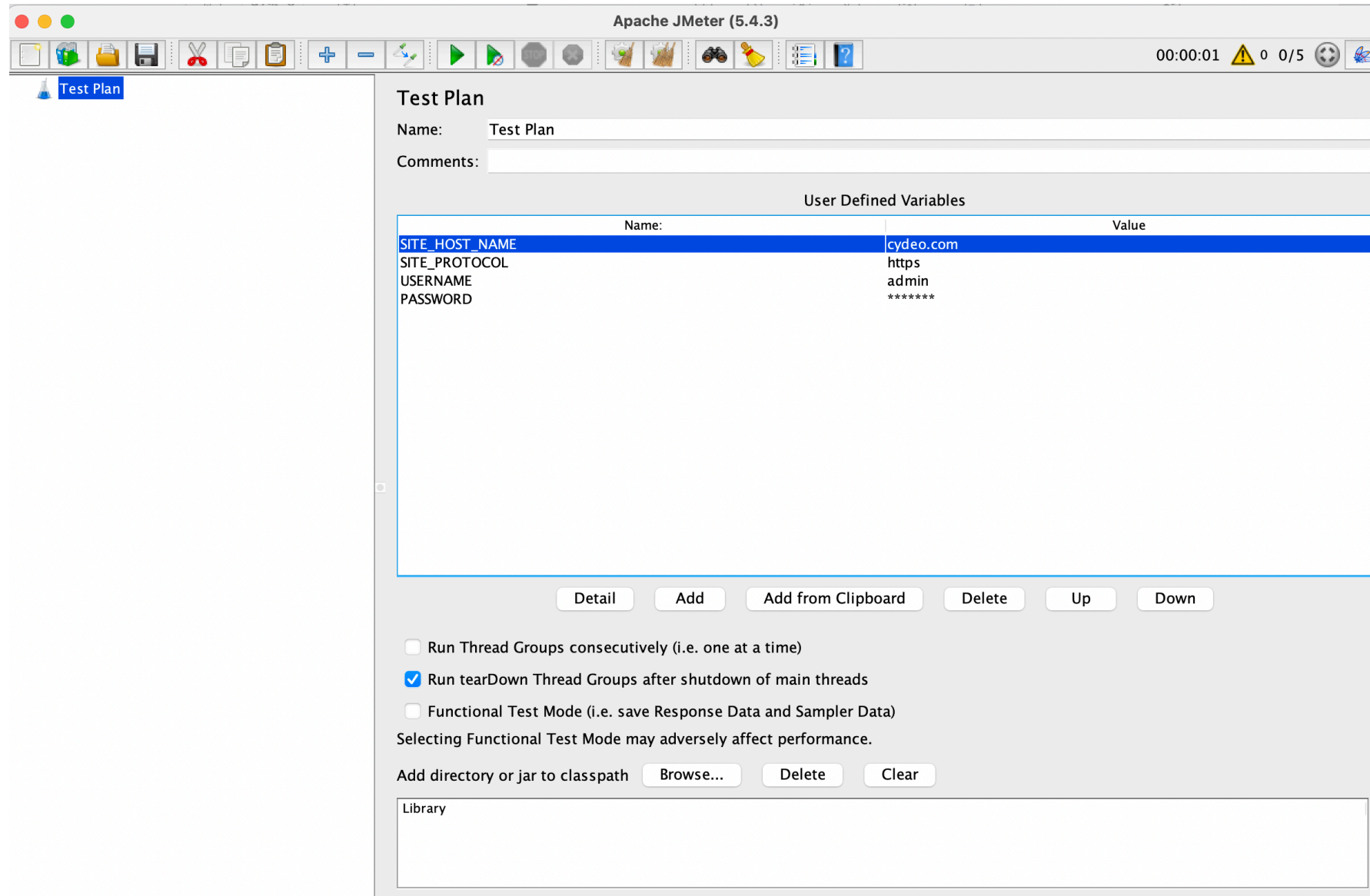


JMeter

GUI Overview

JMeter GUI

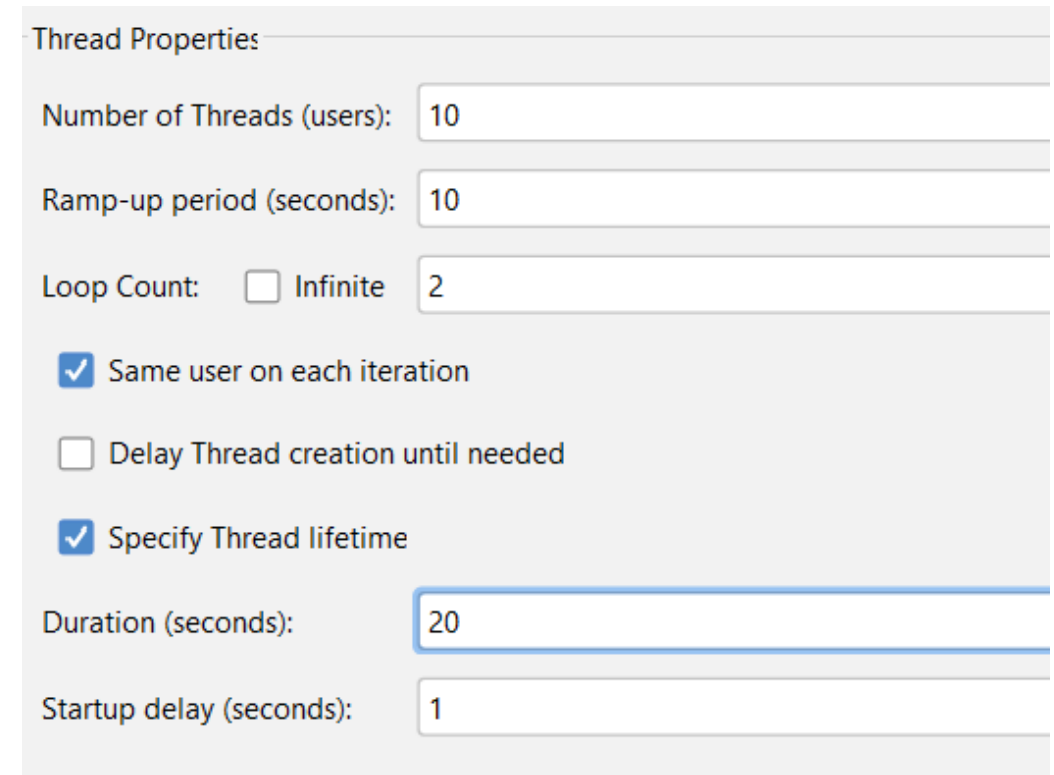


Test Plan

- Test Plan consists of all components and actions to execute a test script.
- A Test Plan might have multiple thread (user) groups.
- Test Plan options:
 - **Run thread group consecutively:** Only one thread group is executed at a time.
 - **Functional Test Mode:** JMeter records response of each request sent to server. This option is used in functional testing but degrades performance.
 - **User Defined Variables:** Global variables such as a URL, a key etc. can be created and these variables can be used throughout the testing using `${parameter}`.

Thread Groups

- Each thread acts as a **user** and system user load can be specified by setting the number of threads.
- **Ramp-up period:** 10 threads in 10 seconds means each second a user is added and at the end of the 10 second, there will be 10 users sending requests.
- **Loop Count:** The number of loops to iterate the requests.
- **Thread life time:** Duration that a thread is active.



