

Foglight for MongoDB

Cartridge Guide

© 2018 Quest Software Inc.
ALL RIGHTS RESERVED.

This guide contains proprietary information protected by copyright. The software described in this guide is furnished under a software license or nondisclosure agreement. This software may be used or copied only in accordance with the terms of the applicable agreement. No part of this guide may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording for any purpose other than the purchaser's personal use without the written permission of Quest Software Inc.

The information in this document is provided in connection with Quest Software products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Quest Software products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, QUEST SOFTWARE ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL QUEST SOFTWARE BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF QUEST SOFTWARE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Quest Software makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Quest Software does not make any commitment to update the information contained in this document.

If you have any questions regarding your potential use of this material, contact:

Quest Software Inc.

Attn: LEGAL Dept

4 Polaris Way

Aliso Viejo, CA 92656

Refer to our Web site (<https://www.quest.com>) for regional and international office information.

Patents

Quest Software is proud of our advanced technology. Patents and pending patents may apply to this product. For the most current information about applicable patents for this product, please visit our website at <https://www.quest.com/legal>.

Trademarks

Quest, the Quest logo, and Join the Innovation are trademarks and registered trademarks of Quest Software Inc. For a complete list of Quest marks, visit <https://www.quest.com/legal/trademark-information.aspx>. All other trademarks and registered trademarks are property of their respective owners.

Table of Contents

| | |
|---|----|
| Table of Contents | 3 |
| Introduction | 6 |
| Description | 6 |
| Business Challenge..... | 6 |
| Key Features..... | 6 |
| Foglight for MongoDB Requirements | 7 |
| MongoDB Agent User Permissions | 8 |
| Configuring an SSL Connection | 9 |
| Installing the MongoDB Cartridge | 10 |
| Creating the MongoDB Agent..... | 11 |
| Roles..... | 14 |
| Dashboards | 15 |
| MongoDB Servers | 15 |
| Replica Sets | 15 |
| MongoDB Clusters | 15 |
| Server Overview..... | 16 |
| Databases..... | 17 |
| Collections..... | 18 |
| Collection Statistics | 18 |
| WiredTiger | 19 |
| Operations | 20 |
| Memory..... | 20 |
| Journal..... | 21 |
| Locks..... | 21 |
| Profiled Operations..... | 22 |
| Replication | 22 |
| Log..... | 23 |
| MongoDB Object Cleanup..... | 24 |
| Rules..... | 25 |
| MongoDB Alarm Email Forwarder | 25 |

| | |
|--|----|
| MongoDB Asserts Count | 25 |
| MongoDB Availability..... | 25 |
| MongoDB Cleared Alarm Email Forwarder..... | 25 |
| MongoDB Collection Growth | 25 |
| MongoDB Connections Used | 25 |
| MongoDB Cursors NoTimeout | 25 |
| MongoDB Database ExecutionTime Command..... | 25 |
| MongoDB Database ExecutionTime Read | 25 |
| MongoDB Database ExecutionTime Write | 25 |
| MongoDB Flush Time | 25 |
| MongoDB Locks Deadlocks | 25 |
| MongoDB Locks Queue Length..... | 25 |
| MongoDB Log Patterns | 26 |
| MongoDB Memory DataFit..... | 26 |
| MongoDB Memory IndexFit..... | 26 |
| MongoDB Memory Mapped Ratio..... | 26 |
| MongoDB Memory Page Faults | 26 |
| MongoDB Profiling Execution Time | 26 |
| MongoDB ReplicaMember PingMS..... | 26 |
| MongoDB Replica Member Unreachable | 26 |
| MongoDB Replica Set Not Stable..... | 26 |
| MongoDB Replication Buffer Ratio | 26 |
| MongoDB Replication NoPrimary | 26 |
| MongoDB Replication Oplog Headroom..... | 26 |
| MongoDB Replication Oplog Lag | 26 |
| MongoDB Server State Change..... | 27 |
| MongoDB SSL Certificate Expiration | 27 |
| MongoDB WiredTiger Cache DirtyBytes | 27 |
| MongoDB WiredTiger Cache PagesEvictedClean..... | 27 |
| MongoDB WiredTiger ConcurrentTransaction ReadTicketsAvailable | 27 |
| MongoDB WiredTiger ConcurrentTransaction WriteTicketsAvailable | 27 |
| MongoDB WiredTiger Cursor CursorCount | 27 |

| | |
|---|----|
| MongoDB WiredTiger Cursor SessionCount | 27 |
| MongoDB WiredTiger Transaction Failures | 27 |
| Reports | 28 |
| MongoDB Cluster Report Iterator | 28 |
| MongoDB Cluster Summary | 28 |
| MongoDB Executive Summary | 28 |
| MongoDB Replica Set Summary | 28 |
| MongoDB Server Health Check | 28 |
| MongoDB Service Report | 28 |
| MongoDB Top Collections | 28 |
| MongoDB Top Profiled Ops | 28 |

Introduction

Description

MongoDB is a cross-platform document-oriented database. MongoDB falls into the class of a NoSQL database and eschews the traditional table-based relational database structure in favor of JSON-like documents with dynamic schemas (MongoDB calls the format BSON). Instead of taking a business subject and breaking it up into multiple relational structures, MongoDB can store the business subject in the minimal number of documents. For example, instead of storing title and author information in two distinct relational structures, title, author, and other title-related information can all be stored in a single document called Book. This has the benefit of making the integration of data in certain types of applications easier and faster. Released under a combination of the GNU Affero General Public License and the Apache License, MongoDB is free and open-source software.

First developed by the software company MongoDB Inc. in October 2007 as a component of a planned platform as a service product, the company shifted to an open source development model in 2009, with MongoDB offering commercial support and other services. Since then, MongoDB has been adopted as backend software by a number of major websites and services, including Craigslist, eBay, and Foursquare among others. As of July 2015, MongoDB is the fourth most popular type of database management system, and the most popular for document stores.

Business Challenge

MongoDB is built to be highly scalable and deployments regularly scale over a number of servers and across network segments. MongoDB scales horizontally using sharding. The user chooses a shard key, which determines how the data in a collection will be distributed. The data is split into ranges (based on the shard key) and distributed across multiple shards. (A shard is a master with one or more slaves.) MongoDB can run over multiple servers, balancing the load and/or duplicating data to keep the system up and running in case of hardware failure. Mongo's architecture makes it highly scalable and capable of running in environments requiring 24/7 availability. The downside to this complex architecture is that many elements need to be monitored and tuned to ensure optimum performance and availability.

Key Features

Foglight for MongoDB[®] is designed to provide enterprises with a powerful tool that can act standalone or as part of broader cross-platform database monitoring requirements. To support enterprise performance Foglight for MongoDB[®] will support the monitoring of key functions including the MongoDB Server, Queries, Indexing, Replication, Load Balancing and File Storage.

As with all Foglight solutions, Foglight for MongoDB[®] will run as a native Foglight process leveraging the Foglight Agent Manager (FglAM) for communications with the agent. Foglight for MongoDB can be run locally (Agent on the Host) or remotely (Agent on FMS or Proxy Server). The solution will leverage the Foglight Rules Engine providing the ability to evaluate and alert on potential issues before they significantly affect performance and availability.

Foglight for MongoDB Requirements

Foglight for MongoDB is compatible with **MongoDB 2.4+**. However, some data may not be available in earlier versions. The following list itemizes which features become available at which versions.

v2.6.0:

User and role data available.

v3.0.0:

Replica set configuration available.

Log cache sample available.

v3.3.12:

Autosplit enabled metric available for sharded clusters.

