

RDS for MySQL

Performance White Paper

Issue 01
Date 2025-04-10



Copyright © Huawei Cloud Computing Technologies Co., Ltd. 2025. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Cloud Computing Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are the property of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei Cloud and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Contents

1 Test Method.....

2 RDS for MySQL 5.6 Test Data.....

2.1 General-Enhanced DB Instances.....

2.2 General-Purpose DB Instances.....

2.3 Dedicated DB Instances.....

3 RDS for MySQL 5.7 Test Data.....

3.1 General-Enhanced DB Instances.....

3.2 General-Purpose DB Instances.....

3.3 Dedicated DB Instances.....

3.4 Kunpeng General-Enhanced DB Instances.....

4 RDS for MySQL 8.0 Test Data.....

4.1 General-Purpose DB Instances.....

4.2 Dedicated DB Instances.....

1

4

4

7

9

12

12

15

17

18

21

21

23

1 Test Method

MySQL is one of the most popular open-source relational databases. It works with the Linux, Apache, and Perl/PHP/Python to establish a LAMP model for efficient web solutions. It solves problems such as poor database performance, long data replication delay, and slow fault recovery in high-concurrency scenarios.

RDS for MySQL is ready for immediate use, and provides backup and restoration, data migration, security protection, high availability, and elastic scalability. You can obtain a production database with high performance and scalability in a few minutes after simple configurations while your data integrity and service continuity are guaranteed.

Test Environment

- Elastic Cloud Server (ECS): general computing | c3.2xlarge.2 | 8 vCPUs | 16 GB, CentOS7.4 64 bit image. Bind an elastic IP (EIP) to the ECS because additional compilation tools need to be installed on stress testing tools.

NOTE

RDS for MySQL 8.0 test environment is as follows:

- ECS: general computing-plus | c6.4xlarge.2 | 16 vCPUs | 32 GB, CentOS 7.6 (64-bit). Bind an EIP to the ECS because additional compilation tools need to be installed on stress testing tools.

Test Tool

Sysbench is a multi-threaded benchmark tool based on LuaJIT, allowing you to quickly get an impression of system performance by using a built-in database test model. For details, visit <https://github.com/akopytov/sysbench>.

Sysbench 1.0.18 is used in this test. Run the following commands to install it:

```
# wget -c https://github.com/akopytov/sysbench/archive/1.0.18.zip
# yum install autoconf libtool mysql mysql-devel vim unzip
# unzip 1.0.18.zip
# cd sysbench-1.0.18
# ./autogen.sh
# ./configure
# make
# make install
```

Test Procedure

Replace the database name, connection IP address, and user password based on the site requirements.

Step 1 Import data.

1. Run the following command to log in to a database and create the test database **loadtest**:

```
mysql -u root -P 3306 -h <host> -p -e "create database loadtest"
```

2. Run the following command to import the test background data to the **loadtest** database:

```
sysbench --test=/usr/local/share/sysbench/tests/include/oltp_legacy/oltp.lua --db-driver=mysql --mysql-db=loadtest --mysql-user=root --mysql-password=<password> --mysql-port=3306 --mysql-host=<host> --oltp-tables-count=64 --oltp-table-size=10000000 --num-threads=20 prepare
```

Step 2 Run the following command to perform a stress testing:

```
sysbench --test=/usr/local/share/sysbench/tests/include/oltp_legacy/oltp.lua --db-driver=mysql --mysql-db=loadtest --mysql-user=root --mysql-password=<password> --mysql-port=3306 --mysql-host=<host> --oltp-tables-count=64 --oltp-table-size=10000000 --max-time=3600 --max-requests=0 --num-threads=200 --report-interval=3 --forced-shutdown=1 run
```

Step 3 Run the following command to delete the test data:

```
sysbench --test=/usr/local/share/sysbench/tests/include/oltp_legacy/oltp.lua --db-driver=mysql --mysql-db=loadtest --mysql-user=root --mysql-password=<password> --mysql-port=3306 --mysql-host=<host> --oltp-tables-count=64 --oltp-table-size=10000000 --max-time=3600 --max-requests=0 --num-threads=200 cleanup
```

----End

Testing Model

1. Table structure:

```
CREATE TABLE `sbtest` (  
  `id` INTEGER UNSIGNED NOT NULL AUTO_INCREMENT,  
  `k` INTEGER UNSIGNED DEFAULT '0' NOT NULL,  
  `c` CHAR(120) DEFAULT '' NOT NULL,  
  `pad` CHAR(60) DEFAULT '' NOT NULL,  
  PRIMARY KEY (`id`)  
) ENGINE=InnoDB
```

2. Read/write ratio:

The default transaction submitted by sysbench contains 18 SQL statements. The details are as follows:

- Ten primary key SELECT statements:
SELECT c FROM \${rand_table_name} where id=\${rand_id};
- Four range SELECT statements:
SELECT c FROM \${rand_table_name} WHERE id BETWEEN \${rand_id_start} AND \${rand_id_end};
SELECT SUM(K) FROM \${rand_table_name} WHERE id BETWEEN \${rand_id_start} AND \${rand_id_end};
SELECT c FROM \${rand_table_name} WHERE id BETWEEN \${rand_id_start} AND \${rand_id_end} ORDER BY c;
SELECT DISTINCT c FROM \${rand_table_name} WHERE id BETWEEN \${rand_id_start} AND \${rand_id_end} ORDER BY c;
- Two UPDATE statements:
UPDATE \${rand_table_name} SET k=k+1 WHERE id=\${rand_id}
UPDATE \${rand_table_name} SET c=\${rand_str} WHERE id=\${rand_id}
- One DELETE statement:
DELETE FROM \${rand_table_name} WHERE id=\${rand_id}
- One INSERT statement:

```
INSERT INTO ${rand_table_name} (id, k, c, pad) VALUES (${rand_id},${rand_k},${rand_str_c},${rand_str_pad})
```

Test Metrics

- Transactions per second (TPS) refers to the number of transactions executed per second by a database. Each transaction contains 18 SQL statements.
- Queries per second (QPS) refers to the number of SQL statements, including INSERT, SELECT, UPDATE, and DELETE statements, executed per second.

