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Monitoring MySQL

A quick overview of available tools

Monitoring

- Monitoring your database is as important as benchmarking
- You want to view trends over time
- See how hardware application and schema changes affect performance
- Get alerts when something goes wrong

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Monitor tool basics

- show full processlist
- Show global status
- Show global variables

All the monitoring of MySQL relies in some way on this framework provided by the server. There are sometimes methods of getting additional information and linking system information to the MySQL data but both of these tools are part of most monitoring solutions, wether the end user is aware of it or not

Show global status

- MySQL keeps status counters on each of the various operations it has performed.

Run a select statement... increment ***com_select***

Run a delete increment ***com_delete***

Open a table increment ***tables_opened***

Accept a connection increment ***Threads_connected***

SHOW GLOBAL VARIABLES

- Many of MySQL configuration options are dynamic. We set them in a config file but a user with appropriate permissions can change them on a running server.
- `SHOW GLOBAL VARIABLES` allows us to see the current configuration.
- Comparing the settings and cache sizes shown in the variables with the operations shown in status allows us to get a view of our servers configuration and performance

Show full processlist

- Shows you who is connected and what they are doing.

Basic tools

- mysqladmin is provided with the server, although I call it basic it is also very powerful. Some examples.

```
mysqladmin -i 10 extended status
```

In this example mysqladmin will connect to the server run “show global status” and then sleep for ten seconds and run the same command again.

“Pipe that through your grep and smoke it” (bad pun.. groan)

mysqladmin

- Final thoughts..

Do not dismiss mysqladmin because it seems simple and unsophisticated. No it does not make pretty graphs or email you when your server crashes.. but by using the sleep function, running a process against the server and watching you can frequently get some useful information.

MySQL administrator

- Our administrator GUI provides a view of server status, server variables, processlist, and a collection of graphs.
- Easy to use
- Good first introduction to the variables and activity that you want to monitor
- Take a look at the health graphs, edit them, add your own and get a feel for how they work.

Cacti

- Cacti is a rrdtool based network graphing tool
- PHP apache and MySQL based solution
- Monitors devices on a network
- Modular has been extended to include MySQL monitoring
- URL for cacti <http://www.cacti.net/>
- MySQL plugin <http://faemalia.net/mysqlUtils/>

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Cacti

- How does CACTI work..

Modular

“Poller” gathers the data to be monitored remote hosts are polled using SNMP

RRDTool stores the data.

“round Robin database” compact, won't grow to fill your disk.

Presentation.

Nice graphs built by RRDtool presented in a browser.

Cacti



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Cacti

- PROS

Cacti is fairly easy to configure. Apache PHP and a crontab managed “poller” so it is a bit more difficult on windows

Cacti is fairly commonly used so you have a large community of users

- CONS

Nothing major

Munin

- Similar to cacti

Seemed to be easier to configure the data collector in munin and it seemed to therefore be less flexible in terms of polling interval.

Google cacti vs munin and make your own decision, to similar to go into the details.

Munin

- URL

<http://munin.projects.linpro.no/>

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Zenoss

- Open source network monitoring tool

I did not have enough time to give Zenoss a good going over. So it is time for an audience poll

Who uses it ?

Who likes it ? Why ?

Who tried it and discarded it ? Why

Zenoss

- Regardless of what the “audience poll” had to say I think Zenoss shows great promise and I intend to check it out.
- Cons..

I hate to be negative but why do we need a plugin to google maps ? If you do not know where your servers are then you need more than monitoring tools.

Seems like the AJAX designers went too far there ?

A few more text based tools

- innotop
- mytop
- mtstat-mysql

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innotop

- Monitoring innodb can be a little more complex
- Show engine innodb status... complex output
- innotop organizes the innodb information and presents it in user friendly but text based form.
- URL
<http://www.xaprb.com/blog/2006/07/02/innotop-mysql-innodb-monitor/>

innotop

```
Terminal
InnoDB Buffers 0.4 QPS, 7 threads, usa, 5.0.21-log, 25+04:59:03
      Buffer Pool and Memory
-----
Memory Allocated 1466180702 | What      Creates Reads  Writes
Add'l Pool Alloc 10368768  | -----
Buffer Pool Size 81920  | Total Pages 1974179 86419210 15128390
Buffers Free      0  | Per-Sec Avg 0.00 0.00 0.00
Buffer Pool Hit Rate --
Buffer Pool Reads 0
Buffer Pool Hits 0
Database Pages 77521
Modified DB Pages 0

      Insert Buffer and Adaptive Hash Index
-----
Insert Buffers for Tablespace 0      Adaptive Hash Index
-----
TblSpc      0      Hash Table Size      5312557
Size        1      Hash Table Used Cells 3030846
Free List Len 5      Node Heap Buffers    4399
Seg. Size   7      Hash Searches/Sec    0.00
Inserts     10709973 Non-Hash Searches/Sec 0.00
Merged Recs 10709973
Merges      971928
Empty?      is empty
```

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Innotop

- Developed by “community member of the year”
Baron Schwartz

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mytop

- Provides MySQL information similar to the linux utility “top”

Some summary information at the top, similar to the output of the “status” command in the client.

List of threads connected, similar to the output of “show full processlist”

mytop

- Cool features

Filter connections based on database/host being used

Kill connections

Queries per second mode

mytop

- MyTop makes the process of connecting to the server and running a series of commands much easier and intuitive. Check it out

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mtstat-mysql

- Plugin for the system monitoring tool mtstat

mtstat provides the functionality of vmstat and iostat tools to monitor system activity.

mtstat-mysql is a collection of plugins that add the ability to monitor mysql performance.

