

# Performance Testing Of Insititute Website Using Jmeter

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## Abstract:

Software Testing is a process of finding errors while executing a program so that we get a zero defect software [5]. Software testing is the most important and time consuming part of software development life cycle. Its purpose is to detect software failures so that defects may be recovered and corrected in early phase [6]. Software testing is gaining more and more importance in the future.

Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not.

Testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

Software testing means to cut errors, reduce maintenances and to short the cost of software development [4]. Software testing is a highly complex and time consuming activity- It is even difficult to say when testing is complete. Software testing is the process to uncover requirement, design and coding errors in the program[3]. White box test suites are derived from the source code of the software component under test. Because programs can be represented in terms of graphs, solid coverage criteria can be defined for white box testing strategies. In this paper, we start with a brief overview of the principles underlying white box testing .In our paper, we have described and compared the most prevalent and commonly used software testing techniques for detecting errors, they are White Box Testing.

**Keywords:** software testing, white box testing, Jmeter:

## Introduction:

### I. Software testing:

Software testing is a method of assessing the functionality of a software program. There are many different types of software testing but the two main categories are dynamic testing and static testing.

Dynamic testing is an assessment that is conducted while the program is executed; static testing, on the other hand, is an examination of the program's code

and associated documentation. Dynamic and static methods are often.

Software testing is a most often used technique for verifying and validating the quality of software .Software testing is the procedure of executing a program or system with the intent of finding faults .It is measured to be labor intensive and expensive, which accounts for > 50 % of the total cost of software development. In other words, we can say it's a process of executing a program with intends to find errors. In the language of Verification and Validation (V&V), black box testings often used for validation (i.e. are we building the right software?) and white box testing is often used for verification (i.e. are we building the software right?). Software testing is a significant activity of the software Development life cycle (SDLC)[5].Software testing identifies defect, flows or errors in the software.

## II. GOAL AND OBJECTIVE OF TESTING

### A. Definition:

Testing is refer to verify that a program give correct and expected output on the basis of specified input. The other definition of software testing given by Dijkstra "A process of executing a program with the goal of finding errors". [7]

### B. Fault and Failure:

Fault and failure both are strictly related but both have different meaning. If software is tested and the result is responses as 'fail' this stated that a programming is showing some undesirable behavior which is called 'failure'.

- Failure is the inability of a system to perform required function with specific requirement [8].
- Fault- The failure is derived from fault .A incorrect process in computer to perform in unanticipated manner.

- Error -The intermediate unstable or unanticipated state is known as error[8]

*FAULT->ERROR->FAILURE[9]*

### III. TYPES OF TESTING

Software can be tested by two methods or we can say that there are main two methods of software testing.

- Black Box Testing
- White Box Testing

Now we can discuss only white box testing:

#### White box testing:

Testing based on an analysis of internal workings and structure of a piece of software. White box testing is a testing technique that examines the program structure and derives test data from the program logic/code. In White box, we see and test the actual code.

It is known as clear box testing, glass box testing, transparent box and structural testing [11] White box testing test the internal structure or working of an application. This testing is highly effective in finding errors and bugs in the program. In white box testing tester uses specific knowledge of program to verify the output [7]. It is the detailed investigation of internal logic and structure of the code. In white box testing it is necessary for a tester to have full knowledge of source code.

White box testing technique is used by both developers as well as testers. It helps them understand which line of code is actually executed and which is not. This may indicate that there is either missing logic or a typo, which eventually can lead into some negative consequences.

White box testing can be quite complex. The complexity involved has a lot to do with the application being tested. A small application that performs a single simple operation could be white box tested in few minutes, while larger programming applications take days, weeks and even longer to fully test. White-box testing is a method of testing the application at the level of the source code.

#### White Box Testing Techniques:

- **Statement Coverage** - This technique is aimed at exercising all programming statements with minimal tests.
- **Branch Coverage** - This technique is running a series of tests to ensure that all branches are tested at least once.
- **Path Coverage** - This technique corresponds to testing all possible paths which means that each statement and branch is covered.

### IV. Tool: Jmeter

JMeter is a desktop Java application. The Apache JMeter™ is pure Java open source software, which was first developed by Stefano Mazzocchi of the Apache Software Foundation, designed to load test functional behavior and measure performance. You can use JMeter to analyze and measure the performance of web application or variety of services. Performance testing means testing a web application against heavy load, multiple and concurrent user traffic. JMeter originally is used for testing Web Application or FTP application. Nowadays, it is used for functional test, database server test etc.

