

JMeter

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Why JMeter is a Key Tool?

- Open Source: Free to use with active community support.
- Platform-Independent: Written in Java, runs on all platforms.
- Flexible: Supports multiple protocols (HTTP, FTP, JDBC, SOAP, REST).
- Extensible: Add plugins for additional features.
- Easy-to-Learn UI: Intuitive interface for new testers.
- Distributed Testing: Handles large-scale tests across multiple machines.
- Integration Support: Works well with CI/CD tools like Jenkins.

Key Testing Types with JMeter summary

- Load Testing
- Stress Testing
- Spike Testing
- Endurance Testing
- Scalability Testing
- Database Testing
- Web Services/API Testing
- Functional Testing

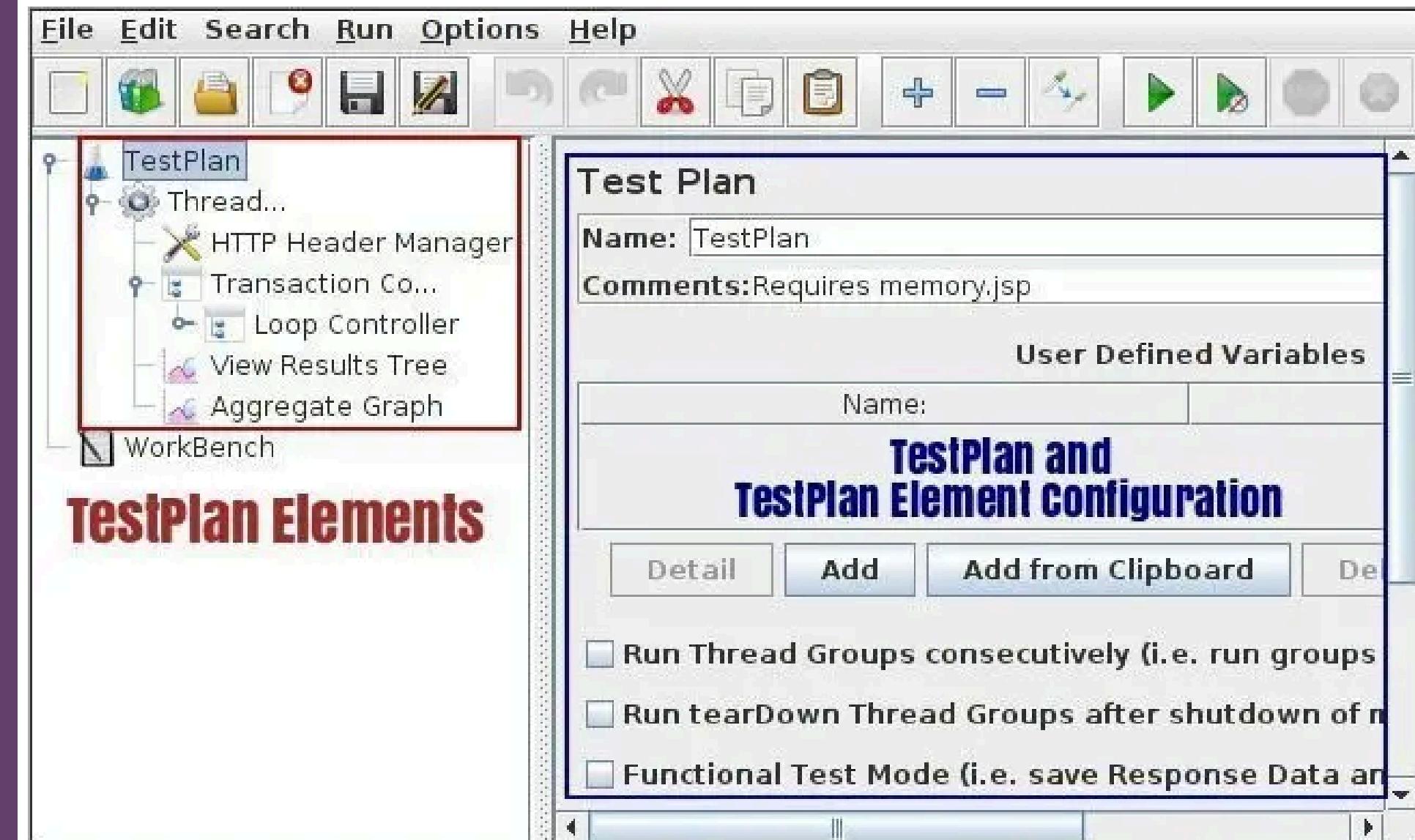
Understanding of JMeter Keywords

Test Plan :

A Test Plan is the container for all test elements in JMeter. It defines the execution sequence of test scenarios.