2 RDS for MySQL 5.6 Test Data

2.1 General-Enhanced DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter `max_connections`.

Table 2-1 vCPU:Memory =1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	2	800	197.19	3,943.85	See About IOPS .
2	4	1,500	470.4	9,400.32	
4	8	2,500	768.23	15,364.64	
8	16	5,000	1,728.84	34,576.84	
16	32	10,000	2,947.42	58,948.35	
32	64	18,000	3,239.9	64,798.05	

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
60	128	30,000	4,735.63	94,712.67	

Table 2-2 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	4	1,500	466.73	9,334.62	See About IOPS .
2	8	2,500	519.24	10,384.74	
4	16	5,000	1,191.98	23,839.68	
8	32	10,000	2,698.01	53,960.27	
16	64	18,000	3,148.77	62,975.44	
32	128	30,000	4,385.29	87,705.81	
60	256	60,000	4,810.94	95,117.75	

Table 2-3 vCPU:Memory = 1:8

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	8	2,500	487.4	9,748.07	See About IOPS .
2	16	5,000	617.59	12,351.83	
4	32	10,000	1,374.01	27,480.14	
8	64	18,000	2,824.63	56,492.64	
16	128	30,000	4,215.09	84,301.79	
60	512	100,000	4,838.57	96,771.34	

