Automation Testing

TECHNOLOGY

JMeter with Selenium

```
#include <iostream>
#include <cstdlib>
using namespace std;
int main()
{
    cout << "Hello, world!" << endl;
    return 0;
}
```

A Day in the Life of an Automation Test Engineer

Alex has performed a lot of load testing on JMeter. During his testing, he created heavy loads on web applications using JMeter to ensure they would perform as expected.

However, he wants to test the logic and behavior on the client's end. His goal is to record user interactions that use AJAX, CSS, and JavaScript.

There are a lot of options in JMeter, but he is unable to check user interaction.

To resolve the above scenario, he must learn how to integrate Selenium with JMeter.

Learning Objectives

By the end of this lesson, you will be able to:

- Integrate Selenium with JMeter
- Configure Chrome drivers
- Implement FTP sampler
- Define debug and test sampler

Integration of JMeter with Selenium

Why Selenium with JMeter?

JMeter is unable to handle all the logic and behavior at the client-side level as HTML5, CSS, AJAX, and JS become more prevalent in applications. To resolve this issue, Selenium web drivers are used.

Record User-Interaction

Selenium records the browser user interactions with web applications using AJAX.

Web-Drive Sampler

In Selenium, the execution and collection of performance metrics are automated based on the user's perspective.

Prerequisites

The user must have the following prerequisites:

01 Install the Selenium/WebDriver plugin using the JMeter plugin manager

02 Install the Gecko/Chrome driver binaries in the system

JMeter or Selenium Environment

The following are the steps to install JMeter plugins Jar files:

01 Download the **JMeter Plugins Manager Jar**

02 Add it to the **JMeter lib/ext directory**

03 Restart the **JMeter**

Selenium Environment

The following are the steps to install Selenium plugins Jar files:

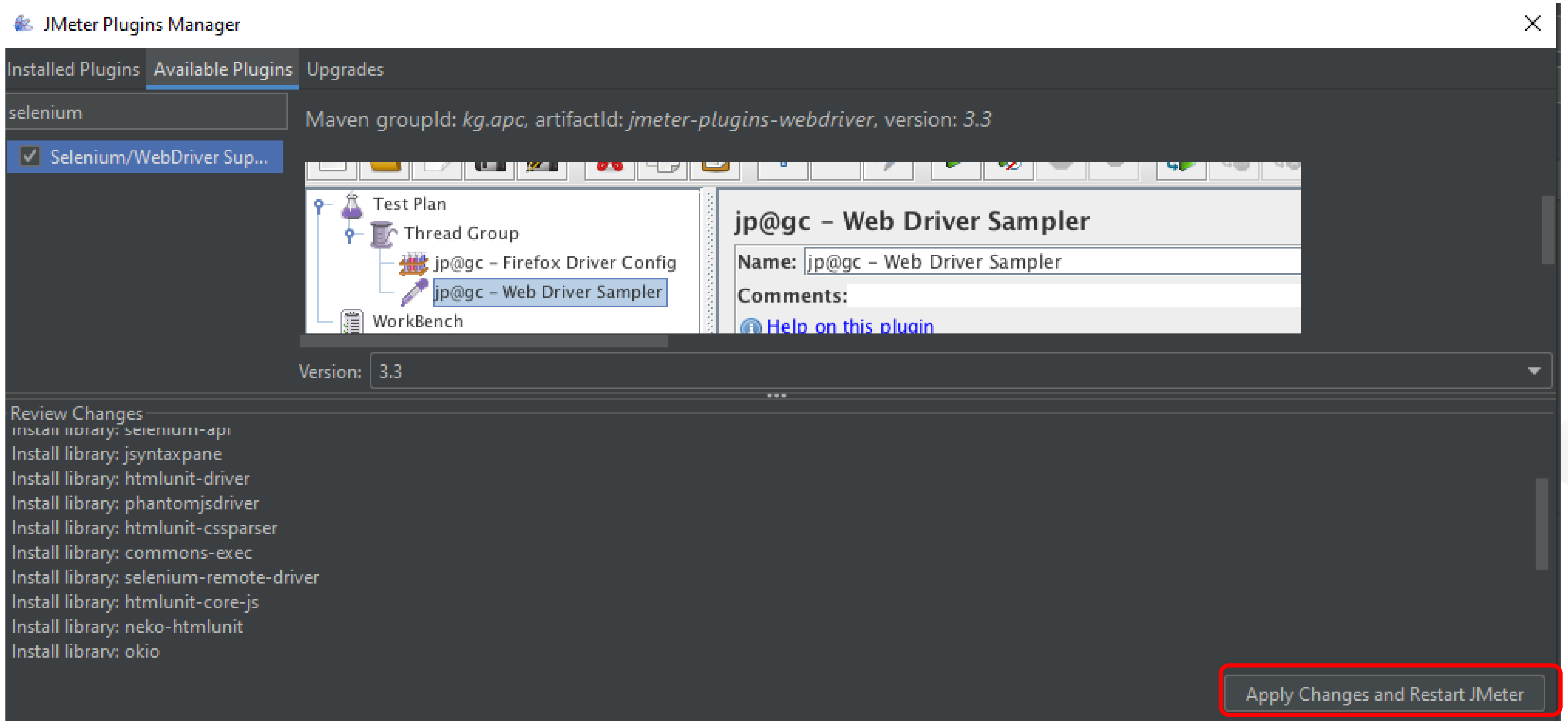
04 Open the **JMeter Plugins Manager**

05 Install **Selenium /Webdriver support Plugin**

06 Restart the **JMeter**

Plugin Window

The following screenshot illustrates how to add the plugin manager under available plugins:



Maven groupId: *kg.apc*, artifactId: *jmeter-plugins-webdriver*, version: *3.3*

Test Plan
Thread Group
jp@gc – Firefox Driver Config
jp@gc – Web Driver Sampler
WorkBench
jp@gc – Web Driver Sampler

