Automating Tests with HammerDB Autopilot

This guide gives you an introduction to automating tests with HammerDB autopilot mode. You should be familiar with running tests successfully manually before proceeding with Autopilot based tests.

Using Autopilot Mode

Having previously read the HammerDB documentation such as Introduction to Transactional (OLTP) Load Testing for all Databases you will understand the importance of generating performance profiles. By far the most common beginners testing error is to configure a number of virtual users well in excess of the number required. Nevertheless modern CPUs have high core and thread counts and therefore it can take be a significant number of tests to profile an entire system as shown in Figure 1.

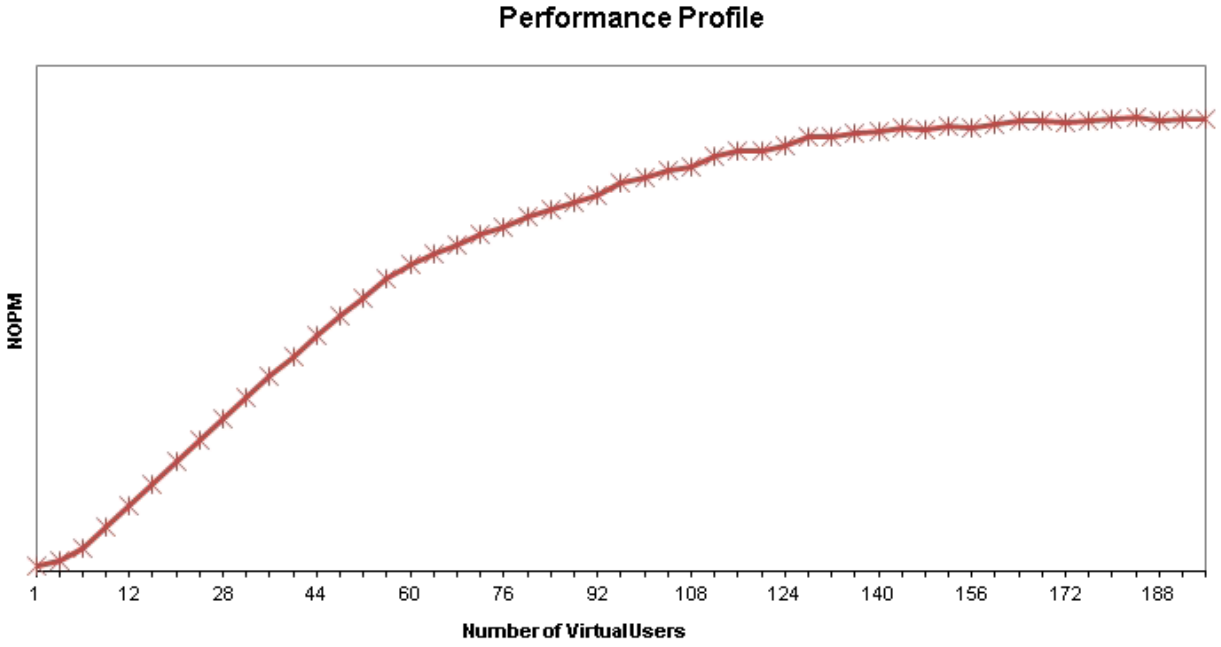

Figure 1 Performance Profile

To automate this process of repeated tests HammerDB provides the autopilot feature that enables you to configure a single test to be repeated by a different numbers of virtual users a number of times.

Conceptually autopilot is best understood as having instructed a virtual DBA to manually repeat the test you have configured a number of times at a pre-determined time interval. That virtual DBA will then run the tests by 'virtually' pressing exactly the same buttons on the HammerDB interface

that you would press as if running the test manually yourself. It is important to understand this concept as the most frequent user errors in using autopilot are as a result of not following this approach.
Before running autopilot you should ensure that you have run a number of tests manually and your system is in an optimal configuration for running tests up to your planned maximum virtual user count (at the current release up to 30 separate tests are permitted), for example you should enable enough space to schema growth throughout all of the tests you plan to run.

Configuring Autopilot Mode

To begin configuring Autopilot mode follow the steps described in the previous section for Running Timed Tests up to the steps illustrated in Figures 36 and 37. You only need to configure the correct driver script but not configure the Virtual Users, they will be configured automatically. To do this select Autopilot Options from the either the Options menu or the treeview as shown in Figure 2.

