The Relevance of Battery Life Tests

Are Real-Life Usage Patterns Considered?

Of all the performance benchmarks touted for notebook computers, battery life is one of the easiest to understand. Yet consumers and critics alike have questioned the accuracy of parameters used to measure battery life. A top concern is whether the most used battery life tests measure up-to-date, real-world scenarios.

Table of Contents

Establishing the Standard 1
Staying Relevant 2
The new BAPCo MobileMark 2018 Test 2
Why Usage Patterns are Important 3
Screen Off and On Idle States 4
Actual Test Compared to Real Life 5
Conclusion 6

Staying Relevant

MobileMark®, produced by BAPCo, has become the industry standard used by the majority of PC makers for battery life benchmark and performance testing. Until recently, MobileMark® 2014 was the consistent standard in comparing notebook battery life performance. Yet, with ever-evolving notebook system requirements and demands, concerns grew that MobileMark 2014 was becoming outdated and that the test no longer reflected current notebook usage. There was also concern that MobileMark 2014 generated battery life numbers that were too optimistic in predicting the actual battery life experienced by the average user.

The MobileMark® 2018 battery life estimation test has been created by BAPCo to closely reflect current, real-life usage of a notebook computer, updated workloads and support for Microsoft Windows® 10 64-bit. MobileMark 2018 has also been updated to use the latest applications, as well as having adjusted the usage time of various applications to match the actual usage from metrics data (see Figure 1).

Why Usage Patterns are Important

Using multiple testing parameters shows how well a system design addresses the inherent tradeoffs between performance and power management. The MobileMark 2014 battery life testing process focused on only one of the two available use cases at a time, office productivity or media creation. Ultimately, productivity, which includes tasks such as composing documents, reading, editing photos, and video manipulation, was the use case scenario designated as the most commonly used. In turn, companies published those battery life results for commercial notebooks.

MobileMark 2014 also didn't take into consideration factors such as laptops being left on and idle and the average screen brightness settings of most users. For MobileMark 2018, BAPCo chose a wide variety of usage models in which the user experience is influenced by system performance. It not only added a new web browsing test scenario, but it also runs all the tests and generates a combined number.

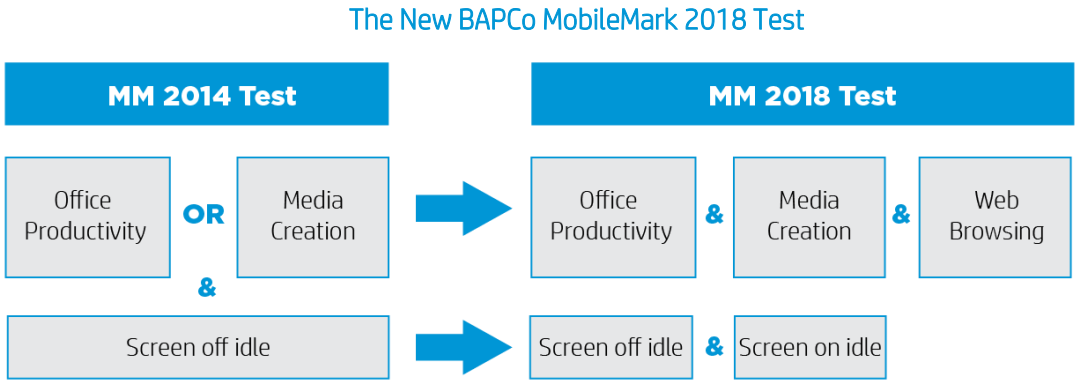

Figure 1. MobileMark Usage Test Models: 2014 and 2018

The new test divides the notebook computer usage into three areas: Productivity, Creation and Web Browsing. These three areas are defined as follows:

Productivity: This scenario models productivity usage, including word processing, spreadsheet data manipulation, financial analysis, software development, application installation, file compression and email creation/management.

Creation: This scenario models creating and editing digital photos, videos and using artificial intelligence for facial detection in photos.

Web Browsing: This scenario models loading and switching between various web sites as well as full-screen local video playback.

As shown in Figure 2, the test spends a similar amount of time between Productivity (PR) and Creation (CR), while spending the least amount of time in Web Browsing (WB).