Name: jp@gc – Web Driver Sampler

Comments:

Version: 3.3

Review Changes

```
Install library: selenium-api
Install library: jsyntaxpane
Install library: htmlunit-driver
Install library: phantomjsdriver
Install library: htmlunit-cssparser
Install library: commons-exec
Install library: selenium-remote-driver
Install library: htmlunit-core-js
Install library: neko-htmlunit
Install library: okio
```

Selenium Script Testing

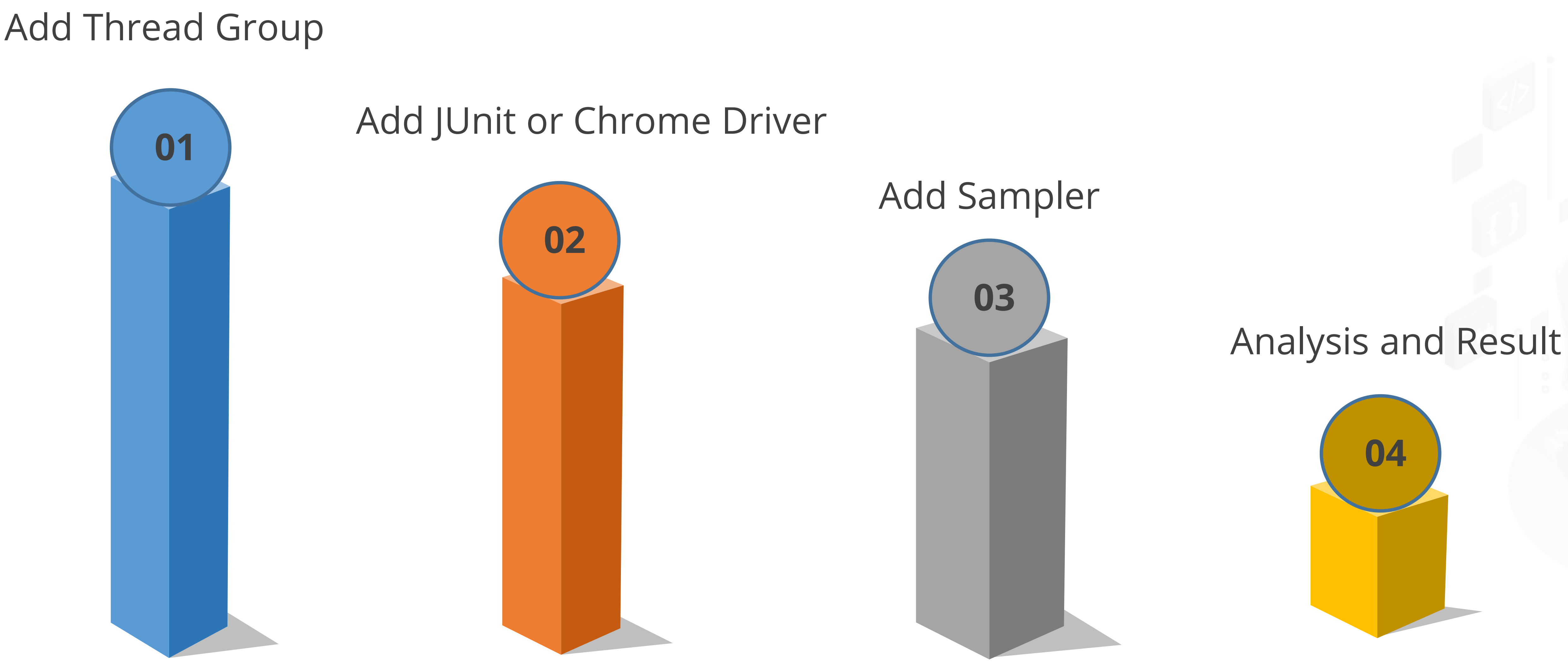
JMeter can be integrated with Selenium test cases using the following methods:

Junit Sampler

Web-Driver Sampler

Test Roadmap

Testing can be performed by following the steps listed below one by one:



01 Add Thread Group

02 Add JUnit or Chrome Driver

03 Add Sampler

04 Analysis and Result

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Selenium Script With JUnit

Add JUnit Test file

Following are the steps to install JUnit Jar files:

01 Download the **Java Test Case Jar file**

02 Add it to the **JUnit directory** under the lib **folder**

03 Restart the **JMeter**

Add JUnit Request

Add a JUnit sampler by following the below steps:

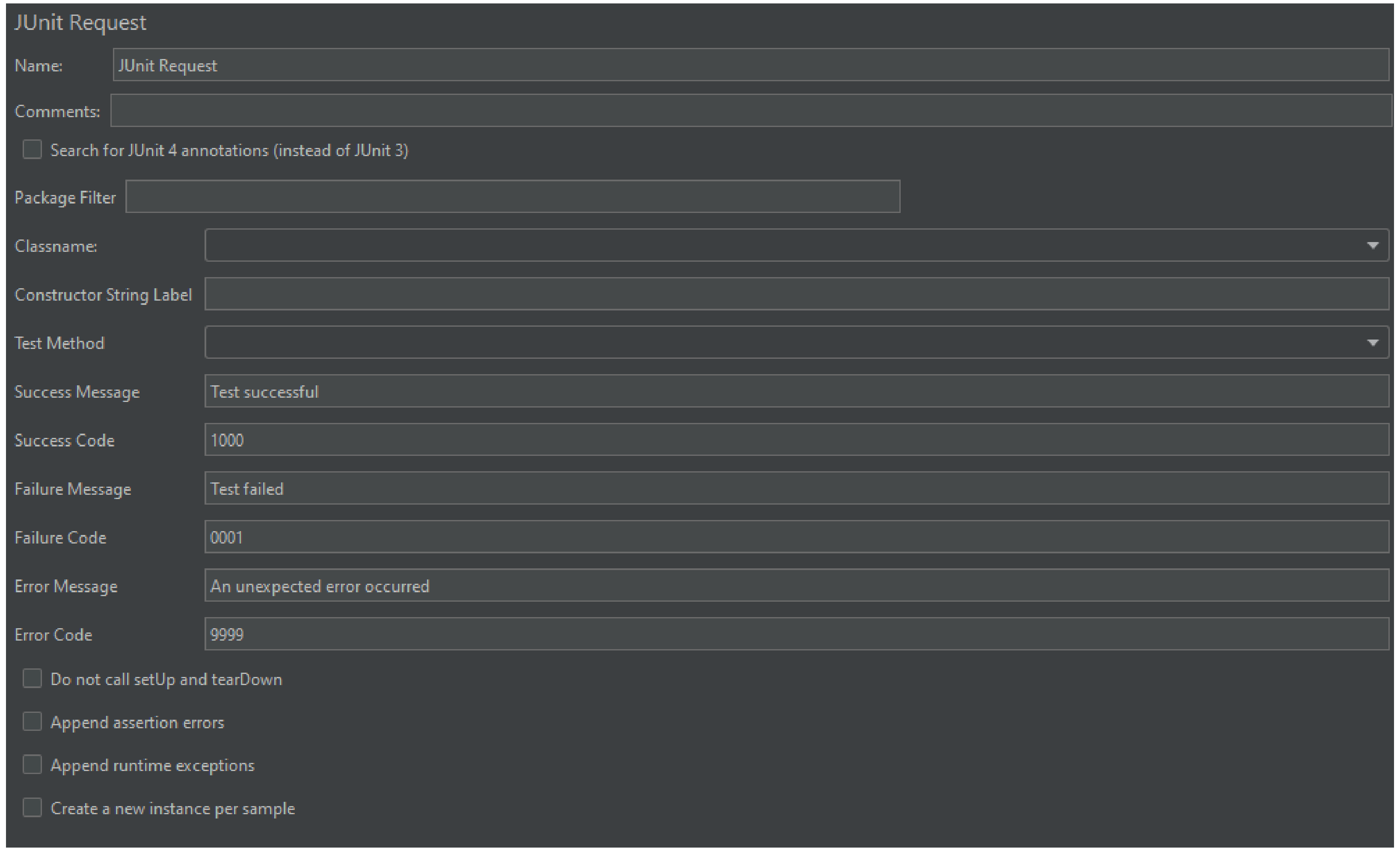
01 Add a new **Thread Group** and set the **Thread** properties

02 Right-click on **Thread Group** and select **Add**

03 Hover over the **Sampler** and select the **JUnit Request**

JUnit Settings Window

Here is the screenshot of the JUnit settings window:



JUnit Request

Name: JUnit Request

Comments:

□ Search for JUnit 4 annotations (instead of JUnit 3)

Package Filter

Classname:

Constructor String Label

Test Method

Success Message: Test successful

Success Code: 1000

Failure Message: Test failed

Failure Code: 0001

Error Message: An unexpected error occurred

Error Code: 9999

□ Do not call setUp and tearDown

□ Append assertion errors

□ Append runtime exceptions

□ Create a new instance per sample

Add Listeners

To add listeners, the user must follow the below steps:

01 Right-click on the **Thread Group** under the **Test Plan**

02 Select **Add** from the menu

03 Hover over the **Listener** and select the **View Results Tree or Graph Result**

Save and Run the Test

.

Ensure to save the test after completing all the steps. Run the test by selecting Run or pressing the green triangle button in the menu bar.

Run the test by selecting **Run** or pressing the green triangle button in the menu bar.

TECHNOLOGY

Selenium Script With Web Drivers

Add Chrome Driver Config

The following steps will guide the user to add a Chrome driver:

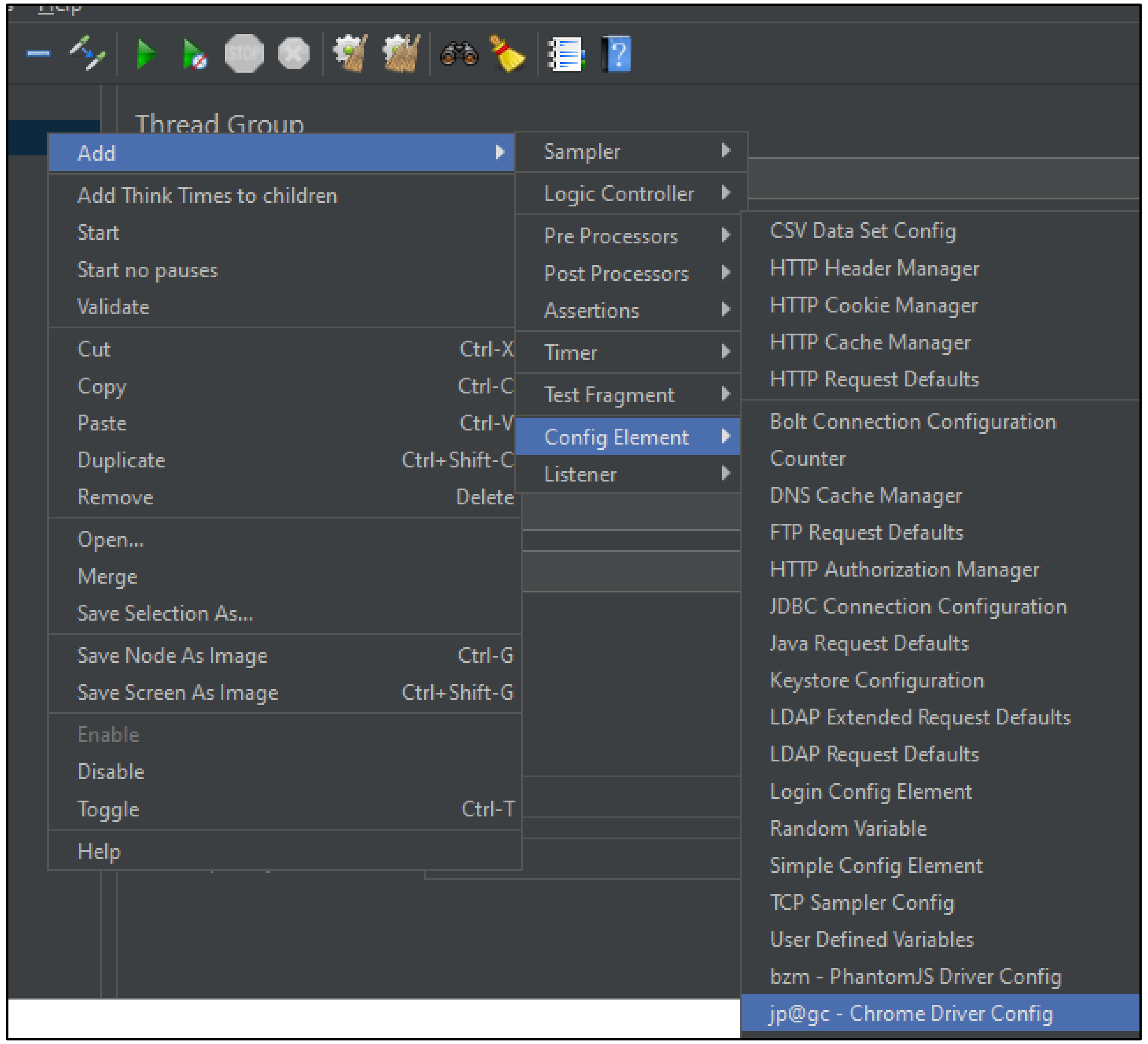
01 Right-click on **Thread Group** and select **Add**

