

TencentDB for SQL Server

General Reference

Product Documentation



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Testing Tool

The performance test in this document is conducted with the TPC-C benchmark load built in HammerDB. TPC-C is a typical OLTP workload that simulates a scenario where a wholesaler with multiple warehouses ships goods to a large number of customers. The adjustment of the number of warehouses can reflect the data size that the database can sustain in the test.

- [HammerDB download address](#)
- [HammerDB User Manual](#)
- [Overview of the TPC-C test load built in HammerDB](#)

Test Environment and Parameters

Physical machines where instances are located

High-performance physical machines with a specification of 80 cores, 767 GB memory, and 30 TB storage capacity.

Test instance specifications

The test instances are of 2008 Enterprise Edition, 2012 Enterprise Edition, 2016 Enterprise Edition, and 2017 Enterprise Edition. They cover almost all purchasable specifications, including 1-core 2 GB, 1-core 4 GB, 1-core 8 GB, 2-core 16 GB, 4-core 32 GB, 8-core 64 GB, 12-core 96 GB, 16-core 128 GB, and 32-core 256 GB.

Load generation environment

The machines on which HammerDB is installed are of the same models as the database instances, ensuring that the performance of the SQL Server instances can be fully measured in the stress test.

TPC-C benchmark parameters

- Number of Warehouses = 100: Sets the number of warehouses to 100, which will generate a test database of approximately 55 GB in size.
- Minutes of Rampup Time = 2: Sets the warm-up time before the test to 2 minutes.
- Minutes Test Duration = 5: Sets the test duration to 5 minutes.

Number of virtual users

The number of virtual users is the number of concurrent connections. In this document, different numbers of concurrent connections are tested on instances with different specifications.

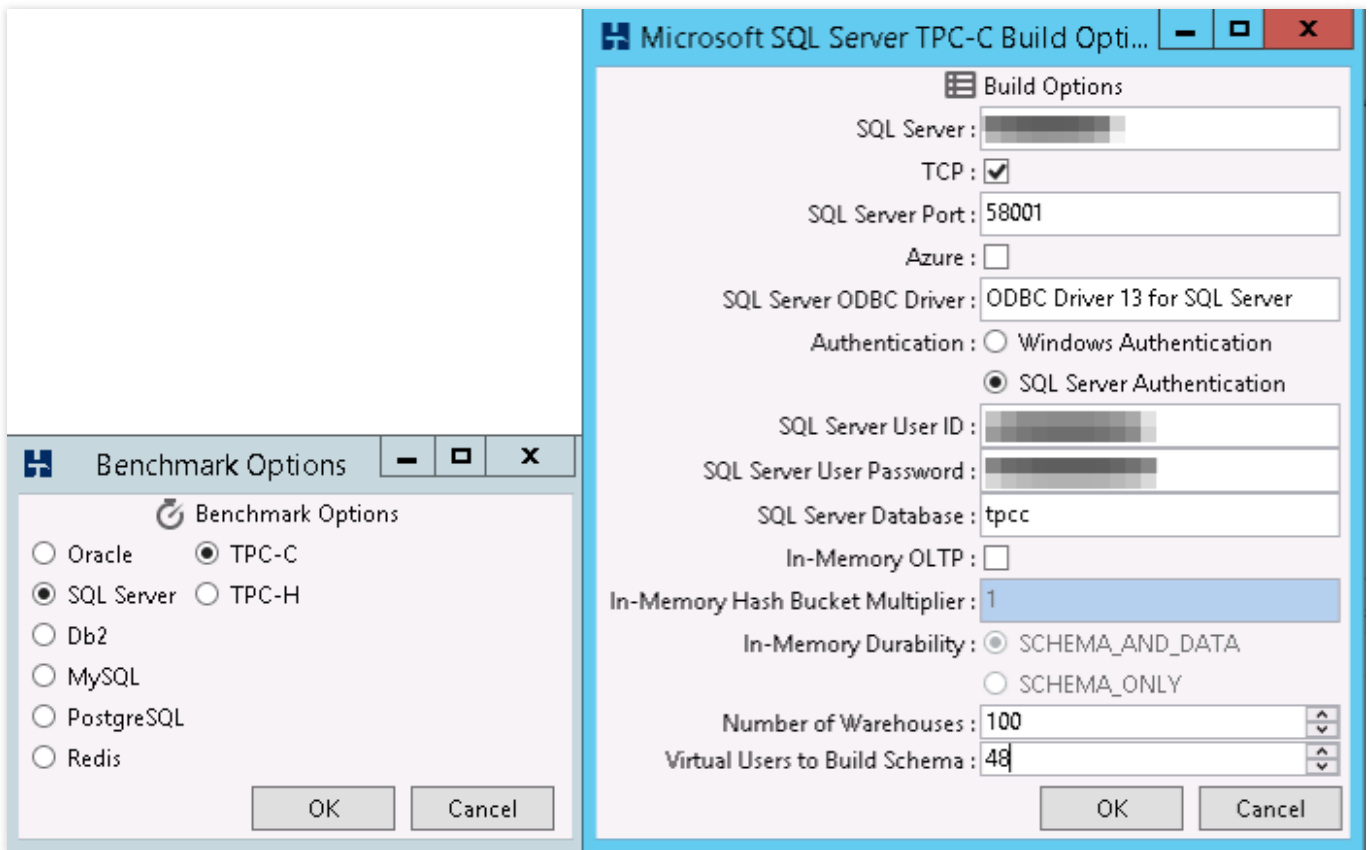
Concurrent Connections	2	4	8	16	32	64	128	256	512	1,024
1-core 2 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
1-core 4 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
1-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
2-core 16 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 32 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 64 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
12-core 96 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16-core 128 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32-core 256 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Testing Method

1. Prepare the TPC-C workload.

- Number of Warehouses: The number of warehouses, which will affect the size of the test database generated.
- Virtual Users to Build Schema: The number of concurrent connections when generating the load data, which cannot be larger than the number of warehouses. This value affects the efficiency of load data generation, so it is recommended to be the same as the number of CPU cores of the load

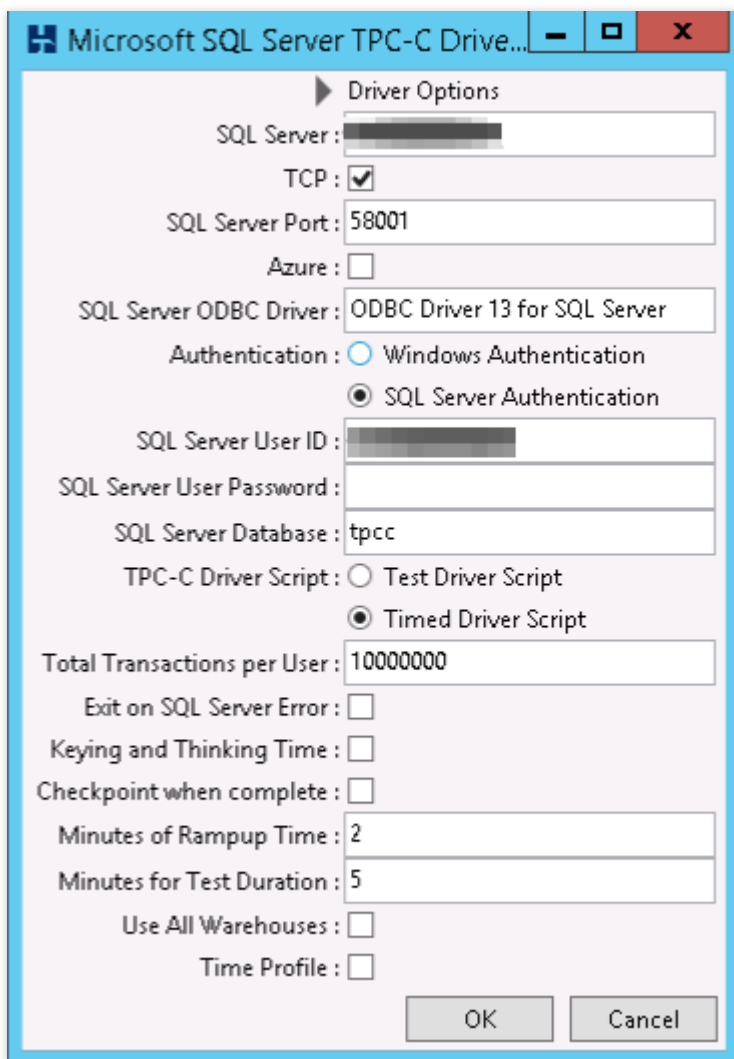
generating device.



