



Two Lenovo ThinkPad business laptops powered by Intel Core i3-10110U and Core i5-10310U vPro processors achieved higher benchmark performance than comparable systems powered by AMD Ryzen 3 PRO 4450U and Ryzen 5 PRO 4650U processors

We used industry-standard benchmarks to measure the performance and battery life of the following four systems:

- **Two comparably configured Lenovo® ThinkPad® X13 business laptops**
 - one powered by an Intel® Core™ i3-10110U processor
 - one powered by an AMD Ryzen™ 3 PRO 4450U processor
- **Two comparably configured Lenovo ThinkPad T14 business laptops**
 - one powered by an Intel Core i5-10310U vPro processor
 - one powered by an AMD Ryzen 5 PRO 4650U processor

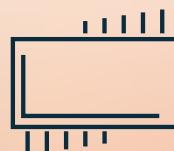
We ran the MobileMark® 2018 benchmark to measure battery life and system performance and the WebXPRT benchmark to measure web browsing performance. Both of these tests reflect real-world business worker usage patterns.

We learned that the Intel Core i3-10110U processor-powered laptop outperformed the AMD Ryzen 3 PRO 4450U processor-powered laptop by up to 64.8 percent and delivered 7 percent longer battery life. The Intel Core i5-10310U vPro-processor-powered laptop outperformed the AMD Ryzen 5 PRO 4650U processor-powered laptop by up to 77.5 percent and delivered battery life that was less than 2 percent shorter.



Up to 77% higher benchmark performance
on WebXPRT 3

Intel Core i5-10310U vPro-processor-powered laptop vs. AMD Ryzen 5 PRO 4650U processor-powered laptop



Comparable or longer battery life
on MobileMark 2018

Intel Core i3-10110U processor-powered laptop lasted 38 minutes longer unplugged than AMD Ryzen 3 PRO 4450 processor-powered laptop

The business laptops we tested

Below, we present some of the configuration details of the two pairs of business laptops we tested. Aside from the processor, we selected configurations that were as similar as possible. For each model, we selected the battery with the largest capacity. For complete configuration details, see the [science behind the report](#).

Lenovo ThinkPad X13

Intel Core i3-10110U processor

- 256GB SSD
- 8 GB of RAM
- 3 cell 48Wh battery with Rapid Charge technology
- 203 nits

AMD Ryzen 3 PRO 4450U processor

- 256GB SSD
- 8 GB of RAM
- 3- cell 48Wh battery with Rapid Charge technology
- 204 nits

Lenovo ThinkPad T14

Intel Core i5-10310U vPro processor

- 512GB SSD
- 16 GB of RAM
- 3-cell 50Wh battery with Rapid Charge technology
- 205 nits

AMD Ryzen 5 PRO 4650U processor

- 512GB SSD
- 16 GB of RAM
- 3-cell 50Wh battery with Rapid Charge technology
- 205 nits



Lenovo ThinkPad T14

The tests we conducted

We set each business laptop to the “best performance” power mode before performing the following benchmark tests:

MobileMark 2018, which creator BAPCo® describes as measuring performance in the areas of “Office Productivity, Creativity and Web Browsing.”¹

WebXPRT 3, a browser benchmark that gauges any web-enabled device’s performance by measuring how well it handles workloads that consist of common online tasks.²

What we learned about the pair of Lenovo ThinkPad X13 laptops we tested

First, we compared two Lenovo ThinkPad X13 systems, which were comparable aside from the fact that one was powered by an Intel Core i3-10110U processor, and the other was powered by an AMD Ryzen 3 PRO 4450U processor.

Testing battery life and performance with MobileMark 2018

The first test we ran was MobileMark 2018, which consists of an overall battery life test and several performance tests. We report the battery life and overall performance score, which summarizes the individual performance subtests, below. (We report the results of the subtests, along with detailed test procedures, in the [science behind the report](#).)

As Figure 1 shows, the Intel Core i3-10110U processor-powered Lenovo ThinkPad X13 achieved a higher MobileMark overall performance qualification score than the AMD Ryzen 3 PRO 4450U processor-powered laptop. The Intel Core i3-10110U processor-powered laptop delivered an improvement of 23.2 percent.

