Tercer Control Xarxes de Computadors (XC), Grau en Enginyeria Informàtica		20/12/2018		Tardor 2018
Nom:	**Cognoms:**	**Grup:**	**DNI:**	

Durada: 1h. El test es recollirà en 20 minuts. Respondre en el mateix enunciat.

Test. (4 punts). Totes les preguntes poden ser multi-resposta. Valen la meitat si hi ha un error, 0 si més. Marqueu la resposta correcta.

1. Regarding the DNS protocols:
   - ☐ The DNS is a protocol of the network layer.
   - ☐ The iterative resolution is applied once the recursive resolution has been completed.
   - ☐ In the iterative resolution of pc.domain.com, you do not go to the .com name server if you already have the information in the cache of the local name server.
   - ☐ When a request is made, the domain name from which we want to know its IP is included in the UDP datagram.

2. Regarding the information in the DNS:
   - ☐ DNS messages start with a Header field, which indicates the type of message.
   - ☐ The QType "MX" identifies the domain name server.
   - ☐ The QType "A" is the one used to obtain the IP address of a machine from its name.
   - ☐ Resource Records have a field that indicates the number of seconds that the record can be saved in the cache.

3. Regarding the mail protocol:
   - ☐ The SMTP protocol allows sending messages as well as retrieving them from a mailbox on a server.
   - ☐ This is a possible sequence of commands sent in SMTP (not including the answers): "HELO", "MAIL", "RCPT".
   - ☐ With POP3, a user can download copies of the messages he has received.
   - ☐ With Webmail, the only protocol that implements the machine with which the user interacts is HTTP.

4. Regarding the SMTP protocol and the format of the messages:
   - ☐ The Header and the Body are separated from each other with a blank line.
   - ☐ The subject of a message is encoded in a special element of the Body.
   - ☐ The only way to know where one Header field ends and another begins is because they are on different lines.
   - ☐ When the machine sending a message with SMTP has finished sending it, it generates a DATA message to end the communication.

5. Regarding MIME:
   - ☐ The only advantage of using MIME is being able to indicate the Content Type.
   - ☐ A multi-part MIME message defines a boundary to separate the various parts. The value of that boundary is defined by the standard.
   - ☐ audio, image and video are valid Content Types of MIME.
   - ☐ base64 is one of the possible Content-Transfer-Encoding.

6. Regarding the HTTP protocol:
   - ☐ To send a file with HTTP we have to use the GET method.
   - ☐ The HTTP response starts with a "status" line.
   - ☐ A Uniform Resource Identifier (URI) is a particular case of Uniform Resource Locator (URL).
   - ☐ The Entity Tag (ETag) element of the HTTP header allows to identify content that we have previously downloaded.

7. Regarding the HTTP protocol:
   - ☐ The HTTP GET method should be used when the content of the server is not going to be modified, while POST is the one to be used otherwise.
   - ☐ “Persistence" in HTTP refers to keeping the TCP connection open after receiving the response from the server.
   - ☐ The first version of HTTP was not used until about 5 years ago.
   - ☐ As in the format of the messages on the Internet, in HTTP the Header and the Body are separated with a blank line.

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Name:	**Surname:**	**Group**	**DNI:**

Duration: 1 h. The quiz will be collected in 20 min.

P1. The user Tom wants to send an email that contains a text and two images from his account tom@metro.com to jerry@goldwyn.net, with a copy to butch@metro.com and a blind copy to spike@mayer.net. The Tom's client application uses mail.metro.com as both SMTP and IMAP server. The Tom's host has been configured using the DHCP server hosted in his ADSL router and received an @IP and a mask, a name (host27.mobis.cat) and two @IP addresses for the local primary and the secondary DNS servers, 88.8.8.8 and 88.9.9.9, respectively.

a) (0,75 points) Assume that the Tom's host has just been switched on and its DNS cache is empty. Determine the steps required by the host in order to send the email to its local mail server

Source Name/ IP	Destination Name/IP	Application level protocol	Description of the message

b) (1 point) Details the sequence of SMTP messages between the Tom's client and its local mail server.

Source	Destination	SMTP message

c) (0,25 points) Determine in which part or parts of the SMTP messages sequence the email spike@mayer.net is present

d) (1 points) Assume that the email is now in the server mail.metro.com. Determine the steps that this server has to perform to deliver the email to all destination mail servers. Assume that the DNS server of metro.com has this @IP 100.1.1.1

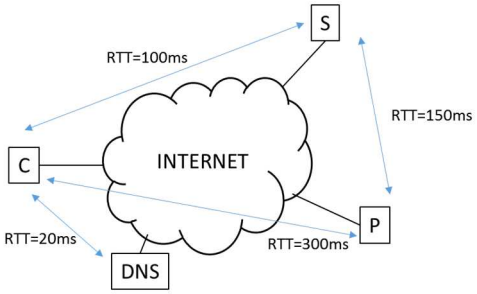
Source Name/IP	Destination Name/IP	Application level protocol	Description of the message

Third Midterm. Xarxes de Computadors (XC), Grau en Enginyeria Informàtica		20/12/2018	Fall 2018
NAME (in CAPITAL LETTERS):	FAMILY NAME (in CAPITAL LETTERS):	GROUP:	DNI/NIE:

Time: 1hour. The quiz will be collected in 20 minutes.

Problem 2 (3 points)

An http client C downloads a web page from server S.
The web page (index.html) contains an image with the "logo" and 5 images retrieved from server P.



The figure shows the RTT ("*round-trip time*") between devices. For simplicity, consider one RTT for the TCP connection establishment. Once the connection is setup, the downloading time for each object is: home page 240ms, logo 100ms, and 2000ms for each of the images. The downloading time includes the initiation of the TCP connection termination, if this is the case.
Compute the total downloading time of the full page including the images in the following scenarios. Complete the corresponding table with the sequence of protocols and connections (DNS, TCP, HTTP) with their corresponding time. In the column for HTTP protocol, include the corresponding object (i.e.: index, logo, img1, etc.)

a) (1 point) The client uses non persistent HTTP and supports one TCP connection at a time.

Protocol		TCP	HTTP							
File			index							
Time		100	240							

Protocol										
File										
Time										

Temps total:

b) (1 point) The client uses persistent HTTP (without *pipelining*) and supports one TCP connection at a time.

Protocol									
File									
Time									

Protocol									
File									
Time									

Temps total:

c) (1 point) The client uses persistent HTTP (without *pipelining*) and it can establish as many TCP connections in parallel as needed.

Protocol								
File								
Time								

Temps total: