Integration

 $\bullet \ \ Instructions: \ https://apps.sematext.com/ui/howto/MySQL/overview$

Metrics

Metric			
Name Key	Agg	Type	Description
openedmysq	1. Subtes	s.deolingit	 i @peped edable_definitions
ta-			The
ble			num-
def-			ber
ini-			of
tions			.frm
			files
			that
			have
			been
			cached

Name Key Agg Type Description

 $created \underline{\ \ } wysql. \underline{\ \ } Subhes. \underline{\ \ } tho \underline{\ \ } pg \quad Created \underline{\ \ } tmp \underline{\ \ } tables:$ The tmp tanumbles ber ofin-ternal temporary tables created by the server while executingstate- ${\rm ments}$

Name Key Agg Type Description

```
flush \quad mysql. \textbf{Subhe}s. \textbf{flushe}s. \textbf{Flush\_commands}:
com-
                                   The
mands
                                   num-
                                   ber
                                   of
                                   {\rm times}
                                   the
                                   server
                                   flushes
                                   ta-
                                   bles,
                                   whether
                                   be-
                                   cause
                                   a
                                   user
                                   exe-
                                   cuted
                                   \operatorname{FLUSH}
                                   TA-
                                   BLES
                                   state-
                                   {\rm ment}
                                   or
                                   due
                                   to
                                   in-
                                   \operatorname{ter}-
                                   nal
                                   server
                                   op-
                                   era-
                                   tion
```

Name Key Agg Type Description

```
table \ mysql. \textbf{Subdes}. lboksgw \textbf{Alabele}\_locks\_waited:
locks
                                      The
waited
                                      num-
                                      ber
                                      of
                                      {\rm times}
                                      that
                                      a
                                      re-
                                      {\it quest}
                                      for
                                      \mathbf{a}
                                      ta-
                                      ble
                                      lock
                                      \operatorname{could}
                                      \operatorname{not}
                                      be
                                      granted
                                      \operatorname{im-}
                                      me-
                                      di-
                                      ately
                                      \quad \text{and} \quad
                                      a
                                      wait
                                      was
                                      needed.
                                      If
                                      this
                                      is
                                      high
                                      and
                                      you
                                      have
                                      per-
                                      for-
                                      mance
                                      prob-
                                      lems,
                                      you
                                      should
                                      \operatorname{first}
                                      op-
                    4
                                      ti-
                                      mize
                                     your
                                      queries,
                                      and
                                      then
```

either

Name Key Agg Type Description

 $opened \underline{mysql}. \underline{\textbf{Subbes}}. \underline{\textbf{dpome}} dOpened \underline{}. \underline{\textbf{tables}}:$

tables
The number of

of tables that have been opened. If

 $Opened_tables$

is big, your ta-

 ble_open_cache

value
is
probably
too
small

Name Key Agg Type Description

```
table \ mysql. \textit{tAdv} ges. \textit{definition} \underline{\ cache} :
def-
                                   The
ini-
                                   num-
tion
                                   ber
\operatorname{cache}
                                   of
                                   ta-
                                   ble
                                   def-
                                   ini-
                                   tions
                                  (from
                                   . {\rm frm}
                                   files)
                                   that
                                   can
                                   be
                                   stored
                                   in
                                   the
                                   def-
                                   ini-
                                   {\rm tion}
                                   cache.
                                   If
                                   you
                                   use
                                   a
                                   large
                                   num-
                                   {\rm ber}
                                   of
                                   ta-
                                   bles,
                                   you
                                   \operatorname{can}
                                   cre-
                                   ate
                                   a
                                   {\rm large}
                                   ta-
                                   ble
                                   def-
                                   ini-
                                   tion
                   6
                                   cache
                                   to
                                   speed
                                   up
                                   open-
                                   ing
                                   of
```

ta-

Name Key Agg Type Description

 $open \quad mysql. \textit{targes}. \textit{definitions} : \\$

 $\begin{array}{ccc} \text{ta-} & & \text{The} \\ \text{ble} & & \text{num-} \\ \text{def-} & & \text{ber} \\ \text{ini-} & & \text{of} \\ \text{tions} & & \text{cached} \\ & & & \text{.frm} \\ \text{files} \end{array}$

Name Key Agg Type Description

```
table \ mysql. \textit{table\_open\_cache:} \\
open
                                The
\operatorname{cache}
                                num-
                                ber
                                of
                                open
                                ta-
                                bles
                                for
                                all
                                threads.
                                In-
                                creas-
                                \operatorname{ing}
                                this
                                value
                                in-
                                creases
                                the
                                num-
                                ber
                                of
                                file
                                \operatorname{de}-
                                {\rm scrip}\text{-}
                                tors
                                that
                                mysqld
                                re-
                                quires.
                                You
                                can
                                check
                                whether
                                you
                                need
                                to
                                in-
                                crease
                                the
                                ta-
                                ble
                                cache
                                by
                 8
                                check-
                                ing
                                the
                                Opened\_tables
                                sta-
```

tus

vari-

able

Name Key Agg Type Description

```
created \underline{\  \  } wysql. \textbf{Subdes.thop}. \textbf{g} dis \textbf{@} reated \underline{\  \  } tmp \underline{\  \  } disk \underline{\  \  } tables:
                                              The
\operatorname{tmp}
\operatorname{disk}
                                              num-
ta-
                                              ber
bles
                                              of
                                              in-
                                              \text{ter-}
                                              nal
                                              on-
                                              \operatorname{disk}
                                              tem-
                                              po-
                                              rary
                                              ta-
                                              bles
                                              cre-
                                              {\rm ated}
                                              by
                                              the
                                              server
                                              while
                                              exe-
                                              cut-
                                              ing
                                              state-
                                              ments.
                                              \operatorname{If}
                                              an
                                              in-
                                              \text{ter-}
                                              nal
                                              tem-
                                              po-
                                              rary
                                              ta-
                                              ble
                                              is \\
                                              cre-
                                              {\rm ated}
                                              ini-
                                              tially
                                              as
                                              an
                                              in-
                         9
                                              memory
                                              ta-
                                              {\rm ble}
                                              but
                                              be-
                                              comes
```

 $\begin{array}{c} too \\ large, \end{array}$

Metric Name Key Agg Type Description

open mysql.tables.dpmg Open_tables:
tables number
of
tables
tables
that
are
open

table mysql. Sabres. Ibokog in Trabble at ecks_immediate:

mediately

 ${\rm locks}$ The im numme- $_{\rm ber}$ of diate ${\rm times}$ that a request for a table lockcould be $\operatorname{granted}$ im -

Name Key Agg Type Description

 $\quad \text{buffer} \quad$ The pool tobytes tal dirty cur- ${\rm rent}$ num- $_{\rm ber}$ ofbytes held indirty pages inthe InnoDBbuffer pool

Name Key Agg Type Description

 $innodbmysql. \textbf{Sumod} b \textbf{Llouffer Locaded} b _buffer _pool_reads:$ buffer The pool numreads ber oflogi- cal readsthat Inn- oDB could not satisfy from the $\quad \text{buffer} \quad$ pool, and had to read directly ${\rm from}$ the disk

Name Key Agg Type Description

 $innodbmysql. i \verb|Ang| db \verb|Lonffer | \verb|Ipages| bfree | uffer _pool _pages _free:$ $\quad \text{buffer} \quad$ The pool numpages ber ${\rm free}$ of ${\rm free}$ pages inthe InnoDBbuffer pool $innodbmysql. i \verb|Ang| db \verb|Lonff| er \verb|Lonff| pages b buffer _pool _pages _total:$ $\quad \text{buffer} \quad$ The pool to-

buffer The
pool topages tal
total of
the
InnoDB
buffer
pool,
in

pages

Name Key Agg Type Description

 $innodbmysql. \textbf{Sumodblkonffer}. \textbf{Inenddth}\underline{\textbf{e}} \textbf{bol.fevi}\underline{\textbf{ctpd}}ol_read_ahead_evicted:$ $\quad \text{buffer} \quad$ The pool numread ber ahead of evicted pages read intothe InnoDBbuffer pool by the readahead background threadthat were subsequently evicted without having been accessed by queries. This variable was addedin ${\rm MySQL}$ 5.1.41

Name Key Agg Type Description

 $innodbmysql. \textbf{iAng} db \textbf{Ibanff} er. \textbf{Ipaged} \textbf{b} \underline{\textbf{lin}} \textbf{ty} \textbf{ff} er_pool_pages_dirty:$ buffer The pool curpages rent dirty number of dirty pages in the InnoDBbuffer

 $in nodbmysql. \textbf{Sumod} b \textbf{Louffer}. \textbf{Murioelbeqbuester}_pool_write_requests:$

pool

buffer pool

buffer The pool numwrite ber re- writes done to the InnoDB

Name Key Agg Type Description

 $innodbmysql. i \verb|Ang| db \verb|Llouff| er \verb|Lpaged| bmi baffer _pool _pages _misc:$ $\quad \text{buffer} \quad$ The pool numpages ber misc of pages inthe InnoDBbuffer pool thatare busy because they have been allo- cated for ad- $\min\!-\!$ istrative overhead, such as row locksor the adaptive hash in- dex

Name Key Agg Type Description

```
innodbmysql. \textbf{Sumod} bl\text{lanffer.lpages} lf\text{lublueffer\_pool\_pages\_flushed:}
\quad \text{buffer} \quad
                                       The
pool
                                       num-
pages
                                       ber
_{\mathrm{flushed}}
                                       of
                                       re-
                                       {\it quests}
                                       to
                                       {\rm flush}
                                       pages
                                       from
                                       the
                                       Inn-
                                       oDB
                                       buffer
                                       pool
innodbmysql. \textbf{iAvg} db \textbf{llouffer isize} db\_buffer\_pool\_size:
\quad \text{buffer} \quad
                                       The
pool
                                       size
size
                                       in
                                       bytes
                                       of
                                       the
                                       \quad \text{buffer} \quad
                                       pool,
                                       the
                                       mem-
                                       ory
                                       area
                                       where
                                       Inn-
                                       oDB
                                       caches
                                       ta-
                                       ble
                                       \quad \text{and} \quad
                                       in-
                                       \operatorname{dex}
                                       data
```