Foglight for MongoDB can be installed on **FMS 5.9.2+** and agents require **FgIAM 5.8.5.2+**.

MongoDB Agent User Permissions

The MongoDB agent requires database user credentials with certain minimum privileges in order to be able to fully monitor the server and cluster. All users should be created on the “admin” database. The roles needed for the user will vary depending on the MongoDB version.

For MongoDB 3.0 and later the following roles are required:

```
'clusterMonitor', 'readAnyDatabase'
```

User creation example for MongoDB 3.0 and later:

```
db.getSiblingDB('admin'). createUser({
  user: 'foglightAgent',
  pwd: '<xxxx>',
  roles: ['clusterMonitor', 'readAnyDatabase']
})
```

For versions prior to MongoDB 3.0 the following roles are required:

```
'clusterAdmin', 'dbAdminAnyDatabase', 'readAnyDatabase'
```

User creation example prior to MongoDB 3.0:

```
db.getSiblingDB('admin'). addUser({
  user: 'foglightAgent',
  pwd: '<xxxx>',
  roles: ['clusterAdmin', 'dbAdminAnyDatabase', 'readAnyDatabase']
})
```

Also, ensure that all firewalls and network configurations allow the machine running the FglAM to access the host of each monitored server at its configured port.

Configuring an SSL Connection

The below instructions cover common steps used to configure a TLS/SSL connection from the MongoDB Agent client. For full information on secure connections and server-side configuration, refer to the [Transport Encryption](#) section of the MongoDB documentation for your version.

In order to use SSL, your MongoDB server must include SSL support and allow SSL connections.

The client requires a client certificate and certificate authority (CA) certificate. These certificates must be imported into the FglAM keystore. You can use the bundled keytool, which will be located in the Foglight Agent Manager\jre\1.8.0.72\jre\bin directory, or the equivalent on your system, with these commands:

```
keytool.exe -import -file ca.pem -keystore truststore -alias mongoCACert
```

```
keytool.exe -import -file client.pem -keystore keystore -alias mongoClientCertificate
```

If you have not changed the password for the keystore, the default password will be “changeit”. Next, edit the `baseline.jvmargs.config` file in the `Foglight Agent Manager\state\default\config` directory and add the following parameters with file paths and passwords appropriate for your system. Escape any quotes with a backslash.

```
vmparameter.0 = "-Djavax.net.ssl.keyStore=\"C:/Program Files/Common Files/Dell/Foglight Agent  
Manager/jre/1.8.0.72/jre/bin/keystore\"";  
vmparameter.1 = "-Djavax.net.ssl.keyStorePassword=changeit";  
vmparameter.2 = "-Djavax.net.ssl.trustStore=\"C:/Program Files/Common Files/Dell/Foglight Agent  
Manager/jre/1.8.0.72/jre/bin/truststore\"";  
vmparameter.3 = "-Djavax.net.ssl.trustStorePassword=changeit";
```

Then, restart the FglAM and continue with the agent configuration, setting the “Use TLS/SSL?” option in the Agent Properties to true. If the client certificate is not configured specifically for the FglAM host, you can also set the “Allow Invalid Cert Hostname?” option to true to allow the certificate to be used anyway.

Installing the MongoDB Cartridge

1. Open Foglight Management Console.
2. From the navigation pane, select: **Dashboards > Administration > Cartridges > Cartridge Inventory**. The Cartridge Inventory screen appears. For more information on agents, see the *Foglight User Guide*.
3. Load the **MongoDBAgent-xxxx.car** file by browsing to the location where the .car file exists and then clicking on “Install Cartridge”. Leave the “Enable on Install” check box checked.
4. Once the installation is completed on the Foglight Management Server, the MongoDBAgent Cartridge will appear in this list below as an installed cartridge.



Creating the MongoDB Agent

When an agent connects to the Foglight Management Server, it is provided a set of properties that is then used to configure its correct running state.

Default Agent properties are installed with the Foglight Cartridge for MongoDB. However, the user will typically edit the default agent properties. Agent properties may apply only to a specific agent instance, or may be applicable across multiple agents.

For more information about working with agent properties, see the *Foglight Administration and Configuration Guide*.

To modify the agent properties for a new agent instance:

Open Foglight.

1. From the navigation pane, select: **Dashboards > Administration > Agents > Agent Status**. The Agent Status screen appears.
2. Deploy the MongoDB agent package.
3. Create a MongoDB agent instance with a name that you will be able to identify as related to the MongoDB Server you intend to monitor.
4. Select the checkbox next to the MongoDB agent row. The selected row is highlighted with a yellow background.
5. Click **Edit**, then **Edit Properties**.
6. Select **Modify the default properties for this agent**.
7. Edit the agent properties for the MongoDB agent instance:

Server connection

- **IP or Hostname** – Host where MongoDB database server is running. Default is “localhost”. (e.g.<hostname> or <IP address>)
- **Port** – Port the MongoDB database is running. Default is 27017.
- **Username** – User that can connect to the MongoDB server being monitored
- **Password** – Password of the user that can connect to the MongoDB server being monitored.
- **Use TLS/SSL?** – Enable an SSL connection to the MongoDB server. SSL must be enabled on the server. More information can be found in the [Configuring an SSL Connection](#) section.
- **Allow Invalid Cert Hostname?** – If the client certificate is not configured specifically for the FglAM host, you can set this option to true to allow the certificate to be used anyway.

Collection Intervals

The Collection Interval fields in the agent properties are used to set the sample frequencies. You can turn off a collection by setting the interval to 0. The defaults are set based on the type of data being collected for relevancy.

Log

- **Maximum entries to retrieve** - The maximum number of log entries to retrieve from per collection period. Set to zero to retrieve all available entries. To disable the log collection, set the Log (sec) period to zero.
- **Log entry match list** - A list of rules specifying conditions for when log entries should cause a Foglight alert to fire. Consists of a severity level found in the log entry, a regular expression text to search for in the log entry message text and the Foglight severity at which to fire an alarm if a

match is found. Any entry with a log severity more extreme than the one provided in the list will naturally also trigger an alarm. Note that the log entry match list works by submitting data through the agent that will cause the rule “MongoDB Log Patterns” to trigger. Hence if this rule is disabled, no alerts will fire on log entries even if the match list has been set up with matching conditions.

- **Log entry ignore list** - The ignore list looks much like the match list except that it prevents triggering of the rule “MongoDB Log Patterns”. If a collected log entry matches a rule in the match list, it will only fire if it does not also match a rule in the ignore list.

Options

- **Host Aliases** – A list of hostnames or IP addresses mapped to aliases. Can be used to standardize discovered hostnames from internal representations (e.g. in a cloud environment) to their external address. Enables, for example, the MongoDB cartridge to link directly to the Hosts dashboard by ensuring host data is submitted uniformly across the monitoring environment.
- **Server Display Aliases** - A mapping from server address and port pairs to arbitrary name strings. The purpose of the alias is solely for human readability and convenience, to shorten long alphanumeric host addresses to descriptive, quickly recognizable names such as “PROD_BillingApp_QueryServer2”.
- **Replica Set Aliases** - A mapping from actual replica set names to aliases. This alias map is required to prevent collisions in collected data between different replica sets with the same name. Ideally, each replica set in an environment should be set up with a unique name.
- **Monitor connection status for discoverable servers in sharded cluster?** – If the agent is connecting to a mongos query server, setting this option to true enables discovery of all servers in the associated sharded cluster. Availability metrics will be collected for each mongos, mongod config server, and mongod shard server in the cluster.
- **Get Profiled Ops Query Options?** – Set to true if you wish to include Query Options in the Profiled Ops collection, if that collection is enabled. This will cause query options to also be factored into the aggregation algorithm, meaning that less aggregation will occur if query options differ in operations of the same type being performed on the same namespace. It is also possible that sensitive data may be exposed in the query options.

