Tutorial

Performance Testing with JMeter

As you found out from the Pre-Class Assignment, JMeter can be a powerful tool to help with load testing an application. We are going to go through some of the basic functionality of JMeter to show you what it can do.

Make sure you have completed the tutorial in the Pre-Class Assignment to install JMeter before continuing.

Start JMeter

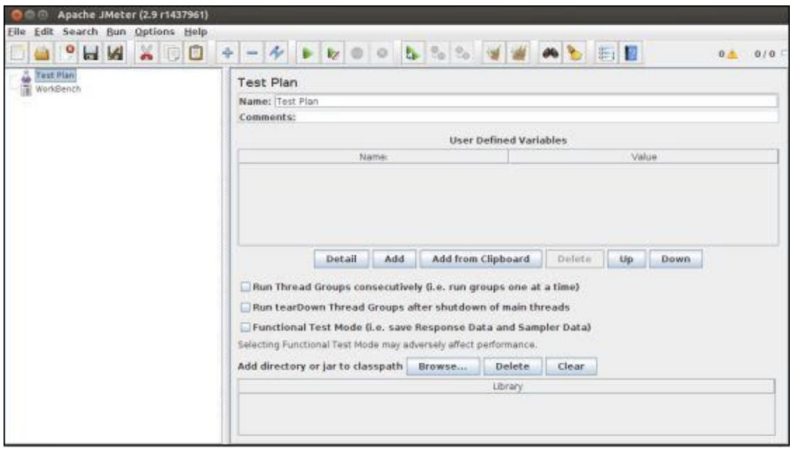
You should have done this in the Pre-Class Assignment but here is the step to start up JMeter.

Step 4: Run JMeter

After downloading JMeter, go to the *bin* directory. In this case, it is **/home/manisha/apache-jmeter-2.9/bin**. Now click on the following −

OS	Output
Windows	jmeter.bat
Linux	jmeter.sh
Mac	jmeter.sh

After a short pause, the JMeter GUI should appear, which is a Swing application, as seen in the following screenshot −



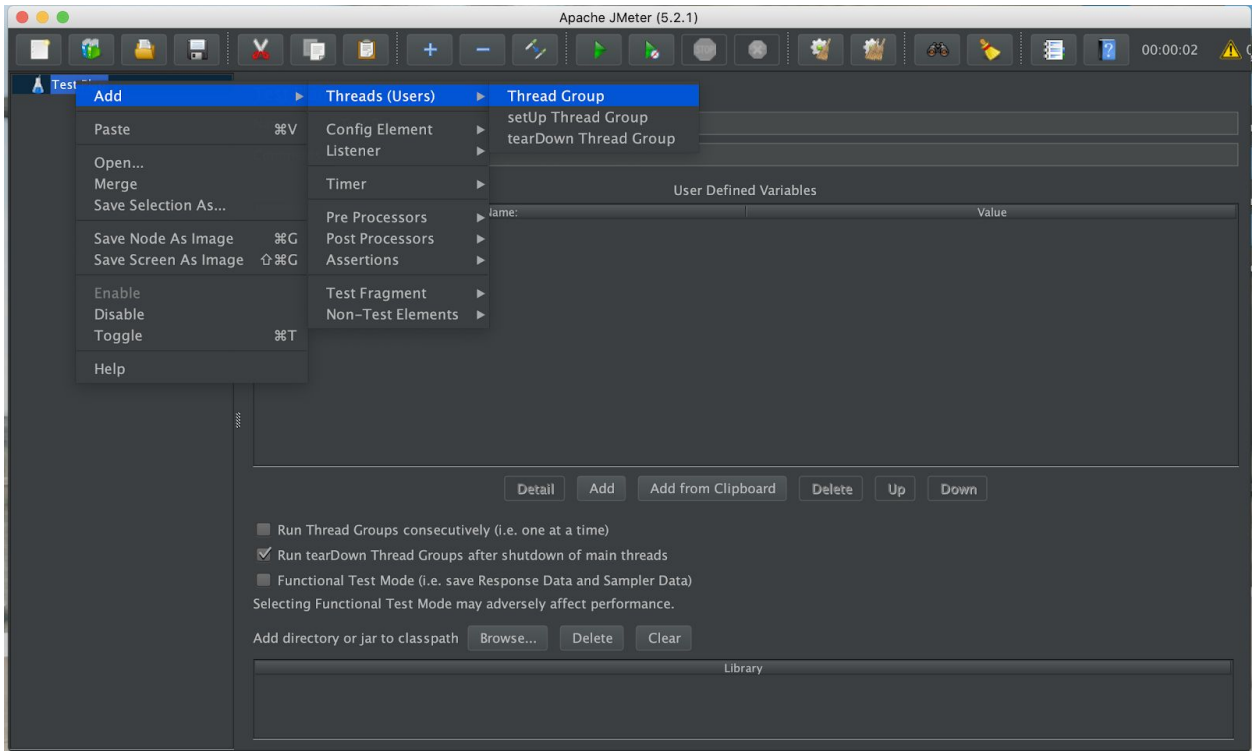
Create a test plan

A test plan describes a series of steps JMeter will execute when run. There are various parts in a test plan, the most useful to what we are doing are: Thread Groups, Samplers, and Listeners.

