RDS for SQL Server

Performance White Paper

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HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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1 Test Method

Huawei Cloud RDS for SQL Server is an online Microsoft SQL Server-compatible relational database service. It is reliable, secure, scalable, inexpensive, and easy to manage. It uses a high availability (HA) architecture, provides flexible backups, guarantees data security, and recovers from faults within seconds.

Test Environment

- ECS specifications: high-performance computing | hc2.2xlarge.2 | 8 vCPUs | 16 GB, SSD disk, 200 GB of storage, Windows Server 2012 R2 Standard 64 bit image and VPC network

Test Tool

HammerDB is a graphical open-source database stress testing and benchmarking tool for Linux and Windows to test databases running on any operating system. HammerDB is automated, multi-threaded and extensible with dynamic scripting support. You can use HammerDB to create a test schema, load data, and simulate workloads of multiple virtual users on databases in online transaction processing (OLTP) and online analytical processing (OLAP) scenarios.

HammerDB 2.19 is used as an example. **Download the latest version.**

HammerDB started

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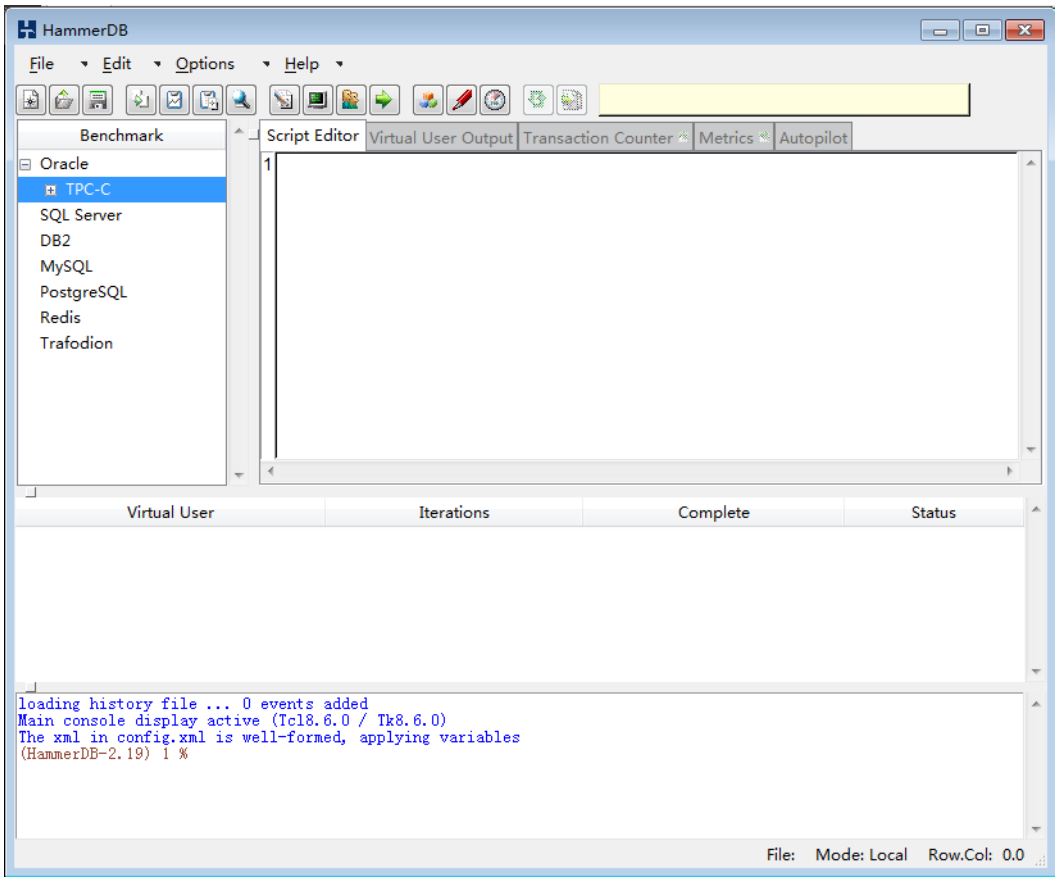

Test Benchmarks

The Transaction Processing Performance Council (TPC) is a non-profit corporation founded to define transaction processing and database benchmarks and to disseminate objective, verifiable performance data to the industry. TPC provides multiple test benchmarks, such as TPC-A, TPC-C, and TPC-H. For details, see the official document. TPC-C is an OLTP benchmark. It is different from and more complex than TPC-A because of its multiple transaction types, complex databases, and overall execution structure.

This test uses the TPC-C test benchmark.

