MySQL Enterprise Monitor 2.3
What's New
Improved Monitoring, Ease of Use

A MySQL® White Paper

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Introduction

Oracle's MySQL Enterprise Monitor is an enterprise monitoring solution for MySQL that enables you to keep an eye on all of your MySQL servers from a consolidated, web-based dashboard. The Enterprise Monitor proactively scans for real and potential performance, security and availability problems, and provides alerts and MySQL expert advice that helps DBAs and Develoers find and fix the underlying issues before they can become costly outages. To this end, the Enterprise Monitor collects MySQL and operating system metrics from each of the MySQL Servers being monitored and uses a set of MySQL Enterprise Advisors to compare the status of the server to known best practice variable settings and values. When certain conditions and/or thresholds are reached or violated, the Advisors trigger events and optional SNMP or SMTP alerts that pinpoint the server needing attention and provide a complete, detailed summary of what happened and what actions should be taken to correct the problem or to tune the server. In addition, statistical data and figures from the MySQL Servers are stored so users can view the information over time using the Enterprise Monitor's collection of MySQL and operating system graphs, for both real-time and historical trend analysis.

Learn more about the Enterprise Monitor, Enterprise Advisors and Advanced Monitoring here: http://mysql.com/products/enterprise/monitor.html

For deeper, application code level performance monitoring, analysis and tuning the Enterprise Monitor includes the Query Analyzer, which can be configured to collect detailed information about the queries executed across all of your development, QA and production servers. Query execution related data can be browsed in aggregate via an intuitive user interface or can be filtered using "grab and go" correlation with the Enterprise Monitor's collection of graphs. Using this option users simply mouse over and highlight a spike in any of the Monitor's graphs and the Query Analyzer is opened, filtered for that specific point in time. Users can then easily analyze the queries that were running when a key resource was "pegged". Once suspect query code is identified users can drill down into execution details, including sample executions, EXPLAIN, histogram graphs on performance and application code level tracing.

Learn more about the Query Analyzer, enablement options, and application code level monitoring, analysis and tuning here: http://mysql.com/products/enterprise/query.html

MySQL Enterprise Monitor 2.3 builds on Oracle's continued investment in MySQL. In this latest version, the Enterprise Monitor can be used to monitor MySQL Servers that are part of a MySQL Cluster deployment (including status information from the Data Nodes). MySQL Enterprise Monitor 2.3 also improves general monitoring for MySQL and the Operating System by adding a set of new graphs for monitoring transactions and the new features available in InnoDB 1.1. Additionally, this latest version enables all of the Enterprise Monitor's features per Oracle's commitment to providing the highest levels of support to all users. Current MySQL users or those considering MySQL for new or future projects can now use the full Enterprise Monitor feature set to implement MySQL in their development, QA and production environments, each with the highest levels of security, performance and availability.

MySQL Enterprise Monitor 2.3 includes these improvements:

Improved Monitoring

- **New MySQL Cluster Advisor and Graphs –** New MySQL Cluster specific Advisor Rules and Graphs enable users to ensure MySQL Cluster deployments are always up and running at the highest levels of performance and availability..
    - o New MySQL Cluster Advisor Rules – Provide automated, real-time monitoring of Cluster data nodes memory, undo/redo buffer space, undo/redo log space, and node up/down status.
    - o New MySQL Cluster Graphs – Provide visual monitoring of Cluster data nodes memory, undo/redo buffer space, undo/redo log space.

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Learn more about the new MySQL Cluster Enterprise Advisor here: http://dev.mysql.com/doc/mysql-monitor/2.3/en/mem-reference-advgraph.html

- **New MySQL and Operating System Graphs** – New MySQL and OS specific graphs provide better visual monitoring of key system resources for real-time and historical trending purposes.
    - o New MySQL Graphs – Provide visual monitoring of database transactions, binlog cache efficiency, binlog space usage, MyISAM key buffer activity, disk I/O, disk space and network throughput.
    - o New InnoDB specific Graphs – Provide visual monitoring of InnoDB 1.1 transactions and compression times.

Each of these new features is detailed below.

Improved Monitoring

New MySQL Cluster Advisor and Graphs

MySQL Enterprise Monitor 2.3 provides a new MySQL Cluster- specific Enterprise Advisor that includes automated best practice rules that alert on key performance and availability metrics from Cluster data nodes.

The new MySQL Cluster Advisor includes the following best practice rules:

- MySQL Cluster Data Node Memory Getting Low – Monitors and advises when the amount of data memory configured for the data nodes starts to run low. Proactively ensures that database inserts do not fail as a result of low memory availability.
- MySQL Cluster Data Node Index Memory Getting Low – Monitors and advises when the amount of index memory configured for the data nodes starts to run low. Proactively ensures that database inserts do not fail as a result of low memory availability.

