Foglight for MongoDB

Cartridge Guide

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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.

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*

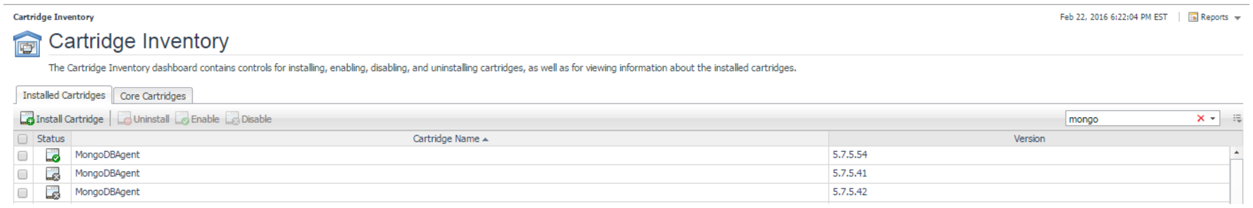
If you have not changed the password for the keystore, the default password will be "changeit". Next, edit the baseline.jvmargs.config file in the Foglight Agent Manager\state\default\config directory and add the following parameters with file paths and passwords appropriate for your system. Escape any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

```
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.



Cartridge Inventory

The Cartridge Inventory dashboard contains controls for installing, enabling, disabling, and uninstalling cartridges, as well as for viewing information about the installed cartridges.

□	Status	Cartridge Name ▲	Version
□	✓	MongoDBAgent	5.7.5.54
□	✗	MongoDBAgent	5.7.5.41
□	✗	MongoDBAgent	5.7.5.42

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

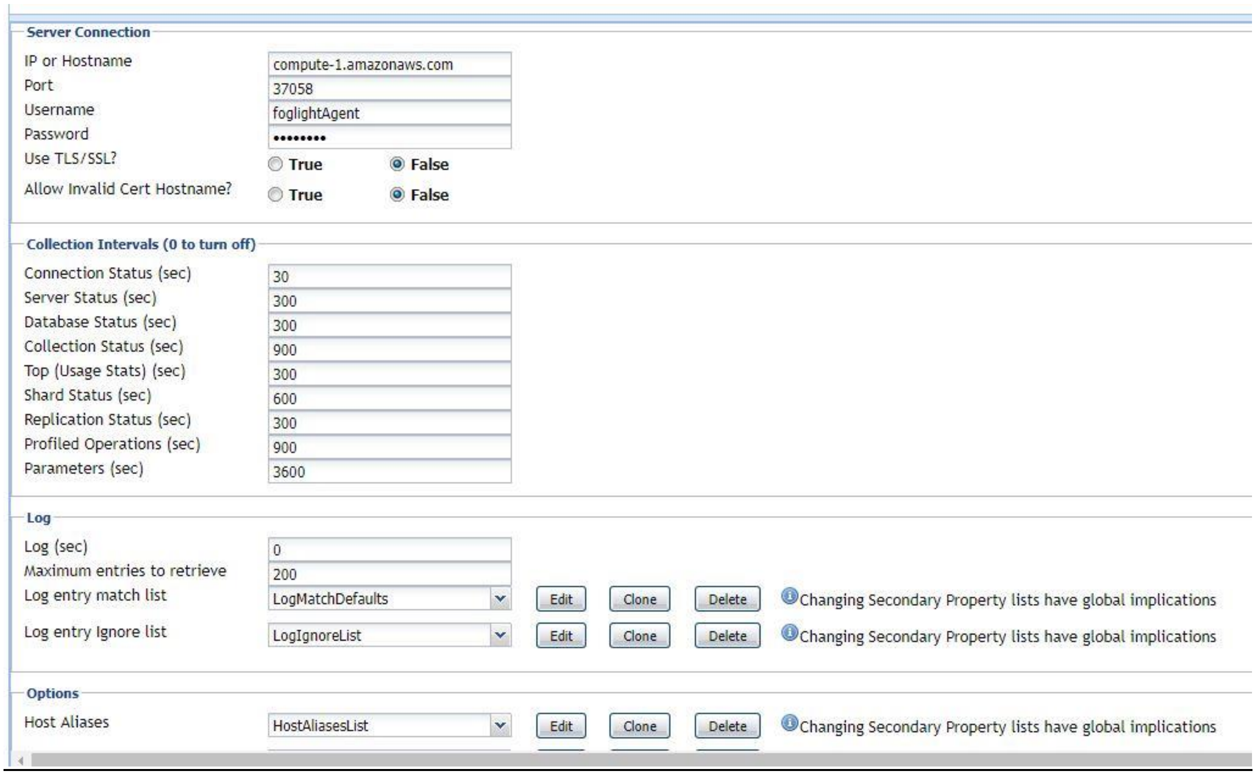
- **Maximum entries to retrieve** - The maximum number of log entries to retrieve from per collection period. Set to zero to retrieve all available entries. To disable the log collection, set the Log (sec) period to zero.
- **Log entry match list** - A list of rules specifying conditions for when log 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	compute-1.amazonaws.com				
Port	37058				
Username	foglightAgent				
Password	••••••••				
Use TLS/SSL?	○ True ● False				
Allow Invalid Cert Hostname?	○ True ● False				

Collection Intervals (0 to turn off)

Connection Status (sec)	30
Server Status (sec)	300
Database Status (sec)	300
Collection Status (sec)	900
Top (Usage Stats) (sec)	300
Shard Status (sec)	600
Replication Status (sec)	300
Profiled Operations (sec)	900
Parameters (sec)	3600

Log

Log (sec)	0				
Maximum entries to retrieve	200				
Log entry match list	LogMatchDefaults	Edit	Clone	Delete	Changing Secondary Property lists have global implications
Log entry Ignore list	LogIgnoreList	Edit	Clone	Delete	Changing Secondary Property lists have global implications

Options

Host Aliases	HostAliasesList	Edit	Clone	Delete	Changing Secondary Property lists have global implications

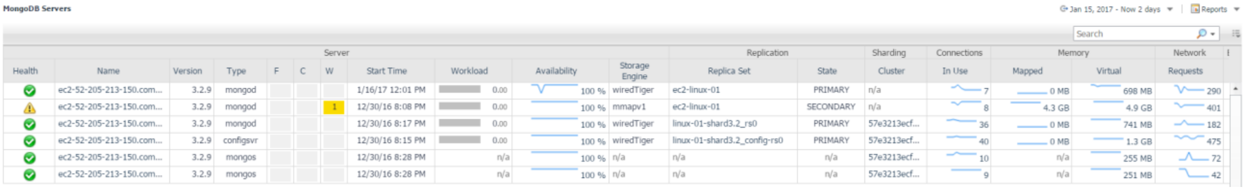
Roles

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.



