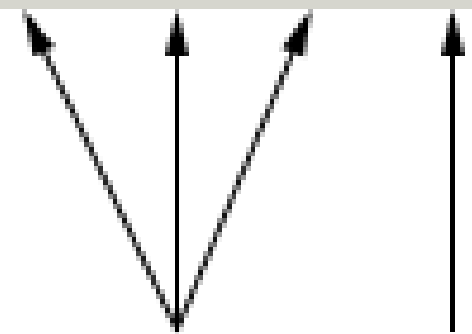
208 Mad St.
Bldg #2,
Ste #172
Cube #5



Business Prk #208 Bldg #2 Ste #172 Cube #5

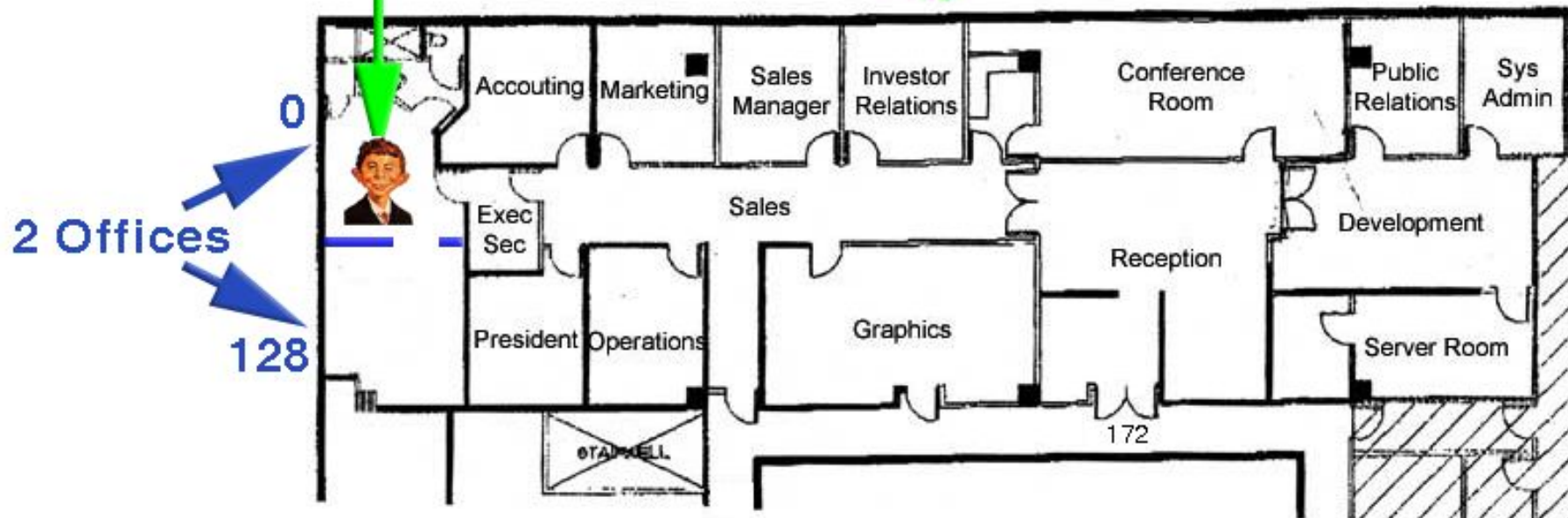


IP address:	208 . 2 . 172 . 5
Subnet mask:	255 . 255 . 255 . 0



Network Host

208 Mad St.
Bldg #2,
Ste #172
Cube #5



IP address:

208 . 2 . 172 . 5

Humans

Subnet mask:

255 . 255 . 255 . 0

	<u>128+64</u>	<u>32+16</u>	<u>8</u>	<u>4</u>	<u>2</u>	<u>1</u>	<u>128</u>	<u>64</u>	<u>32</u>	<u>16</u>	<u>8</u>	<u>4+2</u>	<u>1</u>	<u>+128</u>	<u>64+32</u>	<u>16+8+4</u>	<u>2</u>	<u>1</u>	<u>128</u>	<u>64</u>	<u>32</u>	<u>16</u>	<u>8+4</u>	<u>2+1</u>	
IP	1	1	0	1	0	0	0	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	1	0	1
MASK	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0

Computers

214748364+1073741824+268435456+131072+32768+8192+2048+1024+4+1

IP 11010000000000101010110000000101
 MASK 1111111111111111111111100000000

11010000 00000010 10101100 00000101

IP address:

208 . 2 . 172 . 5

Subnet mask:

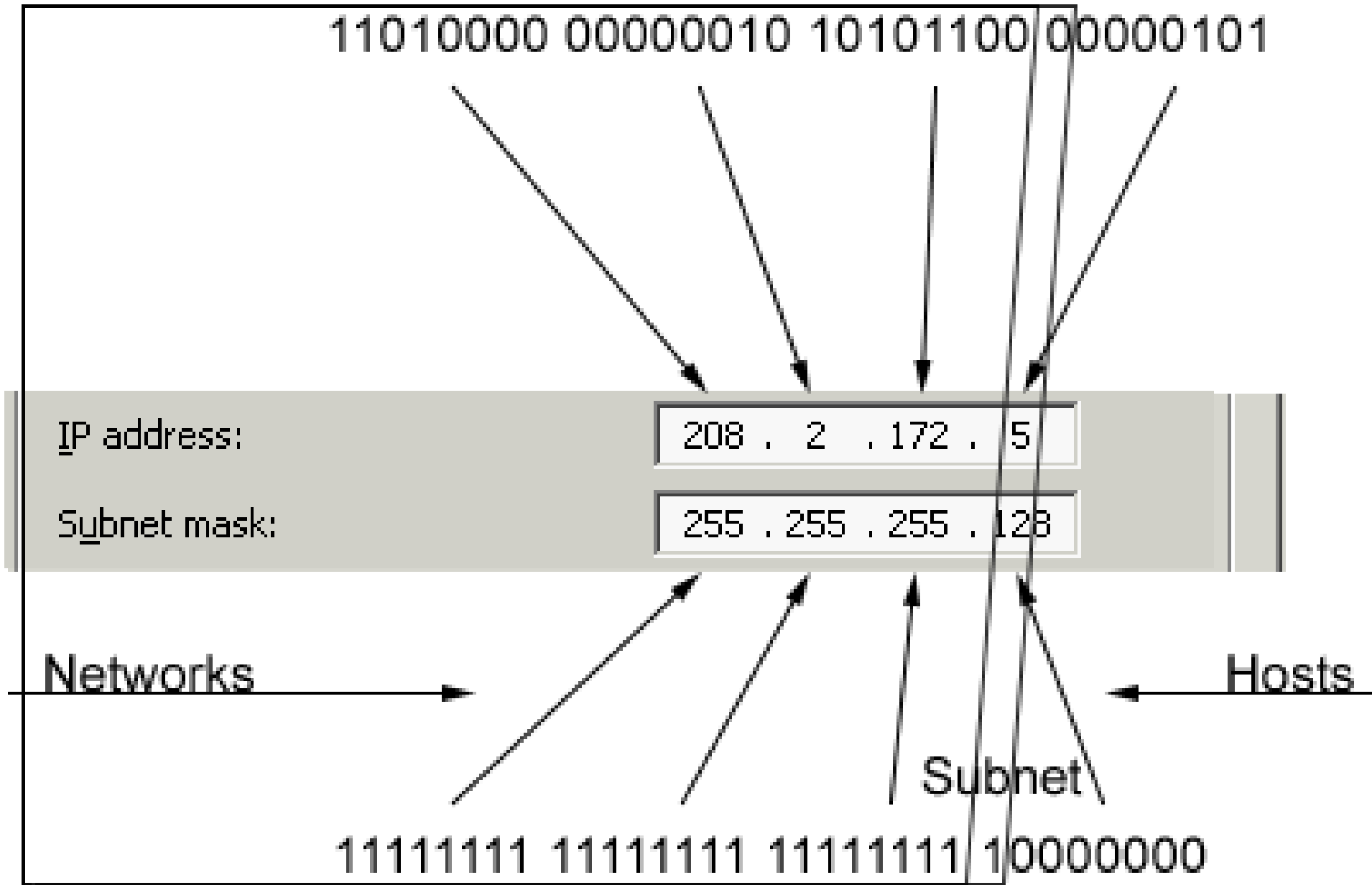
255 . 255 . 255 . 128

Networks

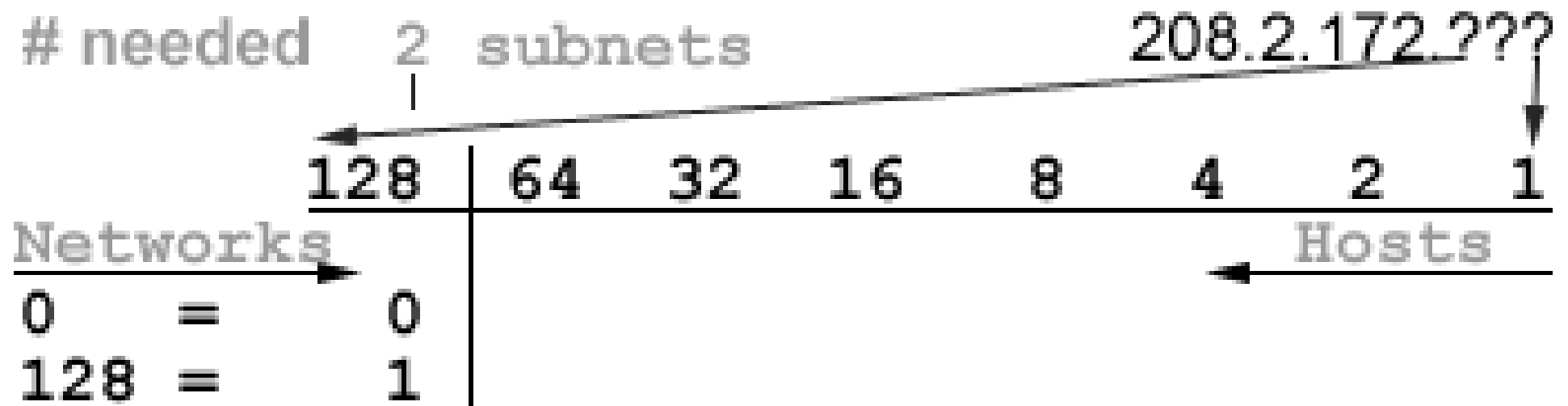
Hosts

Subnet

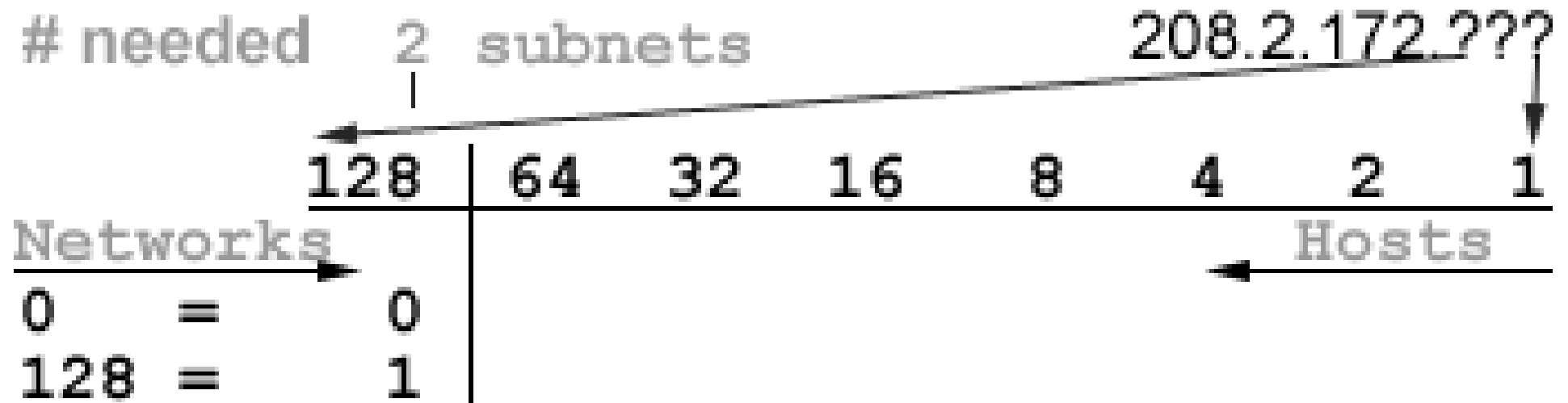
11111111 11111111 11111111 10000000



1) How Many Sub-Networks Do You Need?



2) How Many Bits Did You Have To Use?

