TencentDB for SQL Server

Performance Evaluation

Product Documentation

Contents

Performance Evaluation
Performance Test Report

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Test 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

Test instance editions

The test instances are of 2008 R2 Enterprise Edition, 2012 Enterprise Edition, 2014 Enterprise Edition, 2016 Enterprise Edition, 2017 Enterprise Edition, and 2019 Enterprise Edition, and 2022 Enterprise Edition.

Test instance specifications

Two-node (formerly High Availability Edition)

The test two-node (formerly High Availability Edition) instances cover all purchasable specifications, including 1-core 2 GB, 1-core 4 GB, 1-core 8 GB, 2-core 4 GB, 2-core 8 GB, 2-core 16 GB, 4-core 8 GB, 4-core 16 GB, 4-core 32 GB, 8-core 16 GB, 8-core 32 GB, 8-core 64 GB, 12-core 24 GB, 12-core 48 GB, 12-core 96 GB, 16-core 32 GB, 16-core 64 GB, 16-core 128 GB, 24-core 48 GB, 24-core 96 GB, 24-core 192 GB, 32-core 64 GB, 32-core 128 GB, 32-core 256 GB, 48-core 96 GB, 48-core 192 GB, 48-core 384 GB, 64-core 128 GB, 64-core 256 GB, 64-core 512 GB, and 90-core 720 GB.

Single-node (formerly Basic Edition)

The test single-node (formerly Basic Edition) instances cover all purchasable specifications, including 1-core 2 GB, 1-core 4 GB, 2-core 4 GB, 2-core 8 GB, 4-core 8 GB, 4-core 16 GB, 8-core 16 GB, 8-core 32 GB, 16-core 32 GB, 16-core 64 GB, 24-core 48 GB, and 24-core 96 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.

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 of different editions with different specifications.

Two-node (formerly High Availability Edition)

Concurrent Connections	2	4	8	16	32	64	128	256	512	1024
1-core 2 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
1-core 4 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
1-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
2-core 4 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
2-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
2-core 16 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 16 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 32 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 16 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 32 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 64 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
12-core 24 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12-core 48 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

12-core 96 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16-core 32 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16-core 64 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16-core 128 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24-core 48 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24-core 96 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24-core 192 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32-core 64 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32-core 128 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32-core 256 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
48-cores 96 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
48-core 192 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
48-core 384 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
64-core 128 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
64-core 256 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
64-core 512 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
90-core 720 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Single-node (formerly Basic Edition)

Concurrent Connections	2	4	8	16	32	64	128	256	512	1,024

1-core 2 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
1-core 4 GB	✓	✓	✓	✓	✓	✓	✓	✓	-	-
2-core 4 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
2-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 8 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
4-core 16 GB	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 16 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
8-core 32 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
16-core 32 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16-core 64 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24-core 48 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
24-core 96 GB MEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Test 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.
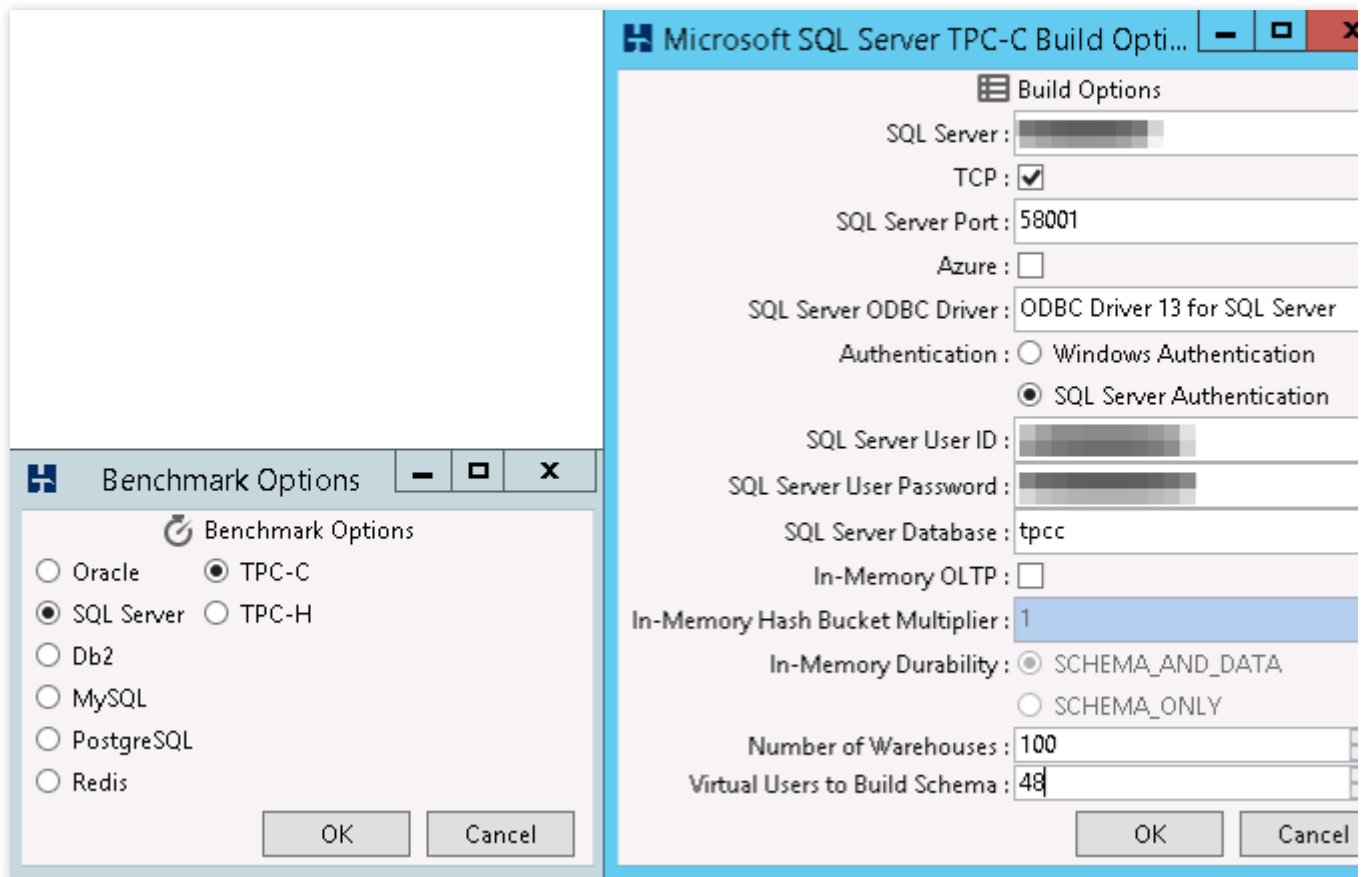
2. Set the test script.

