# PS4

Started: Nov 3 at 6:09pm

## Quiz Instructions

Even though this is listed as a quiz, it is really a written problem set: it's a quiz due to some limitations of Canvas and to make submission easier.

Please answer the following questions You may have **at most 3 attempts for this quiz/problem set.**  I recommend writing your answers down on paper, then submitting the answers online. I will grade the online submissions only.

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| Question 1 | 6 pts |
|---|---|

What is the address space (i.e., how many addresses) in each of the following systems?

1. a system with 8-bit addresses
2. a system with 16-bit addresses
3. a system with 64-bit addresses

1. $2^8$

2. $2^{16}$

3 $2^{64}$

Edit    View    Insert    Format    Tools    Table

12pt ⌄    Paragraph ⌄    |    **B**    *I*    U̲    A ⌄    ✎

## Question 2                                                                                    4 pts

Change the following IP addresses from dotted-decimal notation to binary

notation:

a. 114.34.2.8

b. 208.34.54.12

1. 01110010.00100010.00000010.00001010

2. 11010000.00100010.00110110.00001100

p                                              ⌨  ⓘ  |  4 words  |  </>  ↗  ⋮

## Question 3                                                                                    4 pts

Change the following IP addresses from binary notation to dotted-decimal

notation:

a. 01111111 11110000 01100111 01111101

b. 10101111 11000000 11111000 00011101

a. 127.240. 103.125

b. 175.192.248.29

p

⌨  ⓘ  | 5 words  | </>  ↗  ⋮

## Question 4                                               6 pts

Write the following mask in slash notation (/n):

a. 255.255.255.0

b. 255.0.0.0

c. 255.255.224.0

a 255.255.255.0/24

b 255.0.0.0 /8

c 255.255.224.0/ 23

p ▸ span

8 words     </>  ↗  ⋮

## Question 5

**4 pts**

Find the range of addresses in the following blocks:

a. 123.56.77.32/29

b. 200.17.21.128/27

a. 7 combos 5 if you get rid of the first and the last bits for maintenance

b. 31 combos 29  if you get rid of the first and the last bits for maintenance

## Question 6                                                    **8 pts**

Find the result of each operation:

- (22.14.70.34) AND (255.255.0.0)
- (12.11.60.12) AND (255.0.0.0)
- (14.110.160.12) AND (255.200.140.0)
- (28.14.40.100) AND (255.128.100.0)

1. 22.14.0.0
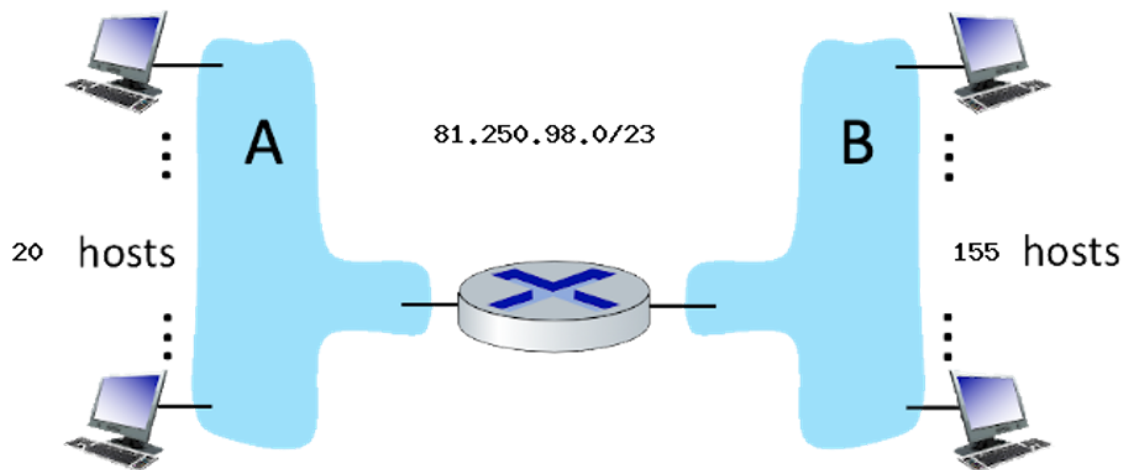
2. 12.0.0.0

3. 14.72.128.0

4. 28.0. 32.0

p                                               ⌨  ⓘ  9 words   </>  ↗  ⋮

## Question 7                                                   **14 pts**

Consider the router and the two attached s

hosts is also shown below. The subnets sh  12pt ⌄   Paragraph ⌄   B  I  U  A⌄  ✎

space: 81.250.98.0/23

A          81.250.98.0/23          B

20  hosts                                      155  hosts

Assign subnet addresses to each of the subnets (A and B) so that the amount of address space assigned is minimal, and at the same time leaving the largest possible contiguous address space available for assignment if a new subnet were to be added. Then answer the questions below.