The screenshot shows a 'Thread Properties' configuration window with the following settings:

- Number of Threads (users): 10
- Ramp-up period (seconds): 10
- Loop Count: ☐ Infinite, 2
- ☒ Same user on each iteration
- ☐ Delay Thread creation until needed
- ☒ Specify Thread lifetime
- Duration (seconds): 20
- Startup delay (seconds): 1

setUp and tearDown Thread Groups

Test Plan > Add > Threads (Users) > setUp Thread Group

setUp thread group can be utilized to perform Pre-Test actions. Below are some cases which we can consider to use setUp Thread Group.

- Creating a list of users that need to be run in your tests.
- Getting data from the database and store into the .csv files or JMeter variables and use them during the test.
- Sending email or any kind of notification to notify that the test has been started.

The screenshot shows the 'setUp Thread Group' configuration window in JMeter. It includes fields for Name, Comments, and a section for 'Action to be taken after a Sampler error' with radio buttons for Continue, Start Next Thread Loop, Stop Thread, Stop Test, and Stop Test Now. Below this is the 'Thread Properties' section with input fields for Number of Threads (users), Ramp-Up Period (in seconds), and Loop Count, along with a checkbox for Scheduler. The 'Scheduler Configuration' section at the bottom contains input fields for Duration (seconds), Startup delay (seconds), Start Time, and End Time.

setUp Thread Group

Name: setUp Thread Group

Comments:

Action to be taken after a Sampler error

☒ Continue ☐ Start Next Thread Loop ☐ Stop Thread ☐ Stop Test ☐ Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-Up Period (in seconds): 1

Loop Count: ☐ Forever 1

☐ Scheduler

Scheduler Configuration

Duration (seconds)

Startup delay (seconds)

Start Time 2017/05/18 16:40:07

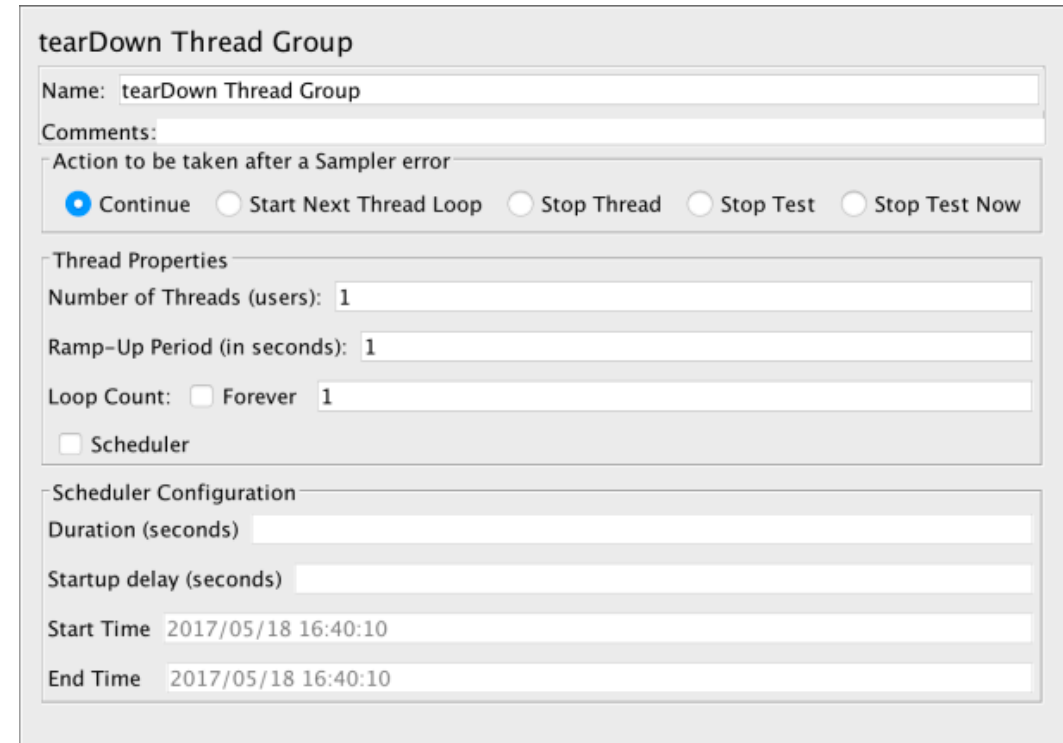
End Time 2017/05/18 16:40:07

setUp and tearDown Thread Groups

Test Plan > Add > Threads (Users) > tearDown Thread Group

tearDown thread group can be used to perform some Post-Test actions after running the test. Below is some cases which we can consider to use tearDown Thread Group:

- Deleting users that were created in the setUp Thread Group.
- Cleaning up the system, deleting the data which were created during the test.
- Sending email or any kind of notification to notify that the test has been stopped.



The screenshot shows the configuration for a 'tearDown Thread Group' in JMeter. The 'Name' field is set to 'tearDown Thread Group'. The 'Comments' field is empty. Under 'Action to be taken after a Sampler error', the 'Continue' radio button is selected. The 'Thread Properties' section shows 'Number of Threads (users)' set to 1, 'Ramp-Up Period (in seconds)' set to 1, and 'Loop Count' set to 1 with the 'Forever' checkbox unchecked. The 'Scheduler' checkbox is also unchecked. The 'Scheduler Configuration' section shows 'Duration (seconds)', 'Startup delay (seconds)', 'Start Time' (2017/05/18 16:40:10), and 'End Time' (2017/05/18 16:40:10) fields.

tearDown Thread Group

Name: tearDown Thread Group

Comments:

Action to be taken after a Sampler error

☒ Continue ☐ Start Next Thread Loop ☐ Stop Thread ☐ Stop Test ☐ Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-Up Period (in seconds): 1

Loop Count: ☐ Forever 1

☐ Scheduler

Scheduler Configuration

Duration (seconds)

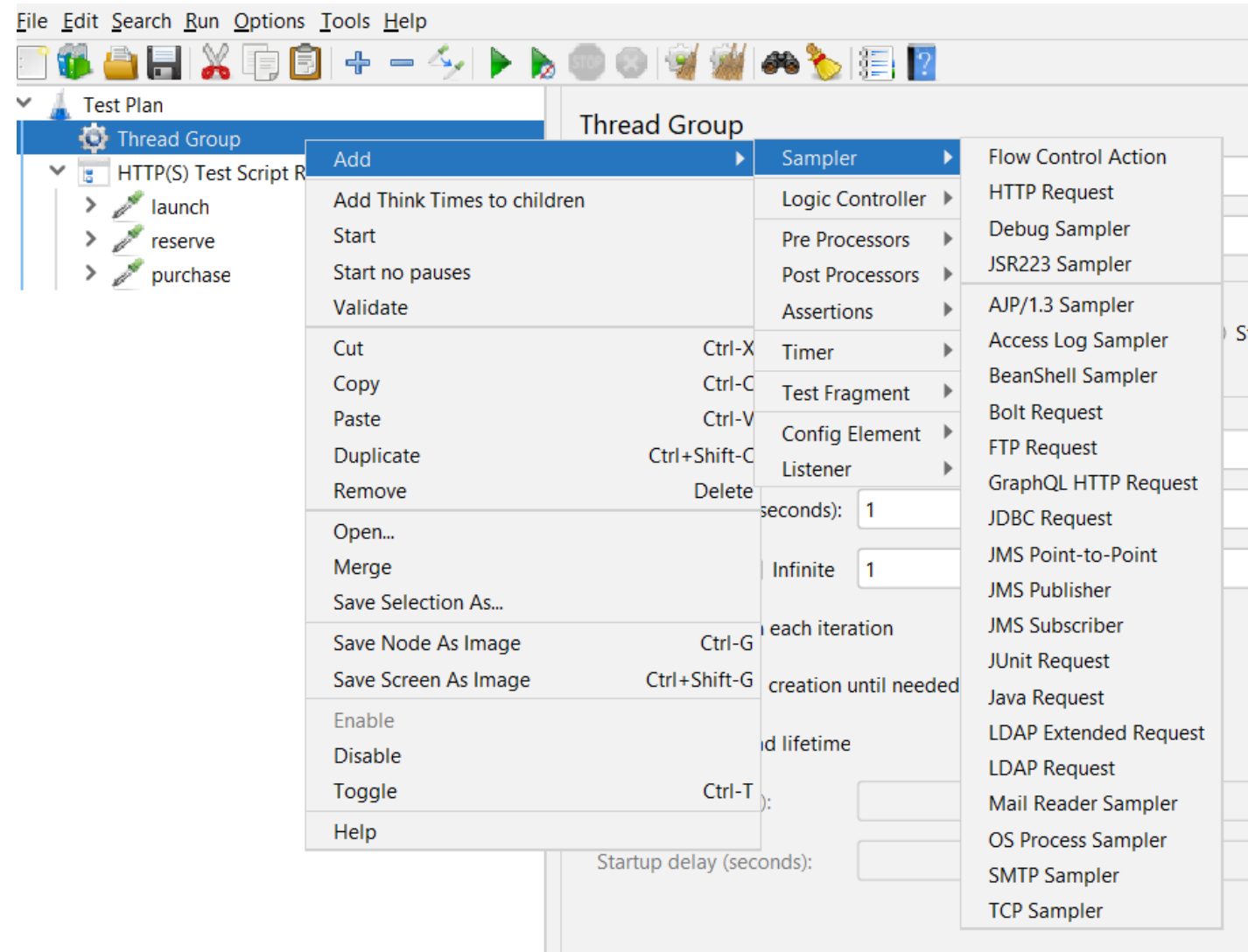
Startup delay (seconds)

Start Time 2017/05/18 16:40:10

End Time 2017/05/18 16:40:10

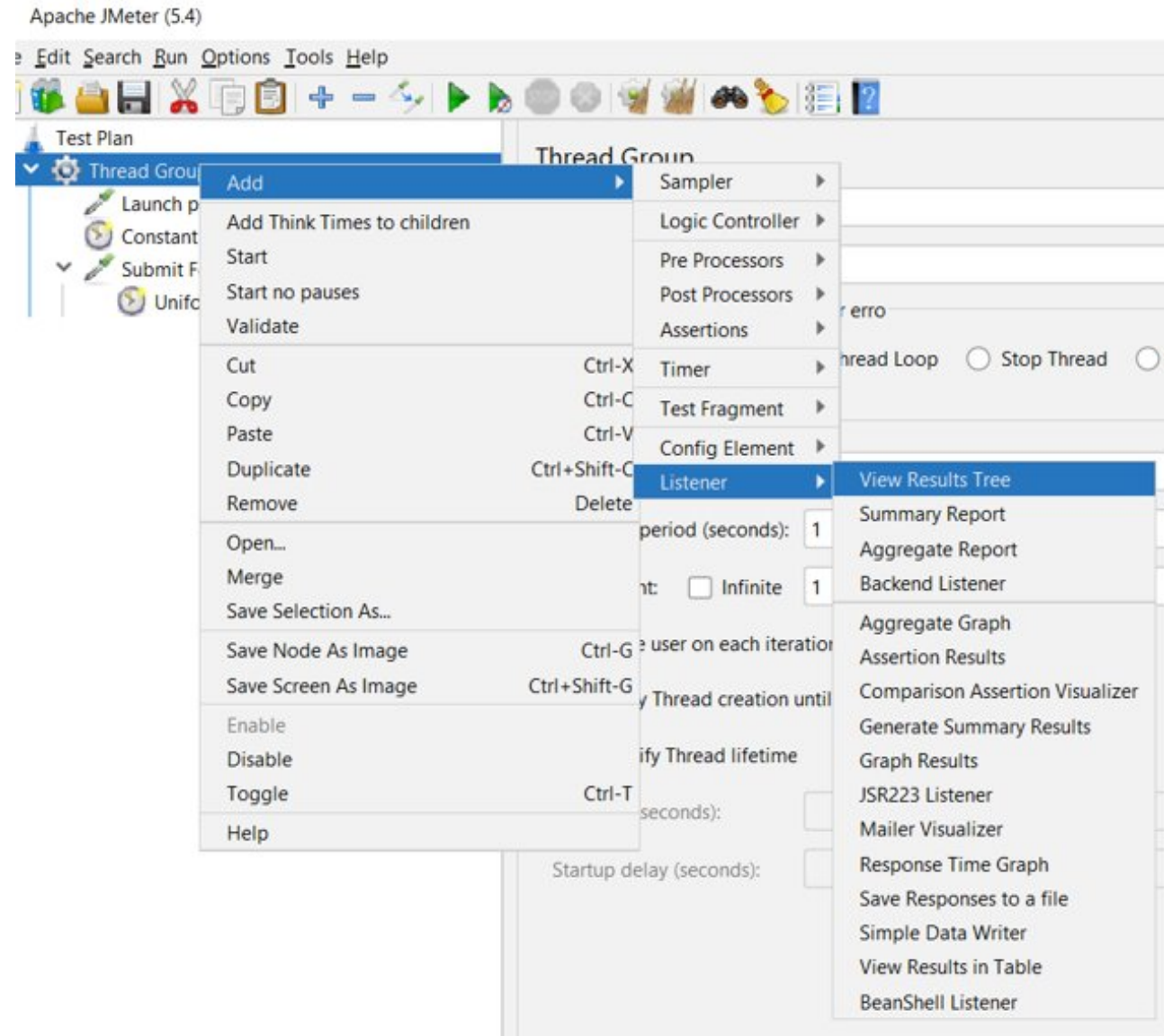
Samplers

- Samplers are used to send requests (HTTP, FTP, JDBC etc.) to servers.
- HTTP Request** is used to send requests such as GET, POST, PUT, PATCH, DELETE etc.