Thread Groups

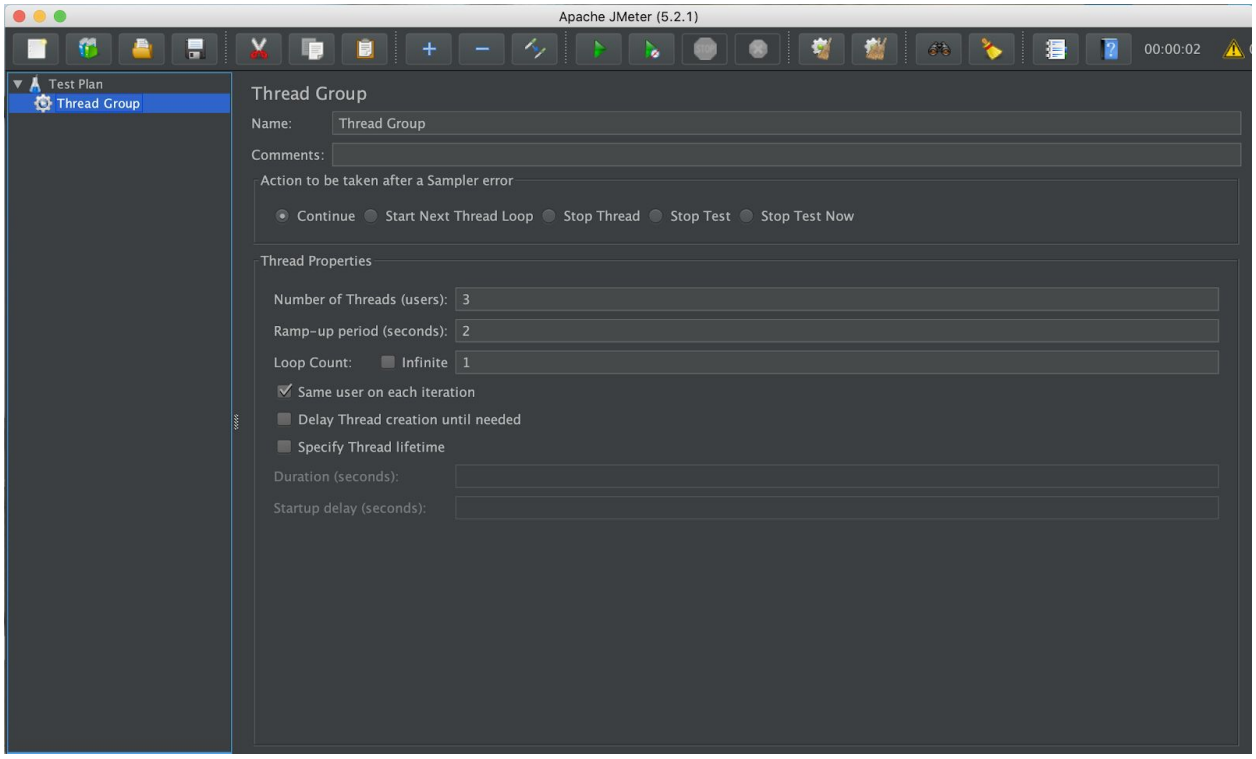
We will start by creating a thread group. Thread groups simulate how users interact with our app and how they behave. Each thread represents a single user. You can increase the number of threads if you want to increase the load on the application being tested.

Create a thread group by right-clicking on Test Plan and clicking ‘Add -> Threads (Users) -> Thread Group’.



Now we are going to configure the Thread Group. You can put whatever name you want. The values that we are going to change are under Thread Properties.
Number of threads as we said before is the number of users being tested. We will set that to 3.
Ramp-up period is how much time you are going to give the Thread Group to go from 0 to the number of users you have, which is 3 in our case. We will set that to 2.
Loop count is how many times the test should be executed. We will leave that set to 1.