2. Set the test script.

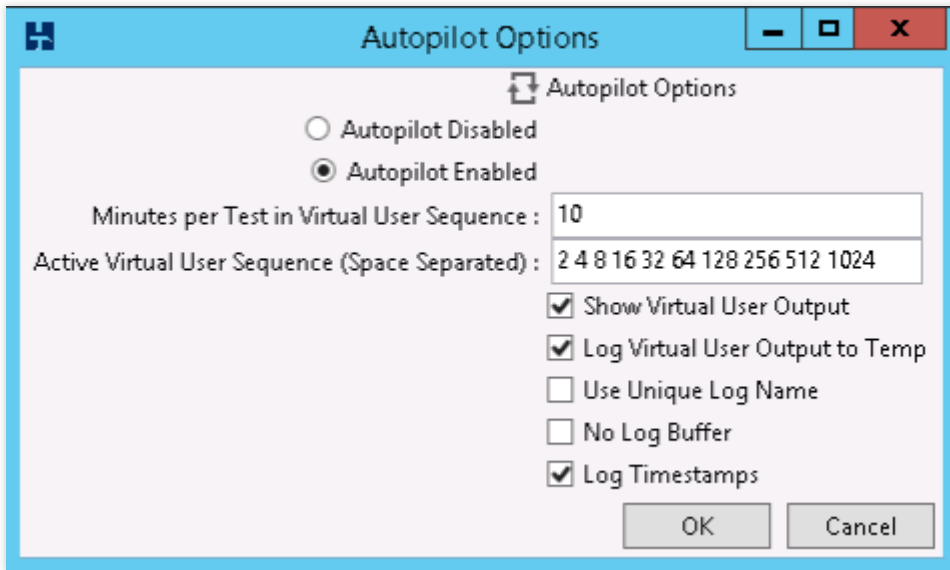
- Total Transactions per User: The total number of transactions per user. You are recommended to set this parameter to a higher value so as to ensure that the user will not exit due to the completion of transactions during the stress test.
- Minutes of Rampup Time: Warm-up time for the stress test.

- Minutes for Test Duration: Duration of the stress test.