MongoDB Servers

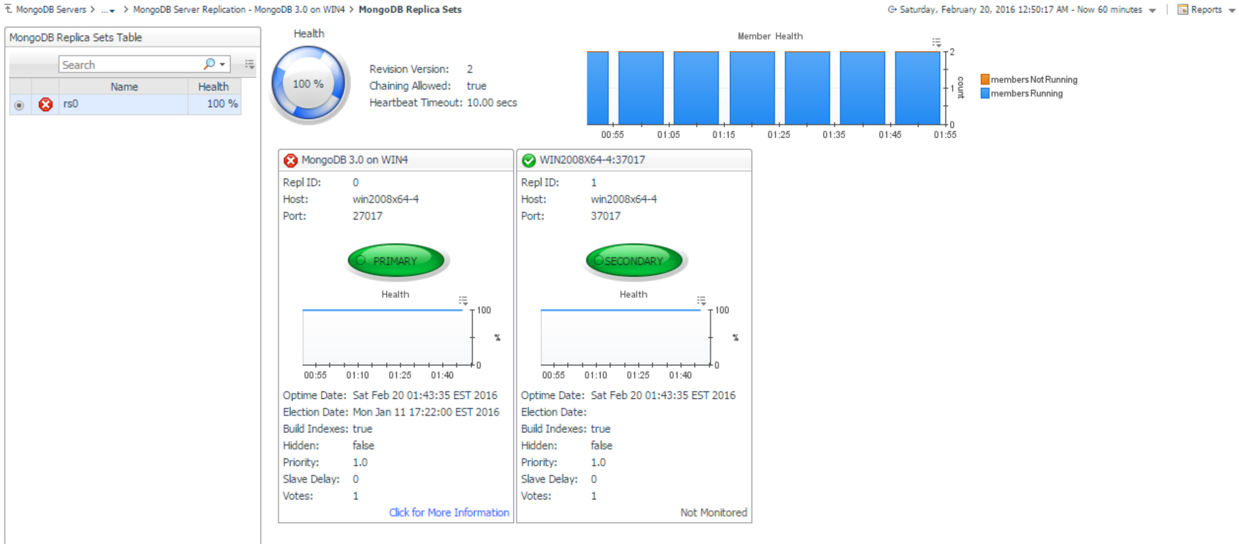
Jan 15, 2017 - Now 2 days | Reports

Search

Server											Replication		Sharding	Connections	Memory		Network
Health	Name	Version	Type	F	C	W	Start Time	Workload	Availability	Storage Engine	Replica Set	State	Cluster	In Use	Mapped	Virtual	Requests
✓	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 Servers > ... > MongoDB Server Replication - MongoDB 3.0 on WIN4 > **MongoDB Replica Sets**

Saturday, February 20, 2016 12:50:17 AM - Now 60 minutes | Reports

MongoDB Replica Sets Table

Search

		Name	Health
●	✗	rs0	100 %

Health

100 %

Revision Version: 2
Chaining Allowed: true
Heartbeat Timeout: 10.00 secs

✗ MongoDB 3.0 on WIN4

Repl ID: 0
Host: win2008x64-4
Port: 27017

PRIMARY

Optime Date: Sat Feb 20 01:43:35 EST 2016
Election Date: Mon Jan 11 17:22:00 EST 2016
Build Indexes: true
Hidden: false
Priority: 1.0
Slave Delay: 0
Votes: 1

Click for More Information

✓ WIN2008X64-4:37017

Repl ID: 1
Host: win2008x64-4
Port: 37017

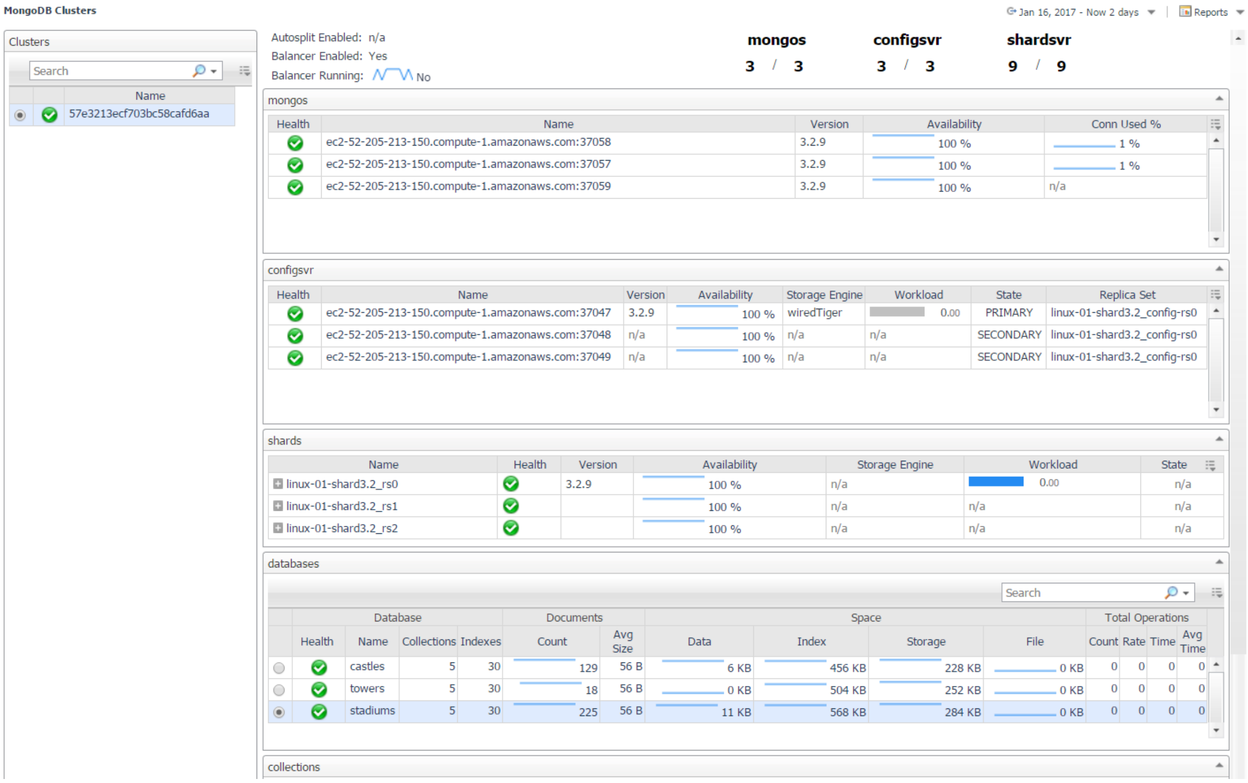
SECONDARY

Optime Date: Sat Feb 20 01:43:35 EST 2016
Election Date:
Build Indexes: true
Hidden: false
Priority: 1.0
Slave Delay: 0
Votes: 1

Not Monitored

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.



		Name
●	✓	57e3213ecf703bc58cafd6aa

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

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

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

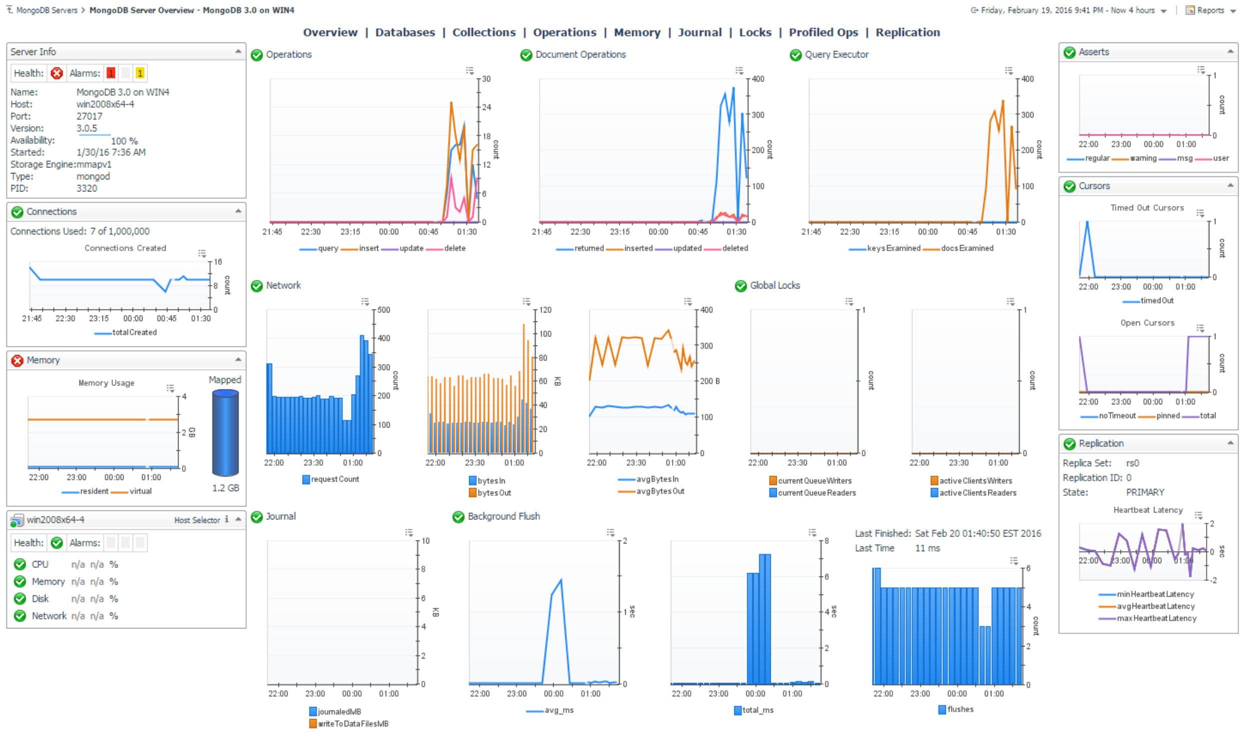
databases

	Database				Documents		Space				Total Operations			
	Health	Name	Collections	Indexes	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.



Health: ☒ Alarms: 1 1

Name: MongoDB 3.0 on WIN4
Host: win2008x64-4
Port: 27017
Version: 3.0.5
Availability: 100 %
Started: 1/30/16 7:36 AM
Storage Engine:mmapv1
Type: mongod
PID: 3320

Connections Used: 7 of 1,000,000

Mapped 1.2 GB

win2008x64-4

Health: ✓ Alarms:

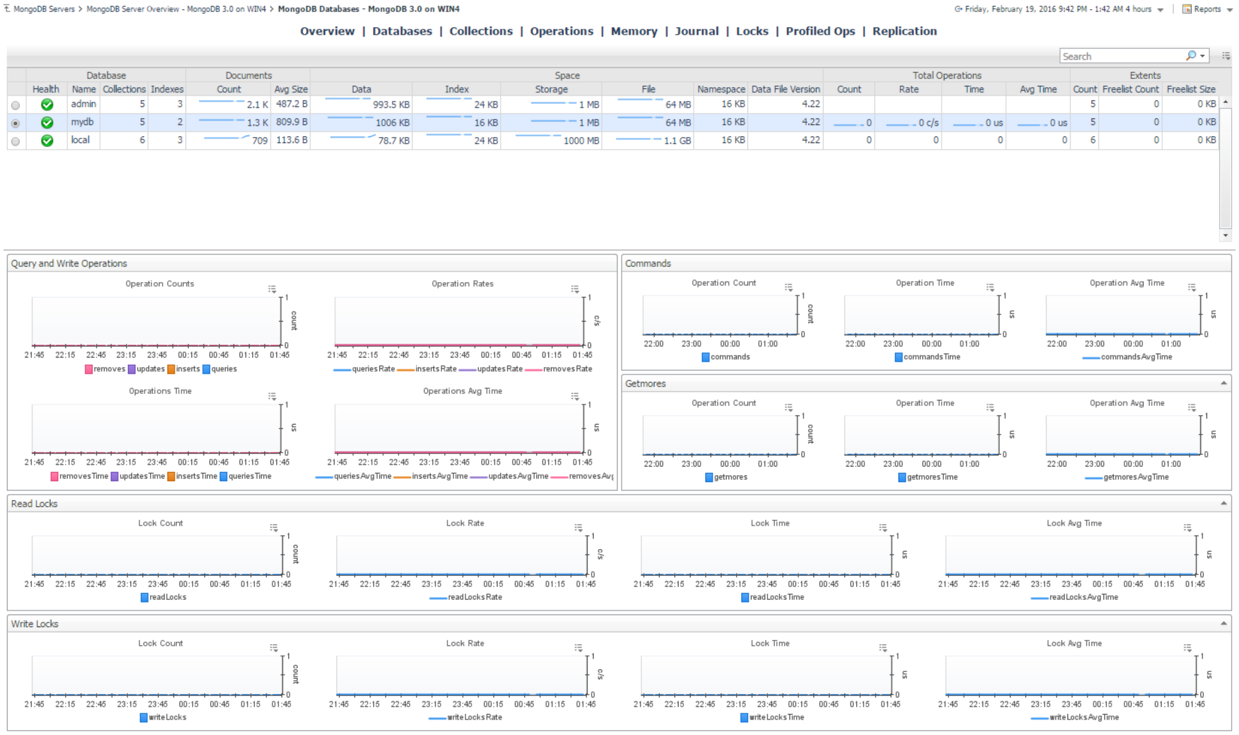
✓ CPU n/a n/a %
✓ Memory n/a n/a %
✓ Disk n/a n/a %
✓ Network n/a n/a %

Last Finished: Sat Feb 20 01:40:50 EST 2016
Last Time 11 ms

Replica Set: rs0
Replication ID: 0
State: PRIMARY

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.