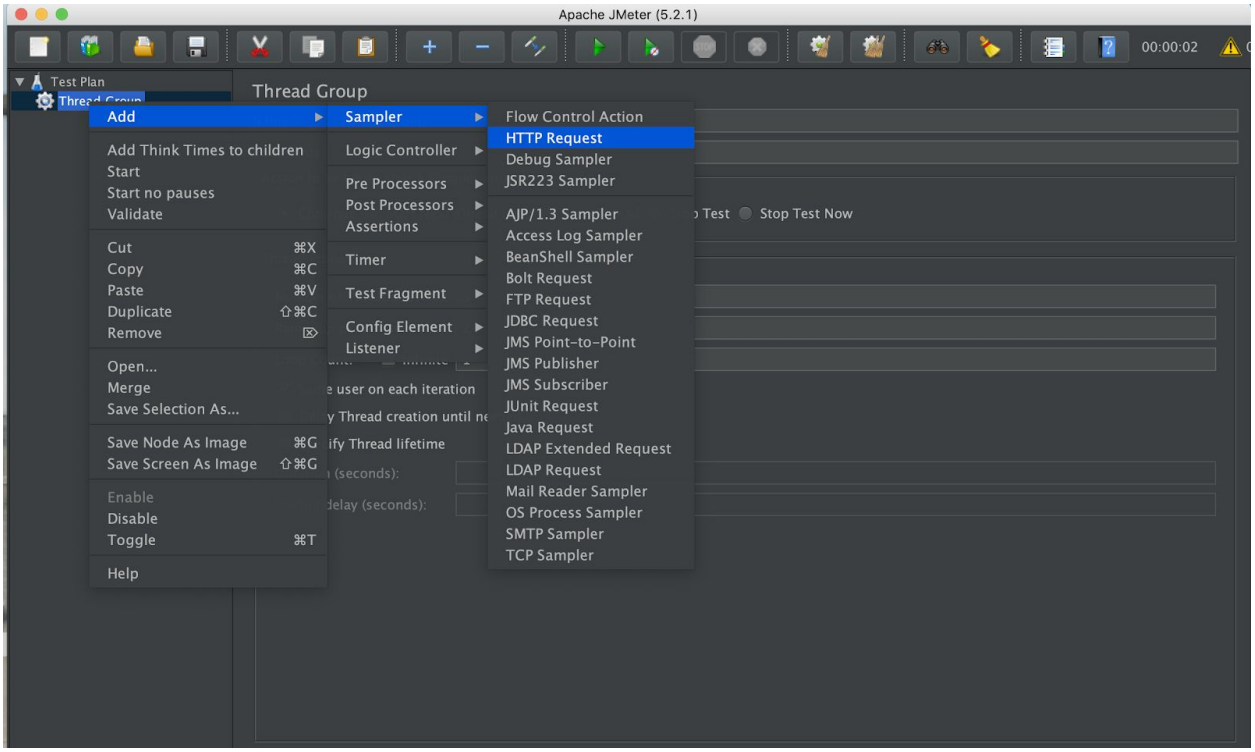
Make sure that your screen has the same values shown in the screenshot below.



Samplers

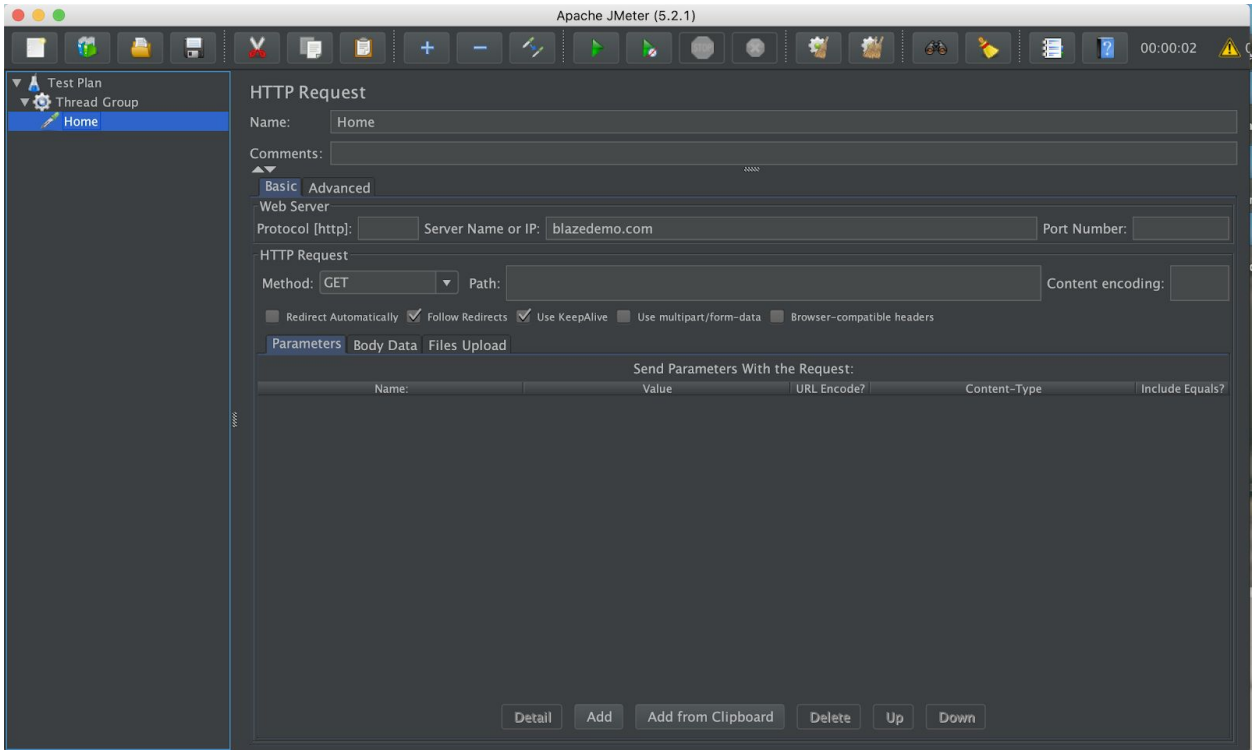
Next, we are going to use a sampler to create an HTTP Request. This will have the HTTP request configuration which the Thread Group will be invoking. We will also set the application URL that we want to load test.

To create an HTTP Request Sampler, right-click on your Thread Group and click ‘Add -> Sampler -> HTTP Request’.