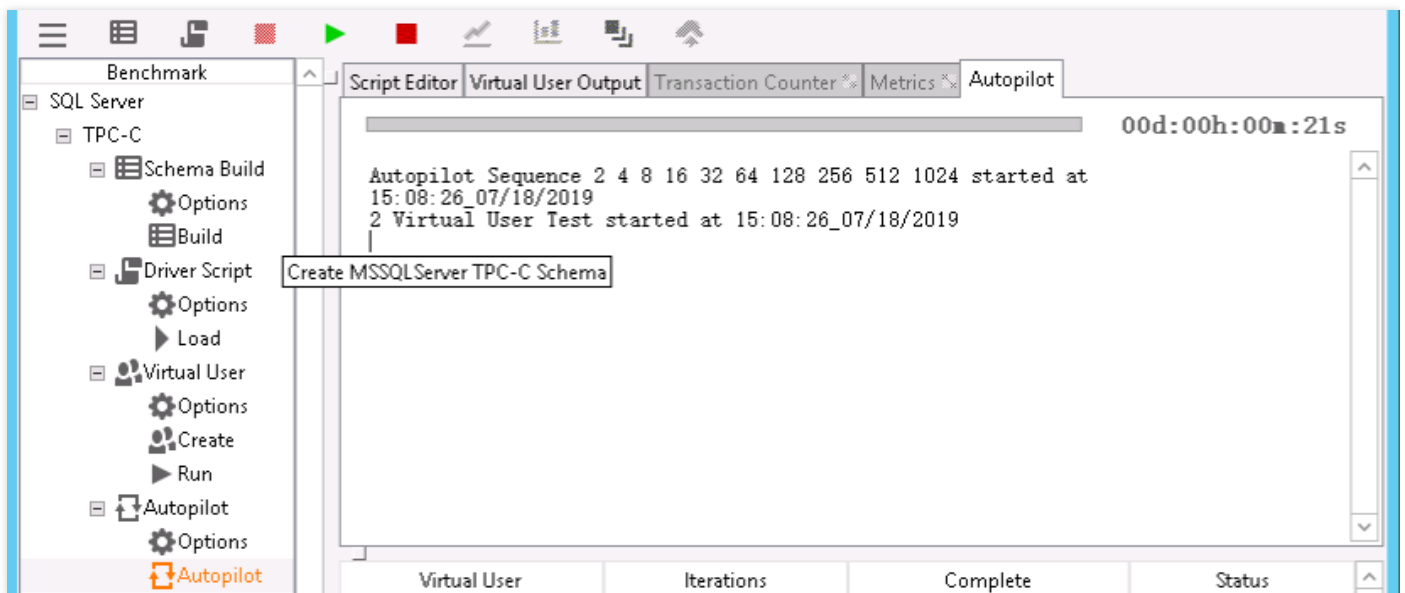


3. Set the automated test script.

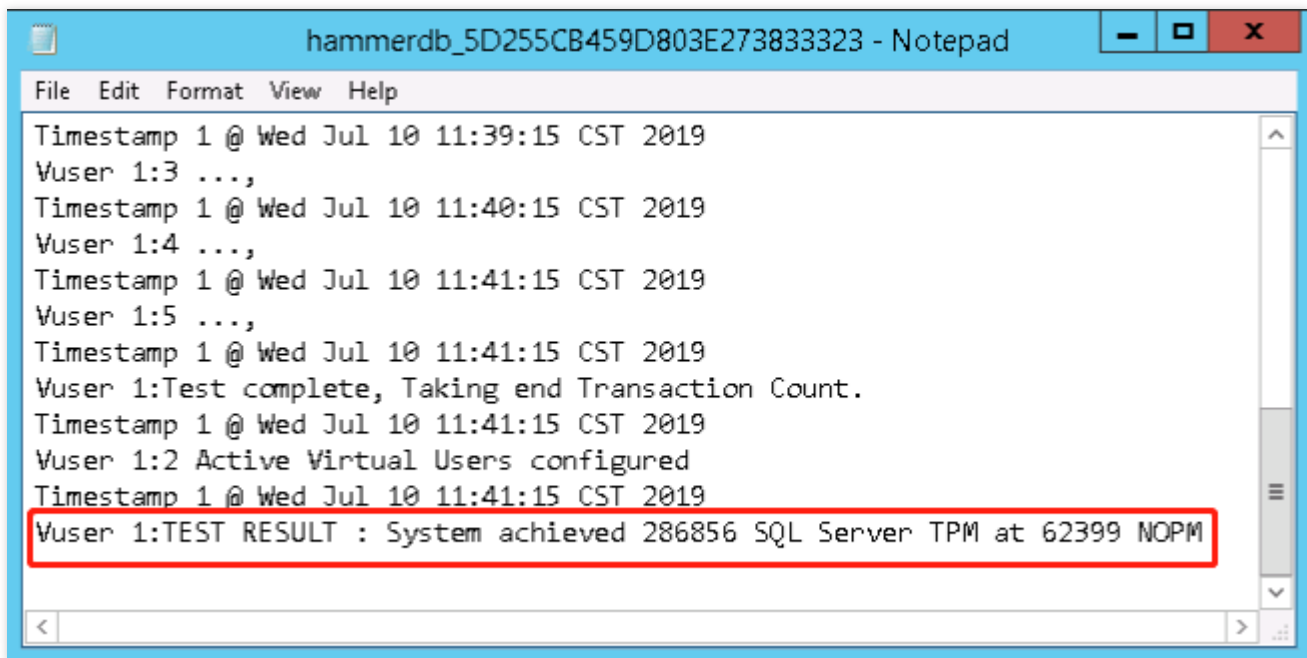
- Minutes per Test in Virtual User Sequence: The interval between two automated test sessions during which the program completes various tasks such as creating virtual users, warming up, running the test, and stopping the test. This value should be greater than that of “Minutes of Rampup Time and Minutes for Test Duration” .
- Active Virtual User Sequence (Space Separated): The number of virtual users generated by each iteration of the automated test. It can be understood as the number of concurrent connections.