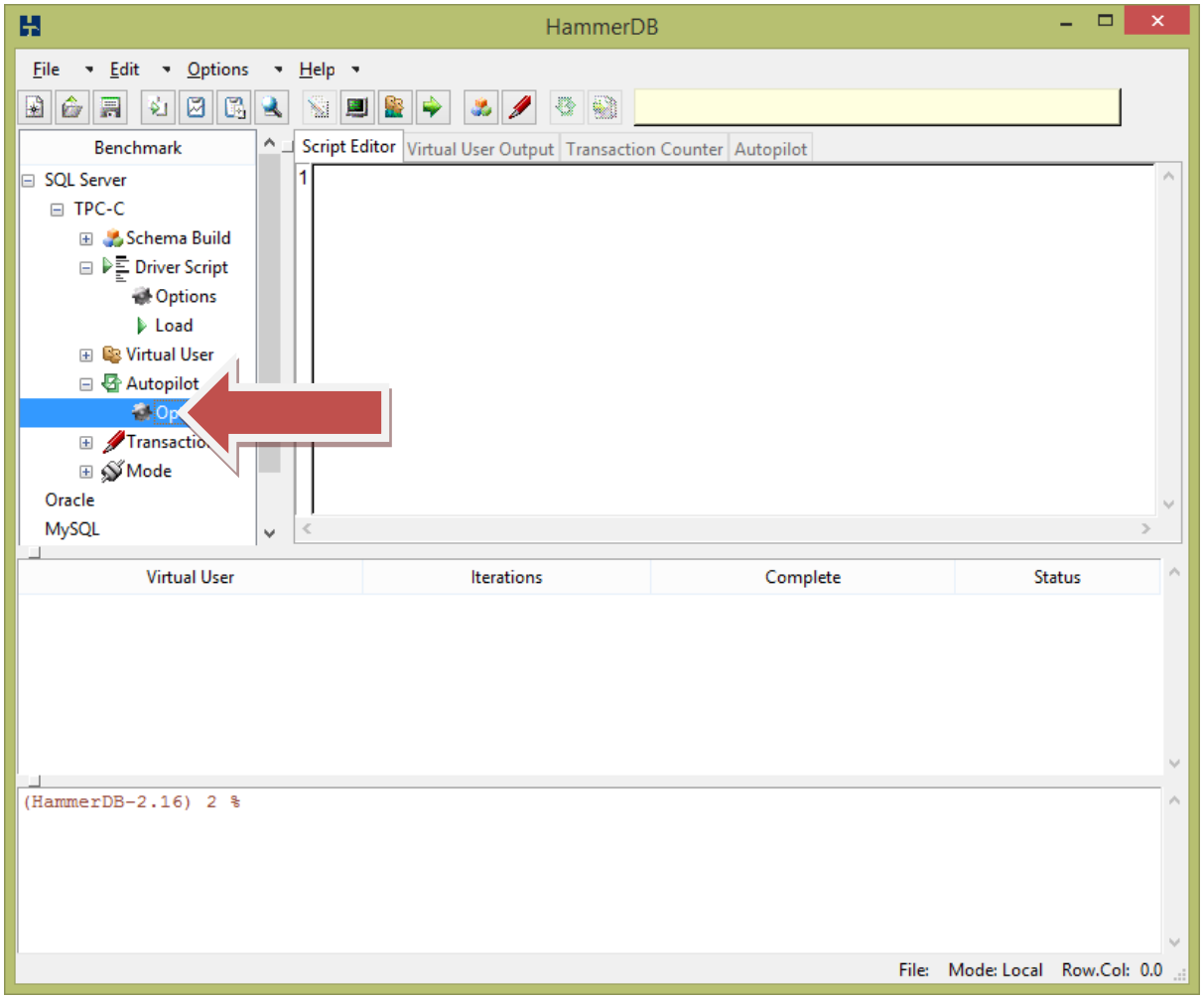

Figure 2 Autopilot menu

This shows the Autopilot Options menu as shown in Figure 3.

