What is Performance Testing:

Performance Testing is a type of testing to ensure software applications will perform well under the particular load.

Load Testing is the simplest form of Performance Testing.

Why JMeter and Advantages of using this?

* It’s Open Source
* Cross platform Support
* Scripting is not Essential to learn JMeter
* JMeter GUI is more User Friendly.

What is TestPlan in Jmeter?

Test plan consist of all actions and components you need to execute your performance testScript.

What is Record and PlayBack?

Test-> Go and perform action in browser

To test this, we need request, response Include in a tool

Exclude Gif,Banner

Do the proxy settings

http-> certificate is not required

https-> need certificate -

Meter Elements:

1. Thread Group
2. Samplers
3. Listeners
4. Configurations

* Start JMeter (Go to apache JMeter downloaded folder) /bin/jmeter.bat
* Create a Test Plan.
* Create a Thread Group (Number of user),

No. of Users

Ramp-up Period

Loop Count

* Add a sampler (Type of Request)
* Add a Listener (report in form of Table, Graph etc.)
* Run a Test Plan
* Save Test Plan

**What is an assertion?**

Assertions helps verifies that your server under test returns the expected results.

Types of Assertions:

1. Response Assertion
2. Duration Assertion
3. Size Assertion
4. HTML Assertion
5. XML Assertion
6. XML Schema Assertion
7. XPATH Assertion
8. JSON Assertion

Listener in JMeter:

Listener provides access to the information JMeter gathers about the test cases while JMeter runs.

The results or information gathered by Listeners can be shown in the form of –

Tree

Tables

Graphs

Log files

Types of Listeners,

View Result Tree

View Result in Table

Graph Results

Aggregate Reports

Aggregate Graphs

Summary Reports

Simple Data Writer.

Timers in JMeter:

Jmeter sends requests without applying any delay between each sampler/request

If you perform load/stress testing on your server without any delay, it will be overloaded. Then it won’t be able to give a realistic results and fail to simulate real world user traffic experience.

Jmeter Timers are the solutions for all these problems.

Timer element can be added in a test plan to apply wait between each sampler/request.

Types of Timers:

Constant Timer

Uniform Random Timer

Precise throughput timer

Constant throughput timer

Gaussian random timer

Synchronizing timer

Bean Shell timer

Uniform Random Timer:

Random delay max

Constant delay offset

* Created Jmeter Script using recorder;

1. Thread Group check with 1 User first
2. View Result Tree Add by Listener

General Check on Response:

Based on 200 responses with green check will say its passed But

Status is 200 code – response may be the wrong one

Example:

Add Employee – For the first time will get response like

Employee is added successfully added and status is 200.

For the second if try to add – Response will be like

Employee is already existing.

In this case We Can’t Ensure that Our script is working fine.

Understand the Jmeter Load parameters to analyze results.

Samplers: Number of Users hit that specific request.

Average: It is the average time taken by all the Samples to execute specific label.

Example: There are 3 Samples

1st Sample = 10 ms

2nd Sample = 13 ms

3rd Sample = 9 ms

Average is = 10 + 13 + 9/ total samples 3

Min: The shortest time taken by a sample for specific label.

From the Above example: 9 ms is Min

Max: The longest time taken by a sample for specific label

From the Above example: 13 ms is Min

Standard Deviation: This shows the set of exceptional cases which were deviating from the average value of sample response time. The lesser this value more consistent the data. Standard deviation should be less than equal to half of the average time for a label.

Error%: Percentage of failed Requests per lable.

Throughput: Throughput is the number of requests that are processed per time unit (seconds, minutes, hours) by the server. This time is calculated from the start of the first sample to end of the last sample. Larger throughput is better.

Custom Thread Group plugins

1. Concurrency Thread Group
2. Ultimate Thread Group
3. Stepping Thread Group

Http Cookie Manager:

It is used to capture Session Id in jmeter

Application: <https://the-internet.herokuapp.com/login>

Login : GET <https://the-internet.herokuapp.com/login>

Authenticate: Based Cookie Session ID

POST data Username = tomsmit&password=SuperSecretPassword!

[no cookies] if we get like this in jmeter then we need to add Http coockie Manager

Performance Testing Plan:

Objective: Objectives of performance Testing varies Depending on the System under test.

1. Verify Application can handle certain number of concurrent user load.
2. Response time within limits
3. Identify Performance Issues.

Scope: Scope of testing should be clearly defined in the performance testing plan.

1. Components of the system.
2. Types of performance test.
3. Metrics to measure.

Methodology: It is used to depends on the objective of testing and the system under test.

Load testing

Stress testing

Endurance Testing

Test Scenarios: To simulate realistic user behavior during testing.

In e-commerce website the scenarios include

* Browsing products
* Adding item to cart
* Checking out

Here we need to define expected load, duration any other parameter that need to be tested.

Test Environment setup:

The Testing environment should be setup to simulate the production environment as closely as possible.

Software

Hardware

Network Infrastructure.

Tools:

Tools and technologies should be identified and includes in the performance testing.

Load testing tools

Monitoring tools

Profiling tools

Timeline: Timeline for performance testing should be clearly defined

Testing Strategy Document:

1. Test Types.

Load Testing – To test the system ability user Load.

Stress Testing – Handle peak loads

Volume Testing – Test the system with large data.

1. Test Approach

Approach for each type of testing should be defined in test strategy document

Load test: - Rampup, Steady state, Rampdown

Stress Test: Peak Load level /Duration of test

1. Performance metrics: - Performance metrics should be defined in the test strategy document.

Response time

Throughput

Error rate

Resource Utilization.

4.Test Data

User data

Input data

Test config

Environment and Infrastructure:

S/w, H/w, Network Infrastructure

Controller:

Difference between Concurrent Users and Simultaneous users

Simultaneous Users:

One transaction is might be used by multiple users at a given point of time.

Concurrent Users:

Multiple users in a given time might be accessing different transactions