

# 4 UNIQUE MONITORING TRAITS DBAS MUST KNOW

## PRIMARY RESPONSIBILITY

The primary responsibility of every database administrator (DBA) is to keep their database up and running efficiently and securely.

There are two main activities that keep DBAs busy. One such activity is the one-time (or less frequent) events, like upgrading database versions, patching the latest service packs, or upgrading server resources. The other activity is constant and seemingly continuous, such as managing server performance.

There are many tools in the relational database ecosystem that DBAs can use to accomplish their daily monitoring tasks. However, the biggest challenge is that those tools help DBAs in quite differently when monitoring daily tasks. In reality, every tool is unique and has its advantages. Many DBAs are still in pursuit of a single comprehensive tool that can do all the essential tasks.



# UNIQUE ADVANTAGES

In my career as a MySQL Performance Tuning expert over the last decade, I have worked with many different solutions, tools, and native products. The biggest challenge I have faced in the real world is that no two problems are the same, and there is no silver bullet to solve all problems instantly and immediately.

If you want to make sure your database is free from performance problems, there are three things you need to be aware of:

- **Past** – you need to know what has been happening with your databases
- **Present** – you need to understand the resources available to your databases
- **Future** – you need to have a good estimate of the future workload of your databases

Once you have enough detail about past events, present resources, and future workload, you will be in a better position to make informed decisions about your MySQL (or any other) relational databases.

In this solution brief, focus is placed on the five most essential things which make the SQL Diagnostic Manager for MySQL the best and most comprehensive tool for MySQL monitoring. After all, a DBA's job is easier when they receive alerts and are able to proactively manage their database.

Here are the five critical features of SQL Diagnostic Manager for MySQL, which makes it distinct from its competitors.

1. Agentless architecture
2. Real-Time monitoring
3. Monitors and advisors
4. Track configuration changes
5. Superior diagnostics and analytics

Below is an explanation of these features in detail.

# AGENTLESS ARCHITECTURE

Security is critical, as is product stability. As a DBA, I am always concerned with the software installed on my machine and its impact on my server's performance. In the DevOps world, there is a significant and ongoing debate on agent-based vs. agentless architecture. When we focus on monitoring solutions, agentless architecture is the clear winner.

An agent is a proprietary software program installed on the database server. This agent collects various information and provides feedback to the centralized server where all the data analysis happens.

Agentless architecture refers to a structure in which information is transmitted or gathered from the database server without installing any proprietary agents. This design requires communication with the native operating system or the application (in our case, MySQL or another relational database).

Nowadays, when DevOps is the new norm, there are more than enough native programs (APIs, protocols, etc.) installed on the server. The development of DevOps as a discipline and standard set of operating protocols eliminates the need for an agent on the server itself.

If the agent resides on the server, it consumes some of the server's critical resources (CPU, Memory, IO) for its functions. In the contrasting case of agentless architecture, all resources on the server are dedicated solely to the database server, leading to optimal performance.

Additionally, in the case of the agentless architecture, system management is much simpler as all the processing and updates happen on a centralized server. This simplicity further enhances the security of the database server, and modifications are no longer necessary when the monitoring algorithm changes on the centralized system.

## SQL DIAGNOSTIC MANAGER FOR MYSQL

SQL Diagnostic Manager for MySQL has a low-footprint web server, explicitly optimized for MySQL server. It uses AJAX (Asynchronous JavaScript and XML) to communicate between the Diagnostic Manager and the MySQL server. This communication protocol reduces bandwidth consumption as compared to the traditional method of reloading the whole page. Unlike competing tools, here, you do not need to install any other runtimes or databases.

Most of the competing tools require some kind of connector or external code to connect to the MySQL server. In contrast, SQL Diagnostic Manager for MySQL has the MariaDB Connector/C 'compiled in' to connect directly to MySQL without any external help (agents). [1]

## VERDICT:

SQL Diagnostic Manager for MySQL with agentless architecture wins over other monitoring competitors as it provides better security, uptime, and monitoring without compromising the resources of the database server. This results in better and more efficient performance.

## REAL-TIME MONITORING

It may seem like DBAs only need to monitor their database to guard against anomalies and ensure stability. In reality, DBAs often wear multiple hats. They regularly recommend hardware upgrades, manage high availability, and maintain tight security around their database.

If you ask any DBA the top priority for their job, they will say with virtually one voice – “We want to know when something goes wrong the moment it happens.”

Let’s say your server’s CPU consumption is increasing. Consider the growth trajectory of this usage; if it is going to hit 100%, would you like to receive this prediction right away or only after it has hit 100% and created performance issues? Of course, you want to know right away before the problem arises. While we may not pay much attention when everything is fine, we all want to know about future issues in advance.

