



# Reading MySQL fingerprints

**FromDual Company Meeting  
10. September 2014, Barcelona**

**by [oli.sennhauser@fromdual.com](mailto:oli.sennhauser@fromdual.com)**

[www.fromdual.com](http://www.fromdual.com)



# About FromDual GmbH

[www.fromdual.com](http://www.fromdual.com)

- FromDual provides neutral and independent:
  - Consulting for MySQL, Galera Cluster, MariaDB and Percona Server
  - Support for all MySQL and Galera Cluster
  - Remote-DBA Services for all MySQL
  - MySQL Training
- Open Source Business Alliance (OSBA)
- Member of SOUG, DOAG, /ch/open



[www.fromdual.com](http://www.fromdual.com)

# Fingerprints

- **Every MySQL has its fingerprints**
- **Information about health**
- **Wrong configuration**
- **Other problems**
- **Slow queries, bad queries etc.**

**SHOW GLOBAL STATUS;**

# Uptime

- **Begin with uptime**
  - → **useful information or NOT?**
  - **1'000'000  $\approx$  12 days**

```

| Uptime | 9809805 |
| Uptime_since_flush_status | 677842 |

| Uptime | 191 |
| Last_query_cost | 0.000000 |

```

**If “since\_flush” is missing →  $\leq 5.0$**

# Aborted\_...

- **Connection “problems”**
  - **Aborted clients: Client died (exit, kill, x\_timeout)**
  - **Aborted connects: Failed connects (user, privs)**

```

| Aborted_clients      | 6175600 |
| Aborted_connects    | 2366773 |
| Uptime               | 7678963 |

| interactive_timeout | 14400   |
| wait_timeout        | 14400   |

| log_error            | /var/lib/mysql/error.log |
| log_warnings        | 2       |

| connect_timeout      |         | 10 |
| Connection_errors_max_connections |         | 275 |
| Max_used_connections |         | 451 |
| max_connections      |         | 450 |

```

# Binlog Cache

- **Caching DML in temporary disk file**
  - Transactions
  - Non-transactional statements
  - Per thread?

<code>Binlog_cache_disk_use</code>	<b>229898</b>	
<code>Binlog_cache_use</code>	78995379	
<code>Binlog_stmt_cache_disk_use</code>	2	
<code>Binlog_stmt_cache_use</code>	173	
<code>binlog_format</code>	MIXED	
<code>binlog_cache_size</code>	<b>32768</b>	
<code>binlog_stmt_cache_size</code>	<b>32768</b>	

# Network / Socket traffic

- Traffic in/out
  - Not good or bad → did you expect this?

Bytes_received	1501169892674	1.5 Pbyte
Bytes_sent	22058611469658	22.0 Pbyte
Uptime	2730233	31.6 days

# Com\_DML

- **Commands sent against the database**
  - **Not good or bad → did you expect this?**

Com_delete	5136637
Com_delete_multi	0
Com_insert	92274259
Com_insert_select	0
Com_replace	226382
Com_replace_select	11865
Com_select	2868492858
Com_update	67269282
Com_update_multi	2
Uptime	2730233



# Com\_Trx

- Transactions

Com_begin	0
Com_commit	1179043996
Com_rollback	5478834
Com_begin	1251036
Com_commit	1251030
Com_rollback	6
Com_begin	85621424
Com_commit	844440316
Com_rollback	597789274

# Com\_stmt

- Prepared Statements (server side)
  - Frameworks? Java?

Com_stmt_prepare	34299289	
Com_stmt_execute	34299289	
Com_stmt_close	160618	
Com_stmt_prepare	410680831	
Com_stmt_execute	304205150	
Com_stmt_close	304204263	890?
Com_stmt_prepare	349208	
Com_stmt_execute	60200559	172 exec/prep!
Com_stmt_close	349180	28?

# Com\_show

- Monitoring?

Com_show_master_status	105734	26 s
Com_show_slave_status	45506	60 s
Com_show_status	8411773	3/s
Com_show_variables	37178223	13/s
Uptime	2730233	

Com_show_master_status	227759	60 s
Com_show_slave_status	227603	60 s
Com_show_status	455295	30 s
Com_show_variables	457652	30 s
Uptime	13650479	

# Temporary tables

- In memory (HEAP/MEMORY)
- On disk (MyISAM)

Created_tmp_disk_tables	3340108	3.5%!
Created_tmp_tables	85673163	
max_heap_table_size	16777216	
tmp_table_size	16777216	

tmp_table_size	1572864000	
max_heap_table_size	4294967296	
Created_tmp_disk_tables	4002	
Created_tmp_tables	1211581	

# Handler read

- Indicates (full) table scan
  - Missing indexes or
  - DWH / Reporting system?

