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Apache JMeter

2-day course

FA-0524 · 2-day

Software Development

Introduction

Apache JMeter is an open-source software application designed to test functional behavior and measure the performance of web applications. Its primary use is for testing web application, but it can also test other services. As software applications grow in complexity, performance testing becomes crucial.

JMeter can be used to simulate a heavy load on a server, group of servers, network, or object to test its strength or to analyze overall performance under different load types. This course aims to impart knowledge about how to effectively use JMeter for performance and functional testing.

Learning outcomes

Upon completion of this course, learners will be able to:

- Understand the basics of performance testing and its significance.
- Install and configure Apache JMeter.
- Design and execute performance tests using JMeter.
- Analyze and interpret the results generated by JMeter.
- Implement advanced JMeter features such as distributed testing and plugins.
- Understand best practices for designing effective test plans.
- Customize JMeter through extensions and plugins.
- Identify bottlenecks in web applications and suggest improvements.
- Use JMeter for other testing types such as Database, FTP, and Web Service testing.

Prerequisites

- Basic understanding of software testing principles.

- Familiarity with web application architecture.
- Basic understanding of Java (helpful for scripting, but not mandatory).
- Knowledge of HTTP protocol and web services.
- Online lab access
- SSH enabled PC

Training outline

1. Introduction to Performance Testing:

- Definition and Importance of Performance Testing.
- Types of Performance Testing: Load, Stress, Endurance, Spike, and Volume Testing.
- Performance Testing Process and Lifecycle.

2. Getting Started with JMeter:

- Introduction to JMeter and its History.
- Installing and Launching JMeter.
- JMeter's User Interface Overview.

3. Creating Your First Test Plan:

- Elements of a Test Plan.
- Setting up Thread Groups.
- Adding Sampler Requests.
- Configuring Basic HTTP Requests.

4. Handling User Input and Variables:

- Using Configuration Elements.
- Parameterizing Tests using CSV Files.
- User-Defined Variables.
- Using Functions in JMeter.

5. Understanding and Implementing Listeners:

- Role of Listeners in JMeter.

- Commonly Used Listeners: View Results Tree, Summary Report, Graph Results, etc.
- Interpreting Results from Various Listeners.

6. Advanced Samplers and Controllers:

- Logic Controllers: Loop, Random, Once Only, etc.
- HTTP Advanced Features: Handling Cookies, Redirects, and HTTPS.
- Other Samplers: FTP, JDBC, JMS, etc.

7. Assertions and Validations:

- Role of Assertions in a Test Plan.
- Types of Assertions: Response, Duration, Size, XML, etc.
- Best Practices for Adding Assertions.

8. Handling Dynamic Data:

- Concepts of Correlation.
- Handling Session IDs and Tokens.
- Using Post-Processors: Regular Expression Extractor, JSON Extractor, etc.

9. Advanced Features and Configurations:

- Handling Cookie and Session Management.
- Configuring Timers and Delays.
- Distributed Testing: Setting Up and Running Tests on Multiple Machines.

10. Using JMeter Plugins and Extensions:

- Introduction to JMeter Plugins.
- Installing and Using Select Plugins: Custom Thread Groups, Graph Generators, etc.

11. Best Practices for Performance Testing with JMeter:

- Designing a Realistic Test Environment.
- Avoiding Common Pitfalls in JMeter Test Plans.
- Strategies for Identifying Bottlenecks.

12. Beyond Web Applications:

- Using JMeter for Database Testing.
- Web Services and API Testing.
- Other Protocols Supported by JMeter.

13. Reporting and Analysis:

- Generating Detailed Reports.
- Understanding Metrics: Response Times, Throughput, Latency, etc.
- Analyzing Results and Drawing Conclusions.

This course, spread across these detailed topics, ensures that participants get a wholesome and in-depth understanding of Apache JMeter, its capabilities, and best practices.

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