Now we will configure the Sampler. Put “Home” as the name. Under ‘Server Name or IP’ put “blazedemo.com”. This is a simple travel company website that we will use to experiment with JMeter. **This website doesn’t work on the eduroam Wifi so if you are on campus make sure you are on BYUWifi.**

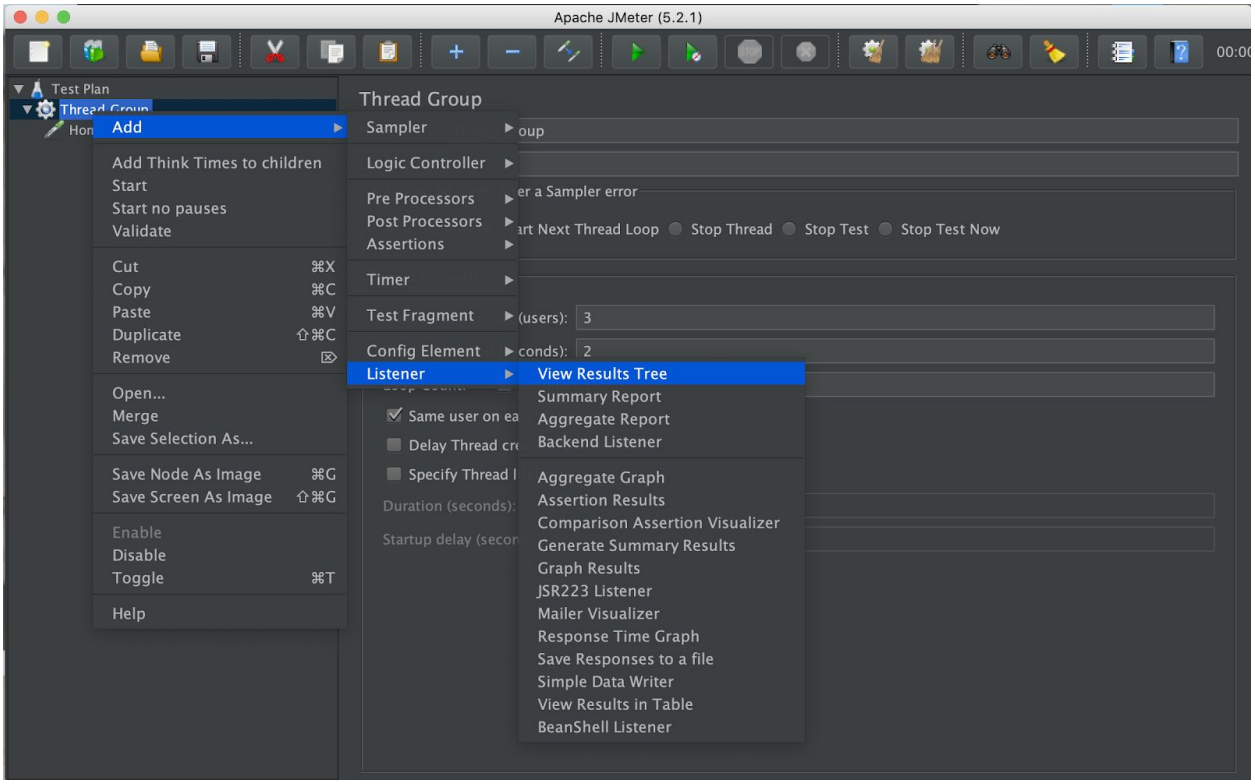
Make sure that your screen has the same values shown in the screenshot below.



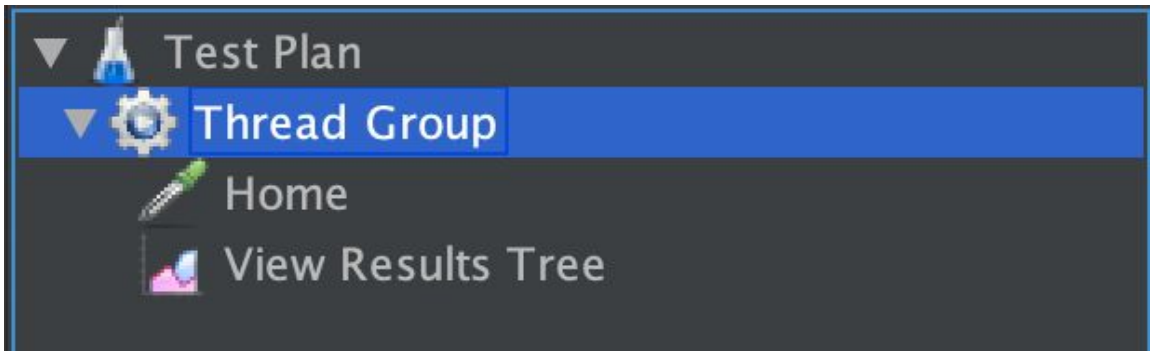
Listeners

Now we will create a Listener. This is how we see the results of our test after running it. There are lots of different types of Listeners that show various things but we are going to use one of the most common listeners--View Results Tree.

To create a listener, right-click on your Thread Group and click ‘Add -> Listener -> View Results Tree’.