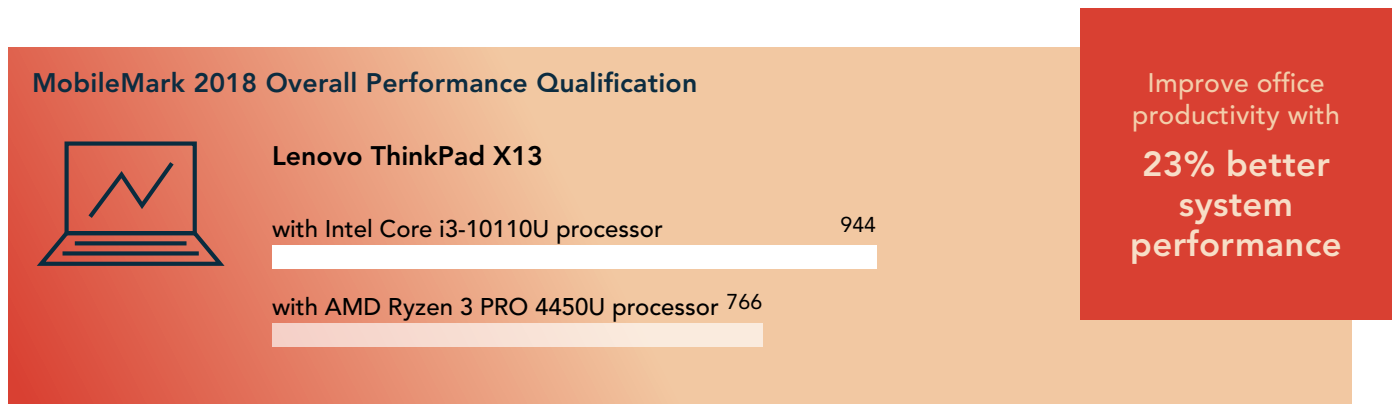


Figure 1: MobileMark 2018 overall performance qualification scores. Higher is better. Source: Principled Technologies.

As Figure 2 shows, the Intel Core i3-10110U processor-powered Lenovo ThinkPad X13 achieved longer battery life than the AMD Ryzen 3 PRO 4450U processor-powered laptop. Based on these results and the performance results above, a user would not only be able to do more work with the laptop equipped with the Intel Core i3-10110U processor, but they would also be able to work for 38 minutes longer, an improvement of 7.8 percent.

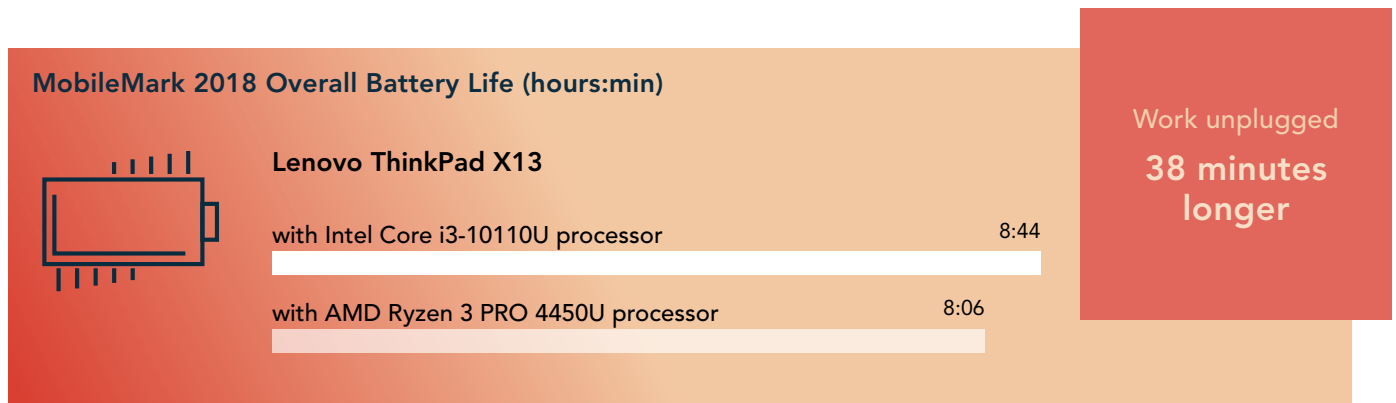


Figure 2: MobileMark 2018 overall battery life results. Time (hh:mm). More time is better. Source: Principled Technologies.

Testing performance with WebXPRT 3

We report the overall score from WebXPRT 3, which summarizes the individual performance subtests, below. (We report the results of the subtests, along with detailed test procedures, in the [science behind the report](#).) As Figure 3 shows, the Intel Core i3-10110U processor-powered Lenovo ThinkPad X13 achieved a higher WebXPRT overall performance score than the AMD Ryzen 3 PRO 4450U processor-powered laptop. The Intel Core i3-10110U processor-powered laptop delivered an improvement of 64.8 percent.