Real-time monitoring is a critical factor when selecting a database monitoring tool. This feature brings the necessary attention to problems and enables users to respond to these problems immediately.

As we move more towards the cloud and software as service (SaaS) as well as a platform as a service (PaaS) model, the ability to keep an eye on resource consumption becomes more critical. If there is a sudden resource crunch on the server, one can easily add more resources temporarily and keep the server running smoothly. At the same time, the user also needs to know the root cause of the resource crunch. This on-demand, root-cause reporting is where real-time monitoring comes in very handy.

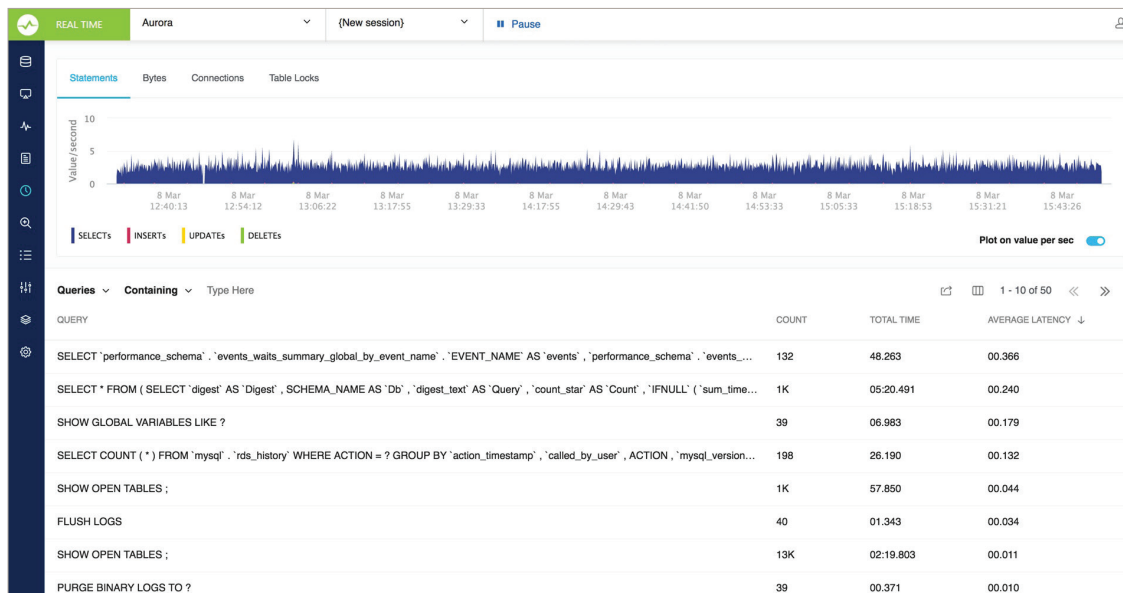
Practical real-time monitoring will provide two vital pieces of information to the users.

1. The resource under pressure and potential solution(s)
2. The underlying program/queries details leading to the resource bottleneck

I have often been called to help clients with their server's sudden sluggishness. Most of my clients want to know what caused this situation and how to avoid it in the future. These two requirements make real-time monitoring an essential feature for any database monitoring tool.

## SQL DIAGNOSTIC MANAGER FOR MYSQL:

SQL Diagnostic Manager for MySQL continuously executes lightweight queries on a server. It fetches information on the top queries, tables, databases, users, hosts, locked queries, locking queries, etc. It also keeps the user updated with the real-time status of the database at any point in time.



Real-time data is time-based. So, if you want to keep the server activity for the future review, you can record the real-time activity and later play it gradually (or step by step) to analyze processes. [2]

## VERDICT:

SQL Diagnostic Manager for MySQL with real-time monitoring wins over its competition by providing meaningful monitoring alerts when they are happening. Most competitors collect data and make it available for post-event analysis only, which does not help the DBA maintain system stability in real-time.

It is vital to pay attention and respond to system problems when they are happening. Real-time monitoring helps the DBA to do this.

# MONITORS AND ADVISORS

“No one knows everything, but everyone knows something.”

This quote is pretty relevant in our daily life, but for DBAs, it can be a nightmare. Let me explain.

Let us assume there is an organization with five different MySQL servers, and five different DBAs manage each server. Now, each of the DBAs will have their own way of looking at the performance metrics as well as various work algorithms to find the root cause of their problems. It is also possible that each of them has a different background and experience level when dealing with MySQL.