Name Key Agg Type Description

 $innodbmysql. \textbf{Summ} db \textbf{Nonffer Ineaddth} \underline{e} \textbf{but} ffer \underline{pool_read_ahead} :$ ${\it buffer}$ The pool numread ber ahead of pages read intothe InnoDBbuffer pool by the readahead background thread.This variable was added in ${\rm MySQL}$

5.1.41

Name Key Agg Type Description

 $in nodbmy sql. \textbf{Sumo} db \textbf{Louffer In endd blant Seq_pool_read_ahead_seq:}$ buffer The pool numread ber ahead of seqsequen- $_{\rm tial}$ readaheads initi- ${\rm ated}$ by InnoDB. This happens when InnoDBdoesa sequential full table scan

Name Key Agg Type Description

 $innodbmysql. i \verb|Ang| db \verb|Louffer | \verb|bytes| data:$ The buffer pool tobytes tal datanumber of bytes inthe InnoDB $\quad \text{buffer} \quad$ pool containing data.The number in- ${\rm cludes}$ bothdirty and cleanpages

Name Key Agg Type Description

 $in nodbmy sql. \textbf{\textit{Sumo}} db \textbf{\textit{llouffer Ineaddbh\underline{e}bol.fferd}_pool_read_ahead_rnd:$ $\quad \text{buffer} \quad$ The pool numread ber ahead of"ran- rnd $\operatorname{dom}"$ readaheadsinitiated by InnoDB. $\quad \text{This} \quad$ happens when query scans ${\rm large}$ por- ${\rm tion}$ of a table but inran- dom or- der

Name Key Agg Type Description

```
innodbmysql. \textbf{Sumodblanffer}. \textbf{Immiddbee} buffer\_pool\_wait\_free:
\quad \text{buffer} \quad
                                 Nor-
                                 mally,
pool
wait
                                 writes
{\rm free}
                                 to
                                 the
                                 Inn-
                                 oDB
                                 buffer
                                 pool
                                 hap-
                                 pen
                                 in
                                 the
                                 back-
                                 ground.
                                 How-
                                 ever,
                                 if it
                                 is \\
                                 nec-
                                 es-
                                 sary
                                 to
                                 \operatorname{read}
                                 or
                                 cre-
                                 ate
                                 page
                                 and
                                 no
                                 {\it clean}
                                 pages
                                 are
                                 avail-
                                 able,
                                 it is
                                 {\it also}
                                 nec-
                                 es-
                                 sary
                                 to
                                 wait
                 22
                                 for
                                 pages
                                 to
                                 be
                                 flushed
                                 first.
```

This counter

Name Key Agg Type Description

```
in nodbmy sql. \textbf{\textit{Sumo}} db \textbf{\textit{llouffer}} \textbf{\textit{lneaddhequbestfier}} pool\_read\_requests:
\quad \text{buffer} \quad
                                        The
pool
                                        num-
read
                                        ber
re-
                                        of
                                        logi-
quests
                                        \operatorname{cal}
                                        \operatorname{read}
                                        re-
                                        quests
innodbmysql. i \verb|Ang| db \verb|Lonff| er \verb|Lonff| abauffer \_pool \_pages \_data:
\quad \text{buffer} \quad
                                        The
pool
                                        num-
pages
                                        _{\rm ber}
data
                                        of
                                        pages
                                        in
                                        the
                                        Inn-
                                        oDB
                                        buffer
                                        pool
                                        con-
                                        tain-
                                        ing
                                        data.
                                        The
                                        num-
                                        _{\rm ber}
                                        in-
                                        cludes
                                        both
                                        dirty
                                        and
                                        clean
```

pages

Name Key Agg Type Description

```
innodbmysql. i \verb|Avag| db \verb|Ibouff| er i \verb|meaodd | beachd | \underline{threshold}.
                                       Con-
read
ahead
                                       {\rm trols}
thresh-
                                       the
\operatorname{old}
                                       sen-
                                       si-
                                       \operatorname{tiv}-
                                       ity
                                       of
                                       lin-
                                       ear
                                       read-
                                       \quad \text{ahead} \quad
                                       that
                                       Inn-
                                       oDB
                                       uses
                                       to
                                       prefetch
                                       pages
                                       into
                                       the
                                       \quad \text{buffer} \quad
                                       pool.
                                       The
                                       per-
                                       mis-
                                       si-
                                       ble
                                       range
                                       of
                                       val-
                                       ues
                                       is 0
                                       to
                                       64.
                                       The
                                       de-
                                       fault
                                       is
                                       56:
                                       Inn-
                                       oDB
                                       \operatorname{must}
                     24
                                       \operatorname{read}
                                       at
                                       {\rm least}
                                       56
                                       pages
                                       se-
```

quentially

```
Metric
                      Type Description
Name Key Agg
innodbmysql. \textbf{Sumodb} \textbf{Lock} \\ w \textbf{knits} odb\_row\_lock\_waits:
row
                               The
lock
                               num-
waits
                               ber
                               of
                               _{
m times}
                               a
                               row
                               lock
                               had
                               to
                               be
                               waited
                               for
innodb mysql. i \verb|Ang| db \verb|Ldantg|. w| \verb|rinexd| bend in \verb|g| pending writes:
data
                               The
pend-
                               cur-
ing
                               rent
writes
                               num-
                               ber
                               of
                               pend-
                               ing
                               writes
innodbmysql.iAngdbIpanges.sizeodb_page_size:
page
                               The
                               compiled-
size
                               in
                               Inn-
                               oDB
                               page
                               size
                               (de-
```

 $\begin{array}{c} {\rm fault} \\ {\rm 16KB}) \end{array}$

M-+--:-

Metric

Name Key Agg Type Description

 $innodbmysql. \textbf{Sumo} db \textbf{Ipauges}. \textbf{Innit} \textbf{tch} \underline{\hspace{0.5cm}} pages \underline{\hspace{0.5cm}} written:$

pages The writ- numten ber of pages written ten

 $innodbmysql. \textbf{Sumod} b \textbf{\textit{Ldantg}}. \textbf{\textit{read}} odb_data_read:$

data The read amount of data read

innodbmysql.iAngdbllog.gvrItasqdhndinsglog_pending_writes:

os The log numpendber ing of writes pending log file writes

 $innodbmysql. \textbf{SumodbIpanges}. \textbf{Fnand} db_pages_read:$

pages The read number of pages read

D. f. . .

Metric

Name Key Agg Type Description

 $innodbmysql. i \verb|Ang| db | \verb|Doubbactqnivithg.tione|.a | ogk_time_avg:$

row The lock avtime eravg age time to acquire a row lock

 $innodbmysql. \textbf{Sumodbllog.g} write_requests:$

log The write numre- ber quests of log write

write requests

Name Key Agg Type Description

```
innodbmysql. i \verb"Ang" db \verb"Ilog_b" uffer \verb"csit" be \verb"log_b" uffer \verb"csit" be "log_b" uffer \"csit" be "log_b" uffer \"csi" be "log_b" uffer \"csit" be "log_b" uffer \"csit" be "log_
   log
                                                                                                                                                                                                                                                                 The
   buffer
                                                                                                                                                                                                                                                                 size
   size
                                                                                                                                                                                                                                                                 in
                                                                                                                                                                                                                                                                 bytes
                                                                                                                                                                                                                                                                 of
                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                 \quad \text{buffer} \quad
                                                                                                                                                                                                                                                                 that
                                                                                                                                                                                                                                                                 Inn-
                                                                                                                                                                                                                                                                 oDB
                                                                                                                                                                                                                                                                 uses
                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                 write
                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                 \log
                                                                                                                                                                                                                                                                 files
                                                                                                                                                                                                                                                                 on
                                                                                                                                                                                                                                                                 disk.
                                                                                                                                                                                                                                                                 The
                                                                                                                                                                                                                                                                 de-
                                                                                                                                                                                                                                                                 fault
                                                                                                                                                                                                                                                                 value
                                                                                                                                                                                                                                                                 is
                                                                                                                                                                                                                                                                 8\mathrm{MB}.
                                                                                                                                                                                                                                                                 Α
                                                                                                                                                                                                                                                                 large
                                                                                                                                                                                                                                                                 log
                                                                                                                                                                                                                                                                 \quad \text{buffer} \quad
                                                                                                                                                                                                                                                                 en-
                                                                                                                                                                                                                                                                 ables
                                                                                                                                                                                                                                                                 large
                                                                                                                                                                                                                                                                 trans-
                                                                                                                                                                                                                                                                 ac-
                                                                                                                                                                                                                                                                 {\rm tions}
                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                 run
                                                                                                                                                                                                                                                                 with-
                                                                                                                                                                                                                                                                 out
                                                                                                                                                                                                                                                                 a
                                                                                                                                                                                                                                                                 need
                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                 write
                                                                                                                                         28
                                                                                                                                                                                                                                                                 the
                                                                                                                                                                                                                                                                 \log
                                                                                                                                                                                                                                                                 to
                                                                                                                                                                                                                                                                 \operatorname{disk}
                                                                                                                                                                                                                                                                 be-
                                                                                                                                                                                                                                                                 fore
                                                                                                                                                                                                                                                                 the
```

trans-

Name Key Agg Type Description

 $innodbmysql. \textbf{Sumo}db \textbf{\textit{Ldantg}}. \textbf{\textit{reads}}db \underline{}data \underline{} reads:$

dataThe reads number of data ${\rm reads}$

 $innodbmysql. i \verb|Ang| db \verb|Ldantg|. r \verb|Ends. oben diantg| pending_reads:$

dataThe pendcuring rent ${
m reads}$ num- $_{\rm ber}$ ofpending reads

innodbmysql.iAngdblloggileisizedb_log_file_size:

The log file size size inbytes of each \log file in a \log group Metric Name Key Agg Type Description