MongoDB Servers > MongoDB Server Overview - MongoDB 3.0 on WIN4 > **MongoDB Databases - MongoDB 3.0 on WIN4**

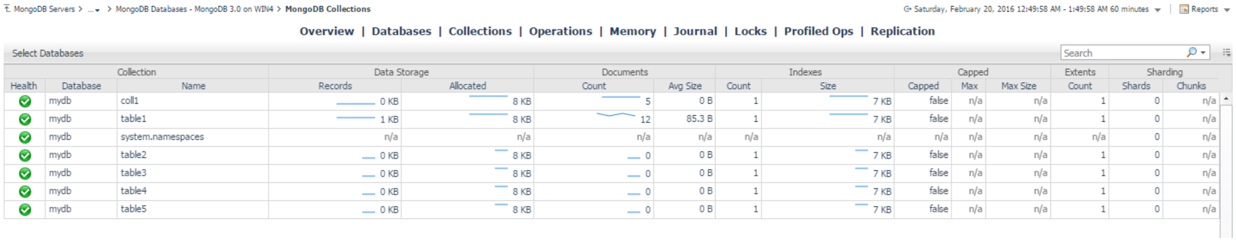
Friday, February 19, 2016 9:42 PM - 1:42 AM 4 hours

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

	Database				Documents		Space						Total Operations				Extents		
	Health	Name	Collections	Indexes	Count	Avg Size	Data	Index	Storage	File	Namespace	Data File Version	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					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	0	0	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.



MongoDB Servers > ... > MongoDB Databases - MongoDB 3.0 on WIN4 > **MongoDB Collections**

Saturday, February 20, 2016 12:49:58 AM - 1:49:58 AM 60 minutes

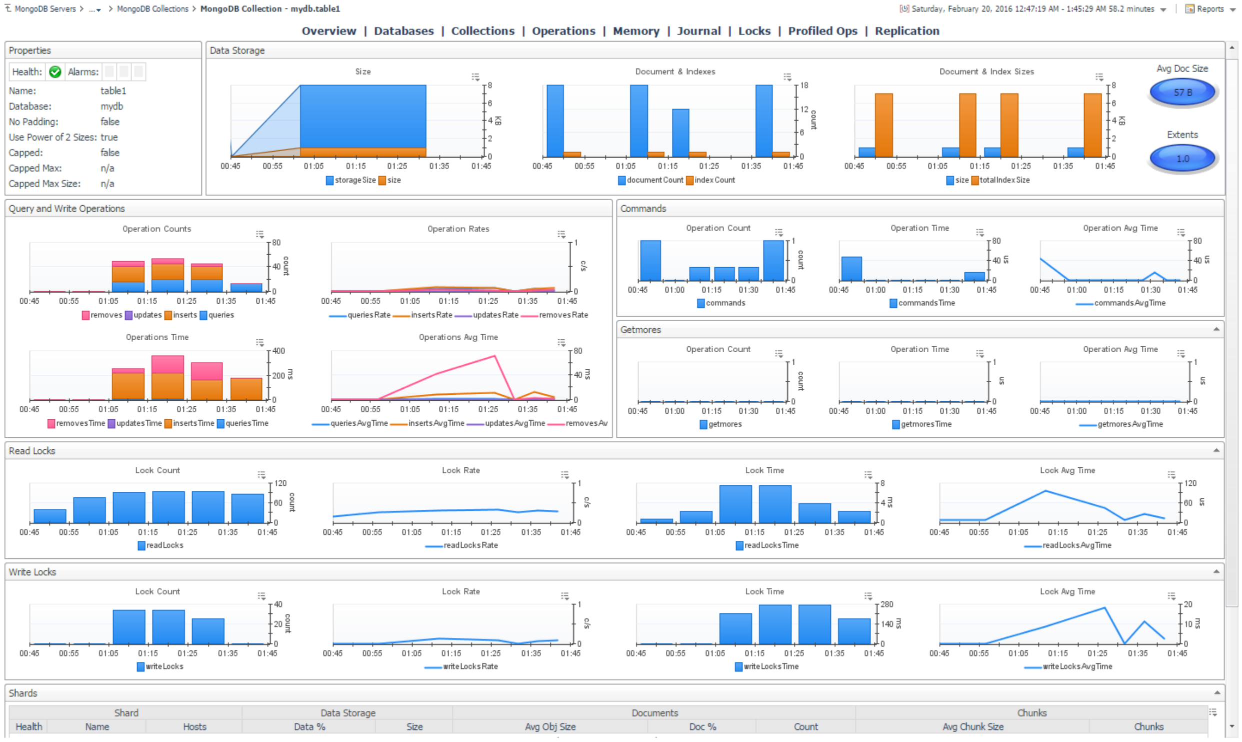
Overview | Databases | Collections | Operations | Memory | Journal | Locks | Profiled Ops | Replication

Select Databases

	Collection		Data Storage		Documents		Indexes		Capped			Extents	Sharding	
Health	Database	Name	Records	Allocated	Count	Avg Size	Count	Size	Capped	Max	Max 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.



MongoDB Servers > ... > MongoDB Collections > **MongoDB Collection - mydb.table1**

Saturday, February 20, 2016 12:47:19 AM - 1:45:29 AM 58.2 minutes | Reports

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

Properties

Health: ✓ Alarms:

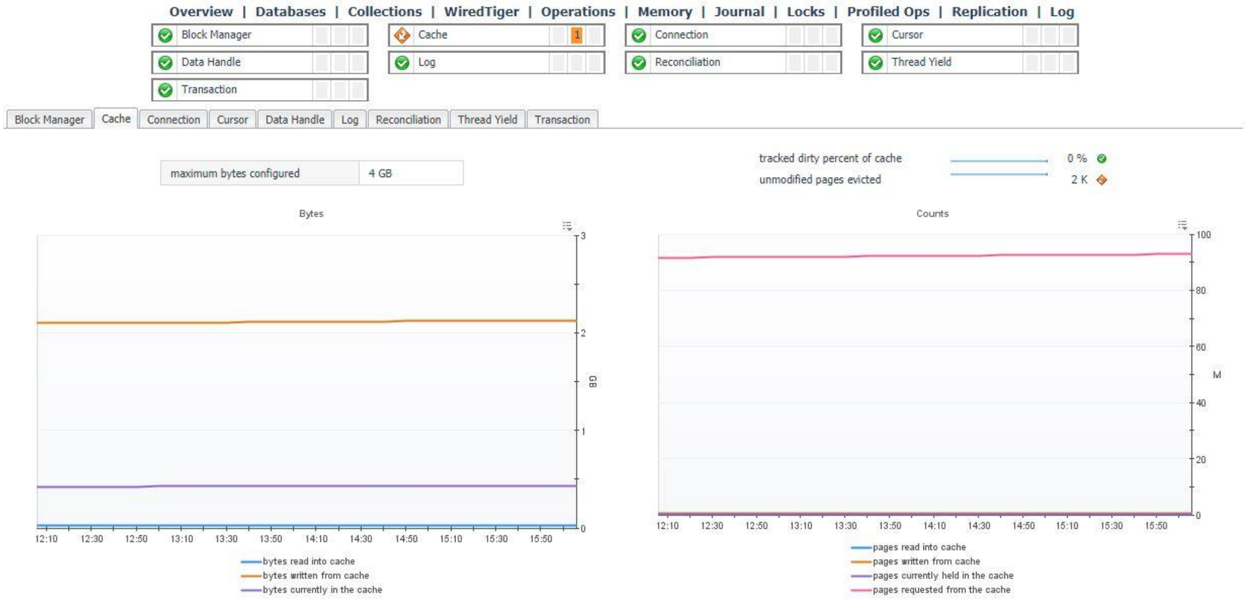
Name: table1
Database: mydb
No Padding: false
Use Power of 2 Sizes: true
Capped: false
Capped Max: n/a
Capped Max Size: n/a

Shards

Shard			Data Storage		Documents			Chunks	
Health	Name	Hosts	Data %	Size	Avg Obj Size	Doc %	Count	Avg Chunk Size	Chunks

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.