| Server Connection | |
|--------------------------------------|--|
| IP or Hostname | <input type="text" value="compute-1.amazonaws.com"/> |
| Port | <input type="text" value="37058"/> |
| Username | <input type="text" value="foglightAgent"/> |
| Password | <input type="password" value="*****"/> |
| Use TLS/SSL? | <input type="radio"/> True <input checked="" type="radio"/> False |
| Allow Invalid Cert Hostname? | <input type="radio"/> True <input checked="" type="radio"/> False |
| Collection Intervals (0 to turn off) | |
| Connection Status (sec) | <input type="text" value="30"/> |
| Server Status (sec) | <input type="text" value="300"/> |
| Database Status (sec) | <input type="text" value="300"/> |
| Collection Status (sec) | <input type="text" value="900"/> |
| Top (Usage Stats) (sec) | <input type="text" value="300"/> |
| Shard Status (sec) | <input type="text" value="600"/> |
| Replication Status (sec) | <input type="text" value="300"/> |
| Profiled Operations (sec) | <input type="text" value="900"/> |
| Parameters (sec) | <input type="text" value="3600"/> |
| Log | |
| Log (sec) | <input type="text" value="0"/> |
| Maximum entries to retrieve | <input type="text" value="200"/> |
| Log entry match list | <input type="text" value="LogMatchDefaults"/> <input type="button" value="Edit"/> <input type="button" value="Clone"/> <input type="button" value="Delete"/> ③ Changing Secondary Property lists have global implications |
| Log entry ignore list | <input type="text" value="LogIgnoreList"/> <input type="button" value="Edit"/> <input type="button" value="Clone"/> <input type="button" value="Delete"/> ③ Changing Secondary Property lists have global implications |
| Options | |
| Host Aliases | <input type="text" value="HostAliasesList"/> <input type="button" value="Edit"/> <input type="button" value="Clone"/> <input type="button" value="Delete"/> ③ Changing Secondary Property lists have global implications |

Roles

Two roles, MongoDB User and MongoDB Administrator, are installed with the cartridge. Viewing MongoDB dashboards requires that a user be assigned one of these or have the core Administrator role. Currently, there are no added privileges for the MongoDB Administrator role, but future cartridge versions which allow user interaction with the MongoDB Server will require this role.

Dashboards

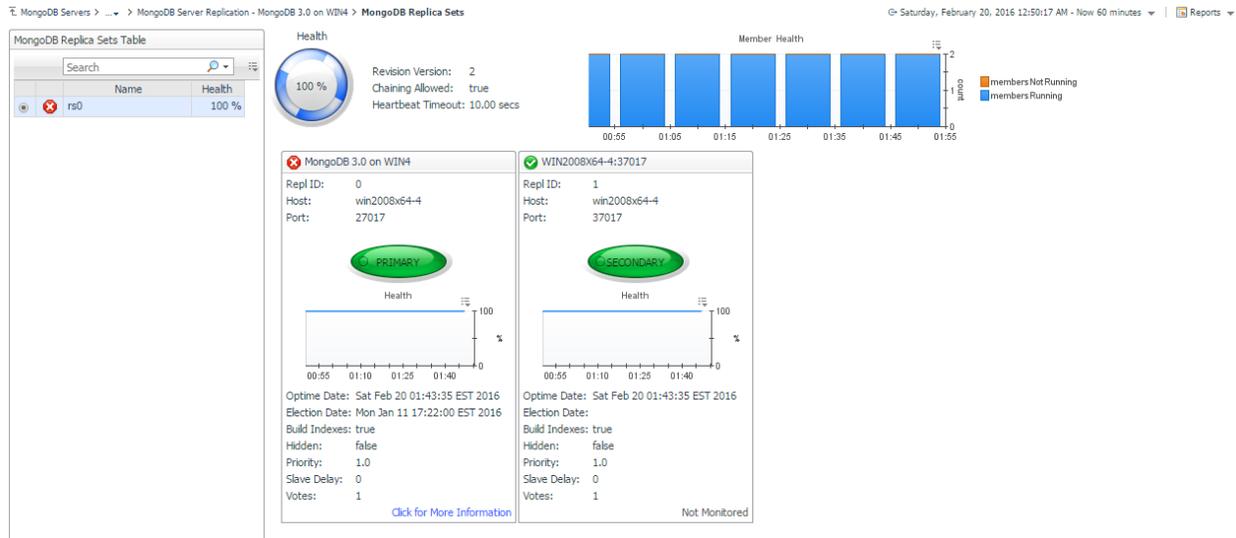
MongoDB Servers

This top-level dashboard lists all monitored MongoDB Servers and contains important configuration information, alarm status, and key metrics for the server. The workload metric is used for comparing the amount of work a server is doing relative to another MongoDB server. Clicking the DB server's name will drill down into the Server Overview dashboard. If using the Infrastructure cartridge to monitor the host, clicking or hovering on the host name will provide more information on the DB server's host.

| Health | Name | Version | Type | F | C | W | Start Time | Workload | Availability | Storage Engine | Replication | Sharding | Connections | Memory | Virtual | Network | |
|--------|---------------------------|---------|-----------|---|---|---|------------------|----------|--------------|----------------|------------------------------|-----------|---------------|--------|---------|---------|-----|
| 🟢 | ec2-52-205-213-150.com... | 3.2.9 | mongod | | | | 1/16/17 12:01 PM | 0.00 | 100 % | wiredTiger | ec2-linux-01 | PRIMARY | n/a | 7 | 0 MB | 698 MB | 290 |
| 🟡 | ec2-52-205-213-150.com... | 3.2.9 | mongod | | | 1 | 12/30/16 8:08 PM | 0.00 | 100 % | mmapv1 | ec2-linux-01 | SECONDARY | n/a | 8 | 4.3 GB | 4.9 GB | 401 |
| 🟢 | ec2-52-205-213-150.com... | 3.2.9 | mongod | | | | 12/30/16 8:17 PM | 0.00 | 100 % | wiredTiger | linux-01-shard3_2_rs0 | PRIMARY | 57e3213ecf... | 36 | 0 MB | 741 MB | 182 |
| 🟢 | ec2-52-205-213-150.com... | 3.2.9 | configsvr | | | | 12/30/16 8:15 PM | 0.00 | 100 % | wiredTiger | linux-01-shard3_2_config-rs0 | PRIMARY | 57e3213ecf... | 40 | 0 MB | 1.3 GB | 475 |
| 🟢 | ec2-52-205-213-150.com... | 3.2.9 | mongos | | | | 12/30/16 8:28 PM | n/a | 100 % | n/a | n/a | n/a | 57e3213ecf... | 10 | n/a | 255 MB | 72 |
| 🟢 | ec2-52-205-213-150.com... | 3.2.9 | mongos | | | | 12/30/16 8:28 PM | n/a | 100 % | n/a | n/a | n/a | 57e3213ecf... | 9 | n/a | 251 MB | 42 |

Replica Sets

This top-level dashboard is dynamic and expands to provide a list of discovered Replica Sets. Selecting a specific Replica Set from the left hand navigation pane automatically updates the right side of the page showing all members of the Replica Set. The Health indicator shows percentage of members currently running. The adjacent bar graph shows number of members running/not running. If the server is actively monitored by a MongoDB Agent, a link “Click for More Information” will appear, leading to the Replication page for that server, covered later in this document.