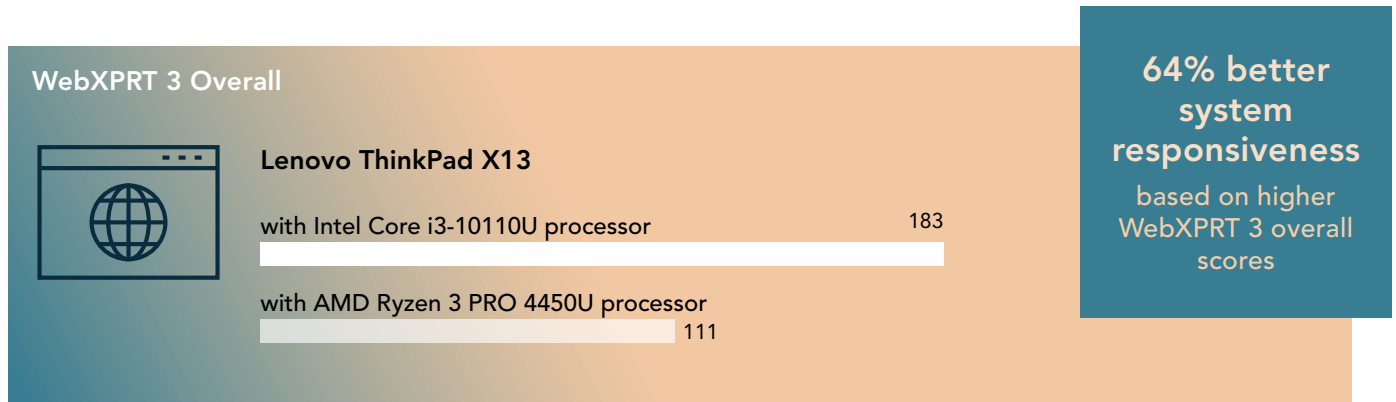


Figure 3: WebXPRT 3 overall scores on browser-based tasks. Higher is better. Source: Principled Technologies.



What we learned about the pair of Lenovo ThinkPad T14 laptops we tested

In this testing, we compared two Lenovo ThinkPad T14 systems, which were comparable aside from the fact that one was powered by an Intel Core i5-10310U vPro processor, and the other was powered by an AMD Ryzen 5 PRO 4650U processor.

Testing battery life and performance with MobileMark 2018

The first test we ran was MobileMark 2018, which consists of an overall battery life test and several performance tests. We report the battery life and overall performance score, which summarizes the individual performance subtests, below. (We report the results of the subtests, along with detailed test procedures, in the [science behind the report](#).)

As Figure 4 shows, the Intel Core i5-10310U vPro processor-powered Lenovo ThinkPad T14 achieved a MobileMark overall performance qualification score that was 50.4 percent higher than that of the AMD Ryzen 5 PRO 4650U processor-powered laptop.

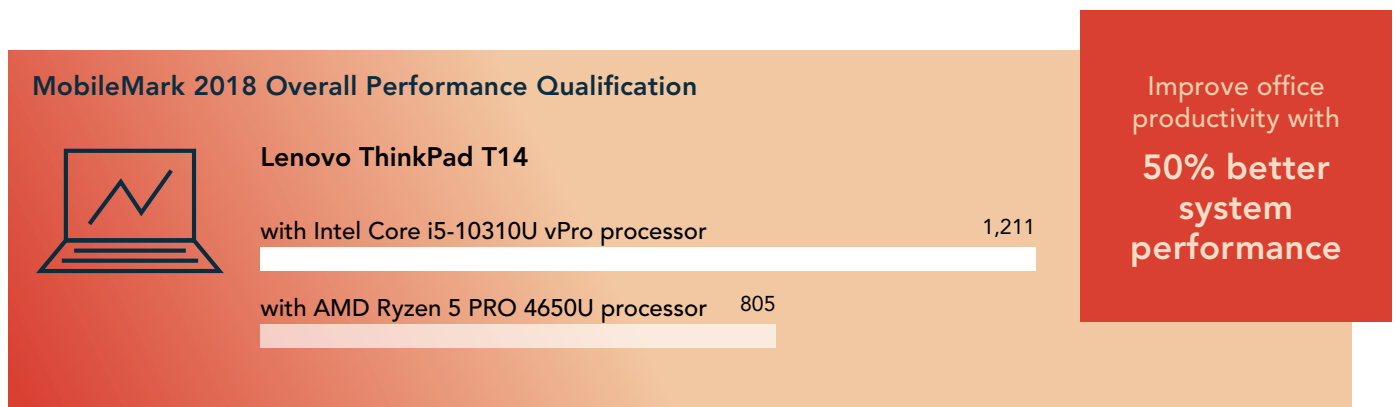


Figure 4: MobileMark 2018 overall performance qualification scores. Higher is better. Source: Principled Technologies.

