CSE421 Assignment 1

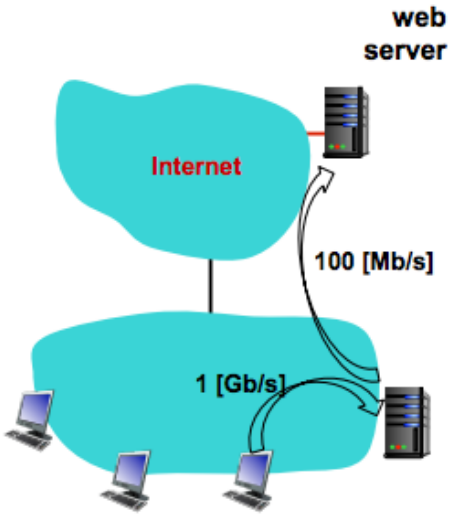
Total Marks - 15

1. In the following you can find the content of an HTTP Request. Answer to the following questions, indicating where (e.g., in which field) in the HTTP Request you can find the answer: **[1 x 4 = 4]**

   GET /api/v2/search?query=hello HTTP/1.1
   Host: example.com
   Accept: application/json
   Accept-Language: en-US,en;q=0.9
   User-Agent: Chrome/91.0.4472.124
   Connection: keep-alive
   Cookie: sessionId=abc123; csrftoken=xyz456

   a. Which version of HTTP is used?
   b. Does the browser ask for a persistent or a non-persistent connection?
   c. What is, in your opinion, the browser used by the client in the HTTP Request?
   d. Is the client using cookies? If so, what are the cookies?

2. An organisation owns a Local Area Network (LAN) with an HTTP proxy having a local cache (see Figure below).



Clients are connected to the HTTP proxy with a dedicated high-speed connection having capacity **C=1 Gbps.** The probability that the content (a web page) requested by a generic client is found in the cache of the local proxy (cache hit rate) is **P=0.4**. Let's assume that: the HTTP request messages have size of **100 B**, the requested web page has size equal to **100 kB**, the HTTP proxy has a communication channel with equivalent capacity **c=100 Mbps** towards the origin server that hosts the requested webpages. The opening and closing time for TCP connections between the client and the proxy as well as between the proxy and the server is

negligible,propagation delays are negligible. **Calculate** the average delay experienced by a generic client, from the instant in which it sends the HTTP request for a web page to the time in which it obtained the requested page. **[5]**

3. An HTTP client requests to an HTTP server a web page constituted by one main object (an HTML file) and 10 other objects. Each object has a size equal to **L=200 kb**. The server has transmission capacity of **1 Mbps** and the client has transmission capacity of **100 kbps**. The control messages used to open the TCP connection between the client and the server, as well as the HTTP "GET" message, have a size **m=100 bits**. The propagation delay of the link is τ = **100 ms**.
    a. **Calculate** the time needed to receive all the objects if the connection is **non-persistent**. **[3]**
    b. **Calculate** the time needed to receive all the objects if the connection is **persistent**. **[3]**

Submission link: https://forms.gle/HVa5v4FT1RmYf9LP6