Handler_read_first	666910697
Handler_read_key	228689782385
Handler_read_next	668867162111
Handler_read_rnd_next	<b>6202456718291</b>
Handler_read_first	990454
Handler_read_key	803290678
Handler_read_next	2642462807
Handler_read_rnd_next	<b>957907147</b>

# InnoDB Buffer Pool

- Buffer Pool Hit Rate should be around 99.9%

Innodb_buffer_pool_pages_data	8077	
Innodb_buffer_pool_pages_free	1	
Innodb_buffer_pool_pages_misc	113	
Innodb_buffer_pool_pages_total	8191	
Innodb_buffer_pool_read_requests	9269651791	
Innodb_buffer_pool_reads	143264886	98.5%
Innodb_buffer_pool_pages_data	2997668	
Innodb_buffer_pool_pages_free	8613535	
Innodb_buffer_pool_pages_misc	1495933	
Innodb_buffer_pool_pages_total	13107136	
Innodb_buffer_pool_read_requests	1300196249	
Innodb_buffer_pool_reads	224	

# InnoDB Log Buffer/File

- InnoDB Log Buffer capacity 60s
- InnoDB Log File capacity 3600s

```
| Innodb_os_log_written | 172852163072 | 62 kybte/s avg  
| Uptime                | 2730233      |  
  
| innodb_log_file_size  | 104857600    |  
| innodb_log_buffer_size| 8388608      |
```

# InnoDB Locking

Innodb_row_lock_current_waits	12	
Innodb_row_lock_time	71397579	
Innodb_row_lock_time_avg	206	
Innodb_row_lock_time_max	121785	
Innodb_row_lock_waits	346124	
innodb_lock_wait_timeout	120	



# InnoDB r/w ratio

- Normal database (r/w)
- Heavy write database

Innodb_rows_deleted	81658570	
Innodb_rows_inserted	92260188	
Innodb_rows_updated	63840419	
Innodb_rows_read	3497505486831	
Innodb_rows_deleted	3534987	
Innodb_rows_inserted	3634822	
Innodb_rows_updated	14328287	
Innodb_rows_read	34640044	

# MyISAM key buffer

- MyISAM is rarely used nowadays

```
| Key_blocks_unused | 319661 | |
| Key_blocks_used   | 38634  | | 1 kbyte pages
| Key_read_requests | 3818219101 | |
| Key_reads         | 23      | |

| key_buffer_size   | 402653184 | |
```

# Table Definition Cache

- New with MySQL 5.1
- Important for “hoster”

```
| Open_table_definitions | 612 |  
| Opened_table_definitions | 616 |  
| table_definition_cache | 1424 |  
  
| Open_table_definitions | 4367 |  
| Opened_table_definitions | 6268726 |  
| table_definition_cache | 256 |
```

# Table (Open) Cache

- Split with MySQL 5.1 (into open and def)
- Important for “hoster”

```

| table_open_cache | 2048 |
| Open_tables      | 2048 |
| Opened_tables    | 5705 |

| table_open_cache | 4000 |
| Open_tables      | 2871 |
| Opened_tables    | 39803 |

| table_cache      | 4096 |
| Open_tables      | 4096 |
| Opened_tables    | 446514619 |

```

# Query Cache

- **Global Query Cache Mutex!**

Qcache_free_memory	<b>412590664</b>	
Com_select	790313901	
Qcache_hits	3277601787	80%
query_cache_size	536870912	
Qcache_free_memory	12483920	
Com_select	<b>2868492858</b>	
Qcache_hits	<b>2892824901</b>	50%
query_cache_size	33554432	

# Query Tuning

- Those values should be ZERO!
  - Indexes missing
  - Slow Query Log:  
`log_queries_not_using_indexes`

<code>Select_full_range_join</code>	406	
<code>Select_range_check</code>	25880	

# Sort Buffer

- **Sort Buffer per connection**
  - **Malloc slow → keep it small**

```
| sort_buffer_size | 2097152 |  
  
| Sort_merge_passes | 401 |  
| Sort_range | 219725044 |  
| Sort_scan | 77618027 |  
| Sort_rows | 2403531992 | avg 8 r/sort
```

# MyISAM lock contention?

- MyISAM is rarely used nowadays

```
| Table_locks_immediate | 3480786626 |  
| Table_locks_waited   | 0          |  
  
| Table_locks_immediate | 5306900555 |  
| Table_locks_waited   | 4952191    |
```



# Threads and thread cache

- Connections and concurrency

Max_used_connections	1564	
max_connections	2000	
thread_cache_size	40	
Threads_cached	23	
Threads_connected	415	
Threads_created	159211	
Threads_running	10	
Threads_cached	0	
Threads_created	6111497	

# Q & A



**Questions ?**

**Discussion?**

**We have time for some face-to-face talks...**

- **FromDual provides neutral and independent:**
  - **Consulting**
  - **Remote-DBA**
  - **Support for MySQL, Galera, Percona Server and MariaDB**
  - **Training**

**[www.fromdual.com/presentations](http://www.fromdual.com/presentations)**