

Computer Systems – Activities 1

UD 11. COMPUTER NETWORKS



Computer Systems
CFGS DAW

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Nomenclatura

A lo largo de este tema se utilizarán distintos símbolos para distinguir elementos importantes dentro del contenido. Estos símbolos son:

🔔 Actividad opcional. Normalmente hace referencia a un contenido que se ha comentado en la documentación por encima o que no se ha hecho, pero es interesante que le alumno investigue y practique. Son tipos de actividades que no entran para examen

👁 Atención. Hace referencia a un tipo de actividad donde los alumnos suelen cometer equivocaciones.

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Activities

1.1 Activity 1

Indicate if these IP are right or not

- a) 1.1.1.1
- b) 2.2.2.200
- c) 200.260.0.3
- d) 4.4.4.4.4
- e) 5.0.0.300
- f) 256.244.244.4
- g) 700.1000.100

1.2 Activity 2

Indicate if these IP are masks or not. For IP that are mask, calculate the number of computers that we can connect to them.

- a) 255.0.0.0
- b) 255.255.0.1
- c) 255.255.128.0
- d) 255.255.127.0
- e) 255.255.128.15

1.3 Activity 3

Given an IP and a mask, calculate network ID and broadcast address. If mask is not provided use default mask for IP class:

- a) 18.120.16.250: Mask not provided
- b) 18.120.16.255 / 255.255.0.0:
- c) 155.4.220.39: Mask not provided
- d) 194.209.14.33: Mask not provided
- e) 190.33.109.133 / 255.255.255.0:

1.4 Activity 4

We have a 255.255.0.0 mask and we want to create as much subnets as we can. Each subnet needs at least 47 hosts.

How many subnets can we create?

1.5 Activity 5

Our computer has IP 194.100.129.120. If there are 8 subnets, indicate:

a) IP class and default mask

IP class: C

Default mask: 255.255.255.0

b) Mask when net is divided in 8 subnets

To obtain 8 subnets, we have to add 3 bits ($2^3=8$) to the default mask.

11111111.11111111.11111111.11100000 = 255.255.255.224 = $\backslash 27$

c) Network ID and broadcast IP of each subnet

Network ID of each subnet:

11000010.01100100.10000001.00000000 = 194.100.129.0

11000010.01100100.10000001.00100000 = 194.100.129.32

11000010.01100100.10000001.01000000 = 194.100.129.64

11000010.01100100.10000001.01100000 = 194.100.129.96

11000010.01100100.10000001.10000000 = 194.100.129.128

11000010.01100100.10000001.10100000 = 194.100.129.160

11000010.01100100.10000001.11000000 = 194.100.129.192

11000010.01100100.10000001.11100000 = 194.100.129.224

Broadcast IP of each subnet:

11000010.01100100.10000001.00011111 = 194.100.129.31

11000010.01100100.10000001.00111111 = 194.100.129.63

11000010.01100100.10000001.01011111 = 194.100.129.95

11000010.01100100.10000001.01111111 = 194.100.129.127

11000010.01100100.10000001.10011111 = 194.100.129.159

11000010.01100100.10000001.10111111 = 194.100.129.191

11000010.01100100.10000001.11011111 = 194.100.129.223

11000010.01100100.10000001.11111111 = 194.100.129.255

d) Subnet that our IP belongs to

Our IP 11000010.01100100.10000001.01111000 = 194.100.129.120

Is in subnet 11000010.01100100.10000001.01100000 = 194.100.129.96

e) Number of host available to each subnet

There are 5 bits for host. We cannot use Network ID IP and Broadcast IP.

The number of host available is $2^5 - 2 = 30$

1.6 Activity 6

Our computer has IP 172.10.130.4. If there are 4 subnets, indicate:

- a) IP class and default mask
- b) Mask when net is divided in 4 subnets
- c) Network ID and broadcast IP of each subnet
- d) Subnet that our IP belongs to
- e) Number of host available to each subnet

1.7 Activity 7

Our computer has IP 170.10.133.2. If there are 5 subnets, indicate:

- a) IP class and default mask
- b) Mask when net is divided in 5 subnets
- c) Network ID and broadcast IP of each subnet
- d) Subnet that our IP belongs to
- e) Number of host available to each subnet