39% less time

to render an Autodesk Revit model*

31% less time

to export an Adobe Premiere Pro timeline*

Process up to 4.2x

as many images/second on machine learning workflows*

Up to 74% higher CPU performance

on SPECworkstation 3 benchmark*

Speed your productivity applications by upgrading to a workstation with Windows 10 Pro for Workstations and Intel Xeon W processors

The newer workstation we tested could save you valuable time on common activities

Everyone likes a speedy computer, but for those who work with large amounts of data, high performance is essential. If your daily routine involves computer-assisted design, video production, or other data-intensive applications, you're likely using a powerful PC. If your system is a couple of years old, however, you are leaving speed on the table.

At the request of Microsoft, we performed hands-on testing to quantify the improvements such users could enjoy by upgrading from a previous-generation system to a current workstation powered by Intel® Xeon® W processors and Windows 10 Pro for Workstations. We carried out a series of tasks in Autodesk® Revit and Adobe® Premiere® Pro, and tested AI performance and overall CPU performance. With Intel Xeon W processors and Windows 10 Pro for Workstations, the current workstation dramatically cut the time needed to get the job done.

Current workstation running Windows 10 Pro for Workstations vs. previous-generation PC running Windows 10 Pro

About our testing

We set out to quantify the performance improvements customers can expect when upgrading from previous-generation PCs running Windows 10 Pro to current workstations powered by Intel Xeon W processors and running Windows 10 Pro for Workstations.

We tested two systems from the same vendor:

- A previous-generation PC powered by an Intel Core™ i7 processor and running Windows 10 Pro
- A current workstation powered by an Intel Xeon W-2245 processor and running Windows 10 Pro for Workstations

We conducted the following tests:

- Architectural design/creative 3D visualization workflow with Autodesk Revit with V-Ray Next
- Creative, high-end video-rendering workflow with Adobe Premiere Pro
- Artificial intelligence/machine learning workload with the AIXPRT benchmark
- General performance with the SPECworkstation 3 benchmark

For complete details on the systems we tested and the tests we performed, see the science behind the report.

We'll present our findings through the lens of three fictional scenarios. Though we've made up the characters, their situations reflect the experiences that real-world workstation users would have.

About Windows 10 Pro for Workstations

According to Microsoft, Windows 10 Pro for Workstations powers users with mission-critical and intensive workloads and provides:

- Faster file sharing
- Automatic corruption repair and persistent memory to protect data during critical failures
- Support for up to 4 CPUs and 6 TB of RAM[1]

Learn more at https://www.microsoft.com/en-us/windowsforbusiness/workstations.

About Intel Xeon W processors

The current workstation we tested was powered by the Intel Xeon W-2245 processor, part of the Intel Xeon W processor family for creative professionals. According to Intel, systems that use Intel Xeon W processors deliver "outstanding performance, security, and reliability along with expanded platform capabilities for VFX, 3D rendering, complex 3D CAD, and AI development & edge deployments."[2]