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

✓ Block Manager
◆ Cache 1
✓ Connection
✓ Cursor
✓ Data Handle
✓ Log
✓ Reconciliation
✓ Thread Yield
✓ Transaction

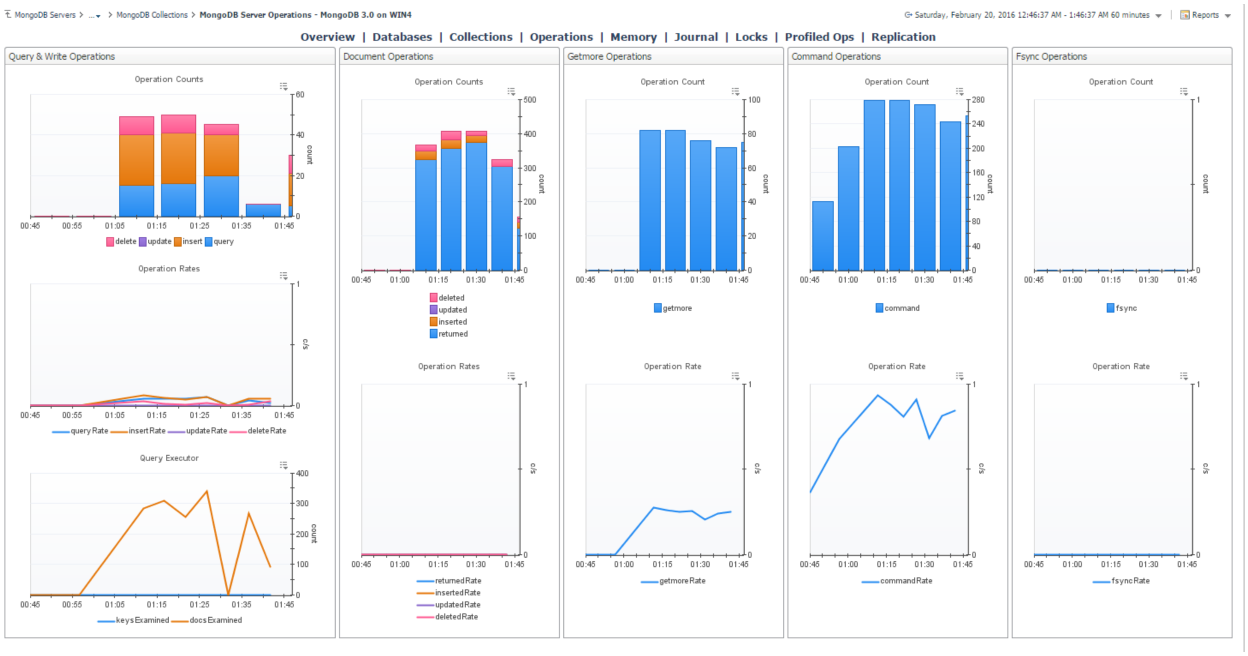
Block Manager | Cache | Connection | Cursor | Data Handle | Log | Reconciliation | Thread Yield | Transaction

maximum bytes configured: 4 GB

tracked dirty percent of cache: 0 % ✓
unmodified pages evicted: 2 K ◆

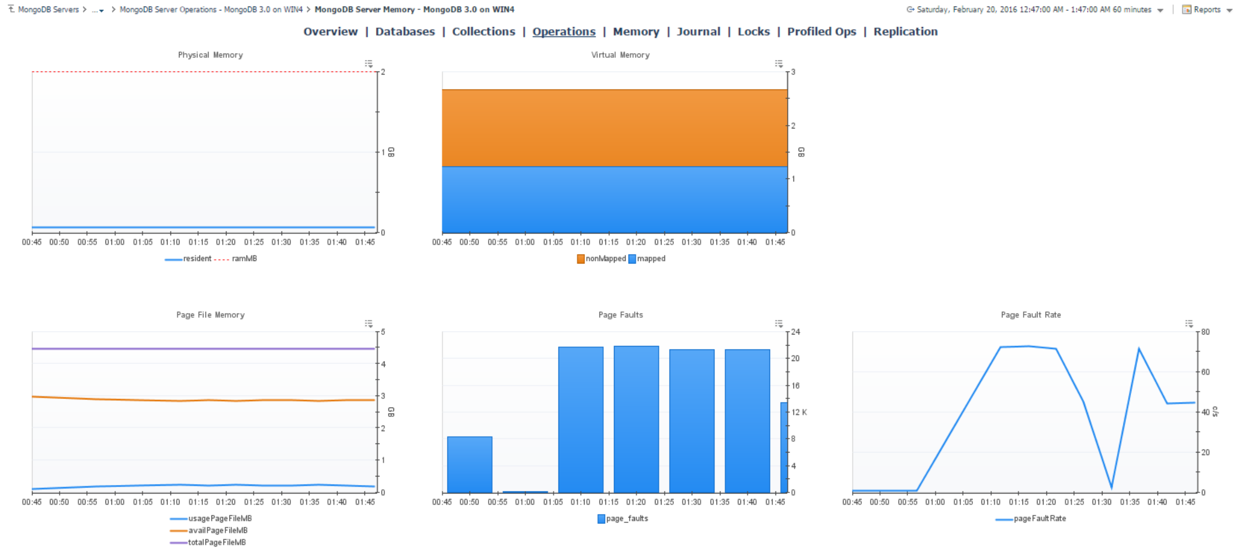
Operations

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.