Test Results

Figure 2-1 vCPU:Memory =1:2

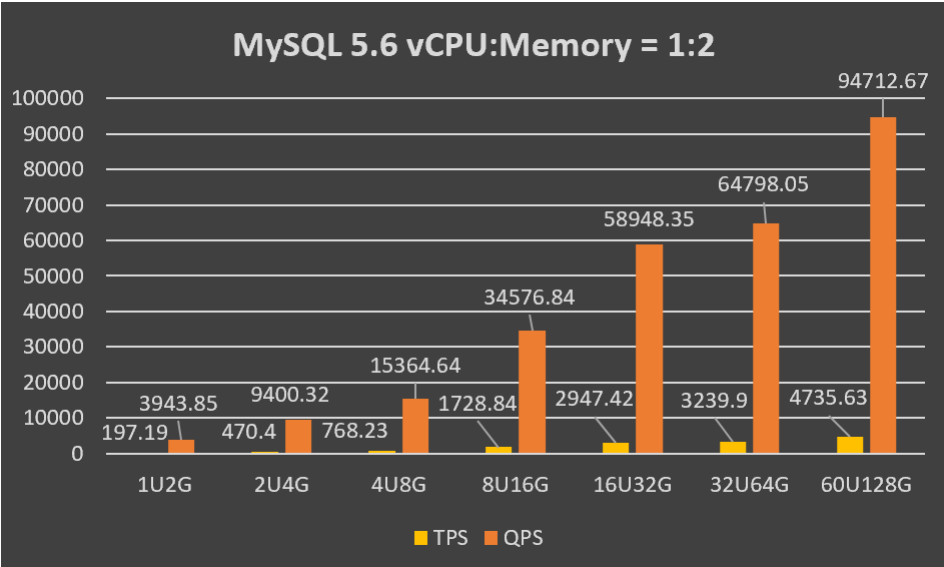


Figure 2-2 vCPU:Memory = 1:4

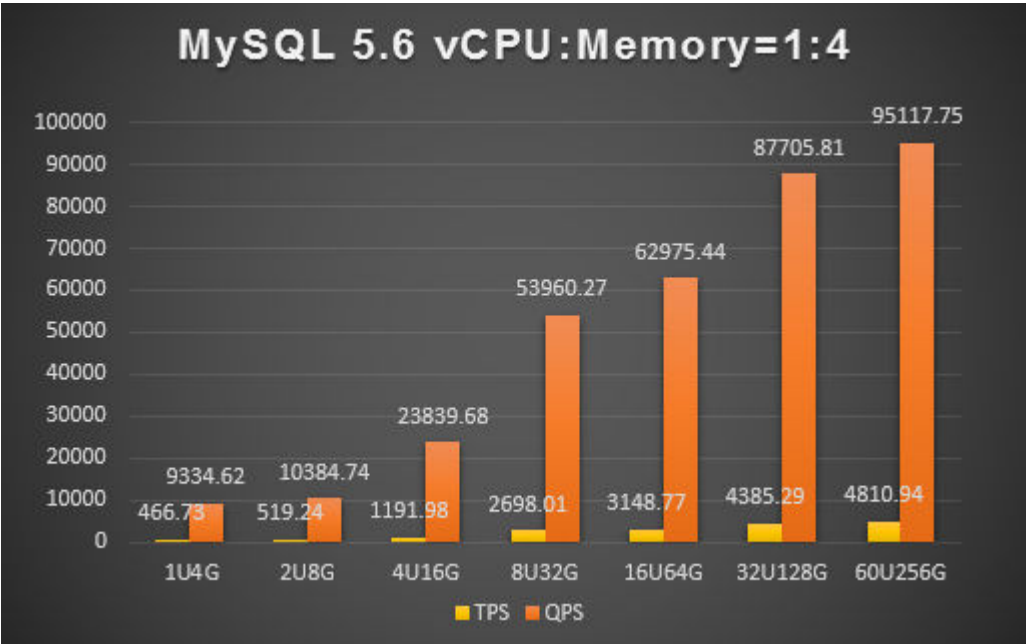
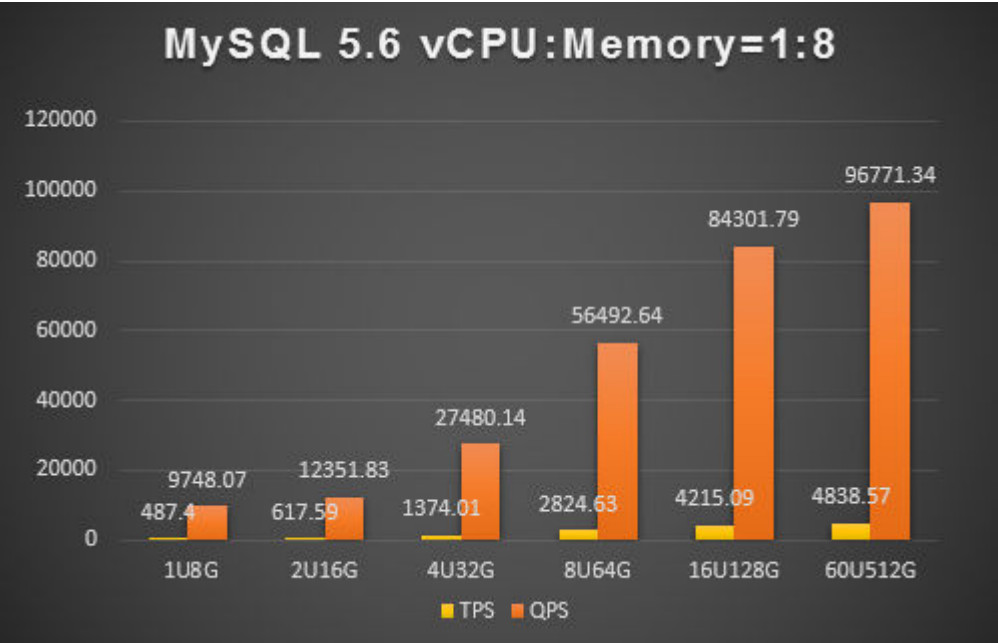


Figure 2-3 vCPU:Memory = 1:8



2.2 General-Purpose DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter `max_connections`.

Table 2-4 vCPU:Memory = 1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	2	800	157	3,140	See About IOPS .
2	4	1,500	362	7,239	

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
4	8	2,500	834	16,672	
8	16	5,000	1,701	34,016	

Table 2-5 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	483	9,669	See About IOPS .
4	16	5,000	983	19,668	
8	32	10,000	2,045	40,902	

Test Results

Figure 2-4 vCPU:Memory = 1:2

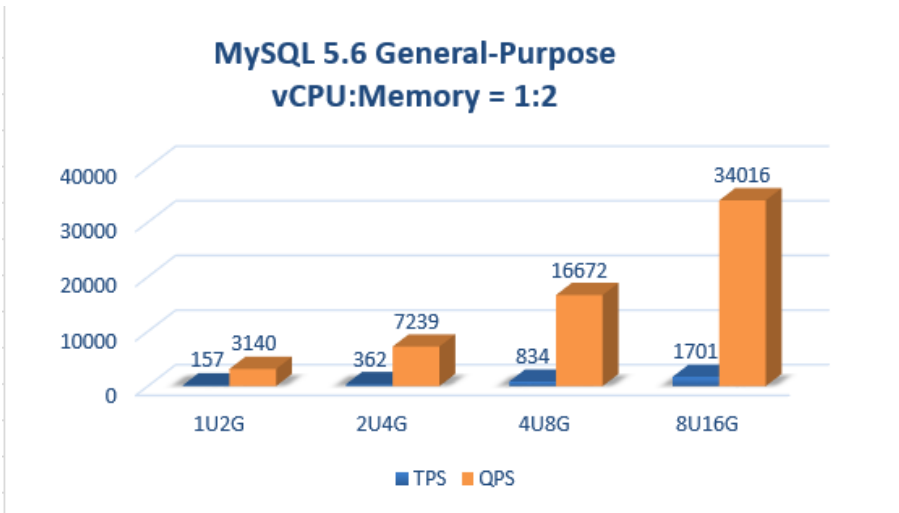
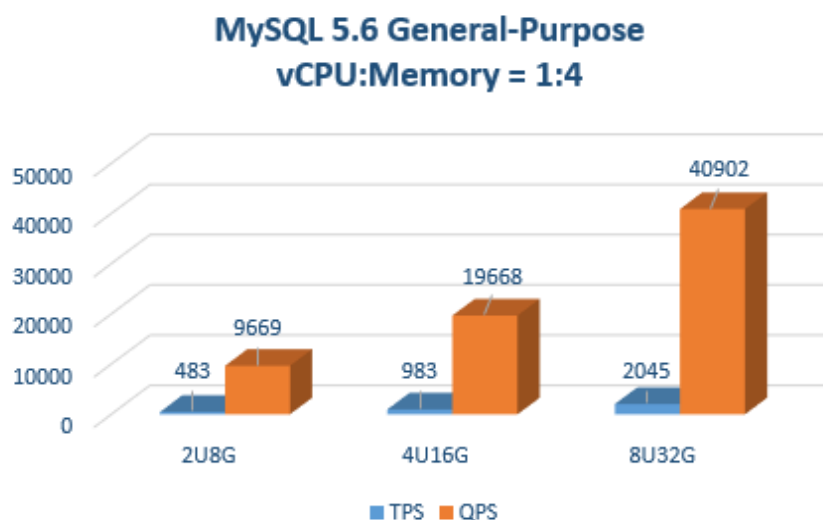