Learn more at https://www.intel.com/content/www/us/en/products/processors/xeon/w-processors.html.
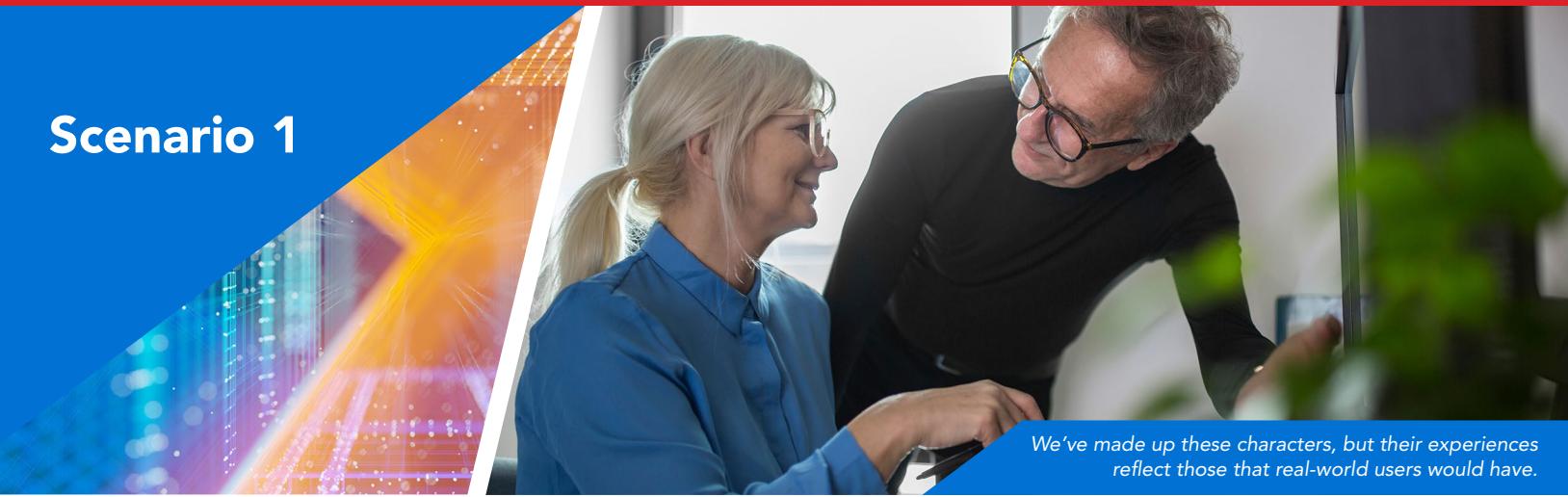
We've made up these characters, but their experiences reflect those that real-world users would have.

Engineers working remotely using Autodesk Revit

Janet and her husband Kevin are structural engineers who work for the same mid-sized city. They used to spend some of their workday in their offices downtown and some of it in the field. Now, city employees are working remotely to the degree possible, so Janet and Kevin brought their computers home. They still venture out to inspect active projects, but they design and create construction documents at home.

Shortly before the shift to remote work, Janet got a new workstation, powered by an Intel Xeon W processor and running Windows 10 Pro for Workstations, but Kevin is still using the previous-generation PC he got two years ago. She told him her current system was a lot faster, and now that he can look over her shoulder as she works, he sees what she meant.

As we show below, Kevin could save over a minute launching Autodesk Revit and could cut the time to render a model by more than one-third if he had a current system like Janet's.

39% less time to render a model
(save 6 minutes 9 seconds)

75% less time to launch the program
(save 1 minute 14 seconds)

Autodesk Revit with V-Ray Next: time to complete tasks
(lower is better)

Render a model (min:sec)

9:16

15:25

Launch the program (min:sec)

0:24

1:38

■ Current workstation w/ Windows 10 Pro for Workstations
■ Previous-generation PC w/ Windows 10 Pro
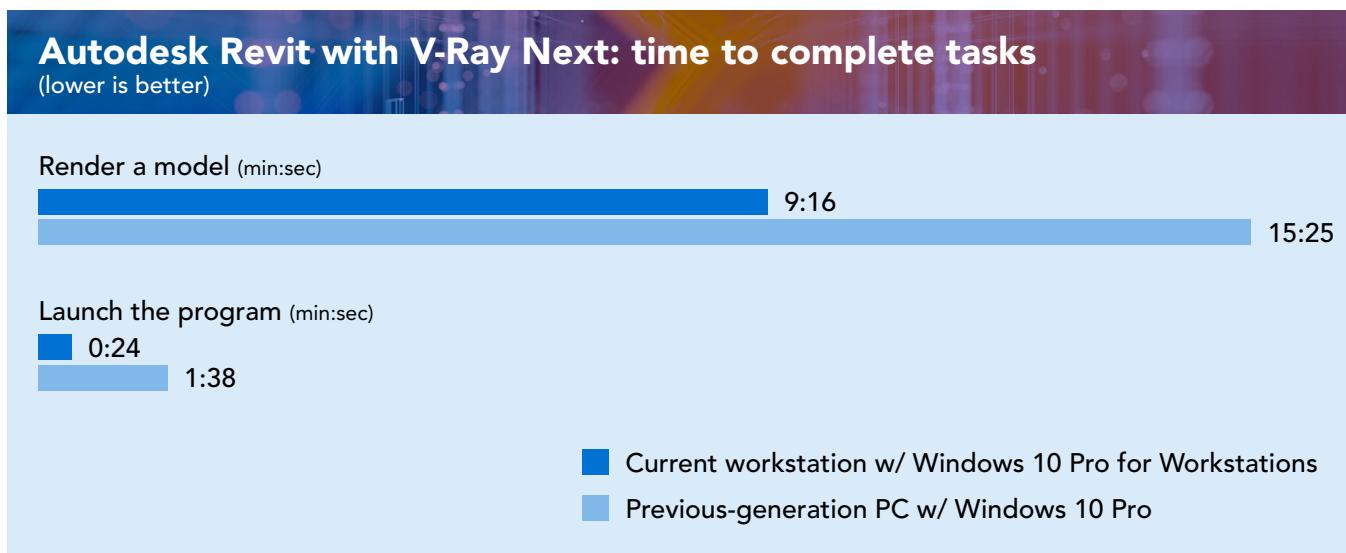
Figure 1: Time to complete tasks with Autodesk Revit (min:sec). Source: Principled Technologies.