MongoDB Clusters

This top-level dashboard lists all monitored MongoDB clusters. Selecting a cluster updates the page with summary data on the cluster status as well as listing the different components in the cluster, including mongos, configsvr, shards, and databases and collections.

MongoDB Clusters Jan 16, 2017 - Now 2 days | Reports

Autosplit Enabled: n/a
Balancer Enabled: Yes
Balancer Running: No

mongos **configsvr** **shardsvr**
3 / 3 3 / 3 9 / 9

Clusters

Search

Name

57e3213ec703bc58cafd6aa

mongos

| Health | Name | Version | Availability | Conn Used % |
|--------|--|---------|--------------|-------------|
| | ec2-52-205-213-150.compute-1.amazonaws.com:37058 | 3.2.9 | 100 % | 1 % |
| | ec2-52-205-213-150.compute-1.amazonaws.com:37057 | 3.2.9 | 100 % | 1 % |
| | ec2-52-205-213-150.compute-1.amazonaws.com:37059 | 3.2.9 | 100 % | n/a |

configsvr

| Health | Name | Version | Availability | Storage Engine | Workload | State | Replica Set |
|--------|--|---------|--------------|----------------|----------|-----------|------------------------------|
| | ec2-52-205-213-150.compute-1.amazonaws.com:37047 | 3.2.9 | 100 % | wiredTiger | 0.00 | PRIMARY | linux-01-shard3.2_config-rs0 |
| | ec2-52-205-213-150.compute-1.amazonaws.com:37048 | n/a | 100 % | n/a | n/a | SECONDARY | linux-01-shard3.2_config-rs0 |
| | ec2-52-205-213-150.compute-1.amazonaws.com:37049 | n/a | 100 % | n/a | n/a | SECONDARY | linux-01-shard3.2_config-rs0 |

shards

| Name | Health | Version | Availability | Storage Engine | Workload | State |
|-----------------------|--------|---------|--------------|----------------|----------|-------|
| linux-01-shard3.2_rs0 | | 3.2.9 | 100 % | n/a | 0.00 | n/a |
| linux-01-shard3.2_rs1 | | | 100 % | n/a | n/a | n/a |
| linux-01-shard3.2_rs2 | | | 100 % | n/a | n/a | n/a |

databases

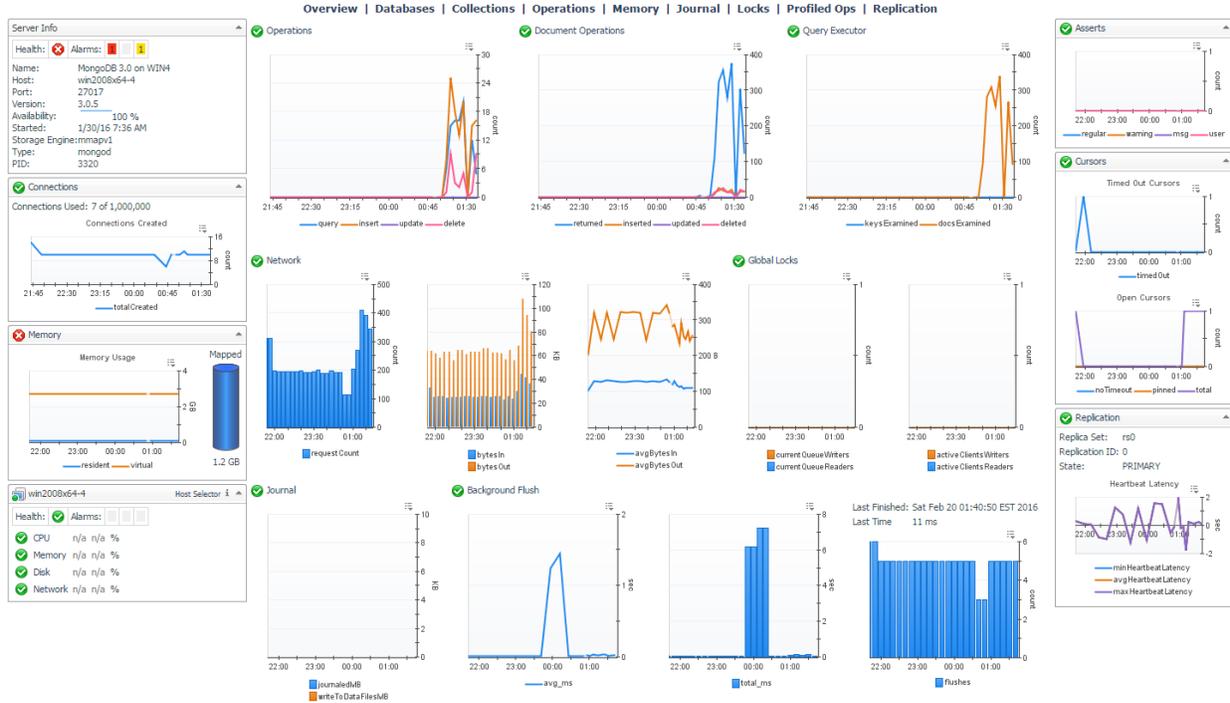
Search

| Health | Database | Name | Collections | Indexes | Documents | | Space | | | | Total Operations | | | |
|--------|----------|------|-------------|---------|-----------|----------|-------|--------|---------|------|------------------|------|------|----------|
| | | | | | Count | Avg Size | Data | Index | Storage | File | Count | Rate | Time | Avg Time |
| | castles | | 5 | 30 | 129 | 56 B | 6 KB | 456 KB | 228 KB | 0 KB | 0 | 0 | 0 | 0 |
| | towers | | 5 | 30 | 18 | 56 B | 0 KB | 504 KB | 252 KB | 0 KB | 0 | 0 | 0 | 0 |
| | stadiums | | 5 | 30 | 225 | 56 B | 11 KB | 568 KB | 284 KB | 0 KB | 0 | 0 | 0 | 0 |

collections

Server Overview

This dashboard provides a comprehensive view of the MongoDB Server, Network, and Host metrics. Operators can hover over titles and the dashboard will display the current state and any associated alarms. The Server Navigation Bar at top can be used to navigate to other pages containing more detailed information on this server. Also, the MongoDB Server Selector link in the action panel on the right of the screen exists for all pages at this level, allowing you to switch between servers without returning to the MongoDB Servers dashboard.

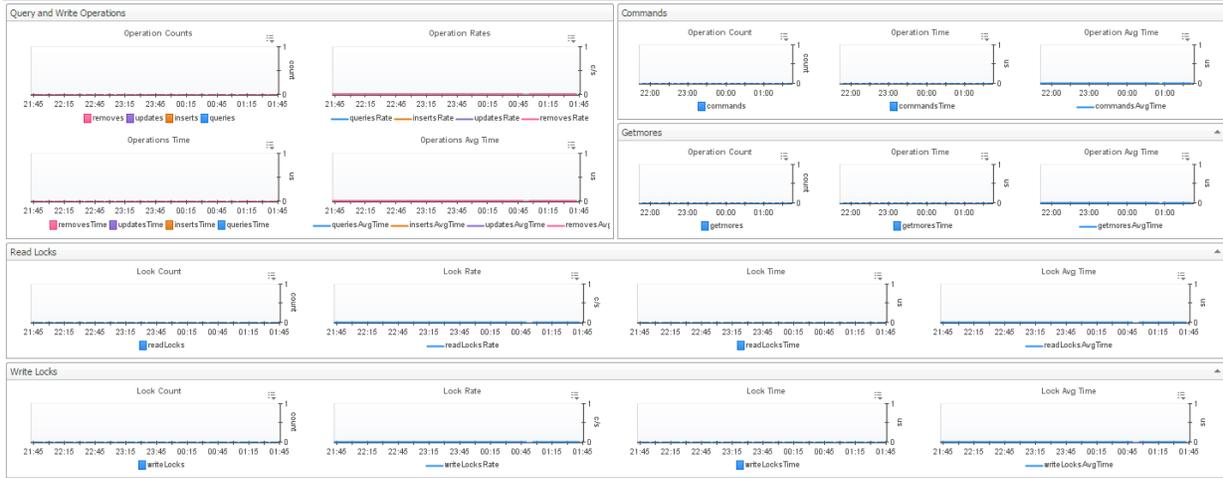


Databases

The Databases dashboard lists all non-system databases for the server, along with key information. Choosing a row will update the bottom section to show Operation statistics for the selected database. Clicking a value in the Collections column will drill down to the Collections page for this server with only the collections for the database row shown by default.