Figure 2-5 vCPU:Memory = 1:4



2.3 Dedicated DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 2-6 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	519	10,385	See About IOPS .
4	16	5,000	1,192	23,840	
8	32	10,000	2,698	53,960	
16	64	18,000	3,149	62,975	

vCPUs	Memor y (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
32	128	30,000	4,385	87,706	
64	256	60,000	4,811	95,118	

Table 2-7 vCPU:Memory = 1:8

vCPUs	Memor y (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
4	32	10,000	1,374	27,480	See About IOPS.
8	64	18,000	2,825	56,493	
16	128	30,000	4,215	84,302	
64	512	100,000	4,839	96,771	

Test Results

Figure 2-6 vCPU:Memory = 1:4

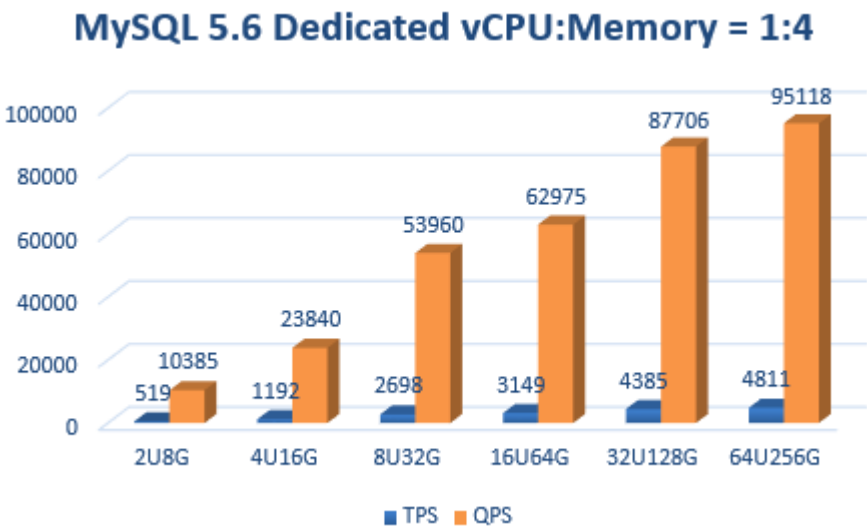
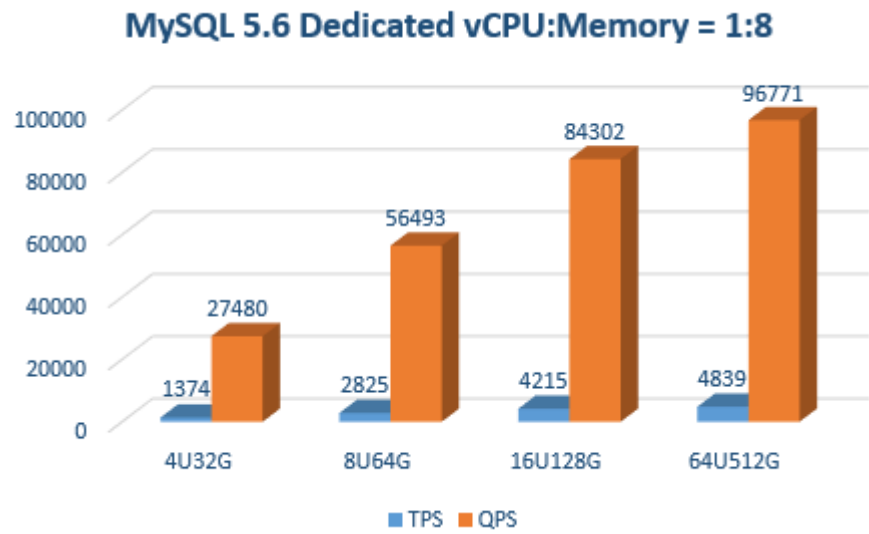


Figure 2-7 vCPU:Memory = 1:8



3 RDS for MySQL 5.7 Test Data

3.1 General-Enhanced DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter `max_connections`.

Table 3-1 vCPU:Memory =1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	2	800	236.59	4,731.85	See About IOPS .
2	4	1,500	470.35	9,400.04	
4	8	2,500	969.14	19,382.91	
8	16	5,000	1,768.01	35,360.39	
16	32	10,000	2,630.5	52,000.99	
32	64	18,000	3,011.89	60,237.87	

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
60	128	30,000	4,471.39	88,428.09	

Table 3-2 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	4	1,500	468.11	9,362.23	See About IOPS .
2	8	2,500	620.7	12,393.97	
4	16	5,000	1,230.39	24,607.81	
8	32	10,000	2,514.48	50,289.62	
16	64	18,000	3,016.84	60,336.77	
32	128	30,000	4,367.67	87,353.69	
60	256	60,000	4,536.41	90,728.55	

Table 3-3 vCPU:Memory = 1:8

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	8	2,500	612.75	12,255.01	See About IOPS .
2	16	5,000	675.66	13,513.18	
4	32	10,000	1,488.25	29,765.06	
8	64	18,000	2,810.79	56,215.81	
16	128	30,000	4,095.49	81,909.79	
60	512	100,000	4,626.18	96,823.95	

