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# COMP90007 Internet Technologies

## Week 11 Workshop

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Semester 2, 2020

*Suggested solutions*

# Question 1

What are the disadvantages of having only one central DNS server that serves all machines connected to the internet?

Ans. Some of the disadvantages of a single DNS are:

- Single point of failure
- Traffic congestion at server
- Distant centralised server for remote queries
- Maintenance issues, not only for keeping large amount of data upto date but also the prospect of simple service maintenance could cause big disruptions.
- May not be able to service all queries fast enough, also scaling on the computation front may be an issue.

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## Question 2

What does iterative mode of execution when querying a DNS mean? Where is it used? What is the recursive mode? Please explain with an example.

Ans. Iterative queries are requests that are propagated from one name server to another, gathering partial results in the form of which name server might know the location of the authoritative record till we reach that location. At which point, we return the final answer (Resource record mapping) to our end user who requested the domain initially, this is referred to as recursive, where we return the final answer only to the end user and not partial answers.

Recursive queries are when a local PC/device delegates to local server the DNS query to recursively follow-up the query with other servers in the DNS system.

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## Question 3

What is non-persistent HTTP connections? Explain with an example request.

Ans. Sessions where only one object/response is returned and a new connection is established for every response to be provided.

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## Question 4

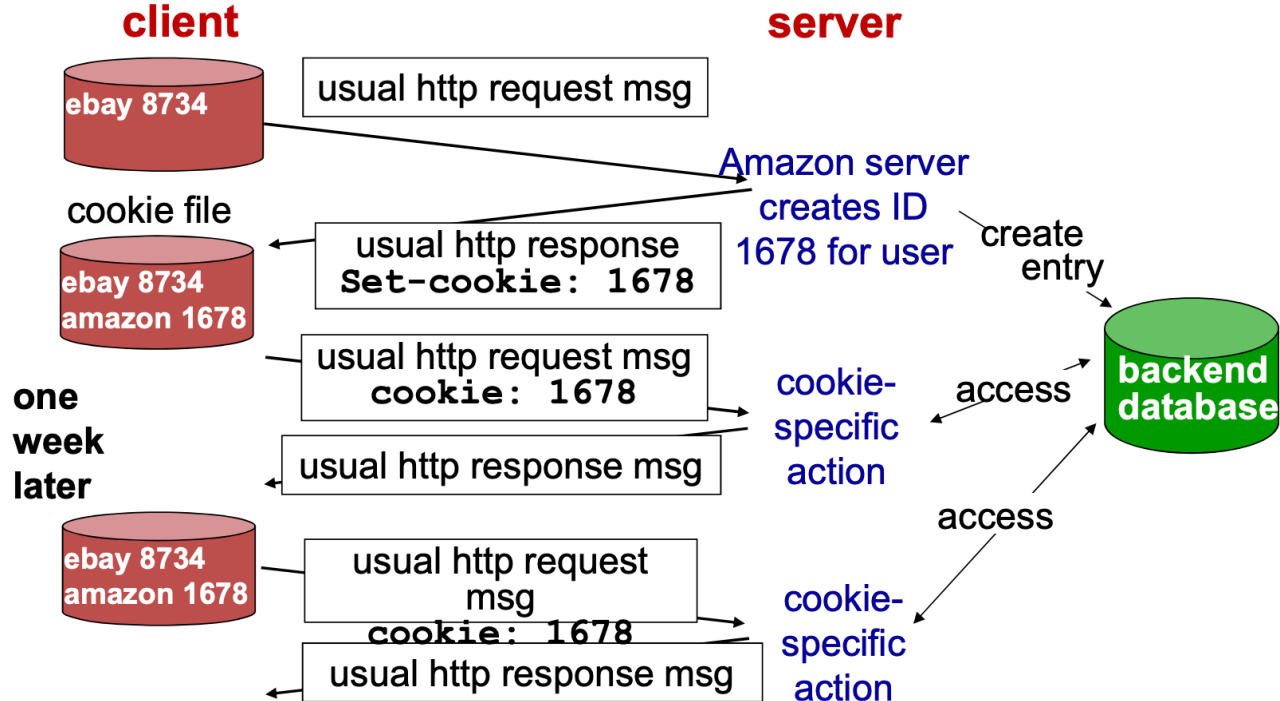
What are the benefits of a persistent HTTP connection?

Ans. A connection established remains open for some time after the transmission of an object, allowing multiple objects to be sent using the same connection as opposed to tearing down an existing connection and recreating it for every response to be sent.

# Question 5

Give an example execution of an HTTP request with a cookie being used?

Ans.



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## Question 6

Web Caching can cause problems such as stale data being served to clients. What are the benefits of web caching?

Ans.

- Reduced response time to distant servers.
- Reduced traffic to congested servers.

# Question 7

What is perceptual coding in terms of compressing media to deliver data over the internet? Give two examples?

Ans. Perceptual coding is that some media content such as audio can be coded into digital form without loss of any perceived quality. For example some sounds can mask other sounds for human hearing and at that point those sounds that are identified can be used to reduce the data size to be transmitted. For example -  
Frequency masking: Some sounds at certain frequencies can mask/hide others so there is no point encoding the ones humans cannot hear.

Temporal masking: Human ears can miss soft sounds immediately after loud sounds, takes time for the ear to adjust, so no need to put these in the compressed data as well.



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## Question 8

What is SMTP protocol and where is it used?

Ans. SMTP is an application layer protocol for mail transfer. It is used from the user agent to the MTA and between MTAs.

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## Question 9

What are the two missing layers of the OSI protocol that we did not see in the Internet so far? Give one service for each.

Ans. Presentation and Session Layer.

Services can be: formatting, encryption, compression for presentation layer and authentication, authorization, session management for the Session layer.