Overview | Databases | Collections | Operations | Memory | Journal | Locks | Profiled Ops | Replication

| Health | Database | | Documents | | Data | | Index | | Space | | File | | Namespace | | Data File Version | | Total Operations | | | | Extents | | |
|--------|----------|-------------|-----------|-------|----------|----------|----------|---------|----------|---------|-------|----------|-----------|----------|-------------------|----------|------------------|------|------|----------|---------|----------------|---------------|
| | Name | Collections | Indexes | Count | Avg Size | Count | Avg Size | Count | Avg Size | Storage | Count | Avg Size | Count | Avg Size | Count | Avg Size | Count | Rate | Time | Avg Time | Count | FreeList Count | FreeList Size |
| ✓ | admin | 5 | 3 | 2.1 K | 487.2 B | 993.5 KB | 24 KB | 1 MB | 64 MB | 16 KB | 4.22 | 0 | 0 c/s | 0 us | 0 us | 5 | 0 | 0 KB | | | | | |
| ✓ | mydb | 5 | 2 | 1.3 K | 809.9 B | 1006 KB | 16 KB | 1 MB | 64 MB | 16 KB | 4.22 | 0 | 0 c/s | 0 us | 0 us | 5 | 0 | 0 KB | | | | | |
| ✓ | local | 6 | 3 | 709 | 113.6 B | 78.7 KB | 24 KB | 1000 MB | 1.1 GB | 16 KB | 4.22 | 0 | 0 c/s | 0 us | 0 us | 6 | 0 | 0 KB | | | | | |



Collections

This dashboard lists non-system collections in the MongoDB Server with identifying information and size and configuration data. Only collections for the selected databases will be shown. You can change which database(s) is/are selected by using the Select Databases option at the top-left portion of the table or the action panel on the right of the window. Clicking a collection name will drill down to the Collection page, covered below.

Overview | Databases | Collections | Operations | Memory | Journal | Locks | Profiled Ops | Replication

| Select Databases | | Collection | Data Storage | | Documents | | Indexes | | Capped | Capped Max | Max Size | Extents | | Sharding | |
|------------------|----------|-------------------|--------------|-----------|-----------|----------|---------|------|--------|------------|----------|---------|--------|----------|--|
| Health | Database | | Records | Allocated | Count | Avg Size | Count | Size | | | | Count | Shards | Chunks | |
| ✓ | mydb | coll1 | 0 KB | 8 KB | 5 | 0 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |
| ✓ | mydb | table1 | 1 KB | 8 KB | 12 | 85.3 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |
| ✓ | mydb | system.namespaces | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | 0 | n/a | |
| ✓ | mydb | table2 | 0 KB | 8 KB | 0 | 0 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |
| ✓ | mydb | table3 | 0 KB | 8 KB | 0 | 0 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |
| ✓ | mydb | table4 | 0 KB | 8 KB | 0 | 0 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |
| ✓ | mydb | table5 | 0 KB | 8 KB | 0 | 0 B | 1 | 7 KB | false | n/a | n/a | 1 | 0 | n/a | |

Collection Statistics

This page shows all available information for a collection, including properties, data storage information, operational metrics, and sharding, if enabled.



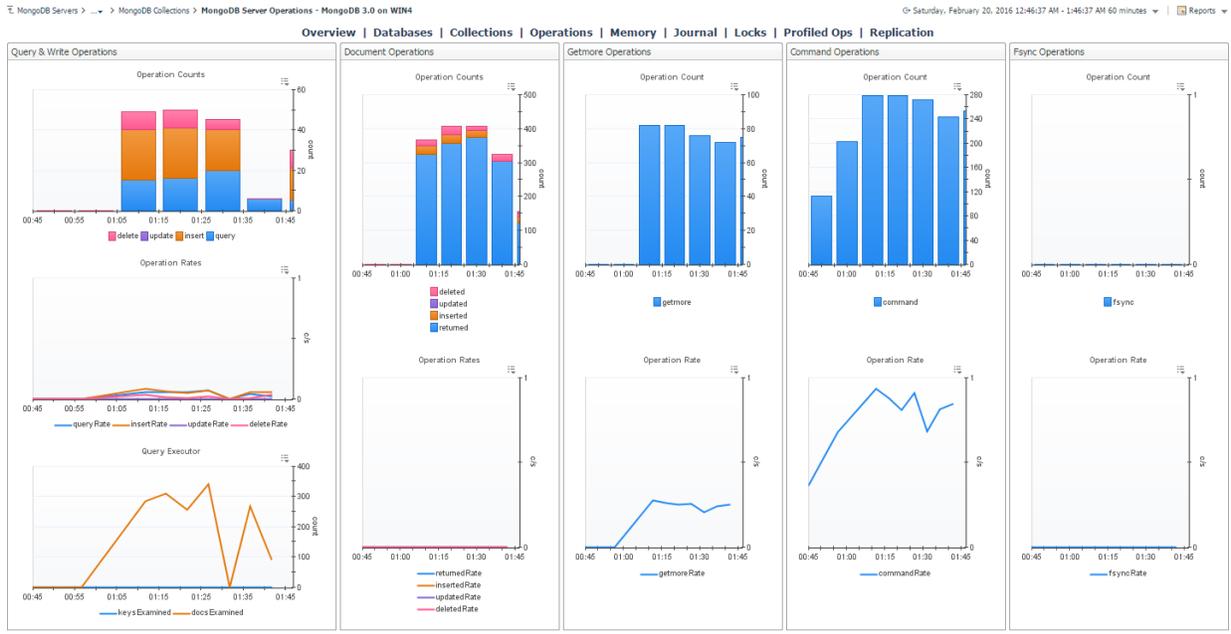
WiredTiger

This dashboard exposes the technical inner workings of the WiredTiger storage engine. Metrics include cache size and state, transaction ticket queues, memory and IO activity, cursor and session counts, and log size and operations.