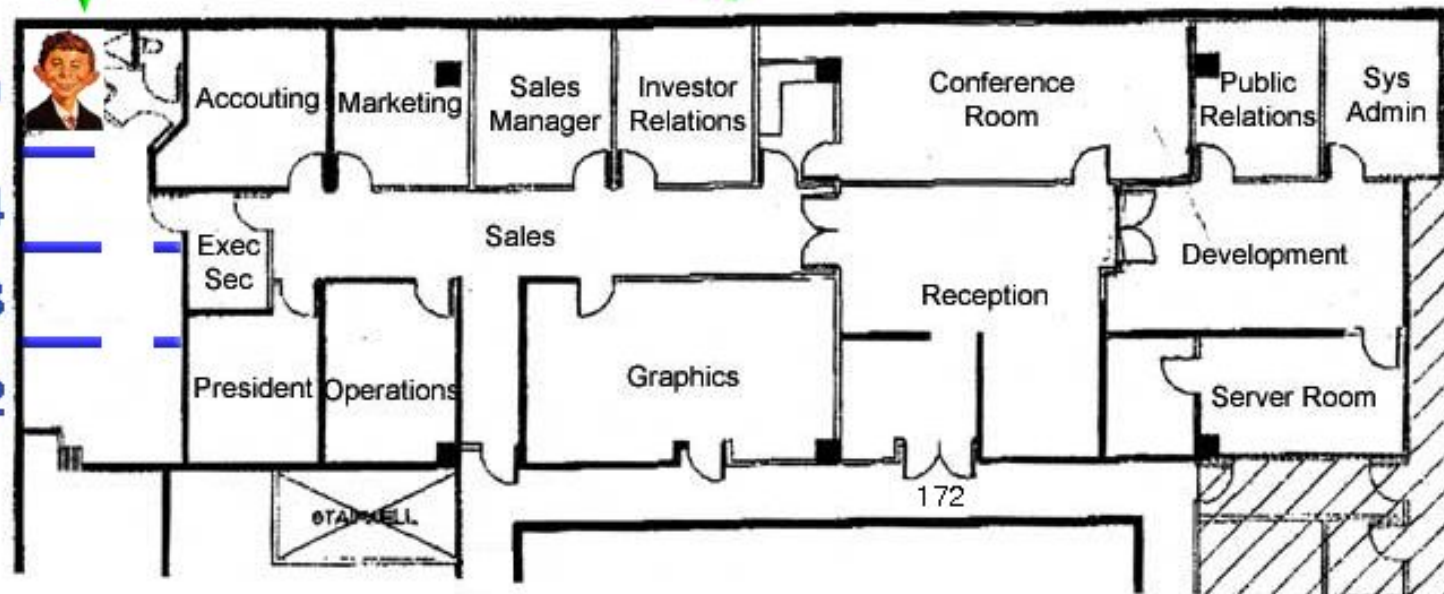


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Cube #5



4
Offices

0
64
128
192



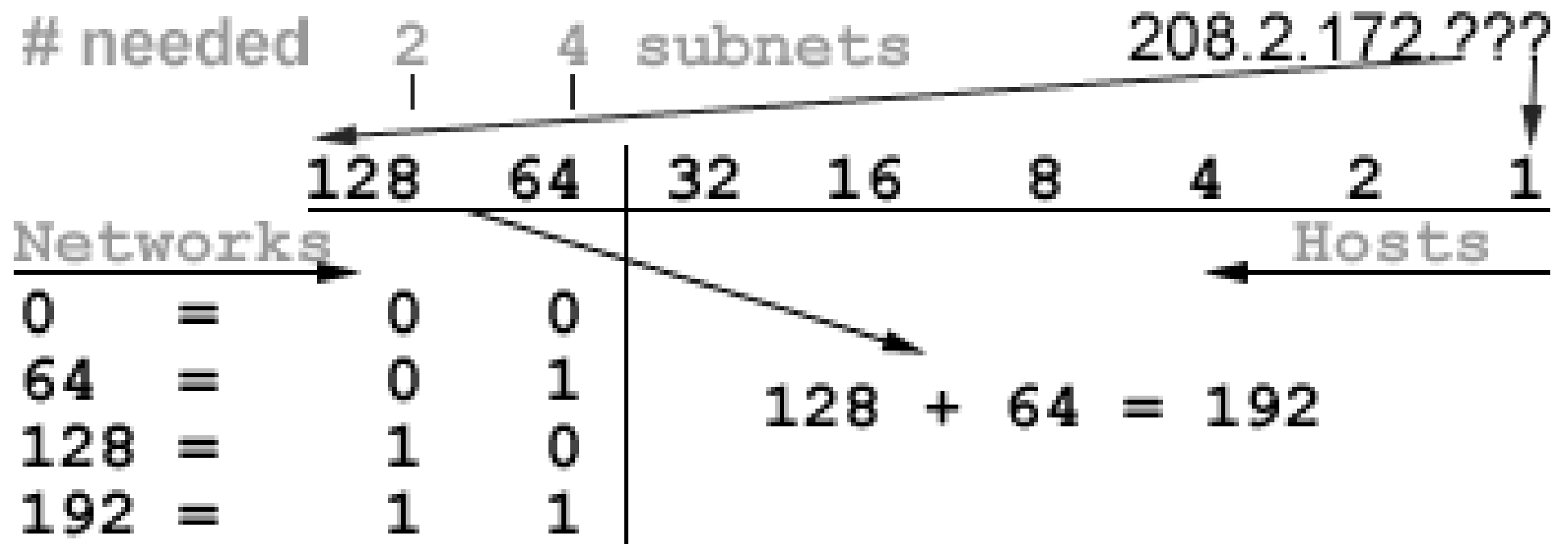
2) How Many Bits Did You Have To Use?

needed 2 4 subnets 208.2.172.???

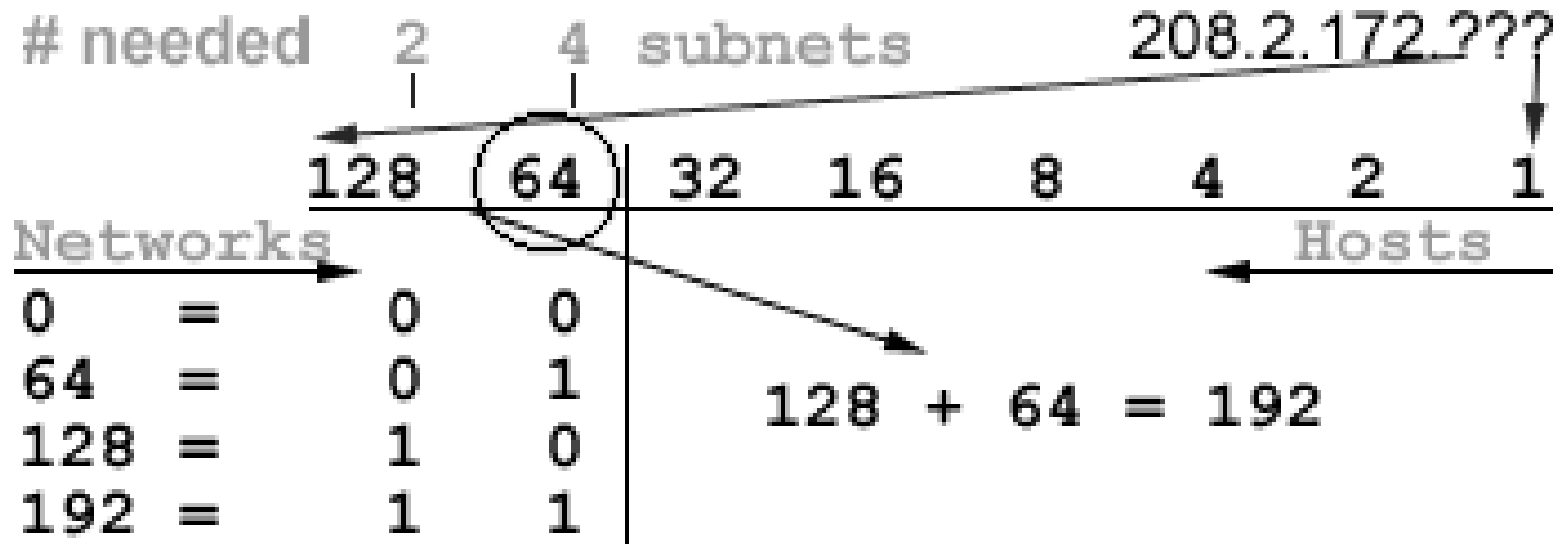
	128	64	32	16	8	4	2	1
Networks	0	0						
0 =	0	0						
64 =	0	1						
128 =	1	0						
192 =	1	1						

← Hosts

3) What Is Your Subnet Mask?



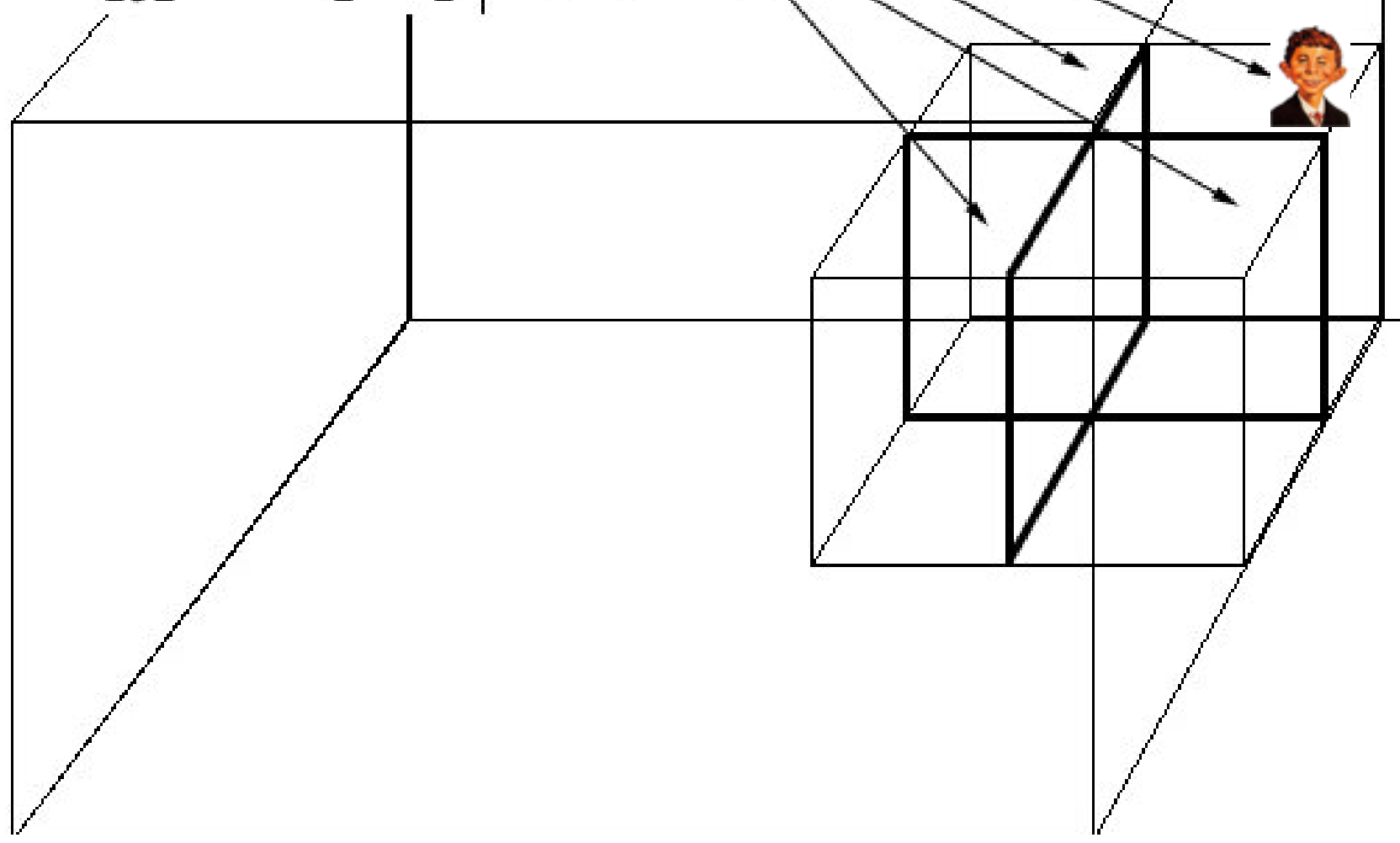
4) What Is Your Block-Size?



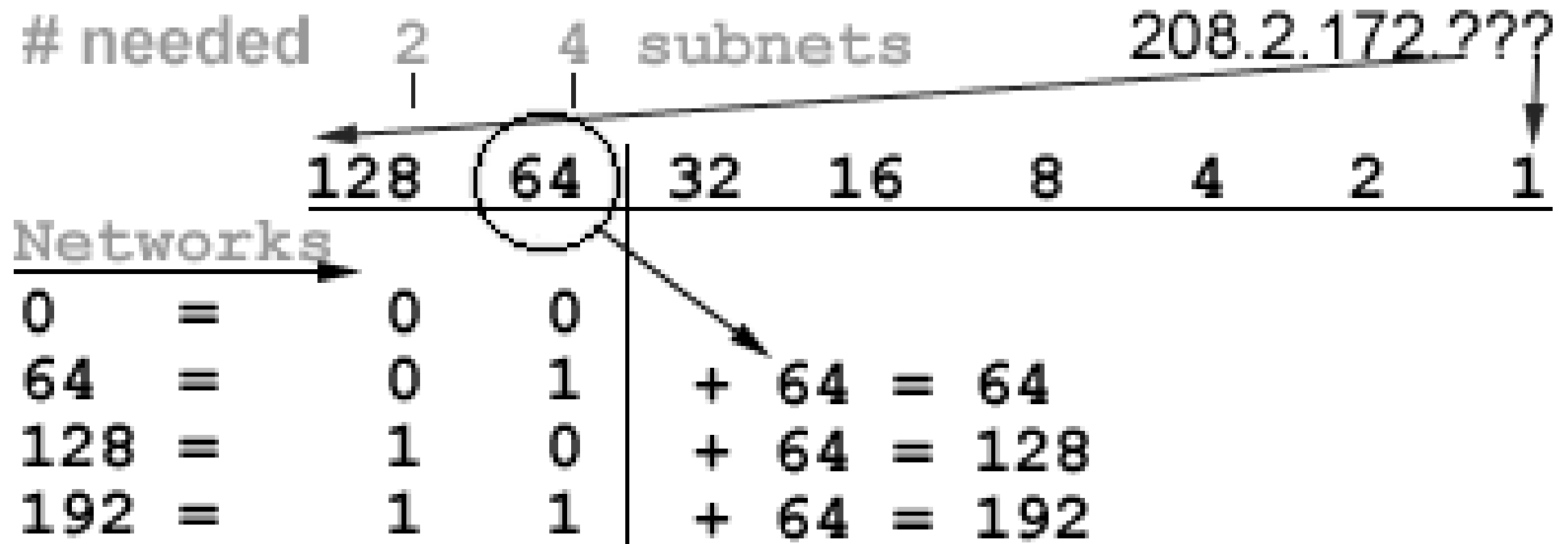
# needed	64	32	16	8	4	2		
	128	64	32	16	8	4	2	1