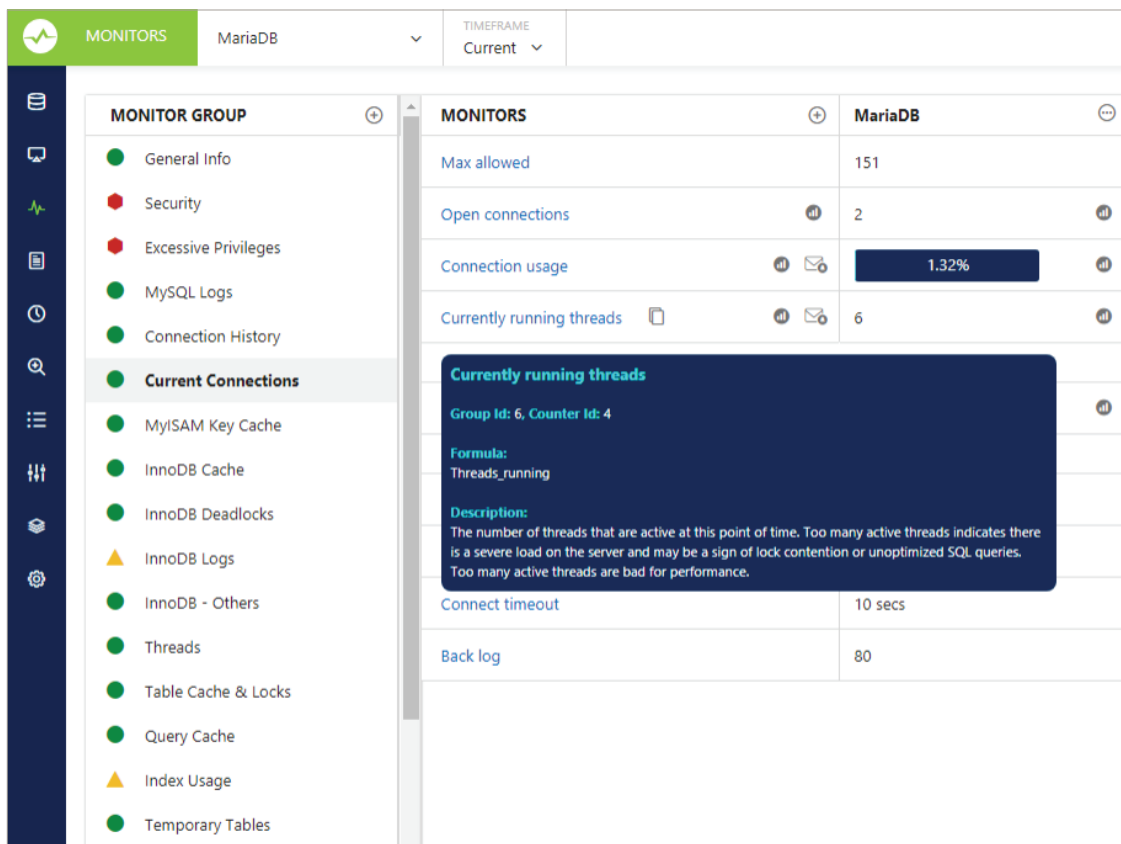
This collective, organized intelligence can be a blessing if they all agree on monitoring parameters. However, the same conditions can create “information chaos” if different people gather different parameters, and then interpret each dataset differently.

Organizations must have a comprehensive view of all the database resources with a uniform weight on all parameters. A system built on the intelligence of the past heuristics and present circumstances can best predict future action items. Again, such a “past and present” thought framework is essential for the future of any organization.

In the real world, I often see that no matter how much DBAs track information and parameters, it is never enough. Many times, when the database server is overworked and underperforming, it falls apart in the area of collecting meaningful data and sending alerts.

## SQL DIAGNOSTIC MANAGER FOR MYSQL:

SQL Diagnostic Manager for MySQL has over 600+ different monitors and advisors. A single person cannot remember every monitoring metric. This human limitation is why the SQL DM for the MySQL web interface itself documents each metric. This documentation makes the life of the DBA less stressful. It means they do not have to continually search on the internet for an explanation of the metrics or related guidance. [3]



## VERDICT:

SQL Diagnostic Manager for MySQL has over 600 monitors and advisors, which makes this tool the most comprehensive in the industry. While most other tools collect data, they fail to resurface the data in a meaningful way due to the lack of analytical negligence inside the application. The key is not only to monitor the activities but to analyze them in real-time and give the best possible corrective suggestions for better system health.

## TRACK CONFIGURATION CHANGES

There are many situations when the performance of the database server goes down as the result of a change in the database server configuration, networking appliances, or OS updates. While DevOps concepts are growing in popularity, we still have a long way to go for complete automation. Human errors have a history of making any application unstable. An incorrect change in the configuration is far more dangerous to database stability than a single poorly-running query.

As a performance tuning expert, whenever I encounter a situation where the performance of MySQL Server has decreased suddenly, my very first question is: "What Changed?" Any Database Administrator must know what configuration change has taken place in their system when their system suddenly starts to perform poorly and stability is at risk.