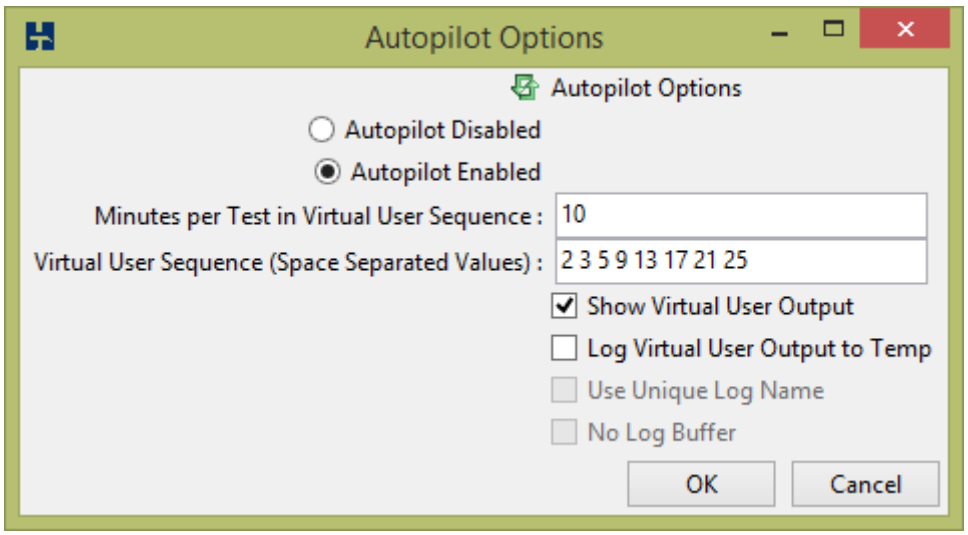

Figure 3 Autopilot Options

Configure the Autopilot options precisely in the same manner as you would use to instruct your Virtual DBA as follows:

Autopilot Disabled/Autopilot Enabled

This Autopilot Disabled/Autopilot Enabled Radio buttons give you the option to select whether the Autopilot button is enabled on the main window.

Minutes per Test in Virtual User Sequence

The minutes for test duration defines the time interval between which your virtual DBA will create the Virtual Users, stop the test and create the next Virtual Users in the sequence. You should configure this value in relation to the Minutes for Ramup Time and Minutes for Test Duration. For example if the values in the test script are 2 and 5 minutes respectively then 10 minutes for the Autopilot Options is a good value to allow the test to complete before the next test in the sequence is run. If however the test overruns the time interval and the Virtual Users are still running the sequence will wait for the Virtual Users to complete before proceeding.

Virtual User Sequence (Space Separated Values)

The Virtual User Sequence defines the number of Virtual Users to be configured in order for a sequence of tests separated by the Minutes for Test Duration. For example as shown in Figure 46, firstly a test with 2 Virtual Users will be run, then after 10 minutes a test with 3 Virtual Users will be run, then 5 Virtual Users and so on to the end of the sequence. Note that the default Values are given as odd numbers to account for the Monitoring Virtual User when running the Timed Test Driver Script. Therefore in this example the actual Users running the workload will be 1, 2, 4, 8, 12, 16, 20 and 24.

Show Virtual User Output/Log Virtual User Output to Temp

These values are exactly the same as set when defining the Virtual Users, the Autopilot Options gives you the opportunity to set them when configuring Autopilot Mode to ensure that you have a permanent record of the output of the tests that you run.

Once your Autopilot Options are defined, press OK to save the values. Close down all running virtual Users and the transaction counter and press the Autopilot button as shown in Figure 40.

Most Frequent Autopilot User Errors

Note that if the autopilot interval is too short it will stop the test running during the timing interval and therefore no results will be reported. For example a TPC-C driver script options window is shown in Figure 4.

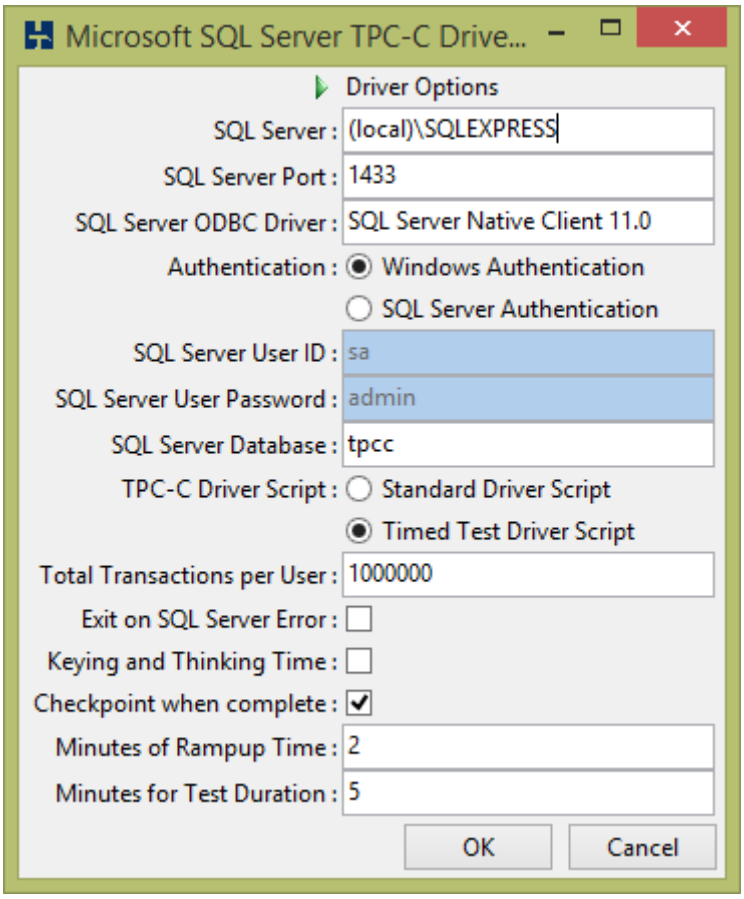

Figure 4 Driver Options

When this script is loaded it will configure a test to take 7 minutes consisting of 2 minutes rampup and 5 minutes test as shown in Figure 5.

```
8  set rampup 2;  # Rampup time in minutes before first Transaction Count is taken
9  set duration 5;  # Duration in minutes before second Transaction Count is taken
```