The test model is developed by Huawei Cloud based on HammerDB without any optimization and modification on the model structure.

Test Procedure

Step 1 Start HammerDB.

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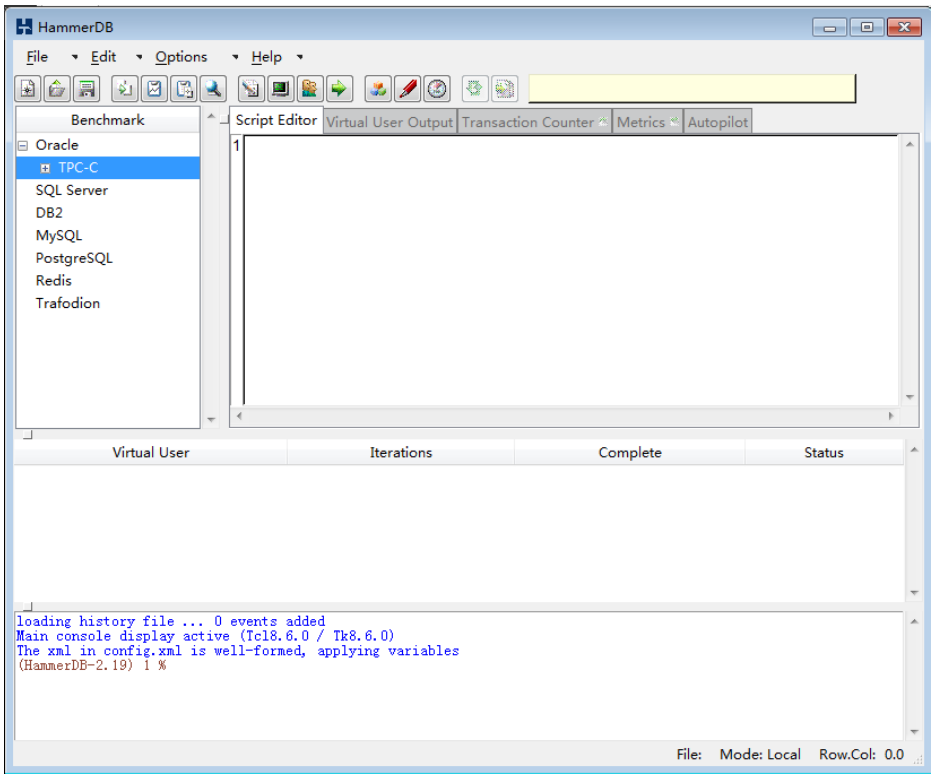
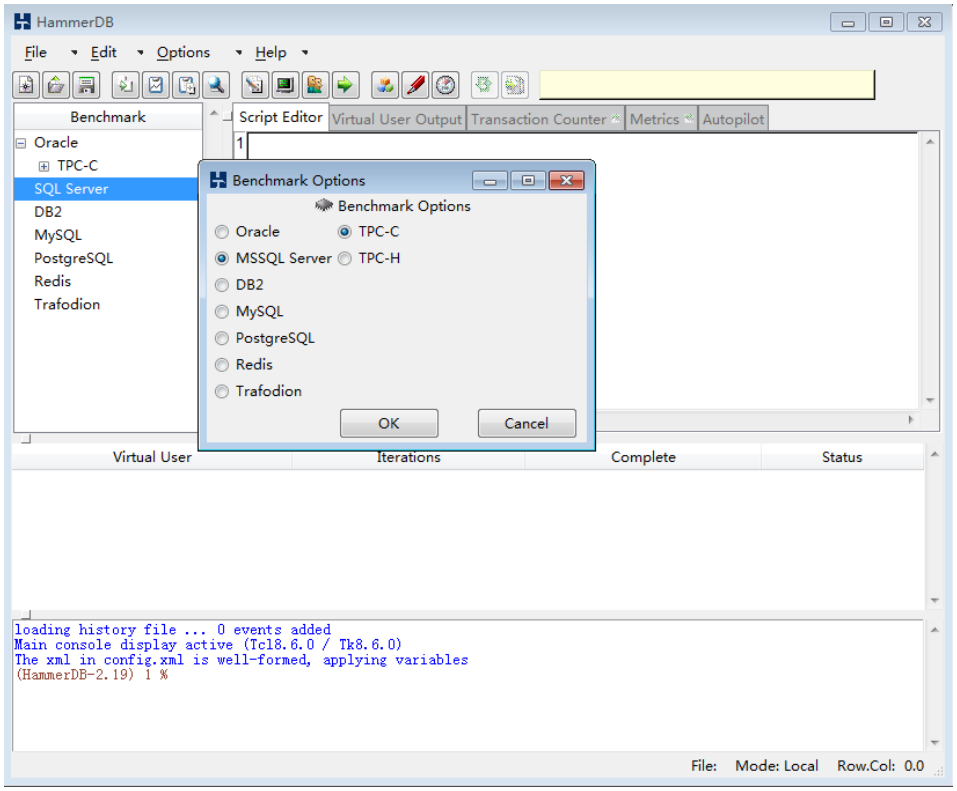
Figure 1-1 HammerDB started



Step 2 In the **Benchmark** area, double-click **SQL Server**. In the displayed dialog box, select **MSSQL Server** and **TPC-C**, and click **OK**.

Figure 1-2 Benchmark Options



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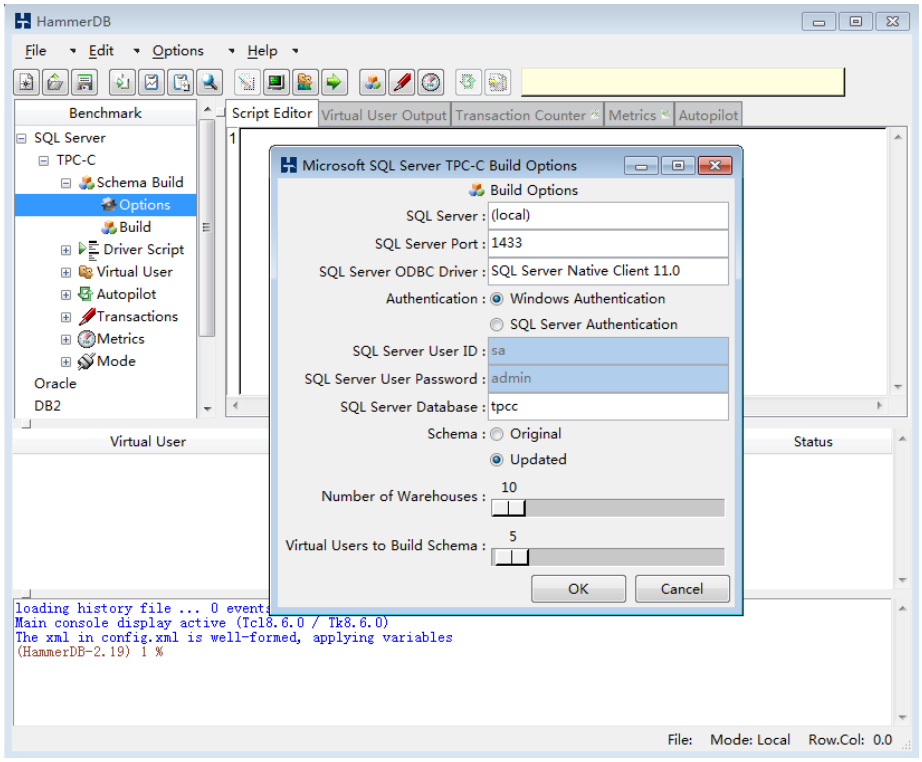
Step 3 Configure the connection information and create the object database **tpcc**.

Choose **SQL Server** > **TPC-C** > **Schema Build** and double-click **Options**.

NOTICE

In the displayed dialog box, select **Updated** for **Schema**.

Figure 1-3 Microsoft SQL Server TPC-C Build Options



Step 4 Choose **SQL Server** > **TPC-C** > **Schema Build** > **Build**. In the displayed dialog box, click **Yes** to create a schema.

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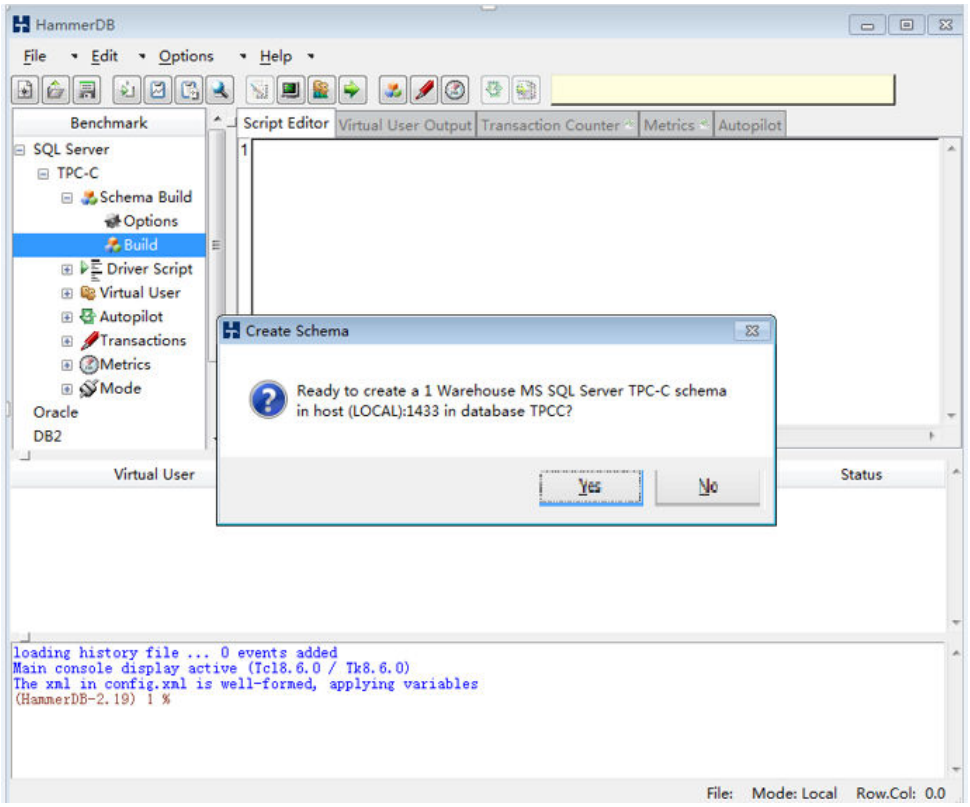
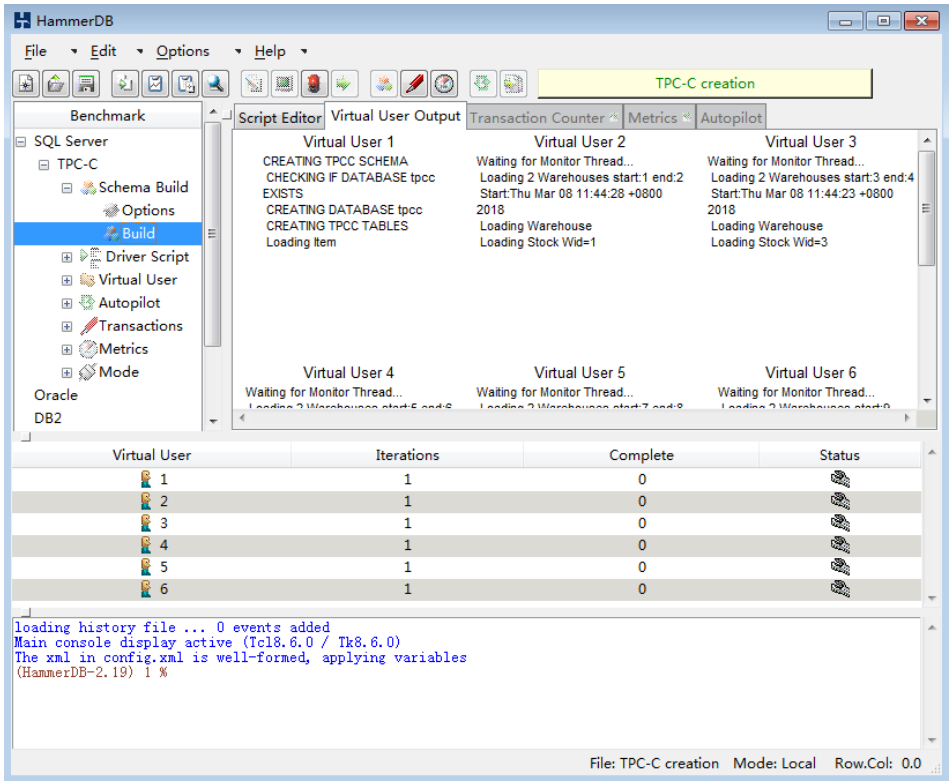
Figure 1-4 Build



Wait until the initialization is complete.

