MySQL and MongoDB Monitoring and Optimization

with Percona Monitoring and Management

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May 11th, 2017

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PMM Stands for

PERCONA

Monitoring and Management

Why Did We Start Working on PMM

Percona Vision

100% Free and Open Source Platform for 95% of applications

Monitoring and Management

Critical need for modern database infrastructure

Monitoring and Management Status

Commercial License

Cloud Based

Do it yourself

Would be great to have

100% Free and Open Source

Can run In the Cloud and on Premises

Easy to use

Available for

Anyone on the Team

- Engineers,
- DBA
- SREs

Any Environment

- Development
- Staging/QA
- Production

About PMM

PMM Philosophy

Do not reinvent the wheel

Use as much of industry leading components as possible

Make Integration and Customization easy

Industry Leading Components

Current Focus

To Become Best 100% Free and Open Source Solution for MySQL and MongoDB

Currently Works

- Metrics for MySQL and MongoDB
- Support for PXC, Galera, ProxySQL
- Support of Amazon RDS
- Query Analytics for MySQL
- Experimental Orchestrator Integration
- Do it yourself Grafana Alerting

PMM Platform Support

Server Side

- Docker
- Virtual Appliance
- AMI

Client Side

- Linux

In Works

- Support for Longer retention period
- Better Cloud Support
- Ease of use
- Query Analytics for MongoDB
- Improved Query Analytics Interface
- Alerting

By the Experts for the Experts ?

Assist Experts to Resolve the most complicated problems

But be friendly enough for Non-Expert use

Actionable Advice

Integration and Automation

PMM Data Capture

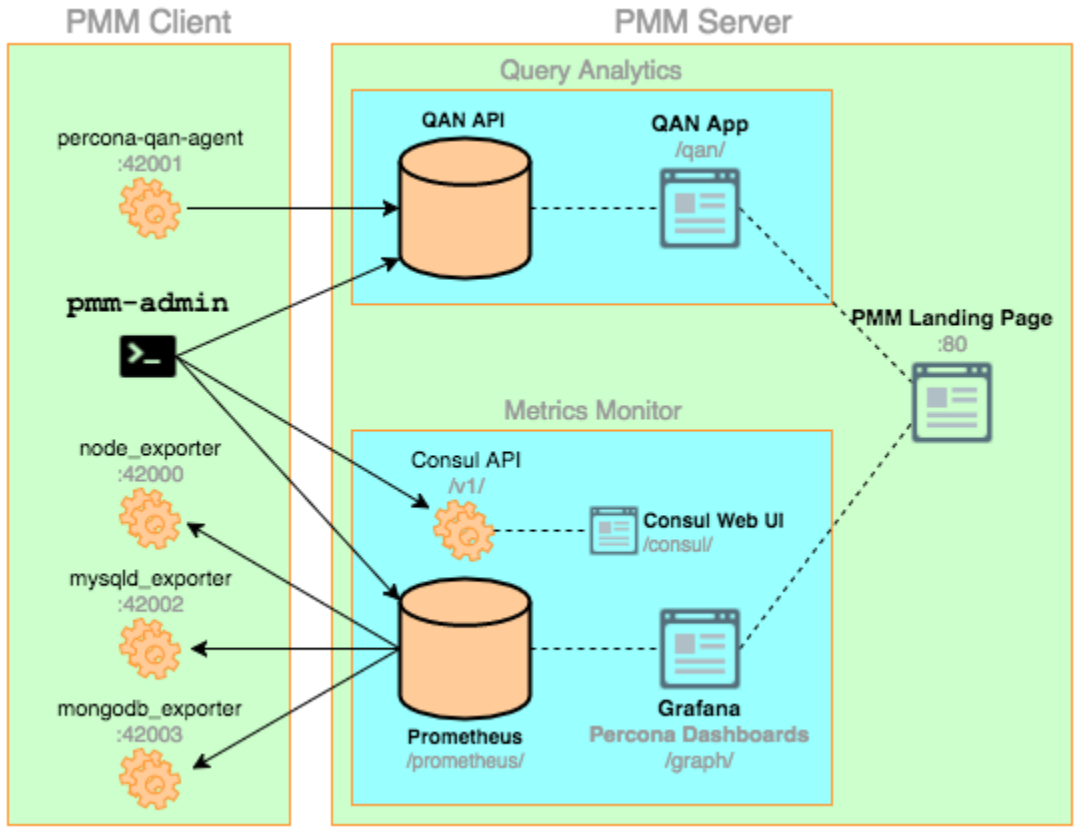
1 sec resolution data capture for most important data