Figure 5 Rampup and Duration

Also note that the Checkpoint when complete option has been chosen to ensure that the database is in the same consistent state before each test. The checkpoint itself will also take time to complete and therefore the Minutes per Test in Virtual User Sequence has been set to 10 minutes to allow the test to complete. Now picture a scenario where the Virtual DBA has been instructed to end the test by pressing the stop button before the test has been completed. Figure 6 shows an example of a single test where Autopilot has been set for 1 minute when the test in fact requires 10 minutes.

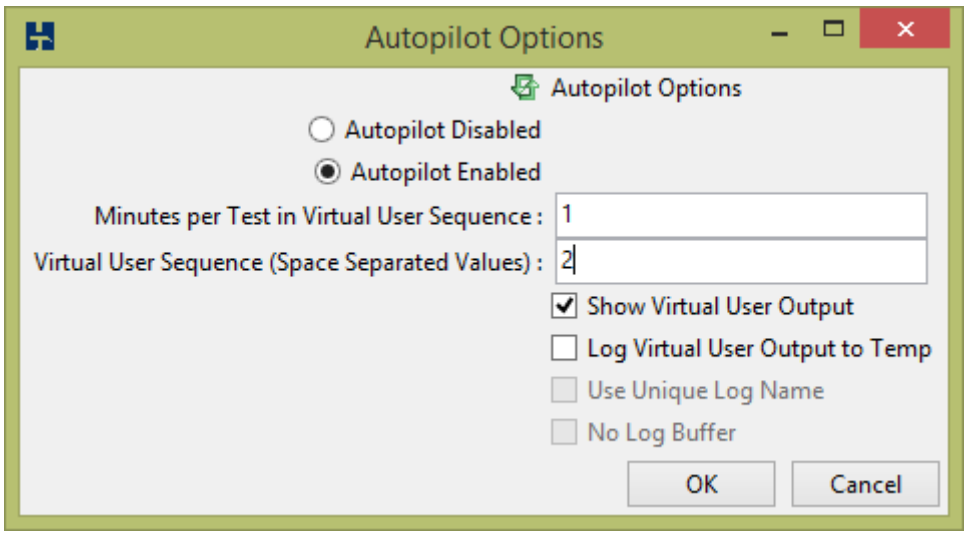

Figure 6 Driver Options

As shown in Figure 7 when Autopilot is run the test will begin as normal showing the rampup time and transactions are being processed.