Figure 1-5 Initialization completed



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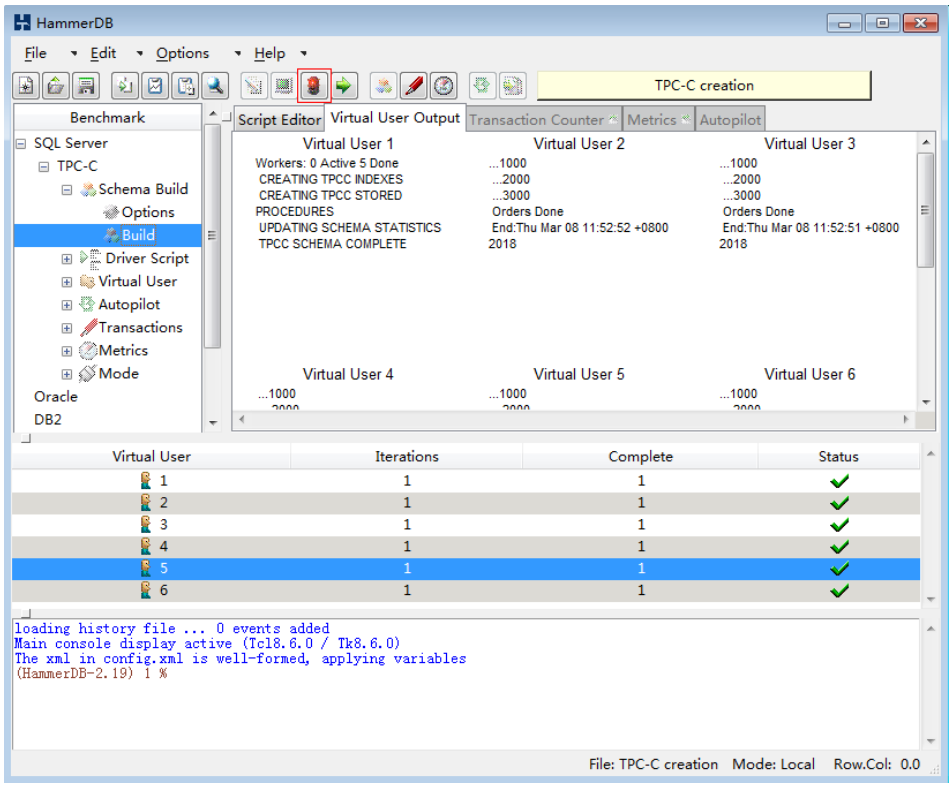
Step 5 Click to stop the execution.

Figure 1-6 Execution stopped



Step 6 Select **SQL Server** > **TPC-C** > **Driver Script** and double-click **Options** to ensure that the connection information is correct.