Total Transactions per User: The total number of transactions per user. We recommend that you 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 the sum 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.
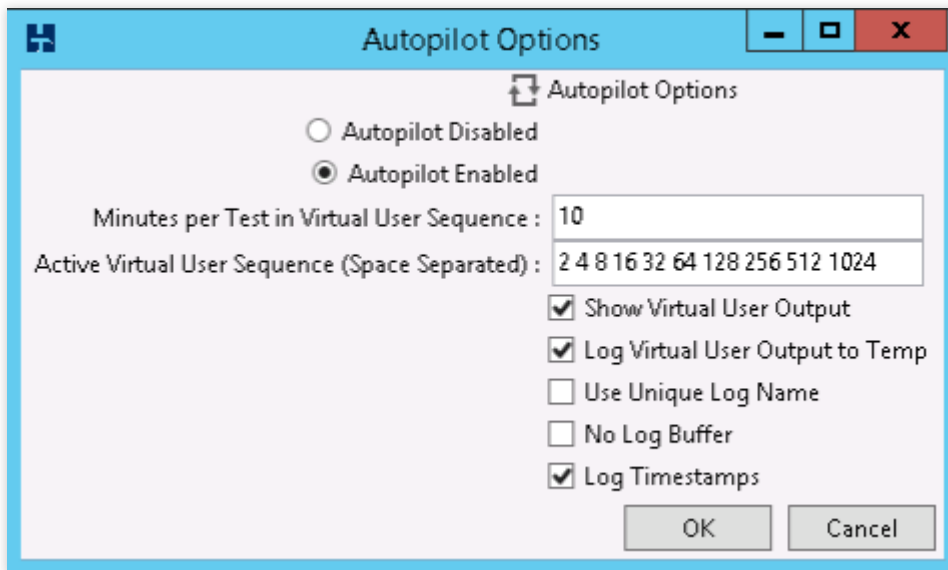
4. Select **Autopilot** > **Autopilot** in the left pane to start the test.
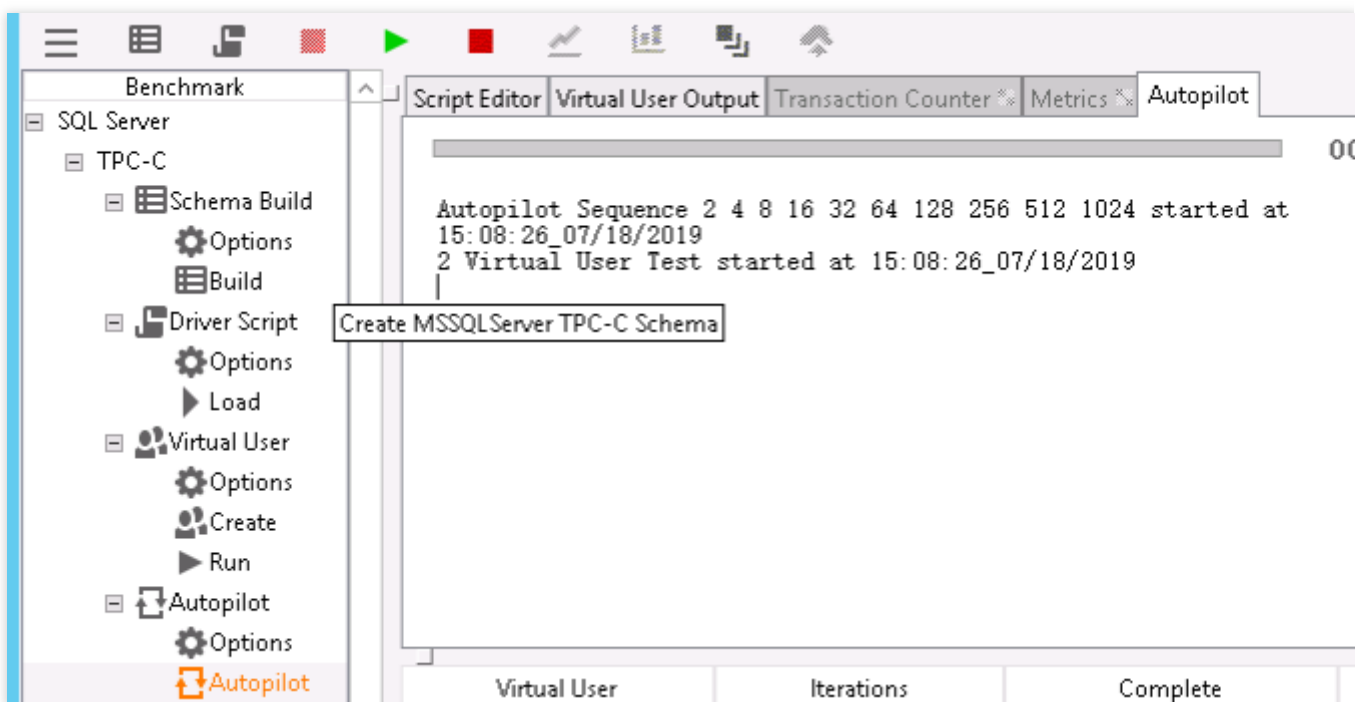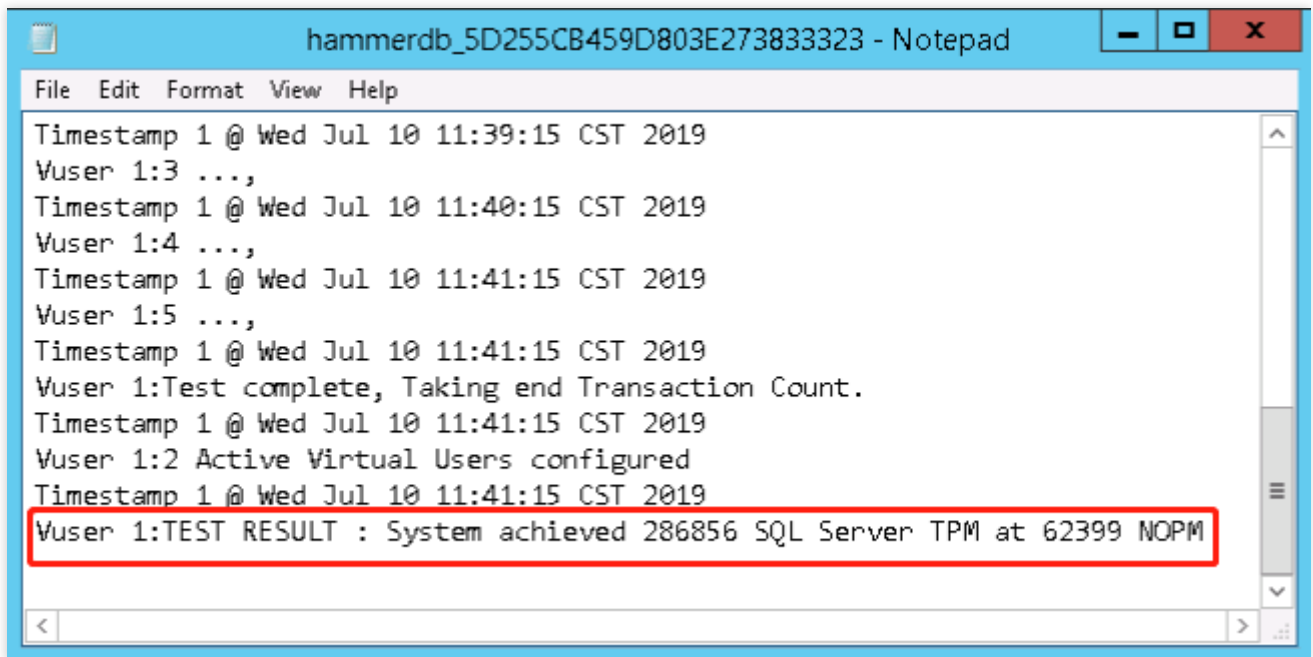

