Save time on key tasks while multitasking*

⚡ Open large presentations in up to **60% less time**

⚡ Open GIMP projects in up to **59% less time**

⚡ Launch Dota 2 in up to **38% less time**

HP ProBook 640

HP EliteBook 840

HP EliteBook x360 1030

Launch key apps faster with new Intel Optane memory

Intel Optane Memory H10 with Solid State Storage enabled three HP notebooks to launch projects and apps faster than the same notebooks without the technology

Responsive devices can deliver a better user experience and less frustration than devices that take a long time to perform tasks such as opening large documents and copying large files. One way to improve a device's responsiveness is to install more RAM—however, it's not the only way.

Intel claims their Intel® Optane™ technology can improve system responsiveness even without purchasing additional RAM.[1] At Principled Technologies, we tested this claim by measuring the time it took for the following HP notebooks to launch projects and apps while simultaneously copying a large file to the system desktop:

- HP ProBook 640
- HP EliteBook 840
- HP EliteBook x360 1030

We tested pairs of each system, with the only difference being that one notebook had Intel Optane memory and the other lacked it. We found that launching the projects and apps took less time with the notebooks that had Intel Optane memory. Customizing a notebook with Intel Optane memory H10 with solid state storage could enable users to achieve better performance out of their machines on the apps they use every day.

*In our tests, we defined multitasking as the act of copying a 41.8GB file to the desktop while launching the app in question.

How we tested

Each of the notebooks we tested contained 16 GB of RAM and 512 GB of storage. The Intel Optane memory modules had 32 GB of capacity.

We measured the time each notebook required to launch documents and projects in the following office productivity and content creation apps:

- Adobe® Reader DC
- Adobe® Photoshop®
- Adobe® Premiere® Pro
- GNU Image Manipulation Program (GIMP)
- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint

Additionally, we launched the following games via the Steam game launcher:

- Dota 2
- Path of Exile

Prior to testing, we installed the apps to each system locally.

Because users rarely ever do just one thing with their computers, we mimicked real-world multitasking by launching each project and app while the system simultaneously made a copy of a ~40GB file on the desktop.

Save time launching key applications

We observed that the systems with Intel Optane memory launched apps and projects in less time than the systems without the technology. The time savings were most pronounced on the notebook with the lowest-level configuration (the HP ProBook 640) and least pronounced on the laptop with the highest specs (the HP EliteBook x360 1030).

Intel Optane Memory H10 with Solid State Storage

Intel Optane memory is a fusion of storage and memory technology that Intel claims can boost system responsiveness. According to Intel, Optane memory H10 with solid state storage is the first in the industry to combine the speed of Intel Optane Technology with the capacity of NAND storage. The module offers "low latency and high performance…delivering fast boot and application launch[.]" Intel positions this storage/memory product to cater to the needs of a wide audience of "gamers, media and content creators, everyday users, and professionals."[1]

To learn more, visit https://www.intel.com/content/www/us/en/products/docs/memory-storage/optane-memory/optane-memory-h10-solidstate-storage-brief.html.

HP ProBook 640 results

The HP ProBook 640 with Intel Optane memory required less time to launch projects in apps—including Microsoft Word and Adobe Photoshop—compared to the same device without Intel Optane memory. When launching Dota 2, the HP ProBook 640 with Intel Optane memory saved 18 seconds, or 38 percent of the time of the same notebook without Intel Optane memory. For full results, see the science behind this report.

Launch a large Word file
while a large file is being copied to desktop

60% less time

5.2	
13.0	

Time (sec)

HP ProBook 640
with Intel Optane memory

HP ProBook 640
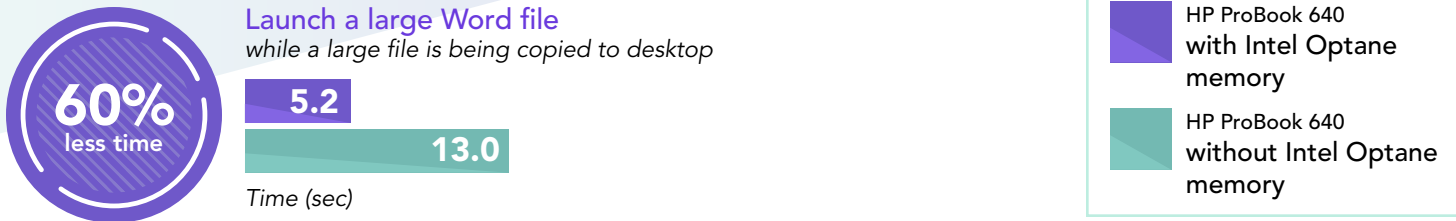**without Intel Optane memory**