 $innodbmysql. \textbf{iAng} db \textbf{llogg} sy \textbf{Imsqpkh} \underline{d} \textbf{ins} \underline{g} \log \underline{\hspace{0.3cm}} pending \underline{\hspace{0.3cm}} f syncs: \\ os \\ \overline{\hspace{0.3cm}} The$

log numpendber
ing of
fsyncs pending
log
file
fsync()
operations

 $innodbmysql. \textbf{Sumodb} \textbf{Log_g} wr \textbf{Items} odb_log_wr \textbf{ites}:$

log The writes number of physical writes to the log file

 $innodb mysql. \textbf{Sumod} b \textbf{Ipages}. \textbf{Encepticed} _pages_created:$

pages The crecreated ber
of
pages
created

Metric
Name Key Agg Type Description

 $innodb mysql. i \verb|Ang| db \verb|Ilock| a \verb|dqnivithg.tione|.r | lock_time_max:$

row The lock maxtime imax mum
time
to
acquire
a
row
lock

 $in nodbmy sql. \textbf{\textit{Summodb Idantg. wIrinteed}} b_data_written:$

data The
written of
data
written
in
bytes

 $innodbmysql. \textbf{Sumo} db \textbf{\textit{Ldantg}}. \textbf{\textit{fsymca}} db_data_fsyncs:$

data The fsyncs number of fsync() operations

```
Metric
Name Key Agg Type Description
_____innodbmysql.iAngdblloclg.whitingb_row_lock_current_waits:
```

```
The
row
lock
                                           num-
cur-
                                           ber
\operatorname{rent}
                                           of
waits
                                           row
                                           locks
                                           cur-
                                           rently
                                           be-
                                           ing
                                           waited
                                           for
in nodbmy sql. \textbf{iAng} db \textbf{Idantg}. \textbf{fSymcadb} \underline{\textbf{ending}}\underline{\textbf{pending}}\underline{\textbf{fsyncs:}}
data
                                           The
pend-
                                           cur-
ing
                                           \operatorname{rent}
fsyncs
                                           num-
                                           _{\rm ber}
                                           of
                                           pend-
                                           ing
                                           fsync()
                                           op-
```

 $tions \\ innodbmysql. \textbf{Sumod} b \textbf{Ilockg} a \textbf{dqniridhg.tiowe}_lock_time:$

era-

 row
 The

 lock
 to

 time
 tal

 spent
 in

 ac quir

 ing
 row

 locks

Name Key Agg Type Description

 $innodbmysql. \textbf{Sumod} b \textbf{llog.g} wr \textbf{Ithen} db_os_log_wr \textbf{itten} :$ The \log numwritber $_{
m ten}$ of bytes writ- $_{
m ten}$ tothe \log file $innodbmysql. \textbf{Sumod}b\textbf{Ipages}. \textbf{Innit} \textbf{tch}\underline{.d} \textbf{bbhw} \textbf{r}\underline{\hspace{0.5cm}} pages\underline{\hspace{0.5cm}} written:$ dblwr The pages numwritber of $_{
m ten}$ pages that have been written for dou-

> blewriteoperations

Actric

Metric

Name Key Agg Type Description

 $in nodbmy sql. \textbf{Sumo} db \textbf{Ipauges}. \textbf{Innites} b \underline{db} \textbf{Abv} hwr_writes:$

dblwr The writes number

ber of doublewrite operations that have been per-

 $\quad \text{formed} \quad$

Name Key Agg Type Description

 $in nodb mysql. \textbf{Sumod} b \textbf{llog.g} wa \textbf{lts} nodb \underline{log} \underline{\hspace{0.1cm}} wa its:$ \log The waits number of ${\rm times}$ that the \log $\quad \text{buffer} \quad$ was too small and a wait was required forittobe ${\it flushed}$ be- $\quad \text{fore} \quad$ contin-

> uing

```
Metric
Name Key Agg
                      Type Description
innodbmysql. \textbf{SumodbLrows}. i \textbf{Mseutedb}\_rows\_inserted:
rows
                               The
in-
                               num-
serted
                               ber
                               of
                               rows
                               in-
                               serted
                               into
                               Inn-
                               oDB
                               ta-
                               bles
innodbmysql. \textbf{Sumodb} \textbf{Log}. \textbf{f}sylmsodb\_os\_log\_fsyncs:
                               The
log
                               num-
fsyncs
                               ber
                               of
                               fsync()
                               writes
                               done
                               to
                               the
                               \log
                               {\rm file}
innodbmysql. \textbf{Sumod} b \textbf{Irong}. d \textbf{eleted:}
rows
                               The
deleted
                               num-
                               ber
                               of
                               rows
                               deleted
                               from
```

InnoDB tables

Name Key Agg Type Description

 $innodbmysql. \textbf{\textit{Sumo}} db \textbf{\textit{Ldantg}}. \textbf{\textit{Writhend}} b_data_writes:$

data The writes number of data writes

 $innodbmysql. \textbf{SumodbLrows}.r \textbf{k} a \textbf{d}odb_rows_read:$

rows The read number of rows read from InnoDB tables

 $innodbmysql. \textbf{Sumon} db \textbf{Irong}. \textbf{ulprabated} \underline{\quad} rows\underline{\quad} updated:$

rows The upupdated ber
of
rows
updated
in
InnoDB
tables

Name Key Agg Type Description

 $select \ mysql. \textbf{Spine} at \underline{\textbf{Spine}} at \underline{\textbf{Noine}} at \underline{\textbf{No$ range The check number ofjoins withoutkeys that check for key usage af- ter ${\rm each}$ row. If this isnot0, you shouldcarefully check the indexesof your ta- ${\it bles}$

Name Key Agg Type Description

```
{\tt queriesmysql. \textbf{Spanies} Long \quad Queries:}
                                The
                                num-
                                ber
                                of
                                state-
                                {\rm ments}
                                exe-
                                \operatorname{cuted}
                                by
                                the
                                server.
                                This
                                vari-
                                able
                                in-
                                cludes
                                state-
                                ments
                                exe-
                                cuted
                                within
                                stored
                                pro-
                                grams,
                                un-
                                like
                                the
                                Ques-
                                {\rm tions}
                                vari-
                                able.
                                It
                                does

    \text{not}

                                \operatorname{count}
                                COM\_PING
                                COM\_STATISTICS
                                com-
                                mands.
                                This
                                vari-
                                able
                 39
                                was
                                added
                                in
                                {\rm MySQL}
```

5.0.76

Name Key Agg Type Description

 $select\ mysql. \textbf{Spiner} ies \textbf{Isolegt.} \textbf{Spiner} a \textbf{x} can:$

scan

The

number

of

joins

that

did

did a

full

scan

of

the first

ta-

ble

Name Key Agg Type Description

slow mysql. Squenies Islow Slow queries: queries The number ofqueries that have takenmore than $long_query_time$ seconds. This counter increments regard- ${\rm less}$ ofwhether the slowquery \log is enabled

```
onumber not
onu
                                                                                                                                                                                     mysql. \textbf{\textit{q}} \textbf{\textit{u}} \textbf{\textit{g}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{i}} \textbf{\textit{g}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{i}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}} \textbf{\textit{o}} \textbf{\textit{o}} \textbf{\textit{o}}
flushed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The
de-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    num-
layed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ber
rows
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    rows
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    wait-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    be
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    writ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    {
m ten}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IN-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \operatorname{SERT}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LAYED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    queues
                                                                                                                                                                                     \operatorname{sort}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The
scan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    num-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sorts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    that
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    were
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    done
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    scan-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ning
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ta-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ble
```

```
select \ mysql. \cite{Spinor} \ under \ unde
   full
                                                                                                                                                                                                                                                                                     The
join
                                                                                                                                                                                                                                                                                     num-
                                                                                                                                                                                                                                                                                     ber
                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                     joins
                                                                                                                                                                                                                                                                                     that
                                                                                                                                                                                                                                                                                     per-
                                                                                                                                                                                                                                                                                     {\rm form}
                                                                                                                                                                                                                                                                                     ta-
                                                                                                                                                                                                                                                                                     ble
                                                                                                                                                                                                                                                                                     scans
                                                                                                                                                                                                                                                                                     be-
                                                                                                                                                                                                                                                                                     cause
                                                                                                                                                                                                                                                                                     they
                                                                                                                                                                                                                                                                                     do
                                                                                                                                                                                                                                                                                     \operatorname{not}
                                                                                                                                                                                                                                                                                     use
                                                                                                                                                                                                                                                                                     in-
                                                                                                                                                                                                                                                                                     {\rm dexes.}
                                                                                                                                                                                                                                                                                     If
                                                                                                                                                                                                                                                                                     this
                                                                                                                                                                                                                                                                                     value
                                                                                                                                                                                                                                                                                     is \\
                                                                                                                                                                                                                                                                                     \operatorname{not}
                                                                                                                                                                                                                                                                                     0,
                                                                                                                                                                                                                                                                                     you
                                                                                                                                                                                                                                                                                     should
                                                                                                                                                                                                                                                                                     care-
                                                                                                                                                                                                                                                                                     fully
                                                                                                                                                                                                                                                                                     \operatorname{check}
                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                     in-
                                                                                                                                                                                                                                                                                     dexes
                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                     your
                                                                                                                                                                                                                                                                                     ta-
                                                                                                                                                                                                                                                                                     bles
```