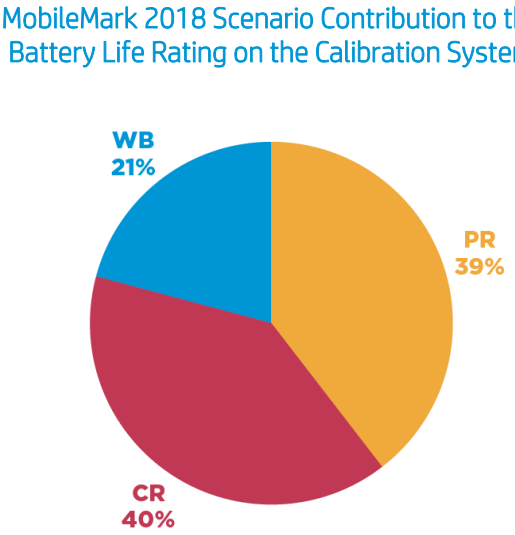

Figure 2. MobileMark 2018 Scenario Contribution

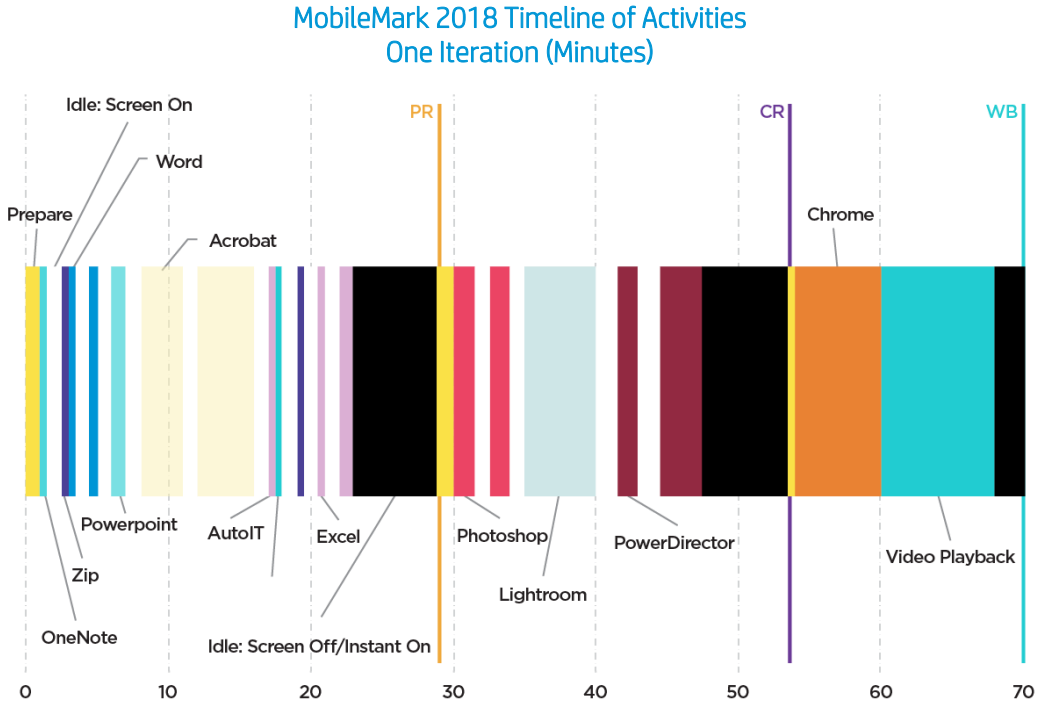

Figure 3. MobileMark 2018 Timeline of Activities

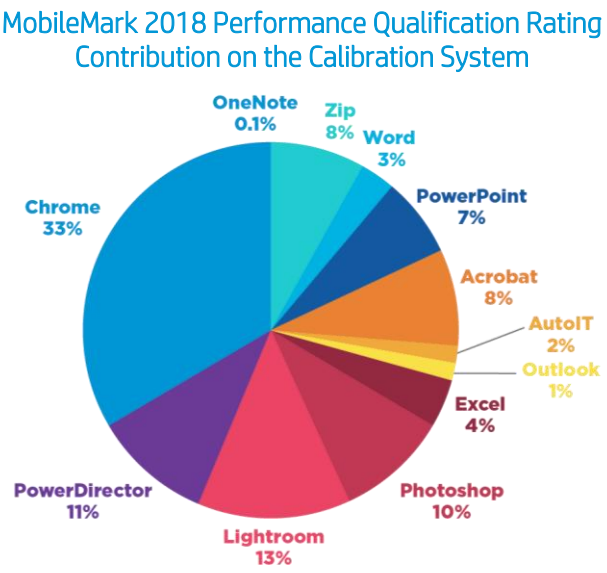

Figure 4. MobileMark 2018 Performance Contribution-Calibration

Screen Off and On Idle States

Among the updates made to MobileMark 2018, one change more readily reflects true user behavior than others. Users leave their laptops on while doing other things, which results in screen on & idle and screen off & idle (see Figure 5). These factors were not previously reflected in the MobileMark 2014 battery life test. Additionally, the screen brightness factor has been increased to 200 nits (a nit is a measure of brightness) in the MobileMark 2018 test to more accurately reflect average screen settings. This is an increase of 50 nits from MobileMark 2014. Brightness setting has a direct impact on battery life. The idle time inclusion in the tests also allow notebook power management features to show their effectiveness.

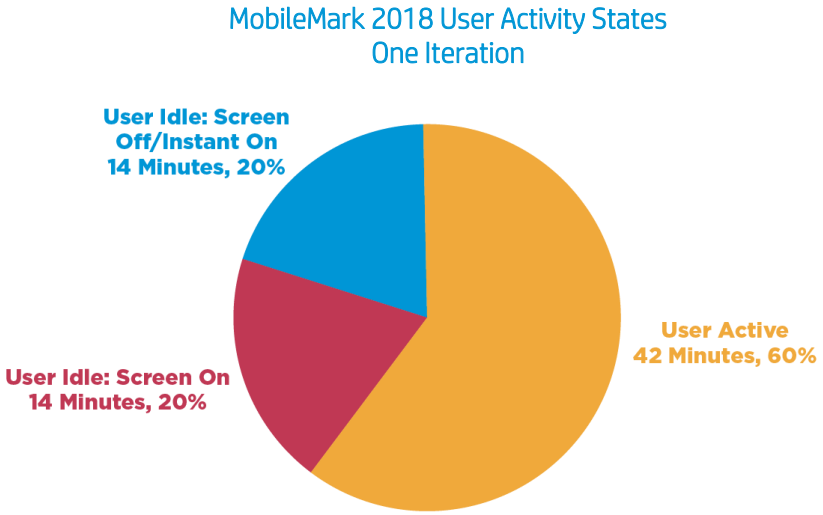

Figure 5. MobileMark 2018 User Activity States

The user activity states, in one iteration of 70 minutes (as shown in Figure 5), include:

- 14 minutes idle, with screen off
- 14 minutes idle, with screen on, and
- The remaining 42 minutes are divided into
    - Web browsing – 9 mins.
    - Creation – 17 mins.
    - Productivity – 16 mins.

Actual Test, Compared to Real Life

MobileMark 2018 runs automatically, using a defined set of parameters, including hardware settings. Each cycle of the MobileMark 2018 test takes approximately 70 minutes and gets repeated until the battery is exhausted (see Figure 3). Using real-life usage metrics is believed to reflect the average usage profile of a mainstream notebook computer user (see Figure 4). Usage figures for an actual user would reflect how the product is being used, which applications are being used and for how long.

In testing the exact same product, using the defined test process, MobileMark 2014 and 2018 generated the following results:

BAPCo MM 2014	17hrs 30min
BAPCo MM 2018	11hrs 20min

The above MobileMark 2018 battery life test result shows a ~35% drop in battery life in comparison to MobileMark 2014. MobileMark 2014 continues to be used for comparing performance between different systems, but in general, most users do not rely on it to predict actual battery life experiences.

Conclusion

With the updates to MobileMark 2018, it's expected this standard will continue to provide good, competitive comparison testing between different PC notebooks and brands. Though results for any individual user would reflect specific usage and the individual battery life number (higher or lower), there is at least a more realistic estimate of battery life available to the end user.

Sign up for updates: hp.com/go/getupdated

4AA7-7365ENW, May 2020