Figure 1: Time to launch a ~90MB Word file while the system copied a large file to the desktop on an HP ProBook 640 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

Launch an Adobe Photoshop project
while a large file is being copied to desktop

36% less time
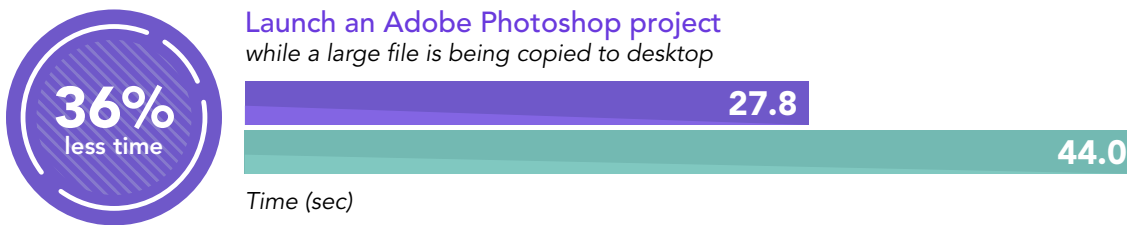
27.8

44.0

Time (sec)

Figure 2: Time to launch a ~16MB Adobe Photoshop project while the system copied a large file to the desktop on an HP ProBook 640 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

Launch the Dota 2 game
while a large file is being copied to desktop
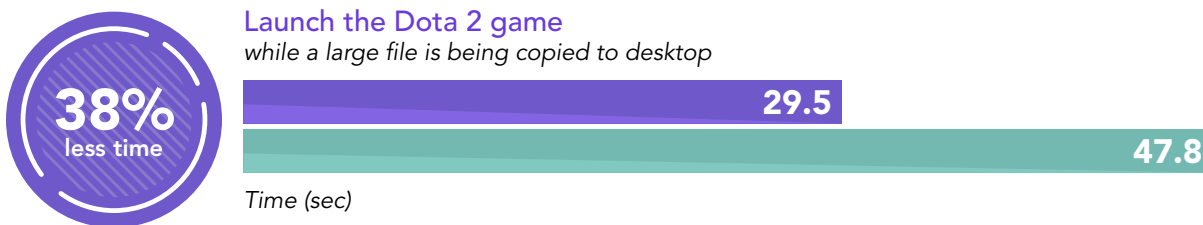
38% less time

29.5

47.8

Time (sec)

Figure 3: Time to launch Dota 2 while the system copied a large file to the desktop on an HP ProBook 640 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

About the HP ProBook 600 Series

HP positions its ProBook 600 Series notebooks as bridges between new technologies that drive business forward and older technologies that are valuable to support. According to the HP website, these devices "support legacy IT" while offering up-to-date security features such as hardware-enforced security options, multifactor authentication, and a privacy camera.

To learn more, visit https://store.hp.com/us/en/mdp/laptops/probook-600-14-243575--1#!&tab=features.

HP EliteBook 840 results

The EliteBook 840 with Intel Optane memory saved time on eight tasks, including launching a ~180MB PowerPoint presentation while the system copied a large file to the desktop. The biggest time difference we observed was in launching an ~85MB sample project in the image manipulation application GIMP. Without Intel Optane memory, this task took 44.8 seconds. The HP EliteBook 840 with Intel Optane memory required only 18.3 seconds to complete the task—a savings of nearly half a minute.

61% less time

Launch a large Word file
while a large file is being copied to desktop

5.6

14.4

Time (sec)

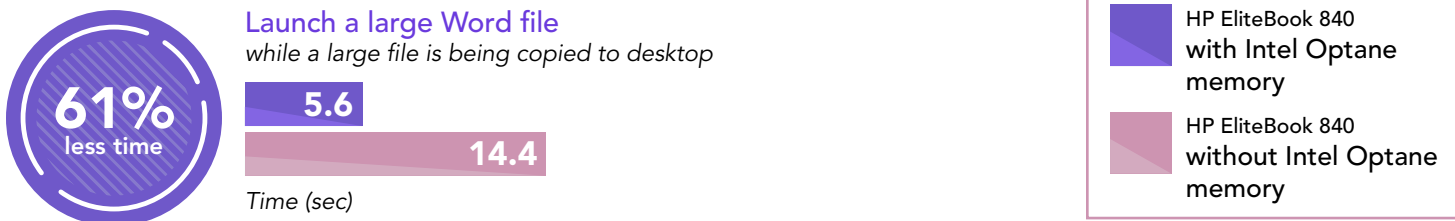| | HP EliteBook 840 **with Intel Optane memory** |
| | HP EliteBook 840 **without Intel Optane memory** |