Name Key Agg Type Description

 $\begin{array}{ccc} sort & mysql. \\ \hline \textbf{Space} ies Isontgro \\ \hline sort _rows: \\ \hline The \\ \end{array}$

num-

ber of

sorted rows

```
mysql. \mbox{\it Quaries Ison} \mbox{\it gm} \mbox{\it Sogt} \mbox{\it passes} \mbox{\it e} \mbox{\it passes} \mbox{\it e} \mbox{\it passes} \mbox{\it e} \mbox{\it e} \mbox{\it passes} \mbox{\it e} 
\operatorname{sort}
merge
                                                                                                                                                                                                                                                                                                  The
                                                                                                                                                                                                                                                                                                    num-
passes
                                                                                                                                                                                                                                                                                                    ber
                                                                                                                                                                                                                                                                                                    of
                                                                                                                                                                                                                                                                                                    merge
                                                                                                                                                                                                                                                                                                    passes
                                                                                                                                                                                                                                                                                                    that
                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                    \operatorname{sort}
                                                                                                                                                                                                                                                                                                    al-
                                                                                                                                                                                                                                                                                                    go-
                                                                                                                                                                                                                                                                                                    {\rm rithm}
                                                                                                                                                                                                                                                                                                    has
                                                                                                                                                                                                                                                                                                    had
                                                                                                                                                                                                                                                                                                    to
                                                                                                                                                                                                                                                                                                    do.
                                                                                                                                                                                                                                                                                                    If
                                                                                                                                                                                                                                                                                                    this
                                                                                                                                                                                                                                                                                                    value
                                                                                                                                                                                                                                                                                                    is
                                                                                                                                                                                                                                                                                                    large,
                                                                                                                                                                                                                                                                                                    you
                                                                                                                                                                                                                                                                                                    {\rm should}
                                                                                                                                                                                                                                                                                                    con-
                                                                                                                                                                                                                                                                                                    \operatorname{sider}
                                                                                                                                                                                                                                                                                                    in-
                                                                                                                                                                                                                                                                                                    creas-
                                                                                                                                                                                                                                                                                                    ing
                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                    value
                                                                                                                                                                                                                                                                                                    of
                                                                                                                                                                                                                                                                                                    the
                                                                                                                                                                                                                                                                                                    {\bf sort\_buffer\_size}
                                                                                                                                                                                                                                                                                                    sys-
                                                                                                                                                                                                                                                                                                    _{\mathrm{tem}}
                                                                                                                                                                                                                                                                                                    vari-
                                                                                                                                                                                                                                                                                                    able
```

Name Key Agg Type Description

 $select \ mysql. \\ \textbf{Specimentanfiel} \\ \textbf{fullrange_join:}$ full The range numjoin ber ofjoins $_{\rm that}$ used a range search on a reference table

Name Key Agg Type Description

 $select\ mysql. \textbf{Spine} a \underline{\textbf{Spine}} a \underline{$ range The number ofjoins that used ranges on the first table. This is normally not a critical issue even if the value is quite large

 ${\it Name \ Key \ Agg \ Type \ Description}$

 $delayed ny sql. \textbf{\textit{q}} \textbf{\textit{ue}} ries \textbf{\textit{linse}} rt. \textbf{\textit{Delayed}}. \textbf{\textit{t}} \textbf{\textit{linse}} ds_threads:$

 $\begin{array}{ccc} \text{in-} & & \text{The} \\ \text{sert} & & \text{num-} \\ \text{threads} & & \text{ber} \\ & & \text{of} \\ & & \text{IN-} \\ & & \text{SERT} \\ & & \text{DE-} \\ & & \text{LAYED} \\ & & \text{han-} \end{array}$

dler threads in use

Name Key Agg Type Description

 $max \quad mysql. \textbf{\textit{q}AvgriesIpong} a \textbf{\textit{neral}} \underline{x} \underline{t} \underline{n} \textbf{\textit{p}tx:paaxe} d \underline{-stmt} \underline{-count:}$ pre-This varipared able stmt lim- count itsthe to- tal num- $_{\rm ber}$ of prepared statements inthe server. (The sum of the num- ${\rm ber}$ ofprepared state- $\quad \text{ments} \quad$ across allsessions)

Name Key Agg Type Description

```
mysql. \textbf{\textit{q}uer} ies \textbf{\textit{Powbletengcy}} query\_time:
query
                                     If a
_{
m time}
                                     query
                                     takes
                                     {\rm longer}
                                     than
                                     this
                                     many
                                     sec-
                                     onds,
                                     the
                                     server
                                     in-
                                     cre-
                                     ments
                                     the
                                     Slow\_queries
                                     \operatorname{sta}-
                                     tus
                                     vari-
                                     able.
                                     \quad \text{If} \quad
                                     you
                                     are
                                     us-
                                     ing
                                     the
                                     log-
                                     {\rm slow}\text{-}
                                     queries
                                     op-
                                     tion,
                                     the
                                     query
                                     is
                                     \log ged
                                     to
                                     the
                                     slow
                                     query
                                     \log
                                     file.
                                     This
                    50
                                     value
                                     is
                                     mea-
                                     \quad {\rm sured} \quad
                                     in
                                     real
                                     time,
```

not

Name Key Agg Type Description

 $max \quad mysql. \textbf{qAver} ies \textbf{Isong} con \textbf{fig}. \underline{\textbf{mlexyethgtfor}} _sort_data:$ length The for cutoff sort ${\rm data}$ on $\quad \text{the} \quad$ sizeofin- dex val ues that deter- $\quad \text{mines} \quad$ which file- sort algo- $_{\rm rithm}$ touse

Name Key Agg

Type Description

```
delayednysql. \textbf{Queries Linsagt}. \textbf{Delayed.} \underline{\textbf{e}} \underline{\textbf{e}} \underline{\textbf{e}} \underline{\textbf{rorr}} \mathbf{rs} :
er-
                                          The
                                          num-
rors
                                          ber
                                          of
                                          rows
                                          writ-
                                          ten
                                          with
                                          IN-
                                          SERT
                                          DE-
                                          LAYED
                                          for
                                          which
                                          some
                                          er-
                                          ror
                                          oc-
                                          \operatorname{curred}
                                         (prob-
                                          a-
                                          bly
                                          du-
                                          pli-
                                          cate
                                          key)
          mysql. Spurnies Isongra Singet_range:
range
                                          The
                                          num-
                                          _{\rm ber}
                                          of
                                          sorts
                                          that
                                          were
```

done using ranges

Name Key Agg Type Description

```
mysql. \textbf{Queries Isontg cosoning.} \underline{buffeer}\underline{\hspace{0.5cm}}size:
\operatorname{sort}
buffer
                                      Each
size
                                      ses-
                                      sion
                                      that
                                      needs
                                      to
                                      do
                                      a
                                      \operatorname{sort}
                                      allo-
                                      cates
                                      a
                                      buffer
                                      of
                                      this
                                      size.
                                      sort\_buffer\_size
                                      is
                                      \operatorname{not}
                                      spe-
                                      cific
                                      to
                                      any
                                      stor-
                                      age
                                      en-
                                      gine
                                      and
                                      ap-
                                      plies
                                      in a
                                      gen-
                                      \operatorname{eral}
                                      man-
                                      ner
                                      for
                                      op-
                                      ti-
                                      miza-
                                      tion.
                                      If
                                     you
                                      see
                    53
                                      many
                                      Sort\_merge\_passes
                                      per
                                      sec-
                                      ond,
                                      you
```

can con ${\rm Metric}$

Name Key Agg Type Description

```
{\it questions} ysql. {\it Questions} :
```

The

num-

ber

of

 $\begin{array}{c} \text{state-} \\ \text{ments} \end{array}$

exe-

cuted

by

the

server.

As

of

 ${\rm MySQL}$

5.0.72,

this

in-

cludes

only

state-

 ${\rm ments}$

sent

to

the server

by

clients

and

no

longer

in-

cludes

state-

ments

exe-

cuted

within

stored

pro-

grams,

un-

like

the

Queries

vari-

able.

This

vari-

able does

not

54

```
preparendy sql. \textbf{qAveg} ies \textbf{Ipvneg} an \textbf{Pedestaned} \_stmt \_count:
\operatorname{stmt}
                                     The
\operatorname{count}
                                     cur-
                                     rent
                                     num-
                                     ber
                                     of
                                     pre-
                                     pared
                                     state-
                                     ments.
                                     (The
                                     max-
                                     i-
                                     mum
                                     num-
                                     _{\rm ber}
                                     of
                                     state-
                                     \operatorname{ments}
                                     is
                                     given
                                     by
                                     the
                                     max\_prepared\_stmt\_count
                                     sys-
                                     _{\rm tem}
                                     vari-
                                     able)
```

Name Key Agg Type Description

 $max \quad mysql. \textit{\textbf{q}} \textit{\textbf{l}} \textit{\textbf{u}} \textit{\textbf{gries}} \textit{\textbf{Isong}} \textit{\textbf{config.s}} \textit{\textbf{soot}} \textit{\textbf{l}} \textit{\textbf{e}} \textit{\textbf{l}} \textit{\textbf{g}} \textit{\textbf{t}} \textit{\textbf{l}} \textit{\textbf{g}} \textit{\textbf{t}} \textit{\textbf{l}} ;$ sort The length number ofbytes $\quad \text{to} \quad$ use when sorting data val ues. Only the first max_sort_length bytes of each value are used; the rest are ignored

