

# TabJolt Installation Guide

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*TabJolt: A Tableau Server Point and Run Load Testing Tool*

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## What is TabJolt?

TabJolt is a point and run load generator built on top of [JMeter](#) that is specifically designed for Tableau Server. It is available as a free download as-is from GitHub.

Unlike traditional load testing tools, TabJolt can drive load against your Tableau Server without you having to develop or maintain scripts. TabJolt is optimized for the Tableau presentation model and can load visualizations and interpret possible interactions during test execution without the need to write and maintain complex scripts.

TabJolt is a subset of our engineering load testing framework and we are making it available in hopes that it allows you to accelerate production go-live with Tableau Server, and also to help you with planning your specific on-site capacity needs.

Of course, running load tests does not replace understanding the Tableau Server architecture and following best practices for deployment during load testing. Treating Tableau Server as a black box for load testing is not recommended, and will probably yield unexpected results. For information about the Tableau Server architecture, see the [Tableau Server Administration Guide](#).

## When to use TabJolt

Here are the key questions TabJolt is designed to help you answer:

1. I want to deploy a brand new Tableau Server. How will Tableau Server scale on my hardware and with my workload?
2. I am moving from Tableau Server 8.x to version 9.0. Given my workbooks and hardware, how will Tableau Server 9.0 scale in my environment?
3. With guidance from Tableau, I want to tune my server configuration to suit my hardware, workbooks and environments. How do I measure and monitor the effects of configuration changes to select the best configuration?
4. I need to complete a load test as part of go-live testing for Tableau Server. How do I accelerate the time it takes to do a full load test?

## Prerequisites

To install and use TabJolt, you need a Windows machine with a minimum of two cores with 8 GB or more RAM. As a best practice, you should monitor this machine for CPU and memory to ensure that your test runs don't create a bottleneck on the load injector.

You must also have downloaded the complete package as described above.

### Tableau Desktop

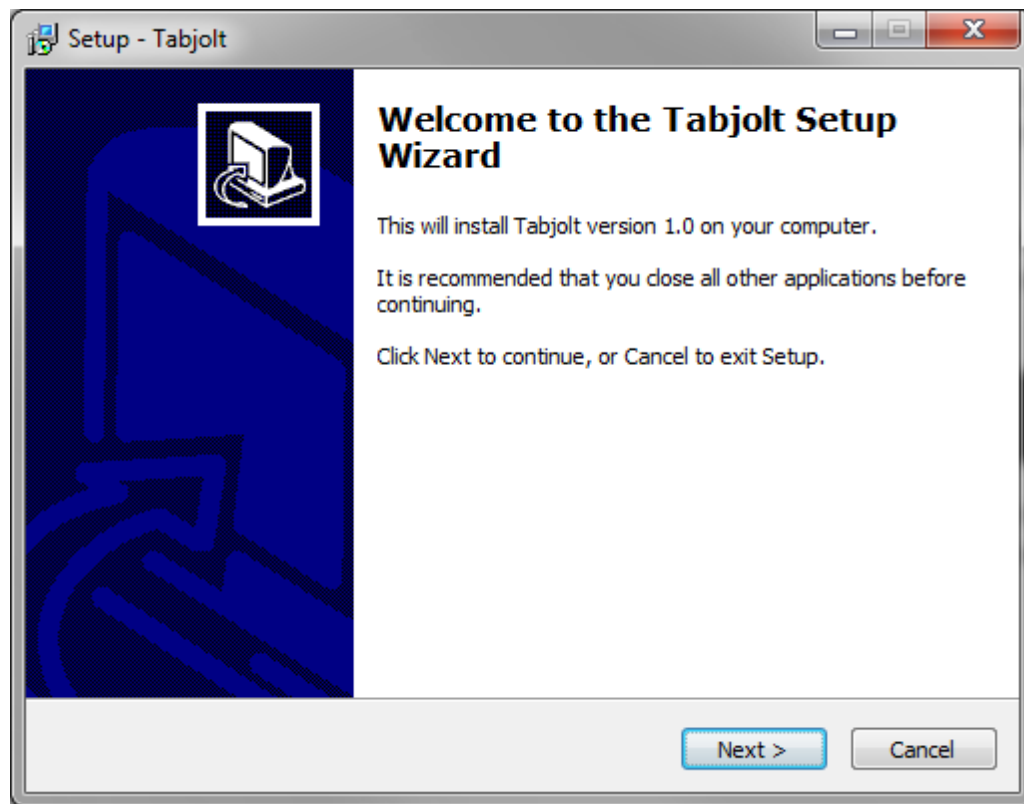
If you already have Tableau Desktop 9.0 or later, you can simply use that. If you don't, you can download a free trial version from this website:

<http://www.tableau.com/products/desktop>

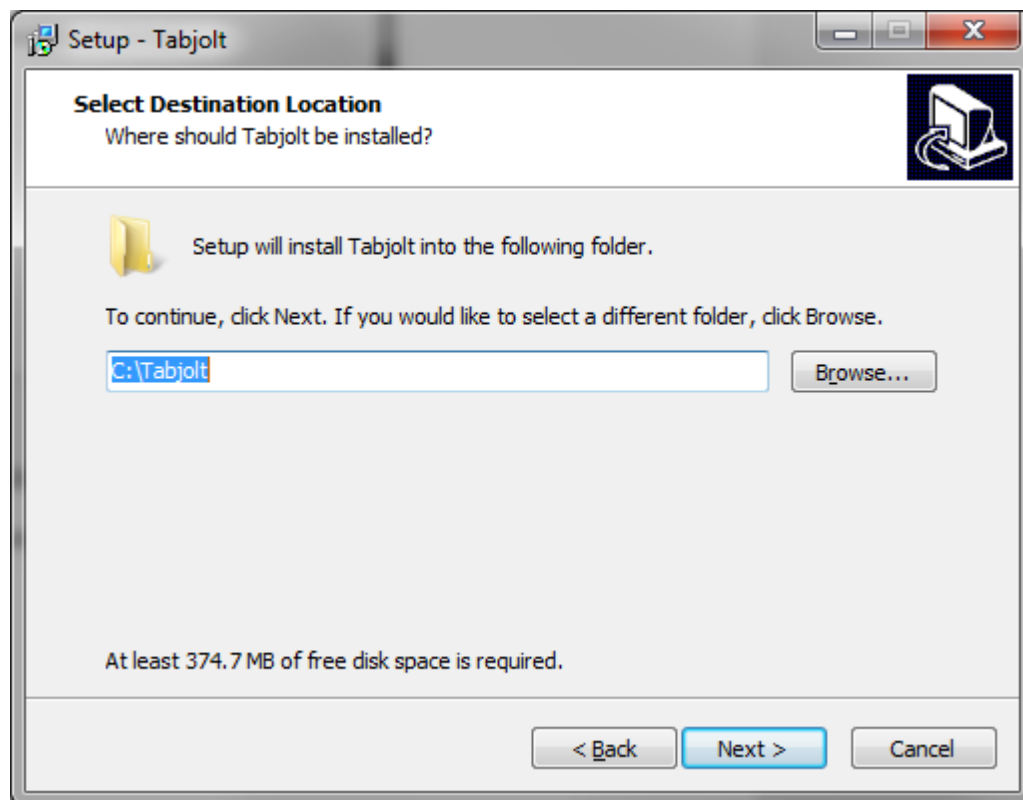
### Install and configure TabJolt

Once you download the project files from github, you start the installation by using the Tabjolt windows installer.

**NOTE:** The installer in this update does not support PGSQL upgrades. While it checks for existing Postgres 9.5 databases (other Postgres version are OK.) on your machine, the installer will prompt you to uninstall existing installation of Postgres 9.5. Make a backup of your test data if you want to preserve it.

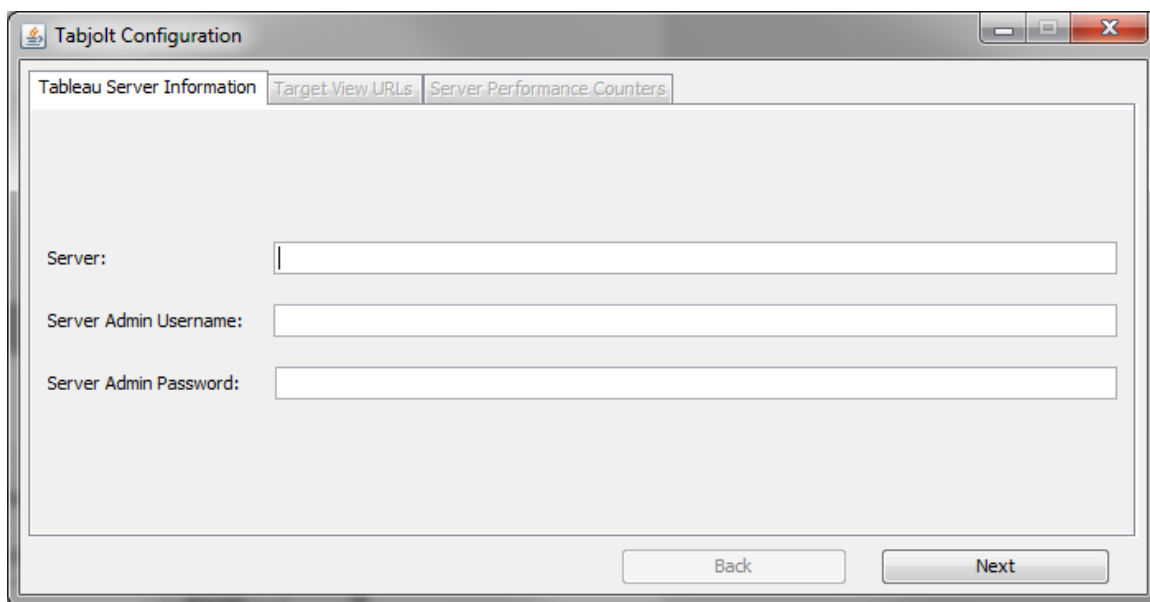


Choose the default folder for your Tabjolt installation.



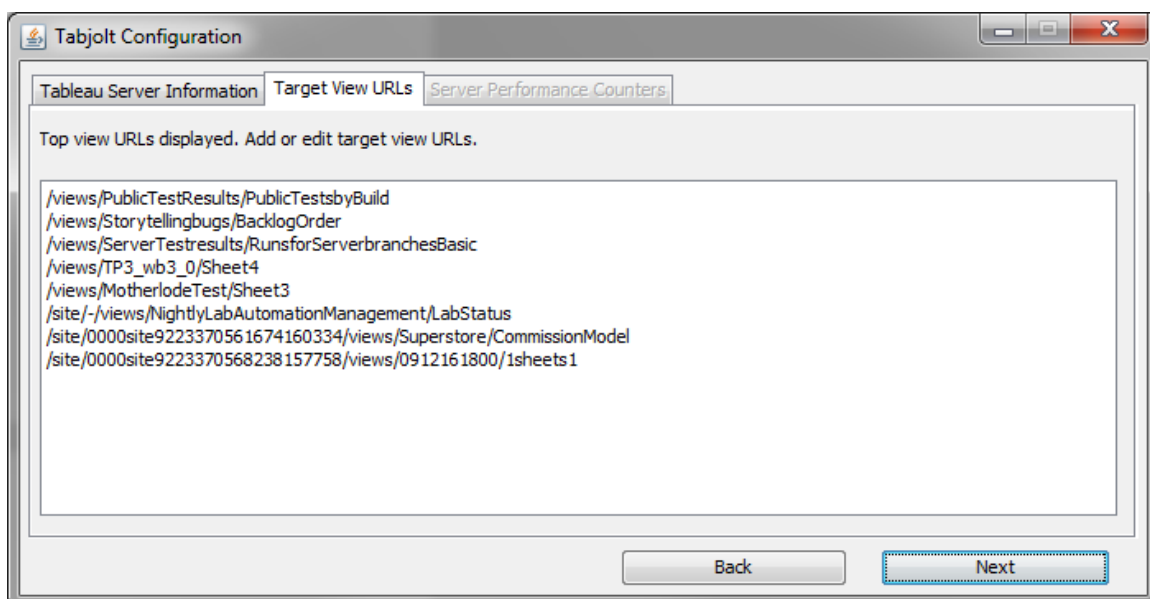
During installation, Tabjolt will install its dependency Postgres 9.5 database silently.

At the end installation, the installer will prompt you to enter necessary configuration information. On the first tab - Tableau Server Information - you need to enter the URL of your tableau server, followed by your server administrator user name and password. Note that your Admin password will be saved in the Tabjolt\config\ServerTestConfig.yaml file as clear text.