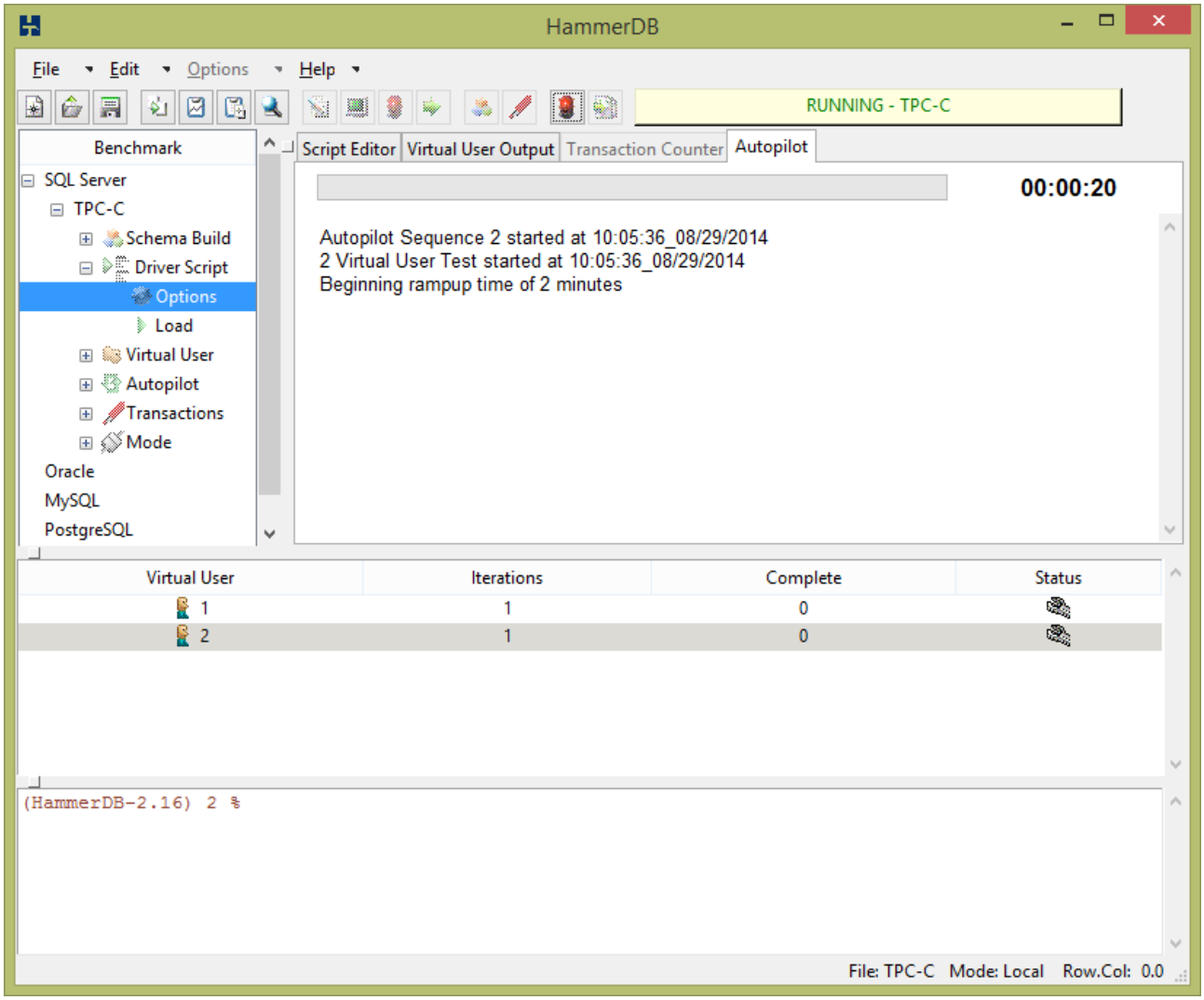

Figure 7 Autopilot Test running

However as defined in Autopilot the Virtual DBA pressed stop to complete the test after one minute. Figure

8 shows the result. It can been seen in the autopilot output that the test started and ended with a minute interval and only 1 minute of rampup was completed. Consequently the test did not complete and as expected no results were generated. It is a common error to complete a test too early and yet to expect results to be printed. You also receive a warning that the Virtual User was terminated and therefore no results will be printed.