Name Key Agg Type Description

 $delayednysql. \textbf{Quenies linsagt. Evel a yved}. \underline{wwitites}:$

writes

The

number

of

IN-

SERT DE-

LAYED

rows

writ-

 $_{\mathrm{ten}}$

Name Key Agg Type Description

```
binlog\ mysql. \\ \textbf{\textit{binlog}}\ mysql. \\ \textbf{\textit
\operatorname{stmt}
                                                                                                                                                                                                                                                                                                                     {\rm Be}\text{-}
\operatorname{cache}
                                                                                                                                                                                                                                                                                                                     gin-
size
                                                                                                                                                                                                                                                                                                                     ning
                                                                                                                                                                                                                                                                                                                     \quad \text{with} \quad
                                                                                                                                                                                                                                                                                                                     MySQL
                                                                                                                                                                                                                                                                                                                     5.5.9,
                                                                                                                                                                                                                                                                                                                     this
                                                                                                                                                                                                                                                                                                                     vari-
                                                                                                                                                                                                                                                                                                                     able
                                                                                                                                                                                                                                                                                                                     de-
                                                                                                                                                                                                                                                                                                                     ter-
                                                                                                                                                                                                                                                                                                                     \quad \text{mines} \quad
                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                     size
                                                                                                                                                                                                                                                                                                                     of
                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                     cache
                                                                                                                                                                                                                                                                                                                     for
                                                                                                                                                                                                                                                                                                                     the
                                                                                                                                                                                                                                                                                                                     bi-
                                                                                                                                                                                                                                                                                                                     nary
                                                                                                                                                                                                                                                                                                                     \log
                                                                                                                                                                                                                                                                                                                     \quad \text{to} \quad
                                                                                                                                                                                                                                                                                                                     \operatorname{hold}
                                                                                                                                                                                                                                                                                                                     non-
                                                                                                                                                                                                                                                                                                                     trans-
                                                                                                                                                                                                                                                                                                                     ac-
                                                                                                                                                                                                                                                                                                                     tional
                                                                                                                                                                                                                                                                                                                     state-
                                                                                                                                                                                                                                                                                                                     ments
                                                                                                                                                                                                                                                                                                                     is-
                                                                                                                                                                                                                                                                                                                     sued
                                                                                                                                                                                                                                                                                                                     dur-
                                                                                                                                                                                                                                                                                                                     ing
                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                                                                                                                                                                                                     {\it trans-}
                                                                                                                                                                                                                                                                                                                     ac-
                                                                                                                                                                                                                                                                                                                     tion.
                                                                                                                                                                                                                                                                                                                     \operatorname{In}
                                                                                                                                                                                                                                                                                                                     {\rm MySQL}
                                                                                                                                                                                                                                                                                                                     5.5.3
                                                                                                                                                                                                                                                                                                                     and
                                                                                                                                                                                                                                                                                                                     later,
                                                                                                                                                                   58
                                                                                                                                                                                                                                                                                                                     sep-
                                                                                                                                                                                                                                                                                                                     a-
                                                                                                                                                                                                                                                                                                                     {\rm rate}
                                                                                                                                                                                                                                                                                                                     bi-
                                                                                                                                                                                                                                                                                                                     nary
                                                                                                                                                                                                                                                                                                                     log
                                                                                                                                                                                                                                                                                                                     trans-
```

ac-

Name Key Agg Type Description

 $binlog\ mysql. \textbf{Simhog}. \textbf{damhg}. u \textbf{Se} nlog_cache_use:$ cache The use number $\quad \text{of} \quad$ ${\it trans-}$ ac- ${\rm tions}$ that used the temporary binary \log cache

Name Key Agg Type Description

 $slave \quad mysql. \textbf{Supph} sla \textbf{\textit{Lexit}} gan \textbf{\textit{Slaxtic}} \underline{\textbf{\textit{onsetritiod}}} \underline{\textbf{\textit{e}}} \underline{\textbf{\textit{d}}} transactions:$ re-The ${\rm tried}$ total transacnum- $\quad \text{ber} \quad$ tionsof ${\rm times}$ $\quad \text{since} \quad$ $\operatorname{startup}$ that the $\operatorname{repli-}$ cation slave SQL threadhas re- ${\rm tried}$ ${\it trans}$ ac- ${\rm tions}$

```
slave \quad mysql.r \verb|App|| slaDeos \verb| app|| slave \_SQL\_Running:
\operatorname{sql}
                                     Whether
                                     the
run-
                                     \operatorname{SQL}
ning
                                     thread
                                     is
                                     started. \,
                                     Value
                                     1
                                     means
                                     YES,
                                     value
                                     means
                                     NO.
                                     Dec-
                                     i-
                                     mal
                                     value
                                     be-
                                     tween
                                     0
                                     and
                                     1
                                     means
                                     that
                                     in
                                     mon-
                                     i-
                                     {\rm tored}
                                     _{\rm time}
                                     pe-
                                     \operatorname{riod}
                                     \operatorname{SQL}
                                     thread
                                     was
                                     at
                                     some
                                     points
                                     run-
                                     \operatorname{ning}
                                     and
                                     at
                                     other
                    61
                                     points

    \text{not}

                                     run-
                                     ning.
```

```
binlog\ mysql. \textbf{Simhog}. \textbf{Atomtg} ca \textbf{Bineloge}. \textbf{dtiskt}\_cache\_disk\_use:
\operatorname{stmt}
                                        The
\operatorname{cache}
                                        num-
\operatorname{disk}
                                        ber
use
                                        of
                                        non-
                                        {\it trans-}
                                        ac-
                                        {\rm tion}
                                        state-
                                        ments
                                        that
                                        {\it used}
                                        the
                                        bi-
                                        nary
                                        \log
                                        state-
                                        ment
                                        cache
                                        but
                                        that
                                        ex-
                                        \operatorname{ceeded}
                                        the
                                        value
                                        of
                                        bin-
                                        log\_stmt\_cache\_size
                                        and
                                        used
                                        a
                                        tem-
                                        po-
                                        rary
                                        {\rm file}
                                        to
                                        store
                                        \quad \text{those} \quad
                                        state-
                                        ments
```

```
slave \quad mysql. \textbf{Supphsla} \textbf{Leahgea} \textbf{Slavest} \underline{\textbf{sneeding}} \underline{\textbf{measure}} \underline{\textbf{me
     re-
                                                                                                                                                                                                                                                                                                                                                                                                                                      This
     ceived
                                                                                                                                                                                                                                                                                                                                                                                                                                      counter
     heart-
                                                                                                                                                                                                                                                                                                                                                                                                                                      in-
     beats
                                                                                                                                                                                                                                                                                                                                                                                                                                      cre-
                                                                                                                                                                                                                                                                                                                                                                                                                                      \operatorname{ments}
                                                                                                                                                                                                                                                                                                                                                                                                                                      \quad \text{with} \quad
                                                                                                                                                                                                                                                                                                                                                                                                                                      {\rm each}
                                                                                                                                                                                                                                                                                                                                                                                                                                      repli-
                                                                                                                                                                                                                                                                                                                                                                                                                                      ca-
                                                                                                                                                                                                                                                                                                                                                                                                                                      tion
                                                                                                                                                                                                                                                                                                                                                                                                                                      heart-
                                                                                                                                                                                                                                                                                                                                                                                                                                      {\it beat}
                                                                                                                                                                                                                                                                                                                                                                                                                                      re-
                                                                                                                                                                                                                                                                                                                                                                                                                                      ceived
                                                                                                                                                                                                                                                                                                                                                                                                                                      by
                                                                                                                                                                                                                                                                                                                                                                                                                                      \mathbf{a}
                                                                                                                                                                                                                                                                                                                                                                                                                                      repli-
                                                                                                                                                                                                                                                                                                                                                                                                                                      ca-
                                                                                                                                                                                                                                                                                                                                                                                                                                      {\rm tion}
                                                                                                                                                                                                                                                                                                                                                                                                                                      slave
                                                                                                                                                                                                                                                                                                                                                                                                                                      since
                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                      last
                                                                                                                                                                                                                                                                                                                                                                                                                                      {\rm time}
                                                                                                                                                                                                                                                                                                                                                                                                                                      that
                                                                                                                                                                                                                                                                                                                                                                                                                                      the
                                                                                                                                                                                                                                                                                                                                                                                                                                      slave
                                                                                                                                                                                                                                                                                                                                                                                                                                      was
                                                                                                                                                                                                                                                                                                                                                                                                                                      \operatorname{restarted}
                                                                                                                                                                                                                                                                                                                                                                                                                                      or
                                                                                                                                                                                                                                                                                                                                                                                                                                      re-
                                                                                                                                                                                                                                                                                                                                                                                                                                      set,
                                                                                                                                                                                                                                                                                                                                                                                                                                      or a
                                                                                                                                                                                                                                                                                                                                                                                                                                      \quad \text{CHANGE} \quad
                                                                                                                                                                                                                                                                                                                                                                                                                                      MAS-
                                                                                                                                                                                                                                                                                                                                                                                                                                      TER
                                                                                                                                                                                                                                                                                                                                                                                                                                      TO
                                                                                                                                                                                                                                                                                                                                                                                                                                      state-
                                                                                                                                                                                                                                                                                                                                                                                                                                      ment
                                                                                                                                                                                                                                                                                                                                                                                                                                      was
                                                                                                                                                                                                                                                                                                                                                                                                                                      is-
                                                                                                                                                                                                                                                                                                                                                                                                                                      \operatorname{sued}
```

Name Key Agg Type Description

```
seconds mysql. \textbf{rapp}. sla \textbf{\textit{Learbg}} h \textbf{\textit{Succends}} \underline{\textbf{\textit{n}}} \underline{\textbf{\textit{d}}} sehind \underline{\phantom{\textbf{\textit{L}}}} Master:
be-
                                                This
hind
                                                field
mas-
                                                is
\operatorname{ter}
                                                an
                                                in-
                                                di-
                                                ca-
                                                {\rm tion}
                                                of
                                                \quad \text{how} \quad
                                               "late"
                                                the
                                                slave
                                                is.
                                                {\rm In}
                                                essence,
                                                this
                                                field
                                                mea-
                                                sures
                                                the
                                                _{\rm time}
                                                dif-
                                                fer-
                                                ence
                                                in
                                                sec-
                                                onds
                                                be-
                                                tween \\
                                                the
                                                slave
                                                \operatorname{SQL}
                                                thread
                                                and
                                                the
                                                slave
                                                I/O
                                                thread.\\
                                                If
                                                the
                                                net-
                                                work
                         64
                                                con-
                                                nec-
                                                {\rm tion}
                                                be-
                                                tween
                                                mas-
```

ter and

Name Key Agg Type Description

 $slave \quad mysql. \textit{rapp.} sla \textit{leantg} bl \textit{Statem.} \textit{properen.} temp_tables:$ open The tempnumtaber bles of tem porary tables that the ${\rm slave}$ SQL threadcurrently has open. If the value is greater than zero, it is not safe toshut down the slave