Example:

A Test Plan could include multiple Thread Groups, Samplers, and Listeners.

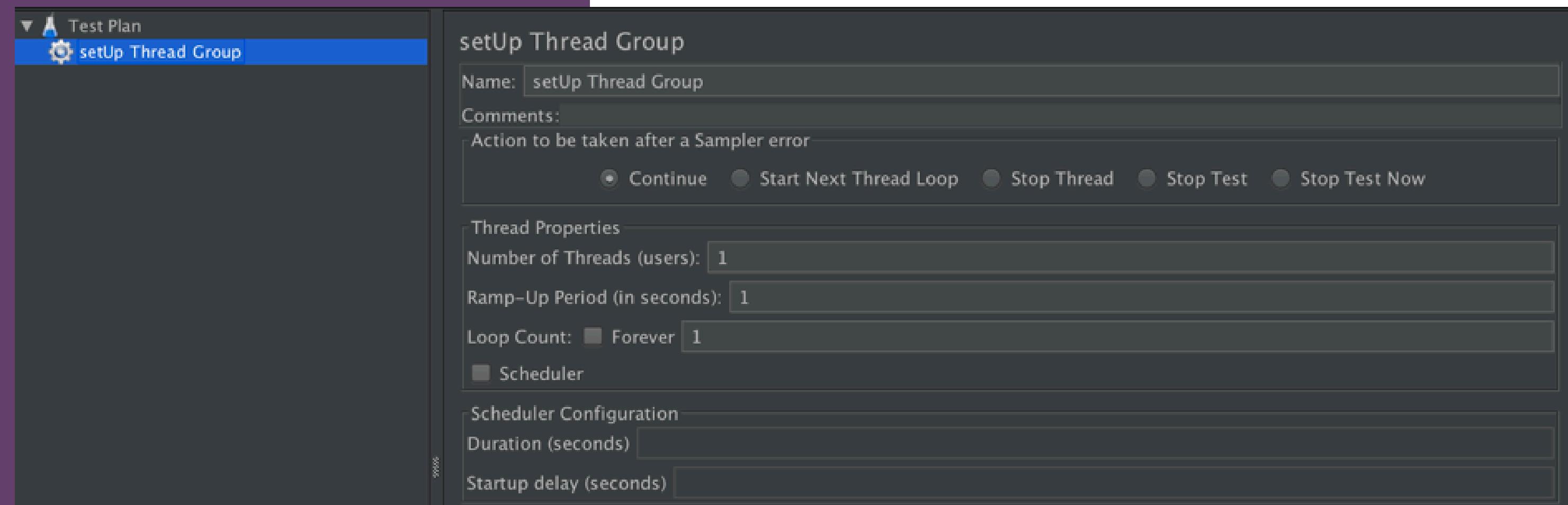


Thread Group

A Thread Group represents a group of virtual users (threads) executing test scenarios.

Example:

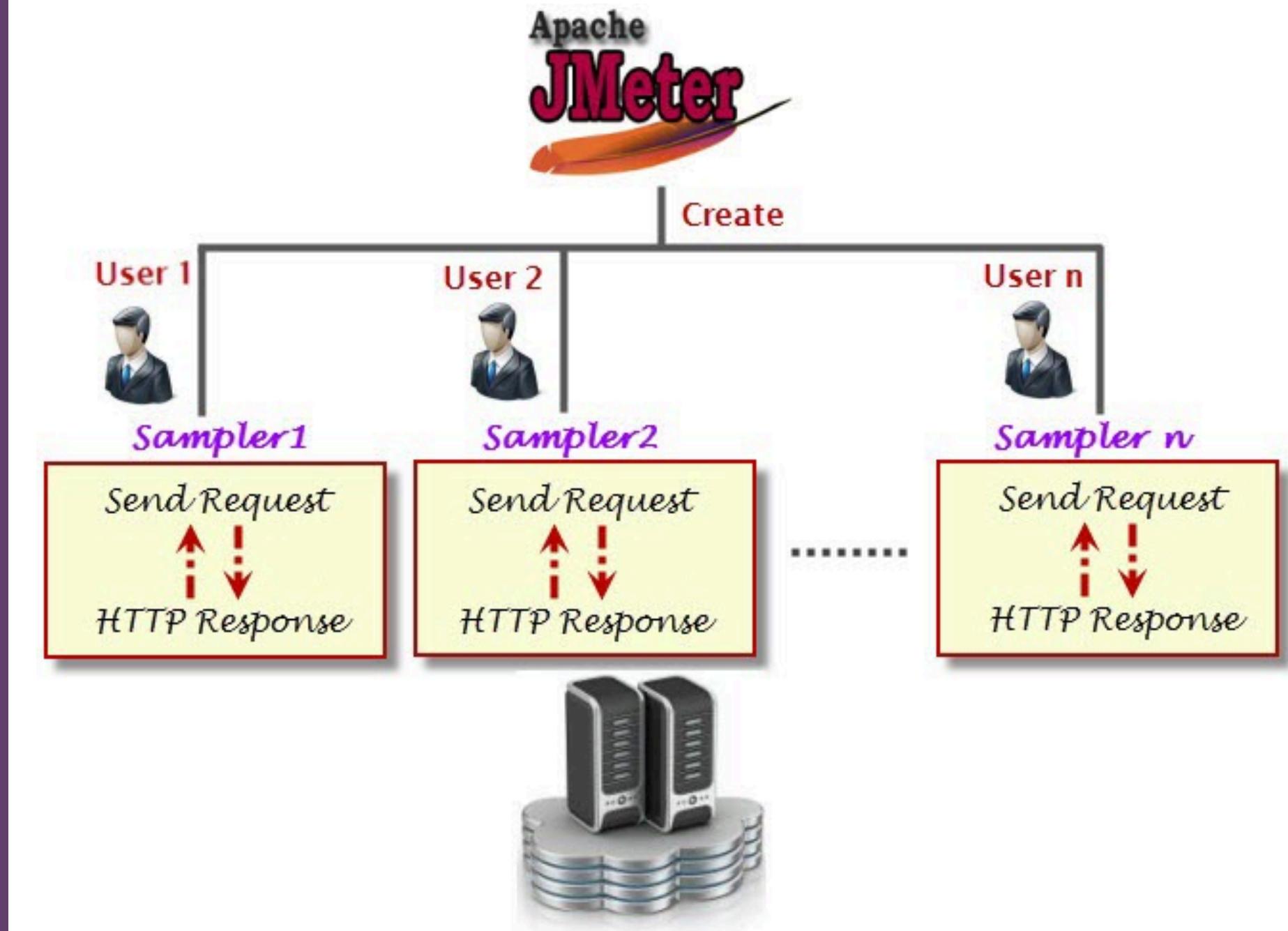
If you configure a Thread Group with 100 threads and a Ramp-Up Period of 10 seconds, JMeter will start 10 threads per second.



Sampler

A Sampler sends requests to a server and waits for the response.

Example: HTTP Sampler for web applications or JDBC Sampler for database testing.



HTTP Request

A type of sampler used to send HTTP/HTTPS requests to a server. Example: Sending a GET or POST request to <https://example.com/api>.

The screenshot shows the JMeter interface with the 'HTTP Request Defaults' configuration dialog open. The left sidebar shows a tree structure with 'build-web-test-plan' expanded, containing 'JMeter Users' and 'HTTP Request Defaults'. The main panel is titled 'HTTP Request Defaults' and contains the following fields:

- Name:** HTTP Request Defaults
- Comments:** (empty)
- Basic** tab selected, showing:
 - Web Server**: Protocol [http]: Server Name or IP: Port Number:
 - HTTP Request**: Path: Content encoding:
- Parameters** tab selected, showing a table for 'Send Parameters With the Request':

Name:	Value:	URL Encode?	Content-Type	Include Equals?

At the bottom of the dialog are buttons: Detail, Add, Add from Clipboard, Delete, Up, and Down.

HTTPs Request

Similar to HTTP but adds encryption for secure communication. Example: Making a secure API call to an ecommerce platform.