1. How many hosts can there be in this address space?
2. What is the subnet address of subnet B? (CIDR notation)
3. What is the starting address of subnet B? (assume book idea that the very first address is reserved)
4. What is the ending address of subnet B? (assume book idea that the very last address is reserved)
5. What is the subnet address of subnet A? (CIDR notation)
6. What is the starting address of subnet A? (assume book idea that the very first address is reserved)
7. What is the ending address of subnet A? (assume book idea that the very last address is reserved)

1. $2^9$
2. 81.250.98.0/25

3 81.250.98.1

4 81.250.98.191

5 81.250.98.192/27

6 81.250.98.193

7. 81.250.98.213

p ▸ span          ⌨   ⓘ  1  12 words   </>  ↗  ⋮

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## Question 8                                                    6 pts

An organization is granted the block 130.56.0.0/16. The administrator wants to

create 1024 subnets.

1. Find the subnet mask.
2. Find the number of addresses in **each subnet**.
3. Find the first and the last address in the **first subnet**.

1 . 255.255.0.0

2 64 addresses in each technically 62 if you reserve the first and the last

3 first address: 130.56.0.1 the last one is 130.56.0.63

## Question 9

6 pts

Consider the figure below (of routers and subnets).



180.70.65.128/25

180.70.65.135/25

201.4.16.0/22

m0

m1

m3

201.4.16.2/22

201.4.22.0/24

201.4.22.3/24

m2  R1

180.70.65.192/26   180.70.65.194/26

180.70.65.200/26

Rest of the
Internet
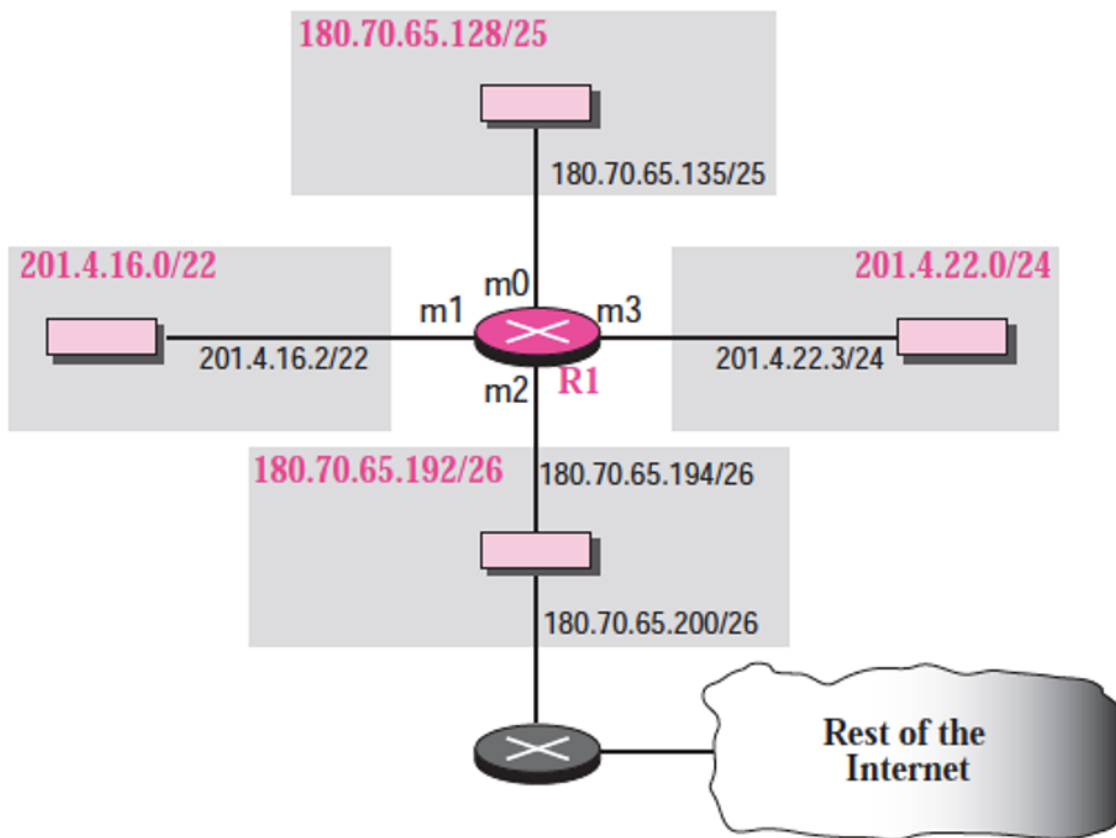
a. A packet arrives at router R1 in the Figure above with destination address 201.4.16.70. Describe how it is forwarded.

b. A packet arrives at router R1 in the figure above with destination address 202.70.20.30. Describe how it is forwarded.

a. r1 would mask ip then check it to all of
then when it reaches m1

b. it would be sent to the router then check it with all of the ips on the network
find that there is not an ip subnet that has the ip meaning that the packet is in the
wrong location and is sent out to the rest of the internet.

Edit   View   Insert   Format   Tools   Table

12pt ∨     Paragraph ∨     B  I  U  A ∨  ✎

p

76 words     </>  ↗  ⋮

No new data to save. Last checked at 7:07pm     Submit Quiz