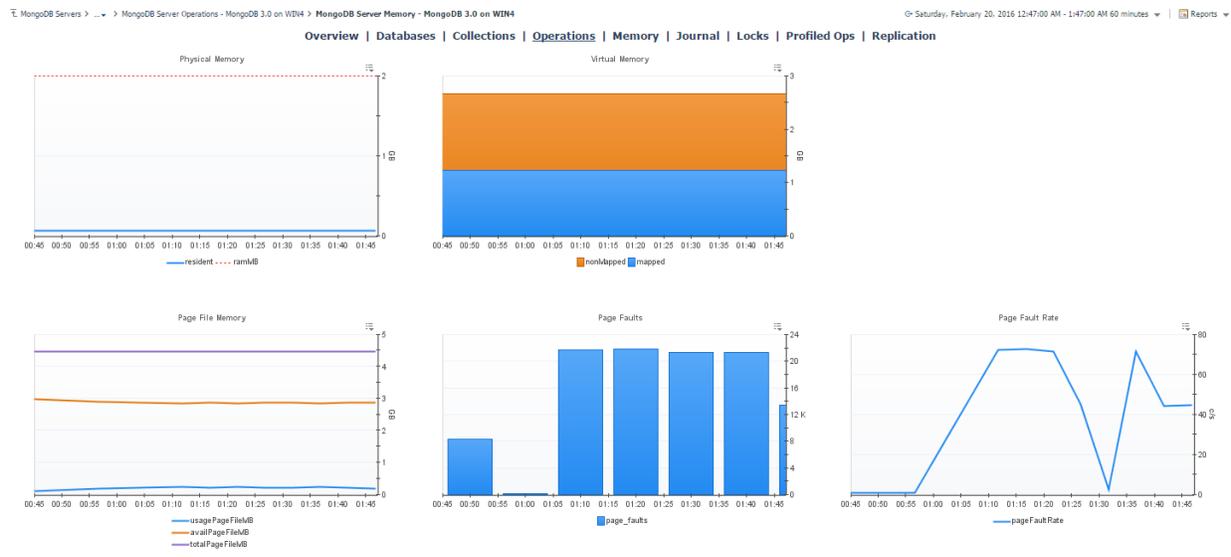
Operations

The operations dashboard updates based on the agent properties setting but can be adjusted to near-real-time monitoring and set to automatically refresh every 60 Seconds (No manual Refresh is required). The dashboard shows operations counts for Query & Write Operations, Document Operations, Getmore Operations, Command Operations, and Fsync Operations.



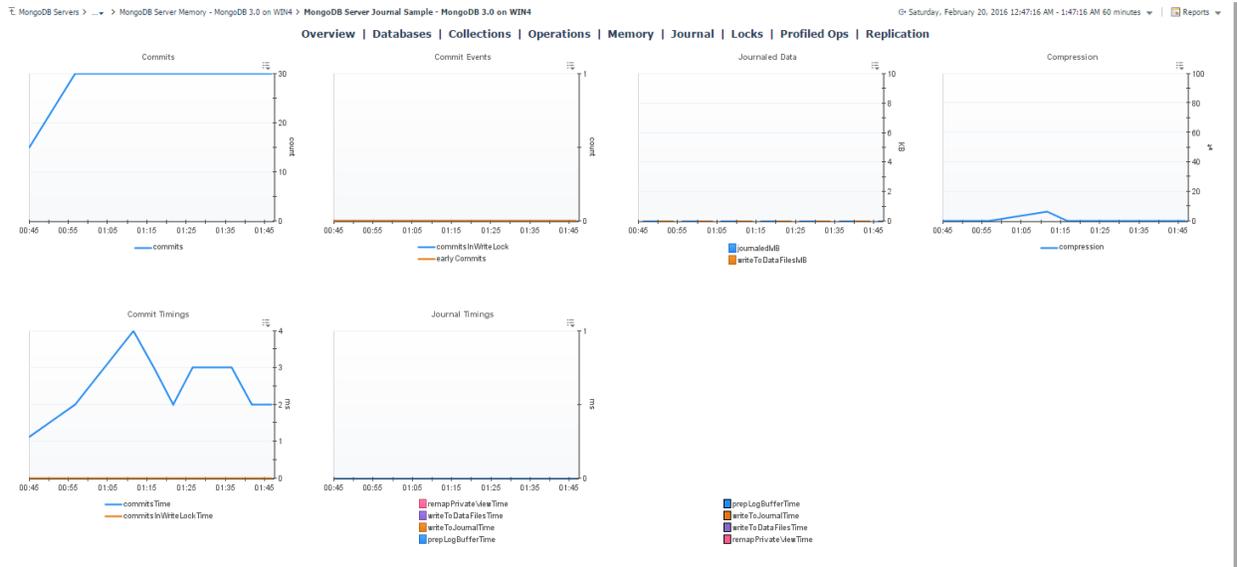
Memory

The memory dashboard displays metrics for Physical and Virtual Memory in addition to Page File Memory, and the number of Page Faults and the Page Fault Rate.



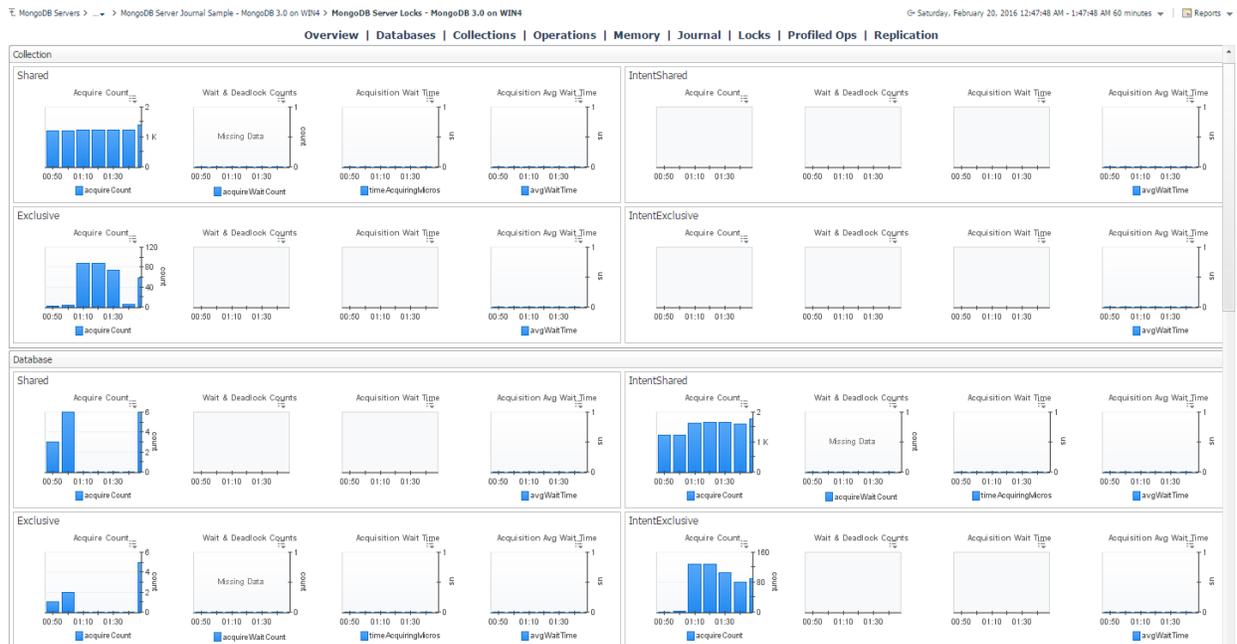
Journal

The Journal Dashboard shows the number of Commits, Commit Events, Journalled Data, Compression Percentage, Commit Timings and Journal Timings for the MMAPv1 journal, if it is enabled.