The screenshot shows the 'TabJolt Configuration' window with the 'Tableau Server Information' tab selected. The window has three tabs: 'Tableau Server Information', 'Target View URLs', and 'Server Performance Counters'. Below the tabs, there are three input fields: 'Server:', 'Server Admin Username:', and 'Server Admin Password:'. At the bottom, there are 'Back' and 'Next' buttons.

Once you fill in the information, click next. Now, you are at the Target View URLs tab where you can specify which views in your Tableau will be load tested by TabJolt. We have made it easy for you by automatically populating this view with the top view URLs from the default site and 3 other different sites (if your server has multiple sites).



The screenshot shows the 'TabJolt Configuration' window with the 'Target View URLs' tab selected. The window has three tabs: 'Tableau Server Information', 'Target View URLs', and 'Server Performance Counters'. Below the tabs, there is a text area containing a list of view URLs. At the bottom, there are 'Back' and 'Next' buttons.

Top view URLs displayed. Add or edit target view URLs.

- /views/PublicTestResults/PublicTestsbyBuild
- /views/Storytellingbugs/BacklogOrder
- /views/ServerTestresults/RunsforServerbranchesBasic
- /views/TP3\_wb3\_0/Sheet4
- /views/MotherlodeTest/Sheet3
- /site/-/views/NightlyLabAutomationManagement/LabStatus
- /site/0000site9223370561674160334/views/Superstore/CommissionModel
- /site/0000site9223370568238157758/views/0912161800/1sheets1

You could then add or edit the target view URLs. The best way to get this link is to manually navigate to it from the browser and copy the URL to the clipboard, and then paste it in the text field.

For example, the default site view URL in the browser looks like this:

```
http://localhost/#/views/WorldIndicators/GDPpercapita?:iid=1
```

The entry in the Target View URLs text field will be like this:

```
/views/WorldIndicators/GDPpercapita
```

As you can see, we removed the `http://localhost` and the `#` and all the query string parameters.

The non-default site view URL in the browser looks like this:

```
http://localhost/#/site/newsite/views/WorldIndicators/GDPpercapita?:iid=1
```

The entry in the Target View URLs text field will be like this::

```
/site/newsite/views/WorldIndicators/GDPpercapita
```

You can now append a query parameter to the Viz Url to force a certain server behavior (You can find a list of query parameters [here](#)). Your vizpool.csv might look something like:

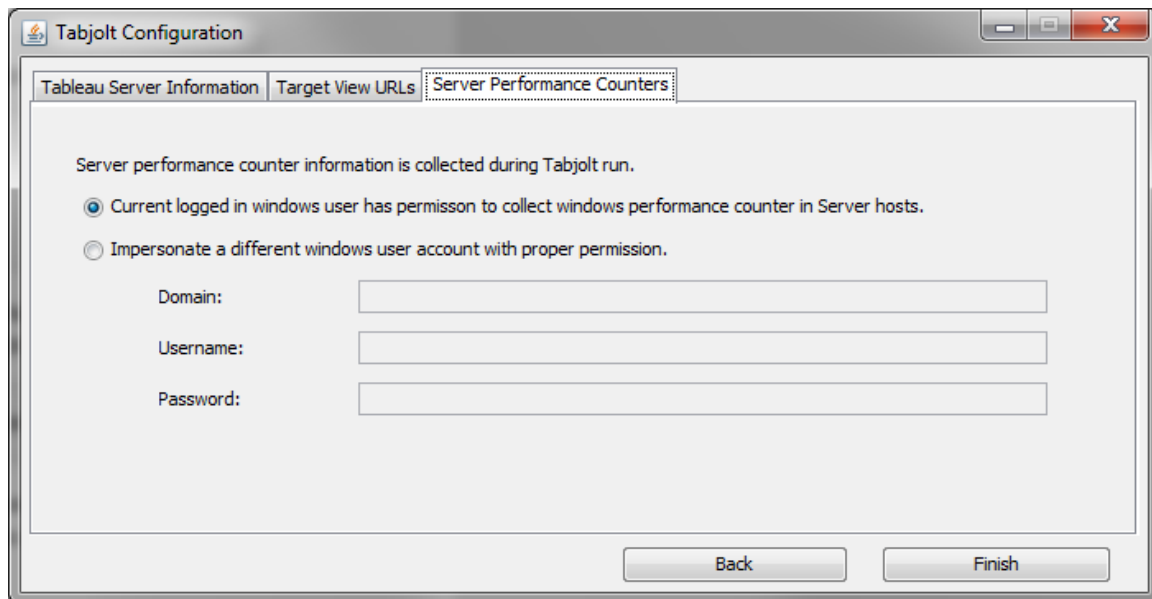
```
/site/newsite/views/WorldIndicators/GDPpercapita?:render=false&:refresh
```

**IMPORTANT:** Before you further scale your load tests, you must ensure that a single user test on this workbook performs within your expectations. If not, you should optimize the workbook by following [best practices](#) for workbook authoring.

Once you are done entering the target view URLs, click next. Now, you are at the “Server Performance Counters” tab.

TabJolt collect windows performance counter from your Tableau server host machines in the background during the run. If the windows user account that you use to execute TabJolt doesn't have permission to collect windows performance counter from Tableau server host machines, you will want to provide a windows user account which has the correct permissions to do so. Sometimes, this is useful when the Tableau Server you are testing is in another domain than where your TabJolt load generator machine resides. While testing over networks is fine, as a best practice consider the implications of having a noisy network with other traffic on it and/or the bandwidth available between the load generator and the

target Tableau Server. Your results will reflect any degradation caused due to external changes in the network conditions.



Click finish, once you are done. The installation is done at this point. You could kick off a test run with TabJolt at this point. If you are ready to try it out, please go to “Run a TabJolt test” test section. Note that not all the configuration settings have been included in the configuration UI in this update, if you want to fine tune other settings, please continue on to the next section to read more about customizing your TabJolt configuration.

### Advance Configuration – Collect JMX counters

TabJolt can collect both Windows performance metrics (perfmon) data and JMX data from Tableau Server very easily. If configured, metrics collection for the server occurs in the background during a load test. Although optional, metrics collection will help you identify performance bottlenecks that may happen. If you want to collect JMX counters, you will have to update the configuration file and enable the JMX counter port in Tableau server.