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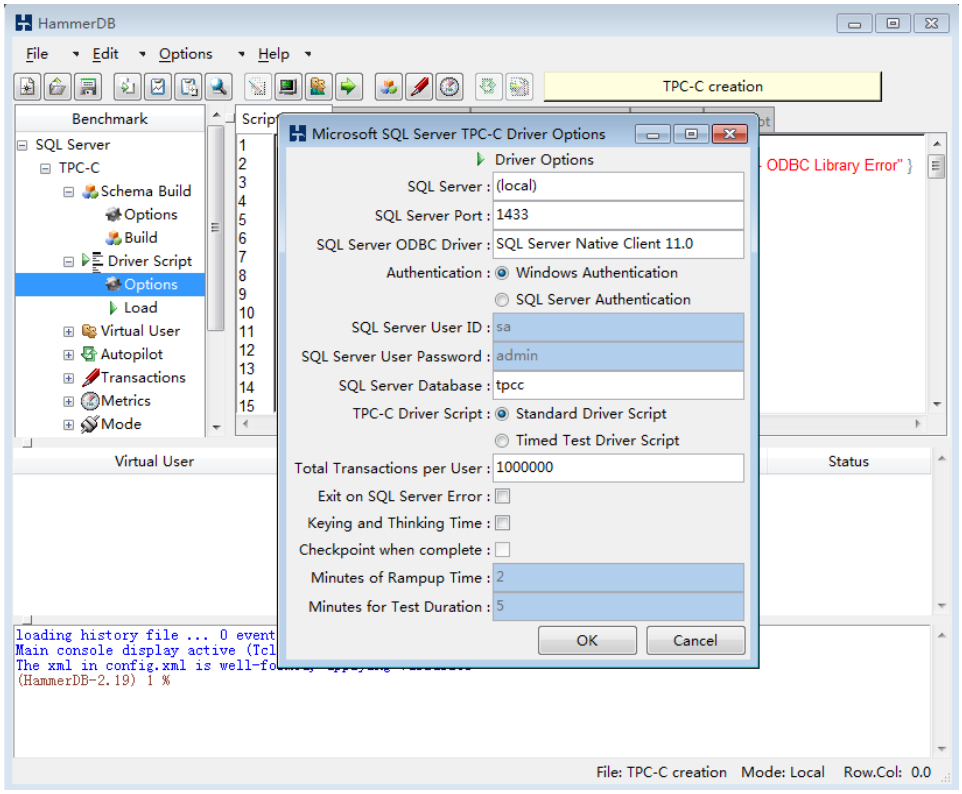
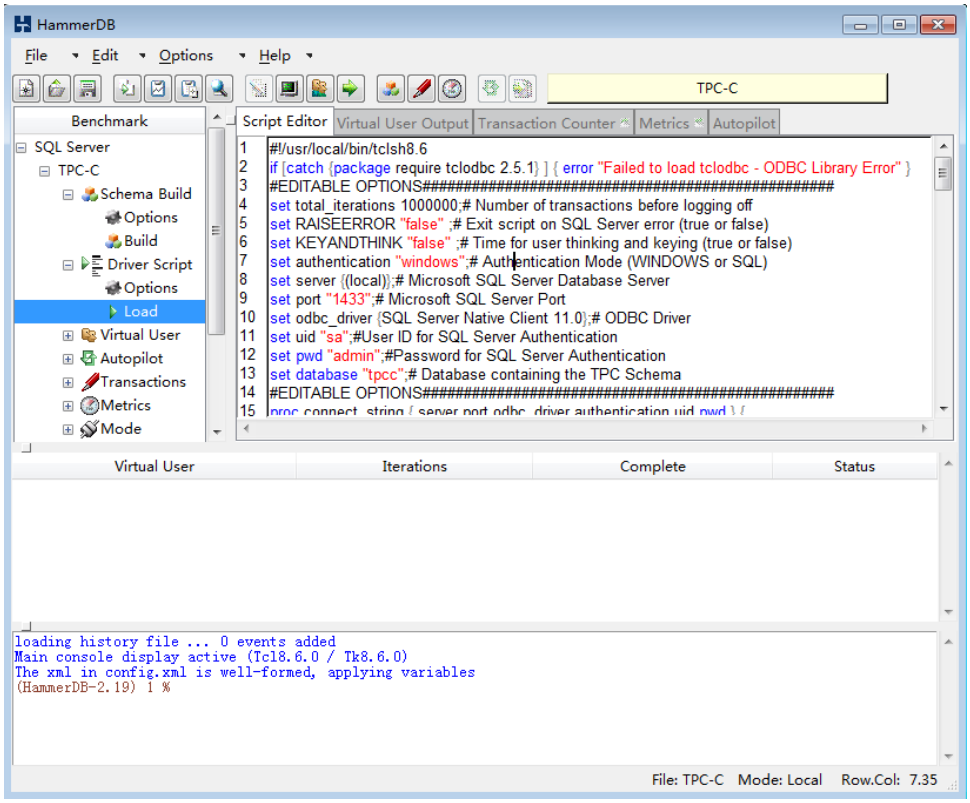
Figure 1-7 Checking the connection information



Step 7 Choose **SQL Server** > **TPC-C** > **Driver Script** and double-click **Load**.

Figure 1-8 Load



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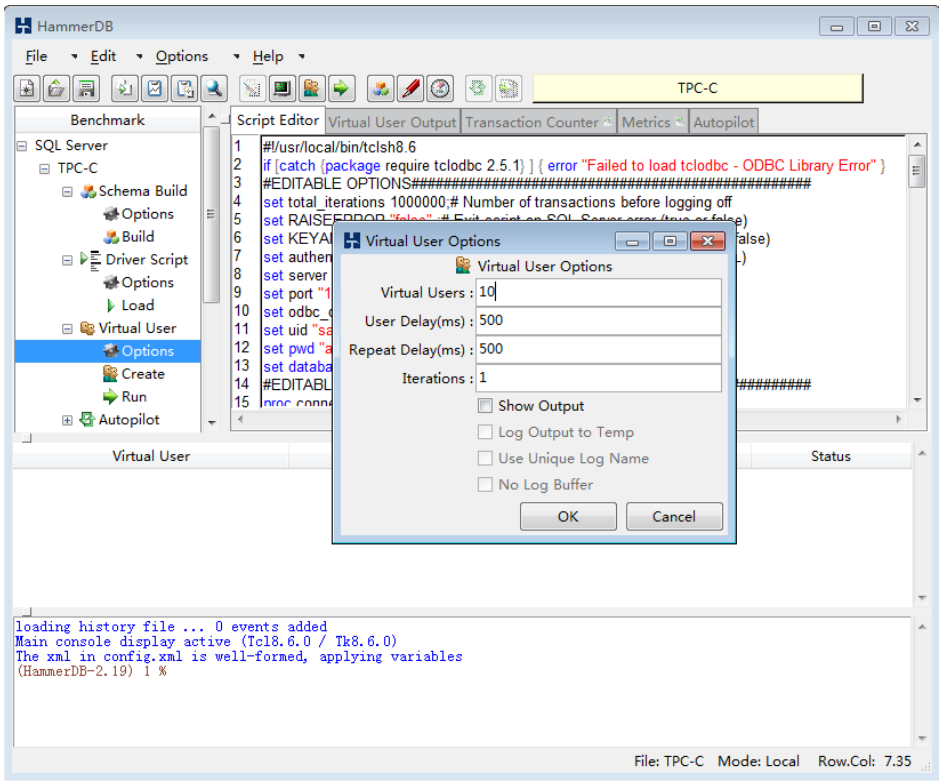
Step 8 Choose **SQL Server** > **TPC-C** > **Virtual User** and double-click **Options**. In the displayed dialog box, you can adjust the number of virtual users repeatedly to generate test results until the Transactions Per Minute (TPM) peak values become consistent. TPM is an important benchmark for measuring database performance.

