

Primer control de Xarxes de Computadors (XC), Grau en Enginyeria Informàtica		3/11/2016	Fall 2016
NAME (CAPITAL LETTERS):	SURNAME (CAPITAL LETTERS):	GROUP:	DNI:

Duration: 1h15mn. The quiz will be collected in 25mn. Answer in the same questions sheet.

Test (4 points). All questions may be multiple choices. Count as half if there is one error, 0 if more. Mark the correct answers.

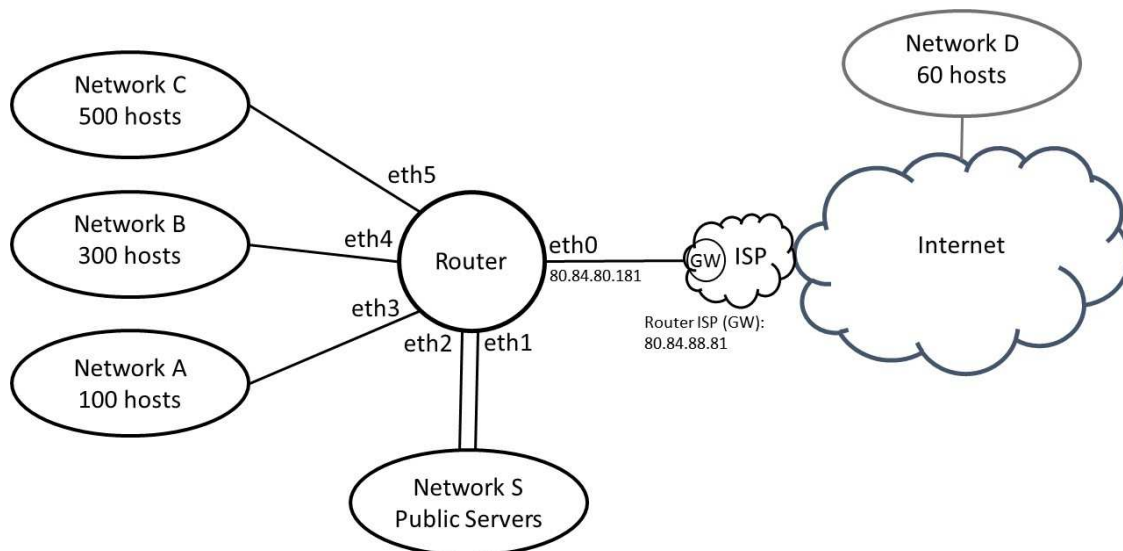
- According to the model TCP/IP if an IP packet is lost into the Internet, the information transported (payload)
 - ☐ Is definitely lost anyway (best effort)
 - ☐ TCP can resend it
 - ☐ IP protocol can resend it
 - ☐ The lower OSI level (Ethernet) can resend it because this level has error control
- Concerning the IPv4 address 192.170.20.128/28
 - ☐ The address 192.170.20.154 is OK as a host
 - ☐ The address 192.170.20.143 is the broadcast
 - ☐ Is a subnetwork address
 - ☐ There are 1 router and 13 possible hosts in the subnetwork
- Regardless of the rules of routing protocol that uses, the addresses 10.0.2.0/24 10.0.3.0/25 and 10.0.3.128/25 can be aggregated in the address
 - ☐ 10.0.3.0/26
 - ☐ 10.0.2.192/24
 - ☐ 10.0.2.0/23
 - ☐ 0.0.0.0/0
- The ARP messages
 - ☐ go encapsulated in a IP packet
 - ☐ carries the information to relate the MAC address associated with an IP address
 - ☐ detect duplicate IP addresses on the same network
 - ☐ update the IP routing tables
- In the IPv4 header
 - ☐ there is a field with the datagram length
 - ☐ it's indicated the protocol transported
 - ☐ the checksum is for all packet content
 - ☐ is not possible to indicate the preference (type of service) of the datagram
- If an IP packet arrives at a router and the routing table has no exit leading destination address
 - ☐ the packet is returned to the source address
 - ☐ a ICMP message is sent to the source with the content "Network Unreachable"
 - ☐ a DHCP transaction is done for resetting the routing table to continue
 - ☐ the router discards the datagram
- In a router with NAT
 - ☐ The source address of the datagrams out of the private network is changed by a public address
 - ☐ A server connected in the private network is accessible from the internet with DNAT
 - ☐ With a dynamic NAT a different public address is associated respectively with a different private address
 - ☐ If ISP is changed it's necessary to change the private address
- Concerning RIP
 - ☐ Count to Infinity allows to overcome metrics 16
 - ☐ If a router is connected to the same network from another router, the RIP metrics between them is 0
 - ☐ Split Horizon allows to send in the Updates the entries referred to the gateway located in the interface where Update is sent
 - ☐ RIP Updates use UDP

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Problem (4.5 points)

The figure shows the network installed in a company and its connection to the Internet.



The internal network uses private addresses. The public IP address of the router is 80.84.80.181 and the IP address of the ISP router is 80.84.88.81.

a) (0.5 points) What is the longest subnetwork mask that may be applied to the ISP's network?

The configuration for subnetwork A is 192.168.180.0 with its corresponding network mask.

b) (0.5 points) What is the corresponding network mask?

Network S connects the public servers and it is configured with two IP addresses for each server. The public addressing is 180.180.180.240/28 via the router's interface eth1 and the private addressing is 192.168.180.240/28 via the router's interface eth2. In this way, the servers are accessible from the Internet using their public IP and from the rest of the company's hosts via their private IP addresses. The address for the web server are 180.180.180.245 and 192.168.180.245, respectively.

c) (0.5 points) How many server can be allocated in subnetwork S?

d) (0.5 points) Define the addressing for networks B and C using private IP addresses that are consecutive to those of subnetwork A.

e) (0.5 points) Which router's interfaces should perform NAT (PAT)?

- f) (1 point) Define the Access Control List of the Firewall for interface eth1 so that: i) only the external clients are allowed to connect to the web server (port 80) and, ii) all the company's devices (in networks A, B and C) may "ping" the servers at their public address. Complete the following table using the fewest number of rules.

[illegible]

- g) (0.5 points) The company's network expands to a remote site where subnetwork D is set up with a /26 network mask. As there are some remaining IP addresses in subnetwork A that are not used (subnetwork A uses part of the 192.168.180.0/24 block only), assign a suitable range of IP addresses for subnetwork D.
- h) (0.5 points) In order to connect subnetwork D to the central office an IP tunnel is set up from router R to the remote router. The tunnel is configured using the addresses 10.0.0.0/30. Complete the routing table of router R specifying the tunnel configuration.

[illegible]