Scenario 2

We've made up these characters, but their experiences reflect those that real-world users would have.

Brothers editing videos with Adobe Premiere Pro

Sameer, a college student studying business, lives with his older brother, a videographer. Sameer's summer internship was canceled, leaving him with lots of free time. His brother suggested that Sameer teach himself video editing, and dusted off the previous-generation PC from which he recently upgraded. Sameer has been using the previous-generation system to explore Adobe Premiere Pro. It gets the job done, but he sees how much faster his brother's current workstation, powered by an Intel Xeon W processor and running Windows 10 Pro for Workstations, performs the same tasks.

As we show below, Sameer's brother could can save over 2 minutes every time he exports a timeline if he had a current workstation like his brother's.

31% less time to export a timeline
(save 2 minutes 14 seconds)

48% less time to launch the program
(save 14 seconds)

Adobe Premiere Pro: time to complete tasks
(lower is better)

Export a timeline (min:sec)

4:47

7:01

Launch the program (min:sec)

0:15

0:29

■ Current workstation w/ Windows 10 Pro for Workstations

■ Previous-generation PC w/ Windows 10 Pro
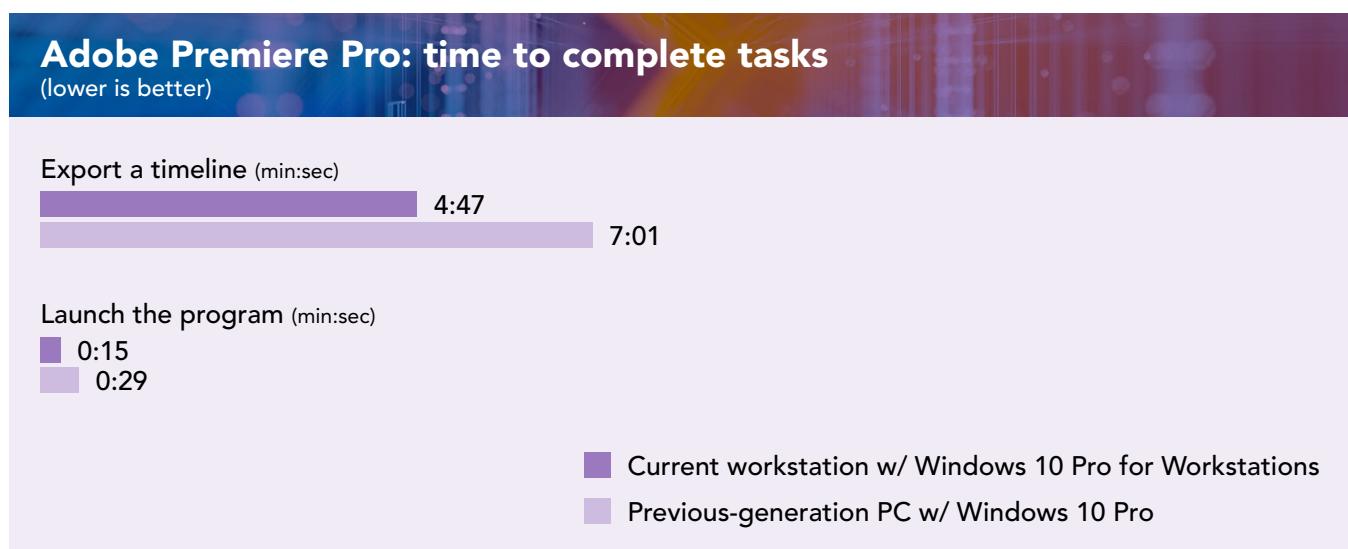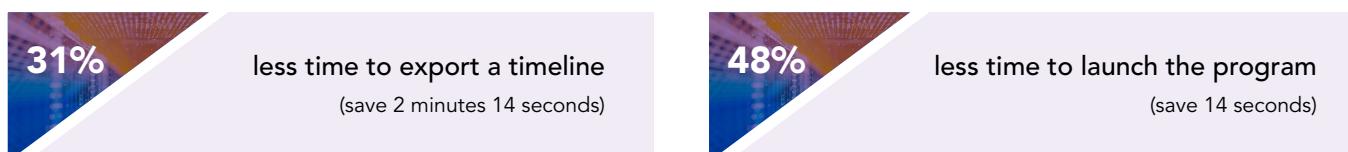
Figure 2: Time to complete tasks with Adobe Premiere Pro (min:sec). Source: Principled Technologies.