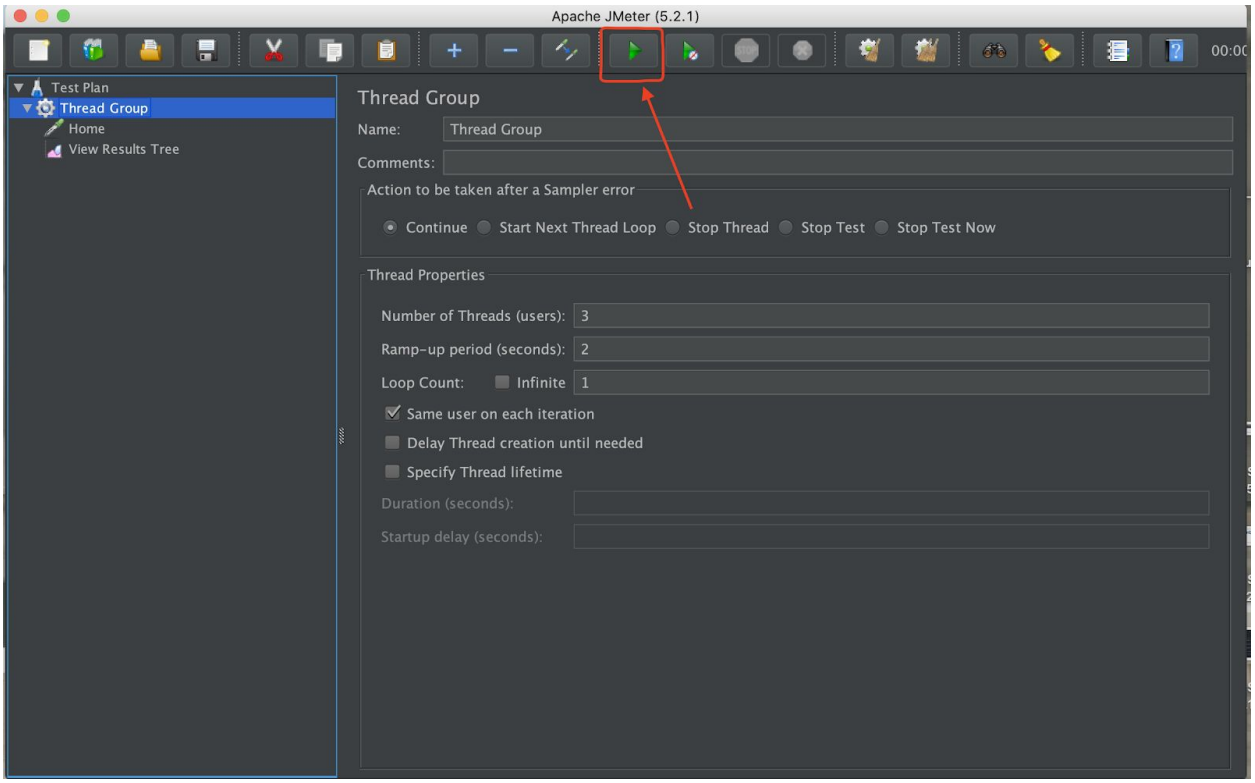


There is nothing to configure for this Listener, but make sure that your Test Plan looks like the one in the screenshot below.

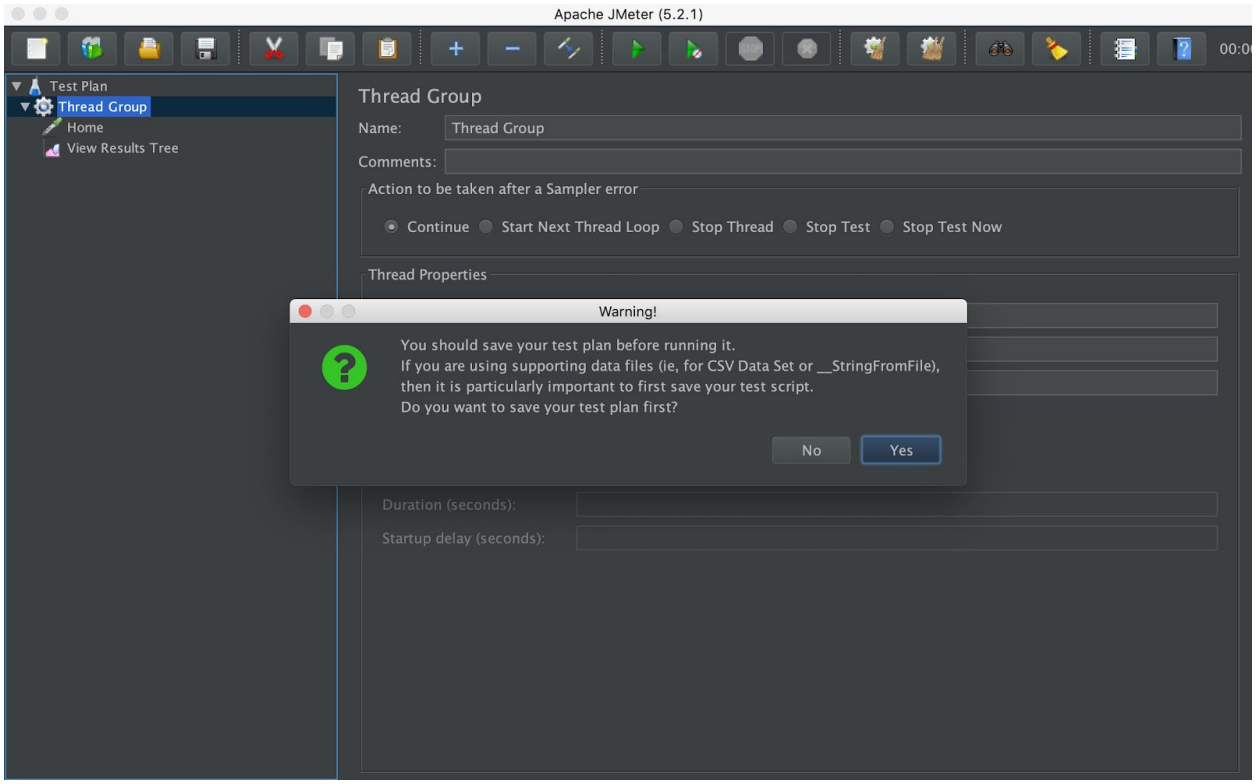


Run the Test Plan

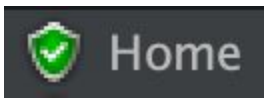
To run the test plan, click on the green play button in the top bar.