Name Key Agg Type Description

```
binlog\ mysql. \textit{land} og. \textit{dambg}. \textit{slzien} log\_cache\_size:
cache
                                        The
size
                                        size
                                        of
                                        the
                                        cache
                                        \quad \text{to} \quad
                                        \operatorname{hold}
                                        the
                                        \operatorname{SQL}
                                        state-
                                        ments
                                        \quad \text{for} \quad
                                        the
                                        bi-
                                        nary
                                        \log
                                        \operatorname{dur}-
                                        ing
                                        a
                                        trans-
                                        ac-
                                        tion.
                                        A
                                        bi-
                                        nary
                                        \log
                                        cache
                                        is
                                        allo-
                                        cated
                                        for
                                        each
                                        {\it client}
                                        if
                                        the
                                        server
                                        sup-
                                        ports
                                        any
                                        {\it trans-}
                                        ac-
                                        tional
                                        stor-
                     66
                                        age
                                        en-
                                        gines
                                        and
                                        if
                                        the
```

server has

Name Key Agg Type Description

```
slave \quad mysql. \textit{Mapple}. slat{\color=10.5em} points less less else unning:
io
                                Whether
                                the
run-
                                I/O
ning
                                thread
                                is
                                started
                                \quad \text{and} \quad
                                has
                                con-
                                nected
                                suc-
                                cess-
                                fully
                                to
                                the
                                mas-
                                ter.
                                Value
                                1
                                means
                                YES,
                                value
                                0
                                means
                                NO.
                                Dec-
                                i-
                                mal
                                value
                                be-
                                tween \\
                                0
                                and
                                1
                                means
                                that
                                in
                                mon-
                                i-
                                {\rm tored}
                                {\rm time}
                                pe-
                                riod
                 67
                                I/O
                                thread
                                was
                                at
                                some
                                points
                                run-
```

ning

Name Key Agg Type Description

 $slave \quad mysql. \textit{rapp.} sla \textit{Dohradslawsets} \\ \textit{lpenitole} \\ \textrm{ext_period} :$

tion slave

 ${\rm Shows}$ heartbeat the replipe- riod ca- ${\rm tion}$ heartbeat interval on a replica-

```
binlog\ mysql. \textbf{Simbog}. \textbf{dawhg}. \textbf{uBerding}\_ cache\_ disk\_ use:
cache
                                    The
\operatorname{disk}
                                    num-
use
                                    ber
                                    of
                                    {\it trans-}
                                    ac-
                                    tions
                                    that
                                    used
                                    the
                                    tem-
                                    po-
                                    rary
                                    bi-
                                    nary
                                    \log
                                    cache
                                    but
                                    that
                                    ex-
                                    \operatorname{ceeded}
                                    the
                                    value
                                    of
                                    bin-
                                    log\_cache\_size
                                    and
                                    used
                                    a
                                    tem-
                                    po-
                                    rary
                                    {\rm file}
                                    to
                                    store
                                    state-
                                    ments
                                    {\rm from}
                                    the
                                    {\it trans-}
                                    ac-
                                    {\rm tion}
```

Name Key Agg Type Description

 $binlog\ mysql. \textbf{Simbog}. \textbf{Stront}gca \textbf{Binelog}\underline{e}_stmt_cache_use:$ stmt The cache numuse ber of non- ${\it trans-}$ actionalstatements that ${\it used}$ the binary \log statementcache

 $thread\,mysql. \textbf{tArrg} ad \textbf{sLonghed larbady} \underline{\textbf{e}} \textbf{d} ache \underline{} size:$

cache How size many threads the server should

cache for reuse

Name Key Agg Type Description

```
mysql. \textit{Awagnect Lions:} althow \underline{ed} connections:
max
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The
con-
nec-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                max-
tions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                i-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \operatorname{mum}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                per-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \operatorname{mit}-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                num-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ber
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                si-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \operatorname{mul-}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ta-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ne-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                {\it client}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                con-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nec-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tions
opened \underline{\  \  } ysql. \underline{\  \  } \underline{\  \  \  } \underline{\  \  \  } \underline{\  \  \  \  } \underline{\  \   \  } \underline{\  \  \  } \underline{\  \  \  } \underline{\  \  \  } \underline{\  \  } \underline{\  \  } \underline{\  \  } \underline{\  \  \  } \underline{\  \  \  } \underline{\  \  } \underline{\  \  \  } \underline{\  \  \  } \underline{\  \  \ } \underline{\  \  } \underline{\  \  } \underline{\  \  } \underline{
files
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                num-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                {\rm ber}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                files
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                that
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                have
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                opened
```

with $my_open()$

Name Key Agg Type Description

 $created mysql. \textbf{\textit{Shown}} tm \textbf{\textit{poorgat@deated_tmp_files:}}$

tmp How files many temporary files

mysqld has created

 $uptime mysql. \textbf{\textit{uptime}} Long \quad Uptime:$

The number of seconds that the server has been

up

Name Key Agg Type Description

 $mysql. \textit{Awg} nect \textbf{flong}. co \textit{Max} \underline{r}\underline{r} \textbf{ext} \underline{d}\underline{n}\underline{a} \textbf{x} on nections:$ \max ${\it used}$ The conmaxinec- ${\rm tions}$ \mathbf{mum} num- $_{\rm ber}$ of connec- ${\rm tions}$ that have been inuse simultaneously $\quad \text{since} \quad$ the serverstarted

Name Key Agg Type Description

 $mysql. \textit{Awg}nec \textit{flions} usen x \underline{n} \underline{aws}er \underline{} connections:$ \max The user conmaxinec- ${\rm tions}$ \mathbf{mum} num- $_{\rm ber}$ ofsimultaneous connec- ${\rm tions}$ per- mit - ted toany given ${\rm MySQL}$ user account

Name Key Agg Type Description

 $aborted ny sql. \textbf{Some cflions}. fa \textbf{Ale} dorted _connects:$

 $\begin{array}{ccc} \text{con-} & & \text{The} \\ \text{nects} & & \text{num-} \\ \text{ber} & & \text{of} \\ \text{failed} & & \text{at-} \end{array}$

tempts to connect to the MySQL server

 $thread {\bf s} mysql. {\bf threads_connected:}$

con- The nected num-

ber of currently open connections

```
Metric
Name Key Agg
                      Type Description
open mysql.fAlveg.oplenong Open_files:
files
                              The
                              num-
                              ber
                              of
                              files
                              that
                              are
                              open.
                              This
                              count
                              in-
                              {\rm cludes}
                              reg-
                              ular
                              files
                              opened
                              by
                              the
                              server
uptime mysql. \verb"uptime" lsim gefl \verb"uptime" since\_flush\_status:
                              The
since
{\rm flush}
                              num-
                              {\rm ber}
                              of
                              sec-
                              \quad \text{onds} \quad
                              since
                              the
                              most
                              re-
                              cent
                              FLUSH
```

STA-TUS statement

Name Key Agg Type Description

 $slow \quad mysql. \textbf{SureadsLsdoy} la \textbf{Slowh_} launch_threads:$ launch The num- ${\it threads}$ ber ofthreadsthat have takenmore ${\rm than}$ $slow_launch_time$ sec- $\quad \text{onds} \quad$

> to create

```
Metric
Name Key Agg Type Description
```

 $thread {\bf s} mysql. {\bf Surea} d {\bf s} Lore {\bf g} te {\bf d} lhread {\bf s}_created:$ cre-The atednumber of threads cre- ${\rm ated}$ tohandleconnections. If Threads_created isbig, you may want toincrease the $thread_cache_size$ value $thread\, mysql. t \hbox{\it Amrg} ad \hbox{\it SLattag} k. \hbox{\it slate} ad _stack:$

stack

The stack size for each thread

Name Key Agg Type Description

 $thread {\bf s} mysql. {\bf tAmg} ad {\bf sLong} if {\bf lg} hreads_running:$ The running number ofthreadsthat are not sleeping open mysql.fAvg.strExxms Open_streams: The streamsnumber ofstreamsthat are open (used mainly for logging)

```
Metric
Name Key Agg
                        Type Description
aborte {\tt chysql.} {\tt Sammec flions:} al {\tt Advoctded\_clients:}
clients
                                The
                                num-
                                ber
                                of
                                con-
                                nec-
                                tions
                                that
                                were
                                aborted
                                be-
                                cause
                                the
                                {\it client}
                                died
                                with-
                                out
                                clos-
                                ing
                                the
                                con-
                                nec-
                                {\rm tion}
                                prop-
                                erly
threads mysql. \textit{tAmg} ads \textit{L} cample all threads \_cached:
cached
                                The
                                num-
                                _{\rm ber}
                                of
                                threads
```

in the thread cache Metric Name Key Agg Type Description $replace mysql. {\bf Sommahdage}_{\bf l} {\bf Som}_{\bf replace} :$ The number of ${\rm times}$ RE - PLACE command has been exe- ${\rm cuted}$ $drop \quad mysql. \textbf{Summahdag} lr \textbf{G} ou \underline{ser} drop_user:$ The user num- $_{\rm ber}$ of $_{\rm times}$ DROP USERcom-

> mand has been executed

```
Metric
```

Name Key Agg Type Description

$updatemysql. \textbf{Sommahdag} up \textbf{Costn}.\underline{m} \textbf{uptl} ate_multi:$

multi The num-

number of times UP-DATE com-

mand with multipletable syn-

tax has been executed

$create \ mysql. {\color{red} Summa} {\color{blue} h} {\color{blue} dag} {\color{blue} re} {\color{blue} able} {\color{blue} able} {\color{blue} table} :$

table The number of

ber of times CRE-ATE TA-BLE command

has been executed

Name Key Agg Type Description

 $insert_mysql. \textbf{Sommahdagns@rdns} \underline{el} \underline{\textbf{cots}} \underline{ert}\underline{} select :$

se-The lect number of $_{
m times}$ IN- SERT with SE-LECT command has been exe- cuted

$replacemysql. {\color{red} Summa hdage} {\color{red} Goorn.\underline{s} elever} lace_select:$

cuted

se-The lect number of ${\rm times}$ RE -PLACE with SE-LECT command has been exe-

Name Key Agg Type Description

 $drop \quad mysql. \textbf{Sommahdag} lr\textbf{Qpota} \underline{b} \textbf{le} rop_table:$

ta-The ble number of ${\rm times}$ DROP TA- BLE command has been

$updatemysql. \textbf{Sommahdag} up \textbf{Gotta} _update:$

The number of ${\rm times}$ UP- DATE command has been exe- ${\rm cuted}$

exe- cuted

Name Key Agg Type Description

 ${\tt delete\ mysql. {\bf Summahdag} lel {\bf \textit{lete}} m_{\tt delete}:}$

The

num-

ber

of

times

DELETE

com-

 mand

has

been

executed

 $rollback nysql. \textbf{Sommahdag} ol \textbf{Chanck}_rollback:$

The

num-

 $_{\rm ber}$

of

 $\begin{array}{c} \text{times} \\ \text{ROLL-} \end{array}$

BACK

com-

mand

has

been

exe-

 cuted

Name Key Agg Type Description

```
rollbacknysql. \textbf{Summahdage}_{\textbf{A}} \textbf{Care.}\underline{\textbf{rollbacks}}\underline{\textbf{atepoint}}:
```