02 Hover over the **Config element**

03 Select the **jp@gc Chrome Driver Config**

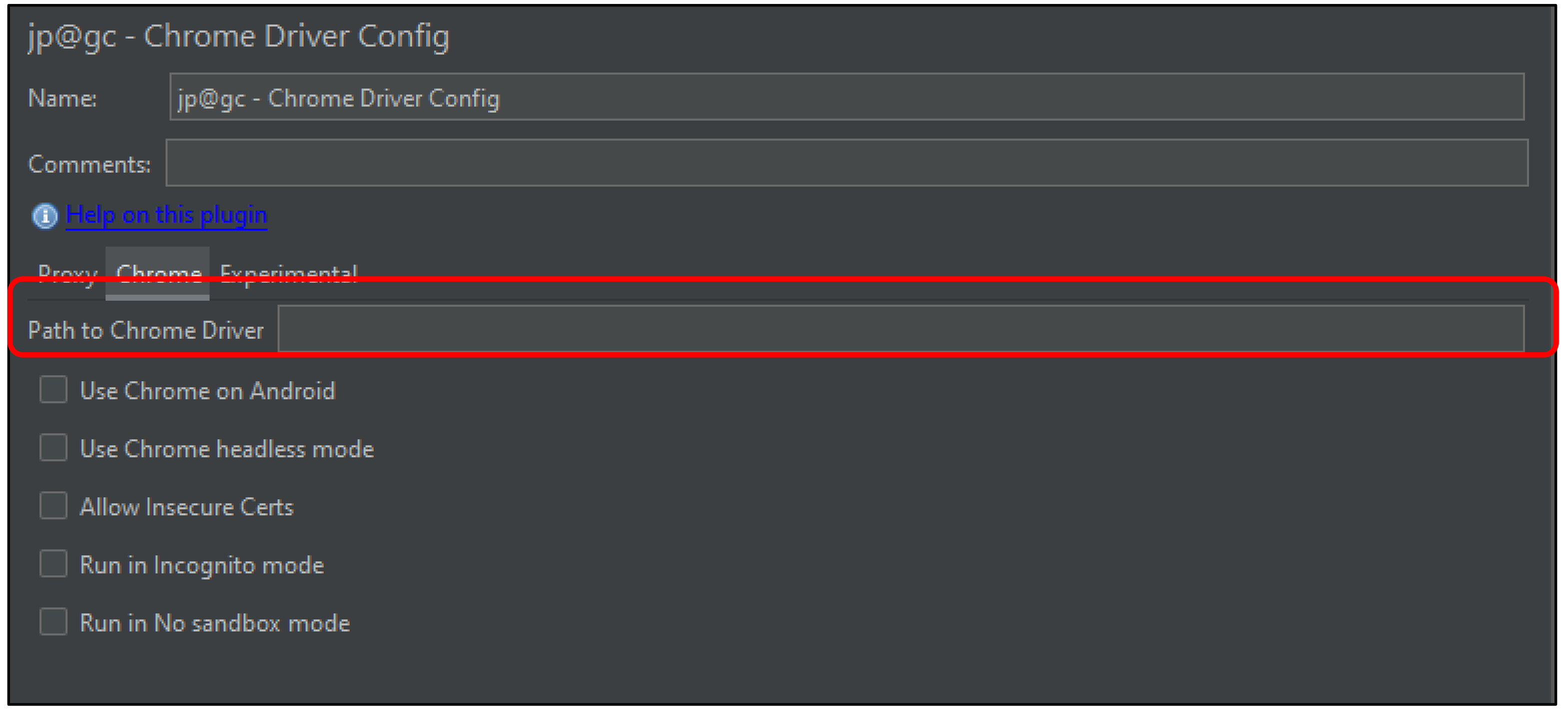
Chrome Driver Config Window

The following screenshot illustrates how to add the Chrome driver config:



Chrome Driver Settings

Specify the "Path to Chrome driver" on the Chrome driver configuration page:



jp@gc - Chrome Driver Config

Name: jp@gc - Chrome Driver Config

Comments:

Path to Chrome Driver

□ Use Chrome on Android

□ Use Chrome headless mode

□ Allow Insecure Certs

□ Run in Incognito mode

□ Run in No sandbox mode

Add Web Driver Sampler

The following steps will guide the user to add a Chrome driver:

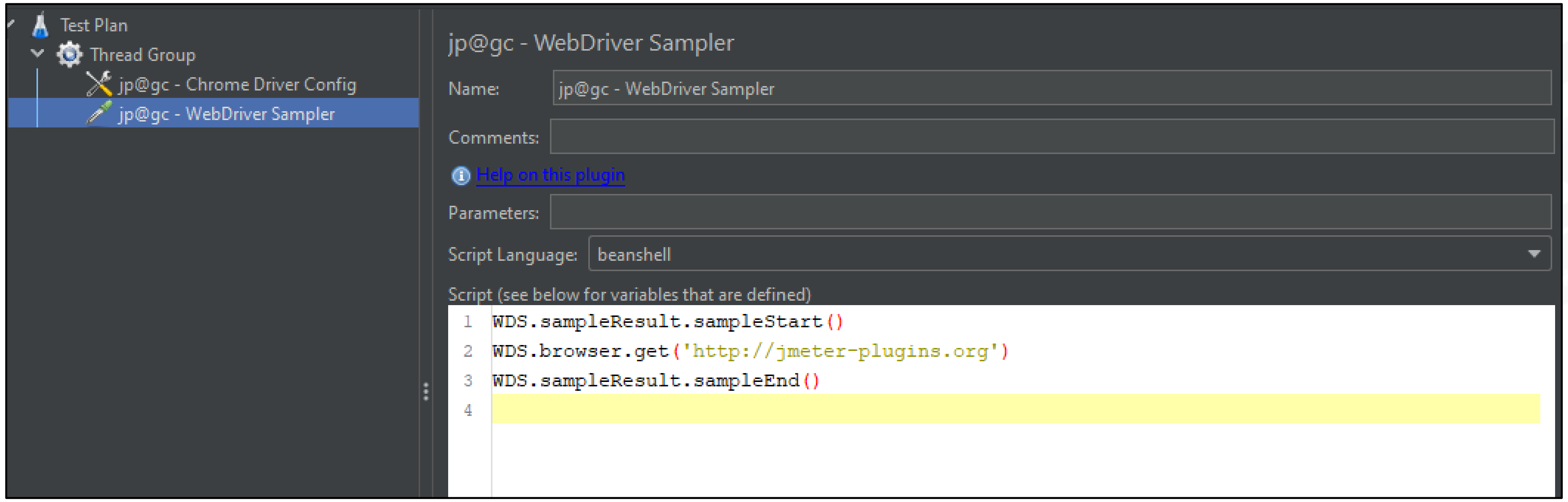
01 Right-click on **Thread Group** and select **Add**

02 Hover over the **Sampler**

03 Select the **jp@gc Web Driver Sampler**

Web Driver Window

The following screenshot shows how to add the Selenium script to this web driver settings window:



Test Plan
Thread Group
jp@gc - Chrome Driver Config
jp@gc - WebDriver Sampler
jp@gc - WebDriver Sampler
Help on this plugin

Name: jp@gc - WebDriver Sampler

Comments:

Parameters:

Script Language: beanshell

Script (see below for variables that are defined)

```
WDS.sampleResult.sampleStart()
WDS.browser.get('http://jmeter-plugins.org')
WDS.sampleResult.sampleEnd()
```

Add Listeners

To add listeners, the user must follow the below steps:

01 Right-click on the **Thread Group** under the **Test Plan**

02 Select **Add** from the menu

03 Hover over the **Listener** and select the **View Results Tree**

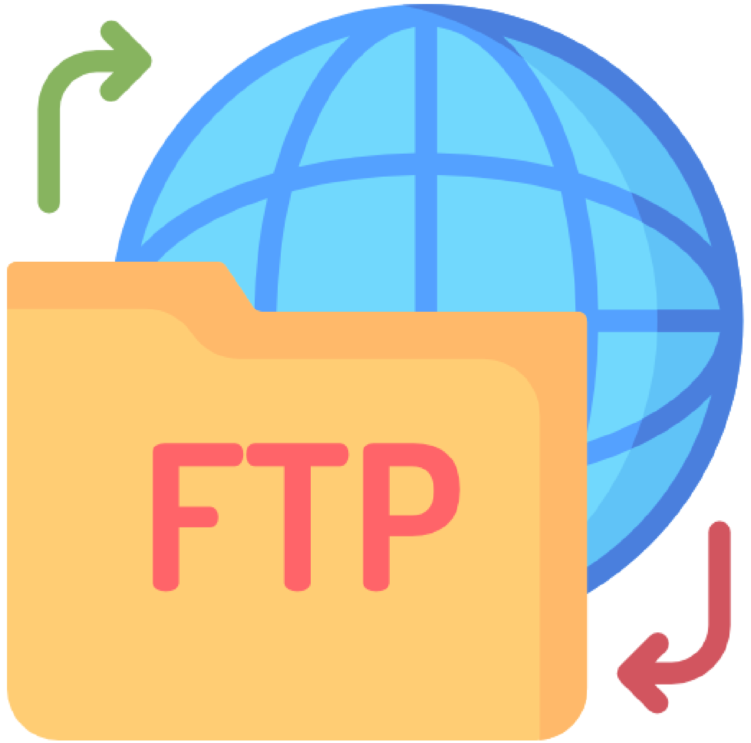
Save and Run the Test

Ensure to save the test after completing all the steps. Run the test by selecting Run or pressing the green triangle button in the menu bar.

Run the test by selecting **Run** or pressing the green triangle button in the menu bar.