The configuration settings that control what information to collect are set in *c:\tabjolt\config\dataretriever.config*. You only need to update the `<hosts> ...</hosts>` section (found at the end of the file) to specify which counters are collected from a host.

```
<hosts>
  <host name="localhost">
    <applicableCounterGroups>
      <applicableCounterGroup>machineStatus</applicableCounterGroup>
      <applicableCounterGroup>tableauProcess</applicableCounterGroup>
      <!--enable the following section only after you jmx counter for
```



```

tableau-->
    <!--
    <applicableCounterGroup>vizqlserver</applicableCounterGroup>
    <applicableCounterGroup>dataserver</applicableCounterGroup>
    <applicableCounterGroup>vizportal</applicableCounterGroup>
    -->
    </applicableCounterGroups>
</host>
</hosts>

```

To specify the host to collect metrics from, update the host element by changing `<host name="localhost">` to `<host name="yourhostname">`. Then update the `<applicableCounterGroups>...</applicableCounterGroups>` section within `<host>...</host>` to specify which performance counter you are collecting from that host (i.e., you will only need *machineStatus* counter groups for the injector machine but you will need additional counter groups for the workers running other Tableau processes).

If you need to collect performance counter information from multiple hosts, simply replicate the `<host>...</host>` section and update the host name for each additional host.

### JMX Counter Group

JMX metrics give you better visibility into the performance of key Tableau Server processes under load. To activate JMX data collection, you must enable the feature on Tableau Server (by default it is disabled).

To enable collection of JMX metrics on Tableau Server, run the following `tabadmin` commands:

```

tabadmin stop

tabadmin set service.jmx_enabled true

```

```

tabadmin configure

tabadmin start

```

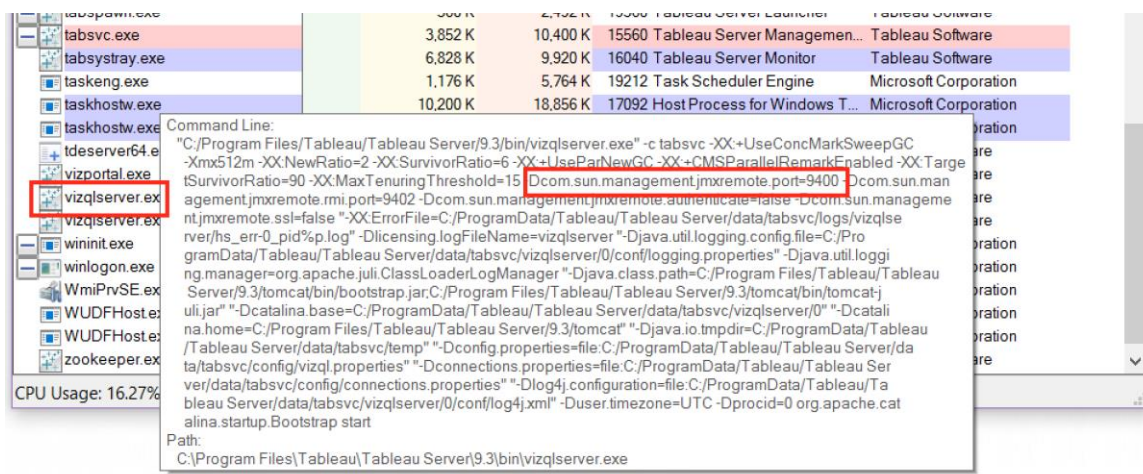
Once you have enabled JMX counters on your Tableau server, uncomment `<applicableCounterGroup>` elements in the `<host>` section of *dataretriever.config* to start collecting information from the processes you are interested in. A quick test to check if the

JMX counters are set properly is done using [JConsole](#), a free java tool. In JConsole, connect to this URL:

```
service:jmx:rmi:///jndi/rmi://<hostname>:<portnumber>/jmxrmi
```

To get JMX port numbers, you can run Process Explorer on your Tableau Server (it can be downloaded from [this link](#)). When launching Process Explorer, right click the program and **Run as Administrator** otherwise you will see “Error Opening Process” messages when browsing.

After clicking the **Process** column header to sort processes by name, mouse over each Tableau server component in the table below and look up the jmx port number (i.e. - Dcom.sun.management.jmxremote.port=**9400** for vizqlserver component in the following screenshot).



Record the JMX port for each of these processes:

Counter Group	Description
<b>vizqlserver</b>	Collects JMX counter information for Vizql process.
<b>dataserver</b>	Collects JMX counter information for data server process.
<b>searchservice</b>	Collects JMX counter information for search and browse process.
<b>vizportal</b>	Collects JMX counter information for application server process.

Note that your Tableau Server may run multiple copies of vizqlserver, dataserver, and potentially vizportal. Record the JMX port of each and every process. If you have deployed Tableau Server to multiple machines, repeat this process on each box.

Once you have the information in question, open `c:\tabjolt\config\dataretriever.config` and verify that the settings in the `jmx/components` section match your computer.

In the sample below, TabJolt will query:

- Two instances of vizqlserver (on ports 9400 & 9401)
- Two instances of dataserver (ports 10000 & 10001)
- A single instance of searchservice and vizportal

```
<jmx duration="300" outputFile="d:\jmxcounter.csv">
  <settings>
    <scheduler threadCount="5" />
    <connectorPoolConfiguration maxActive="5" testOnBorrow="true" testOnReturn="false" />
  </settings>
  <components>
    <component name="vizqlserver" serviceURL="service:jmx:rmi:///jndi/rmi://%s:9400/jmxrmi" />
    <component name="vizqlserver#1" serviceURL="service:jmx:rmi:///jndi/rmi://%s:9401/jmxrmi" />
    <component name="dataserver" serviceURL="service:jmx:rmi:///jndi/rmi://%s:10000/jmxrmi" />
    <component name="dataserver#1" serviceURL="service:jmx:rmi:///jndi/rmi://%s:10001/jmxrmi" />
    <!-- <component name="wgserver" serviceURL="service:jmx:rmi:///jndi/rmi://%s:8300/jmxrmi" /> -->
    <component name="searchservice" serviceURL="service:jmx:rmi:///jndi/rmi://%s:9004/jmxrmi" />
    <component name="vizportal" serviceURL="service:jmx:rmi:///jndi/rmi://%s:8900/jmxrmi" />
  </components>
```

Note that the `wgserver` process has been commented out in the file above. Beginning in Tableau 9.3, `wgserver` is disabled by default – therefore it makes no sense to attempt to monitor it.