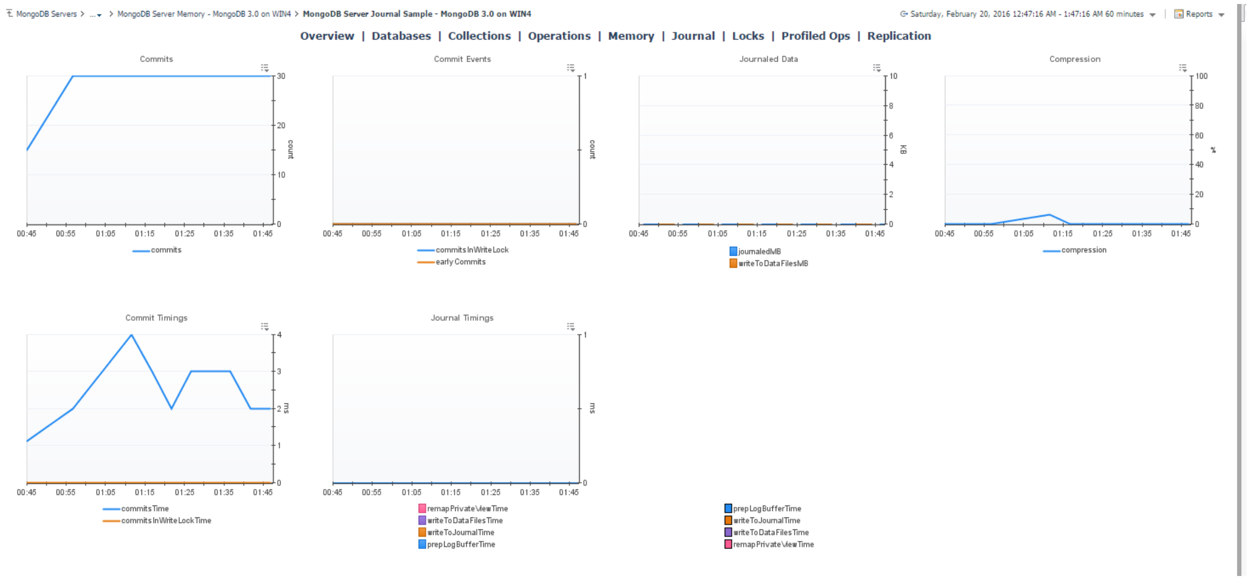
Memory

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.


MongoDB Servers > ... > MongoDB Server Operations - MongoDB 3.0 on WIN4 > MongoDB Server Memory - MongoDB 3.0 on WIN4
Saturday, February 20, 2016 12:47:00 AM - 1:47:00 AM 60 minutes
Reports
Overview | Databases | Collections | Operations | Memory | Journal | Locks | Profiled Ops | Replication
Physical Memory
GB
resident
ramMB
Virtual Memory
nonMapped
mapped
Page File Memory
usagePageFileMB
availPageFileMB
totalPageFileMB
Page Faults
12 K
page_faults
Page Fault Rate
c/s
pageFaultRate
00:45
00:50
00:55
01:00
01:05
01:10
01:15
01:20
01:25
01:30
01:35
01:40
01:45

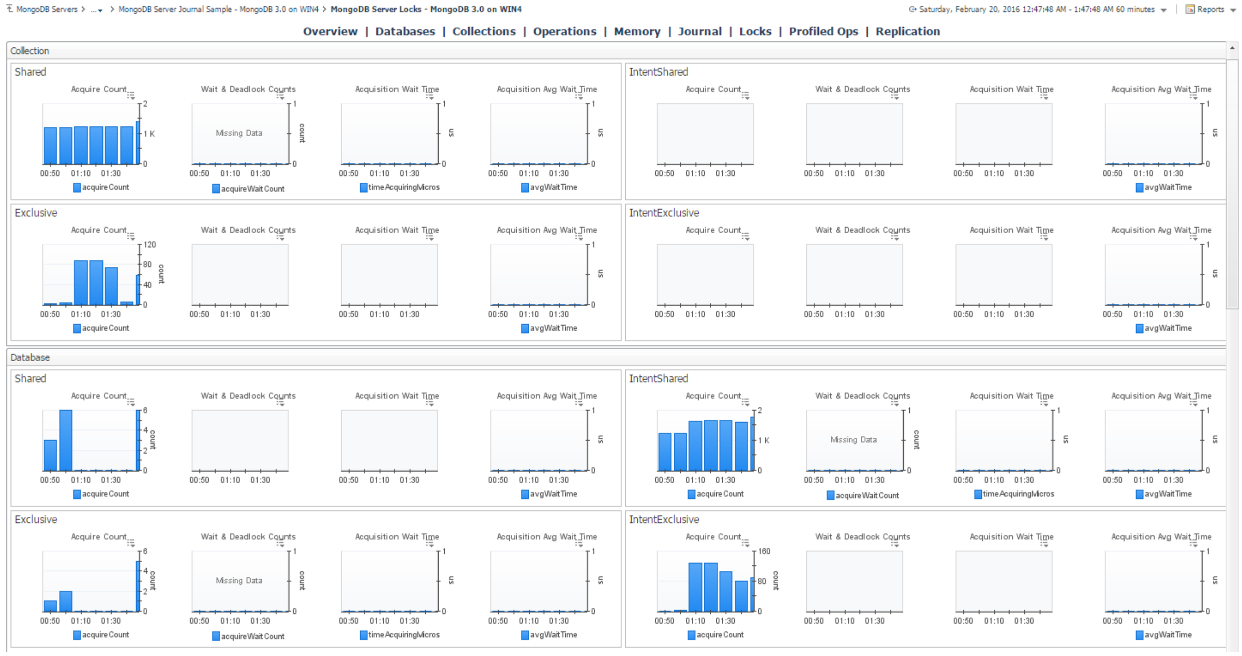
Journal

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



Locks

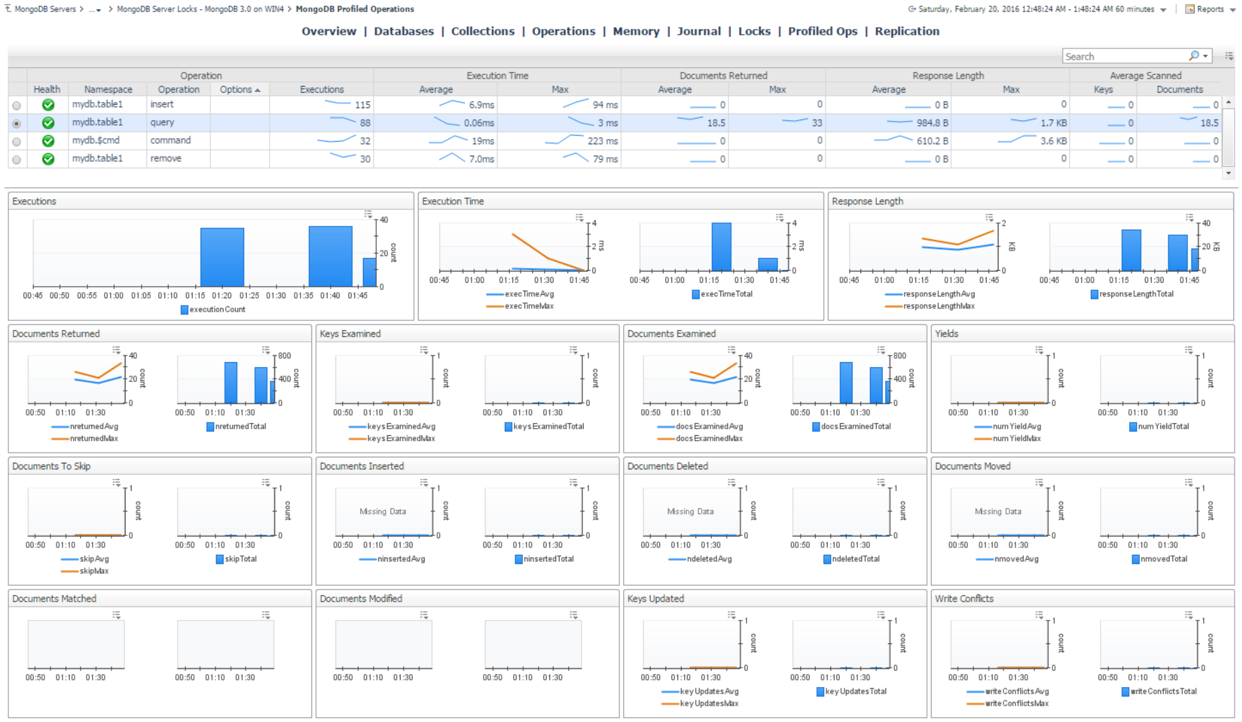
The Locks Dashboard displays a Dynamic Collection of locks for various lock types. MongoDB collects information on locks at a number of levels within its architecture. This dashboard will capture all lock information present. The illustration below shows Collection; Database; Global; MMAPV1Journal; Metadata: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



MongoDB Servers > ... > MongoDB Server Journal Sample - MongoDB 3.0 on WIN4 > MongoDB Server Locks - MongoDB 3.0 on WIN4
