Automation Testing

TECHNOLOGY

Load and Scalability With JMeter

simplilearn

A Day in the Life of an Automation Test Engineer

Alex's manager has given a newly developed application for scalability and database load testing to his colleague Alex. He instructed Alex to notify actual testing reports via email using the JMeter tool.

To complete his task, he must first develop a complete test plan and used a variety of samplers to notify the same. The JMeter various sampler like SMTP, JDBC, and JUnit will be used to check the load and scalability of online applications and notify the actual reports to the user at the time of testing only.

To achieve the above, he will learn a few concepts in this lesson that will help him come up with a solution.

Learning Objectives

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

- Define the SMTP sampler
- Discuss JDBC sampler
- Implement JUnit sampler
- Test and result analysis

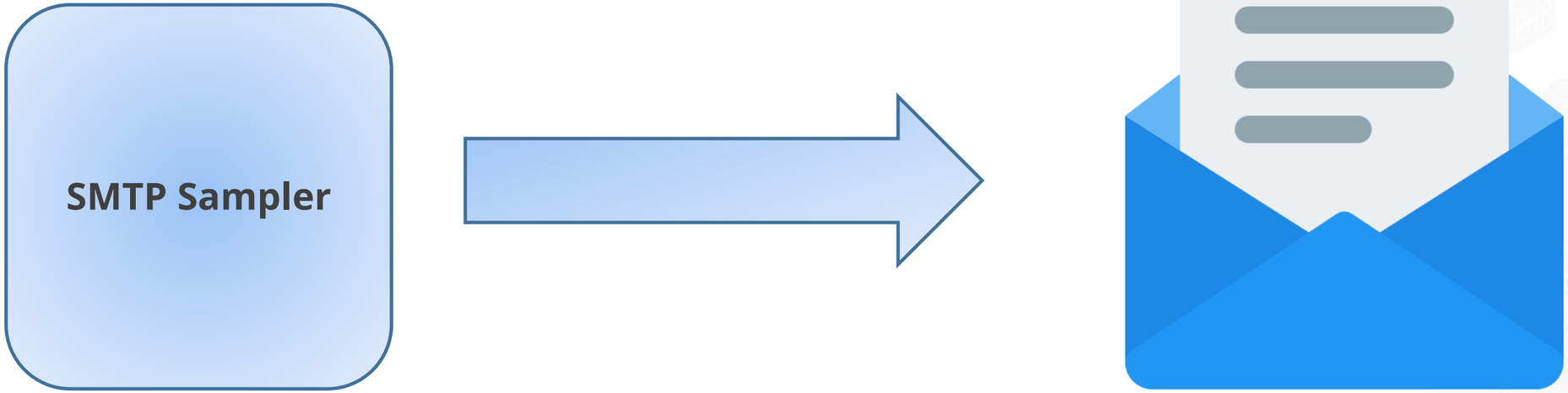
SMTP Sampler

SMTP

- SMTP stands for Simple Mail Transfer Protocol.
- SMTP protocol sends and receives emails to senders and receivers.
- An SMTP email server has an address (or addresses) that can be set by email client or application, usually in the format smtp.serveraddress.com.
- For example, Gmail uses smtp.gmail.com as its SMTP server.

SMTP Sampler

SMTP sampler is used to send and receive test email notifications.



SMTP Environment

Following are the steps to install Java Mail Jar:

01 Download the **Java Mail Jar**

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

03 Restart the **JMeter**

Test RoadMap

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

Create Test Plan **Add Thread Group** **SMTP Requests** **Analysis and Result**

Add SMTP Sampler

Add an SMTP sampler by following these steps:

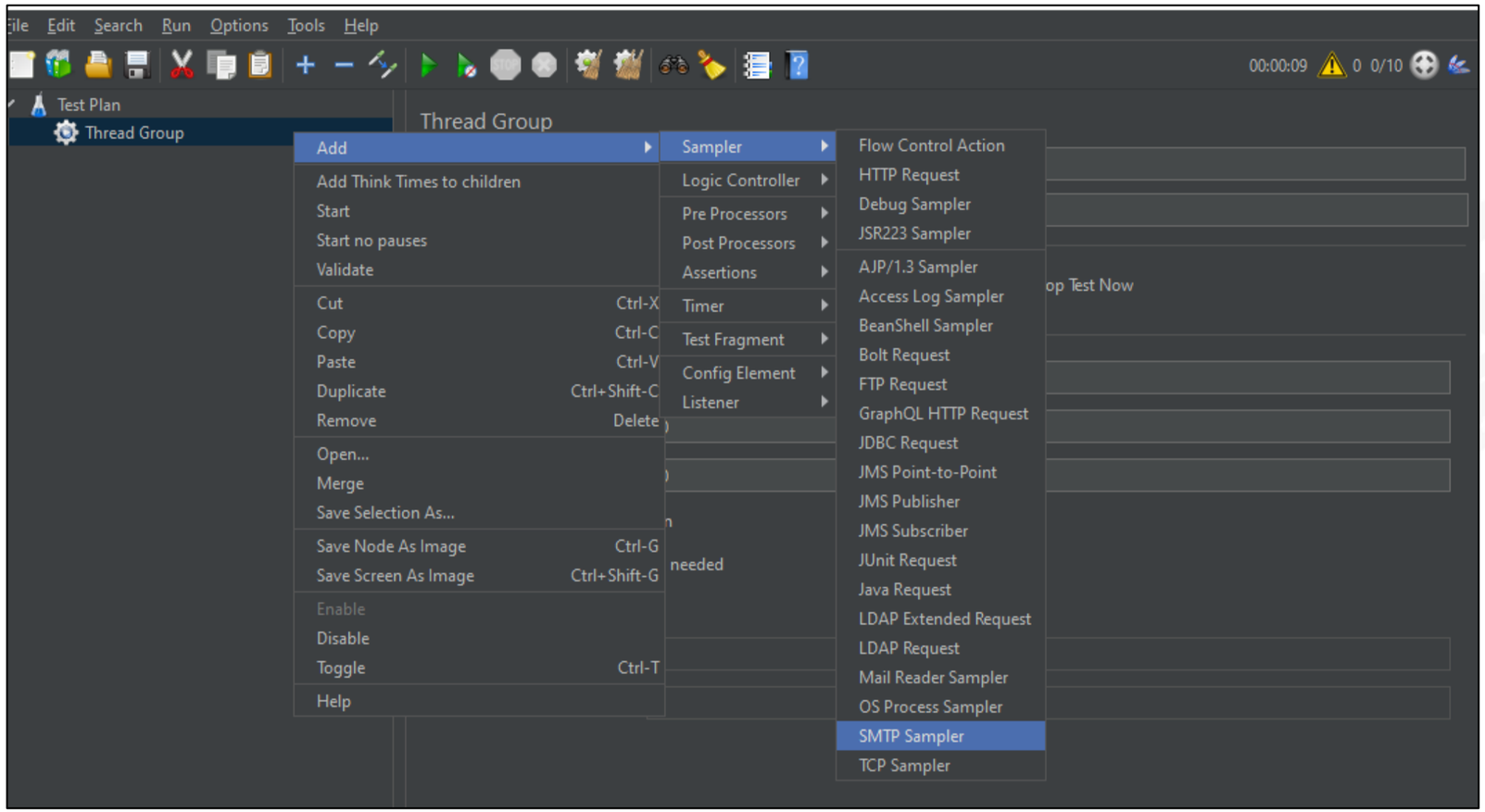
01 Create a **Test plan and add** a new **Thread Group under Test Plan**

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

03 Hover over the **Sampler** and select the **SMTP Sampler**

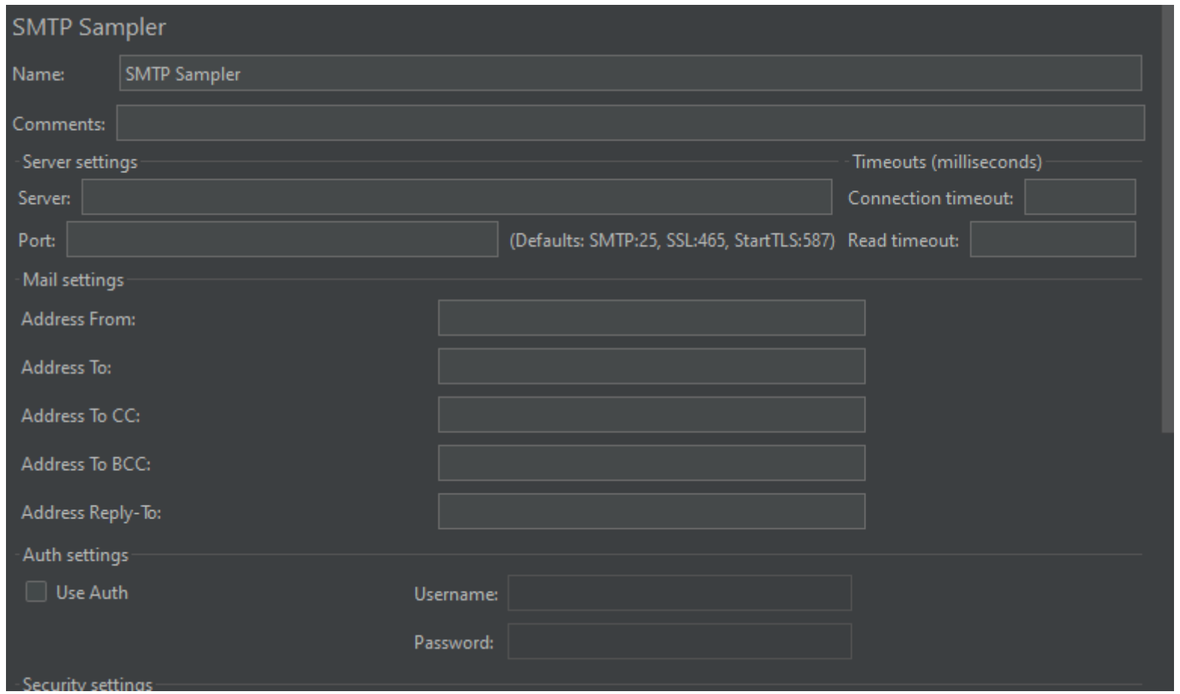
Add SMTP Window

The SMTP add sampler output window will look like this:



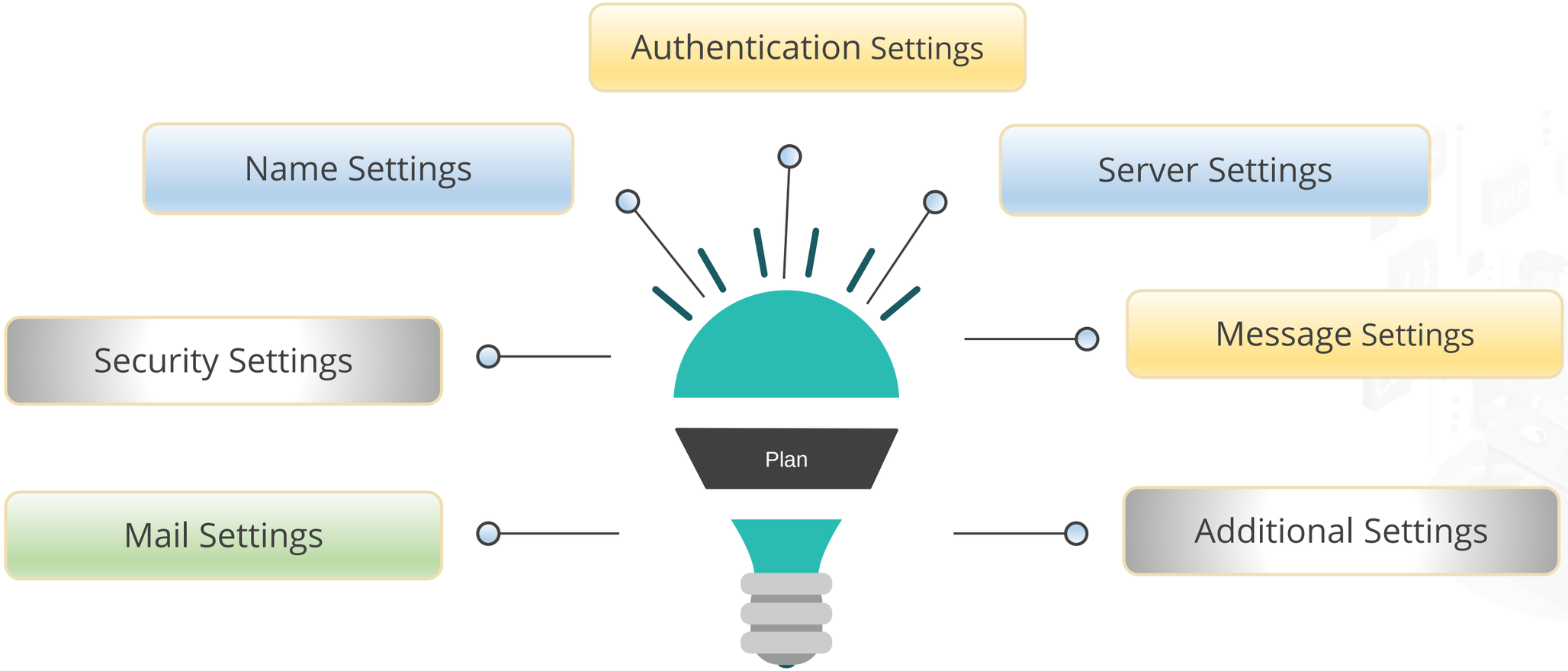
SMTP Sampler Window

The following properties can be set in the SMTP sampler window:



SMTP Sampler Properties

Many properties can be set in the SMTP sampler window.



Name Settings

Set the name of the SMTP sampler.

Server Settings

In the SMTP sampler, the user must fill in the details of the SMTP server.

Server

Step 01

Step 02

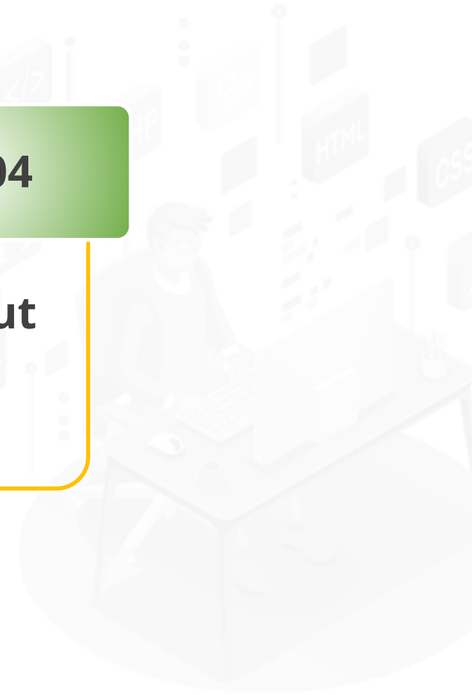
Port Number

Connection time out

Step 03

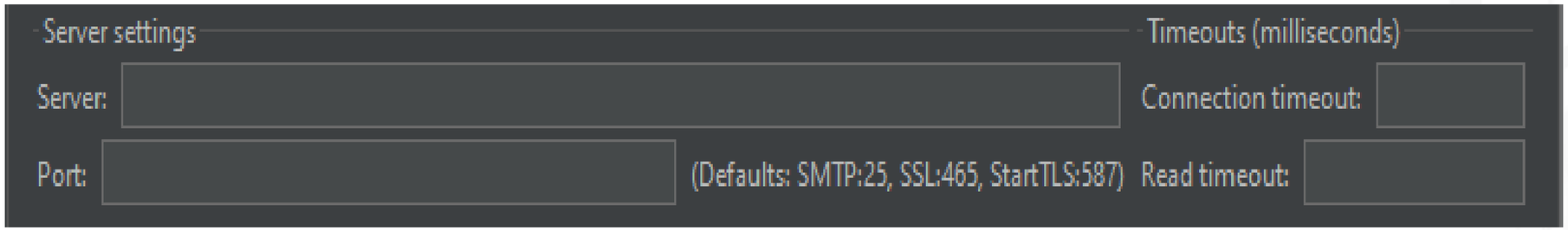
Step 04

Read time out



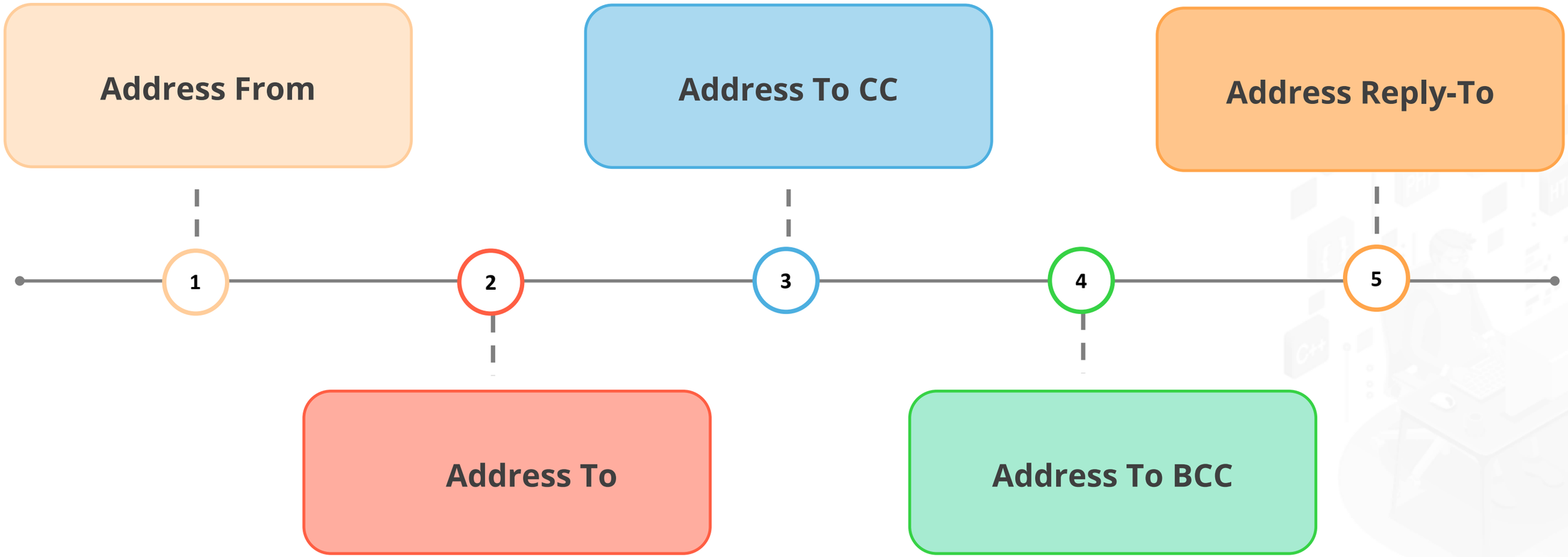
Server Settings Output

:Here is a screenshot of the configuration window for the server settings:



Mail Settings

JMeter performs the following steps during mail settings:



Mail Settings Output

:

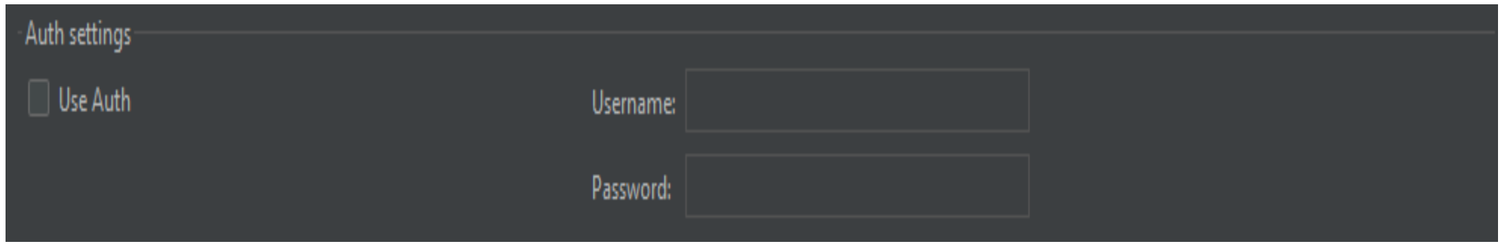
Here is a screenshot of the configuration window for the mail settings:

Authentication Properties

To authenticate the process, the user must fill in the username and password in the SMTP sampler.

Authentication Settings Output

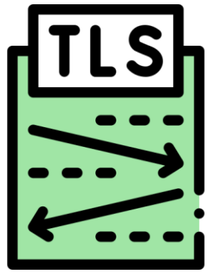
Here is a screenshot of the configuration authentication settings:



Security Settings

To ensure the communication's security, the user must enable security protocols.

