Introduction

Performance testing allows testers to judge how well an application or website performs under specific circumstances, and Apache JMeter is a robust tool to measure performance test. Testing Anywhere allows testers to better create, manage, edit and analyze their performance tests.

JMeter is an Apache Jakarta project that can be used as a load testing tool for analyzing and measuring the performance of variety of services, with focus on web applications. It is a open source tool, pure java desktop application and it available for all platforms.

JMeter can be used as unit test tool for JDBC database connections, FTP, LDAP, Web services, JMS, HTTP, and generic TCP connections. JMeter can also be configured as a monitor, although this is typically considered an ad-hoc solution in lieu of advanced monitoring solutions.
What is Performance Testing?

Performance Testing means to check a system how it performs in terms of responsiveness, throughput, reliability and scalability of a system under given workload. Performance testing does not aim to find defects or bug in the application, it address a little more critical task of testing the benchmark and standard set for the application. Accuracy and close monitoring of the performance and results of the test is the primary characteristic of performance testing.

In Normal Terms Performance testing is to ensure that the application respond within the time limit set by the user or not.

Normaly we check during Performance Test:

- **Capacity**: The maximum number of object the application can handle.
- **Latency**: The average and maximum time to complete the system's operation.
- **Response time**: The average and maximum application's response time.
- **Throughput**: The maximum transaction rates that the application can handle.

Examples: To check a response time for online processing systems, and also can measure processing time for batch works.
Why do We need Performance Testing?

Today majority of modern applications, especially online application, is focused on the mass, assumes a joint and / or simultaneous operation of multiple users, and in such cases it is necessary to measure his performance test under applying load. It is a fairly considered one of the most technically complex types of software testing, because it requires engineers and testers extensive technical knowledge and experience in programming.

Depending on the application architecture, we select the necessary tools to define with the customer the required level of performance and the threshold number of concurrent users. Based on these data, we simulate the required number of concurrent users and control the quality and speed of service under such a load.
Types of Performance Testing

- **Load Testing:**
  
  Load testing is subjecting your system to statically representative load. Measure the application's performance under applying user load.

  Main Goal is to identify application's performance bottlenecks before goes live.

- **Stress Testing:**
  
  Stress testing is the process of trying to break the application, which is under test and identify that breaking point. Subject of the system to extreme pressure in order to verify that system is getting failed or not. A stress testing is designed to test that how much heavy load the system or web application can handle.

  We can say that testing conducted to evaluate a system or component at beyond the limits of its specified requirements.

- **Volume Testing:**
  
  Volume testing refers to the testing with a certain amount of data. Data, in generic terms we can say database size or it could be size of interface.

  Example: If we want to test the volume testing with the database size then expand the database to that size and check the performance of the application.

  If our application has requirement to interact with the interface like from .dat, .xml file. These interaction could be writing/reading data from/to the file then we can also do the volume testing.
- **Scalability Testing:**

  Scalability testing is to determine the software application’s effectiveness in “scaling up” to support an increase in user load.

  How an application scales as it is deployed on larger systems and/or more systems or as more load is applied to it.

  The goal is to understand at what point the application stops scaling and identify the reasons for this. It helps plan capacity addition to your software system.

- **Spike Testing:**

  Spike Testing is a form of testing process in which an application is tested with unusual increment and decrements in the load. The system is unexpectedly loaded and unloaded. It is done to notice how actually the system reacts with unexpected rise and decline of users.

- **Endurance Testing (Soak Testing):**

  Soak testing or endurance testing is also known as reliability testing. It is a type of stress testing in which testing will be done for longer periods of time inorder to check application's stability.

  Main goal is to make sure the application can handle the expected load over a long period of time.
Configuration of Apache JMeter

1. Getting all required Components to Run Apache JMeter.

You need to first download latest production release of Apache JMeter Binaries & JAVA later on install it. Once downloaded, simply unzip the file into your favorite installation path for Apache JMeter.

- **JAVA ( jdk version 1.6 or above)**: http://java.sun.com/javase/downloads/index.jsp

- **Apache JMeter Binaries**: http://JMeter.apache.org/download_JMeter.cgi

Performance Testing with Apache JMeter
2. How to Run Apache JMeter

We can go for apache JMeter after configuring Java to set environment variable at JAVA_HOME.

Now extract .zip or .gz file to your system as per platform requirement. I am working with linux environment so i choose [apache-JMeter-2.10.tgz](http://example.com) file, After extract we need two file. JMeter.sh or JMeter.bat from bin location in JMeter. If you are using windows platform run JMeter.bat file to open Apache JMeter and if you are using linux platform then run JMeter.sh file.
Run your first Script in JMeter

After Running JMeter you can look like below screen. Now follow the steps to create simple script to check 5 user load at a time on a particular website.

Step 1: Create a Thread Group and Set their values.

To create a thread group, right click on Testplan click on Add – Thread – Thread Group. Now Set Values 5 in Number of Thread and left other fields with defaults values. Because we need to check 5 user load at 1 second.

Step 2: Create a View Result Tree

To create a View Result Tree, right click on Testplan click on Add – Listener – View Result Tree. No need to change any thing in view result tree. We need to check result in tree view so we add to our script.
**Step 3: Create a Summary Report**

To create a Summary Report, right click on Testplan click on Add-Listener – Summary Report. Same as above, no need to change any thing in summary report. We need to check result by average, min time to load page and max time to load page.

After perform above task your screen look like as below image.
Step 4: Now Create a HTTP Request and Set Their Values.

To create HTTP Request, right click on Thread Group – Add – Sampler – Http Request.
These is the simple request. Just view below image and set values. And Click on Run button to run this script.
Step 5: Check Performance Testing Report.

- Click on View Result Tree

- Click on Summary Report
Conclusion

We can measure the application performance after applying user load, and without using tool we can not able to check application performance. So JMeter is the robust tool to measure application's performance.