

Alibaba Cloud ApsaraDB for MongoDB

Performance White Paper

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Document conventions

Style	Description	Example
	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restart an instance.
	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	 Notice: If the weight is set to 0, the server no longer receives new requests.
	A note indicates supplemental instructions, best practices, tips, and other content.	 Note: You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click Settings > Network > Set network type.
Bold	Bold formatting is used for buttons, menus, page names, and other UI elements.	Click OK.
Courier font	Courier font is used for commands.	Run the <code>cd /d C:/window</code> command to enter the Windows system folder.
Italic	Italic formatting is used for parameters and variables.	<code>bae log list --instanceid Instance_ID</code>
[] or [a b]	This format is used for an optional value, where only one item can be selected.	<code>ipconfig [-all -t]</code>

Style	Description	Example
{ } or {a b}	This format is used for a required value, where only one item can be selected.	switch {active stand}

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1 Overview

ApsaraDB for MongoDB fully supports the MongoDB protocol and is based on the distributed Apsara system and high-reliability storage engine. ApsaraDB for MongoDB provides solutions such as multiple-node high-availability architecture, elastic scaling, disaster recovery, backup and rollback, and performance optimization.

For more information, see [#unique_4](#).

2 Test environment

This topic describes the performance test environment for ApsaraDB for MongoDB.

- All tests are performed in Zone B of the China (Hangzhou) region.
- A replica set instance (three-node) is used.
- The database version of the instance is 3.4.
- The network type of the instance is classic network.
- The CentOS 6.0 64-bit image is used in the stress testing.

3 Test tool

The open-source YCSB 0.12.0 tool is used for stress testing.



Note:

YCSB is a Java tool that can be used in performance testing for multiple databases. For more information about its installation and usage, see [YCSB](#).

4 Test procedure

This topic describes how to test the performance of ApsaraDB for MongoDB.

Procedure

1. Modify the following parameters in the workloada configuration: recordcount, operationcount, readproportion, and updateproportion.

**Note:**

The values of the recordcount and operationcount parameters vary with instance types. For more information, see [Test results](#).

2. Prepare data resources for testing.

```
./bin/ycsb load mongodb -s -P workloads/workloada -p mongodb.url=mongodb://ip:port/ycsb? w=0 -threads xx > outputLoad.txt
```

3. Start the performance test.

```
./bin/ycsb run mongodb -s -P workloads/workloada -p mongodb.url=mongodb://ip:port/ycsb? w=0 -threads xx > outputRun.txt
```

5 Test results

This topic describes the performance test results of ApsaraDB for MongoDB with different read/write ratios.

Parameters

- Count: the sum of recordcount and operationcount.
- Thread: the total number of threads used for the client test. In this test, four ECS instances of 4 cores and 32 GB are used as the clients for concurrent testing. The thread count is an average.
- Throughput: the number of read and write operations.
- RAL: the average latency of read operations. Unit: us.
- WAL: the average latency of write operations. Unit: us.

Read/write ratio of 50:50

Instance type	Count	Thread	Throughput	RAL	WAL
General-purpose, 1-core 2 GB	1000000	100	3997	22080	27934
General-purpose, 2-core 4 GB	2000000	100	7674	11778	14271
General-purpose, 4-core 8 GB	4000000	100	17002	5249	6502
General-purpose, 8-core 16 GB	8000000	100	30500	3027	3520
General-purpose, 8-core 32 GB	16000000	100	33655	2679	3253
General-purpose, 16-core 64 GB	32000000	100	64883	1322	1761
Dedicated, 2-core 16 GB	100000000	150	4354	30674	38167
Dedicated, 4-core 32 GB	100000000	150	10890	12517	15019
Dedicated, 8-core 64 GB	100000000	150	21145	6347	7826

Instance type	Count	Thread	Throughput	RAL	WAL
Dedicated, 16-core 128 GB	100000000	150	50625	2589	3323
Dedicated, 32-core 256 GB	100000000	150	65472	1982	2588
Dedicated host, 30-core 220 GB	100000000	150	62472	1955	2770
Dedicated host, 60-core 440 GB	100000000	150	90181	1410	1870

Read/write ratio of 95:5

Instance type	Count	Thread	Throughput	RAL	WAL
General-purpose, 1-Core 2 GB	1000000	100	7849	12519	16801
General-purpose, 2-core 4 GB	2000000	100	14923	6621	8109
General-purpose, 4-core 8 GB	4000000	100	37573	2623	3277
General-purpose, 8-core 16 GB	8000000	100	51085	1936	2247
General-purpose, 8-core 32 GB	16000000	100	70780	1383	1885
General-purpose, 16-core 64 GB	32000000	100	105606	920	1371
Dedicated, 2-core 16 GB	100000000	150	7175	20701	24635
Dedicated, 4-core 32 GB	100000000	150	17270	8634	9529
Dedicated, 8-core 64 GB	100000000	150	46707	3167	3920
Dedicated, 16-core 128 GB	100000000	150	106386	1372	2013
Dedicated, 32-core 256 GB	100000000	150	150378	970	1233
Dedicated host, 30-core 220 GB	100000000	150	132717	1100	1405

Instance type	Count	Thread	Throughput	RAL	WAL
Dedicated host, 60-core 440 GB	100000000	150	225365	643	856