

Part I- Theory**1. Project 2.1:**

Q: If the DNS service stopped working, would you still be able to surf the Web? Explain why or why not.

A: In my opinion, it depends. DNS service functions as a large mapping database, which records the relationship between domain name in URLs and specific IP addresses. Instead of making a query request to root name server every time people try to access a link, every user linked to internet has their own DNS database cache, i.e. when user establishes connection to a website, the cache will record this mapping between domain and IP address until next update. Therefore, if this mapping remain active and effective, user could still surf the website they ever accessed.

However, if the target website has a dynamic IP address and the cache database is outdated, unfortunately DNS service stops working at the same time, user will not be able to query a series of name servers or resolve domain name to IP addresses. In this case they might not be able to surf web using URL. Nevertheless, if they do know exactly the IP address of target website or resources, I think they could still connect to it and surf the web in a different way.

2. Project 2.4:

Q: What port numbers are implied by each of the following URIs and why:

1. <https://paypal.com>
2. <http://mysite.com:8000/index>
3. <ssh://root@cs.berkeley.edu/tmp/file> (HINT: recall that the IANA establishes default port numbers for various network services.)

A: According to http://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers, the answers are given as follows.

1. https uses TCP with port number 443.
2. the website uses port 8000 for itself.
3. ssh uses TCP/UDP with default port number 22.

3. Describe why TCP can be considered a “better” protocol for the Transport Layer.

Describe why UDP can be considered a “better” protocol for the Transport Layer. (10 points)

A: These two protocols are designed for different requirements and circumstances. TCP is more of a handshake protocol, it provides reliable, ordered and error checked delivery. For example, when data integrity, guarantee, and security are considered the most important requirements, such as bank transfer and message sending, TCP is a better protocol.

However, when speed surpasses reliability as priority key here, application would prefer connectionless UDP. Comparatively, UDP reduces latency and is thus faster. FPS games and video streaming could be examples where UDP is a better protocol.

4. HTTP is a stateless protocol. Give two options that we could devise to keep track of users and their state. (10 points)

A: One option is to store cookies so that user behavior would be recorded and tracked. Examples can be found at online shopping websites such as amazon. Another option is to use URL. Simply appending data to the URL, when different users are browsing the same webpage, they will be assigned different URLs specifically to themselves. Other options could be using certificate that functions similarly as cookies, or hiding tracking information under HTML headers. However, I personally believe that all these behaviors should be agreed by the current user.

PartII- Webpage: <http://www.seas.upenn.edu/~zhili/lego.html>

PartIII- Calendar: <http://www.seas.upenn.edu/~zhili/calendar.html>