

## Ex4:

### Part A: DoH

1. One advantage to the DoH - its helps to hide your online activities, and avoid your service provider peeking into your traffic.  
When users enters a URL into their browser, a DNS query is usually needed in order to get the IP address.  
If DNS server isn't existing on the local network, the request has to pass through the internet server provider's network.  
It means for example that that an ISP can see which sites you were visit, by monitoring DNS name resolution requests.  
DoH hides the name resolution requests from the ISP and from anyone listening on intermediary networks.
2. Disadvantage:
  - 2.1 Because the DNS request has to go over HTTPS, it may take a little longer for your packet to go across the internet than if it used HTTP.
  - 2.2 It weakens cyber-security-by encrypting DNS queries, companies using DNS monitoring for cyber security measures will lose visibility into data such as query type, response and originating IP that are used to determine bad actors.
  - 2.3 It overrides any sort of DNS filtering your network is doing to provide insight into security and your network info
  - 2.4 The ISP will not get the information about the DNS queries and sites we want to travel, and will be unable to provide us  
With the right kind of service, that because the DNS queries will be send encrypted and not necessarily through the ISP DNS Server.
3. We will choose disadvantage 2.4. If we will implements DoH by application level , the ISP will not be able to see the details of the DNS query but although there are still many other protocols send in web browsing such as TCP which can provide the ISP with enough info to provide good service although the DNS query being Encrypted Or not sent by Default ISP DNS Server.
4.
  - a. advantage: the browsers could perform queries by bypassing the operating system's DNS functionality.  
con: the application doesn't know if its bypass over DOH queries.
  - b. advantage: the client systems continue to use DNS for queries that asking the local name server and then replies via DOH by reaching DOH servers  
con: the end user is transparent.
  - c. Advantage: the system is configured to sent DOH proxy queries instead of sending DNS queries trough certain port (53 or 853).  
con: proxy must be installed locally on each system, in large organizations it requires a lot of work.
  - d. Advantage: all the queries goes through a certain plugin which manage DOH.  
Con: not all applications know how to connect the plugin  
We think that option b is the best
5. DOH has a follow-up that all the material that is supposed to be sent is sent, and if not it will be sent again.

## Part B:

packet loss:

10%

```
Size of bytes: 1048682
Size of bytes: 1048576
Size of bytes: 1048629
Size of bytes: 1049494
Size of bytes: 1048576
Avarage time - reno: 92.445200 ms
itay@itay-Ubuntu:~/Desktop/Share/Networking/Ex3/316451749/316451749$ ./Measure
----- Socket created SUCCEES -----
----- bind SUCCEES -----
----- Listening SUCCEES -----
Size of bytes: 1049465
Size of bytes: 1049409
Size of bytes: 1048925
Size of bytes: 1049524
Size of bytes: 1048629
Avarage time - cubic: 71.870400 ms
Size of bytes: 1048576
Size of bytes: 1048576
Size of bytes: 1048981
Size of bytes: 1048576
Size of bytes: 1049089
Avarage time - reno: 279.844600 ms
itay@itay-Ubuntu:~/Desktop/Share/Networking/Ex3/316451749/316451749$
```

15%

```
itay@itay-Ubuntu:~/Desktop/Share/Networking/Ex3/316451749/316451749$ ./Measure
----- Socket created SUCCEES -----
----- bind SUCCEES -----
----- Listening SUCCEES -----
Size of bytes: 1049547
Size of bytes: 1049070
Size of bytes: 1049352
Size of bytes: 1048576
Size of bytes: 1049354
Avarage time - cubic: 460.648400 ms
Size of bytes: 1048911
Size of bytes: 1048593
Size of bytes: 1049547
Size of bytes: 1048576
Size of bytes: 1049354
Avarage time - reno: 141.653800 ms
```

20%

```
itay@itay-Ubuntu:~/Desktop/Share/Networking/Ex3/316451749/316451749$ ./Measure
----- Socket created SUCCEES -----
----- bind SUCCEES -----
----- Listening SUCCEES -----
Size of bytes: 1049411
Size of bytes: 1048712
Size of bytes: 1048593
Size of bytes: 1048964
Size of bytes: 1048593
Avarage time - cubic: 4350.148600 ms
Size of bytes: 1048576
Size of bytes: 1049087
Size of bytes: 1048576
Size of bytes: 1048720
Size of bytes: 1048805
Avarage time - reno: 702.963800 ms
```

25%

```
itay@itay-Ubuntu:~/Desktop/Share/Networking/Ex3/316451749/316451749$ ./Measure
----- Socket created SUCCEES -----
----- bind SUCCEES -----
----- Listening SUCCEES -----
Size of bytes: 1048763
Size of bytes: 1048763
Size of bytes: 1049411
Size of bytes: 1048589
Size of bytes: 1048593
Avarage time - cubic: 17154.379400 ms
Size of bytes: 1049458
Size of bytes: 1048752
Size of bytes: 1048805
Size of bytes: 1048858
Size of bytes: 1049176
Avarage time - reno: 11266.159600 ms
```