Test Results

Figure 3-1 vCPU:Memory =1:2

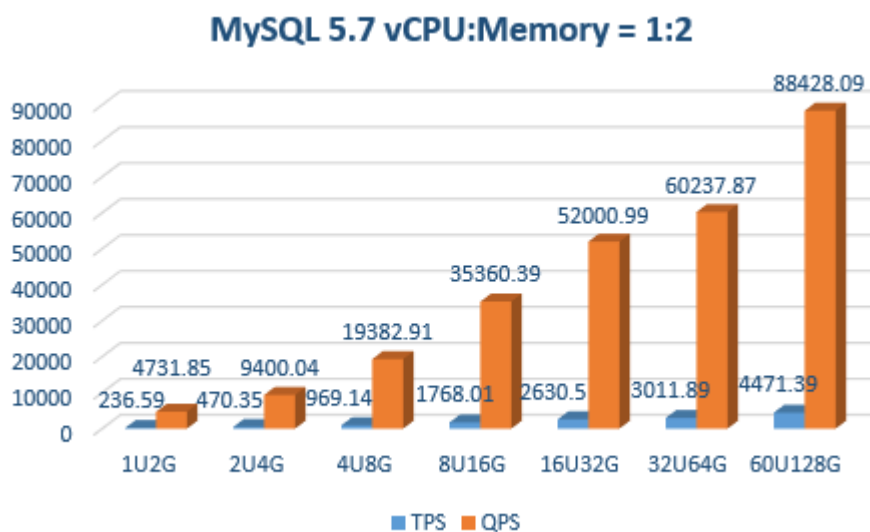


Figure 3-2 vCPU:Memory = 1:4

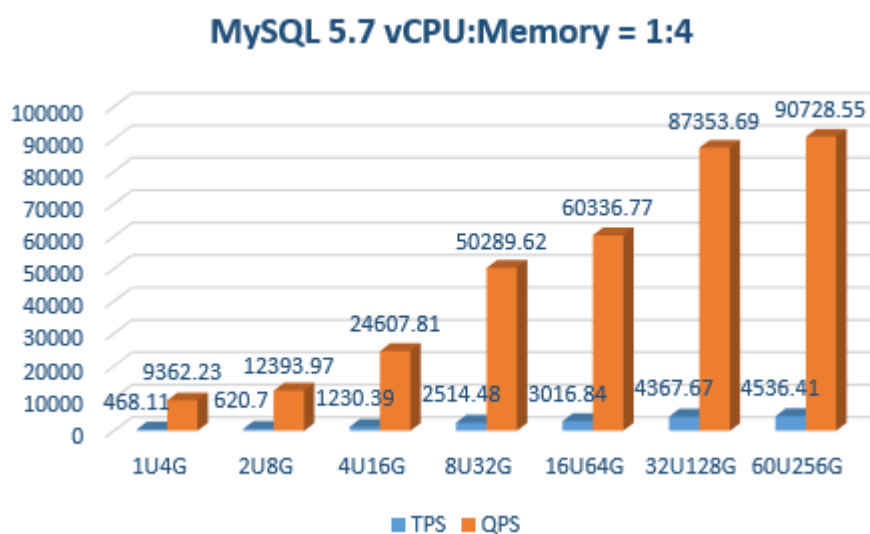
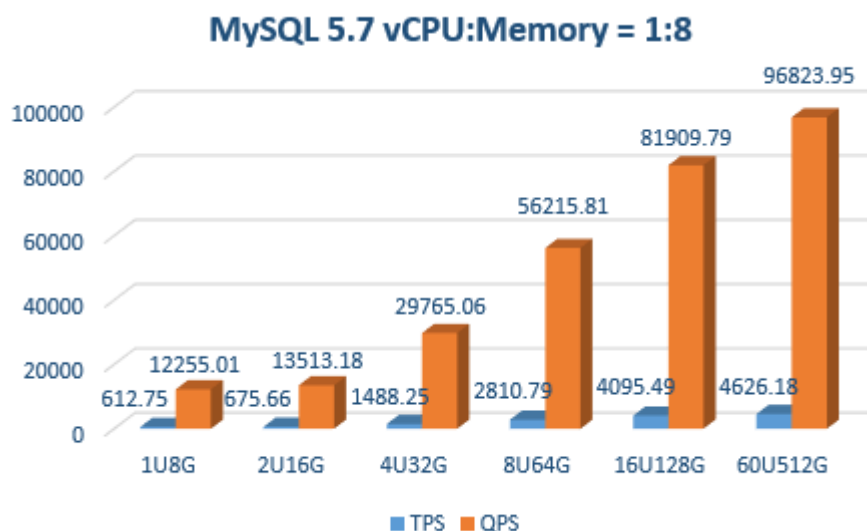


Figure 3-3 vCPU:Memory = 1:8

3.2 General-Purpose DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 3-4 vCPU:Memory = 1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
1	2	800	185	3,707	See About IOPS .
2	4	1,500	334	6,673	
4	8	2,500	756	15,122	
8	16	5,000	1,338	26,756	

Table 3-5 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	552	11,039	See About IOPS .
4	16	5,000	1,062	21,249	
8	32	10,000	2,117	42,335	