## Auto discover views

You may want TabJolt to auto-discover all the available views across all sites on the server. Instead of specifying each individual view to load, you can set the auto-discover mode to find them all. This is done by changing the auto-discover mode in `c:\tabjolt\config\PerfTestConfig.yaml` from “vizDataSource: csv” to “vizDataSource: web”.

## Set Think Time

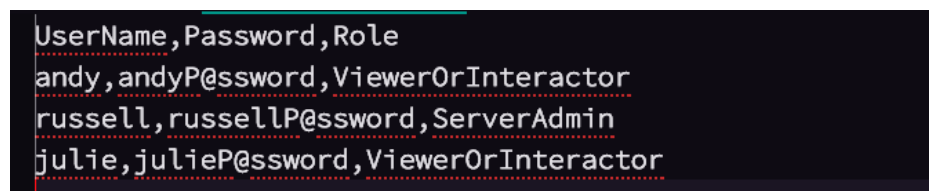
You can use the think time settings to create a pause between a tests or between interaction operations (for an interact test case). Think time, in milliseconds, is set in the `c:\tabjolt\config\PerfTestConfig.yaml` with the following configuration entry:

```
# set think time to create a pause between tests
thinktimeBetweenTest: 0
# set think time to create a pause between view and interaction
thinktimeBeforeInteraction: 0
```

**Note:** Think time is reflected in the response time metrics you view in in the console and PerformanceViz.twb. For example, if the response time on a specific workbook is normally 2500ms and you add 1000ms of thinktime in PerfTestConfig.yaml, PerformanceViz.twb and the console will reflect a grand total of 3500ms for viz response time. The viz is still executing in 2500ms, of course – but thinktime makes it *appear* it is executing more slowly. Don't be fooled!

## User Pool

You could configure TabJolt to use multiple Tableau server user accounts. To provide test user names and passwords for login, you should edit `c:\tabjolt\config\userpool.csv`:



```
UserName,Password,Role
andy,andyP@ssword,ViewerOrInteractor
russell,russellP@ssword,ServerAdmin
julie,julieP@ssword,ViewerOrInteractor
```

In the file above, three user names (andy, russell, julie) and passwords (andyP@ssword, russellP@ssword, julieP@ssword) have been specified.

These users can exist in active directory or a local Tableau Server. The users must be valid, active, and have permissions on the vizzes you wish to test.

A **role** has also been set for each user. **ViewerOrInteractor** should be leveraged for “normal users”, while **ServerAdmin** tells TabJolt that the particular user has admin permissions on the server. Users associated with the ServerAdmin role are used to access the Tableau Server metadata database when TabJolt is placed in “web mode” (see the topic [Auto discover views](#) for more information).

## Run a TabJolt test

### Choose your load mix

The workload mix that really matters for Tableau Server scale testing is not how many people are logged into the sever, but how many users are concurrently loading and interacting with visualizations.

To that end, we have provided the following three load mixes out of the box. Choose the one that best meets your needs.

- InteractVizLoadTest.jmx
- ViewVizLoadTest.jmx

- ViewInteractVizLoadTest.jmx

These load mixes are located in the **testplans** directory under the main install location. The underlying JMeter execution engine uses these files, so don't add to or change anything in them.

For the interaction mix, *InteractVizLoadTest.jmx*, TabJolt selects the URLs for the views (these views you provide in the *vizpool.csv* file, based on a uniform distribution). Next, it tries to load the view. After the viz is loaded, TabJolt checks whether the viz has any elements that allow interaction with the view (such as a slider bar, drop-down menu, and so on). If the view has interaction elements, TabJolt performs those interactions without requiring script development. If the view doesn't have any interactions, TabJolt selects marks on view.

The *ViewVizLoadTest.jmx* is a simple test and just loads the visualization without doing any interactions.

The *ViewInteractVizLoadTest.jmx* will do an interaction test for 50% of the test time and a view test with the other 50% of the test time.

You can specify the load mix you want on the command line using the `--t` command line parameter.

The command line parameter `--d` is the test run duration in seconds, and `--c` is the number of virtual users (clients) that you want TabJolt to use.

### Command line execution

Now, you can start your scale test by using a Windows command prompt, navigating to `c:\tabjolt` and running the example command below for a short test. The command tells TabJolt to run the test for 240 seconds (using the `-d` parameter) and to run a single user client (`-c`). You can, of course, change these parameters.

```
go --t=testplans\InteractVizLoadTest.jmx --d=240 --c=1
```

The test will run and you will results displayed on the console.

```

Command Prompt - go --t=testplan:InteractVizLoadTest.jmx -d=100 -c=60
#39 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 28069 Errors: 0
#40 Threads: 60/60 Samples: 5 Latency: 0 Resp.Time: 20603 Errors: 0
#41 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 12336 Errors: 0
#42 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 26146 Errors: 0
#43 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 18189 Errors: 0
#44 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 24267 Errors: 0
#45 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 14474 Errors: 0
#46 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 28534 Errors: 0
#47 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 49819 Errors: 0
#48 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 16745 Errors: 0
#49 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 39829 Errors: 0
#50 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 30653 Errors: 0
#51 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 61315 Errors: 0
#52 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 21471 Errors: 0
#53 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 21389 Errors: 0
#54 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 36519 Errors: 0
#55 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 22240 Errors: 0
#56 Threads: 60/60 Samples: 5 Latency: 0 Resp.Time: 27188 Errors: 0
#57 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 34253 Errors: 0
#58 Threads: 60/60 Samples: 1 Latency: 0 Resp.Time: 68524 Errors: 0
#59 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 24687 Errors: 0
#61 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 12271 Errors: 0
#62 Threads: 60/60 Samples: 5 Latency: 0 Resp.Time: 20225 Errors: 0
#63 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 1312 Errors: 0
#64 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 16513 Errors: 0
#65 Threads: 60/60 Samples: 1 Latency: 0 Resp.Time: 1496 Errors: 0
#66 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 33279 Errors: 0
#67 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 17337 Errors: 0
#68 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 25113 Errors: 0
#69 Threads: 60/60 Samples: 1 Latency: 0 Resp.Time: 1691 Errors: 0
#70 Threads: 60/60 Samples: 4 Latency: 0 Resp.Time: 25307 Errors: 0
#71 Threads: 60/60 Samples: 1 Latency: 0 Resp.Time: 50603 Errors: 0
#72 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 25382 Errors: 0
#73 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 25251 Errors: 0
#74 Threads: 60/60 Samples: 1 Latency: 0 Resp.Time: 49775 Errors: 0
#75 Threads: 60/60 Samples: 3 Latency: 0 Resp.Time: 33556 Errors: 0
#76 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 24802 Errors: 0
#77 Threads: 60/60 Samples: 2 Latency: 0 Resp.Time: 24890 Errors: 0

```

Figure 3: TabJolt running a test.