## SQL DIAGNOSTIC MANAGER FOR MYSQL:

SQL Diagnostic Manager for MySQL has a version control for the Global Variables for MySQL Server. The section Track Configuration Changes keeps track of any global configuration even if it is absent from the configuration file my.ini/my.cnf. In the 'Track Configuration Changes' section, all the timestamps are listed in the drop-down menu when it detects any changes in the MySQL Global Configurations. [4]

| Variables                               | Wed Sep 06, 2017 11:23 (Latest)          | Wed Aug 23, 2017 17:28 (Oldest)          |
|---|--|--|
| auto_increment_increment                | 2  | 2  |
| auto_increment_offset                   | 1  | 1  |
| autocommit                              | ON                                       | ON                                       |
| automatic_sp_privileges                 | ON                                       | ON                                       |
| avoid_temporal_upgrade                  | OFF                                      | OFF                                      |
| back_log                                | 80                                       | 80                                       |
| basedir                                 | C:\Program Files\MySQL\MySQL Server 5.6\ | C:\Program Files\MySQL\MySQL Server 5.6\ |
| big_tables                              | OFF                                      | OFF                                      |
| bind_address                            | .  | .  |
| binlog_cache_size                       | 32768                                    | 32768                                    |
| binlog_checksum                         | CRC32                                    | CRC32                                    |
| binlog_direct_non_transactional_updates | OFF                                      | OFF                                      |
| binlog_error_action                     | IGNORE_ERROR                             | IGNORE_ERROR                             |
| binlog_format                           | STATEMENT                                | STATEMENT                                |
| binlog_gtid_simple_recovery             | OFF                                      | OFF                                      |
| binlog_max_flush_queue_time             | 0  | 0  |
| binlog_order_commits                    | ON                                       | ON                                       |
| binlog_row_image                        | FULL                                     | FULL                                     |

## VERDICT:

SQL Diagnostic Manager for MySQL has unique timestamp-based version control for the configuration, which I have not seen in other tools. Keeping track of what is going on inside MySQL engine is relatively easy and available in many products. However, real-time version tracking with history is unique to SQL Diagnostic Manager for MySQL. If you are working for an organization where many people have access to the database configuration, this one feature is good enough to deploy it across your database farms.

## SUPERIOR DIAGNOSTICS AND ANALYTICS

While every monitoring tool boasts about its information, the reality is that each has access to the same set of internal data on query execution and server performance counters. These products distinguish themselves from one another based on the ability to display information in the most meaningful way. More specifically, these products set themselves apart by presenting information in a way that helps end-users take the most suitable action for the environment.

My personal experience is that SQL Diagnostic Manager for MySQL has superior diagnostics and analytics features. This superiority makes it the most user friendly as well as the most effective for monitoring MySQL. Here are a few of the features I keep coming back to when I am responsible for monitoring servers.

- Flexible dashboard for custom charts and monitoring metrics
- Access all available metrics for MySQL or MariaDB servers
- Analyze executing threads of SQL query
- Find and analyze problematic queries based on execution time
- View parsed audit logs for anomaly
- View the replication hierarchy of servers along with details
- Deadlock monitoring for queries
- Disk usage monitoring for server

## SUMMARY

SQL Diagnostic Manager for MySQL is the best tool available for monitoring MySQL (or MariaDB). Its unique agentless monitoring architecture reduces resource consumption and provides robust stability to the monitoring solution itself. The real-time monitoring and comprehensive dashboards/reports help us to identify the performance issues and help us resolve them proactively. Many DBAs have successfully reduced the downtime, improved the performance, and tightened their security with the help of the SQL Diagnostic Manager for MySQL.

To fully summarize, SQL Diagnostic Manager for MySQL's 600+ monitors and advisors continuously check the health of your MySQL server and aid you in finding and fixing problems with database applications before they become severe or escalate into costly outages.

# ABOUT THE AUTHOR

Pinal Dave is a SQL Server Performance Tuning Expert and an independent consultant. He has authored 12 SQL Server database books, 34 Pluralsight courses, and has written over 5200 articles on the database technology on his blog at a <https://blog.sqlauthority.com>. Along with 17+ years of hands-on experience, he holds a Masters of Science degree and several database certifications.

## REFERENCE:

- [1] <http://wiki.idera.com/display/SQLDMYSQL/Architecture>
- [2] <http://wiki.idera.com/display/SQLDMYSQL/Real-Time>
- [3] <http://wiki.idera.com/display/SQLDMYSQL/Monitors>
- [4] <http://wiki.idera.com/display/SQLDMYSQL/Track+Configuration+Changes>