Test Results

Figure 3-4 vCPU:Memory = 1:2

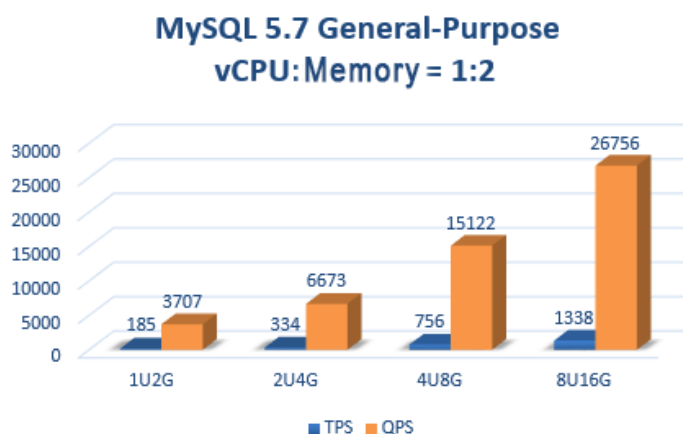
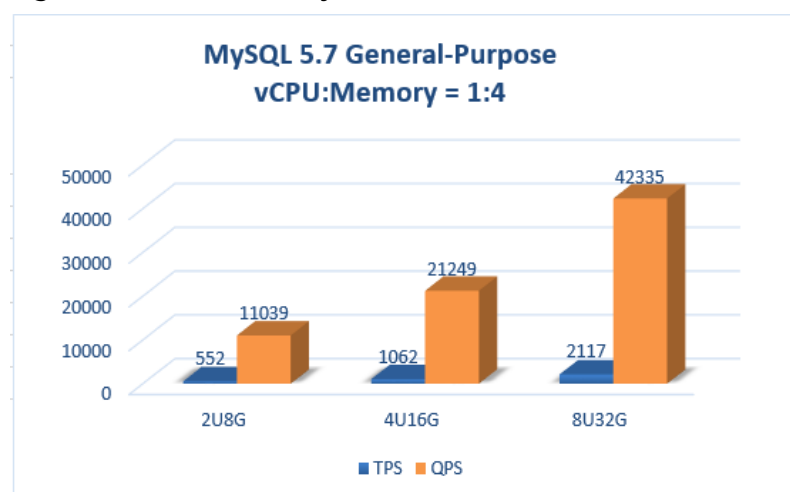


Figure 3-5 vCPU:Memory = 1:4



3.3 Dedicated DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 3-6 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	621	12,394	See About IOPS .
4	16	5,000	1,230	24,608	
8	32	10,000	2,514	50,290	
16	64	18,000	3,017	60,337	
32	128	30,000	4,368	87,354	
64	256	60,000	4,536	90,729	

Table 3-7 vCPU:Memory = 1:8

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
4	32	10,000	1,488	29,765	See About IOPS .
8	64	18,000	2,811	56,216	
16	128	30,000	4,095	81,910	
64	512	100,000	4,626	96,824	

Test Results

Figure 3-6 vCPU:Memory = 1:4

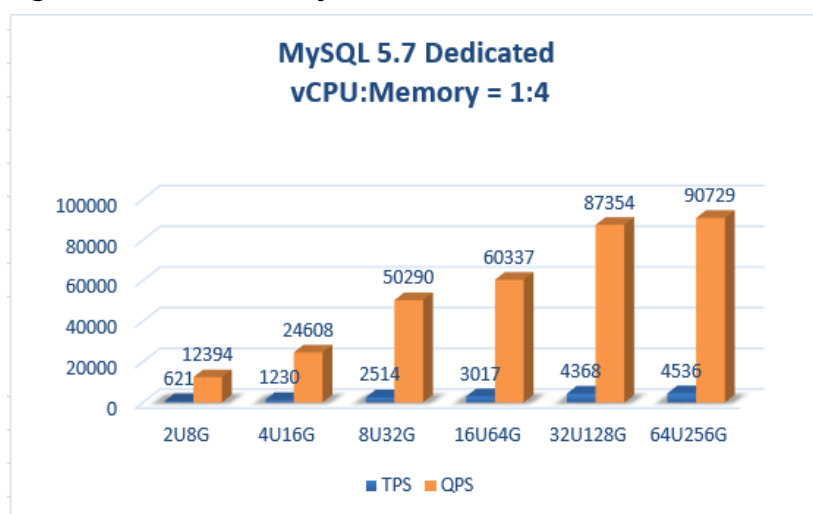
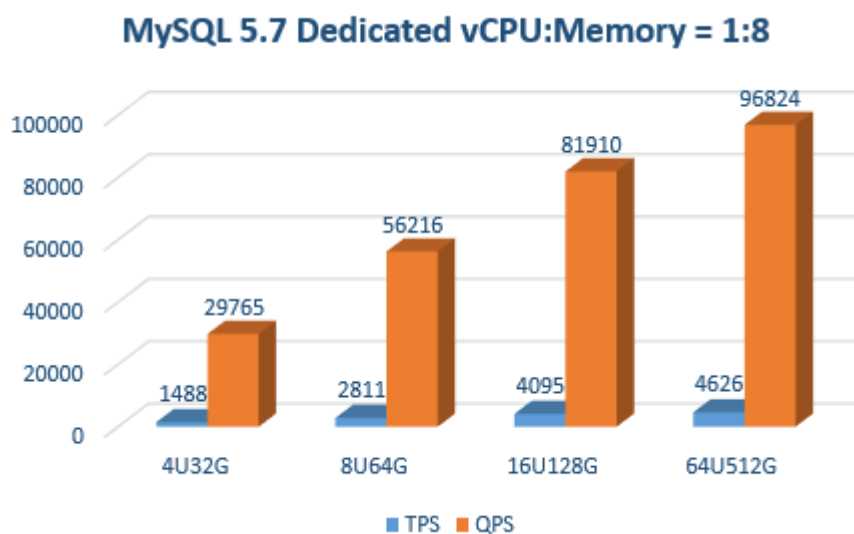


