Assignment 3

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1. HTTPS service provides web services with access to all types of DNS records, avoiding some limitations of existing browser (or web app), which mostly support only host-to-address lookups.
2. Two disadvantages:
    a. If DoH turned on by default in web browser it means that all DNS queries are relayed to the fixed DNS server, which may not default organization's (even proxy) own DNS server, or even by the provider DNS server.
    b. DoH has a negative impact on cyber-security. By encrypting DNS queries, IT administrators using DNS monitoring for cybersecurity measures will lose visibility into data such as query type, response and originating IP that are used to determine cyber-attacks.
3. Possible solution for b):
   We can try to modify DNS queries to first load a network sign-on page for new users and then pass to DNS over HTTPS.
4. a. DoH implementation within an application
    Advantage - Using this method you can submit queries by skipping the DNS protocol of our operating system.
    Disadvantage- The disadvantage is actually quite large because after performing the operation. the app does not inform the user about the skip that Performed.
   b. DoH implementation proxy network
    Advantage - The use of this method is completely visible to the end users and actually provides a safe feeling
    Disadvantage - Is not encrypted and exposed to a third party.
   c. DoH proxy a local
    Advantage - Unlike network DNS requests are encrypted as soon as they leave the computer and thus are not exposed to a third party.
    Disadvantage - Requires more resources because it needs to be applied in any local environment .
   d. doh implementation with plugin on computer
    Advantage - You can configure once for all applications, instead of configuring each application that supports DNS separately.
    Disadvantage - In large organizations when there is a large number of computers, it is necessary to configure each computer.
    It's ineffective.

   The question of which of the methods is the best, in our opinion is not correct because it depends on the use (individual or organization) but if we had to choose one method we would choose to install a plugin that implements the doh at the computer settings level. Because this method is efficient and does not require setting up each application individually and saves time for the private user.

5. TCP actually allows DoH to perform better than Do53 In terms of page load times, Although the higher response times. Especially when there is a case of a significant packet loss.
   In DO53 there is a minimum time limit for retransmission of query that failed the transfer. however, In DOH which is from TCP configuration DoH packets may be automatically retransmitted after only double speed time.
   Thus DOH is more efficient in this respect.