FTP Sampler

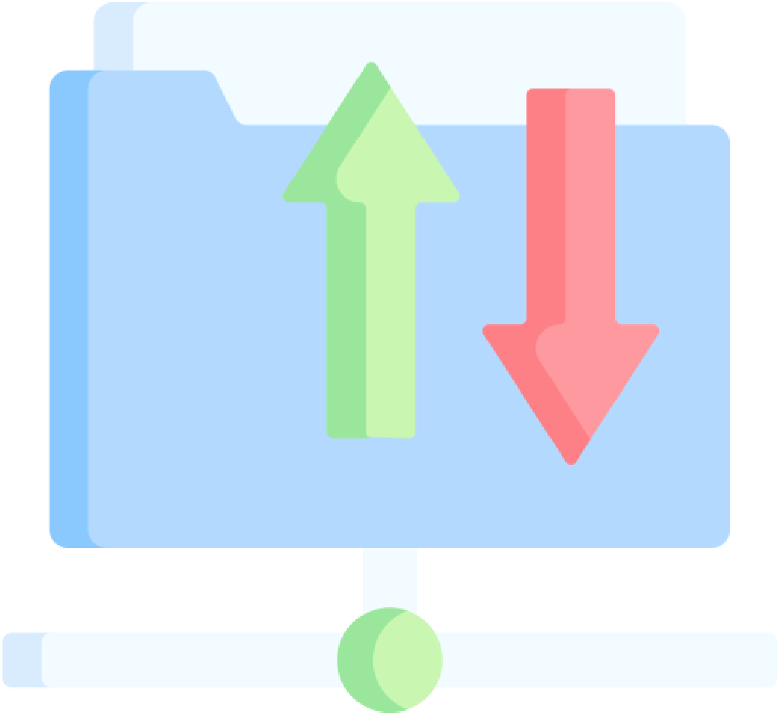
File Transfer Protocol



- The File Transfer Protocol is a set of rules that govern how computers transfer files over the internet from one system to another.
- Websites use FTP to upload and download files from their website's servers, whereas businesses use FTP for sending files between computers.

FTP Sampler

The FTP sampler will raise an FTP request that requires a username and password authentication, as, without authentication, no FTP server can upload or remove files from a remote server.



The user must first provide the server's name, mention the file location, and select upload or download as per the test scenario.

Add FTP Request

The following steps will guide the user to add an FTP request:

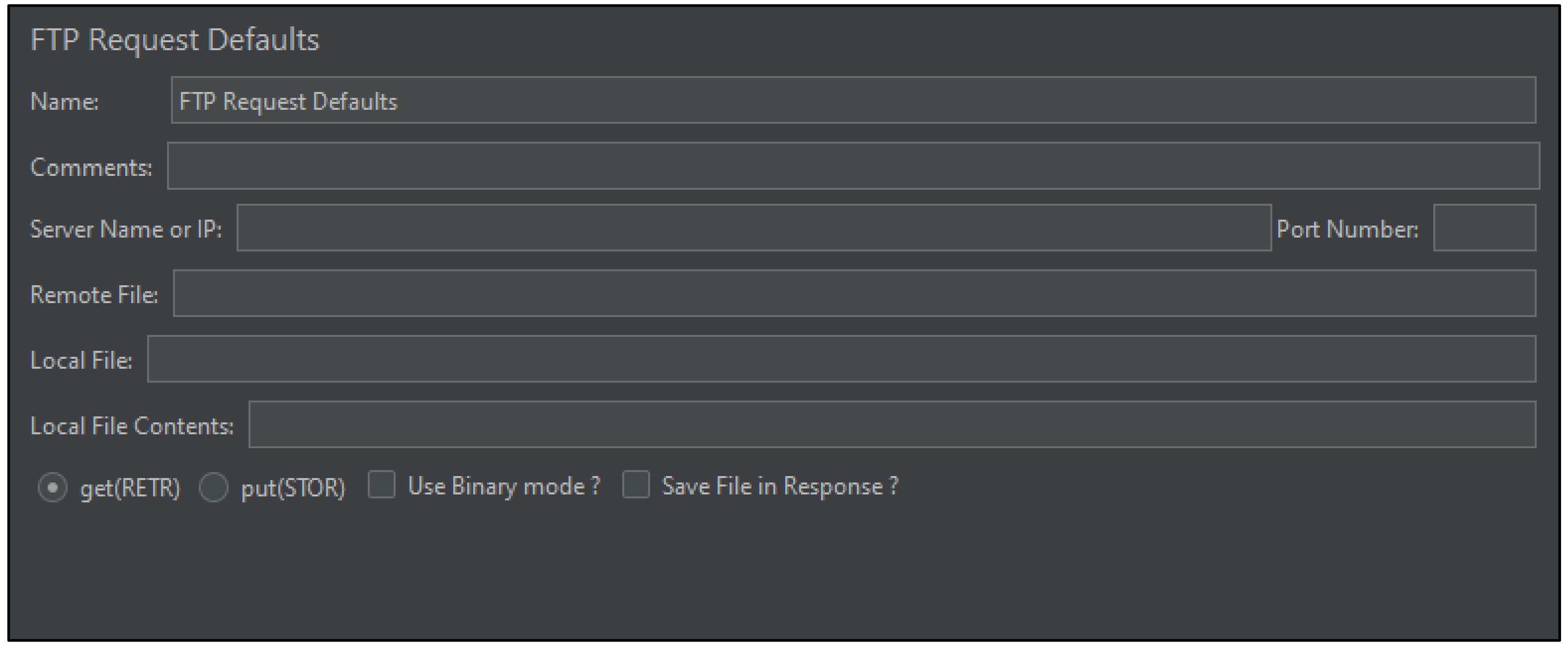
01 Right-click on **Thread Group** and select **Add**

02 Hover over the **Config Elements**

03 Select the **FTP Request**

FTP Request Settings Window

Here is the screenshot of the FTP request settings window:



FTP Request Defaults

Name: FTP Request Defaults

Comments:

Server Name or IP: Port Number:

Remote File:

Local File:

Local File Contents:

● get(RETR) ○ put(STOR) □ Use Binary mode ? □ Save File in Response ?

FTP Server Name and Port

The user needs to enter the server address or IP address of the FTP server and the port which is being used by the FTP server.