Figure 3-7 vCPU:Memory = 1:8



3.4 Kunpeng General-Enhanced DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 3-8 vCPU:Memory = 1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	4	1,200	375	7,513	See About IOPS .
4	8	2,200	973	19,461	
8	16	4,200	1,462	29,256	
12	24	6,000	1,909	38,182	
16	32	8,600	2,566	51,325	
24	48	13,000	2,764	55,294	
32	64	16,000	2,980	59,608	
48	96	22,000	3,334	66,701	
60	120	30,000	3,858	77,180	

Table 3-9 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,000	495	9,918	See About IOPS .
4	16	4,000	1,020	20,404	
8	32	8,000	2,017	40,342	
12	48	12,000	2,628	52,565	
16	64	14,400	2,896	57,938	
24	96	21,600	3,061	61,219	
32	128	24,000	3,192	63,853	

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
48	192	36,000	3,528	70,570	

Test Results

Figure 3-8 vCPU:Memory = 1:2

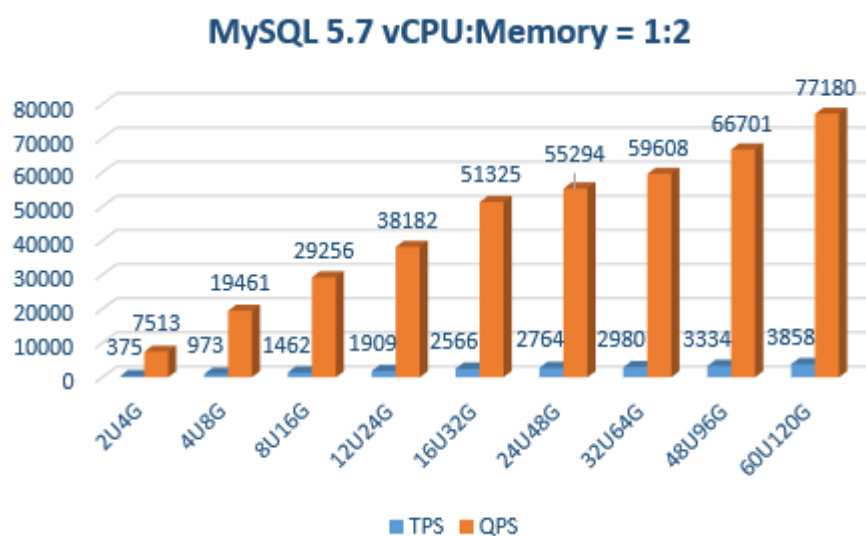
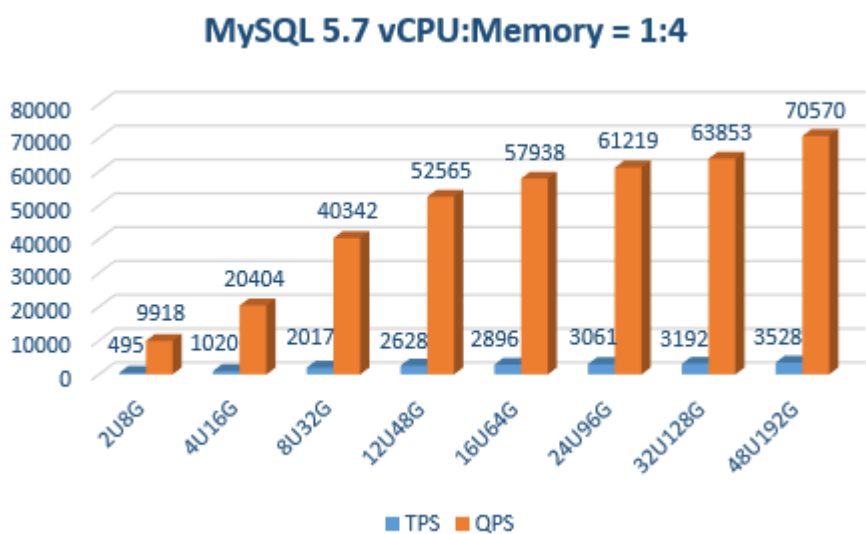


Figure 3-9 vCPU:Memory = 1:4



4 RDS for MySQL 8.0 Test Data

4.1 General-Purpose DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

Depending on service scenarios, the test results of RDS for MySQL 8.0 may be lower than those of RDS for MySQL 5.7, which is normal.

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 4-1 vCPU:Memory = 1:2

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	4	1,500	434	8,679	See About IOPS .
4	8	2,500	1,363	27,252	
8	16	5,000	2,014	40,280	

Table 4-2 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	645	12,899	See About IOPS .
4	16	5,000	1,428	28,554	
8	32	10,000	2,422	48,445	