Capture a lot more with lower resolution

Allow to perform deep analyses

1000s of metrics captured per instance

PMM Architecture Overview



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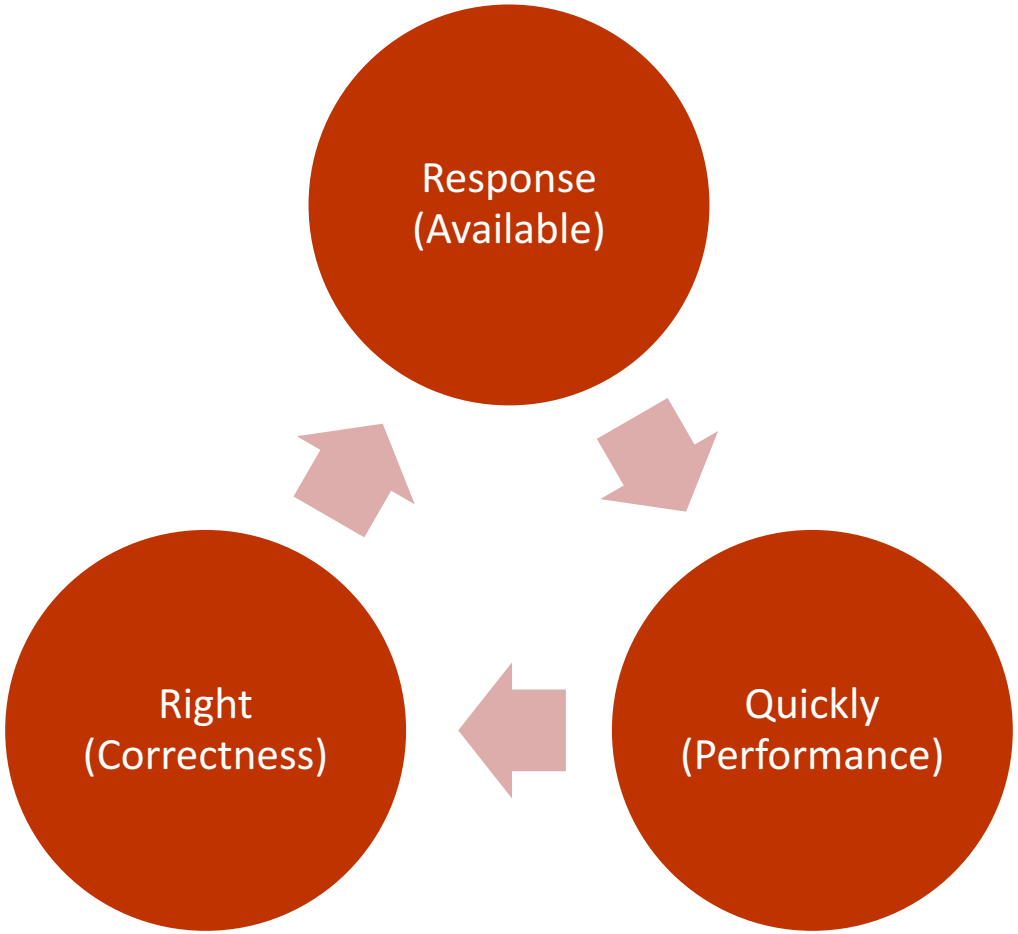
Database as a Black Box….

What does MySQL and MongoDB do ?

Responds Application Requests

Criteria



Problem Caused By

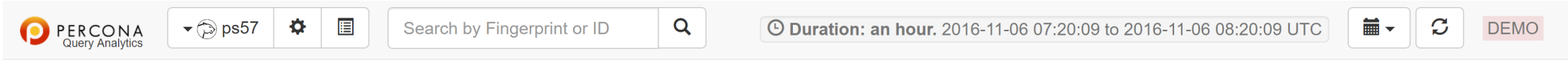
Application	Database	Hardware and Environment
• Too many Queries • Bad Queries • Improper Capacity Planning	• Choosing Bad Plan • Contention Issues • Locking	• CPU • Disk • Memory • Network

Query Analyses

Working for MySQL

Will be available for MongoDB shortly

What Queries are causing the load ?



Top 10 of 57 Queries by % Grand Total Time (%GTT)

#	Query Abstract	ID	Load	Count	Latency
	TOTAL		7.88 (100%)	780.82 QPS	2.81 m (100%)	10.10 ms avg
1	UPDATE sbtest	D30AD7E3079ABCE7	5.31 (67.30%)	258.58 QPS	930.90 k (33.12%)	20.52 ms avg
2	LOCK sbtest	0B759DF6D01BDB8F	1.20 (15.21%)	2.54 QPS	9.15 k (0.33%)	471.58 ms avg
3	SELECT sbtest	558CAEF5F387E929	0.42 (5.31%)	170.65 QPS	614.35 k (21.86%)	2.45 ms avg
4	COMMIT	813031B8BBC3B329	0.23 (2.86%)	14.06 QPS	50.62 k (1.80%)	16.05 ms avg
5	SELECT myisam.sbtest	C4832A98728C4424	0.18 (2.25%)	<0.01 QPS	4.00 (0.00%)	159.32 sec avg
6	SELECT sbtest	87625C47A176BEDD	0.08 (0.96%)	188.79 QPS	679.63 k (24.18%)	399.86 µs avg
7	SELECT sbtest	6433B7802D745420	0.07 (0.86%)	17.27 QPS	62.19 k (2.21%)	3.93 ms avg
8	SELECT sbtest	9CD3EAA5A1950648	0.07 (0.85%)	16.88 QPS	60.75 k (2.16%)	3.97 ms avg
9	SELECT sbtest	FE6FFA06B3AC9BB4	0.07 (0.83%)	17.09 QPS	61.53 k (2.19%)	3.83 ms avg
10	SELECT sbtest	F54DBEF3D7AE474D	0.06 (0.75%)	17.33 QPS	62.39 k (2.22%)	3.42 ms avg

Load next 10 queries

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Why are they causing this load ?

UPDATE sbtest D30AD7E3079ABCE7

Selected query class: 930.90 k Queries (258.58 QPS, 67.30%, 5.31 Load) | Total: 2.81 m Queries (780.82 QPS, 100.00%, 7.88 Load)

Metrics	Rate/Sec	Sum	Per Query Stats
Query Count	259.12 (per sec)	932.85 k 32.40% of total	
Query Time	5.31 load (67.16%)	19101.45 sec 67.16% of total	5.25 ms avg
Lock Time	1.38 (avg load)	4965.60 sec 51.50% of total 15.13% of query time	793.79 µs avg
Innodb Row Lock Wait	<0.01 (avg load)	28.14 sec 42.03% of total 1.44% of query time	75.79 µs avg
Innodb IO Read Wait	<0.01 (avg load)	35.85 sec 2.47% of total 10.93% of query time	573.60 µs avg
Innodb Read Ops	2.48 (per sec)	8.91 k 1.86% of total	0.00 avg
Innodb Read Bytes	39.61 KB (per sec)	139.25 MB 1.86% of total 16.00 KB avg io size	3.50 KB avg
Innodb Distinct Pages	-	-	6.03 avg
Bytes Sent	13.18 KB (per sec)	46.35 MB 1.72% of total	52.00 Bytes avg
Rows Examined	258.17 (per sec)	929.43 k 0.64% of total 0.00 per row sent	0.88 avg

How to fix them

EXPLAIN

Database: innodb EXPLAIN

Id	SelectType	Table	Partitions	CreateTable	Type	PossibleKeys	Key	KeyLen	Ref	Rows	Extra
1	SIMPLE	sbtest1			const	PRIMARY	PRIMARY	4	const	1	

CREATE STATUS

```
CREATE TABLE `sbtest1` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `k` int(10) unsigned NOT NULL DEFAULT '0',
  `c` char(120) NOT NULL DEFAULT '',
  `pad` char(60) NOT NULL DEFAULT '',
  PRIMARY KEY (`id`),
  KEY `k_1` (`k`)
) ENGINE=MyISAM AUTO_INCREMENT=100000001 DEFAULT CHARSET=latin1 |
```

CREATE STATUS

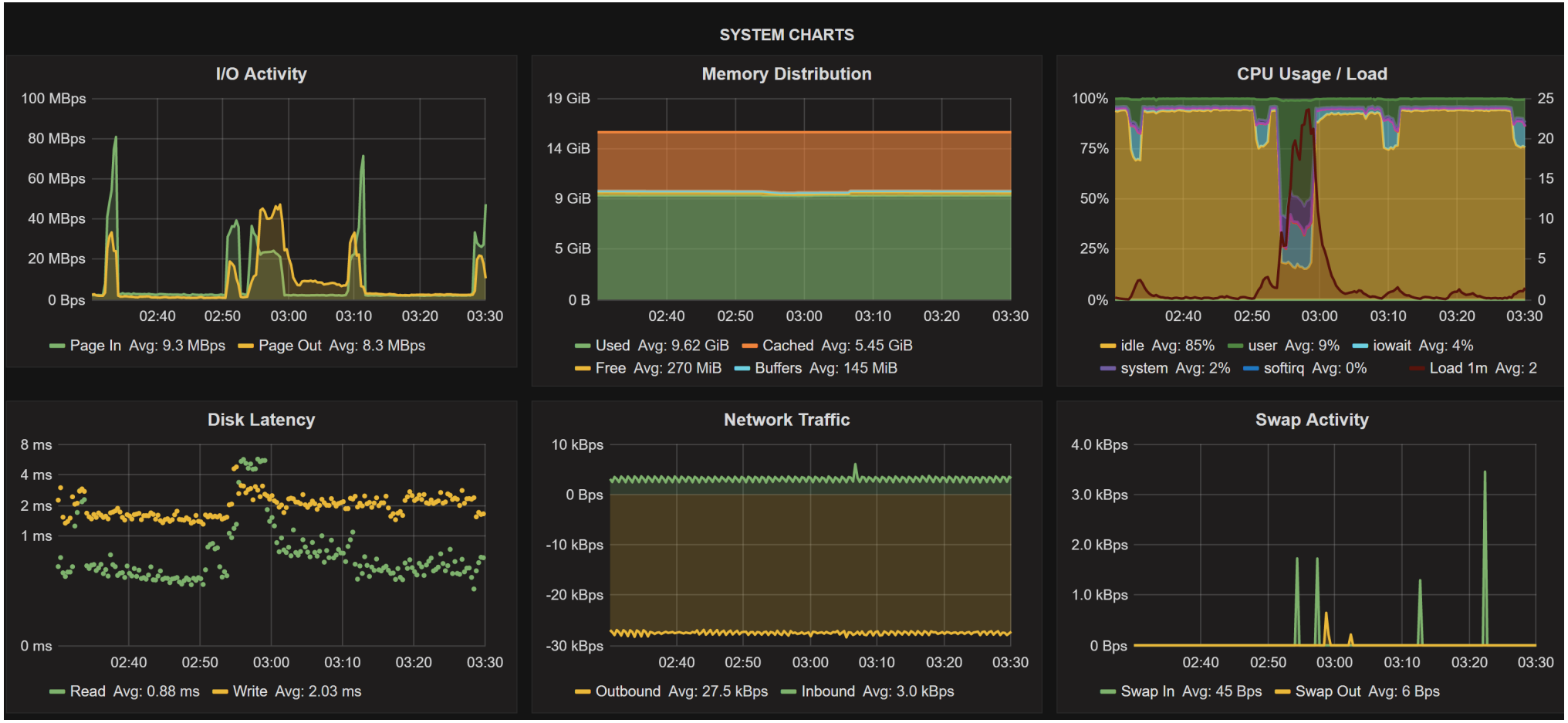
Name	Value
Name	sbtest1
Engine	MyISAM
Version	10
RowFormat	Fixed
Rows	100.00 m
AvgRowLength	189.00 Bytes
DataLength	17.60 GB
MaxDataLength	756.00 GB
IndexLength	1.70 GB