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- MySQL Cluster Data Node Redo Buffer Space Getting Low – Monitors and advises when the redo buffers start to fill up so they can be proactively resized.
- MySQL Cluster Data Node Undo Buffer Space Getting Low - Monitors and advises when the undo buffers start to fill up so they can be proactively resized.
- MySQL Cluster Data Node Undo Log Space Getting Low - Monitors and advises when the undo log spaces start to fill up so they can be proactively resized.
- MySQL Cluster Data Nodes Not Running - Monitors and advises when data nodes are not running so users can proactively investigate and correct the issue.
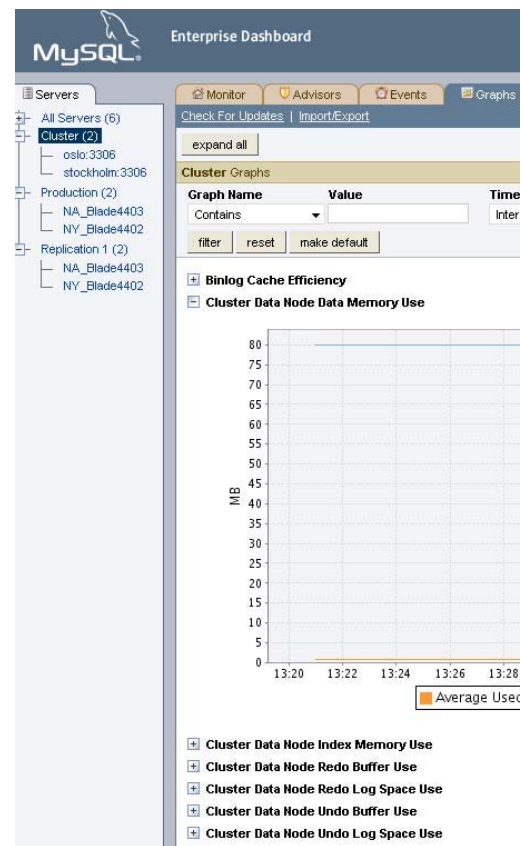
The above rules can be automated to monitor MySQL Cluster data nodes by scheduling them to run on any MySQL Server that is connected to the Cluster using the ndbinfo database (introduced in MySQL Cluster 7.1). The new MySQL Cluster Advisor can be activated (scheduled) against a single MySQL Server in the Cluster or against a redundant pair of servers in order to provide a higher level of availability for the monitoring service. Further, each of the above rules can be automated to run at default or user specified intervals and can be customized to better meet specific needs of a MySQL Cluster deployment or application.

In addition to the above rules, there is a new set of MySQL Cluster specific graphs that allow you to visually monitor your Cluster enabled systems.

The following new graphs correspond to the new Cluster specific best practice rules noted above:

- MySQL Cluster Data Node Data Memory Use
- MySQL Cluster Data Node Index Memory Use
- MySQL Cluster Data Node Redo Buffer Use
- MySQL Cluster Data Node Redo Log Space Use
- MySQL Cluster Data Node Undo Buffer Use
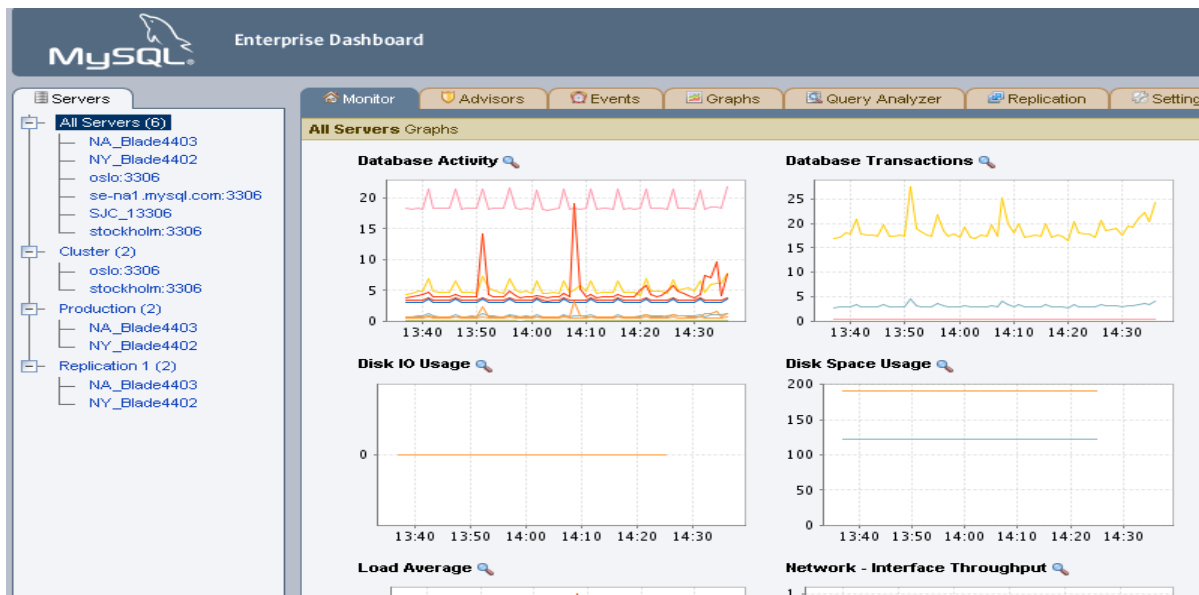- MySQL Cluster Data Node Undo Log Space Use.