Use no security features

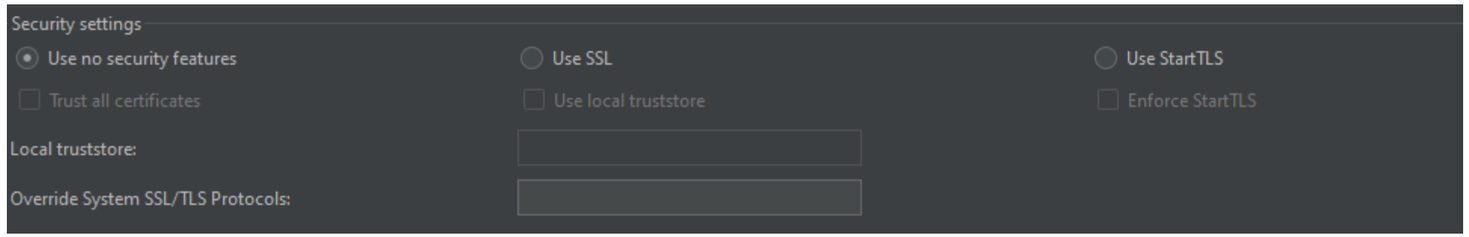


Use Start TLS

Use SSL

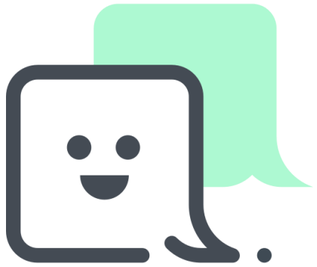
Security Settings Output

Here is a screenshot of the configuration of security settings:



Message Settings Output

The user must put in the message subject and body in the message setting window. Additionally, users can attach files to their messages.

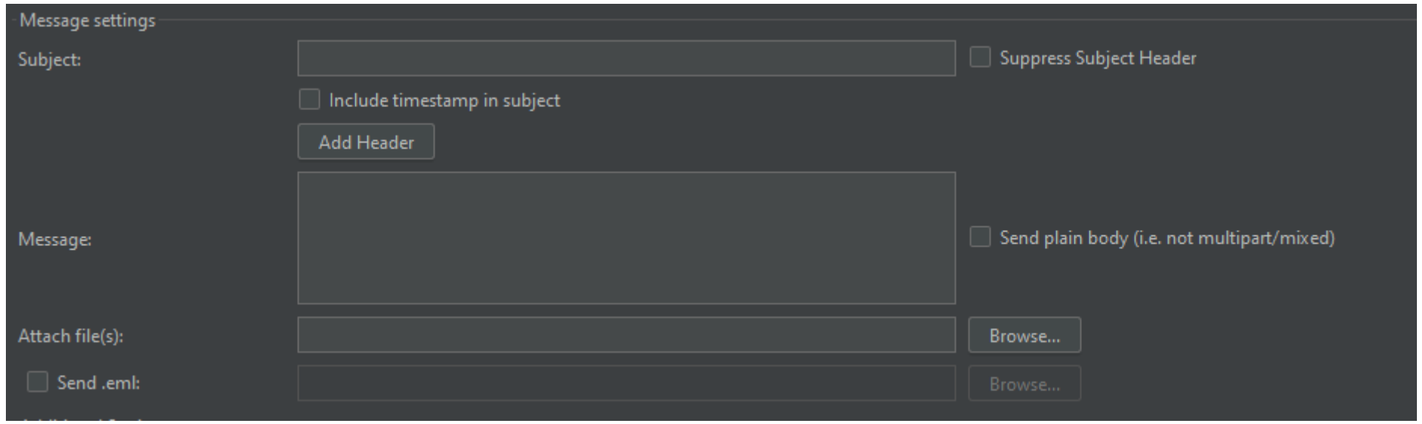


Insert message subject and message body

Attach files to the message

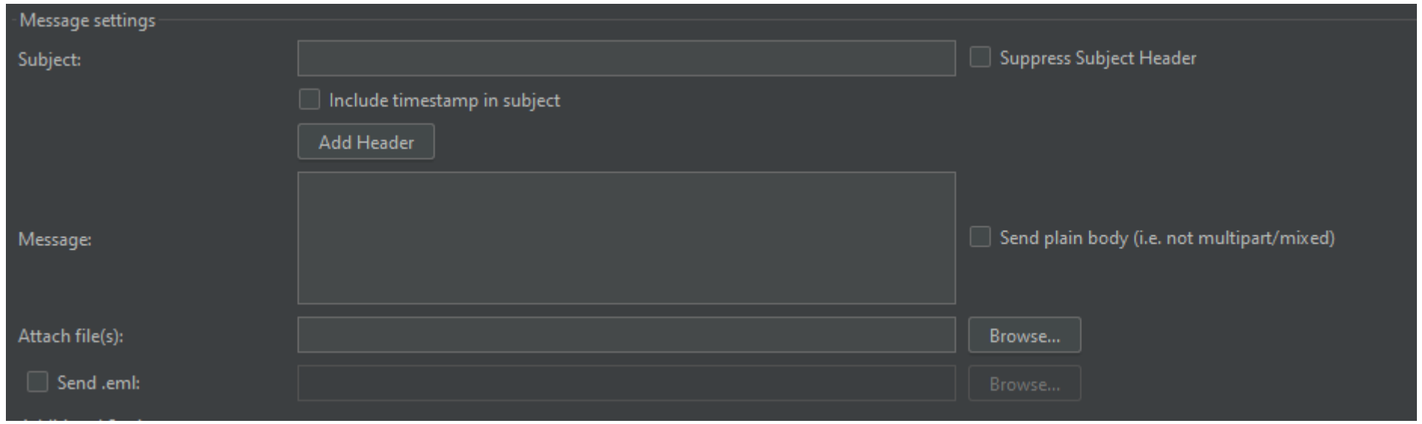
Message Settings Output

Here is a screenshot of the configuration of message settings:



Message Settings Output

Here is a screenshot of the configuration of message settings:



Message Settings Output

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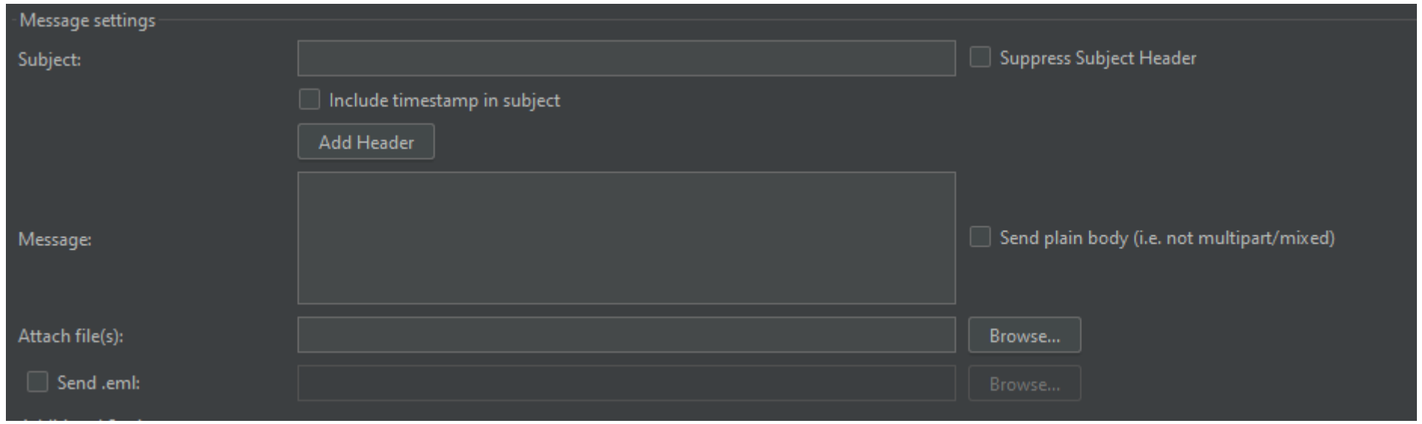


Additional Settings Output

Here is a screenshot of the configuration of additional settings:

Add Listeners

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

01

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

02

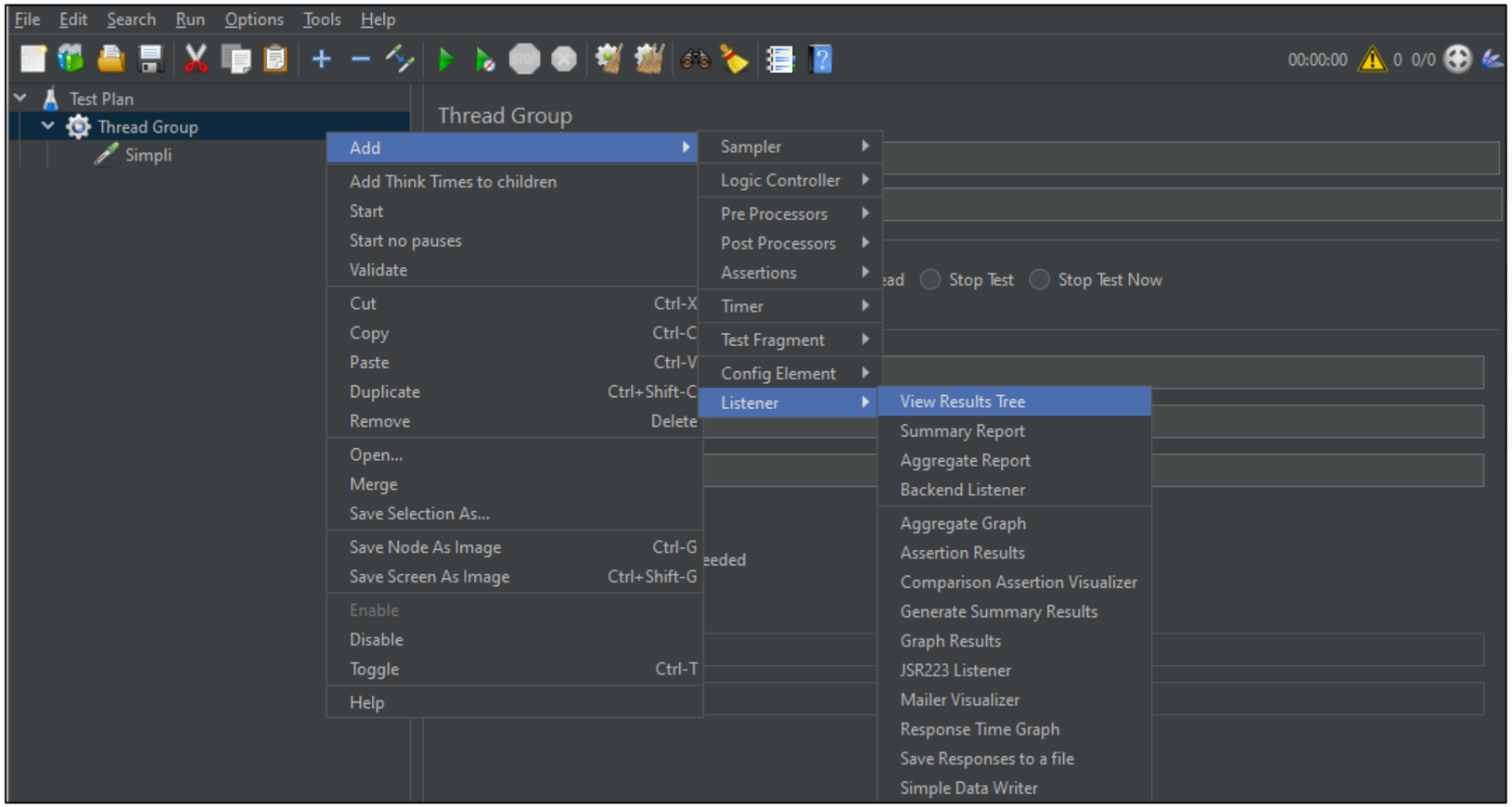
Select **Add** from the menu

03

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

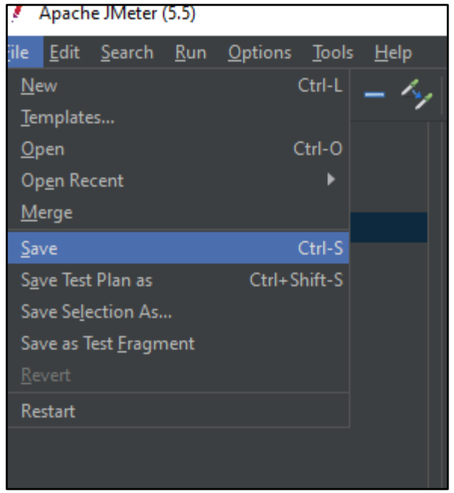
Listener Output Window

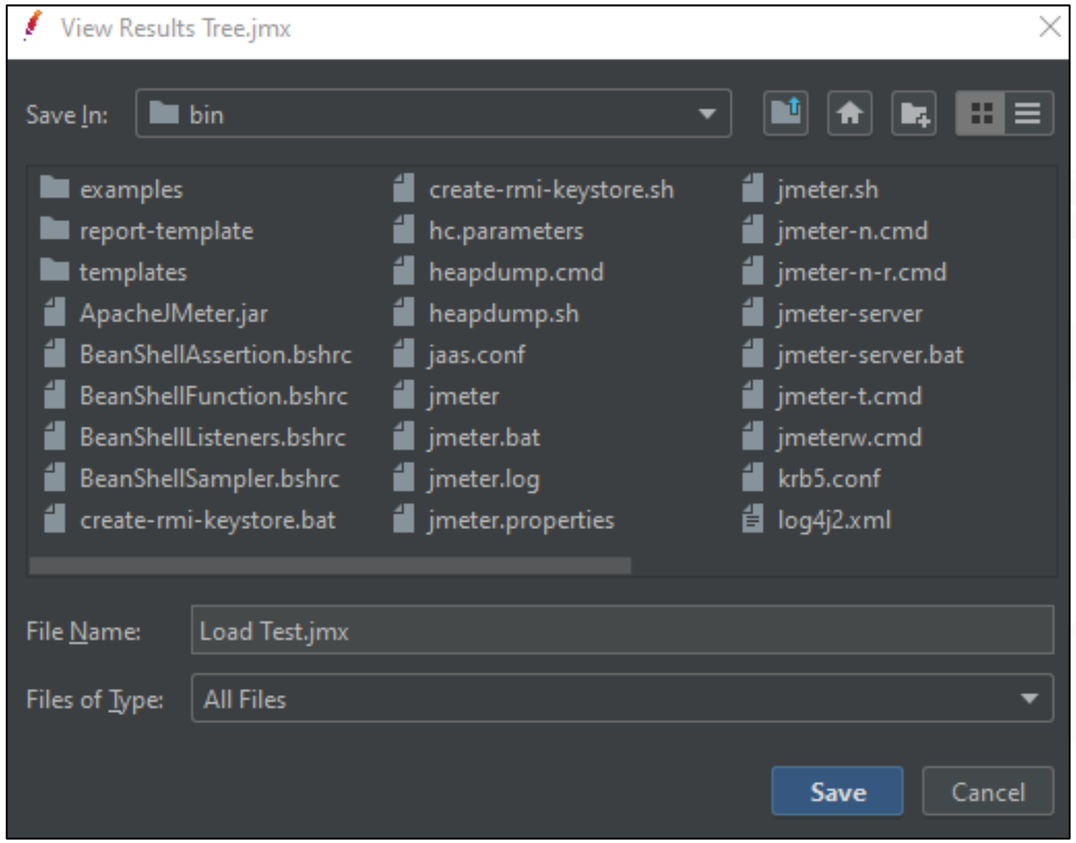
The listener output window will look like this:



Save the Test

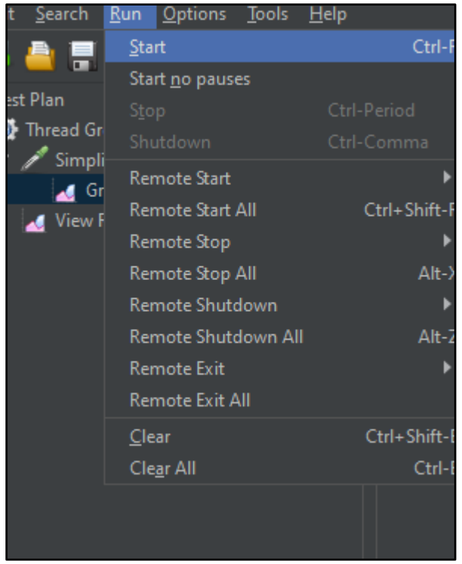
Ensure to save the test after completing all the steps.





Run the Test

It is now time to run the test after completing all the steps. The user can either select **Run** or press the green triangle button in the menu bar.



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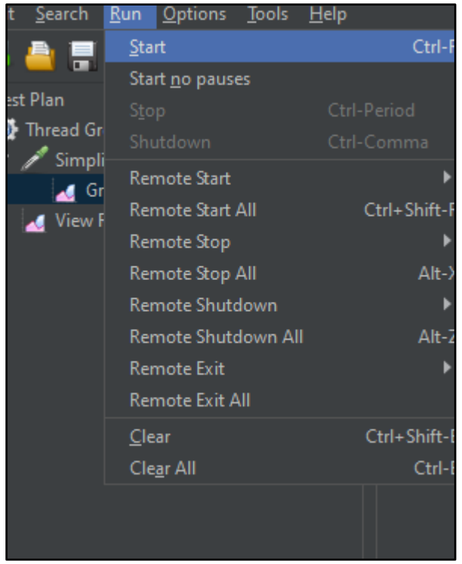
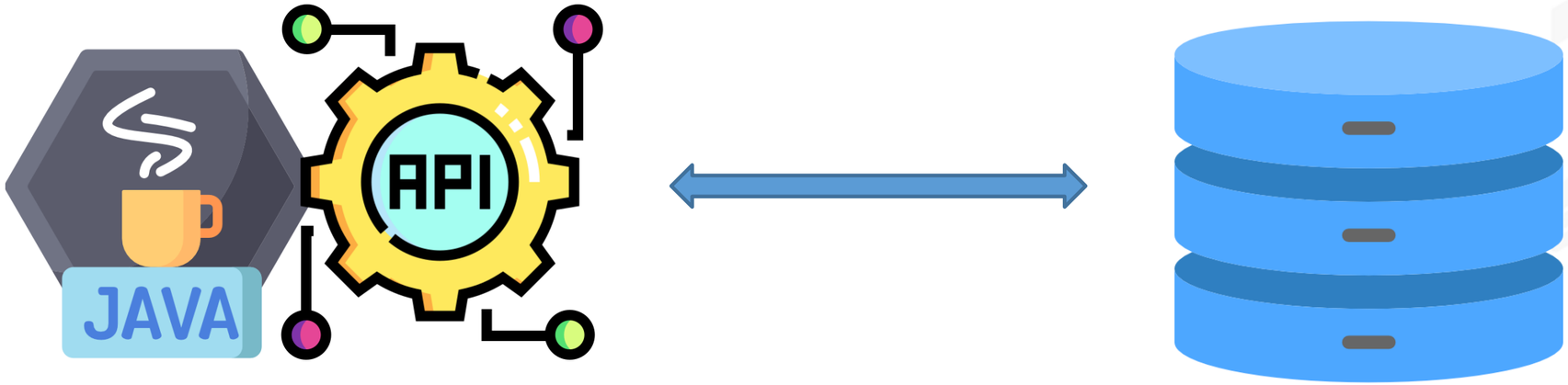