System Information

MySQL Summary

```
# Percona Toolkit MySQL Summary Report ######################
             System time | 2016-11-06 08:27:41 UTC (local TZ: CET +0100)
# Instances ################################################
  Port  Data Directory             Nice OOM Socket
  ===== ========================== ==== === ======
                                   0    0
# MySQL Executable #########################################
       Path to executable | /usr/sbin/mysqld
              Has symbols | No
# Report On Port 3306 ######################################
                     User | root@localhost
                     Time | 2016-11-06 09:27:41 (CEST)
                 Hostname | ps57
                  Version | 5.7.14-8-log Percona Server (GPL), Release 8, Revision 1f84ccd
                 Built On | Linux x86_64
                  Started | 2016-10-06 16:33 (up 30+16:54:37)
                Databases | 8
                  Datadir | /var/lib/mysql/
                Processes | 250 connected, 2 running
              Replication | Is not a slave, has 1 slaves connected
                  Pidfile | /var/run/mysqld/mysqld.pid (exists)
```

What happens on OS and Hardware Level



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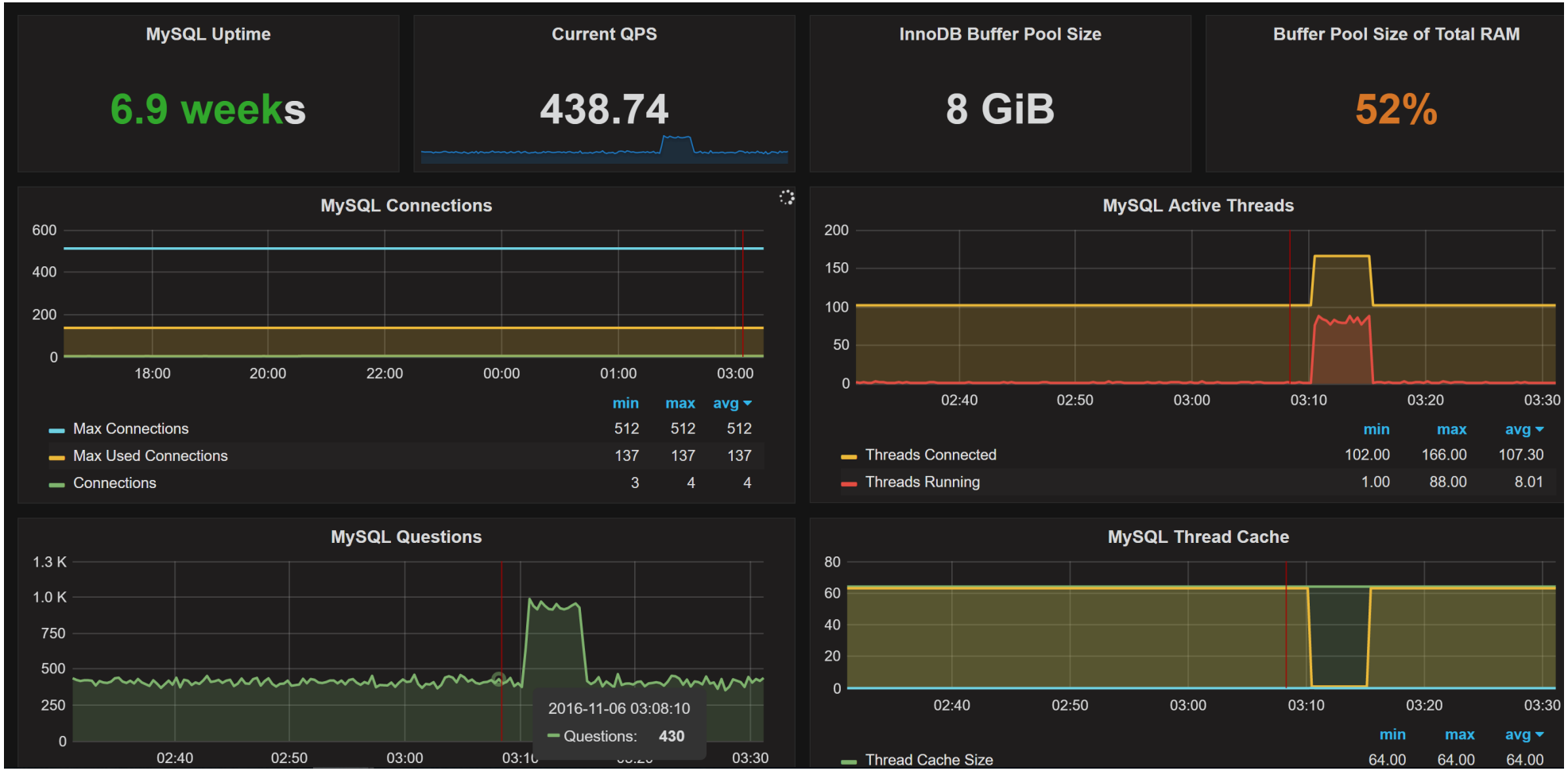
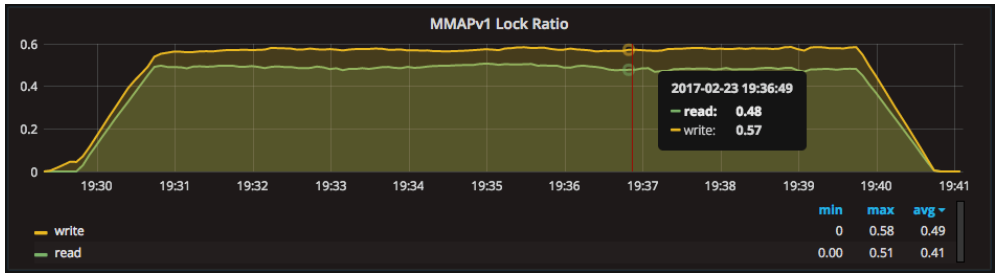
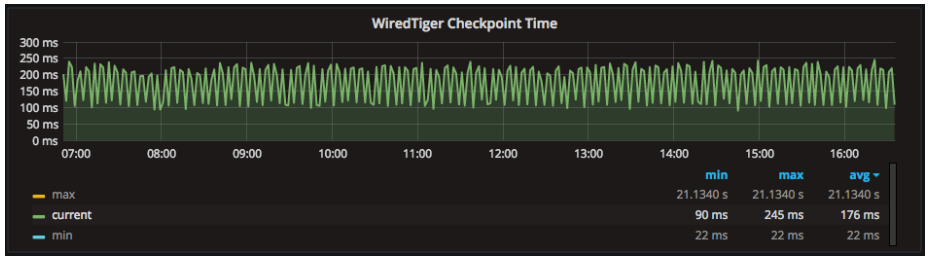
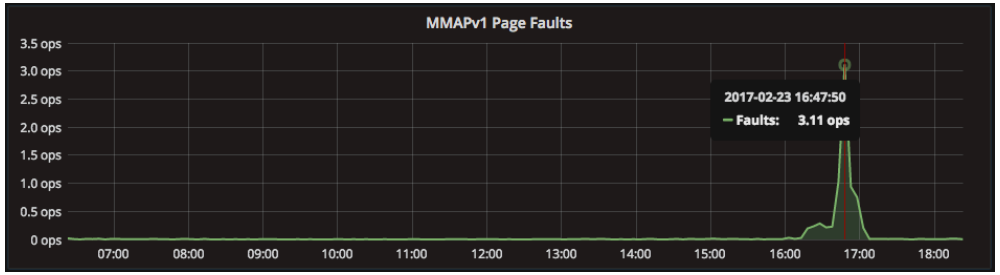
As well as Database Level