Saturday, February 20, 2016 12:47:48 AM - 1:47:48 AM 60 minutes
Reports
Overview | Databases | Collections | Operations | Memory | Journal | Locks | Profiled Ops | Replication
Collection
Shared
IntentShared
Exclusive
IntentExclusive
Database
Shared
IntentShared
Exclusive
IntentExclusive
Acquire Count
Wait & Deadlock Counts
Acquisition Wait Time
Acquisition Avg Wait Time
Missing Data
count
us
00:50 01:10 01:30
acquireCount
acquireWaitCount
timeAcquiringMicros
avgWaitTime
2
1 K
0
120
80
40
160
6
4

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.



MongoDB Servers > ... > MongoDB Server Locks - MongoDB 3.0 on WIN4 > MongoDB Profiled Operations

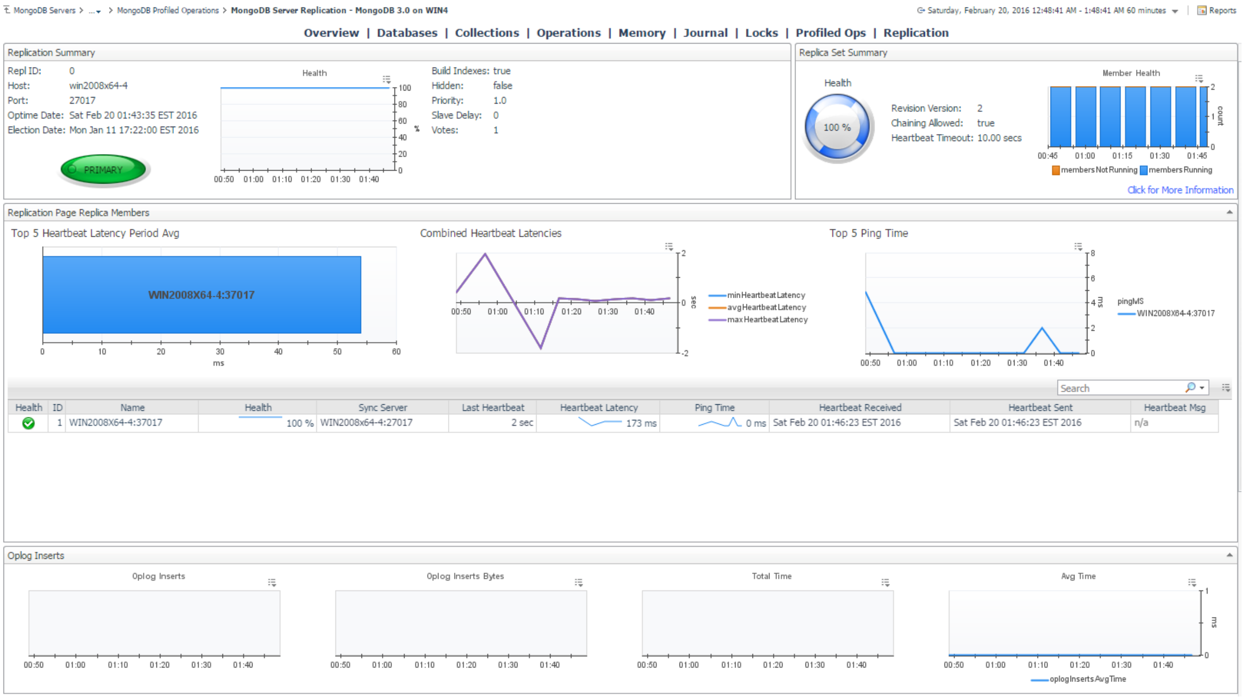
Saturday, February 20, 2016 12:48:24 AM - 1:48:24 AM 60 minutes

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

	Operation					Execution Time		Documents Returned		Response Length		Average Scanned	
	Health	Namespace	Operation	Options ▲	Executions	Average	Max	Average	Max	Average	Max	Keys	Documents
○	✓	mydb.table1	insert		115	6.9ms	94 ms	0	0	0 B	0	0	0
●	✓	mydb.table1	query		88	0.06ms	3 ms	18.5	33	984.8 B	1.7 KB	0	18.5
○	✓	mydb.$cmd	command		32	19ms	223 ms	0	0	610.2 B	3.6 KB	0	0
○	✓	mydb.table1	remove		30	7.0ms	79 ms	0	0	0 B	0	0	0

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.