0	=	0	0	= 62 Hosts
64	=	0	1	= 62 Hosts
128	=	1	0	= 62 Hosts
192	=	1	1	= 62 Hosts

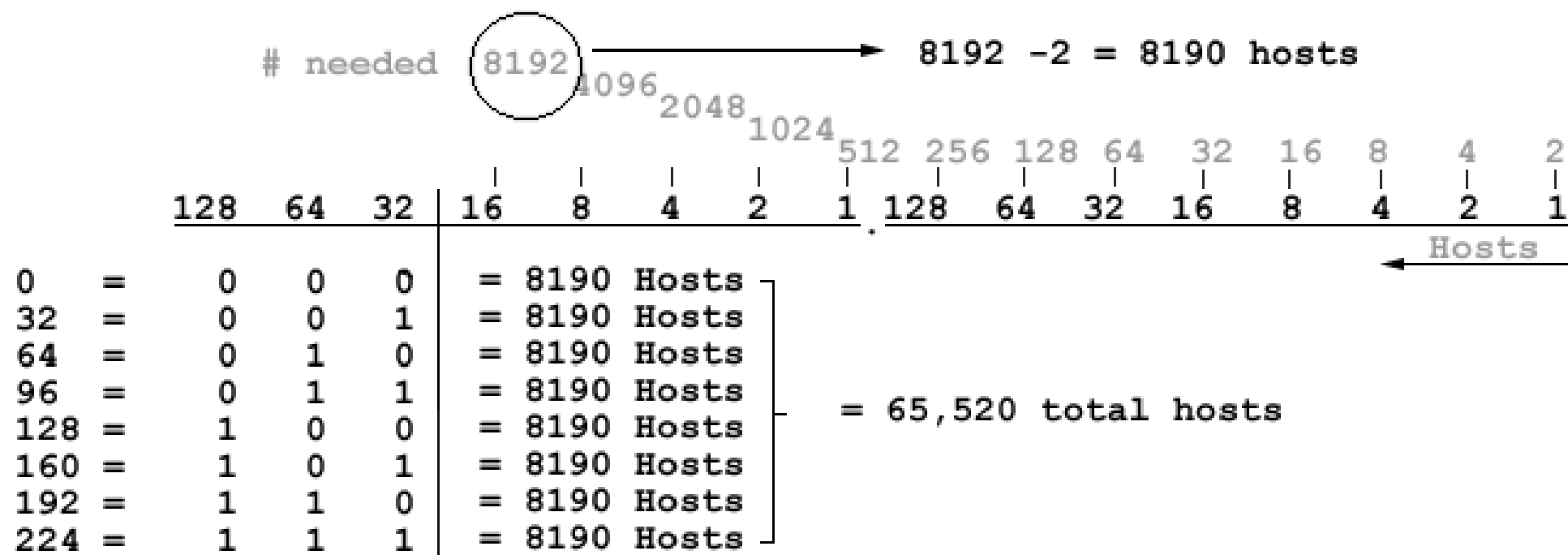
-2 = 64



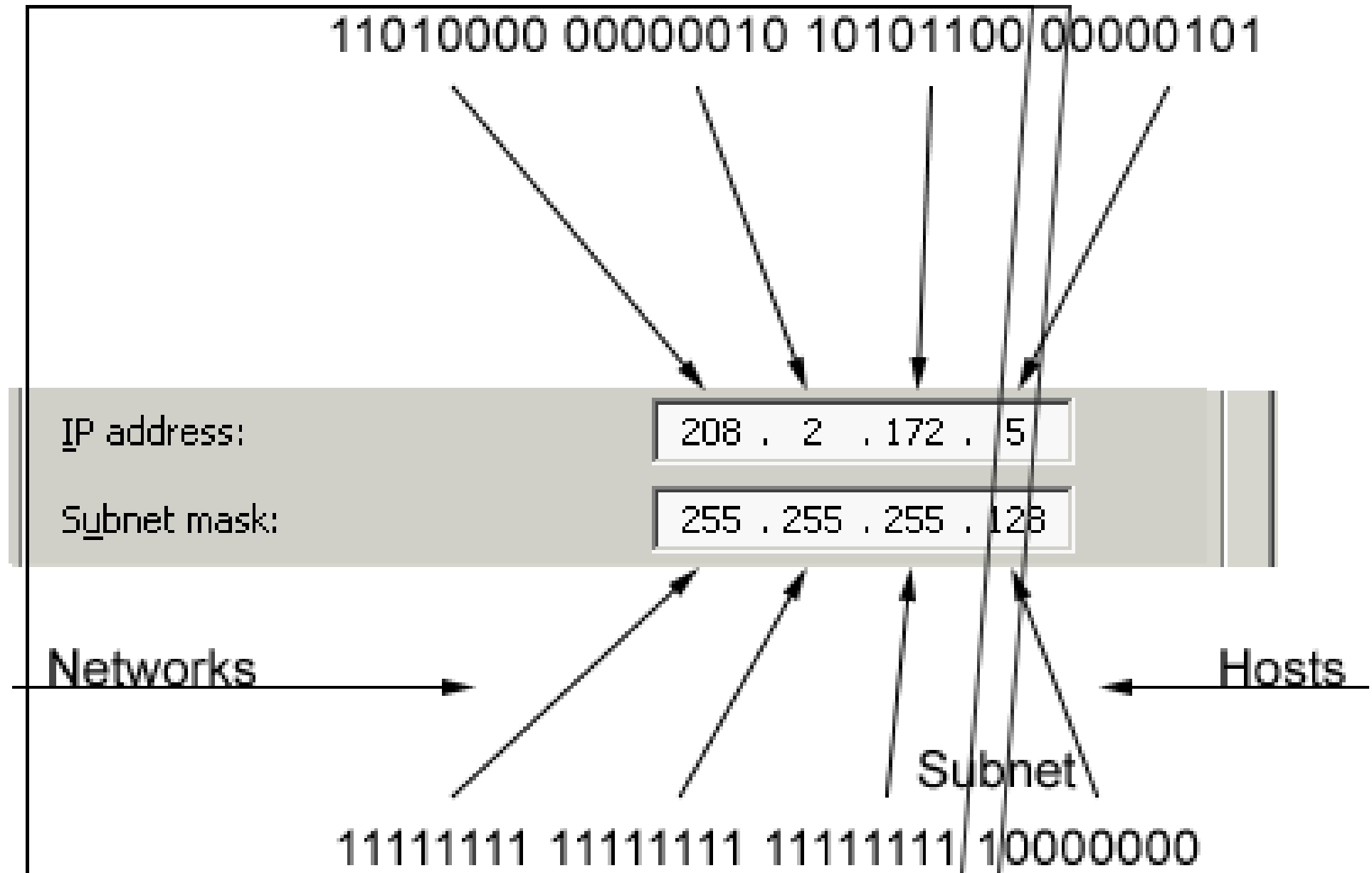
5) What Are Your Subnets?