At the end of the run, on the command line, you will get the run ID, which you need to use as a filter when you analyze your data in Tableau Desktop.

You should explore all the options with the `go` command. If you expect to do a lot of runs, you should give your runs a useful description, by using the command `--r` followed by the description for the run.

## Analyze results

After the run is finished, open the analysis workbook located at `c:\tabjolt\PerformanceViz.twb` using Tableau Desktop from the same computer. You must provide the user name and password for your TabJolt Postgres repository that you installed above (remember, this is not your Tableau Server repository).

You can view the test results and review each of the worksheets.

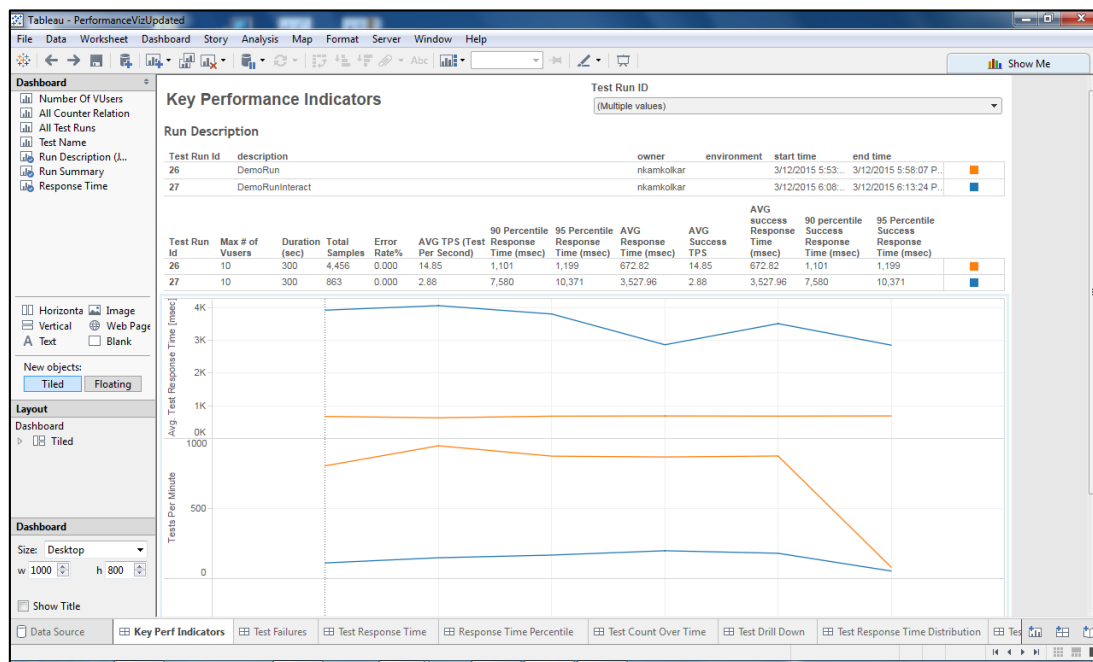


Figure 4: Tableau Desktop showing the results captured from a test run.

Analyzing your load test data is as exploratory as working with any data with Tableau. TabJolt has some key worksheets as starting point. Standard KPI metrics like response times, test cases per second (TPS), host metrics, and JMX metrics (if configured) appear in the workbooks automatically.

A test case is defined as either a “view” or an “interact” test case as described above. These parent test cases might have many child test steps to run. For example, as part of loading a new view, we might create a bootstrap session for the view, get a customized view, or perform operations after the load. These are subtests of the parent test case:

#### Test Case (Load View)

- Boot Strap Request
- Get Customized View
- Perform Post Load Operations

When you look at these results, you can quickly find patterns and check how your workload is behaving under load.

Before proceeding with a larger scale test, best practice is to ensure that your workbook is optimized for a single user. If your workbook takes a very long time just for one user, you should either follow best practices on how to author workbooks for performance or request Tableau to help.



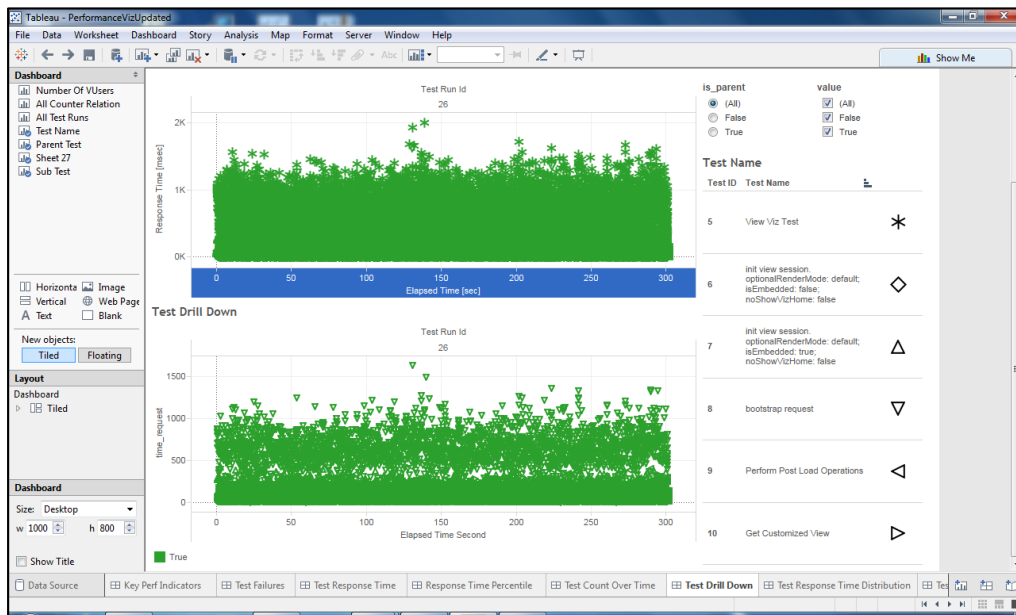


Figure 5: Tableau Desktop showing test drill down from a test run.