After you hit the green play button, the message in the below screenshot might come up. This comes up if you haven't saved your test plan yet. Hit yes and save it somewhere on your computer.



Once the test plan is done running (it shouldn't take more than a few seconds), click on your View Results Tree listener. After clicking on your listener, you will know if the tests ran correctly if you see three green shields with check marks in them (like the below screenshot). There will be one for each thread that you run with the name of the HTTP Request that was run. If you run the test plan more than once, this won't get cleared in between so don't worry if there are more than three.



After you have checked to see if they ran correctly, **take a screenshot of the entire JMeter GUI with the "View Results Tree" listener selected so your screenshot shows the test run results**.

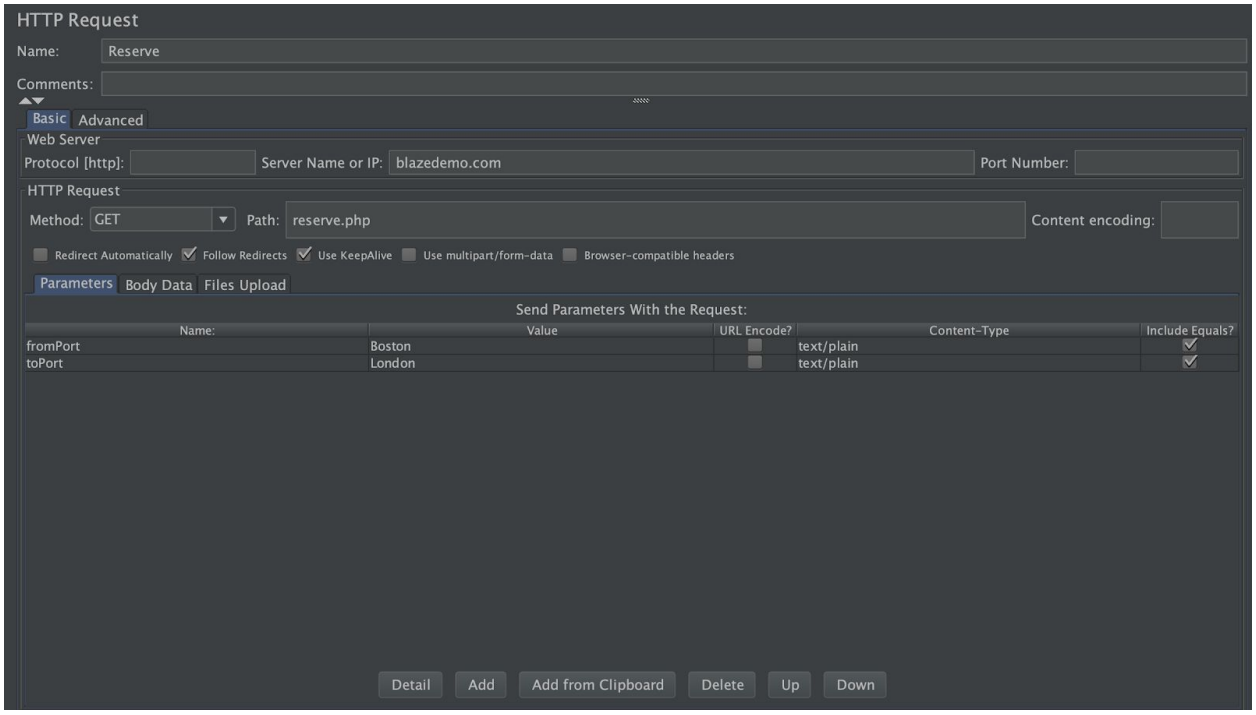
Another Sampler

For the next part of the test plan, we want to choose the flight that we want to take. The page http://blazedemo.com/reserve.php looks like this:

Flights from to :

Choose	Flight #	Airline	Departs:	Arrives:	Price
Choose This Flight	43	Virgin America	1:43 AM	9:45 PM	$472.56
Choose This Flight	234	United Airlines	7:43 AM	10:45 PM	$432.98
Choose This Flight	9696	Aer Lingus	5:27 AM	8:22 PM	$200.98
Choose This Flight	12	Virgin America	11:23 AM	1:45 PM	$765.32
Choose This Flight	4346	Lufthansa	1:45 AM	8:34 PM	$233.98

Go back to JMeter, click on your thread group, and create another HTTP Request Sampler but this time call it Reserve. As before, enter “blazedemo.com” in the “Server Name or IP” field. It will look similar to the Home Sampler but this time add “reserve.php” in the path field. We are also going to add parameters to send with the request. These will be named “fromPort” and “toPort”. These names are based on the HTML names on the site. For your values use Portland and Berlin. Yours should look similar to the screenshot below but with different values.