Scenario 3

We've made up these characters, but their experiences reflect those that real-world users would have.

Colleagues collaborating on AI

Lowell and Asmara are post-doctoral fellows conducting research into machine learning applications in cancer detection. These days, instead of working side by side in the lab, they've been working from their respective apartments and meeting online multiple times daily. Asmara, who's using a previous-generation PC, can't believe how quickly Lowell can process sets of images using his current workstation powered by an Intel Xeon W processor and running Windows 10 Pro for Workstations. She's going to insist that the lab provide her with a similar system.

We used the AIXPRT benchmark[3] to measure the machine learning inference performance of the two systems. As we show below, the test results indicate that Lowell's current workstation would let his applications process up to 4 times as many images per second as Asmara's previous-generation PC, while cutting latency by more than half.

Process up to **4.2 times** as many images per second

Reduce latency by up to **62 percent**

AIXPRT images per second
(higher is better)

SSD-MobileNet v1
978.20
280.10

ResNet-50
642.90
150.70

■ Current workstation w/ Windows 10 Pro for Workstations
■ Previous-generation PC w/ Windows 10 Pro
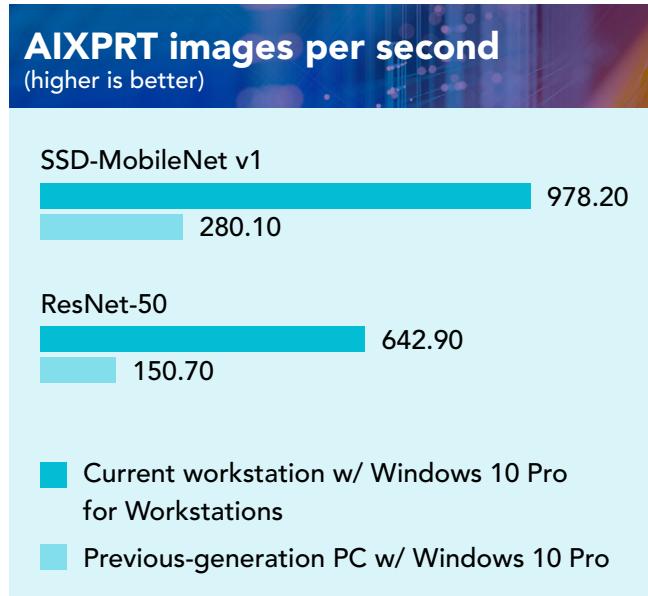
Figure 3: AIXPRT images per second.
Source: Principled Technologies.