l. Select **Autopilot > Autopilot** in the left pane to start the test.



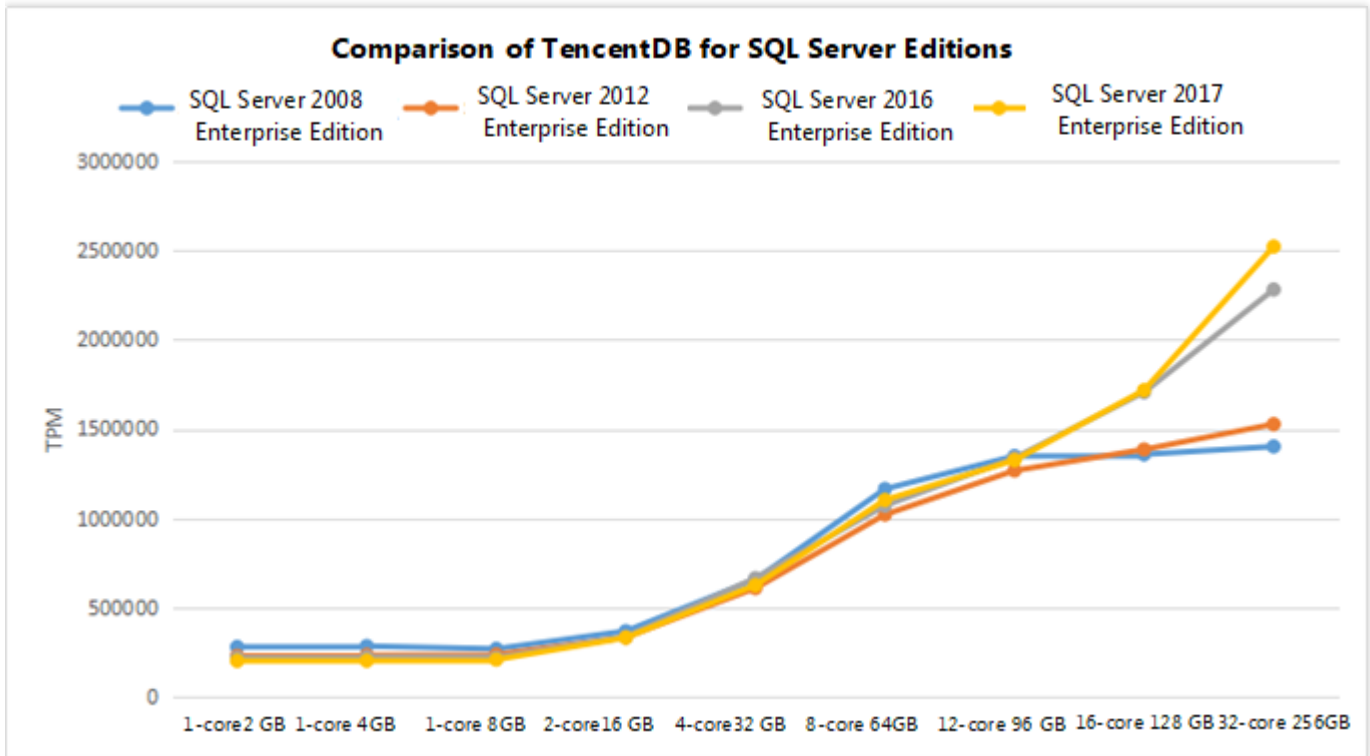
i. The test result will be output in the hammerdb.log file.



```
File Edit Format View Help
Timestamp 1 @ Wed Jul 10 11:39:15 CST 2019
Vuser 1:3 ...,
Timestamp 1 @ Wed Jul 10 11:40:15 CST 2019
Vuser 1:4 ...,
Timestamp 1 @ Wed Jul 10 11:41:15 CST 2019
Vuser 1:5 ...,
Timestamp 1 @ Wed Jul 10 11:41:15 CST 2019
Vuser 1:Test complete, Taking end Transaction Count.
Timestamp 1 @ Wed Jul 10 11:41:15 CST 2019
Vuser 1:2 Active Virtual Users configured
Timestamp 1 @ Wed Jul 10 11:41:15 CST 2019
Vuser 1:TEST RESULT : System achieved 286856 SQL Server TPM at 62399 NOPM
```

