

troubleshooting, and so forth. Put the statements for each monitoring configuration into their own file and specify the appropriate file as the `init_file` value when you start the server.

## 27.4.1 Performance Schema Event Timing

Events are collected by means of instrumentation added to the server source code. Instruments time events, which is how the Performance Schema provides an idea of how long events take. It is also possible to configure instruments not to collect timing information. This section discusses the available timers and their characteristics, and how timing values are represented in events.

### Performance Schema Timers

Performance Schema timers vary in precision and amount of overhead. To see what timers are available and their characteristics, check the `performance_timers` table:

```
mysql> SELECT * FROM performance_schema.performance_timers;
```

TIMER_NAME	TIMER_FREQUENCY	TIMER_RESOLUTION	TIMER_OVERHEAD
CYCLE	2389029850	1	72
NANOSECOND	1000000000	1	112
MICROSECOND	1000000	1	136
MILLISECOND	1036	1	168

If the values associated with a given timer name are `NULL`, that timer is not supported on your platform.

The columns have these meanings:

- The `TIMER_NAME` column shows the names of the available timers. `CYCLE` refers to the timer that is based on the CPU (processor) cycle counter.
- `TIMER_FREQUENCY` indicates the number of timer units per second. For a cycle timer, the frequency is generally related to the CPU speed. The value shown was obtained on a system with a 2.4GHz processor. The other timers are based on fixed fractions of seconds.
- `TIMER_RESOLUTION` indicates the number of timer units by which timer values increase at a time. If a timer has a resolution of 10, its value increases by 10 each time.
- `TIMER_OVERHEAD` is the minimal number of cycles of overhead to obtain one timing with the given timer. The overhead per event is twice the value displayed because the timer is invoked at the beginning and end of the event.

The Performance Schema assigns timers as follows:

- The wait timer uses `CYCLE`.
- The idle, stage, statement, and transaction timers use `NANOSECOND` on platforms where the `NANOSECOND` timer is available, `MICROSECOND` otherwise.

At server startup, the Performance Schema verifies that assumptions made at build time about timer assignments are correct, and displays a warning if a timer is not available.

To time wait events, the most important criterion is to reduce overhead, at the possible expense of the timer accuracy, so using the `CYCLE` timer is the best.

The time a statement (or stage) takes to execute is in general orders of magnitude larger than the time it takes to execute a single wait. To time statements, the most important criterion is to have an accurate