Counting Hosts



Mask only divides Networks from Hosts



6b) What Are The IP Ranges For Each Subnet? $2n-2$?

IP address:	172 . 16 . .1/254
Subnet mask:	255 . 255 . 192 . 0

	128	64	32	16	8	4	2	1	
Networks	←								→ Hosts
0	=	0	0	0	through	63			
64	=	0	1	64	through	127			
128	=	1	0	128	through	191			
192	=	1	1	192	through	255			

There are only 8 subnets in any octet

# needed	2	4	8	16	32	64	128	256
	128	64	32	16	8	4	2	1
<u>Networks</u>	<hr/>							
→								

There are only 8 subnets in any octet

$$\begin{array}{rcl} 128 & & = 128 \\ 128 + 64 & & = 192 \\ 128 + 64 + 32 & & = 224 \\ 128 + 64 + 32 + 16 & & = 240 \\ 128 + 64 + 32 + 16 + 8 & & = 248 \\ 128 + 64 + 32 + 16 + 8 + 4 & & = 252 \\ 128 + 64 + 32 + 16 + 8 + 4 + 2 & & = 254 \\ 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1 & & = 255 \end{array}$$

What are the slashes about?

Class A	11111111.00000000.00000000.00000000	/8
Class B	11111111.11111111.00000000.00000000	/16
Class C	11111111.11111111.11111111.00000000	/24
Classless IP	11111111.11111111.11111100.00000000	/22

Class A	255.0.0.0	/8
Class B	255.255.0.0	/16
Class C	255.255.255.0	/24
Classless IP	255.255.252.0	/22

6 Questions

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6 Questions

Variable Length Subnet Masking (VLSM)

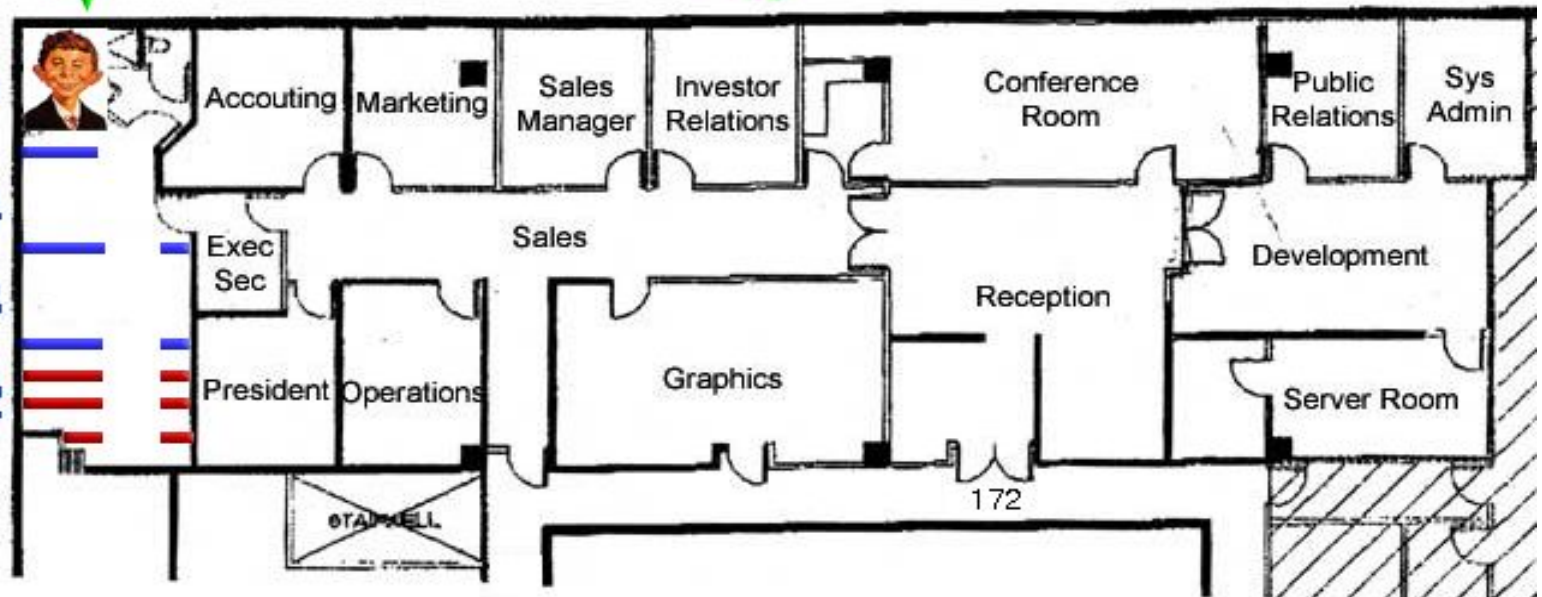
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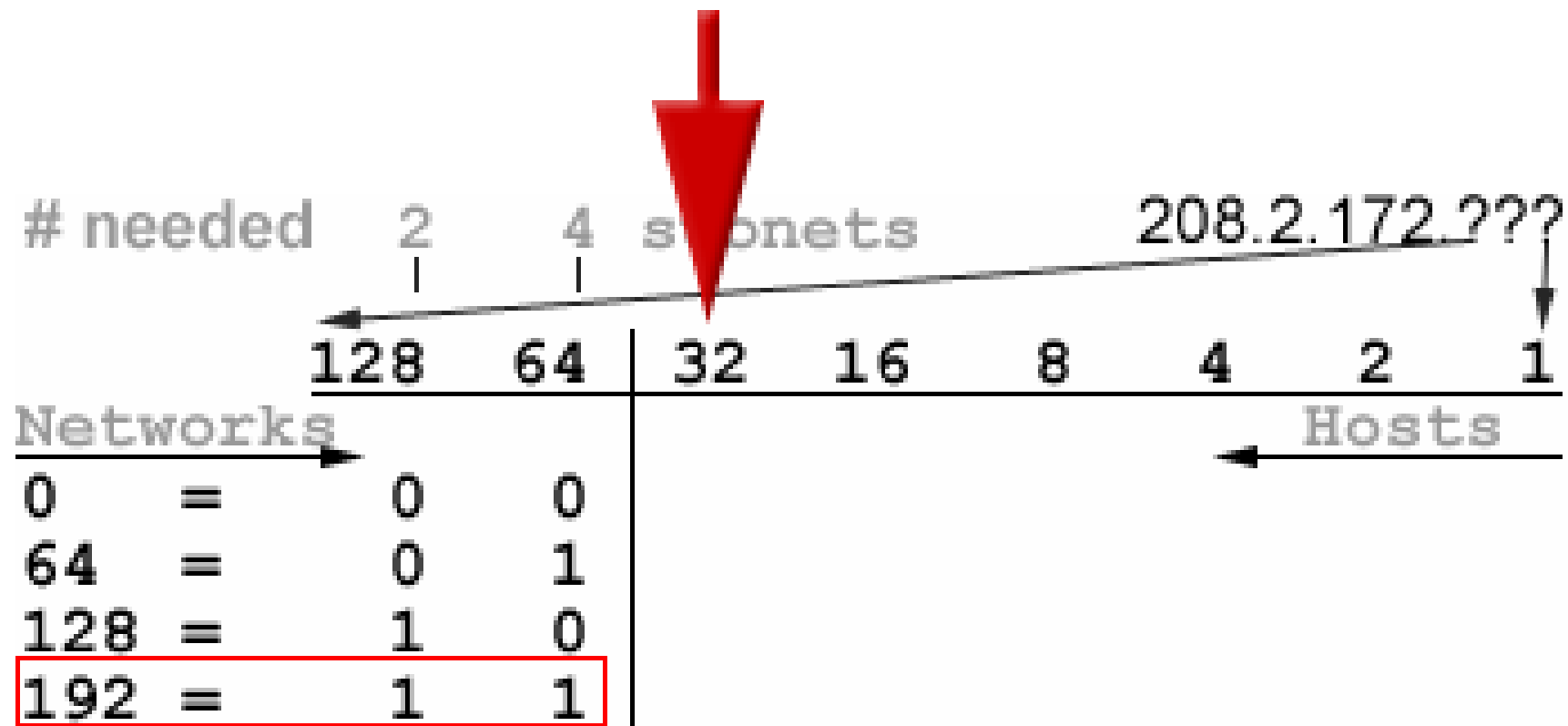
4
Offices