## Upgrading TabJolt

The installer doesn't support upgrade yet. If you already have TabJolt installed with Postgres DB version 9.5 (other versions are OK), you will have to uninstall Postgres 9.5 and delete the data folder `C:\Program Files\PostgreSQL\9.5`.

You must backup your data if you want to retain your previous test run results., because the installer will attempt to install Postgres 9.5 with specific port, admin user name and password and the existing Postgres instance will conflicts with it.

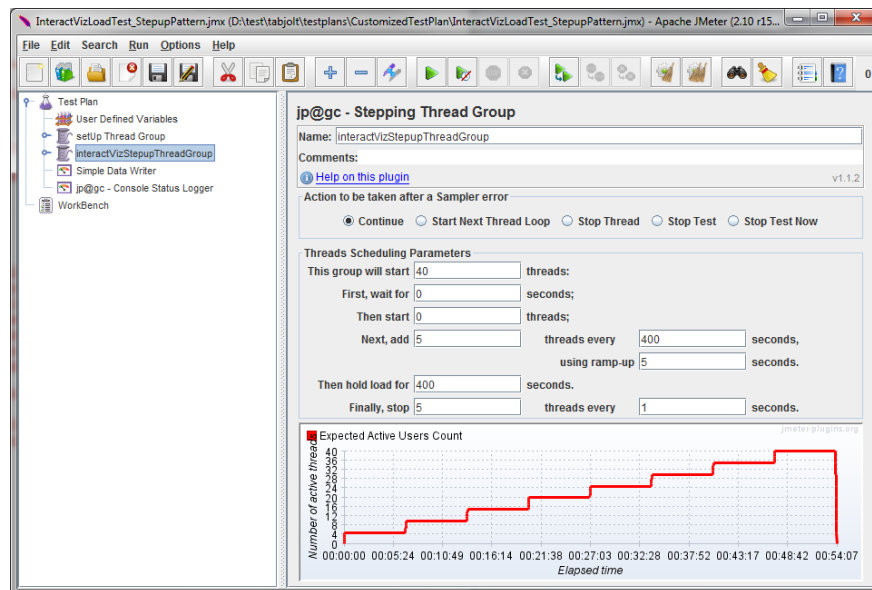
## Customizing workload mix

The default workload mix (*InteractVizLoadTest.jmx*, *ViewVizLoadTest.jmx*, and *ViewInteractVizLoadTest.jmx*) has a constant load pattern which means that the number of threads stays the same throughout the run. Since TabJolt is built on top of JMeter, it is possible to customize the workload mix to have other load patterns also supported by JMeter ([stepup](#), [RPS](#), and [ultimate](#)). There are few templates already in `c:\tabjolt\testplans\CustomizedTestPlan`. You can start by opening the test plan which has the load pattern that you want in the JMeter UI. Here the steps to make a custom workload mix:

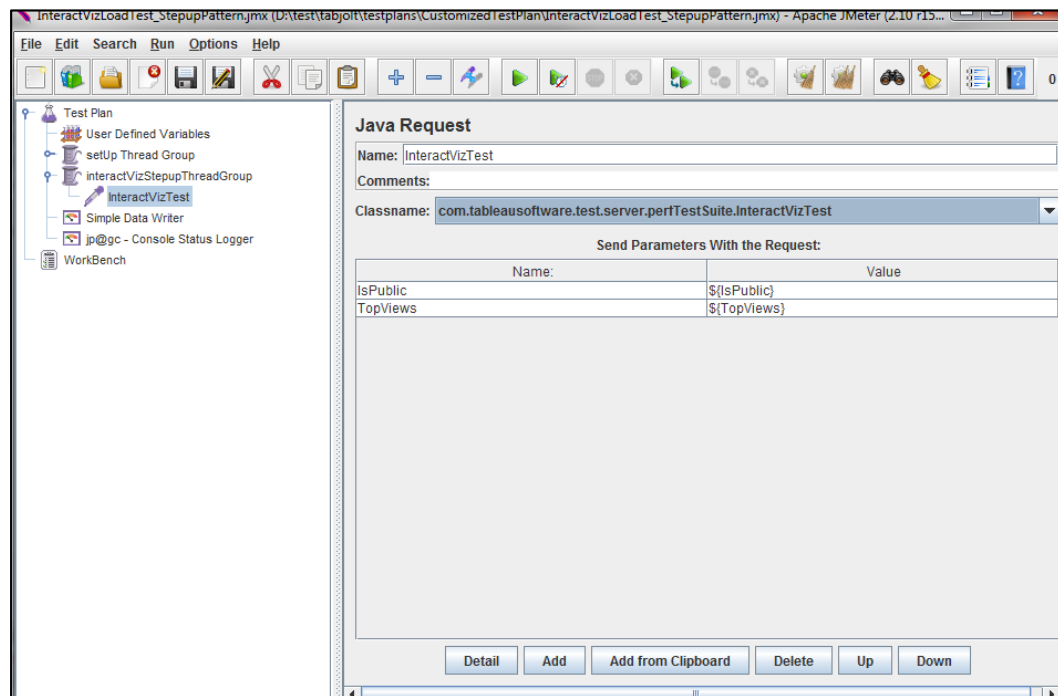
1. As an example, we use  
`c:\tabjolt\testplans\CustomizedTestPlan\InteractVizLoadTest_StepupPattern.jmx`.