Test Results

The TPM in HammerDB is obtained through the SQL Server performance counter "batch requests/sec", so the TPM actually refers to the batch requests per minute.



- SQL Server 2008 Enterprise Edition

Instance Specification	Storage Capacity	Data Set	Concurrent Connections	TPM
1-core 2 GB	300 GB	55 GB	256	279,798
1-core 4 GB	300 GB	55 GB	256	284,680
1-core 8 GB	300 GB	55 GB	256	269,039
2-core 16 GB	800 GB	55 GB	256	368,366
4-core 32 GB	800 GB	55 GB	256	657,641
8-core 64 GB	1,500 GB	55 GB	256	1,164,062
12-core 96 GB	1,500 GB	55 GB	1024	1,348,121
16-core 128 GB	2,000 GB	55 GB	1024	1,357,678
32-core 256 GB	3,000 GB	55 GB	1024	1,401,600

- SQL Server 2012 Enterprise Edition

Instance Specification	Storage Capacity	Data Set	Concurrent Connections	TPM
1-core 2 GB	300 GB	55 GB	256	229,854
1-core 4 GB	300 GB	55 GB	256	234,401
1-core 8 GB	300 GB	55 GB	256	236,773
2-core 16 GB	800 GB	55 GB	256	333,797
4-core 32 GB	800 GB	55 GB	256	608,801
8-core 64 GB	1,500 GB	55 GB	256	1,020,500
12-core 96 GB	1,500 GB	55 GB	1024	1,266,868
16-core 128 GB	2,000 GB	55 GB	1024	1,385,158
32-core 256 GB	3,000 GB	55 GB	1024	1,526,762

- SQL Server 2016 Enterprise Edition

Instance Specification	Storage Capacity	Data Set	Concurrent Connections	TPM
1-core 2 GB	300 GB	55 GB	256	219,142
1-core 4 GB	300 GB	55 GB	256	222,796
1-core 8 GB	300 GB	55 GB	256	219,676
2-core 16 GB	800 GB	55 GB	256	336,843
4-core 32 GB	800 GB	55 GB	256	665,065
8-core 64 GB	1,500 GB	55 GB	256	1,070,826
12-core 96 GB	1,500 GB	55 GB	1024	1,337,473
16-core 128 GB	2,000 GB	55 GB	1024	1,705,660
32-core 256 GB	3,000 GB	55 GB	1024	2,280,252

- SQL Server 2017 Enterprise Edition

Instance Specification	Storage Capacity	Data Set	Concurrent Connections	TPM
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Instance Specification	Storage Capacity	Data Set	Concurrent Connections	TPM
1-core 2 GB	300 GB	55 GB	256	201,851
1-core 4 GB	300 GB	55 GB	256	202,510
1-core 8 GB	300 GB	55 GB	256	208,685
2-core 16 GB	800 GB	55 GB	256	331,650
4-core 32 GB	800 GB	55 GB	256	625,370
8-core 64 GB	1,500 GB	55 GB	256	1,102,296
12-core 96 GB	1,500 GB	55 GB	1024	1,325,010
16-core 128 GB	2,000 GB	55 GB	1024	1,716,818
32-core 256 GB	3,000 GB	55 GB	1024	2,520,856