# Error calculus within p11perftest

The utility p11perftest is making a lot of measures, it is therefore essential to be able to quantify the error on each measurement.

## Precision of platform timer

The base measurement is time. When a PKCS#11 call is performed, time is measured when it starts and when it ends, and latency (abbreviated ) is computed by subtracting both times.

Time is measured using platform timers. Precision of these timers may vary, but it is generally around 1μs.

Let ε be the resolution of the platform timer, and let Δε be the error on ε measurement:

Δε is obtained from the square root of the mean variance:

With being the variance estimator of

p11perftest performs 100 measurements to estimate . This value is later used to set an error on the elapsed wall clock throughout a whole test case. It is however not directly used for error calculus of other values, as latency will also be measured statistically. The only condition being, for the results to be significant, to have remain much smaller than the actual measured timings:

Practically:

## Error on latency

It is measured using the same statistical methods as for timer precision above:

With:

Note that all latencies in p11perftest are expressed in ms.

## Error on TPS

The number of transactions per second, abbreviated , is obtained through the equation:

Therefore,