JDBC Sampler

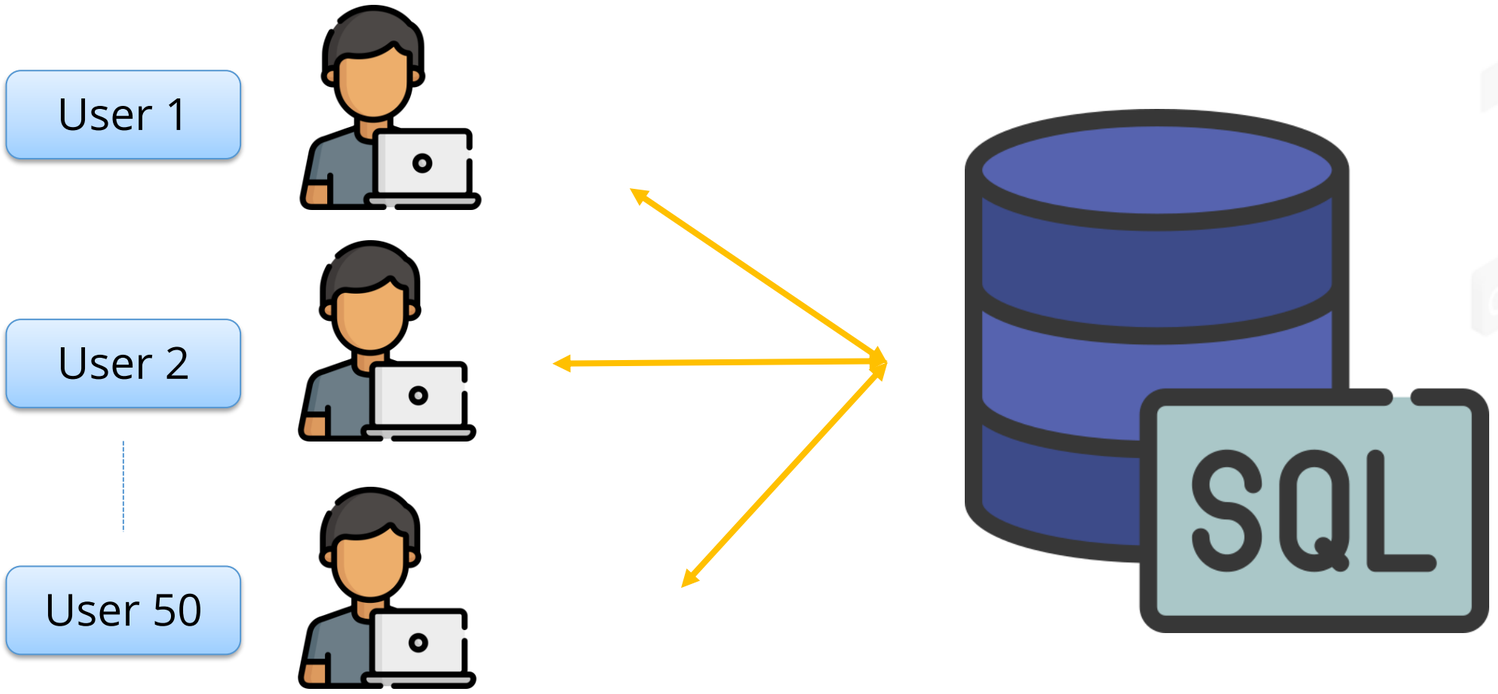
JDBC

JDBC stands for Java Database Connectivity, a Java API that connects Java programming with a wide range of databases.



JDBC Sampler

JDBC sampler helps to perform a load test on SQL Server. JDBC sampler helps to create an SQL query for the database.



Test RoadMap

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

Add Thread Group **JDBC Connection** **JDBC Requests** **Analysis and Result**

JDBC Environment

Following are the steps to install MySQL JDBC Jar:

01 Download the **MySQL JDBC Jar**

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

03 Restart the **JMeter**

Create SQL Database

To perform JDBC testing, users must have access to an SQL database.

Add JDBC Connection Configuration

Add JDBC sampler by following these steps:

01

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

02

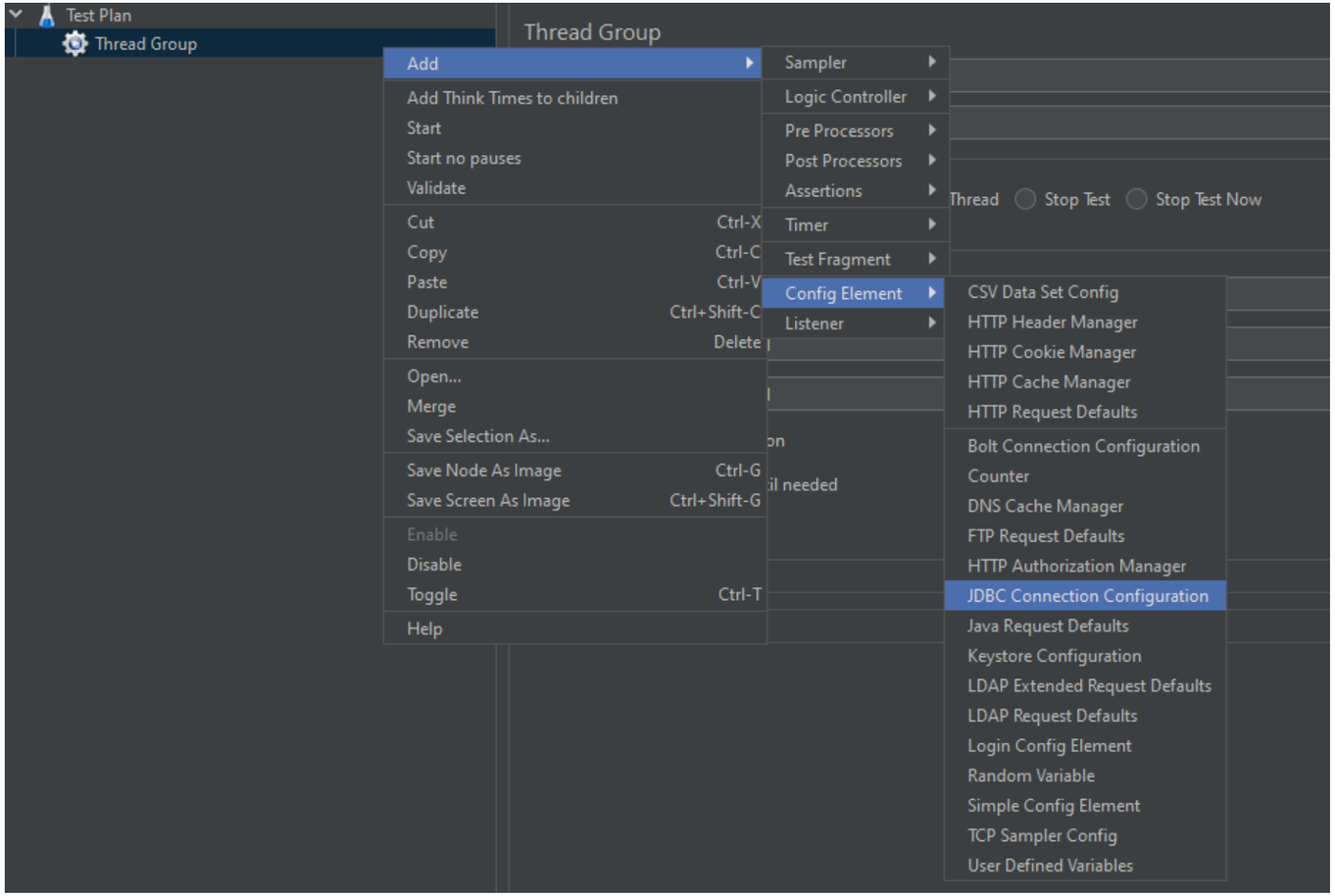
Right-click on **Thread Group** and select **Add**

03

Hover over the **Config Element** and select the **JDBC Connection Configuration**

JDBC Connection Configuration Window

The JDBC connection configuration output window will look like this:

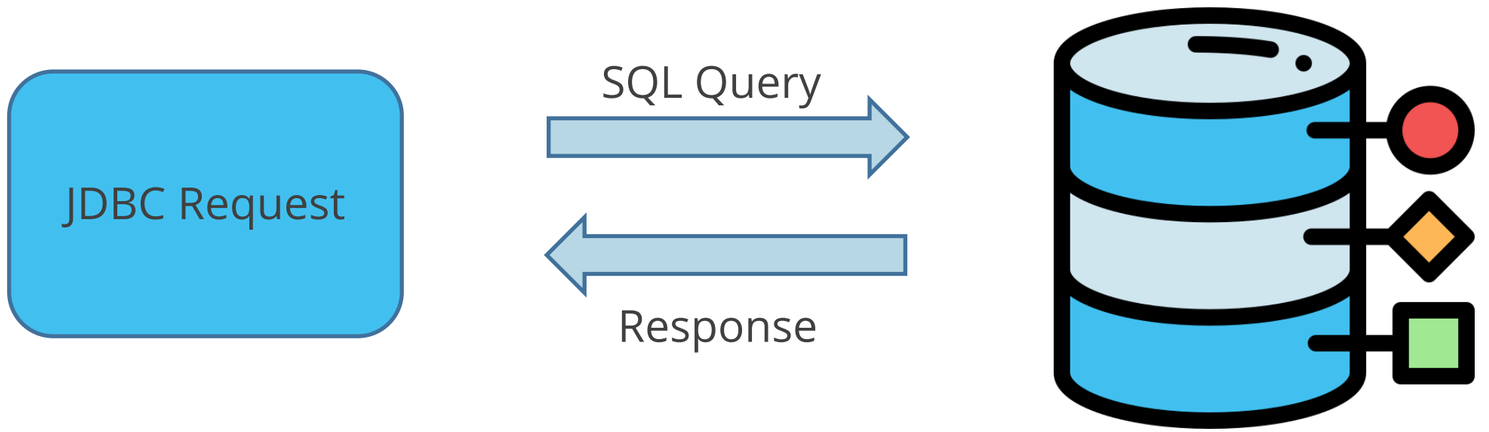


JDBC Configuration Setting

To access the database, the user must set the database URL, drivers, username, and password details in the configuration settings.

JDBC Request

The JDBC request allows the user to perform database load and performance testing. It sends a JDBC request to the database, which is an SQL query.