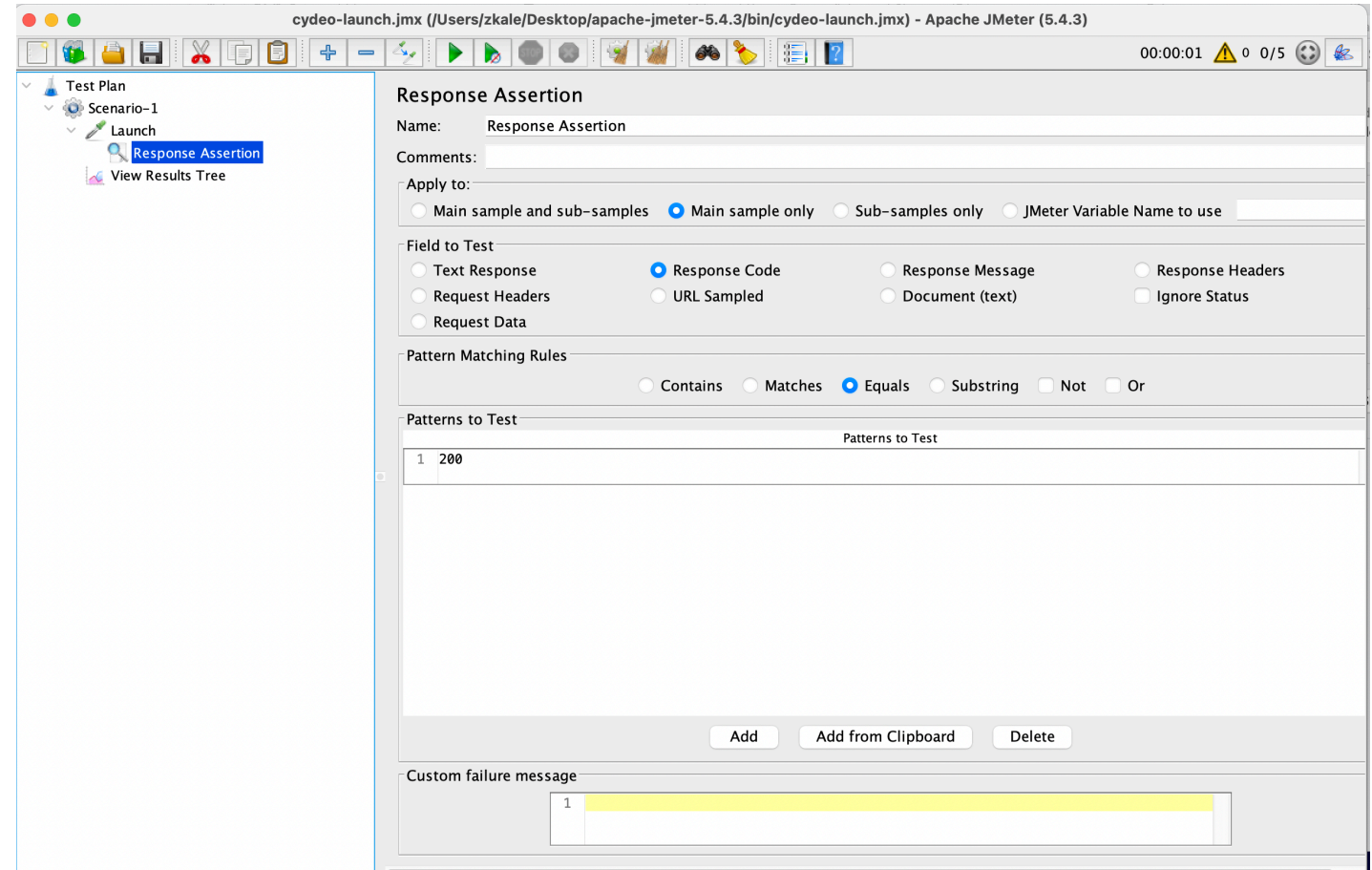
Listeners

- Listeners are used to display the test results.
- The results can be shown as a **tree, table, graph or recorded as a log file.**
- Adding more listeners to a test scenario decreases the performance of the test execution so listeners need to be added as needed.



Assertions

- Assertions are used to validate responses.
- Right-click HTTP Request>Add>Assertions
- **Response Assertion** checks whether a response text/body/code/message/header contains, matches, or equals a specified pattern.
- All assertions come with a cost in terms of CPU or memory consumption.