5. The test result will be output in the hammerdb.log file.

Test Results

Note:

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.

The size of test data set for a instance specification is larger than the memory size of the specification.

Due to potential fluctuations in each stress test, the following results should be considered as references only.

Two-node (Enhanced SSD Cloud Block Storage)

Two-node (Enhanced SSD Cloud Block Storage) performance comparison trend chart for each version

TencentDB for SQL Server
Dual node Performance Comparison Trend Chart for Each Version(Enhanced SSD Cloud Block Storage)

Legend: ■ 2008R2企业版 ■ 2012企业版 ■ 2014企业版 ■ 2016企业版 ■ 2017企业版 ■ 2019企业版 ■ 2022企业版
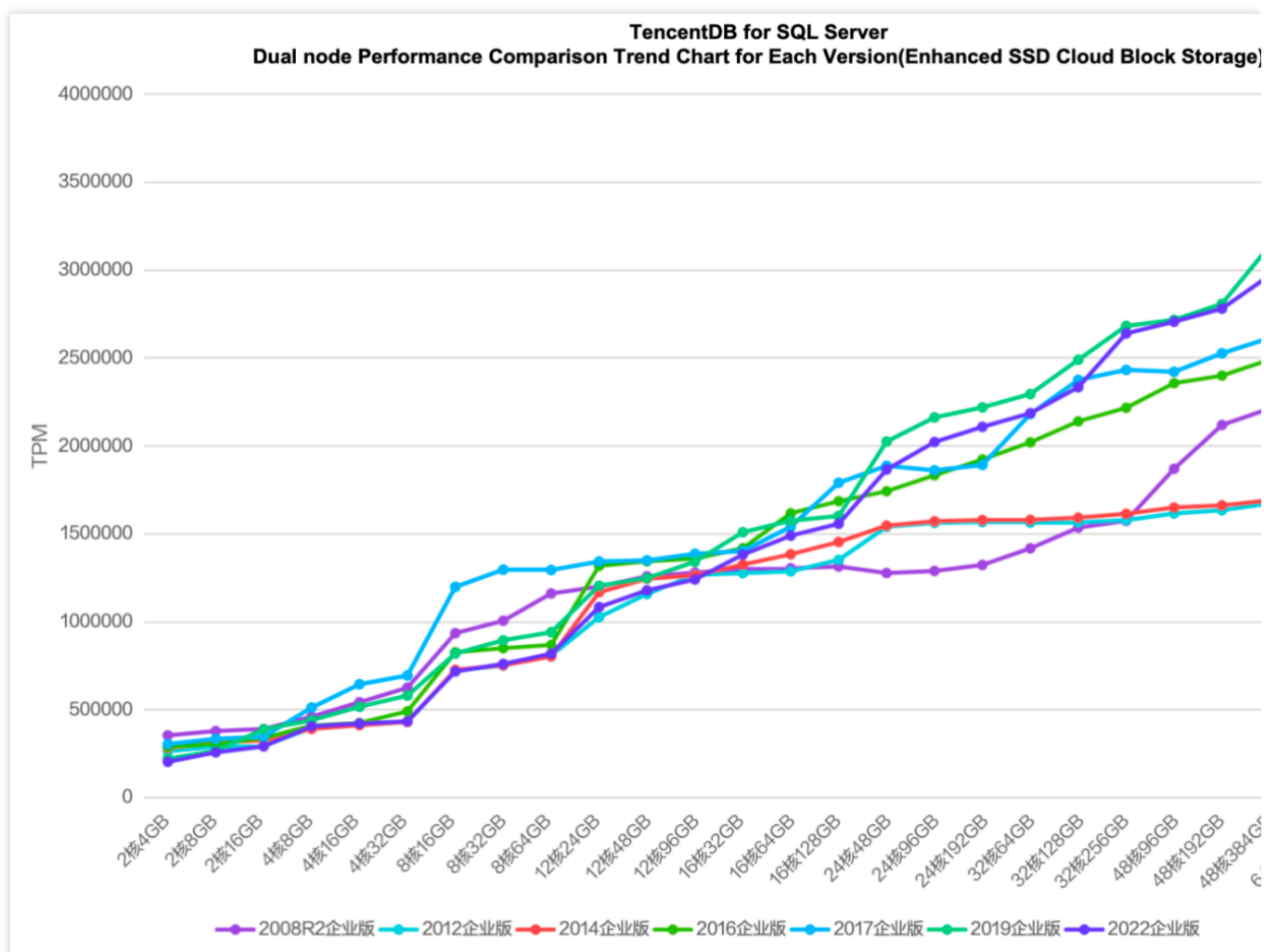
Two-node (Enhanced SSD Cloud Block Storage) TPM performance comparison value for each version