Add JDBC Request

The following steps will guide the user to add a JDBC request:

01

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

02

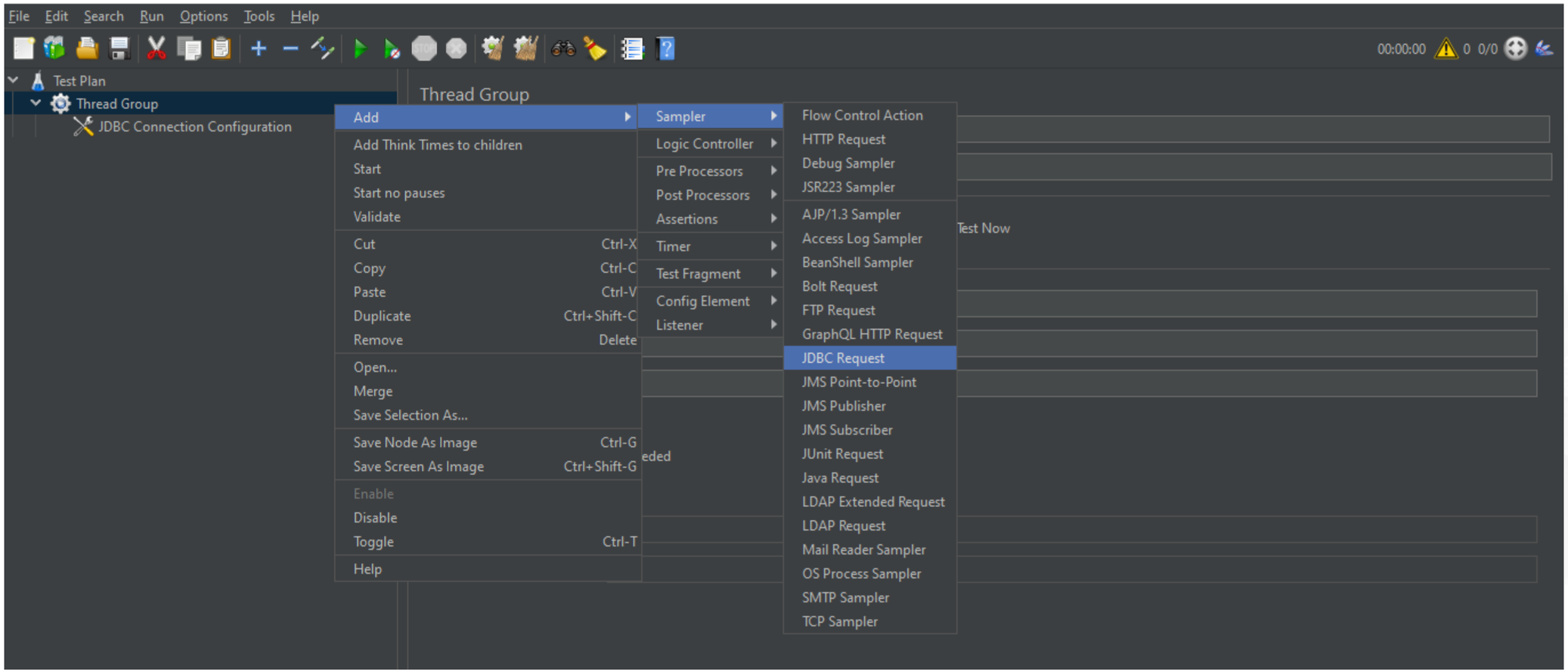
Right-click on **Thread Group** and select **Add**

03

Hover over the **Sampler** and select the **JDBC Requests**

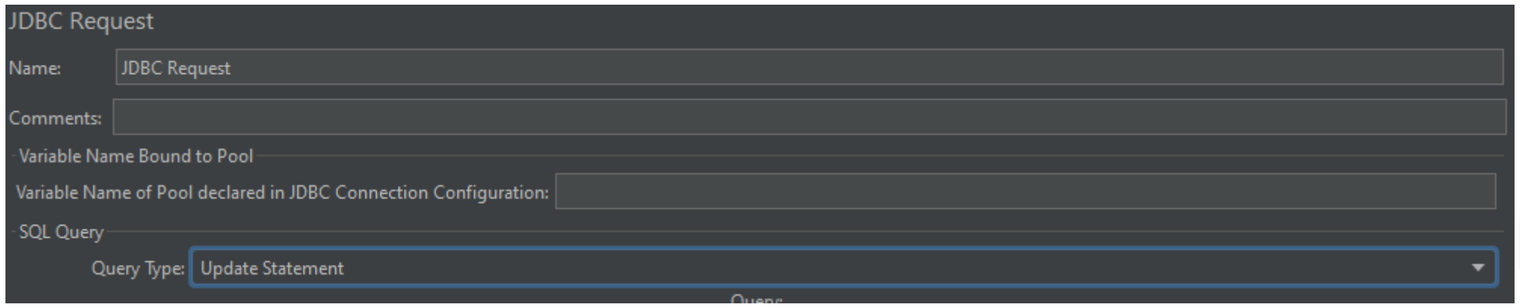
JDBC Request Window

The JDBC request output window will look like this:



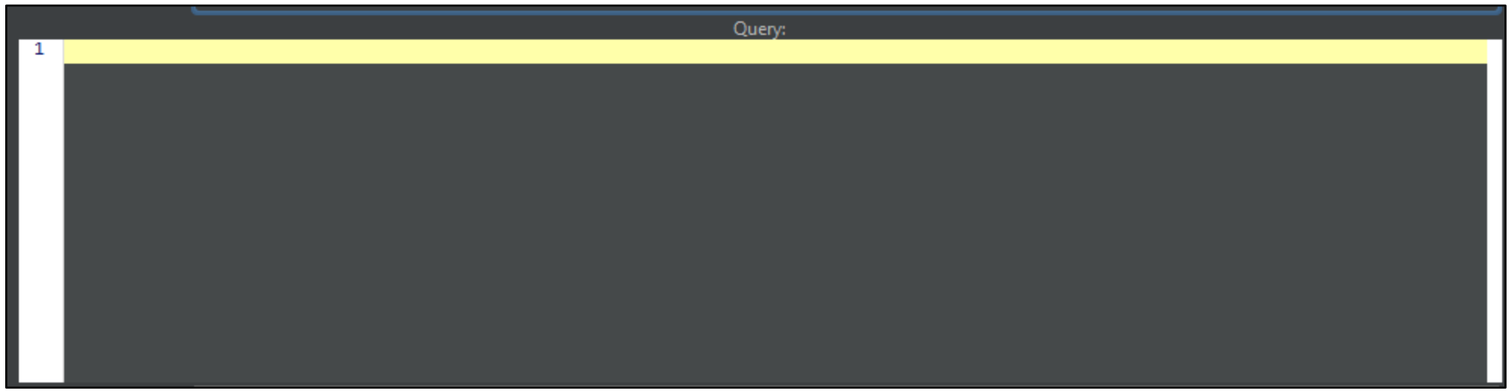
JDBC Request Setting

The next step is to set up a JDBC request and write SQL queries to access the database.



SQL Query

A query panel is present in the JDBC request window. Here, the user can write SQL queries for testing purposes.



Add Listeners

To add listeners, the user must follow below steps:

01

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

02

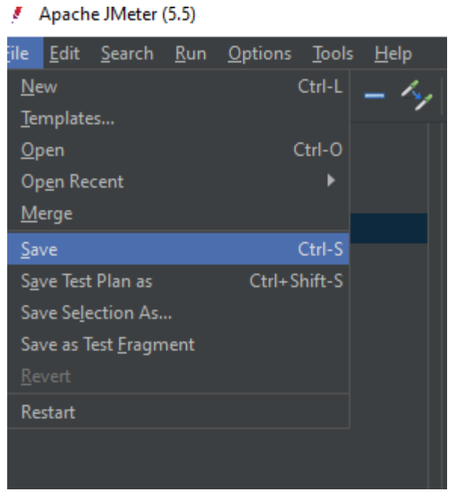
Select **Add** from the menu

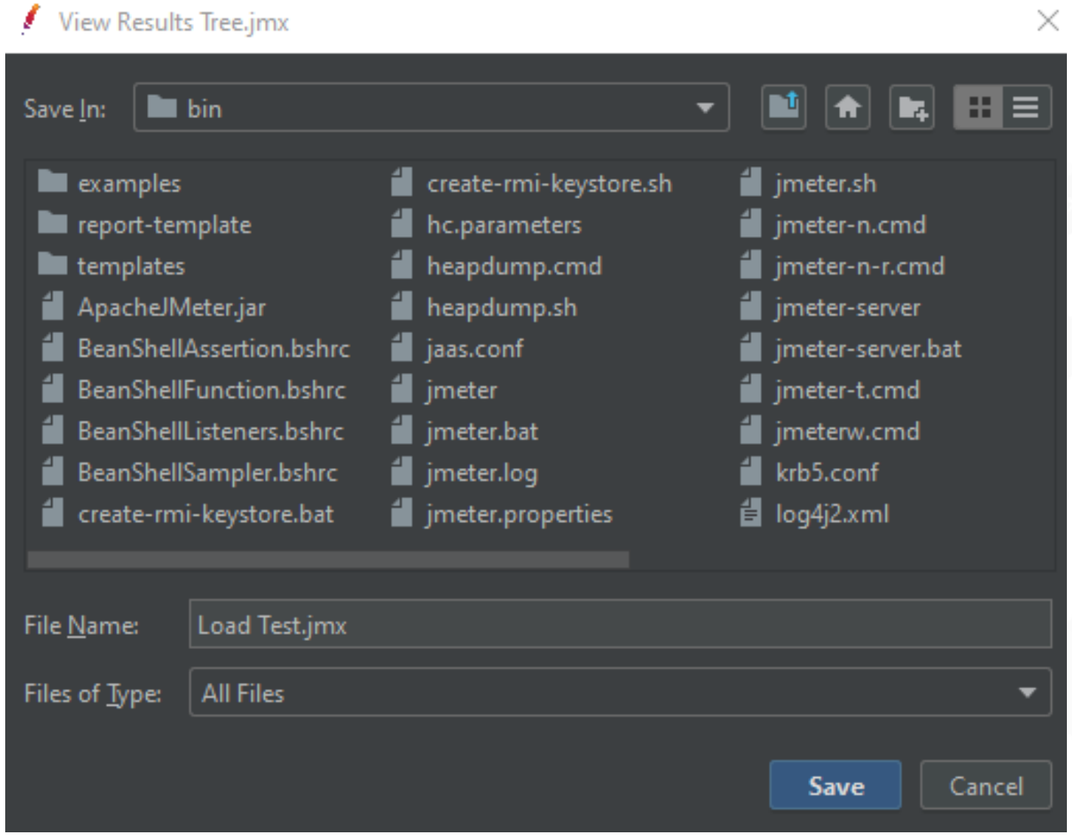
03

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

Save the Test

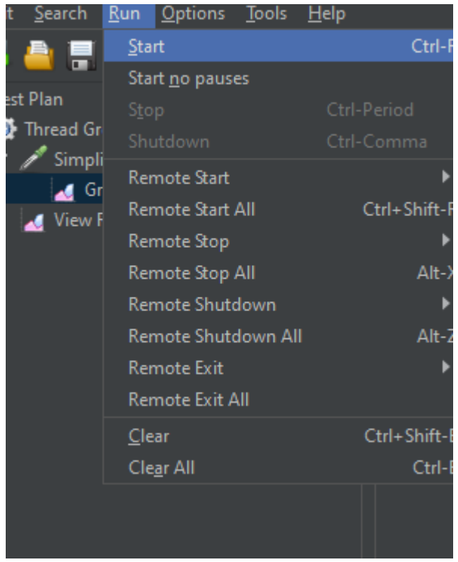
Ensure to save the test after completing all the steps.