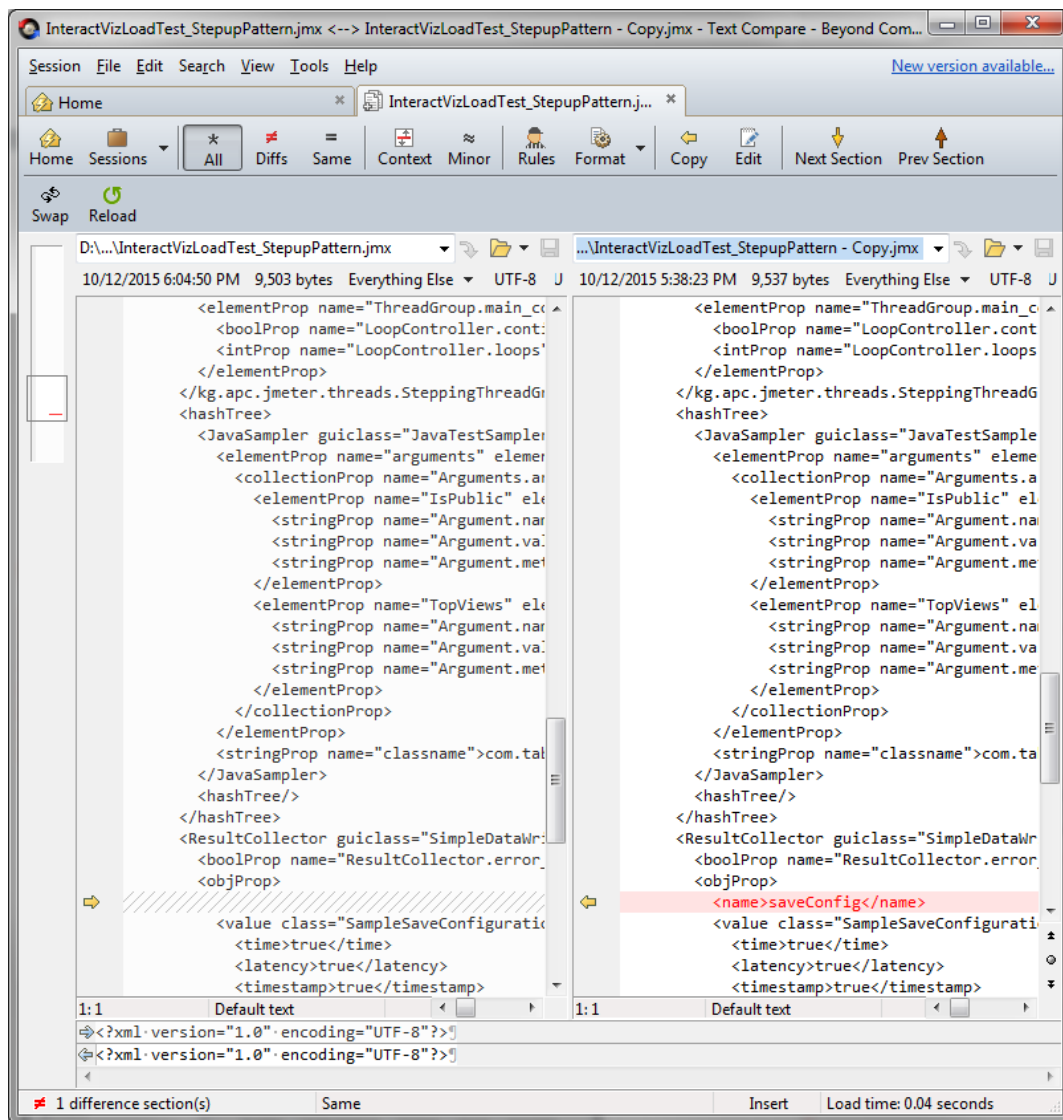
2. Make a backup of the test plan.
3. To open JMeter UI, type in `bin\jmeter.bat` from the TabJolt root folder.
4. Once the Jmeter UI is opened, load the test plan `InteractVizLoadTest_StepupPattern.jmx` by selecting **File->Open** and entering the test plan path.
5. Click on the **interactVizStepupThreadGroup**.



6. You can then change the *stepup load pattern* to match you want, such as extending the run duration and the maximum number of threads. Note that the `--d` and `--t` parameters from the `go` command won't work anymore if you are using the customized test plan. However, you still want to set `--d` to have same time duration as the test plan so that TabJolt can connect performance counter information on the background with the same duration as the load generation.
7. To change the test case from interact to view only, expand **interactVizStepupThreadGroup**, select **interactVizTest**, click on the **Classname** dropdown, and choose `com.tableausoftware.test.server.perfTestSuite.ViewVizTest`.



8. If you want to have both the view and interact tests running in the mix, replicate *interactVizStepThreadGroup*.
9. Once you are done, save the test plan.
10. There is a bug in JMeter which will give invalid results in the output file. You need to make a change the test plan to work around the bug. To fix this, load the saved test plan and the backup test plan in [Beyond Compare](#), or a similar comparison utility, and find all the instances where `<name>saveConfig</name>` are missing. Copy over the entries from the backup file to the file which you have just saved. Then save the file again with the additional entries.



11. Now you can use the customized test plan in the go command :

```
go --t=testplans\CustomizedTestPlan\InteractVizLoadTest_StepupPattern.jmx --d=60 --c=1.
```

Note that the **--d** and **--t** parameter from **go** command won't work anymore if you are using the customized test plan. However, you still want to set **--d** to have same time duration as the test plan, so that TabJolt can connect performance counter information on the background with the same duration as the load generation.

## Known Issues and Troubleshooting

### 1. Is there source code for download?

TabJolt uses Github as a repository for external distribution and you don't really need to download or edit source code to use TabJolt.

### 2. Why does TabJolt cause a heap allocation error at start up?

By design, TabJolt tries to allocate 2GB RAM at startup. If you are NOT running x64 bit version of JAVA or you are running TabJolt on a system that has very low memory, you may run into an error or warning that says

```
JavaHotSpot(TM) 64-Bit Server VM warning: ignoring option  
PermSize=64m; support was removed in 8.0.
```

To solve this, you need to either move to an x64 bit JAVA installation, OR increase RAM in your system, OR update the heap requirement to suit your environment constraints with an aim to maximize the memory available to TabJolt. Set the HEAP range in *C:\tabjolt\bin\jmeter.bat*.

```
set HEAP=-Xms512m -Xmx2048m
```

### 3. How do I turn on verbose logging?

By default, TabJolt only logs fatal errors (to reduce the performance impact from logging itself). Sometimes, you may want to turn on verbose logging to troubleshoot a problem. To turn on verbose logging, open up the *c:\tabjolt\config\log4j.properties* file. Disable the first line by adding # in front of it and enable the second by removing # in front of it.

```
#log4j.rootLogger=FATAL, stdout, logfile  
log4j.rootLogger=ALL, stdout, logfile
```

The log is saved in *c:\tabjolt\logs\test.log*.

## Additional Resources and Feedback

[TabJolt Overview Video](#)

[Getting Started with TabJolt Video](#)

[Analyzing TabJolt Results Video](#)

Tweet us @neeleshkamkol or @tableau

You can also post questions or comments in the [forum](#) for the Server Administration Community on Tableau.com.