NOTICE

You are advised not to select **Show Output** because the client may not respond.



Step 9 Click **Yes**.

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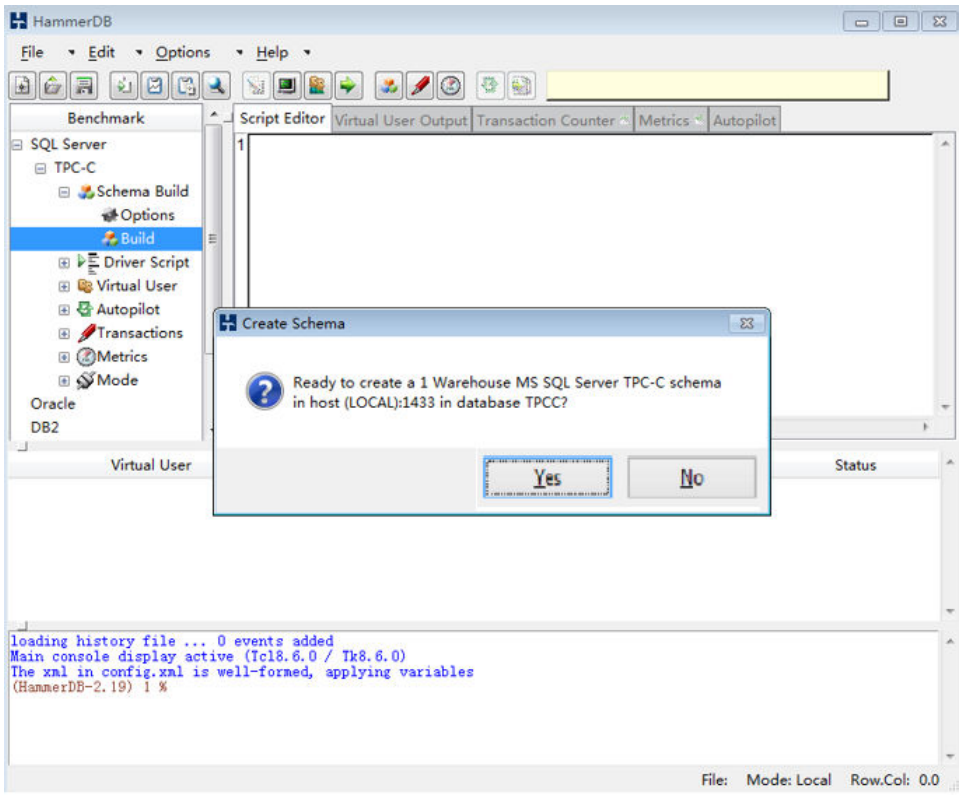

Step 10 Choose **Virtual User** and double-click **Run** until the TPM peak value is stable.