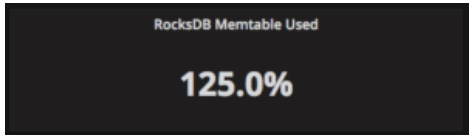


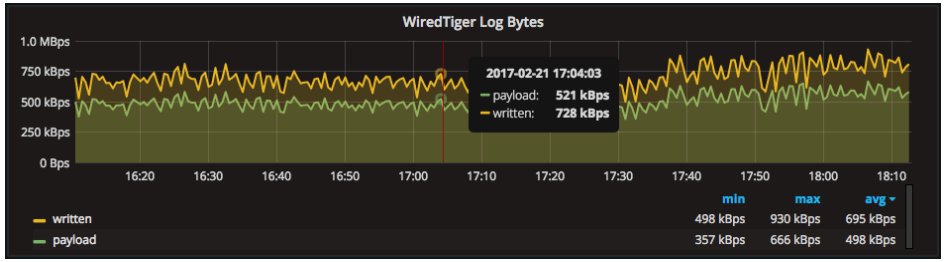
In-Depth MongoDB Dashboards

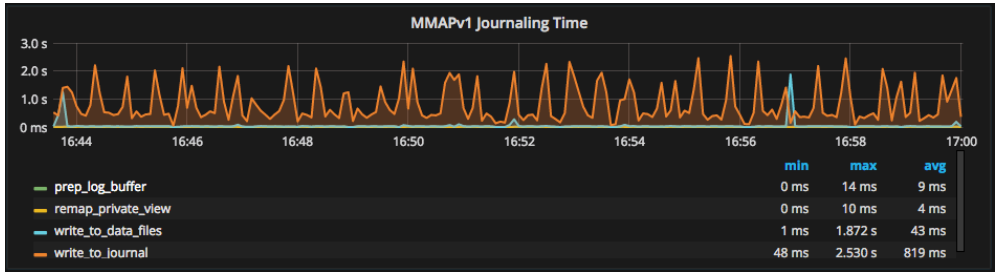


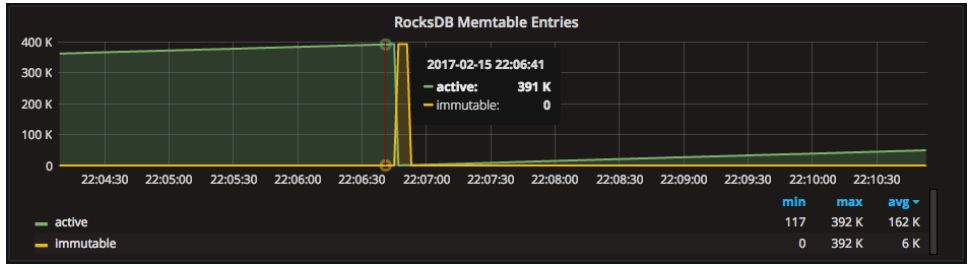






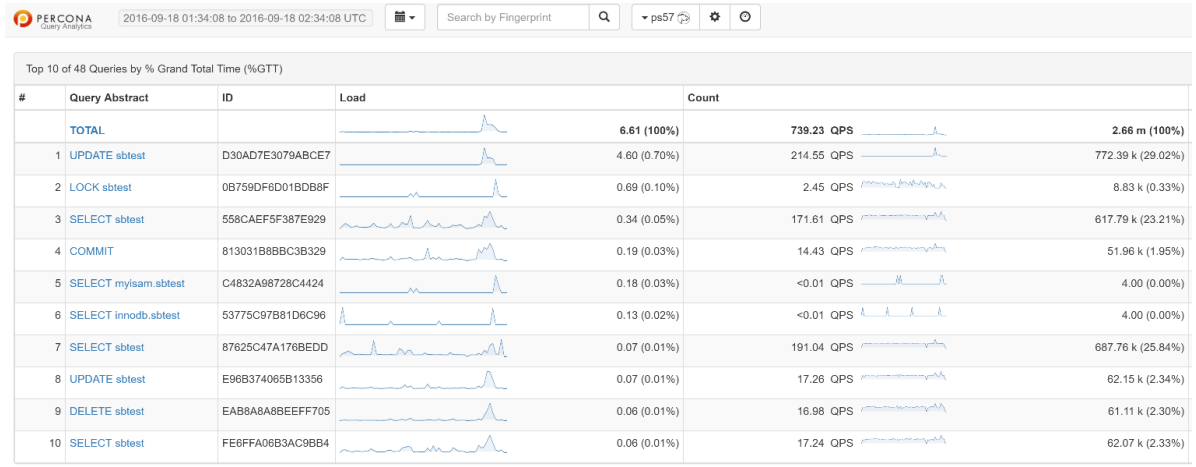