An FTP server listens on port 21 by default.

Local vs. Remote File

To use the file, the user must define the following directory links:

Remote File

Users can save download or upload files from the FTP server and paste the directory link.

Local File

Users can save download or upload files from the FTP server in the local system and Paste the local file link in this field.

Local File Contents

The source file content can be provided using this input when the file is uploaded.

Get and Post

The user must specify whether to upload or download the file using the following commands:

Get

The Get command downloads files from FTP servers.

Post

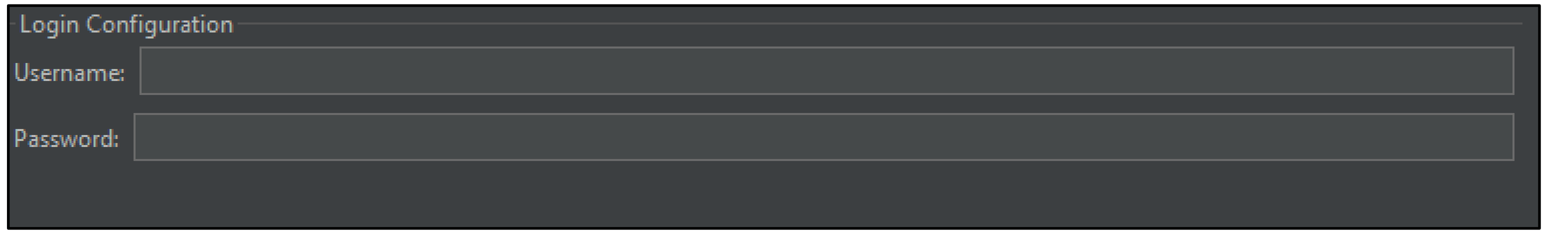
The Post command uploads files to the FTP servers.

Binary Mode

The user should uncheck this box when uploading or downloading plain text files, otherwise, keep it checked.

Login Configuration

In this field, the user must provide the FTP server credentials:



Login Configuration

Username:

Password:

Add Listeners

To add listeners, the user must follow the below steps:

01 Right-click on the **Thread Group** under the **Test Plan**

02 Select **Add** from the menu

03 Hover over the **Listener** and select the **View Results Tree**

Save and Run the Test

.

Ensure to save the test after completing all the steps. Run the test by selecting Run or pressing the green triangle button in the menu bar.

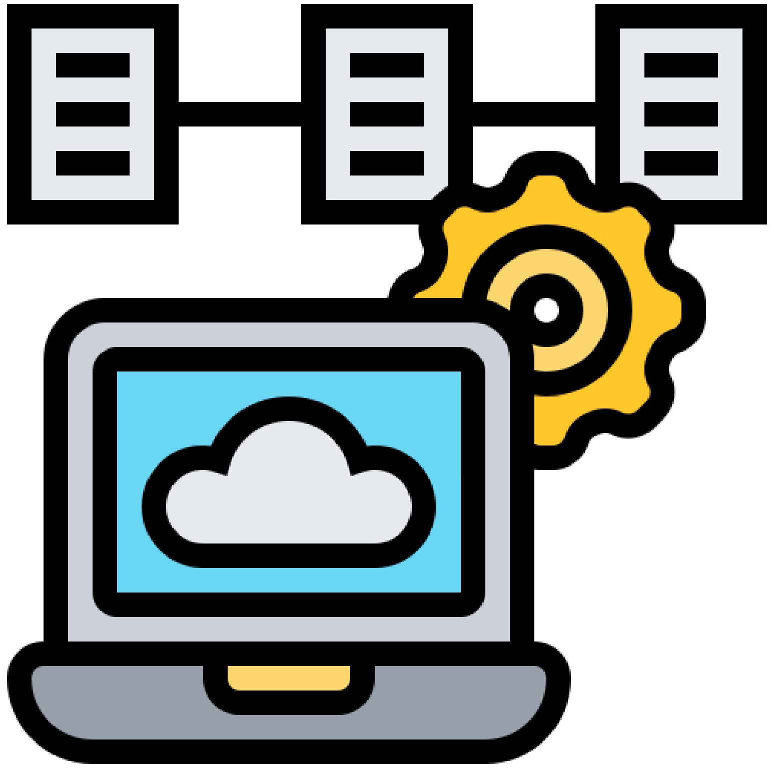
Run the test by selecting **Run** or pressing the green triangle button in the menu bar.

TECHNOLOGY

OS Process Sampler

OS Process Sampler

An OS Process sampler can be used to execute commands on the local machine.



The user should be able to execute any command from the command line.

Add OS Sampler

The following steps will guide the user to add an OS sampler:

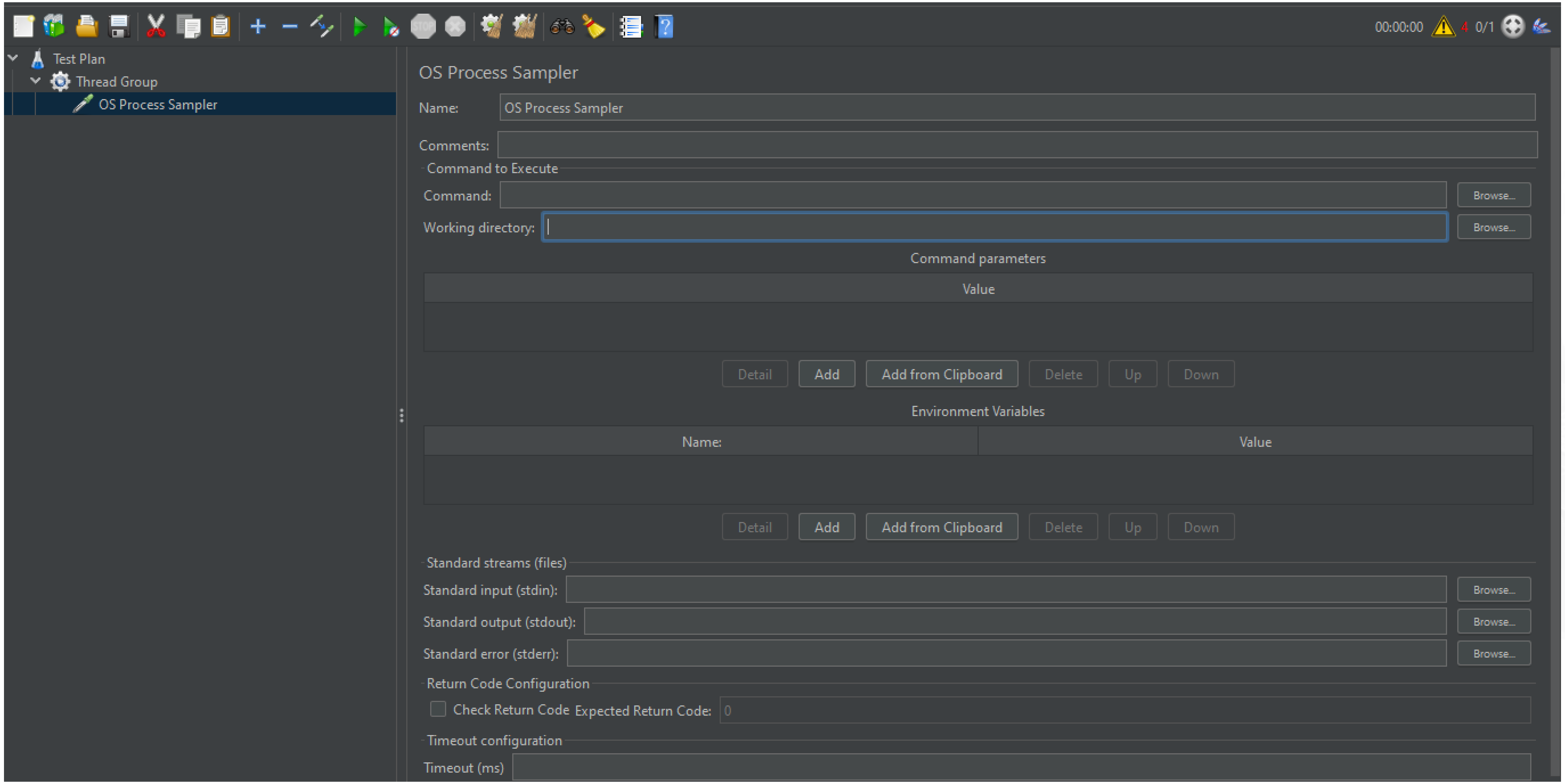
01 Right-click on **Thread Group** and select **Add**

02 Hover over the **Sampler**

03 Select the **OS Sampler**

OS Sampler Settings Window

Below is a screenshot of the OS Sampler settings window:



OS Process Sampler

Name: OS Process Sampler

Comments:

Command to Execute

Command: Browse...

Working directory: Browse...

Command parameters

Value

Environment Variables

Name:	Value

Standard streams (files)

Standard input (stdin): Browse...

Standard output (stdout): Browse...

Standard error (stderr): Browse...

Return Code Configuration

□ Check Return Code Expected Return Code: 0

Timeout configuration

Timeout (ms)

OS Sampler Parameters

User must specify OS Samplers' parameters to execute the commands:

Working Directory

It is a directory from which commands will be executed, by default the folder specified by the system property **user.dir.**

Command Parameters

User must write input program parameters in this section.

Environment Parameters

Key or Value pairs are added to the environment while running the command.

OS Sampler Parameters

The user must define input, output, and error parameters using the following commands:

Standard Input

The name of the file from which input will be taken (STDIN)

Standard Output

The name of the output file for standard output (STDOUT)

Standard error

The name of the output file for standard error (STDERR)

OS Sampler Parameters

To execute the OS Sampler, the user must set the return code and time out parameters as below:

Check Return Code

The sampler will compare the return code with the expected return code.

Expected Return Code

A return code for a system call is required if **Check Return Code"** is selected.

Time Out

The default timeout for commands is 0, which means no timeout. JMeter will terminate the OS process if the timeout expires before the command finishes.

Add Listeners

To add listeners, the user must follow the below steps:

01 Right-click on the **Thread Group** under the **Test Plan**

02 Select **Add** from the menu

03 Hover over the **Listener** and select the **View Results Tree**

Save and Run the Test

Ensure to save the test after completing all the steps

Run the test by selecting **Run** or pressing the green triangle button in the menu bar

Debug Sampler

Debug Sampler

The Debug Sampler can be used to troubleshoot script variables.

It is added during the debug phase of the script and should be deleted or disabled during the execution of the performance test.

Add Debug Sampler

The following steps will guide the user to add Debug Sampler:

01 Right-click on **Thread Group** and select **Add**

02 Hover over the **Sampler**

03 Select the **Debug Sampler**

Debug Parameters

The user must set the Debug parameters to process the sampler.

Attribute	Description
Name	Describe name of the element
Properties	Describe JMeter properties which are displayed in the View results tree listener
Variables	Displays the JMeter variables and their values in the response pane
System Properties	Display the system properties

Add Listeners

To add listeners, the user must follow the below steps:

01 Right-click on the **Thread Group** under the **Test Plan**

02 Select **Add** from the menu

03 Hover over the **Listener** and select the **View Results Tree**

Save and Run the Test

Ensure to save the test after completing all the steps

Run the test by selecting **Run** or pressing the green triangle button in the menu bar.

Key Takeaways

- A Selenium web driver handles all client-side logic based on such as HTML5, CSS, AJAX, and JS for web applications.
- The File Transfer Protocol governs the transfer of files over the internet from one system to another.
- The OS Process Sampler executes commands on the local machine using the Command line.
- The Debug Sampler is used to troubleshoot script variables.