Feedback — Homework 8

Help

You submitted this homework on **Sun 16 Mar 2014 11:38 AM PDT**. You got a score of **5.00** out of **6.00**. You can attempt again, if you'd like.

Question 1

This question explores the basic process of DNS resolution in the case that there is NO caching. We recommend that you draw a diagram of the resolution and use this diagram to select your answer to the question.

A host **alice.uw.edu** uses a local, newly started DNS name server to resolve the host **www.bob.com** to an IP address. *Which answer best describes the sequence of address (A) and nameserver (NS) resolutions that are found?*

Your Answer		Score	Explanation
○ com(A), bob.com(A), www.bob.com(A).			
◉ com(NS), bob.com(NS), www.bob.com(A).	✔	1.00	Yes
○ alice.uw.edu(A), uw.edu(NS), edu(NS), root(NS), com(NS), bob.com(NS), www.bob.com(A).			
○ uw.edu(NS), edu(NS), com(NS), bob.com(NS), www.bob.com(A)			
Total		1.00 / 1.00	

Question Explanation

Resolution proceeds downwards from the root, which is already known. Each level supplies the resolution of either the nameserver for the next level to make forward progress (e.g., root supplies the nameserver for com) or the requested resource itself (e.g., foo.com supplies the address for www.foo.com). Omitted for simplicity is the fact that the address of nameservers for a domain is also supplied (as well as their name) so that they can be reached.

Question 2

This question tests your understanding of the process of DNS resolution when CACHING is used. Assume that nothing is cached before the first query. To model the cache, consider only one nameserver (NS) record for each nameserver and one address (A) record for each host. To roughly estimate resolution performance consider that each message exchange with any remote server takes 1 RTT, no messages are lost, and other times are negligible. We recommend that you draw a diagram of the resolution and use this diagram to select your answer to the question.

A host **alice.uw.edu** uses a local, newly started DNS nameserver first to resolve the host **evan.mit.edu** to an IP address, and second to resolve the host **fred.uw.edu** to an IP address.

Select ALL the statements that correctly describe the resolution process that happens.

Your Answer		Score	Explanation
☐ Caching saves two message exchanges for the second resolution.	✔	0.25	No, it saves one exchange to learn edu(NS).
☐ Caching saves no message exchange for the second resolution.	✔	0.25	No, it saves one exchange to learn edu(NS).
☑ The first resolution will take up to roughly 3 RTTs.	✔	0.25	Yes, for the resolutions of edu(NS), mit.edu(NS), and evan.mit.edu(A), assuming the name servers are on different machines.
☑ After the first resolution, the cache at the local nameserver contains three entries.	✔	0.25	Yes, they are edu(NS), mit.edu(NS), and evan.mit.edu(A).
Total		1.00 / 1.00	

Question Explanation

Each name resolution proceeds from the known root down levels until the final resolution, except that locally cached levels do not require a remote message exchange. All parts of a resolution are cached (e.g., foo.com(NS)) and not only the final answer (e.g., www.foo.com(A)). Note that the domain name of the client is not relevant to the answer. The root is not considered part of the cache since it is fixed by configuration. Omitted for simplicity is the fact that the address of nameservers for a domain is also supplied (as well as their name) so that they can be reached.

Question 3

This question explores how different transport protocols fit the needs of applications in the context of the DNS. The DNS protocol normally runs over UDP for name resolution, but it can be run over either UDP or TCP as needed. *Consider the implications of using either UDP or TCP for DNS operations.* Check ALL the statements that are correct.

Your Answer		Score	Explanation
☐ TCP is the best choice for good performance with short (single packet) queries and replies.	✔	0.25	No, because compared to UDP it adds delay and reduces the scalability of nameservers.
☑ With UDP and iterative queries, nameservers do NOT need to maintain state about ongoing queries; they can fully process each query as it arrives.	✔	0.25	Yes, this is what the root name servers do for scalable performance.
☐ The latency of name resolution is lower with TCP	✔	0.25	No, TCP adds a delay to set up a connection.
☑ The latency of name resolution would be 1 RTT higher with TCP.	✔	0.25	Yes, because TCP has a delay to set up a connection.
Total		1.00 / 1.00	

Question 4

This question asks you to explore the performance of HTTP/1.0 versus HTTP/1.1. Consider a simple experiment in which a single connection at a time is used to fetch web resources from a single server using either HTTP/1.0 or HTTP/1.1. Ignore server processing times and caching effects.

Suppose page C is made up of **1 small resource** while page D is made up of **8 small resources**. All resources are the same size. In experiment I, page C is fetched **8 times with HTTP/1.0**. In experiment II, page D is fetched **once with HTTP/1.1**. *Which experiment is faster, and why?* Assume there are no parallel connections. Select the single best explanation.

Your Answer	Score	Explanation

○ Experiment I is slower because it does not use HTTP/1.1.			
◉ Experiment I is faster because the pages do not have resource dependencies and the total size is equivalent.	✖	0.00	No, there is no resource dependency issue and HTTP/1.1 provides the benefits of pipelining over a single connection.
○ Experiment II is faster because the 8 resources are fetched with pipelining over a single connection.			
○ Experiment II is faster because it uses HTTP/1.1.			
Total		0.00 / 1.00	

Question Explanation

Make sure you understand the differences between HTTP/1.0 and HTTP/1.1. Draw a diagram of the fetches while thinking about the overheads of connections and slow-start in each case.

Question 5

CDNs and proxy caches both reduce Web page load time (PLT). This question asks you to compare the techniques as they are commonly used. *Check ALL statements that are correct.* Statements about "reducing PLT" mean reducing PLT by using CDN or proxy caches as appropriate compared to the alternative of fetching the page from the origin server (in the case that there were no CDN or proxy cache).

Your Answer		Score	Explanation
☐ A proxy cache reduces PLT for all clients in the Internet accessing servers in its organization.	✔	0.25	No, proxy caches are deployed by organizations to assist only their clients.
☐ For a CDN to reduce PLT for a server, it should have a node placed	✔	0.25	No, it is the location of the client with respect to the node that is important for

near the origin server.			reducing PLT.
☑ For a proxy cache to reduce PLT for a client, it should be placed near the client.	✔	0.25	This is true; otherwise fetching a page from a distant cache will not reduce PLT.
☑ A proxy cache reduces PLT for all clients in its organization accessing all servers in the Internet.	✔	0.25	Yes, proxy caches are deployed by organizations to assist their clients with all web activity.
Total		1.00 / 1.00	

Question 6

Content distribution may be accomplished today with either peer-to-peer systems such as BitTorrent or CDNs. This question asks you to compare BitTorrent with CDNs. *Select ALL the statements that are correct.*

Your Answer		Score	Explanation
☑ The total amount of content that BitTorrent can deliver depends on the access links of the participating users.	✔	0.25	Yes, since these links are used for both upload and download.
☑ CDNs use a clients Internet access link only for the download of content to the client.	✔	0.25	Yes
☐ The total amount of content that CDNs can deliver depends primarily on access links of a typical client.	✔	0.25	No, it depends primarily on CDN node placement within the Internet backbone.
☐ CDNs use a client's Internet access link for both upload and download of content.	✔	0.25	No, CDNs are primarily used to download content to hosts.
Total		1.00 / 1.00	