JMeter is an Apache Jakarta project that can be used as a load testing tool for analyzing and measuring the performance of a variety of services, with a focus on web applications. The Apache JMeter™ application is open source software, a 100% pure Java application. Apache JMeter is an open source load and performance tool written in Java and it's available on almost any OS. It was originally designed for testing Web Applications but has since expanded to other test functions.

JMeter can be used as a unit test tool for JDBC database connection, 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.

#### Proxy Server (preparing test)

##### Role

- Record Http requests run by users.
- Stick to the exact http request a lambda user. Record only what is meaningful.

- To be organized.
- Warning
- Doesn't record https.

uses text editor to create a test plan and supplies in XML format.

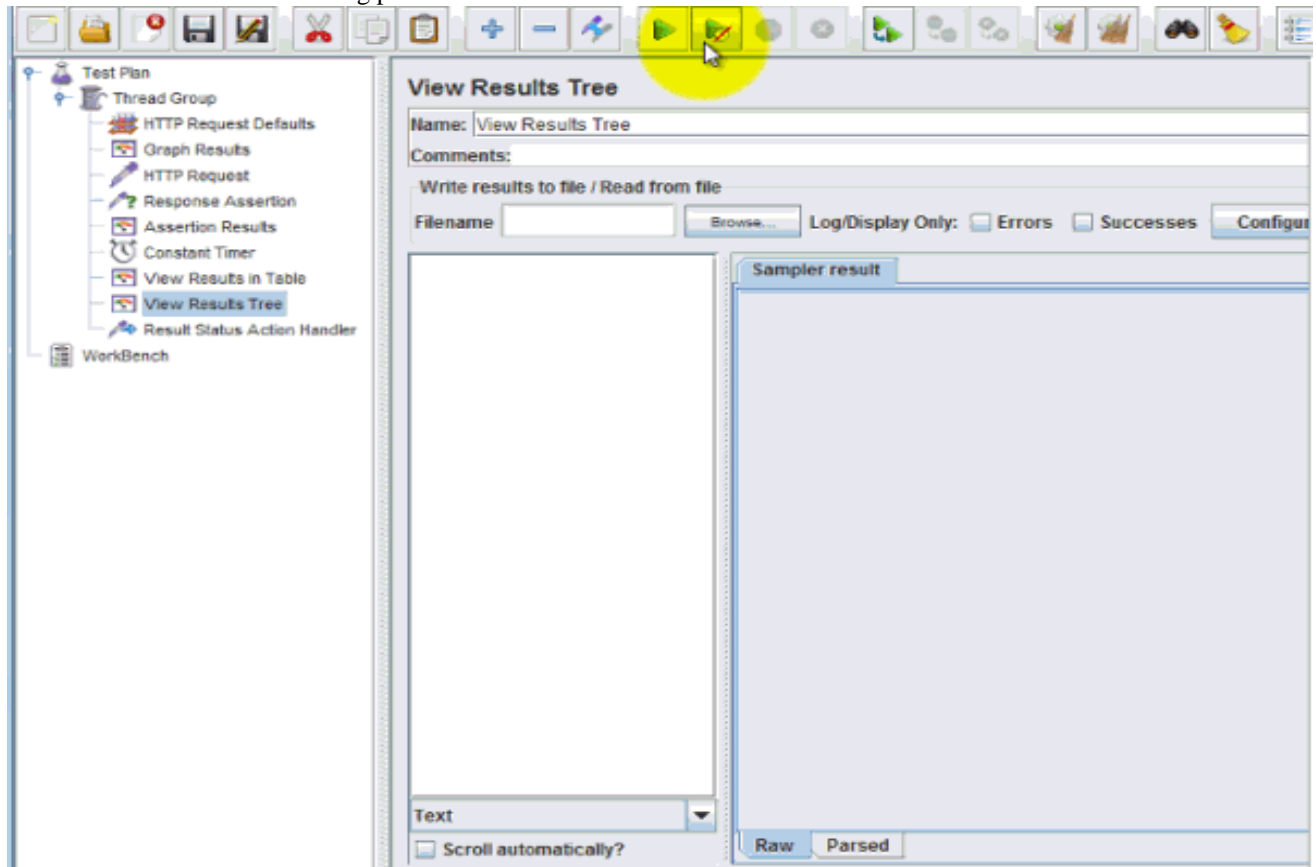
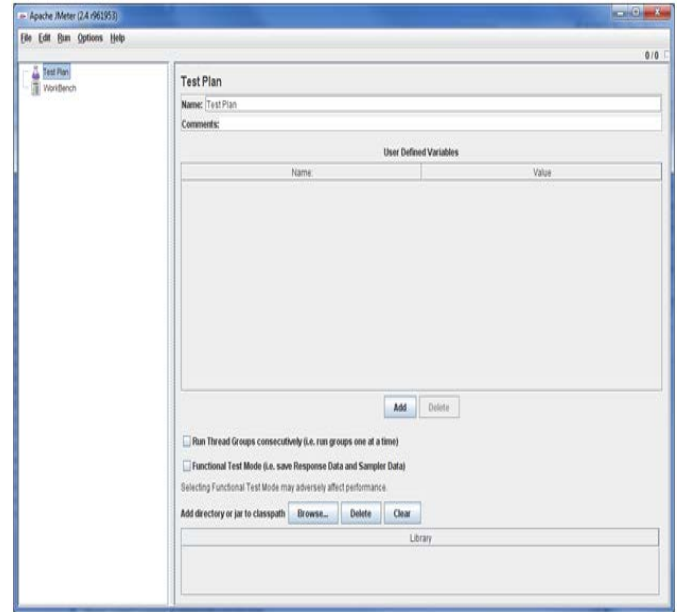
**Features supported by Jmeter**