Run the Test

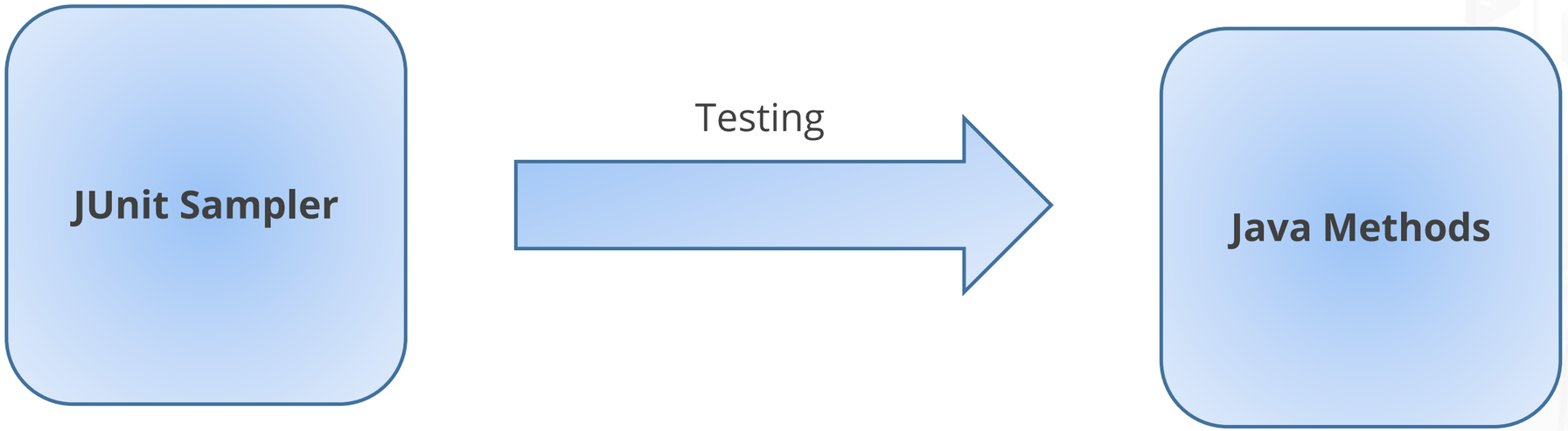
It is now time to run the test after completing all the steps. The user can either select **Run** or press the green triangle button in the menu bar.



JUnit Sampler

JUnit Sampler

The JUnit sampler is used to perform load testing on Java methods.



Test RoadMap

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

Create Test Plan

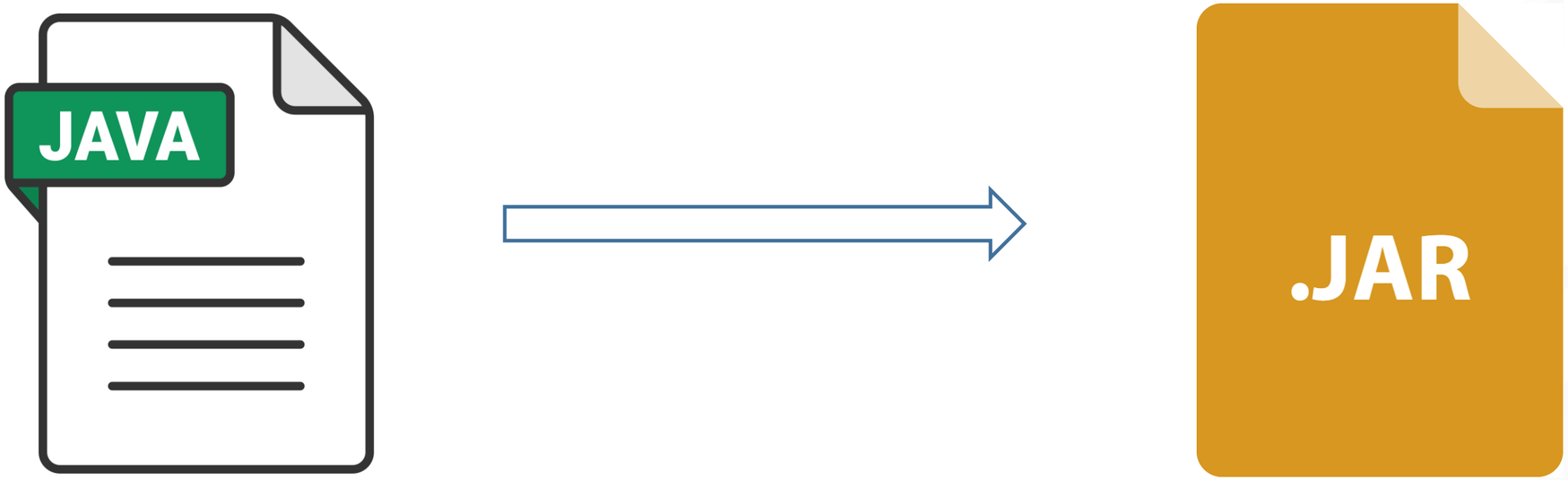
Create JUnit Case

JUnit Request

Analysis and Result

JUnit Test Case

To perform JUnit testing, the user needs to create or use pre-built Java test cases.



JUnit Environment

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 these steps:

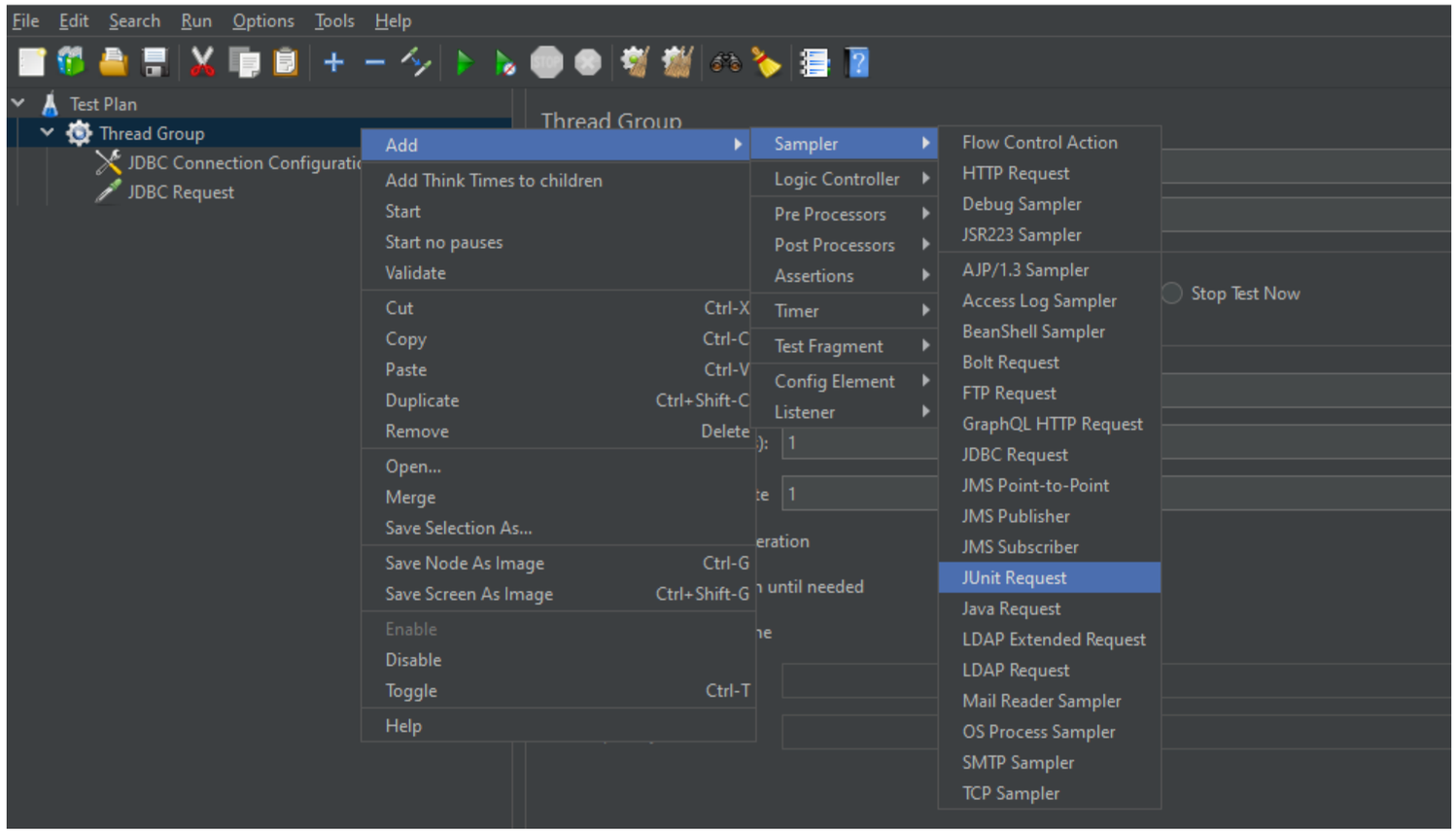
01 Add a new **Thread Group under** and set the **Thread** properties