The tonumsavepoint ber of ${\rm times}$ ROLL- BACK TOSAVE-POINT command has been exe- cuted

$drop \quad mysql. \textbf{Sommahdag} lr \textbf{G} podb_drop_db:$

DB The

number of times DROP DATABASE

command has been executed

```
Metric
Name Key Agg Type Description
create\ mysql. \textbf{Summahdagr} \textbf{--Gtenuser} ereate\_user:
user
                              The
                              num-
                              ber
                              of
                              {\rm times}
                              CRE-
                              {\rm ATE}
                              USER
                              com-
                              mand
                              has
                              been
                              exe-
                              \operatorname{cuted}
create\ mysql. \textbf{Summahdngreatemdb} create\_db:
DB
                              The
                              num-
                              ber
                              of
                              {\rm times}
                              CRE-
                              ATE
                              {\bf DATABASE}
                              com-
```

mand has been executed Metric Name Key Agg Type Description

 $insert\ mysql. {\color{red} Sommahdag} ins {\color{red} Cotm_insert} :$

The number of times IN-SERT command has been executed

$commit my sql. \\ \textbf{Summahdag} of \\ \textbf{Smit}_commit:$

The number of times COM-MIT command has been exe-

cuted

```
Metric
Name Key Agg
                        Type Description
load
       mysql. {\color{red}SommaIndag} oad om\_load:
                                 The
                                 num-
                                 ber
                                 of
                                 {\rm times}
                                 LOAD
                                 com-
                                 mand
                                 has
                                 been
                                 exe-
                                 {\rm cuted}
{\tt delete\ mysql. \textbf{Sommahdagleleten} \underline{multi:}}
multi
                                 The
                                 num-
                                 _{\rm ber}
                                 of
                                 {\rm times}
                                 DELETE
                                 com-
                                 mand
                                 \quad \text{with} \quad
                                 \quad \text{multiple-} \quad
                                 table
                                 syn-
                                 tax
                                 has
```

been executed

```
Metric
                     Type Description
Name Key Agg
select \ mysql. \textbf{Sommahdag} el \textbf{Cotm}\_select:
                             The
                             num-
                             ber
                             of
                             times
                             SE-
                             \operatorname{LECT}
                             com-
                             mand
                             has
                             been
                             exe-
                             {\rm cuted}
       mysql. Anche. bly bergfr @cache_free_memory:
free
cache
                             The
mem-
                             amount \\
                             of
ory
                             free
                             mem-
                             ory
                             for
                             the
                             query
                             cache
       mysql. \textit{Auche.} blooks. ft\center free\_blocks:
free
blocks
                             The
                             num-
                             ber
                             of
                             free
                             mem-
                             ory
                             blocks
                             in
                             the
                             query
                             cache
```

```
Metric
Name Key Agg Type Description
inserts mysql. \textbf{Studine}. \textbf{Queries}. \textbf{Querite}\_inserts:
                                       The
                                       num-
                                       ber
                                       of
                                       queries
                                       \operatorname{added}
                                       to
                                       the
                                       query
                                       cache
queries mysql. {\color{red} \textbf{Studine}}. {\color{red} \textbf{Queries}}. {\color{red} \textbf{Queries}} \\ {\color{red} \textbf{Cached}}:
                                       The
cached
                                       num-
                                       ber
                                       of
                                       non-
                                       cached
                                       queries
                                       (not
                                       cacheable,
                                       or

    \text{not}

                                       cached
                                       due
                                       to
                                       the
                                       query\_cache\_type
```

set-ting)

```
Metric
Name Key Agg
                        Type Description
queries mysql. \textit{Anche}. queries\_in\_cache:
in
                                 The
\operatorname{cache}
                                 num-
                                 ber
                                 of
                                 queries
                                 reg-
                                 is-
                                 \operatorname{tered}
                                 in
                                 the
                                 query
                                 \operatorname{cache}
hits
        mysql. \textbf{Suchne}. \textbf{qLuorigs}. \textbf{Qlca} che\_hits:
                                 The
                                 num-
                                 ber
                                 of
                                 query
                                 cache
                                 hits
total \quad mysql. \textit{Anche}. blooks: \\ Qcache\_total\_blocks:
blocks
                                 The
                                 to-
                                 tal
                                 num-
                                 ber
                                 of
                                 blocks
                                 in
                                 the
                                 query
```

cache

 ${\it Name \ Key \ Agg \ Type \ Description}$

 $low memmy sql. \textbf{Suchne}. \textbf{Qluenche} \underline{lo} \textbf{low memm} \underline{\hspace{0.5cm}} prunes:$

prunes

The number of queries that were deleted from the query cache because

of low memory Metric Name Key Agg Type Description

 $query \ mysql. \textit{Charche.bly toesg} \ query_cache_size:$ cacheThe size amount of memory allo- ${\rm cated}$ for caching query results. The default value is 0, which dis ables the query

bytes mysql. Staffic. Txologtes Bytes_received:

 ${\rm cache}$

received

The
number
of
bytes
received
from
all
clients

```
Metric
Name Key Agg
                      Type Description
bytes \  \  \, mysql. \textbf{Snaffic.tlxologgtesBytes\_sent:}
sent
                              The
                              num-
                              ber
                              of
                              bytes
                              {\rm sent}
                              to
                              all
                              clients
key
       mysql. Siyinam Lberg rekteybloreksls:
{
m reads}
                              The
                              num-
                              _{\rm ber}
                              of
                              phys-
                              ical
                              reads
                              of a
                              key
                              block
                              from
                              {\it disk.}
                              If
                              Key_reads
                              is
                              large,
                              then
                              your
                              key_buffer_size
                              value
                              is
                              prob-
                              a-
                              bly
                              too
```

 small

Name Key Agg Type Description

```
mysql. \textbf{\textit{rAy}} \textbf{\textit{is}} san \textbf{\textit{Lkerg}} \, b \textbf{\textit{keffy}} \underline{} \, buffer \underline{} \, size:
key
buffer
                                         In-
size
                                         \operatorname{dex}
                                         blocks
                                         for
                                         My-
                                         \operatorname{ISAM}
                                         ta-
                                         bles
                                         are
                                         buffered
                                         and
                                         are
                                         shared
                                         by
                                         all
                                         threads.
                                         key\_buffer\_size
                                         is
                                         the
                                         size
                                         of
                                         the
                                         buffer
                                         used
                                         for
                                         in-
                                         \operatorname{dex}
                                         blocks.
                                         The
                                         key
                                         buffer
                                         is
                                         also
                                         known
                                         as
                                         the
                                         key
                                         cache.
                                         The
                                         value
                                         of
                                         this
                                         vari-
                     96
                                         able
                                         in-
                                         di-
                                         cates
                                         the
                                         amount
```

of mem-

Name Key Agg Type Description

 $key \qquad mysql. \textbf{Siyiis} an \textbf{Lbeyg} \, w \textbf{Ktey}. \underline{\textbf{b}} \textbf{lwcktse} s:$

writes

The

num-

ber

of phy

physical

writes

of a

key block

 $_{\rm disk}^{\rm to}$

Name Key Agg Type Description

 $mysql. \textbf{\textit{Ay}} \textbf{\textit{is}} am \textbf{\textit{L}} \textbf{\textit{beg}} ca \textbf{\textit{c}} \textbf{\textit{d}} \textbf{\textit{v}} \underline{\textbf{\textit{e}}} \textbf{\textit{-}} \textbf{\textit{agachh}} \underline{\textbf{\textit{r}}} \textbf{\textit{es}} \textbf{\textit{p}} \underline{\textbf{\textit{o}}} \underline{\textbf{\textit{l}}} threshold:$ key ${\rm cache}$ This value age threshcon- old trols the demo- ${\rm tion}$ of buffers ${\rm from}$ the hot sublist of a key cachetothe warm sublist. Lower values cause demotion tohappen morequickly

Name Key Agg Type Description

 $mysql. \textbf{Snyis} am \textbf{Lkey} re \textbf{Key} \underline{re} \textbf{aqad} \underline{st} \textbf{s} equests:$ key read The numreber quests ofre- ${\it quests}$ to read a key block ${\rm from}$ the cache

Name Key Agg Type Description

 $mysql. \textbf{\textit{rAy}} \textbf{\textit{is}} san \textbf{\textit{Lkeys}}. \textbf{\textit{th}} \textbf{\textit{uskd}} \underline{\hspace{0.5cm}} unused:$ key blocksThe unnumused ber ofunused blocksinthe key cache. You can use this value tode- ter - $_{
m mine}$ $\quad \text{how} \quad$ much of the key cacheisinuse

Name Key Agg Type Description

 $mysql. \\ \textbf{rAyis} an \textbf{Lkeys} \ b \textbf{lkeys}. \\ \textbf{uhddeshe} \\ \textbf{d} ot \\ \textbf{flushed}:$ key blocks The notnumflushed ber of key blocksinthe key cachethat have changed but have not yet been flushed to disk $mysql. \textbf{Snyin} am \textbf{Lkeng} w \textbf{Ktey}. \underline{requirests} requests:$ key write The re-

write The re- num-quests ber of re- quests to write a key block to the cache

Name Key Agg Type Description

```
mysql.n \verb"Ay' is an \verb"Lbeng" bl \verb"Kelys.ubled" ks\_used:
blocks
                                 The
{\it used}
                                 num-
                                 ber
                                 of
                                 used
                                 blocks
                                 in
                                 the
                                 key
                                 {\it cache}.
                                 This
                                 value
                                 is a
                                 high-
                                 water
                                 \max
                                 that
                                 in-
                                 di-
                                 cates
                                 the
                                 max-
                                 i-
                                 \operatorname{mum}
                                 num-
                                 ber
                                 of
                                 blocks
                                 that
                                 have
                                 ever
                                 been
                                 in
                                 use
                                 at
                                 one
                                 _{\rm time}
```