The screenshot shows the JMeter interface with the 'build-web-test-plan' test plan selected. In the left sidebar, under 'JMeter Users', the 'HTTP Request Defaults' item is highlighted. On the right, the 'HTTP Request Defaults' configuration dialog is open. The 'Name:' field contains 'HTTP Request Defaults'. The 'Comments:' field is empty. The 'Basic' tab is selected under 'Advanced'. Under 'Web Server', the 'Protocol [http]:' dropdown is set to 'http', and the 'Server Name or IP:' field contains 'jmeter.apache.org'. The 'Port Number:' field is empty. Under 'HTTP Request', the 'Path:' field is empty, and the 'Content encoding:' field is also empty. The 'Parameters' tab is selected, showing a table for sending parameters with the request. The table has columns for 'Name', 'Value', 'URL Encode?', 'Content-Type', and 'Include Equals?'. At the bottom of the dialog are buttons for 'Detail', 'Add', 'Add from Clipboard', 'Delete', 'Up', and 'Down'.

Name:	Value:	URL Encode?	Content-Type:	Include Equals?

CSV Data Set Config

A configuration element for parameterizing tests using external CSV files.

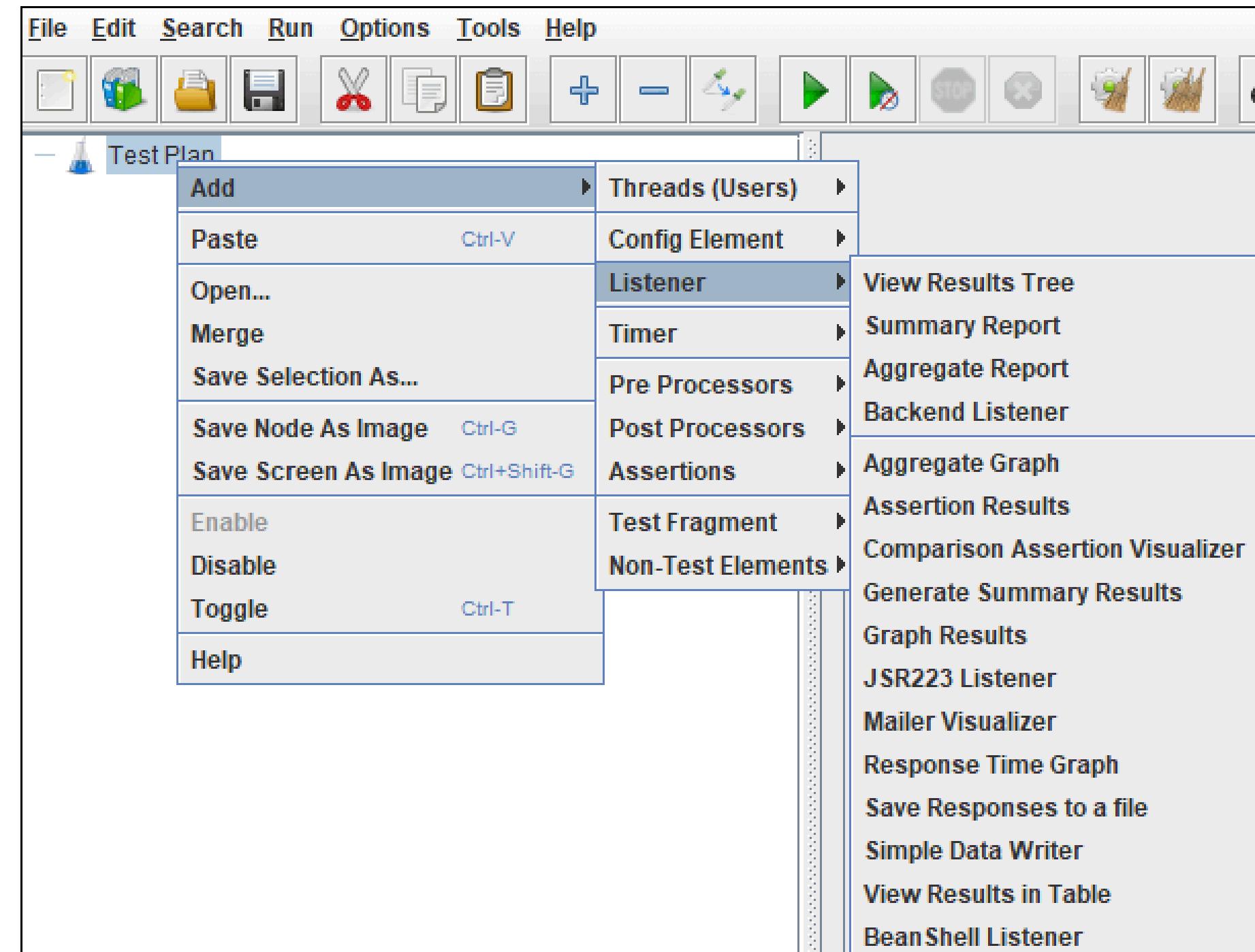
Example: Using a CSV file with usernames and passwords for login testing.