Two-node (Enhanced SSD Cloud Block Storage) instance specifications	Number of concurrent connections	2008R2 Enterprise Edition	2012 Enterprise Edition	2014 Enterprise Edition	2016 Enterprise Edition	2017 Enterprise Edition	2019 Enterprise Edition
2-core 4 GB	256	352239	262042	280212	286968	303026	21942
2-core 8 GB	256	377076	288812	311882	304311	332601	26339
2-core 16 GB	256	388685	293021	322642	336443	344545	38688
4-core 8 GB	256	458636	393323	389012	408183	509896	43841
4-core 16 GB	256	540709	409963	410222	423021	642954	51492
4-core 32 GB	256	623564	428425	428862	488802	692582	57839

8-core 16 GB	256	933452	721646	725086	824979	1196618	81783
8-core 32 GB	256	1004120	748527	751189	848024	1294605	89306
8-core 64 GB	256	1159254	806337	801032	866793	1292605	93890
12-core 24 GB	512	1198194	1024785	1166112	1316035	1341090	12032
12-core 48 GB	512	1257225	1156326	1242539	1342146	1347441	12461
12-core 96 GB	512	1278163	1264625	1262306	1357239	1384425	13397
16-core 32 GB	512	1298662	1275058	1323309	1416524	1400905	15074
16-core 64 GB	512	1302512	1285033	1382275	1615427	1538581	15731
16-core 128 GB	512	1312663	1350118	1452141	1683900	1788873	15998
24-core 48 GB	1024	1275539	1538106	1545238	1740442	1884856	20233
24-core 96 GB	1024	1287150	1560003	1569981	1831271	1859375	21602
24-core 192 GB	1024	1321485	1565067	1577023	1921253	1890143	22174
32-core 64 GB	1024	1416006	1562021	1577873	2018539	2179611	22933
32-core 128 GB	1024	1533686	1563443	1590213	2138102	2373436	24879
32-core 256 GB	1024	1571679	1575837	1612420	2215074	2430662	26805
48-core 96 GB	1024	1868288	1614482	1648078	2355156	2419828	27149
48-core 192 GB	1024	2117315	1632638	1660248	2398103	2524866	28067
48-core 384	1024	2211281	1671979	1688813	2489417	2612611	31378

GB							
64-core 128 GB	1024	2316704	1821545	1829664	2545152	2653252	33060
64-core 256 GB	1024	2357315	1834979	1851950	2694004	2725555	34302

Two-node (formerly High Availability Edition - local SSD)

Performance comparison of different editions

TencentDB for SQL Server
Performance comparison of different high availability editions (local
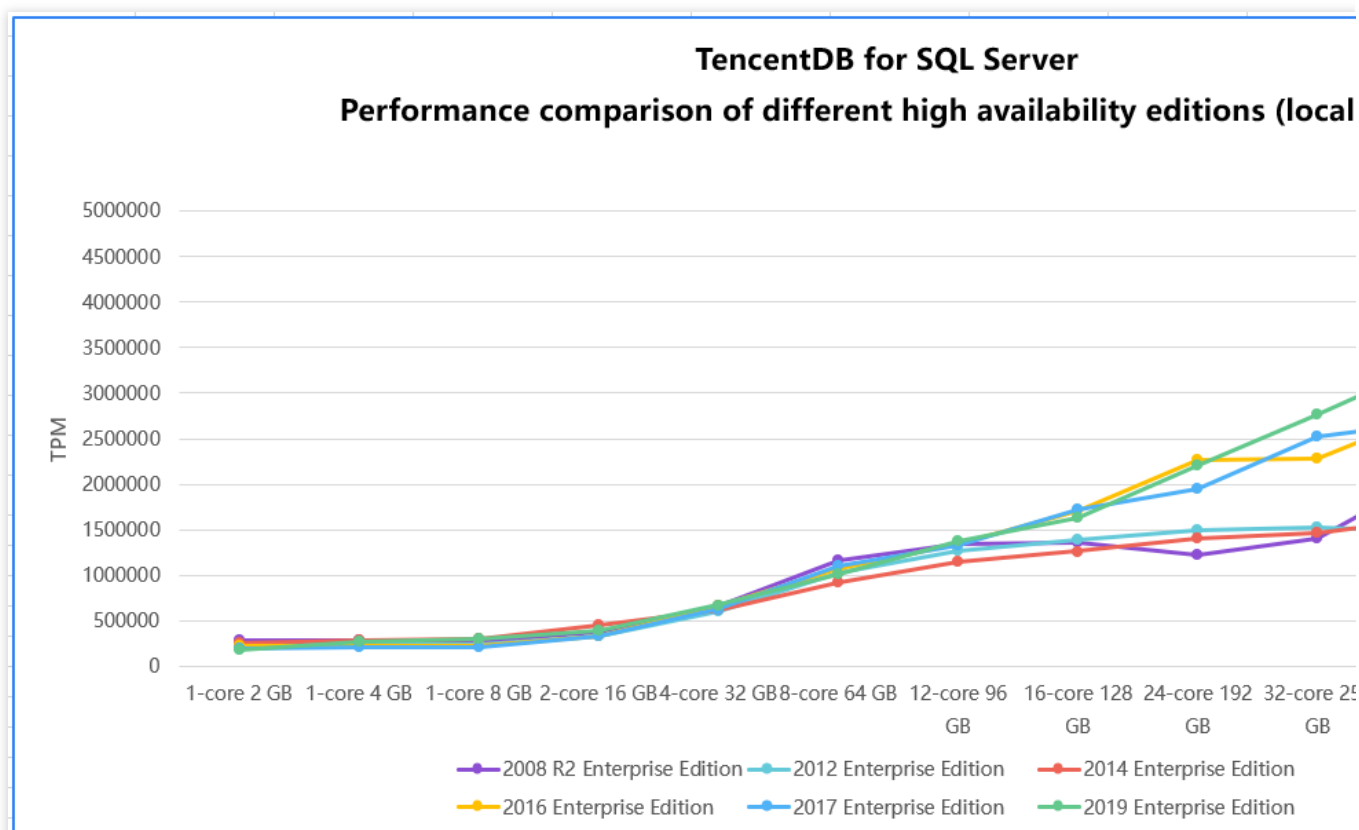
TPM comparison of different editions