4 More
Subnets



1) How Many Sub-Networks Do You Need? (Start with /26)

192 is effectively 0
Start Here



2) How Many Bits Did You Have To Use?

		2		4		subnets			
						208.2.172 ???			
192									
128	64	32	16	8	4	2	1		
Networks				Hosts					
0	=	0	0						
64	=	0	1						
128	=	1	0						
192	=	1	1						

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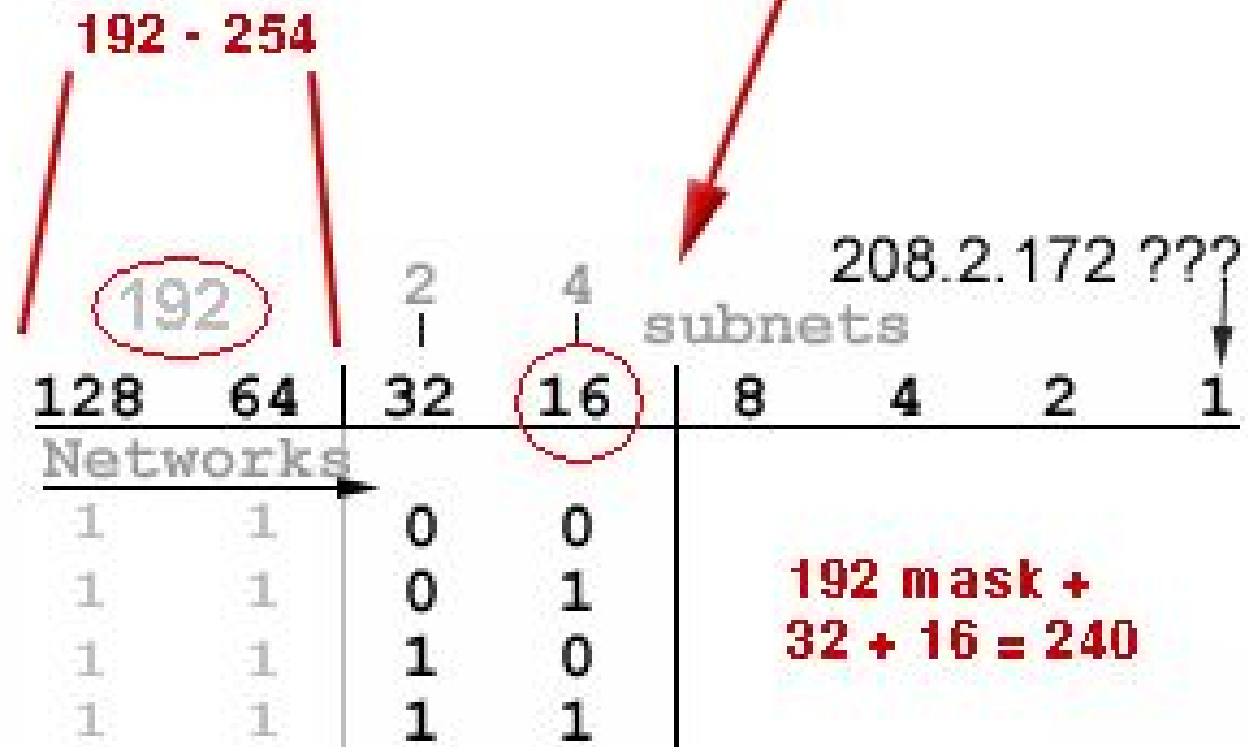
3) What Is Your Subnet Mask?

IP address:

208 . 2 . 172 . 195

Subnet mask:

255 . 255 . 255 . 240



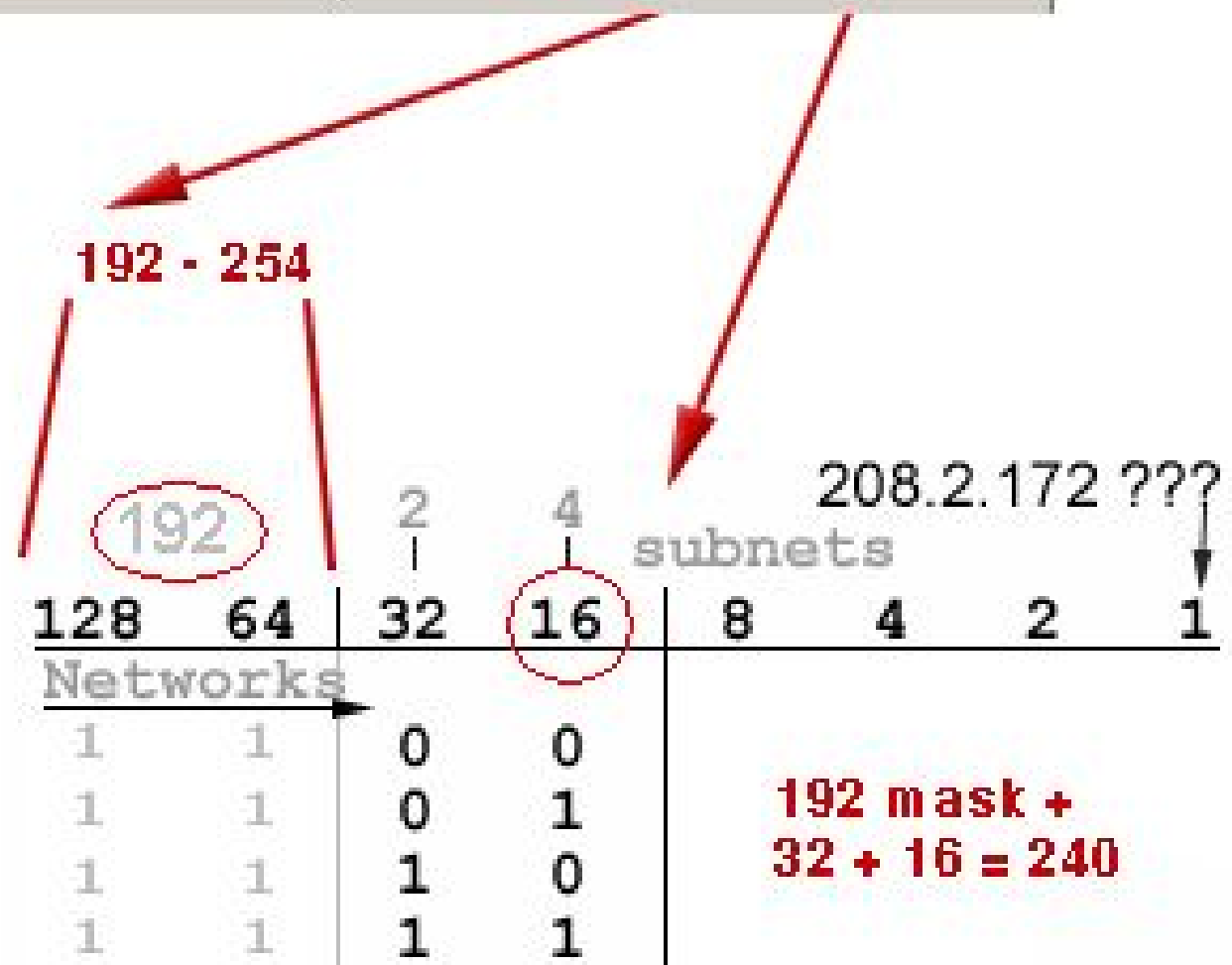
4) What Is Your Block-Size?

IP address:

208 . 2 . 172 . 195

Subnet mask:

255 . 255 . 255 . 240



5) What Are Your Subnets?

IP address:

208 . 2 . 172 . 195

Subnet mask:

255 . 255 . 255 . 240

192 - 254

192

2

4

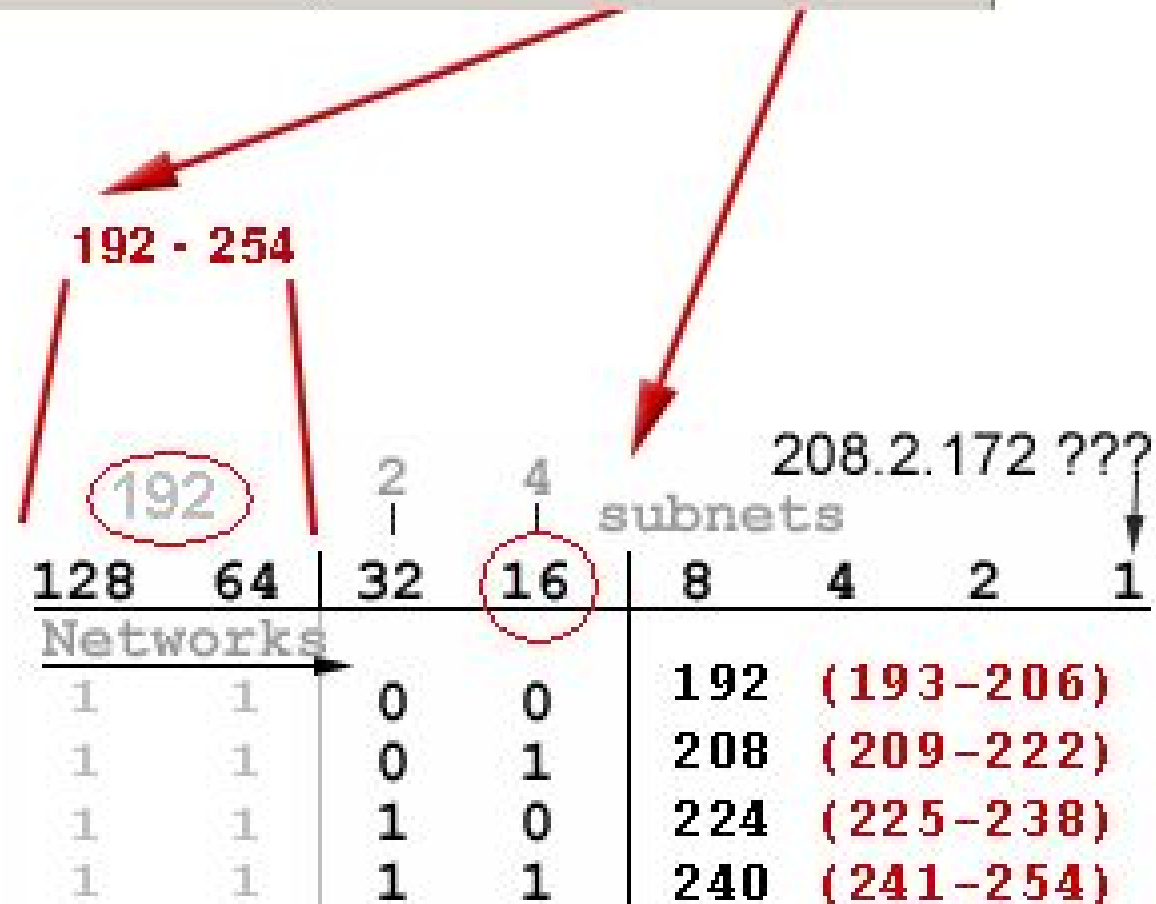
subnets

208.2.172 ???

128	64	32	16	8	4	2	1
Networks							
1	1	0	0	= 192			
1	1	0	1	= 208			
1	1	1	0	= 224			
1	1	1	1	= 240			

6) What Are The Number Of Hosts And IP Ranges For Each Subnet?

IP address: 208 . 2 . 172 . 195
 Subnet mask: 255 . 255 . 255 . 240



6 Questions

Variable Length Subnet Masking (VLSM)

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