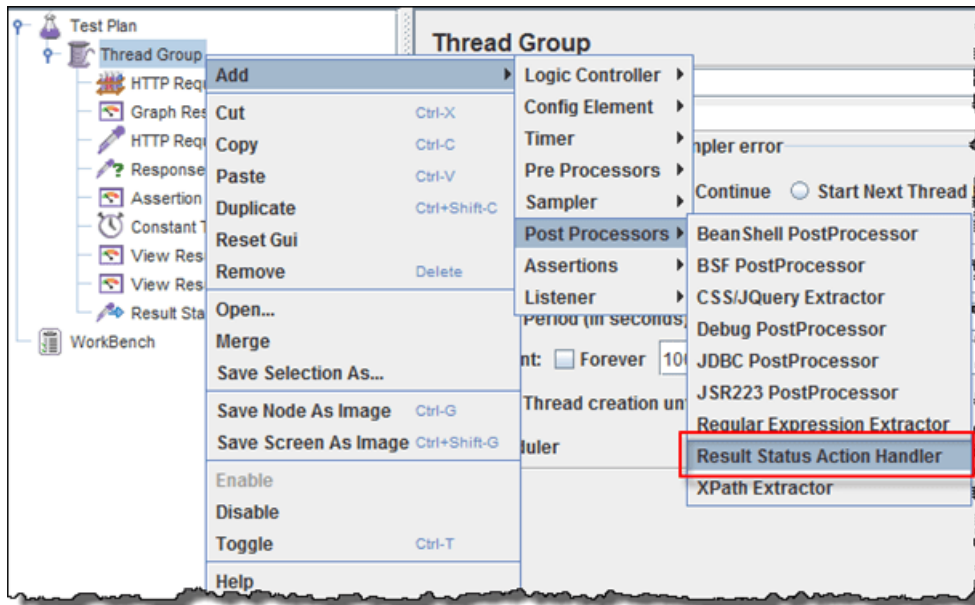
**i. Open source application:** JMeter is a free open source application which facilitates users or developers to use source code for other development or modification purpose.

**ii. User – friendly GUI:** JMeter comes with natural GUI. It is very simple and easy to use and users get familiar very soon with it.

**iii. Platform independent:** Although, it is totally a Java based desktop application. That's why; it can run on any platform. It is highly extensible and capable to load the performance test in many different server types: Web – HTTP, HTTPS, SOAP, Database via JDBC, LDAP, JMS, Mail – POP3.

**iv. Write your own test:** Using plugins, write your own test case to extend the testing process. JMeter





**Conclusion:** There are various type of testing but my focus is on white box testing.

Many tools are available but I will be using jmeter. jmeter is open source software whose widely used for measuring the performance means used for performance testing.

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