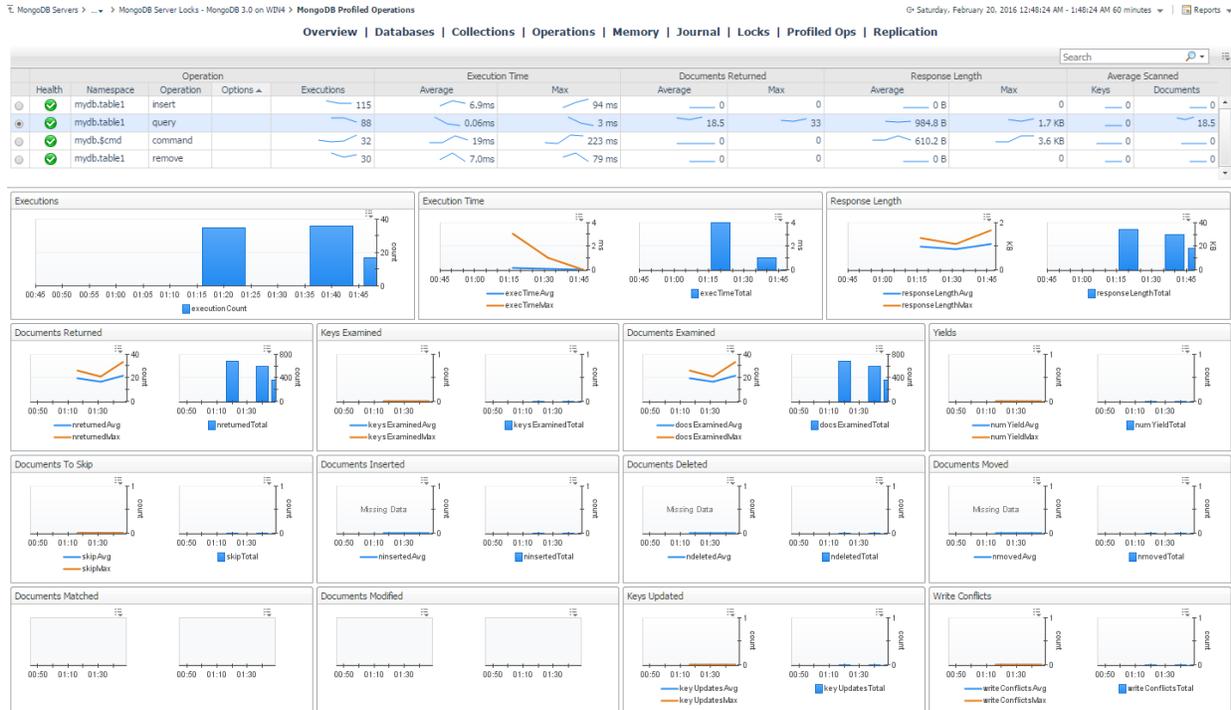
Locks

The Locks Dashboard displays a Dynamic Collection of locks for various lock types. MongoDB collects information on locks at a number of levels within its architecture. This dashboard will capture all lock information present. The illustration below shows Collection; Database; Global; MMAPV1Journal; Metadata: Oplog. It shows Shared and Intent Shared for each Collection.



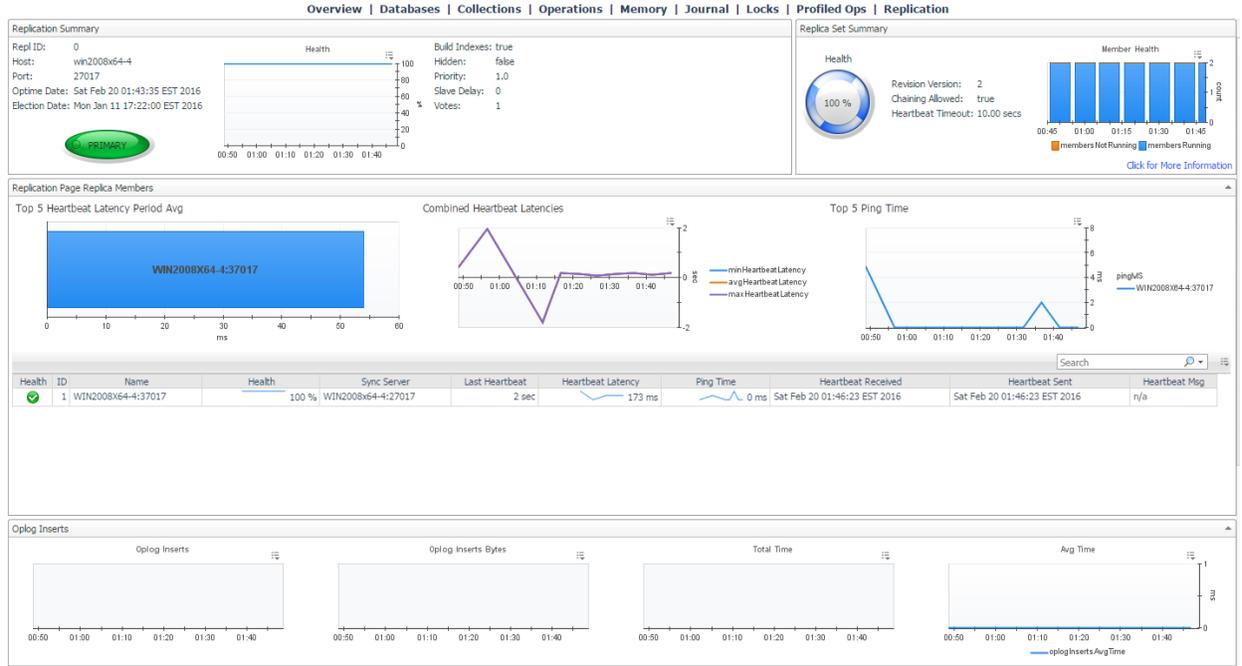
Profiled Operations

This dashboard shows collected Profiled Operations that have been aggregated into groups for statistical analysis. System profiling must be enabled on the MongoDB server. Metrics shown in the table are for the selected period (the time window selected at the top-right of the page). The page shows data general data on an operation like executions and execution time, documents returned, response length, and scanned objects as well as operation type-specific information in the section below when a row is selected. Query options will only be shown and factored into the aggregation if that option is selected in the Agent Properties.



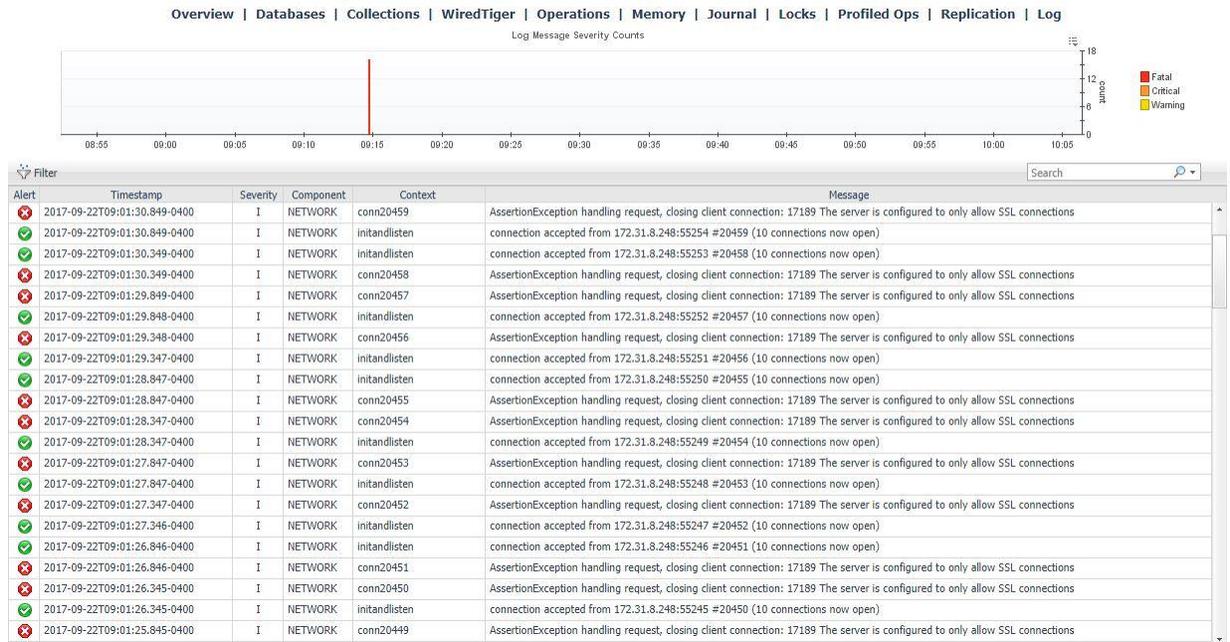
Replication

This dashboard shows Replication information for a MongoDB server. It contains summaries of the server status and replica set to which it belongs, followed by a section on Replica Members as seen from the current server's perspective, followed by performance metrics covering operations used in the replication process.



