

Alerting With MySQL and Nagios



http://bit.ly/nagios_mysql2013

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What is Monitoring?



- Threshold alerting
- Graphing/trending

Why Monitor?



- Problem alerting
- Find patterns
 - capacity planning
 - troubleshooting
- Early warning for potential issues

What to Alert?



- Problems you can fix
 - max_connections
 - long running queries
 - locked queries
 - backup disk space

Nagios is great because...



...anyone can write a plugin

The problem with Nagios...



...anyone can write a plugin

Official Nagios Plugins for MySQL



- `check_mysql`
- `check_mysql_query`

check_mysql



- db connectivity
- slave running
- slave lag using `seconds_behind_master`

check_mysql_query



- Checks the output of a query is within a certain range (numerical)

Third party plugins



System vars

Status vars

Caching

Calculations

check_mysql	yes	yes	no	no
check_mysql (standard)	no	yes	no	no
check_mysqlid_status	no	yes	no	no
check_mysql_stats	yes	no	yes	no
check_mysqlid	no	many	no	no
check_mysql_health	yes	yes	no	Hard-coded
check_mysql	yes	yes	no	Hard-coded



“Let us know what you'd like to see!”



What I wanted

System vars Status vars Caching Calculations

mysql_health_check.pl

yes

yes

yes

flexible



`mysql_health_check.pl`

Caching



- Save information to a file

Caching



- Save information to a file
 - `--cache-dir /path/to/dir/`

Caching



- Save information to a file
 - `--cache-dir /path/to/dir/`
- Use the file instead of connecting again

Caching



- Save information to a file
 - `--cache-dir /path/to/dir/`
- Use the file instead of connecting again
 - `--max-cache-age <seconds>`

Caching



- Save information to a file
 - `--cache-dir /path/to/dir/`
- Use the file instead of connecting again
 - `--max-cache-age <seconds>`
 - `--no-cache` to force connection

--mode=varcomp



- `%metadata{varstatus}`

--mode=varcomp



- `%metadata{varstatus}`
 - SHOW GLOBAL VARIABLES
 - SHOW GLOBAL STATUS

--mode=varcomp



- `%metadata{varstatus}`
- `SHOW GLOBAL VARIABLES`
- `SHOW GLOBAL STATUS`
- `--expression` allows word replacement

--mode=varcomp



- `%metadata{varstatus}`
- `SHOW GLOBAL VARIABLES`
- `SHOW GLOBAL STATUS`
- `--expression` allows word replacement
- `--warning` `--critical` are flexible

Sample Command Definition



```
define command {  
    command_name      check_mysql_cxns  
    command_line      $USER1$/mysql_health_check.pl  
    --hostname $HOSTADDRESS$ --user myuser --password  
    mypass
```

Sample Command Definition



```
define command {  
    command_name      check_mysql_cxns  
    command_line      $USER1$/mysql_health_check.pl  
    --hostname $HOSTADDRESS$ --user myuser --password  
    mypass  
    --cache-dir=/var/lib/nagios/mysql_cache  
    --max-cache-age=300
```


Sample Command Definition



```
define command {  
    command_name      check_mysql_cxns  
    command_line      $USER1$/mysql_health_check.pl  
    --hostname $HOSTADDRESS$ --user myuser --password  
    mypass  
    --cache-dir=/var/lib/nagios/mysql_cache  
    --max-cache-age=300  
    --mode=varcomp  
    --expression=  
        "Max_used_connections/max_connections * 100"  
    --warning=">80" -critical=">90"  
}
```


Sample Command Definition



```
command_name      check_mysql_cxns
```

```
--mode=varcomp
```

```
--expression=
```

```
    "Max_used_connections/max_connections * 100"
```

```
--warning=">80" -critical=">90"
```

```
}
```

Sample Service Definition



```
define service {  
    use                generic-service  
    host_name          HOSTNAME  
    service_description MySQL Connections  
    check_command      check_mysql_cxns  
}
```