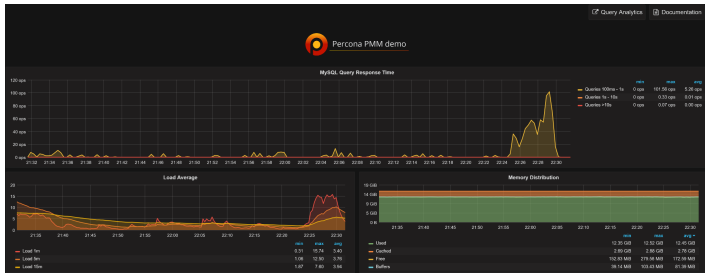


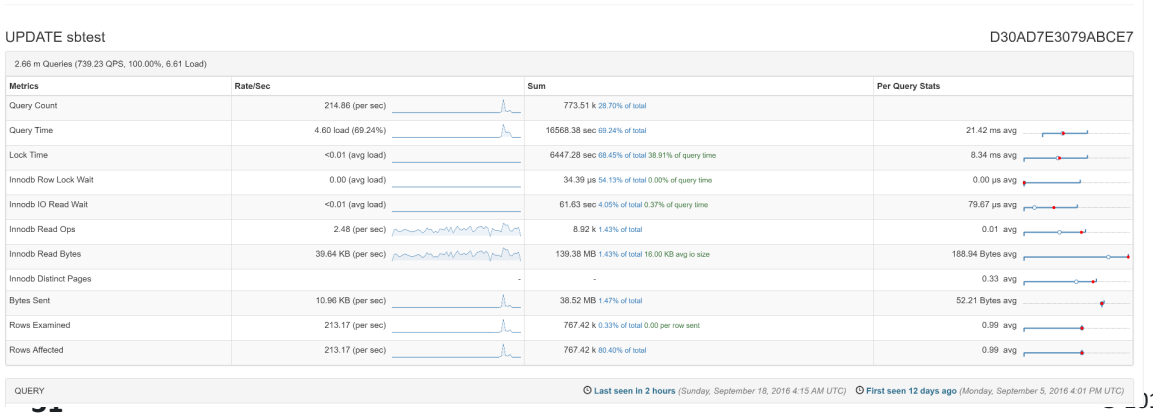


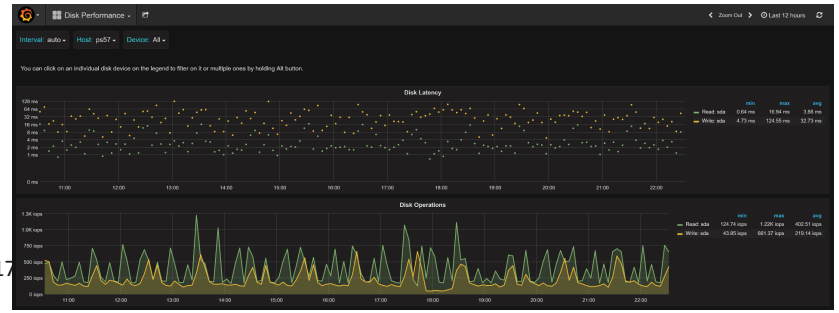
Lets Explore the Demo!

http://pmmdemo.percona.com









Database Performance Matters