Two-Node (Formerly High Availability Edition) Instance Specification	Concurrent Connections	2008 R2 Enterprise Edition	2012 Enterprise Edition	2014 Enterprise Edition	2016 Enterprise Edition	2017 Enterprise Edition	2019 Enterp Edition
1-core 2 GB	256	279,798	229,854	261,396	219,142	201,851	181,19
1-core 4 GB	256	284,680	234,401	288,282	222,796	202,510	268,33

1-core 8 GB	256	269,039	236,773	303,002	219,676	208,685	300,38
2-core 16 GB	256	368,366	333,797	446,344	336,843	331,650	390,54
4-core 32 GB	256	657,641	608,801	621,186	665,065	625,370	670,66
8-core 64 GB	256	1,164,062	1,020,500	924,915	1,070,826	1,102,296	1,007,6
12-core 96 GB	1,024	1,348,121	1,266,868	1,153,585	1,337,473	1,325,010	1,367,2
16-core 128 GB	1,024	1,357,678	1,385,158	1,260,322	1,705,660	1,716,818	1,629,5
24-core 192 GB	1,024	1,226,621	1,500,900	1,406,203	2,261,815	1,950,871	2,198,6
32-core 256 GB	1,024	1,401,600	1,526,762	1,462,100	2,280,252	2,520,856	2,771,7
48-core 384 GB	1,024	2,127,159	1,486,582	1,637,912	2,806,496	2,683,302	3,358,7
64-core 512 GB	1,024	2,136,500	1,512,763	1,789,105	2,630,581	2,814,599	3,635,7
90-core 720 GB	1,024	2,205,323	1,602,736	1,813,094	2,948,427	3,391,680	4,579,9

Single-node (formerly Basic Edition - premium cloud disk)