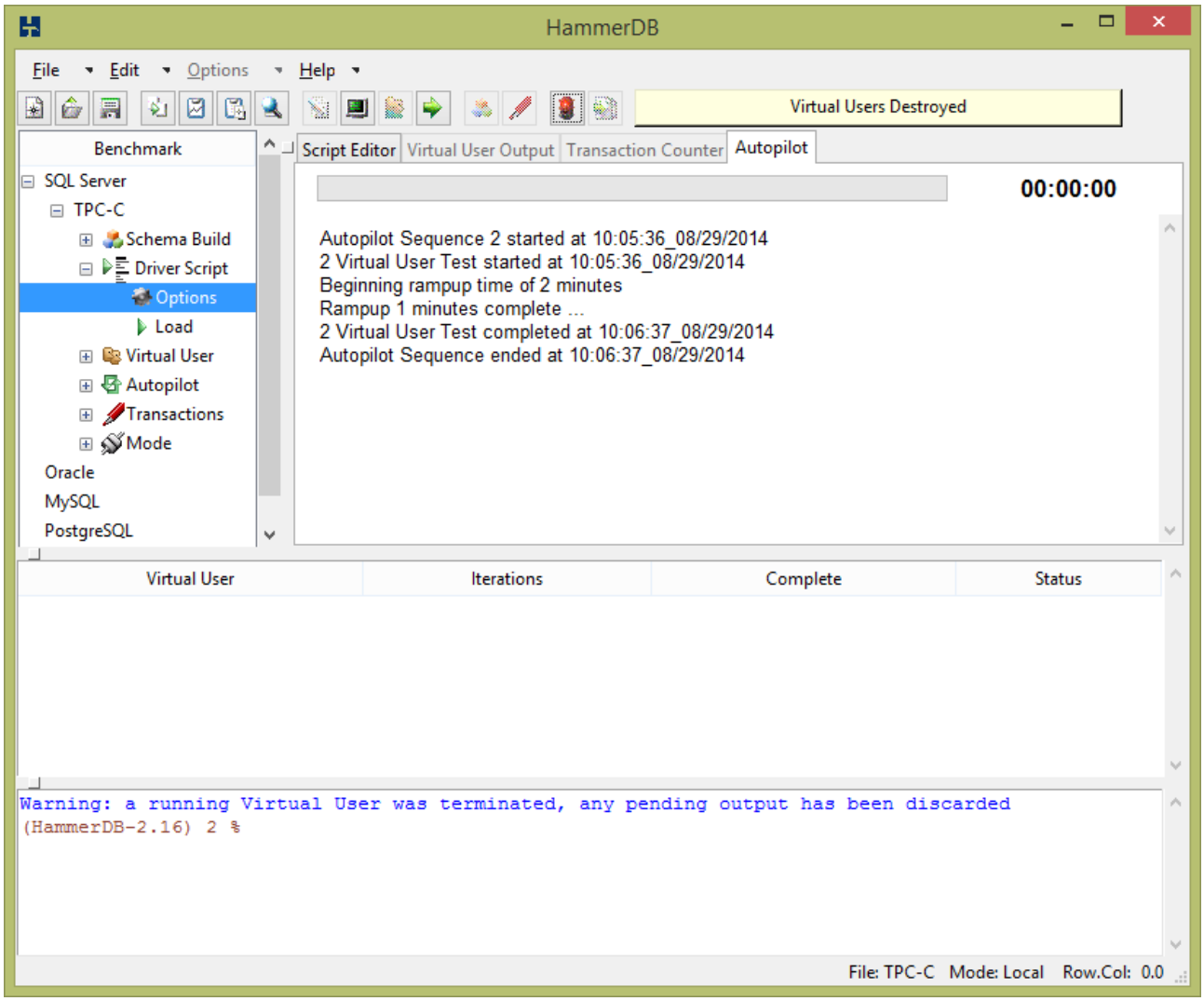

Figure 8 Driver Options

If you see this error increase the time interval within autopilot to ensure that tests complete and generate results.