MongoDB Servers > ... > MongoDB Profiled Operations > **MongoDB Server Replication - MongoDB 3.0 on WIN4**

Saturday, February 20, 2016 12:48:41 AM - 1:48:41 AM 60 minutes | Reports

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

Replication Summary

Repl ID: 0
Host: win2008x64-4
Port: 27017
Optime Date: Sat Feb 20 01:43:35 EST 2016
Election Date: Mon Jan 11 17:22:00 EST 2016

Build Indexes: true
Hidden: false
Priority: 1.0
Slave Delay: 0
Votes: 1

PRIMARY
Health
100
80
60
40
20
0
%
00:50
01:00
01:10
01:20
01:30
01:40

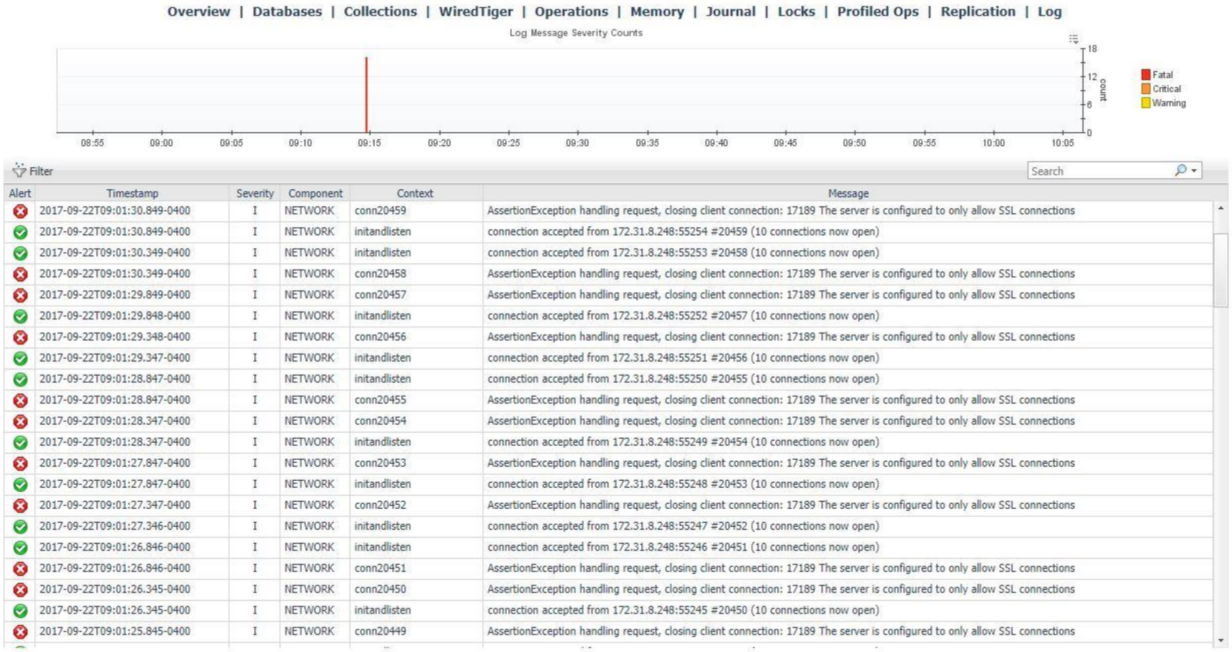
Replica Set Summary

Revision Version: 2
Chaining Allowed: true
Heartbeat Timeout: 10.00 secs

Health	ID	Name	Health	Sync Server	Last Heartbeat	Heartbeat Latency	Ping Time	Heartbeat Received	Heartbeat Sent	Heartbeat Msg
✓	1	WIN2008X64-4:37017	100 %	WIN2008x64-4:27017	2 sec	173 ms	0 ms	Sat Feb 20 01:46:23 EST 2016	Sat Feb 20 01:46:23 EST 2016	n/a

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.).

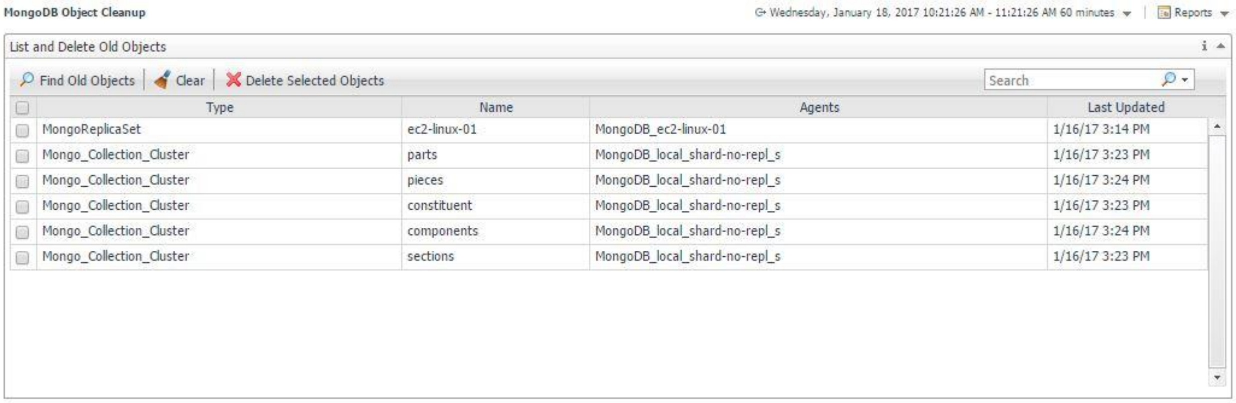


Overview | Databases | Collections | WiredTiger | Operations | Memory | Journal | Locks | Profiled Ops | Replication | Log
Log Message Severity Counts
18
12
6
0
count
08:55
09:00
09:05
09:10
09:15
09:20
09:25
09:30
09:35
09:40
09:45
09:50
09:55
10:00
10:05
Fatal
Critical
Warning
Filter
Search

Alert	Timestamp	Severity	Component	Context	Message
✗	2017-09-22T09:01:30.849-0400	I	NETWORK	conn20459	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:30.849-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55254 #20459 (10 connections now open)
✓	2017-09-22T09:01:30.349-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55253 #20458 (10 connections now open)
✗	2017-09-22T09:01:30.349-0400	I	NETWORK	conn20458	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✗	2017-09-22T09:01:29.849-0400	I	NETWORK	conn20457	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:29.848-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55252 #20457 (10 connections now open)
✗	2017-09-22T09:01:29.348-0400	I	NETWORK	conn20456	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:29.347-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55251 #20456 (10 connections now open)
✓	2017-09-22T09:01:28.847-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55250 #20455 (10 connections now open)
✗	2017-09-22T09:01:28.847-0400	I	NETWORK	conn20455	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✗	2017-09-22T09:01:28.347-0400	I	NETWORK	conn20454	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:28.347-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55249 #20454 (10 connections now open)
✗	2017-09-22T09:01:27.847-0400	I	NETWORK	conn20453	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:27.847-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55248 #20453 (10 connections now open)
✗	2017-09-22T09:01:27.347-0400	I	NETWORK	conn20452	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:27.346-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55247 #20452 (10 connections now open)
✓	2017-09-22T09:01:26.846-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55246 #20451 (10 connections now open)
✗	2017-09-22T09:01:26.846-0400	I	NETWORK	conn20451	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✗	2017-09-22T09:01:26.345-0400	I	NETWORK	conn20450	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections
✓	2017-09-22T09:01:26.345-0400	I	NETWORK	initandlisten	connection accepted from 172.31.8.248:55245 #20450 (10 connections now open)
✗	2017-09-22T09:01:25.845-0400	I	NETWORK	conn20449	AssertionException handling request, closing client connection: 17189 The server is configured to only allow SSL connections

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 Catridge enabled.

MongoDB Memory IndexFit

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