Listeners

Components to visualize and analyze test results.

Example:

View Results Tree or Aggregate Report to display request success rates and response times.



Assertions

Assertion help verifies that your server under test returns the expected results.

Most used Assertions

RESPONSE ASSERTION



The response assertion lets you add pattern strings to be compared against various fields of the server response.

DURATION ASSERTION



The Duration Assertion tests that each server response was received within a given amount of time. Any response that takes longer than the given number of milliseconds (specified by the user) is marked as a failed response.

SIZE ASSERTION



The Size Assertion tests that each server response contains the expected number of byte in it. You can specify that the size be equal to, greater than, less than, or not equal to a given number of bytes.

HTML ASSERTION



The HTML Assertion allows the user to check the HTML syntax of the response data. It means the response data must be met the HTML syntax.



Response Time

The time taken by the server to respond to a request.

EXAMPLE

A web page loading in 2 seconds.

Throughput

The number of requests processed by the server per second.

EXAMPLE

A server handling 200 requests/sec during a load test.

Load Testing: A testing technique to simulate normal or peak user load on an application.

Example: Simulating 1,000 users accessing a website simultaneously.

Stress Testing: Testing the system under extreme load to find its breaking point.

Example: Simulating 10,000 users on a website to identify the maximum capacity.

Distributed Testing: Running tests across multiple systems to simulate a larger load.

Example: Using 5 machines to simulate 5,000 users collectively.

Ramp-Up Period: The time JMeter takes to start all the threads in a Thread Group.

Example: A Ramp-Up of 20 seconds for 100 threads starts 5 threads per second.

General Terms



Scheduler

Enables running tests at specific start and end times.

EXAMPLE

Running a test from 2:00 PM to 2:30 PM.

Controllers

Elements that control the execution flow of a test plan.

EXAMPLE

If Controller runs only if a specific condition is met.

Logic Controllers

Control how samplers are executed.

EXAMPLE

Loop Controller runs a set of samplers repeatedly.

JDBC Request: A sampler for testing database queries.

Example: Executing a SELECT query on a database table.

Beanshell Scripting: Allows writing custom scripts for complex test scenarios.

Example: Custom login scripts to handle dynamic tokens.

Plugins Manager: A feature to install additional plugins for enhanced functionality

Example: Installing the JMeter PerfMon Plugin for server monitoring.

Heap Memory: The memory allocated to JMeter for execution.

Example: Increasing heap size in jmeter.bat for large-scale tests.

General Terms



JMeter Variables

User-defined variables that can be reused in test plans.

EXAMPLE

Define baseURL as `https://example.com` and use it across requests.

Assertions on Response Codes

Ensures the response status code matches expectations.

EXAMPLE

Validating a 200 OK status for successful API calls.

Thread Lifetime

Configures whether threads run indefinitely or for a fixed duration.

EXAMPLE

Setting a test duration of 10 minutes for a Thread Group

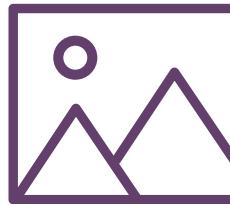
Blaze Meter

A CLOUD-BASED PLATFORM FOR
RUNNING JMETER SCRIPTS AT SCALE.



Non-GUI Mode

Example



Running tests from the command line for better performance.

```
jmeter -n -t testplan.jmx -l results.jtl
```

AGGREGATE REPORT

A Listener that provides summary statistics like average response time, max time, throughput, etc.

Example: Showing an average response time of 1.5 seconds for a test

SAVE RESPONSES TO A FILE

A Listener that saves server responses to external files.

Example: Saving API responses to a local file for debugging.

RANDOM VARIABLE

Generates random values for testing dynamic scenarios.

Example: Generating random user IDs from a range like 1000-9999.

Post-Processors

Used to process the server response after a request is made.

Example: Extracting a specific JSON field using a JSON Extractor.

Pre-Processors

Components that execute before a sampler is run to modify requests

Example: Using a User Parameters PreProcessor to dynamically assign variables before sending a request.

Thank You