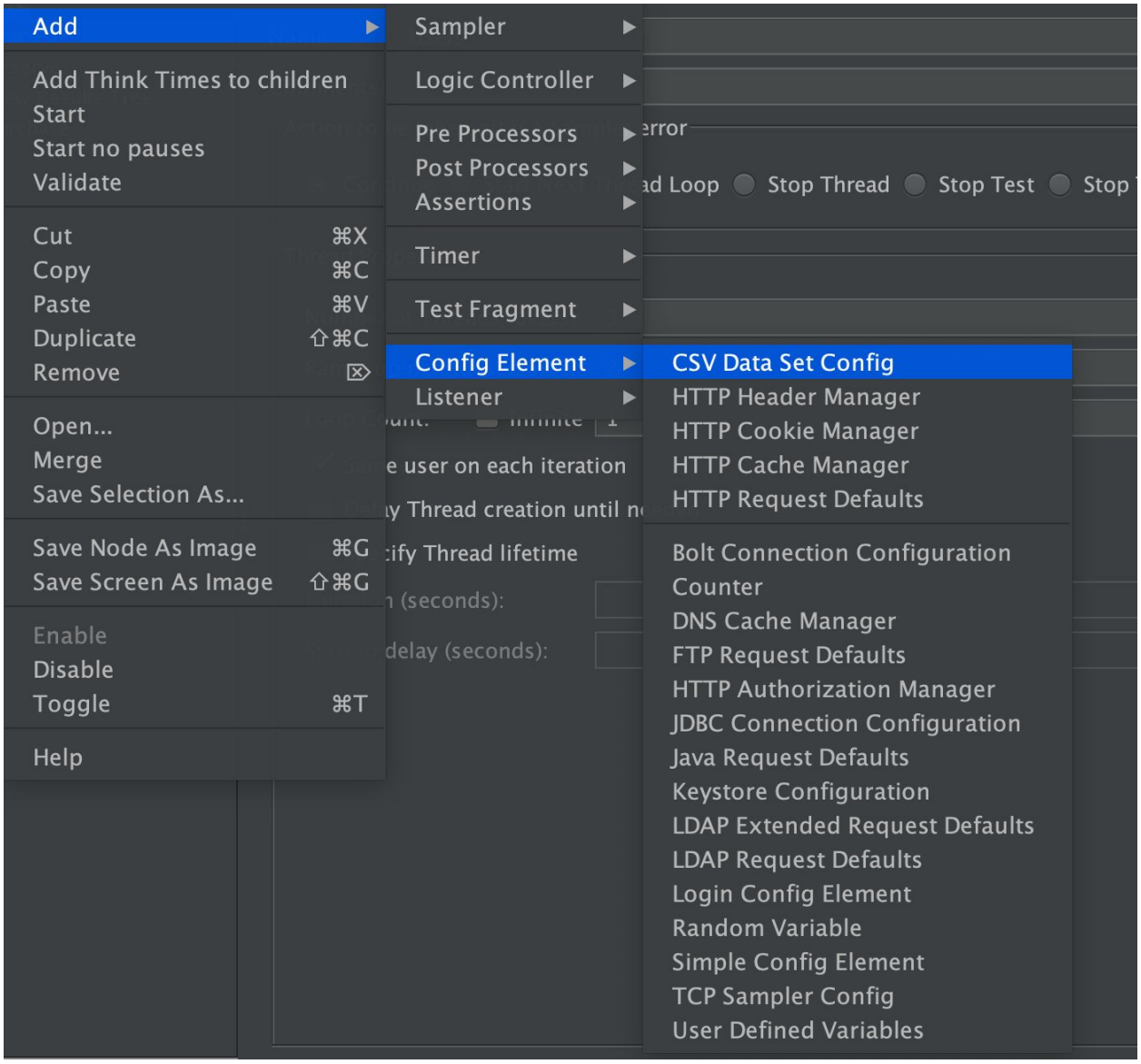
Click and drag to move the “View Results Tree” from the last part of the tutorial to below the Reserve Sampler. Now run the test plan again by clicking on the green button. Again, make sure that the tests have run correctly. **Take a screenshot of the entire JMeter GUI.**

Dynamic Data

We can test different parameters by creating a CSV file to use for our tests. Create an excel spreadsheet that looks like this and save it somewhere you will remember. **Make sure to save it as a .csv file.**

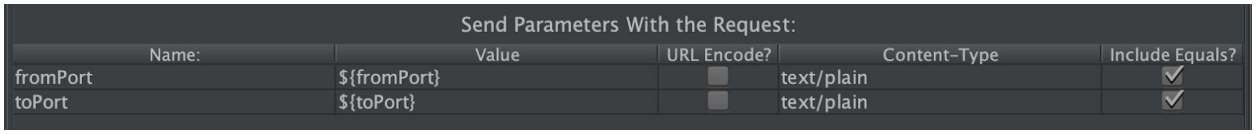
	A	B
1	Philadelphia	Boston
2	Portland	Rome
3	Paris	Dublin
4	Rome	London
5	Dublin	Boston

Go back to JMeter, right-click on your thread group, and click ‘Add -> Config Element -> CSV Data Set Config’.