As Figure 5 shows, the Intel Core i5-10310U vPro processor-powered Lenovo ThinkPad T14 achieved just slightly less battery life than the AMD Ryzen 5 PRO 4650U processor-powered laptop, a difference of 8 minutes, which is less than 2 percent. Based on these results, a user would be able to do considerably more work with the laptop equipped with the Intel Core i5-10310U vPro processor, while being able to work for a comparable amount of time unplugged.



Figure 5: MobileMark 2018 overall battery life results. Time (hh:mm). More time is better. Source: Principled Technologies.

Testing performance with WebXPRT 3

As Figure 6 shows, the Intel Core i5-10310U vPro processor-powered Lenovo ThinkPad T14 achieved a WebXPRT 3 overall performance score that was 77.5 percent higher than that of the AMD Ryzen 5 PRO 4650U processor-powered laptop.

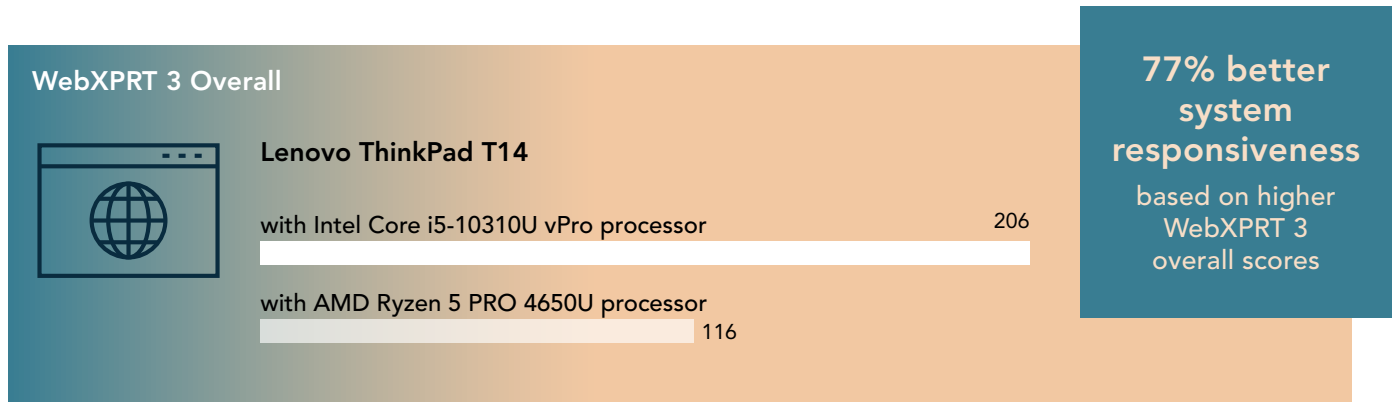


Figure 6: WebXPRT 3 overall scores on browser-based tasks. Higher is better. Source: Principled Technologies.

Conclusion

We used two industry-standard benchmark tests to measure the performance and battery life of two pairs of Lenovo ThinkPad laptops. We learned that the Intel Core i3-10110U processor-powered Lenovo ThinkPad X13 achieved up to 64.8 percent better performance than its AMD Ryzen 3 PRO 4450U processor-powered counterpart and would last 38 minutes longer while unplugged. The Intel Core i5-10310U vPro-processor-powered Lenovo ThinkPad T14 achieved up to 77.5 percent better performance than its AMD Ryzen 5 PRO 4650U processor-powered counterpart, and its battery life was only 8 minutes shorter.

- 1 BAPCo, "MobileMark 2018," accessed April 12, 2021, <https://bapco.com/products/mobilemark-2018/>.
- 2 Principled Technologies, "WebXPRT 3," accessed April 12, 2021, <https://www.principledtechnologies.com/benchmarkxprt/webxpert/>.

Read the science behind this report at <http://facts.pt/yIIQEJI> ►



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