Test Results

Figure 4-1 vCPU:Memory = 1:2

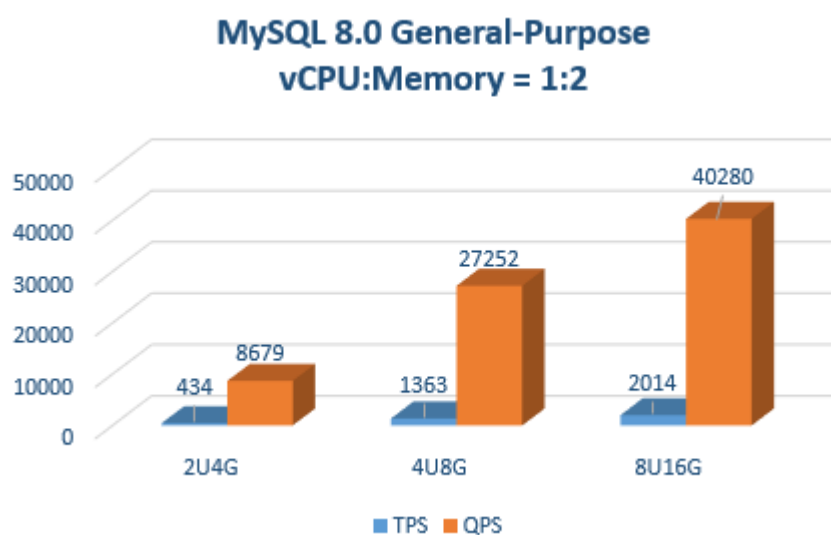
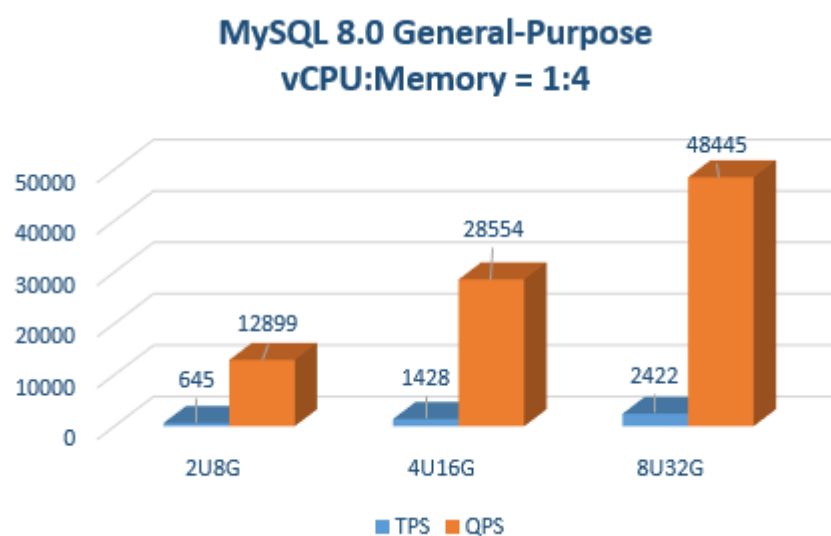


Figure 4-2 vCPU:Memory = 1:4



4.2 Dedicated DB Instances

About IOPS

The input/output operations per second (IOPS) supported by RDS for MySQL depends on the I/O performance of Elastic Volume Service (EVS) disks. For details, see [Disk Types and Performance](#) in the *Elastic Volume Service Service Overview*.

Test Data

Depending on service scenarios, the test results of RDS for MySQL 8.0 may be lower than those of RDS for MySQL 5.7, which is normal.

NOTICE

The **Maximum Connections (Stress Testing)** columns in the following tables indicate the results of the RDS performance stress testing. For running services on the live network, set the parameter **max_connections**.

Table 4-3 vCPU:Memory = 1:4

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
2	8	2,500	647	12,936	See About IOPS .
4	16	5,000	1,556	31,117	
8	32	10,000	2,543	50,867	
16	64	18,000	4,006	80,115	
32	128	30,000	5,979	119,575	
64	256	60,000	6,463	129,261	

Table 4-4 vCPU:Memory = 1:8

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
4	32	10,000	1,642	32,849	See About IOPS .
8	64	18,000	3,102	62,045	

vCPUs	Memory (GB)	Maximum Connections (Stress Testing)	TPS	QPS	IOPS
16	128	30,000	5,467	109,349	
64	512	100,000	6,484	129,684	

Test Results

Figure 4-3 vCPU:Memory = 1:4

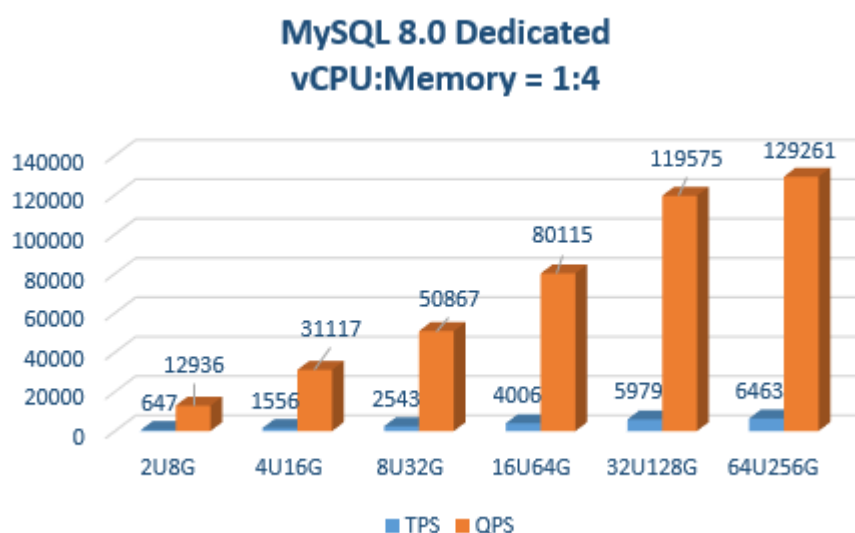


Figure 4-4 vCPU:Memory = 1:8