Name Key Agg Type Description

key mysql.nAyigsanLkengcaldeng.lokacklesizblock_size:
cache
block size
size in
bytes
of
blocks
in
the
key
cache

handlermysql. KaundlerLoodgbaHandler_rollback:

roll- The back number of

ber of re-quests for a stor-age engine to perform

a rollback operation

Name Key Agg Type Description

```
handle {\bf r} mysql. {\bf Sammal ler Lreagel}. {\bf f} {\bf H} {\bf s} {\bf t} ndler\_read\_first:
read
                                          The
\operatorname{first}
                                          num-
                                          ber
                                          of
                                          {\rm times}
                                          the
                                          \operatorname{first}
                                          en-
                                          \operatorname{try}
                                          in
                                          an
                                          in-
                                          \operatorname{dex}
                                          was
                                          read.
                                          If
                                          this
                                          value
                                          is \\
                                          high,
                                          it \\
                                          sug-
                                          gests
                                          that
                                          the
                                          server
                                          is
                                          do-
                                          ing
                                          a
                                          lot
                                          of
                                          full
                                          in-
                                          \operatorname{dex}
                                          scans;
                                          for
                                          ex-
                                          am-
                                          ple,
                                          SE-
                                          \operatorname{LECT}
                                          col1
                     104
                                          FROM
                                          foo,
                                          as-
                                          sum-
                                          ing
                                          that
                                          col1
```

is

Name Key Agg Type Description

```
handle {\bf r} mysql. {\bf l} {\bf Kaumdle i Located}. {\bf l} {\bf l} {\bf d} {\bf y} mdler\_read\_key:
read
                                          The
key
                                          num-
                                          ber
                                          of
                                          re-
                                          {\it quests}
                                          to
                                          \operatorname{read}
                                          a
                                          row
                                          based
                                          on
                                          a
                                          key.
                                          If
                                          this
                                          value
                                          is
                                          high,
                                          it is
                                          a
                                          \operatorname{good}
                                          in-
                                          di-
                                          ca-
                                          tion
                                          that
                                          your
                                          ta-
                                          bles
                                          are
                                          prop-
                                          erly
                                          in-
                                          \operatorname{dexed}
                                          \quad \text{for} \quad
                                          your
                                          queries
```

Name Key Agg Type Description

```
handle {\bf r} mysql. {\bf Saumal} le {\bf r} {\bf L} {\bf reag} l. {\bf r} {\bf l} {\bf e} {\bf x} {\bf t} dler {\bf r} ead {\bf l} ext. \\
read
                                          The
                                          num-
next
                                          ber
                                          of
                                          re-
                                          {\it quests}
                                          to
                                          \operatorname{read}
                                          the
                                          next
                                          row
                                          in
                                          key
                                          or-
                                          der.
                                          This
                                          value
                                          is
                                          in-
                                          cre-
                                          mented
                                          if
                                          you
                                          are
                                          query-
                                          ing
                                          an
                                          in-
                                          \operatorname{dex}
                                          col-
                                          umn
                                          with
                                          a
                                          range
                                          con-
                                          \operatorname{straint}
                                          or
                                          if
                                          you
                                          are
                                          do-
                                          ing
                                          an
                     106
                                          in-
                                          \operatorname{dex}
                                          scan
```

Name Key Agg Type Description

 $handle {\bf mysql.} {\bf lSamdle iLsange} {\bf blandler_s avepoint:}$

save-The point number of re- ${\it quests}$ for a storage

engine toplace a save-

point

 $handle {\bf mysql. Saumdle iLde lgte} Handle {\bf r_delete:}$

delete The

> number of ${\rm times}$ thatrows have been ${\rm deleted}$ ${\rm from}$ tables

```
Metric
Name Key Agg Type Description
```

 $handle {\bf r} mysql. {\bf F} {\bf a} {\bf r} {\bf m} {\bf d} le {\bf r} L {\bf w} {\bf n} {\bf j} {\bf t} e \ Handle {\bf r} _ write:$ write The number of re- ${\it quests}$ toin- sert a row in a table

$handle {\bf r} mysql. {\bf Saumdle i Lopg} at {\bf H} and ler _update:$

update

number
of
requests
to
update
a
row
in a
ta-

ble

Name Key Agg Type Description

 $handle {\bf r} mysql. {\bf Saund} le {\bf i} L {\bf p} {\bf r} {\bf e} {\bf p} a {\bf H} and le {\bf r} _prepare:$

pre-

A pare counter

for the pre-

pare phase of

twophase com-

 mit opera- ${\rm tions}$

Name Key Agg Type Description

```
handle {\bf r} mysql. {\bf l} {\bf Sammle i Locag} l. {\bf r} {\bf l} {\bf d} ndler\_read\_rnd:
read
                                     The
\operatorname{rnd}
                                     num-
                                     ber
                                     of
                                     re-
                                     {\it quests}
                                     to
                                     \operatorname{read}
                                     a
                                     row
                                     based
                                     on
                                     a
                                     fixed
                                     po-
                                     si-
                                     tion.\\
                                     This
                                     value
                                     is
                                     high
                                     if
                                     you
                                     are
                                     do-
                                     ing
                                     a
                                     lot
                                     of
                                     queries
                                     that
                                     re-
                                     quire
                                     sort-
                                     ing
                                     \quad \text{of} \quad
                                     the
                                     re-
                                     sult.
                                     You
                                     prob-
                                     a-
                                     bly
                   110
                                     have
                                     a
                                     lot
                                     of
                                     queries
                                     that
                                     re-
```

quire

Name Key Agg Type Description

```
handle \verb"mysql." \textbf{Saumalle "Lxeagel.} l \verb"Astndler_read_last:
read
                                    The
last
                                    num-
                                    ber
                                    of
                                    re-
                                    {\it quests}
                                    to
                                    \operatorname{read}
                                    the
                                    last
                                    key
                                    in
                                    an
                                    in-
                                    dex.
                                    With
                                    OR-
                                    DER
                                    BY,
                                    the
                                    server
                                    will
                                    is-
                                    sue
                                    a
                                    first-
                                    key
                                    re-
                                    quest
                                    fol-
                                    lowed
                                    by
                                    sev-
                                    \operatorname{eral}
                                    next-
                                    key
                                    re-
                                    quests,
                                    whereas
                                    \quad \text{with} \quad
                                    With
                                    OR-
                                    DER
                  111
                                    {\rm BY}
                                    DESC,
                                    \quad \text{the} \quad
                                    server
                                    will
                                    is-
                                    sue
```

a

Name Key Agg Type Description

 $handle {\it mysql}. \textbf{Saund} le {\it iLsause} p \textbf{\textit{bland}} ld \underline{\textit{b}} \underline{\textit{ast}} we point_roll back:$

point

save-The point numrollber ${\rm back}$ ofre- ${\it quests}$ $\quad \text{for} \quad$ a storage engine torollback to a save-

Name Key Agg Type Description

```
handler \underline{\hspace{0.1cm}} \textbf{Mandler} \underline{\hspace{0.1cm}} \textbf{disgov} \underline{\hspace{0.1cm}} \underline{\hspace{0.1cm}} \textbf{dandler} \underline{\hspace{0.1cm}} \underline{\hspace{0.1cm}} \textbf{discover} :
dis-
                                                   The
                                                   {\rm MySQL}
cover
                                                   server
                                                   \operatorname{can}
                                                   ask
                                                   the
                                                   ND-
                                                   В-
                                                   CLUS-
                                                   TER
                                                   stor-
                                                   age
                                                   en-
                                                   gine
                                                   if it
                                                   knows
                                                   about
                                                   a
                                                   ta-
                                                   ble
                                                   with
                                                   given
                                                   name.
                                                   This
                                                   is
                                                   {\rm called}
                                                   \operatorname{dis-}
                                                   cov-
                                                   ery.
                                                   Han-
                                                   {\rm dler\_discover}
                                                   in-
                                                   di-
                                                   cates
                                                   the
                                                   num-
                                                   ber
                                                   of
                                                   {\rm times}
                                                   that
                                                   ta-
                                                   bles
                          113
                                                   have
                                                   been
                                                   \operatorname{dis-}
                                                   cov-
                                                   \operatorname{ered}
                                                   us-
```

ing this M-4-:--

Metric

Name Key Agg Type Description

 $handle {\bf r} {\bf mysql. {\bf Saumdle Lreagl. p Hew} dler_read_prev:}$ read The numprev ber of re- ${\it quests}$ to read the previous row inkey order. This read methodis mainly ${\it used}$ toopti- mize OR- DER BYDESC

Name Key Agg Type Description

```
handle {\bf mysql. \textbf{Saund}} le {\bf iLreagl.rHelmdlet}\_read\_rnd\_next:
read
                                    The
\operatorname{rnd}
                                    num-
next
                                    ber
                                    of
                                    re-
                                    {\it quests}
                                    to
                                    \operatorname{read}
                                    the
                                    next
                                    row
                                    in
                                    the
                                    data
                                    file.
                                    This
                                    value
                                    is
                                    high
                                    if
                                    you
                                    are
                                    do-
                                    ing
                                    a
                                    lot
                                    of
                                    ta-
                                    {\rm ble}
                                    scans.
                                    Gen-
                                    er-
                                    ally
                                    this
                                    sug-
                                    gests
                                    that
                                    your
                                    ta-
                                    bles
                                    are
                                    \operatorname{not}
                                    prop-
                  115
                                    erly
                                    in-
                                    \operatorname{dexed}
                                    or
                                    that
                                    your
                                    queries
```

are

Name Key Agg Type Description

 $handle \textbf{r} mysql. \textbf{Saumd} le \textbf{1Lcong} m \textbf{H} and le \textbf{r} _commit:$

commit number of in-

ternal COM-MIT statements