Performance comparison of different editions

TencentDB for SQL Server

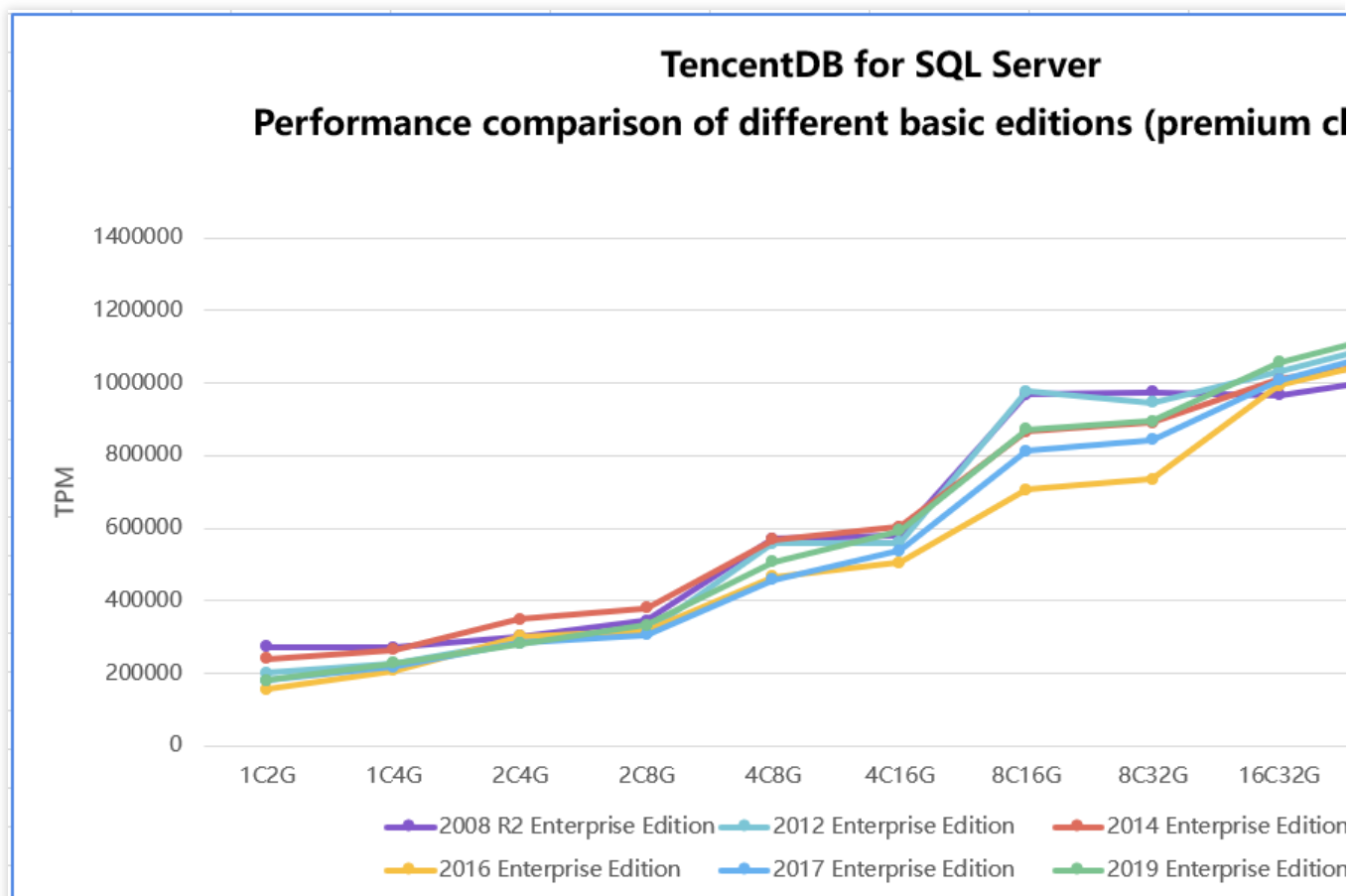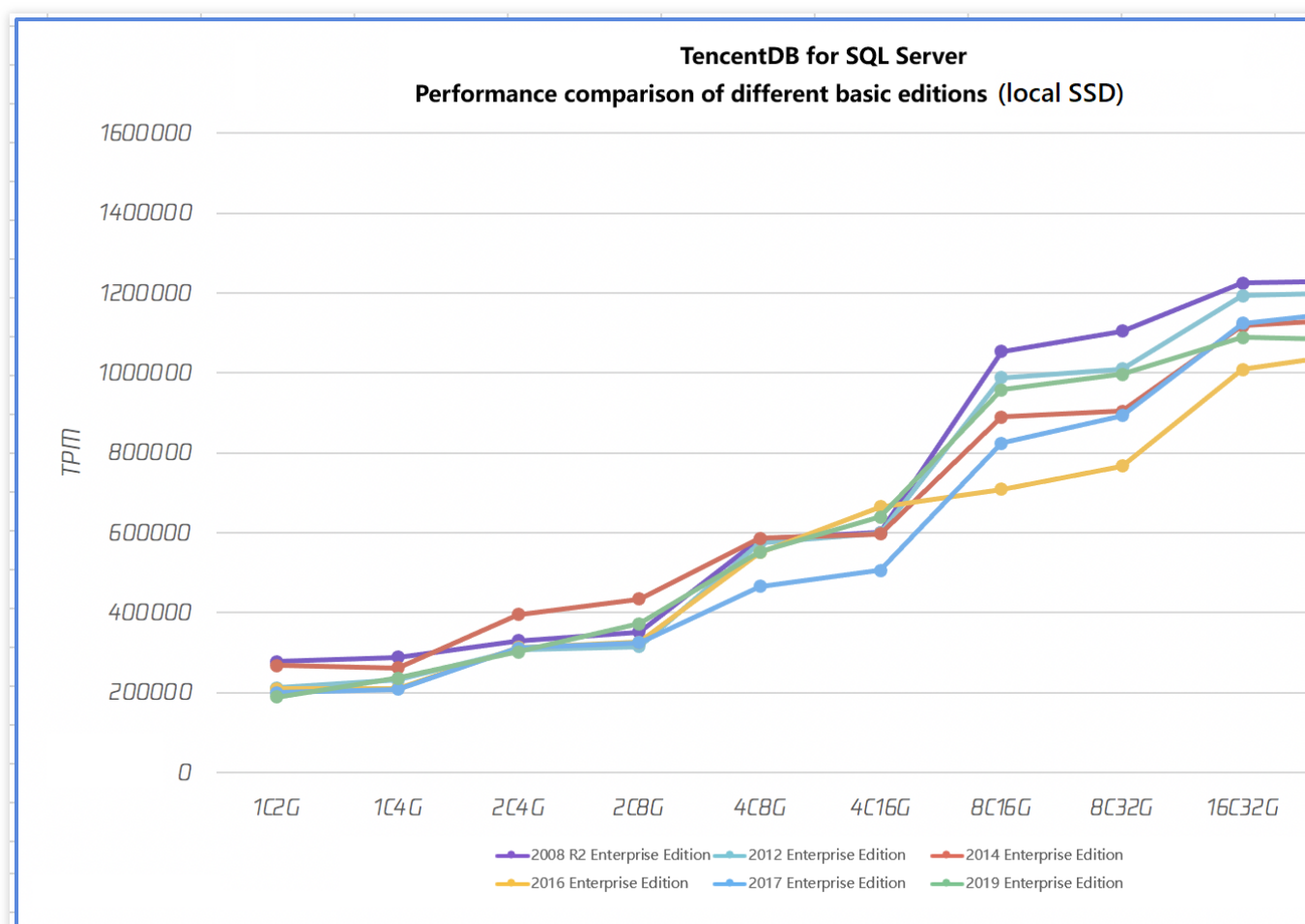**Performance comparison of different basic editions (premium cl...**