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

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

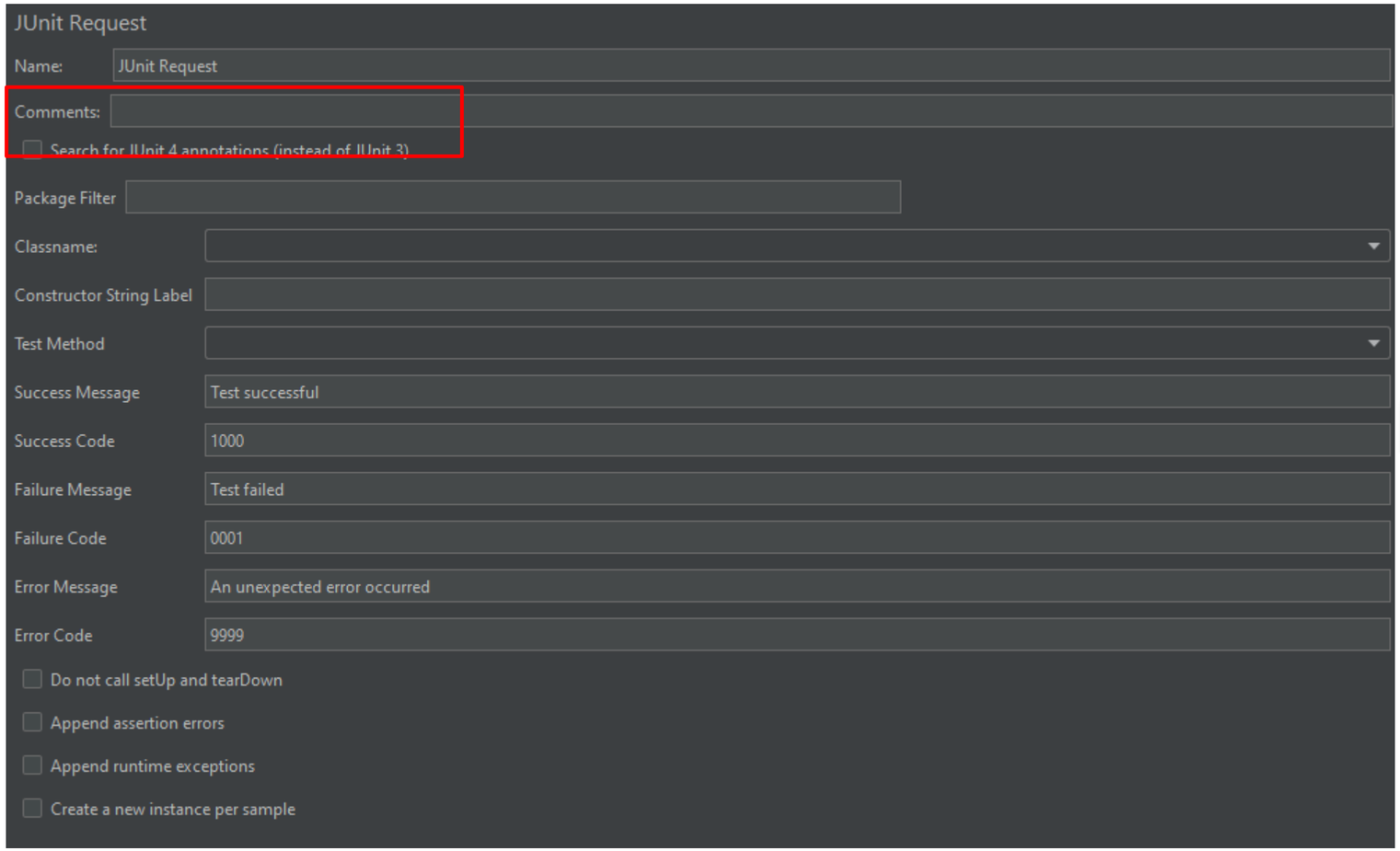
Junit Request Window

Here is the screenshot of the JUnit settings window:



JUnit Settings Window

Here is the screenshot of JUnit setting window:



Error Message

JMeter provides several default success/failure codes and messages. For all tests, users should define unique success and failure codes.

Success Message	Test successful
Success Code	1000
Failure Message	Test failed
Failure Code	0001
Error Message	An unexpected error occurred
Error Code	9999

Add Listeners

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

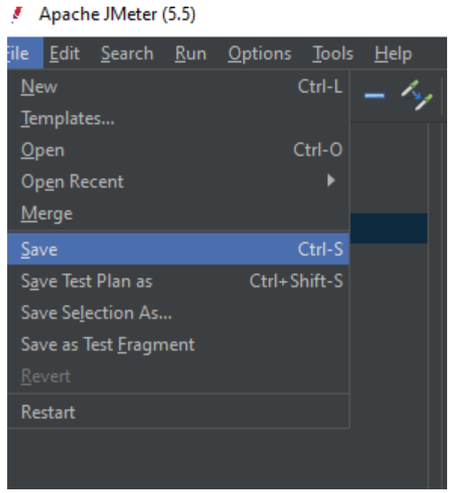
01 Right-click on the **Thread Group** under the **Test Plan**

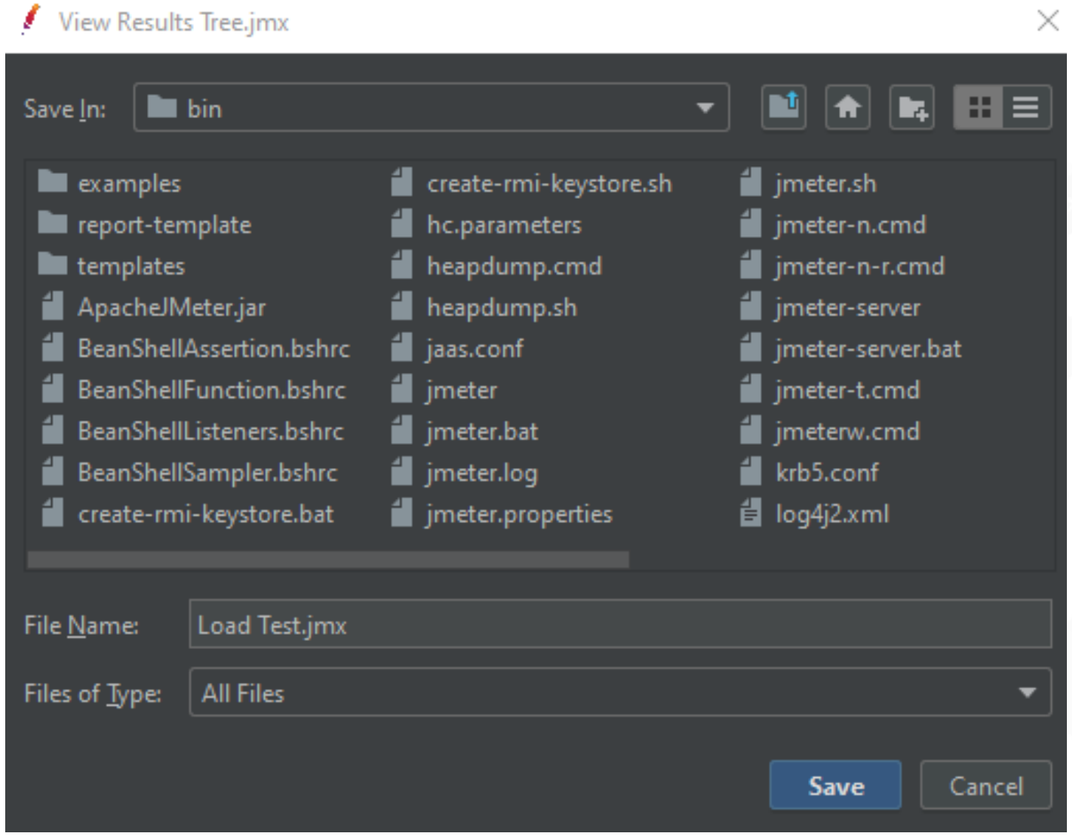
02 Select **Add** from the menu

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

Save the Test

Ensure to save the test after completing all the steps.





Run the Test

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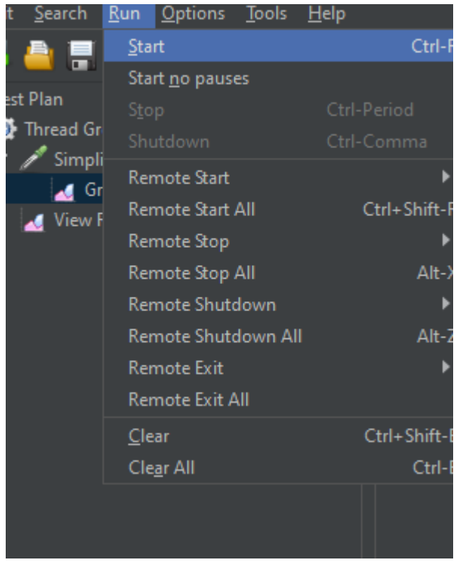
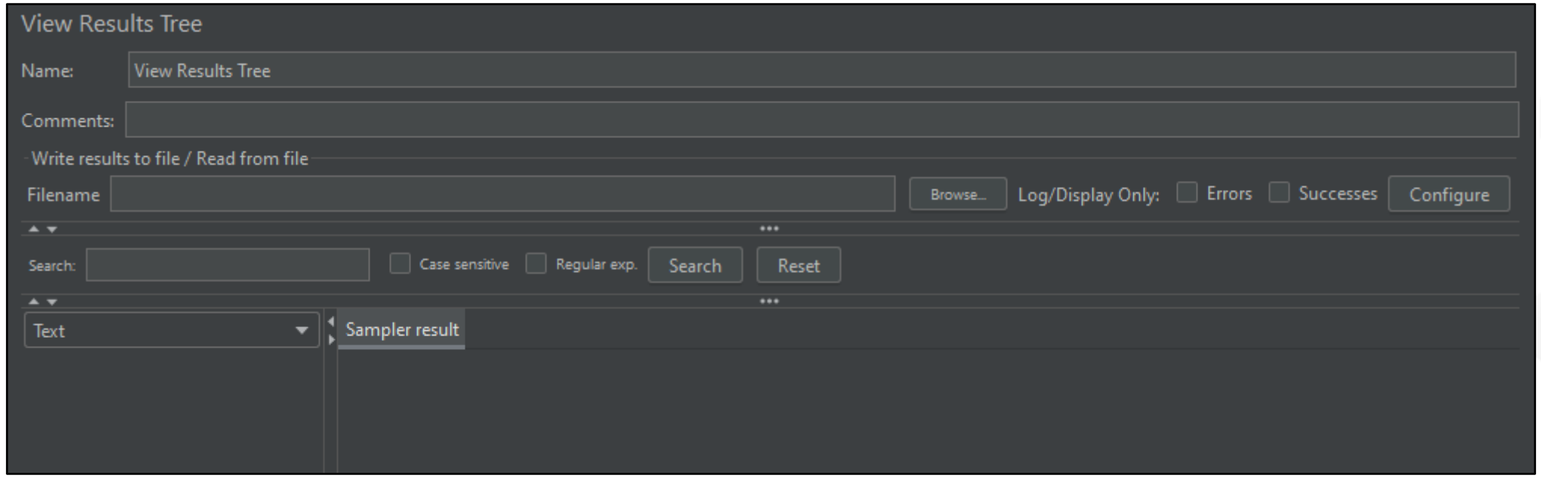


JMeter Output

The output window will look like this:



Key Takeaways

- The SMTP sampler is used to send and receive emails. An SMTP email server has an address that can be specified by an email client or application, usually in the format smtp.serveraddress.com.
- The JDBC sampler is used to test the load on the database. It allows users to create SQL queries. Database professionals use these tests to identify and fix performance problems before releasing the database into production.
- The JUnit sampler is used to test Java methods. The user must create or use Java test cases to conduct JUnit testing.