

# Web Infrastructure

## Task 2

### Definitions and Explanation:

1. **For every additional element, why you are adding it:** SSL certificate job is to secure sessions with the user's browser via the secure sockets layer (SSL) protocol. The secure connection cannot be established without the SSL certificate. Monitoring clients is used to collect health and performance data from servers, virtual machines, containers, databases and other backend components in a tech stack. Also, can be used to visualize, analyze and alert on metrics and understand whether a backend issue is impacting users. Firewalls are software or hardware that works as a filtration system for the data attempting to enter your computer or network.
2. **What are firewalls for:** Firewalls are a filtering system for data entering your network. They scan packets for malicious code or attack vectors that have already been identified as established threats. Should a data packet be flagged and determined as a security threat, the firewall prevents it from entering the network.
3. **Why is the traffic served over HTTPS:** Traffic is served over HTTPS to ensure that the data exchanged between a user's browser and the website's server is encrypted and secure. HTTPS uses SSL protocols to encrypt data, which helps protect sensitive information such as login credentials, personal information, and financial details from being intercepted by malicious actors.
4. **What monitoring is used for:** Monitoring is used to collect health and performance data from servers and other backend components. Engineers can use an infrastructure monitoring tool to visualize, analyze and alert on metrics and understand whether a backend issue is impacting users.
5. **How the monitoring tool is collecting data:** It tracks the availability, performance and resource utilization of hosts and other backend components. Engineers typically install software, called an agent, on their hosts. i.e. physical servers, or virtual machines which use the resources of a physical server. The agent collects infrastructure metrics from hosts and sends the data to a monitoring platform for analysis and visualization.
6. **Explain what to do if you want to monitor your web server QPS:** one web server handles 1K queries per second, I would basically monitor it from the network and application level.

### **Issues**

- A. **Why terminating SSL at the load balancer level is an issue:** it is an issue because if the master goes down, the Application cannot write to the database anymore
- B. **Why having only one MySQL server capable of accepting writes is an issue:** Having only one MySQL server capable of accepting writes is an issue because if the master goes down, the application cannot write to the database anymore.
- C. **Why having servers with all the same components (database, web server and application server) might be a problem:** this is because their consumption will not grow the same way between each of them [Hence a need to have more database servers than application servers].