Log

The log dashboard samples current log entries generated by the MongoDB process. Entries that have generated an alert are graphed above, while all alerts displayed can be filtered by log severity (Fatal, Debug, etc.) or log component (NETWORK, SHARDING, STORAGE, etc.).



MongoDB Object Cleanup

This dashboard is a convenient utility for deleting MongoDB topology objects which are no longer being monitored. First, click the “Find Old Objects” button in the table header, then input the requested information and click “Find”. The Days Old field will narrow the filter to objects which have been updated in X number of days. Include Types allows you to select the topology types you want to delete. The For Agents table will include or exclude data from the selected agents depending on the option selected. Once objects have been found, they can be selected and deleted from the FMS.

MongoDB Object Cleanup Wednesday, January 18, 2017 10:21:26 AM - 11:21:26 AM 60 minutes | Reports

List and Delete Old Objects

Find Old Objects | Clear | Delete Selected Objects Search

| Type | Name | Agents | Last Updated |
|--------------------------|--------------|-------------------------------|-----------------|
| MongoReplicaSet | ec2-linux-01 | MongoDB_ec2-linux-01 | 1/16/17 3:14 PM |
| Mongo_Collection_Cluster | parts | MongoDB_local_shard-no-repl_s | 1/16/17 3:23 PM |
| Mongo_Collection_Cluster | pieces | MongoDB_local_shard-no-repl_s | 1/16/17 3:24 PM |
| Mongo_Collection_Cluster | constituent | MongoDB_local_shard-no-repl_s | 1/16/17 3:23 PM |
| Mongo_Collection_Cluster | components | MongoDB_local_shard-no-repl_s | 1/16/17 3:24 PM |
| Mongo_Collection_Cluster | sections | MongoDB_local_shard-no-repl_s | 1/16/17 3:23 PM |

Rules

MongoDB Alarm Email Forwarder

Forwards alarms from the MongoDB cartridge via email when they fire.

MongoDB Asserts Count

Raises an alert if any warning or user asserts are raised. While assert errors are typically uncommon, if there are non-zero values for the asserts, you should check the log file for more information. In many cases, these errors are trivial, but are worth investigating.

MongoDB Availability

Raises an alert if the monitored mongod or mongos server is unreachable two or more times in a row.

MongoDB Cleared Alarm Email Forwarder

Forwards alarms from the MongoDB cartridge via email when they clear.

MongoDB Collection Growth

Raises an alert if a collection has grown faster than usual. Collection size is compared to an historical average to determine if collection size growth/shrinkage is out of the ordinary.

MongoDB Connections Used

Raises an alert if the monitored instance is approaching its limit of available simultaneous connections.

MongoDB Cursors NoTimeout

Alert if there are open "no timeout" cursors.

MongoDB Database ExecutionTime Command

Alert if database command execution times are higher than usual.

MongoDB Database ExecutionTime Read

Alert if database read lock times are higher than usual.

MongoDB Database ExecutionTime Write

Alert if database write lock times are higher than usual.

MongoDB Flush Time

Raises an alert if the average amount of time the server has spent writing data to disk is high. Background flush information only appears for instances that use the MMAPv1 storage engine.

MongoDB Locks Deadlocks

Raises an alert if any deadlocks are encountered during lock acquisition.

MongoDB Locks Queue Length

Raises an alert if the combined global reader lock queue and global writer lock queue is getting long.

MongoDB Log Patterns

Alert if there are any log entries matching configured agent properties patterns.

MongoDB Memory DataFit

Alert if the total data size and index size on a server does not fit in physical memory. Must have the Infrastructure Cartridge enabled.

MongoDB Memory IndexFit

Alert if the total index size on a server does not fit in physical memory. Must have the Infrastructure Cartridge enabled.

MongoDB Memory Mapped Ratio

Raises an alert if mapped memory is too large with respect to non-mapped memory, the virtual memory used by a mongod process. With journaling enabled, non-mapped memory should be at least double the value of mapped memory. Three times larger or more may indicate a memory leak.

MongoDB Memory Page Faults

Raises an alert if the ratio of page faults to total database operations is too high.

MongoDB Profiling Execution Time

Raises an alert if the average execution time for profiled operations is too high. Applicable when profiling is enabled for a given database.

MongoDB ReplicaMember PingMS

Alert if replica member pingMs is large.

MongoDB Replica Member Unreachable

Raises an alert if one or more members of a replica set are not running.

MongoDB Replica Set Not Stable

Raises an alert if a replica set member is unreachable two or more times in a row.

MongoDB Replication Buffer Ratio

Raises an alert if the replication buffer is filling up. MongoDB buffers oplog operations from the replication sync source buffer before applying oplog entries in a batch.

MongoDB Replication NoPrimary

Alert if a replica set has no primary.

MongoDB Replication Oplog Headroom

Alert if replication on a secondary is falling behind and may not have time to replicate the oldest oplog entries before they are recycled.

MongoDB Replication Oplog Lag

Alert if the replication oplog lag on a secondary server is too long.

MongoDB Server State Change

Alert if a member of a replica set changes state.

MongoDB SSL Certificate Expiration

Raises an alert if a MongoDB server using an SSL/TLS certificate is approaching its expiration date.

MongoDB WiredTiger Cache DirtyBytes

Alert if the tracked dirty bytes in the WiredTiger cache is high.

MongoDB WiredTiger Cache PagesEvictedClean

Alert if the percentage of unmodified pages evicted to the total pages currently held in the WiredTiger cache is high.

MongoDB WiredTiger ConcurrentTransaction ReadTicketsAvailable

Alert if the number of available WiredTiger concurrent transaction read tickets approaches zero.

MongoDB WiredTiger ConcurrentTransaction WriteTicketsAvailable

Alert if the number of available WiredTiger concurrent transaction write tickets approaches zero.

MongoDB WiredTiger Cursor CursorCount

Alert if there is a higher than average number of open WiredTiger cursors.

MongoDB WiredTiger Cursor SessionCount

Alert if there is a higher than average number of open WiredTiger sessions.

MongoDB WiredTiger Transaction Failures

Alert if there are any WiredTiger transaction failures due to cache overflow.

Reports

MongoDB Cluster Report Iterator

Run the MongoDB Cluster Summary report for all clusters in the monitoring environment.

MongoDB Cluster Summary

Summary of a sharded MongoDB cluster. Includes availability, version, and high-level metrics for all query servers, config servers, and shard servers.

MongoDB Executive Summary

Executive summary of a MongoDB server. Includes availability, workload, operations and alarms.

MongoDB Replica Set Summary

Summary of a MongoDB replica set. Includes availability, status, latency, and high-level metrics for all member servers.

MongoDB Server Health Check

In-depth overview of a MongoDB server. Includes availability, workload, operations and alarms.

MongoDB Service Report

Display an overview and detailed health report for each MongoDB server in a service.

MongoDB Top Collections

Top collections on a MongoDB server. Sortable by document count, size, operations, etc.

MongoDB Top Profiled Ops

Top profiled operations for a MongoDB server. Sortable by execution time, rows returned, etc.