Running Autopilot Mode

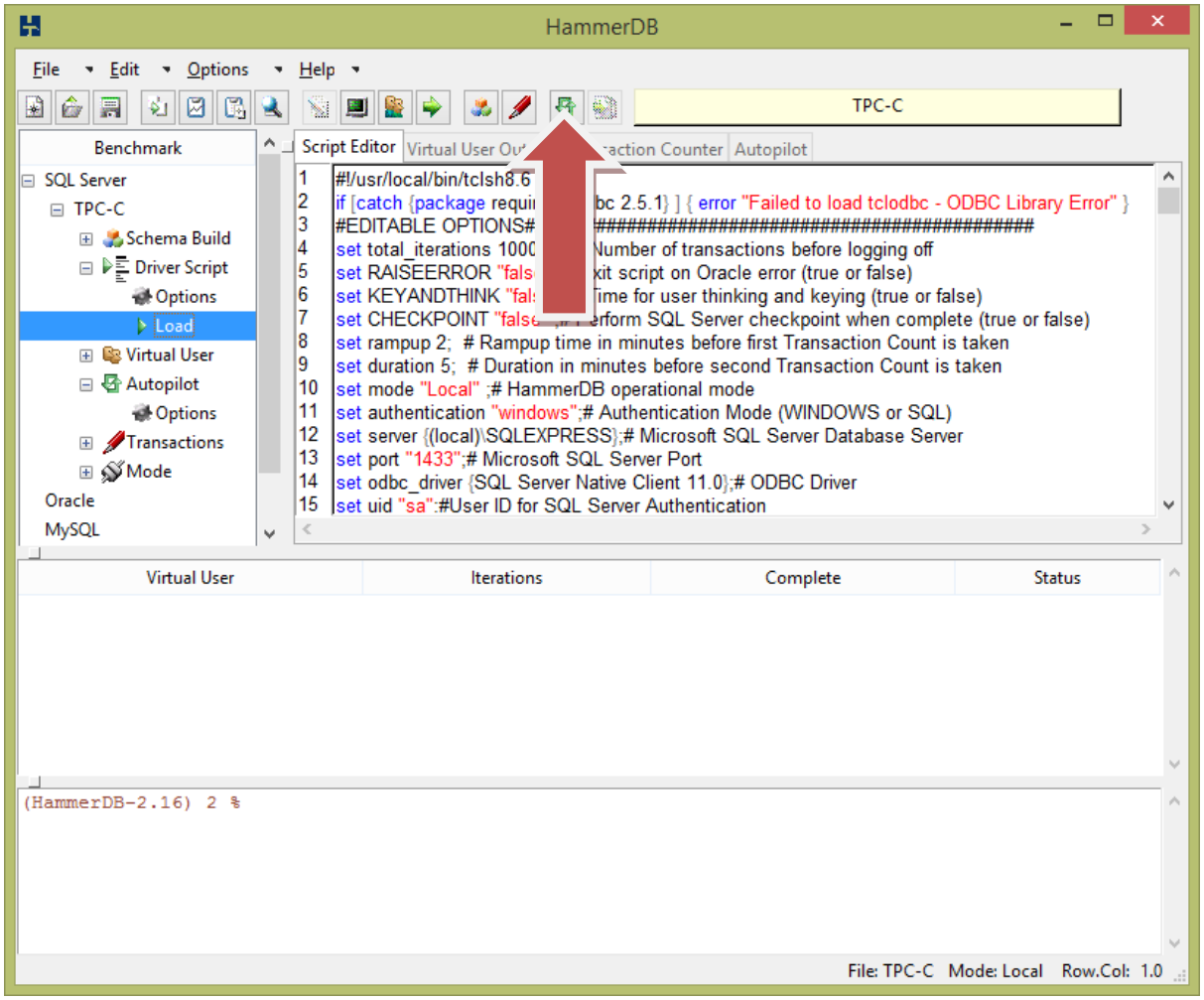

Figure 9 Start Autopilot

When configured correctly you can now leave the autopilot mode to run your chosen sequence of tests without any further intervention. The Autopilot screen as shown in Figure 10 becomes active and reports your progress. In particular note the timer in the top right hand corner tracking the interval times at which your tests should be run. As noted previously to avoid errors this interval must be long enough to allow for your ramp up time, test time and any post-test workload such as running a checkpoint.

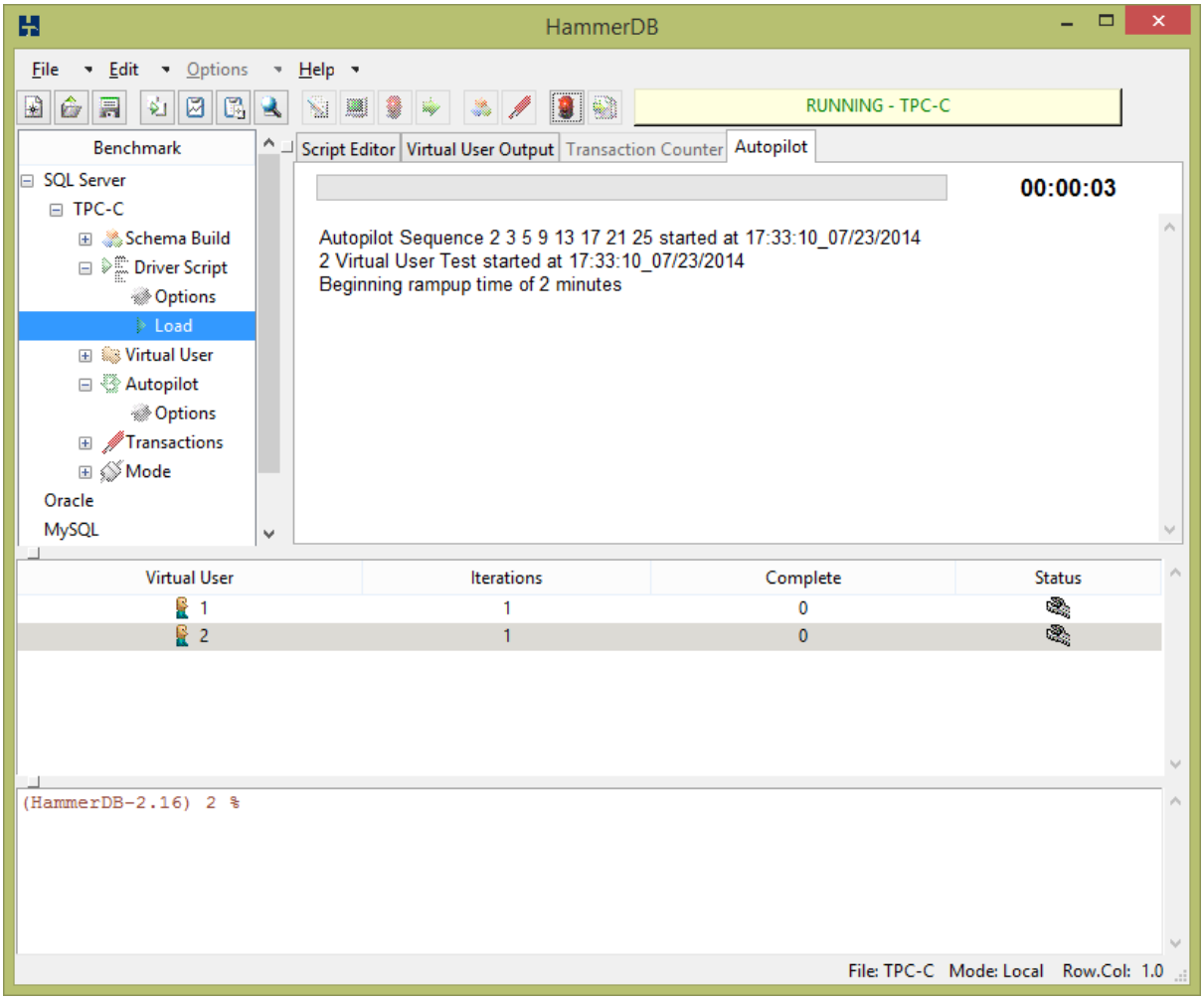

Figure 10 Autopilot Screen

The Autopilot will continue to run through your chosen sequence, creating virtual users and running the test in the test script as shown in Figure 11.