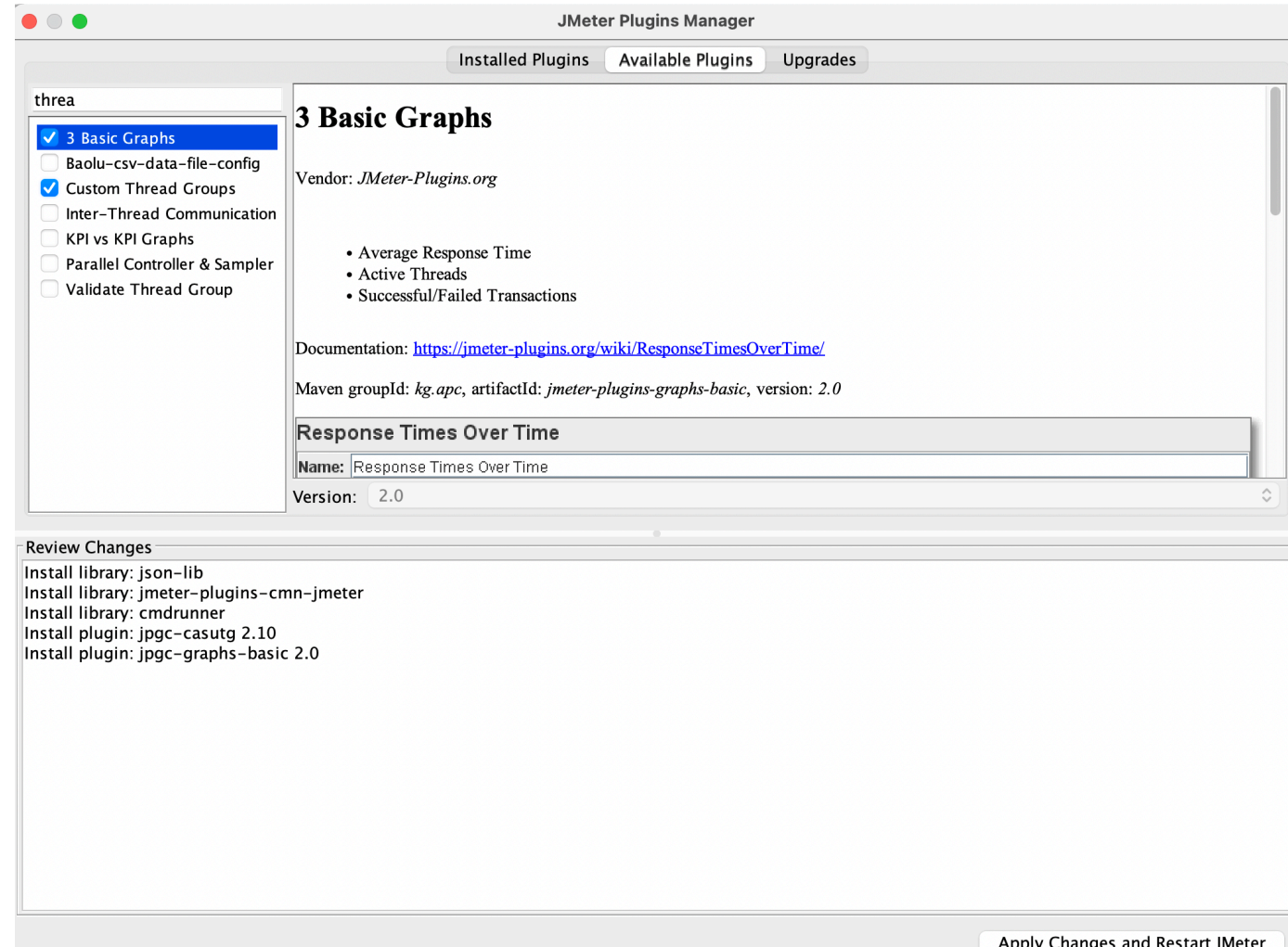
Creating a JMeter Test Script

1. Launch JMeter.
2. Add a thread group under Test Plan.
3. Add samplers under thread group.
4. Add a listener under Test Plan.
5. Add assertion to samplers.
6. Save the Test Plan and run the scenario.
7. Check the test results from the listener added.

Best Practice: JMeter reads and writes to bin directory by default. Saving the Test Script (.jmx) to the JMeter/bin directory would make it easier to locate and run the test script from the command line.

JMeter Plugins Manager

- Download the **Plugins Manager JAR file**:
<https://jmeter-plugins.org/wiki/PluginsManager/>
- Save it under **JMeter lib/ext** directory.
- Relaunch JMeter and go to **Options** menu to access the Plugins Manager.



Specialty Thread Groups

- **Concurrency Thread Group:** Target concurrency, ramp-up time and ramp up steps can be specified so that we can identify at which point (number of users) the scenario fails.
- **Ultimate Thread Group:** Different groups of users can be added with different profiles (initial delay, startup time, hold load, shutdown time). Ultimate Thread Group can be used to perform Spike Testing.