Click Browse to find the cities spreadsheet that you have saved on your computer. Then fill out the Variable Names field with “fromPort, toPort”. These are the variable names we are giving the values that will be pulled from the .csv file. We will use them in the next step.

Now go back to the Reserve HTTP Request we created earlier. We have to change the request parameters to instead use the values from the .csv file. Change the parameters to look like the screenshot below. Make sure that the values are in curly braces like this {}.



Before you run this, go to your Thread Group and change the “Number of Threads” to 5 so we can see all of the results. Once you have done this, run the test plan. Find the Reserve request that was from Rome to London. Once you have found it, click on Request -> Request Body. **Now take a screenshot of the entire JMeter GUI.**

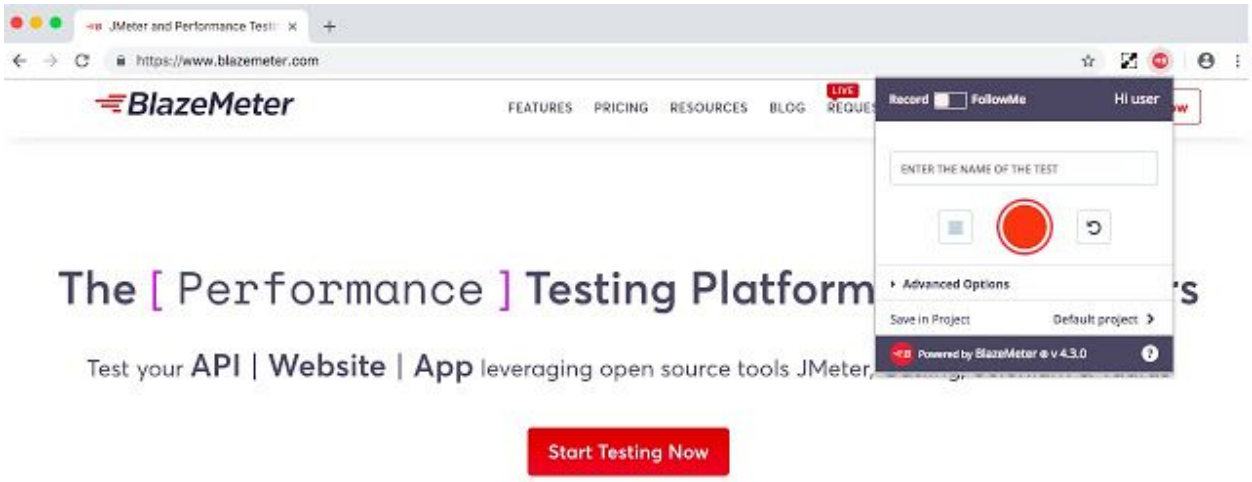
BlazeMeter Plugin

As you might realize, creating test plans can get kind of tedious, especially if you want to test a lot of different things at once. JMeter has a tool to record a user flow but it is hard to configure. We are going to briefly show you how this works with a similar tool called BlazeMeter.

BlazeMeter is a powerful tool that makes the process of creating a test plan more simple. As you record, it will keep track of the requests for you and then make it into a test plan for you to use in JMeter.

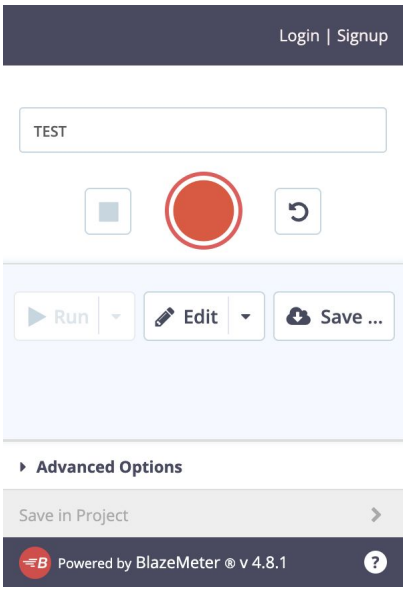
Download the BlazeMeter plugin for Chrome here: https://chrome.google.com/webstore/detail/blazemeter-the-continuous/mbopgmdnpcbohhpnfglgohlbhfongabi?hl=en

Navigate to a website of your choice but one that has a login page. Before you login, click on the BlazeMeter icon in the top right of the screen. Click the red record button and then login to the website and do a few other things. Once you have finished, click the red stop button.



Now click back on the BlazeMeter icon in the top right corner. Click on the Edit dropdown and select JMeter Script. This will bring you to a page with the various requests that were just recorded. **Expand one of the requests and take a screenshot of the entire page.**

After you have done this, click on the BlazeMeter plugin and then click “Signup” to create a free BlazeMeter account.



Once you have an account, make sure that you are logged in and refresh the webpage that has the JMeter Script on it. You should see that the .JMX button is no longer grayed out. Click on that button to export your JMeter Script to a .JMX file. Save it somewhere you will remember.

Now go back to JMeter and open the .JMX file you just saved. Add a “View Results Tree Listener” to the Thread Group like we did before. Then run the test plan. You may have a few that fail because of authentication. Make your screen big enough to show as many of the results as possible. **Take a screenshot of the entire JMeter GUI.**

What to submit

The five screenshots that you have taken throughout the tutorial.