Figure 4: Time to launch a ~90MB Word document while the system copied a large file to the desktop on an HP EliteBook 840 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

59% less time

Launch a GIMP project
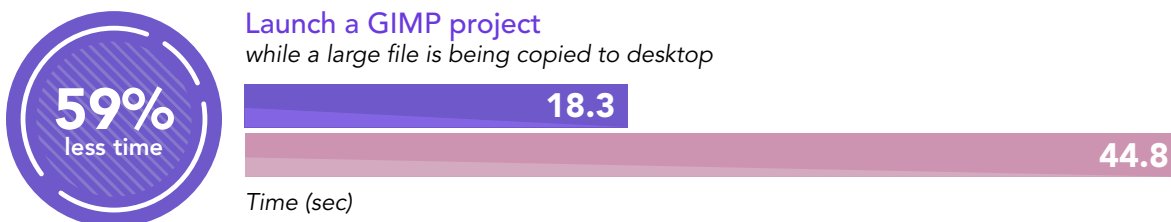*while a large file is being copied to desktop*

18.3

44.8

Time (sec)

Figure 5: Time to launch a ~85MB GIMP project while the system copied a large file to the desktop on an HP EliteBook 840 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

38% less time

Launch the Dota 2 game
while a large file is being copied to desktop
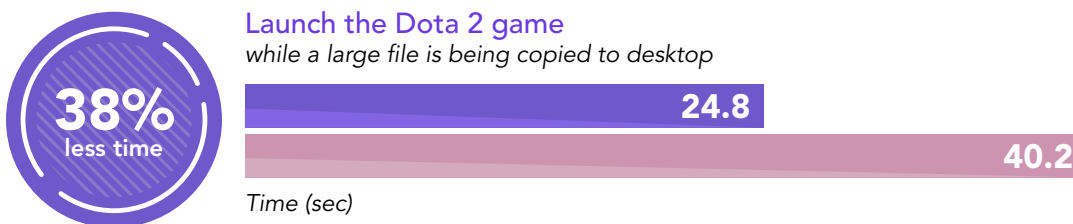
24.8

40.2

Time (sec)

Figure 6: Time to launch Dota 2 while the system copied a large file to the desktop on an HP EliteBook 840 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

About the HP EliteBook 800 Series

According to HP, their EliteBook 800 Series notebooks boast several features that working professionals may appreciate, including:

- Up to 1GbE 4G LTE for working without a Wi-Fi connection
- HP Noise Cancellation for improved remote collaboration
- Hardware-level security features[3]

To learn more, visit https://www8.hp.com/us/en/laptops/business/elitebook-800.html.

HP EliteBook x360 1030 results

The HP EliteBook x360 1030 with Intel Optane memory saved time on seven tasks compared to the same device without Intel Optane memory. The largest time difference we observed in the office productivity/creativity categories was in launching a large GIMP project, which saved 4.2 seconds with Intel Optane memory.

	HP EliteBook x360 1030 **with Intel Optane memory**
	HP EliteBook x360 1030 **without Intel Optane memory**

Launch a large PowerPoint presentation
while a large file is being copied to desktop
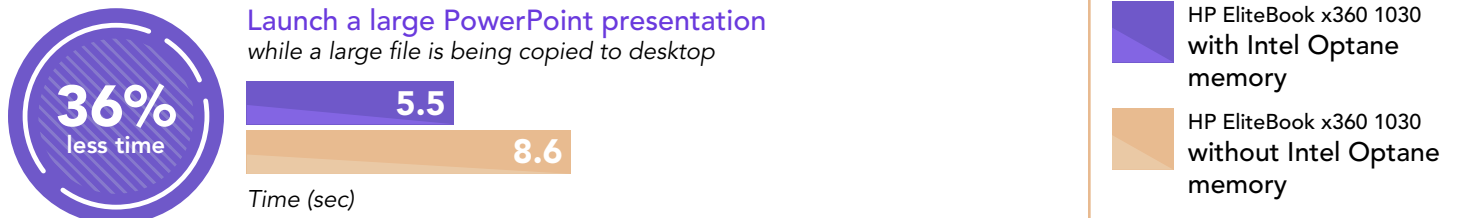
36% less time