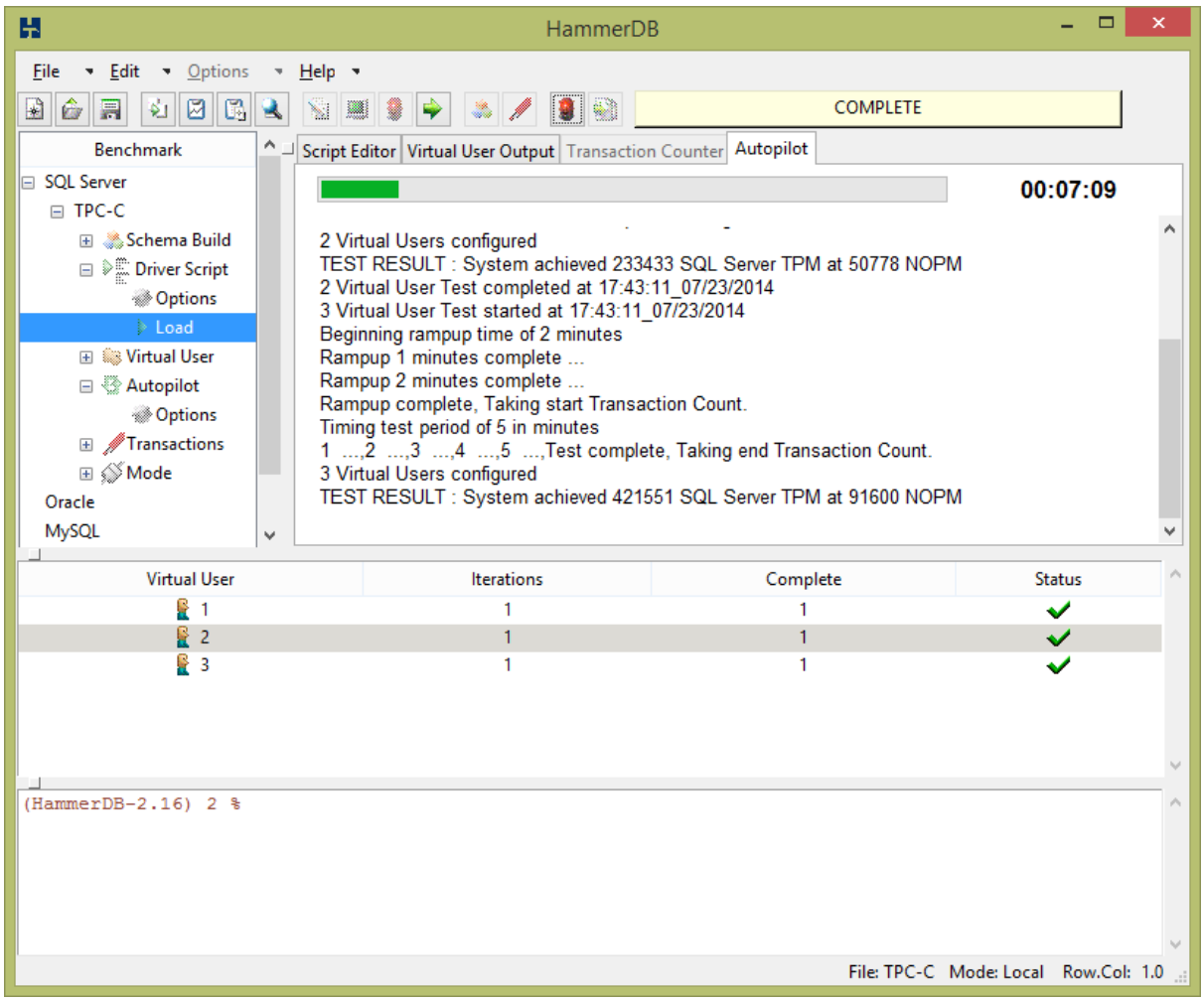

Figure 11 Autopilot Continuing

When your tests has completed you may retrieve all of your results from the main autopilot window. You can collect the results for an entire sequence of tests into your spreadsheet without having run each test manually. This enables you to generate comprehensive performance profiles with an efficient use of time.

Support and Questions

For help use the HammerDB Sourceforge forum available at the HammerDB sourceforge project.