How reliable is the BatteryLifePercent member of the SYSTEM_POWER_STATUS structure?

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A customer was writing a program that called `GetSystemPowerStatus` and used the `SYSTEM_POWER_STATUS.BatteryLifePercent` value. The customer wanted to know whether a reported battery life percentage of 38% really means that the remaining battery life is between 37.5% and 38.5%. Although the value is reported to 1% precision, the accuracy in practice is much worse. Similarly, the `BatteryLifeTime` is reported in seconds, but if your battery actually lasts exactly the amount of time predicted by that field (and not a second longer or shorter), it's almost certainly a fluke. Even a stopped clock is right twice a day. These battery levels come from the hardware itself, so you are at the mercy of whoever manufactured your motherboard. Some laptops update the values at 1-second intervals; others can take 5 seconds or more. In practice, these hardware-reported values have been found not to be particularly precise, and in odd cases have occasionally been spotted behaving in strange ways, such as spiking briefly and then returning to a sane value. But if you use the values (as flaky as they might be), you'll at least be in good company: These are the same values that the Windows Battery Meter displays.

Bonus chatter: There's another interface for retrieving battery life information, and that's WMI `Win32_Battery.EstimatedRunTime`. The values for this also come from the hardware, but they are more unstable than the values returned by `GetSystemPowerStatus` because the estimated run time is an extrapolation based on the current battery load. This makes it more sensitive to short-term fluctuations in energy consumption, creating the paradoxical situation where more accurate information is actually less useful.

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