Performance Testing

**Application Layers:**

* + Request Layer : Your pc, mobile or any device
  + Presentation Layer : Your Web Server where we have HTML code and formatting available for your web page
  + Logical Layer : Application Server where we have logical implementation and deployment
  + Database Layer : Where all information get stored and it provides the request as per request from Logical layer in form of query and connections.

**Protocols:**

* Protocol is a set of rules based on these the communication will happen between client and server.

**What kind of protocol you have used?**

* Protocol means a set of rules
* Some common protocols:
  + Http - Best protocol for Web Applications
  + Https - Best protocol for Web Applications
  + FTP
  + SMPT (Mail)
  + SNMP
  + TCP

**Set of Rules for HTTP Protocol:**

* Every request should have header and body
* Header has key value pairs
* Header is mandatory and body is optional
* HTML is used in the body

**Server Definition and Server Types**

WebServer Definition: Full Implementation of HTTP Protocol

Web Browser Definition : Partial implementation of HTTP Protocol

* + Server is that who understands the request and performs that dedicated task
  + Web Server : Web Server which host HTML/ CSS codes for your web page. Mainly web page designing and formats related codes are available written in HTML and CSS.
  + Application/app Server : The logic of your application are written and stored at application server. This logic can be written in any language like Java, .net or C#. When we send the a request through browser like clicking on any button or any action, this request first goes to Web Server then WebServer sends information to Application Server and App server takes information from Database if required and sends the result to web server.
* Database Server : Database is a collection all data that you store for your application. We have deviated query language installed on this server to communicate. Like Sql, Oracle etc.

**Architecture Types**

* + 2 Tier - Old model architecture where we have client and server. In this client is your machine(laptop, browser etc) and server is where we have UI, Application - Web application logics and database all available on single server.
  + 3 Tier : In this structure, we have Web Server, Application Server and Database Server
  + N Tier : 3 Tier plus additional servers and connection to other systems and servers.

**Thin Architecture :**

* + Its a 2 tier architecture in which web, app and database server are on 1 single serve (not Client side)

**Thik/Fat Architecture :**

* It's a 2 tier architecture in which web, app and database server are on 1 single serve at client side. For example, Mobile apps are at client side where we install app and everything is at client side.

**Type of Web - App Server:**

* In real world, mostly we have web and app services are installed on the same server. We don’t have separate servers.
* Types of web-app servers are:
  + Tomcat
  + Boss
  + WebLogic
  + ISS
  + Websphere

**Type of Database server:**

* Oracle
* Microsoft SQL Server
* Mongo DB

**Type of Host:**

* HP - UX
* Solaries
* Red Hat Linux
* AIX

**Client and server communication key points:**

* Every communication is unique and server doesn’t recall its previous request
* Explain which web-app server and database server you have worked on and what version while explaining the answer of architecture

**How can we find the detailed repose time to find out the bottleneck or the area which is taking more than expected response time?**

* Using APM - Application Monitoring Tool
* DynaTrace HP Dignosis and AppDynamic are most popular Monioring tools available in the market
* We call these tools ad profiling tools
* We can install these monitoring tools one the server (DB or app server) which we want to monitor the performance.
* The Piece of code and process of installing this monitoring tools (DynaTrace or App Dynamics) is called Profiling/ Probe

**What is Work Load Modelling (WLM)**

* During performance testing, we need to understand how to approach with validation. For example, in an application which need to be tested, we have to get list of critical functionalities from BA and the current or expected traffic details:
  + - Login - 200 transactions for peak hours i.e. morning 9 to 10 am i.e 1 hour
    - Product search - 50 transactions
    - Add to Cart - 30 transactions
    - Logout - 180 transactions
* These are called different business process of an applications
* We need to create separate work load process for each
* For example, for Login, we need to first launch the url , think time then login, think time and then log out. Majority 3 transactions if we ignore think time. This is one Work load model for Login only.

**What is Think Time and Pacing in Load Testing?**

* Think Time : Time taken between one action to another action of a user during script creation is called Think Time
* Pacing : Time Interval or Gap between 1 Iteration and another is called Pacing which can be setup by a user based on requirement to achieve different Work Load Benchmark.

**What is Little’s Law Formula and how it works?**

* Little’s Laws give you formula to calculate throughput and pacing and other data.

What is Shakedown/ Mock Test in Performance Testing?

* Before starting the actual test, we do a mock testing or Shakedown testing to make sure that scripts and other settings are all setup correctly.
* We can consider similar to Smoke Test in Function testing.
* Let’s say the actual load need to be run for 1000 users so we can test with 5 concrete users to check if everything fine.

What is Load Generator/ Load Injector/ Agent Machine?

- Load Generator or Load Injector or Agent Machine are same. This is the 4th component of LoadRunner Architecture which gets installed on Web, App or Database server. This

Interview Q : Where your script runs during Load Testing?

* On Load Generator

Interview Q : What is Memory Footprint? How LG calculation works?

* Memory Footprint varies Protocol to Protocol and tool to tool.
* For example HTTP Protocol, LR takes 2.3 MB Ram for each user
* For example for 1000 users & machine RAM is 500 MB, so calculation will be 500/2.3 mb = 250 Vusers, we would need 4 Load Generators.