The combination allows you to see what sort of database requests lead to what sort of system utilization

mtstat-mysql

- URL

<https://launchpad.net/mtstat>

- Cool features

Text based yet feature rich.. color coding, autoupdating.

mtstat-mysql

- Details

Python based, sparse documentation.

Mostly intuitive.

Install mtstat and then mtstat-mysql

Nagios

- URL
<http://www.nagios.org/>
- Nagios is more of a notification tool. It is frequently used in combination with CACTI MUNIN or any of the monitoring tools.

Configure the other tools to gather the information and make graphs of normal behavior, configure nagios to call/email you when something is wrong.

Nagios

- A few tools, zenoss and our dashboard do there own alerting. Centralized alerts are important so plenty of tools can be used in combination with Nagios.

Nagios

- PROS

Widely used, flexible, configurable, comprehensive

- CONS

Complex setup, time consuming, strange config file.

MySQL Enterprise Monitor

- URL

<http://www.mysql.com/products/enterprise/monitor.html>

- Cool features

Monitoring , alerting, graphing, heat chart, advisors for tuning and the like all in one place

MySQL Enterprise Monitor

- Buy the Monitor get free MySQL enterprise subscription and support. Or is it buy MySQL enterprise get the Monitor for free ?
- Regardless of how you look at it the Monitor is not available for free, except for the free thirty day trial. Install it and check it out.

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MySQL Enterprise Monitor

The screenshot displays the MySQL Enterprise Monitor interface. On the left is a tree view of servers. The main area contains several performance graphs: Database Activity, CPU Utilization, InnoDB OS File Access, InnoDB Semaphores, RAM Usage, and Sort Activity. On the right is an 'All Servers Heat Chart' table. Below the graphs is a table of 'All Servers Critical Events'.

All Servers Heat Chart

Server	Server Status	CPU Usage	RAM Usage	IO Usage	Lock Contention	MySQL Agent	Temp Tables to Disk	Query Cache	Table Scans	Critical Alerts	Warnings	Info	
All Servers (6)	●	●	●	●	●	●	●	●	●	●	13	29	15
BoI2-3306	●	●	●	●	●	●	●	●	●	●	1	2	1
BoPAV:3306	●	●	●	●	●	●	●	●	●	●	5	3	0
Boise_XP-3308	●	●	●	●	●	●	●	●	●	●	5	14	5
LA_DataCenter:3306	●	●	●	●	●	●	●	●	●	●	1	8	8
local_development:3306	●	●	●	●	●	●	●	●	●	●	0	2	0
UK_DataCenter:13306	●	●	●	●	●	●	●	●	●	●	1	0	1
DataCenters (2)	●	●	●	●	●	●	●	●	●	●	2	8	9
LA_DataCenter:3306	●	●	●	●	●	●	●	●	●	●	1	8	8
UK_DataCenter:13306	●	●	●	●	●	●	●	●	●	●	1	0	1
Development (1)	●	●	●	●	●	●	●	●	●	●	0	2	0
local_development:3306	●	●	●	●	●	●	●	●	●	●	0	2	0
Replication 1 (3)	●	●	●	●	●	●	●	●	●	●	11	19	6
BoI2-3306	●	●	●	●	●	●	●	●	●	●	1	2	1
BoPAV:3306	●	●	●	●	●	●	●	●	●	●	5	3	0
Boise_XP-3308	●	●	●	●	●	●	●	●	●	●	5	14	5
Replication 2 (1)	●	●	●	●	●	●	●	●	●	●	0	2	0
local_development:3306	●	●	●	●	●	●	●	●	●	●	0	2	0

All Servers Critical Events [1 to 13 of 13]

Server	Category	Rule	Time	Action
LA_DataCenter:3306	Heat Chart	MySQL Agent Not Reachable	Aug 23, 2007 2:57 PM	close
UK_DataCenter:13306	Heat Chart	Table Scans Excessive	Aug 23, 2007 2:30 PM	close
BoPAV:3306	Heat Chart	CPU Usage Excessive	Aug 11, 2007 7:42 AM	close
BoPAV:3306	Replication	Slave IO Thread Not Running	Aug 9, 2007 4:54 PM	close
BoPAV:3306	Heat Chart	CPU IO Usage Excessive	Aug 9, 2007 7:41 AM	close
Boise_XP-3308	Memory Usage	Key Buffer Size May Not Be Optimal For System RAM	Aug 8, 2007 9:13 PM	close
Boise_XP-3308	Performance	Indexes Not Being Used Efficiently	Aug 8, 2007 3:26 PM	close
Boise_XP-3308	Replication	Slave IO Thread Not Running	Aug 5, 2007 3:40 PM	close
Boise_XP-3308	Performance	Excessive Disk Temporary Table Usage Detected	Aug 2, 2007 12:39 PM	close
BoPAV:3306	Heat Chart	Table Scans Excessive	Jul 30, 2007 8:47 AM	close
BoI2-3306	Heat Chart	Table Scans Excessive	Jul 20, 2007 12:28 PM	close
BoPAV:3306	Heat Chart	RAM Usage Excessive	Jul 20, 2007 11:31 AM	close
Boise_XP-3308	Heat Chart	Table Scans Excessive	Jul 19, 2007 4:32 PM	close

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Monitoring 4 of 50 MySQL Enterprise Platinum servers. MySQL Enterprise Platinum subscription expires Jul 1, 2008.

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Monitor details

- Built by folks who know MySQL well
- Agent based
Agent installed on server or remotely gathers MySQL data and Server data and the Monitor presents that data in a series of graphs.
- Well organized
Allows for grouping of servers graphs and heat charts so that I can quickly view a screen and spot any trouble spots for large groups of servers.

Monitor Details

- Replication Aware

Auto detects your replication setup and monitors accordingly.

- URL that discusses features briefly

<http://www.mysql.com/products/enterprise/benefits.html>