5.5
8.6

Time (sec)

Figure 7: Time to launch a ~180MB PowerPoint presentation while the system copied a large file to the desktop on an HP EliteBook x360 1030 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

Launch a GIMP project
while a large file is being copied to desktop
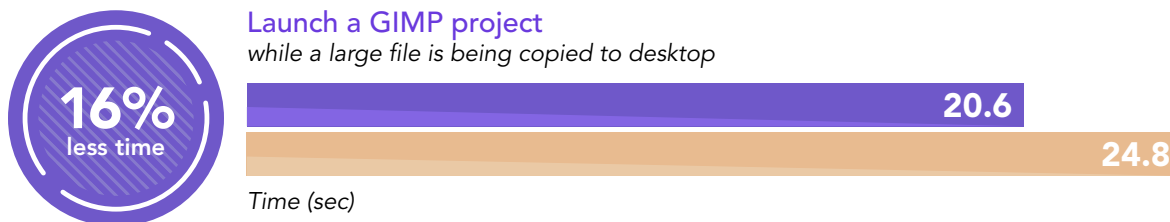
16% less time

20.6
24.8

Time (sec)

Figure 8: Time to launch a ~85MB GIMP project while the system copied a large file to the desktop on an HP EliteBook x360 1030 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

Launch the Path of Exile game
while a large file is being copied to desktop
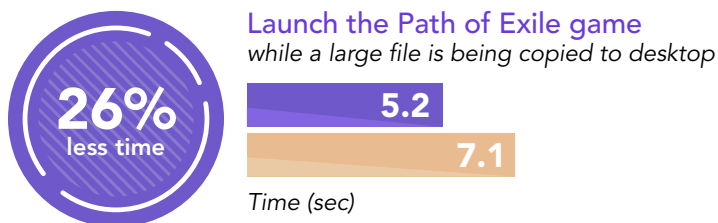
26% less time

5.2
7.1

Time (sec)

Figure 9: Time to launch Path of Exile while the system copied a large file to the desktop on an HP EliteBook x360 1030 system with and without Intel Optane memory. Time (sec). Lower is better. Source: Principled Technologies.

About the HP EliteBook x360 Series

EliteBook x360 Series devices from HP offer physical flexibility to support a variety of work modes. You can use HP EliteBook x360 Series devices as laptops, presentation screens, or tablets. Features include:

- Noise cancellation for improved remote collaboration
- HP Sure View to prevent others from viewing your screen
- Hardware-level security features[4]

To learn more, visit https://store.hp.com/us/en/mdp/business-solutions/hp-elitebook-x360-1030-g2#!&tab=features.

Conclusion

Dealing with slow load times on a device can be frustrating and interrupt a user's flow, whether they are editing long documents, applying creative flair to visual projects, or relaxing with some gaming in their downtime. A device that can save time on launching key applications—a task that many perform multiple times per day— could make for a more pleasant user experience that's more conducive to productivity.

At Principled Technologies, we compared the app and project launch performance of three HP notebooks with and without Intel Optane memory H10 with solid state storage. The notebooks with Intel Optane memory each required less time to launch a variety of apps and projects, from Microsoft Office documents to creative projects in applications such as Adobe Premiere and gaming apps such as Dota 2.

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1   "Intel Optane Memory H10 with Solid State Storage," accessed July 7, 2020,
    https://www.intel.com/content/www/us/en/products/docs/memory-storage/optane-memory/optane-memory-h10-solid-state-storage-brief.html.
2   "HP ProBook 600 Series," accessed July 7, 2020,
    https://store.hp.com/us/en/mdp/laptops/probook-600-14-243575--1#!&tab=features.
3   "HP EliteBook 800 Series," accessed July 7, 2020,
    https://www8.hp.com/us/en/laptops/business/elitebook-800.html.
4   "HP EliteBook x360 Series," accessed July 7, 2020,
    https://store.hp.com/us/en/mdp/business-solutions/hp-elitebook-x360-1030-g2#!&tab=features.

Read the science behind this report at http://facts.pt/AbQvY9d ▶

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This project was commissioned by HP.