Rates



- Compare to last run

Rates



- Compare to last run
- `mode=lastrun-varcomp`

Rates



- Compare to last run
- `mode=lastrun-varcomp`
- `current{expr}`

Rates



- Compare to last run
- `mode=lastrun-varcomp`
- `current{expr}`
- `lastrun{expr}`

Rates



- Compare to last run
- `mode=lastrun-varcomp`
- `current{expr}`
- `lastrun{expr}`
- `--comparison, no warn/crit`

Query Rate



mysql_health_check.pl [host,user,pass]

Query Rate



```
mysql_health_check.pl [host,user,pass]  
--mode lastrun-varcomp
```

Query Rate



```
mysql_health_check.pl [host,user,pass]
```

```
--mode lastrun-varcomp
```

```
--expression "(current{Queries} - lastrun{Queries})"
```


Query Rate



```
mysql_health_check.pl [host,user,pass]
```

```
--mode lastrun-varcomp
```

```
--expression "(current{Queries} - lastrun{Queries})  
/ (current{Uptime} - lastrun{Uptime})"
```

Query Rate



```
mysql_health_check.pl [host,user,pass]
--mode lastrun-varcomp
--expression "abs((current{Queries} - lastrun{Queries})
              / (current{Uptime} - lastrun{Uptime}))*100"
--comparison ">80"
```



```
define command {  
    command_name      check_mysql_query_rate  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --user myuser  
    --password mypass  
--cache-dir=/var/lib/nagios/mysql_cache  
--max-cache-age=300  
--mode=lastrun-varcomp  
--expression=  
    "abs((current{Queries} - lastrun{Queries}) /  
        (current{Uptime} - lastrun{Uptime}))*100"  
--comparison > 100  
}
```

Other Modes



- `--mode=long-query`
- `--mode=locked-query`
- `%metadata{proc_list}`
 - `SHOW FULL PROCESSLIST`

Sample Command Definition



```
define command {  
    command_name      check_mysql_locked_queries  
    command_line      $USER1$/mysql_health_check.pl  
    --hostname $HOSTADDRESS$ --user myuser  
    --password mypass  
    --cache-dir=/var/lib/nagios/mysql_cache  
    --max-cache-age=300  
    --mode=locked-query  
    --warning=$ARG1$ --critical=$ARG2$  
}
```


Extending Information



```
sub fetch_server_meta_data {}
```

add a new hash key to %metadata

```
$metadata{varstatus} =  
    $dbh->selectall_arrayref(  
        q|SHOW GLOBAL VARIABLES|);
```

Extending Information



```
sub fetch_server_meta_data {}
```

add a new hash key to %metadata

```
$metadata{innodb_status} =  
    $dbh->selectall_arrayref(  
        q|SHOW ENGINE INNODB STATUS|);
```

For example



- `%metadata{innodb_status}`
 - `SHOW ENGINE INNODB STATUS`
 - Already exists, unused

For example



- `%metadata{innodb_status}`
 - `SHOW ENGINE INNODB STATUS`
 - Already exists, unused
- `%metadata{master_status}`
 - `SHOW MASTER STATUS`

For example



- `%metadata{innodb_status}`
 - `SHOW ENGINE INNODB STATUS`
 - Already exists, unused
- `%metadata{master_status}`
 - `SHOW MASTER STATUS`
- `%metadata{slave_status}`
 - `SHOW SLAVE STATUS`

“Standard” checks



% max connections

--expression

'Threads_connected/max_connections*100'

“Standard” checks



% max connections

--expression

'Threads_connected/max_connections*100'

InnoDB enabled

--expression "have_innodb"

--comparison="ne 'YES'"



```
define command {  
    command_name      check_mysql_connections  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --port 3306 --user  
<user> --password <password> --mode=varcomp  
--expression="Threads_connected/max_connections  
* 100" --comparison=">80"  
}
```

```
define command {  
    command_name      check_mysql_innodb  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --port 3306 --user  
<user> --password <password> --mode=varcomp  
--expression="have_innodb" --comparison="ne  
'YES'  
}
```

Did MySQL Crash?