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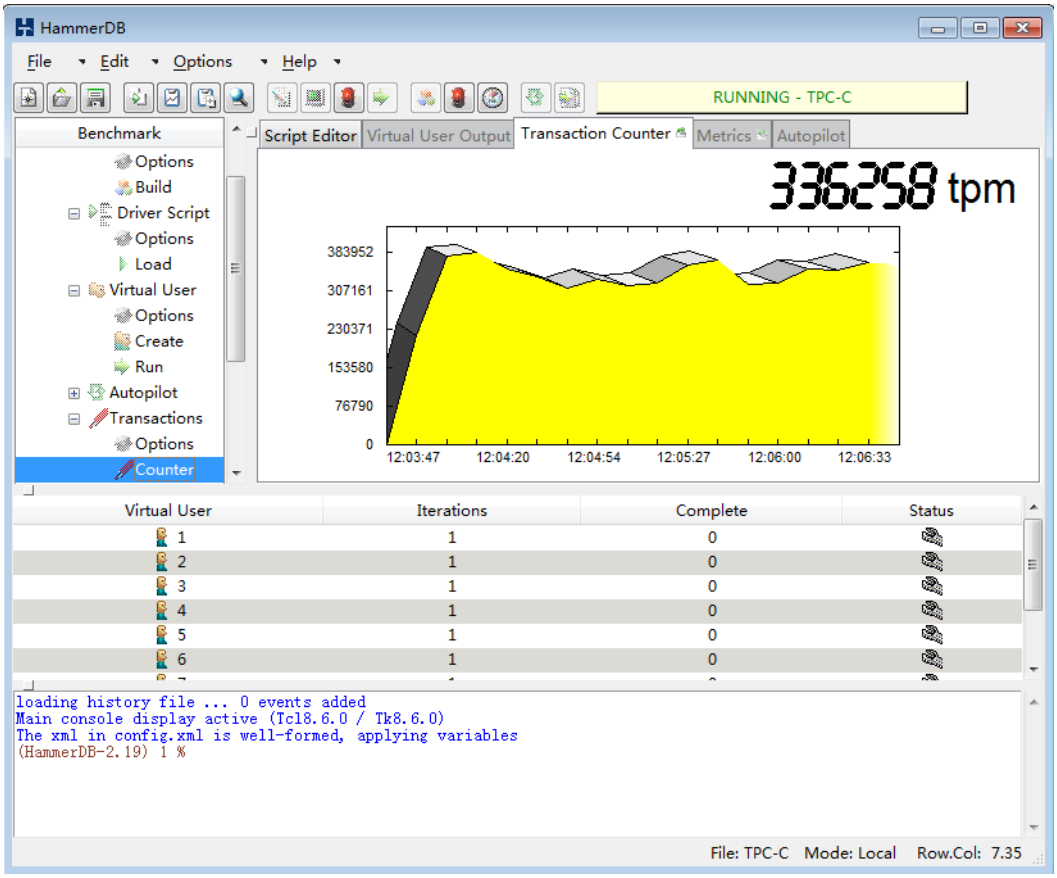
Figure 1-9 Stable TPM peak value



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2 Test Data

Concepts

Transactions per minute (TPM): Number of simulated orders processed by the system in the TPCC standard model per minute.

TPS: Number of simulated orders processed by the system in the TPCC standard model per second.

Input/output operations per second (IOPS): Number of disk read/write operations per second. IOPS in this document refers to the IOPS displayed when the performance reaches the peak in the stress testing, instead of the maximum IOPS capability.

NOTICE

TPM reflects more comprehensive performance than TPS. IOPS indicates the disk read/write capability in the current stress testing, which is for reference only.

Test Result

Table 2-1 Test results

DB Instance Type	Edition	vCPUs	Memory (GB)	TPM	TPS	IOPS
Primary/ Standby	2008 R2 Enterprise	2	8	300,000	5,500	4,000
	2008 R2 Enterprise	4	16	530,000	9,700	7,000
	2008 R2 Enterprise	8	32	930,000	17,050	15,000
	2008 R2 Enterprise	16	64	1,250,000	23,000	20,000

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DB Instance Type	Edition	vCPUs	Memory (GB)	TPM	TPS	IOPS
	2008 R2 Enterprise	2	16	290,000	5,300	4,000
	2008 R2 Enterprise	4	32	540,000	9,900	7,000
	2008 R2 Enterprise	8	64	960,000	17,600	15,000
	2008 R2 Enterprise	16	128	1350000	24750	20000
Single	2014 Enterprise and 2014 Standard	4	16	550,000	10,083	7,000
	2014 Enterprise and 2014 Standard	8	32	1,100,000	20,166	16,000
	2014 Enterprise and 2014 Standard	16	64	1,500,000	27,500	22,000
Primary/ Standby	2014 Enterprise and 2014 Standard	4	32	500,000	9,000	7,000
	2014 Enterprise and 2014 Standard	8	64	1,000,000	18,333	16,000
	2014 Enterprise and 2014 Standard	16	128	1,400,000	24,000	21,000
Single	2014 Web	4	16	550,000	10,000	6,000
	2014 Web	8	32	1,100,000	20,000	12,000
	2014 Web	16	64	1,500,000	27,000	18,000

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