AIXPRT latency (ms)
(lower is better)

SSD-MobileNet v1 latency
1.57
4.14

ResNet-50 latency
3.35
8.44

■ Current workstation w/ Windows 10 Pro for Workstations
■ Previous-generation PC w/ Windows 10 Pro
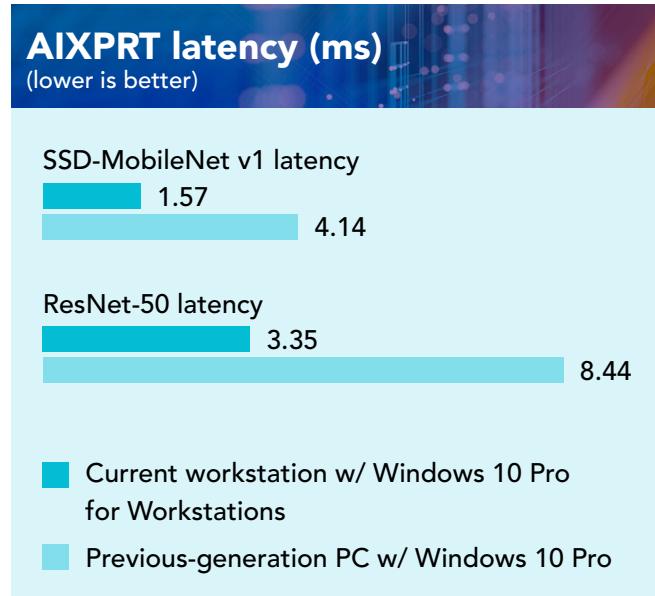
Figure 4: AIXPRT latency (ms).
Source: Principled Technologies.

Testing overall performance

To measure the overall CPU performance of the two systems, we used the SPECworkstation 3 benchmark, which tests a variety of professional applications.[4] As we show below, the current workstation powered by an Intel Xeon W processor and running Windows 10 Pro for Workstations outperformed the previous-generation PC on every CPU metric.

Up to **74 percent** higher
CPU performance score

SPECworkstation 3 CPU scores
(higher is better)