Nagios set to check every 5 minutes

Did MySQL Crash?



Nagios set to check every 5 minutes

Might miss a crash

Did MySQL Crash?



Nagios set to check every 5 minutes

Might miss a crash

Uptime!

--expression 'Uptime'

--comparison=" <1800 "

Did MySQL Crash?



```
define command {  
    command_name      check_mysql_uptime  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --port 3306 --user  
<user> --password <password> --mode=varcomp  
--expression="Uptime" --comparison="<1800"  
}
```

“Standard” checks



read_only for slaves

```
--expression "read_only"  
--comparison="ne 'YES'"
```

“Standard” checks



read_only for slaves

--expression "read_only"

--comparison="ne 'YES'"

% of sleeping connections

connected, # running, # max connections

“Standard” checks



read_only for slaves

```
--expression "read_only"  
--comparison="ne 'YES'"
```

% of sleeping connections

connected, # running, # max connections

```
--expression="(Threads_connected-  
Threads_running)/max_connections * 100"  
--comparison=">$ARG1$"
```




```
define command {  
    command_name      check_mysql_read_only  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --port 3306 --user  
<user> --password <password> --mode=varcomp  
--expression="read_only" --comparison="ne  
'YES'"  
}
```

```
define command {  
    command_name      check_mysql_connections  
    command_line      $USER1$/mysql_health_check.pl  
--hostname $HOSTADDRESS$ --port 3306 --user  
<user> --password <password> --mode=varcomp  
--expression="(Threads_connected-  
Threads_running)/max_connections * 100"  
--comparison=">$ARG1$"
```

Limitations



- One check/calculation per Nagios service
 - But, you can use many variables
 - Cached output
- Does not output for performance data
 - Not hard to modify, just no need yet

Where to get it



<https://github.com/palominodb/PalominoDB-Public-Code-Repository/tree/master/nagios/>

www.palominodb.com->Community->Projects



Other Nagios Plugins

Nagios Plugin for Partitions



```
table_partitions.pl --host  
--user --pass  
--database --table  
--range [days|weeks|months]  
--verify #
```


Nagios Plugin for Partitions



```
table_partitions.pl --host db1.mozilla.com  
--user nagiosuser --pass nagiospass  
--database addons --table user_addons  
--range months  
--verify 3
```

Nagios Plugin for Checksums



After using pt-table-checksum (master)

Slaves have a table with checksum

`this_crc` vs `master_crc`

Nagios Plugin for Checksums



```
check_table_checksums.pl -H host  
--user username --pass password  
-T checksum_table  
-l checksum_freshness  
-b dbs,to,skip
```

More Resources

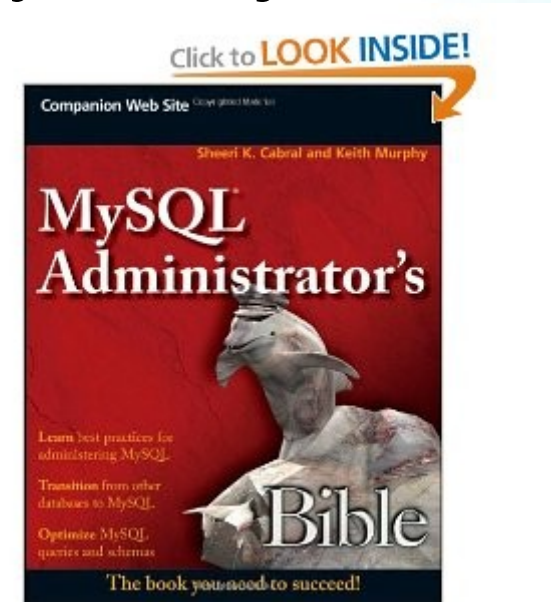


www.palominodb.com->Community->Projects

www.mysqlmarinate.com

scabral@mozilla.com

OurSQL podcast (oursql.com)



slides: http://bit.ly/nagios_mysql2013

MySQL Administrator's Bible

youtube.com/tcation

<http://planet.mysql.com>