TPM comparison of different editions

Single-Node (Formerly Basic Edition) Instance Specification	Concurrent Connections	2008 R2 Enterprise Edition	2012 Enterprise Edition	2014 Enterprise Edition	2016 Enterprise Edition	2017 Enterprise Edition	2019 Enterp Edition
1-core 2 GB	256	271,822	201,348	239,864	155,318	180,204	181,06
1-core 4 GB	256	271,311	224,851	263,445	206,871	218,065	226,52
2-core 4 GB	256	300,573	286,984	349,251	301,520	282,145	280,96
2-core 8 GB	256	343,630	312,184	379,705	315,539	304,840	331,57
4-core 8 GB	256	569,589	557,047	567,886	464,900	457,702	507,04
4-core 16 GB	256	578,367	560,981	602,897	504,379	537,819	592,71
8-core 16 GB MEM	256	968175	977350	866079	705806	812833	871512

8-core 32 GB MEM	256	974293	945406	890642	734445	842877	89522
16-core 32 GB MEM	1024	965995	1033233	1008835	993027	1007447	10560
16-core 64 GB MEM	1024	1017271	1122514	1064300	1075603	1100160	11472
24-core 48 GB MEM	1024	912623	1055985	1045071	1129963	1139872	12030
24-core 96 GB MEM	1024	954747	1061295	1044175	1184654	1147836	13158

Single-node (formerly Basic Edition - SSD cloud disk)

Performance comparison of different editions

TencentDB for SQL Server
Performance comparison of different basic editions (local SSD)

TPM comparison of different editions

Single-Node	Concurrent	2008 R2	2012	2014	2016	2017	2019

(Formerly Basic Edition) Instance Specification	Connections	Enterprise Edition	Enterprise Edition	Enterprise Edition	Enterprise Edition	Enterprise Edition	Enterprise Edition
1-core 2 GB MEM	256	277486	212148	268084	209753	198943	188967
1-core 4 GB MEM	256	287696	230418	261590	210630	207538	236449
2-core 4 GB MEM	256	329331	307056	395540	312891	311241	301509
2-core 8 GB MEM	256	351604	314275	434242	325675	324843	371492
4-core 8 GB MEM	256	582886	574929	585404	550150	464908	551348
4-core 16 GB MEM	256	600462	599149	596735	664131	505928	638924
8-core 16 GB MEM	256	1053565	987506	889740	708025	824114	957938
8-core 32 GB MEM	256	1104104	1009945	903942	767060	892721	995933
16-core 32 GB MEM	1024	1224515	1193629	1118041	1009075	1123299	1088804
16-core 64 GB MEM	1024	1230516	1200651	1136268	1052159	1156376	1081417
24-core 48 GB MEM	1024	1145090	1080964	1099758	1155533	1187867	1269444
24-core 96 GB MEM	1024	1200990	1040499	1108077	1243883	1262611	1377718