General operations
1.28
1.07

Energy
1.04
0.61

Financial services
2.60
1.70

Life sciences
2.43
1.41

Product development
2.30
1.32

Media and entertainment
2.31
1.61

■ Current workstation w/ Windows 10 Pro for Workstations
■ Previous-generation PC w/ Windows 10 Pro
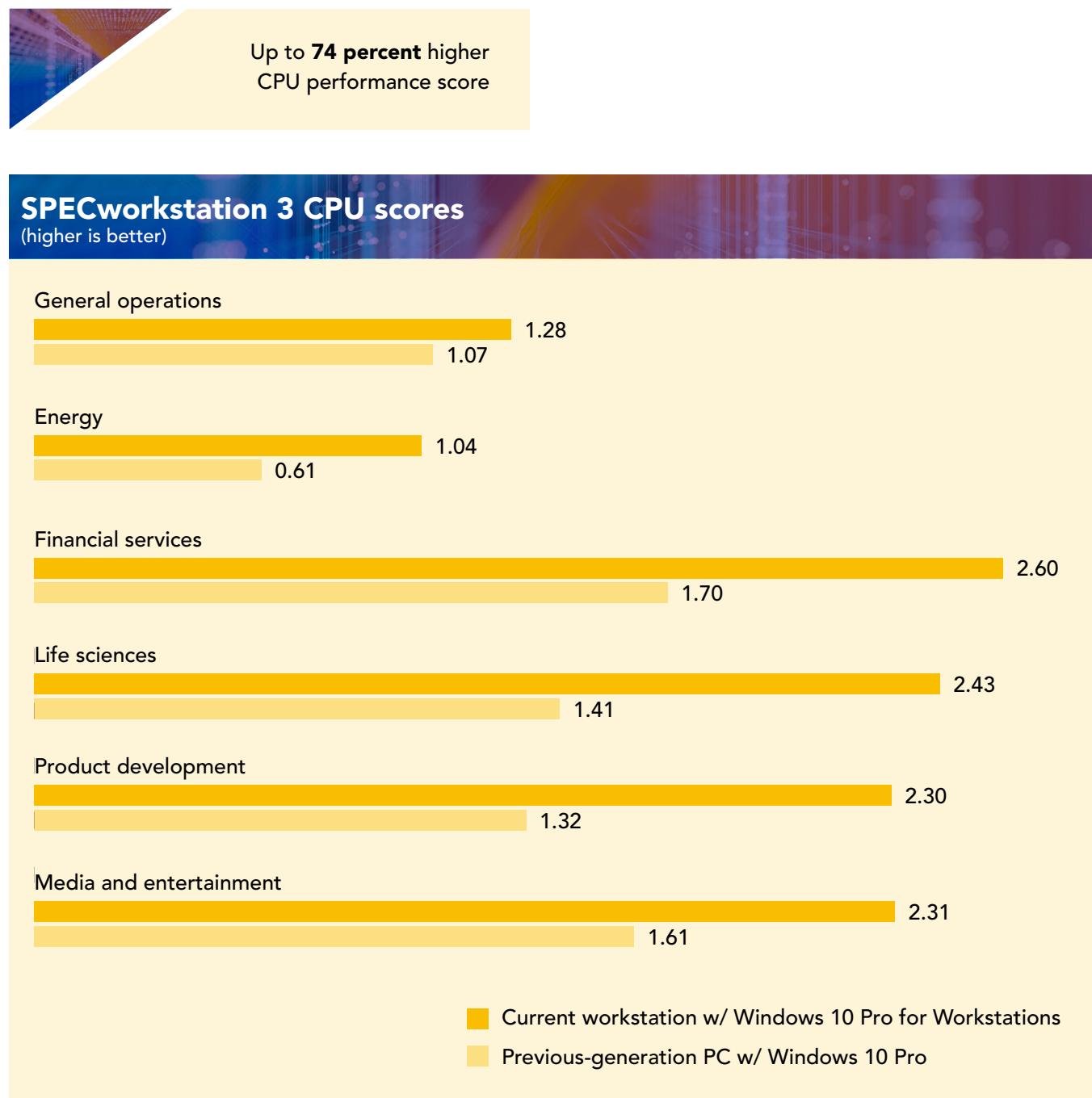
Figure 5: SPECworkstation 3 CPU scores. Source: Principled Technologies.

Conclusion

How much more quickly could you perform your everyday compute-intensive activities if you upgraded your previous-generation PC to a current workstation powered by Intel Xeon W processors and Windows 10 Pro for Workstations? According to our hands-on testing, the answer is "Quite a bit!"

When we executed tasks in Autodesk Revit and Adobe Premiere Pro and conducted AI and general benchmark testing, the current workstation left the previous-generation system in the dust. It reduced the time to perform every task, by as much as 75 percent.

If you've made the shift to remote work, you've already gotten back some time by eliminating your commute. Get back even more by upgrading your previous-generation PC to a current workstation with an Intel Xeon W processor and Windows 10 Pro for Workstations.

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1   "Windows 10 Pro for Workstations," accessed July 16, 2020, https://www.microsoft.com/en-us/windowsforbusiness/workstation.

2   "Intel Xeon X Processors," accessed July 16, 2020, https://www.intel.com/content/www/us/en/products/processors/xeon/w-processors.html.

3   AIXPRT is an AI benchmark tool that runs common image-classification, object-detection, and recommender system work-loads so that users can measure a system's machine learning inference performance. Learn more at https://www.principledtechnologies.com/benchmarkxprt/aixprt/.

4   Learn more about SPECworkstation 3 at https://www.spec.org/gwpg/wpc.static/workstation3-info.html.

Read the science behind this report at http://facts.pt/xzwl7hs ▶

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For additional information, review the science behind this report.

This project was commissioned by Microsoft.