Why it's important – The new MySQL Cluster Enterprise Advisor and Graphs provide a deeper insight into the interworking of a MySQL Cluster deployment. As MySQL Cluster expands into more mainstream use cases for web and online applications, it is important that users have the ability to monitor performance and availability and are enabled to quickly and proactively respond to problems and issues before they can become costly outages. To complement the improved MySQL Cluster Monitoring provided by MySQL Enterprise Monitor 2.3, MySQL Cluster Manager has been introduced to simplify the management of a MySQL Cluster deployment – for example for a user to simply and safely modify configuration settings following an alert from MySQL Enterprise Monitor.

New MySQL and Operating System Graphs

MySQL Enterprise Monitor 2.3 now includes a gallery of 40+ graphs that help you visually monitor your MySQL and Operating System performance in real-time or over time to determine key resource usage trends during peak user times.

Enterprise Monitor 2.3 includes these new and enhanced graphs:

New general usage graphs include:
- Database Transactions – monitors/tracks transaction statements per second
- Binlog Cache Efficiency – monitors/tracks cache operations per second
- Binlog Space Usage – monitors/tracks binlog space in MB
- MyISAM Key Buffer Activity – monitors/tracks cache operations per second
- Disk I/O Usage – monitors/tracks MB per second
- Disk Space Usage – monitors/tracks GB used
- Network – Interface Throughput – monitors/tracks throughput in KBs per second

New graphs for InnoDB 1.1 include:
- InnoDB Transactions – monitors/tracks running, blocked and lock waiting transactions
- InnoDB Compression Time – monitors/tracks total seconds used during compress/uncompress operations

Enhancements to current graphs include:
- Adds data dictionary memory usage to the InnoDB Buffer Pool graph
- Adds Opened_table_definitions to the Opened Tables graph

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Why it's important – New and improved graphs provide better visual monitoring of key MySQL, InnoDB 1.1, and Operating System performance and throughput statistics.

Conclusion

Oracle's MySQL Enterprise Monitor helps users manage one to many MySQL servers with less time and effort, and helps reduce downtime by alerting and advising on problems before they become costly outages. The newest release of the Enterprise Monitor builds on Oracle's commitment to MySQL by providing a new MySQL Cluster Enterprise Advisor and Graphs gallery. This provides MySQL Cluster users with a deeper insight into their Cluster deployments and adds to MySQL's legacy of providing solutions that are known for performance, reliability, and ease of use. Additionally, Enterprise Monitor 2.3 provides a fresh set of MySQL and Operating System specific graphs that provide additional visual, correlated monitoring of server and application performance and throughput. As in previous releases, all of the new graphs are integrated with the MySQL Query Analyzer so users can visually monitor performance and drill down into application code level tracing. Finally, Enterprise Monitor 2.3 is fully enabled so all current MySQL users and those considering MySQL for upcoming projects can use the full set of Enterprise Advisors, Query Analyzer, Replication Monitor and other advanced features to ensure their systems are always up and running at peak performance.

Learn More

For more information on MySQL products and services, please visit:

MySQL Enterprise, the Enterprise Monitor, Query Analyzer and Production Support
http://mysql.com/products/enterprise/

MySQL Cluster Architecture and New Features Whitepaper
http://www.mysql.com/why-mysql/white-papers/mysql_wp_cluster7_architecture.php

MySQL Cluster Manager Whitepaper
http://www.mysql.com/why-mysql/white-papers/mysql_wp_cluster_manager.php