Introduction
Before starting performance testing, we need to understand what elementary information is required to initiate the performance test and then we will discuss different approaches and techniques to collect the relevant information from the concerned sources.

Clear and complete requirements are mandatory for successful performance testing.

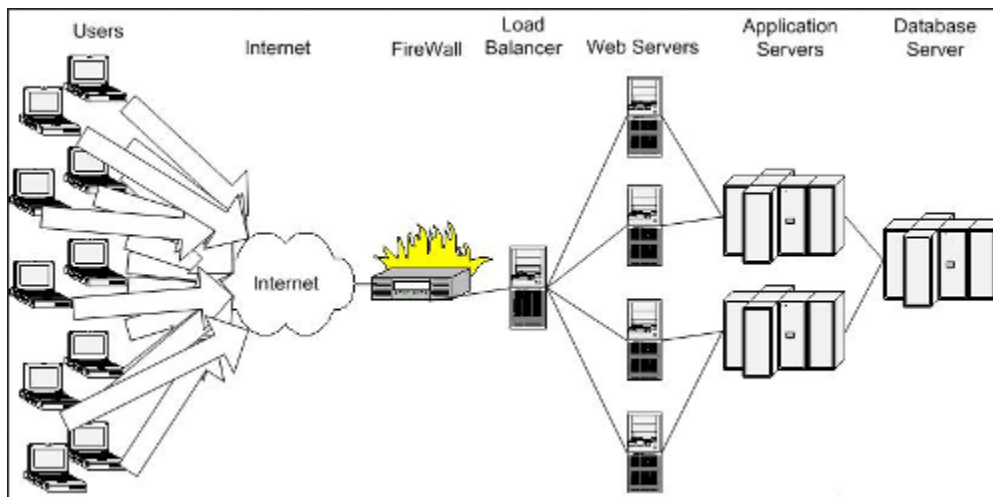**What we need to start the performance testing?**
Few questions flash in mind immediately whenever an application is given for performance testing. These questions are as following:

- What is the type of application and its architecture?
- What are the known current as well as previous performance bottlenecks?
- Which application scenarios to be tested?
- What will be the workload model?
- What are the performance goals?

Application Technology and Architecture
Application type (web, desktop or mobile) and its development technology information are always crucial to make a decision on appropriate performance testing tool. There are many performance testing tools can be used according to application under test (AUT).

The test environment can be like:

Setting up the Test Environment
Following question can asked to collect desired information:

What is the application type?
E.g. Desktop, Web or Mobile App or any other

In which technology/platform the application is developed?
E.g. J2EE, .Net, PHP, Silverlight, Ruby, SAP, Any other

Which data base is used?
E.g. Oracle, MySQL, SQL Server

Which Application server is running with the system?
E.g. Tomcat, IIS, WebSphere

How is the targeted application look like? (Please specify all servers and network appliances configurations and their interaction mechanism)
LAN/WAN details
Terminal servers
Bandwidth link
Load Balancing techniques
Batch Transactions
Disaster recovery

What is the protocol between the client and server?
E.g. HTTP, HTTPS, FTP, TCP/IP, Telnet etc.

Is the client browser version dependent in case of web application?
E.g. Application runs only on IE-8

Will separate test environment be provided to do a performance test run?
Any preference on performance tools?
E.g. LoadRunner, JMeter

What is the current project lead time for testing activities?
I.e. starting and completion date

Pre-Production Environment

On the other hand, if application is not yet in production environment, functional team can be asked about various bugs they would have encountered during testing. Their input would also help in deciding the type of performance test.

Following question can asked to collect desired information:

- ❖ Is the functional testing completed?
- ❖ Are all functional testing defects fixed?
- ❖ Is there any incomplete development of application feature(s)? Those must be identified
    - o Specify the functionality
    - o Specify current behavior
    - o Specify desired behavior
    - o When will this be fixed?
- ❖ Is there any known issue(s) in this application? E.g.
    - o Memory lock
    - o Unexpected growth in daily visitors
    - o More response time which leads to time out error
    - o What type of performance tests need to be performed? E.g. Load Test, Stress Test, Soak Test, Spike Test, Scalability Test
- ❖ What are the goals of the performance testing activity? E.g.
    - o Evaluate System against performance criteria
    - o Discover what parts of the system perform poorly and under what conditions
    - o Compare two platforms with the same software to see which performs better

Workload Model

Following question can asked to collect desired information:

If selected scenarios require some unique inputs then these should be specified.
E.g. Credit Card, SSN etc.

Do you have statistics, how many users visit the application in 24 hours?
E.g. Facebook is access by more than 175 million users daily

What is the peak load time on production server?
E.g. Maximum number of US based users log on to facebook.com at 8pm EST

How many users access the application in peak load time?
E.g. Facebook is accessed by up to 10 million users during peak hours

What is the average user session time on application?
 E.g. Facebook user average session time is 23 minutes

What will be user distribution on test scenarios?
 E.g. on Facebook, 1 million users will concurrently login, 4 million will view posts and 1 million will add posts etc.

How many users are intended to access application simultaneously?
E.g. Currently Facebook is supporting 10 million users simultaneously but in future it would support 20 million users

Are there any time constraints for running the test?
E.g. the server can only be accessed outside business hours; server can only be accesses from 7 pm – 8 am

Is it required to generate load from multiple geographical regions? If yes, which?

Performance Goals
These performance goals will help in decision making whether the application is ready for production or not. There are various parameters which can be selected for the pass/fail criteria of the performance test. Some of them are as following,

- ❖ Response Time (E.g. search should not take more than 3 seconds)
- ❖ User load (E.g. application should be able to handle 500 concurrent users)
- ❖ Transaction Rate (E.g. application must be able to handle 50 transactions per second)
- ❖ Hardware Resource Utilization (E.g. CPU utilization on application server should not exceed 70%)

Following question can asked to collect desired information:

Have you set any acceptable maximum transaction completion time?
E.g. System response time should not exceed 3 seconds while retrieving user's order history

Have you set the expected throughput of the application?
E.g. 1000 transaction per minute

What will the acceptance criteria for each performance test?
E.g. all user transaction should pass with response time less than 3 seconds and CPU utilization should be less than 70%
Which is the most important performance goal of the application?