PT

Take a victory lap with image classification tasks

90.5% higher Geekbench AI GPU Quantized score

Burn rubber while creating an image

34.8% less time to generate a Stable Diffusion image from a text prompt

Render 3D projects at speed

44.7% higher 3DMark Time Spy Extreme score

HP ZBook Power 16-inch G11 Mobile Workstation PC: Accelerate growth and performance

vs. an HP ZBook Power 15.6-inch G10 Mobile Workstation PC

The HP ZBook Power 16-inch G11 mobile workstation PC is powered by an Intel® Core™ Ultra processor, which integrates central processing unit (CPU), graphic processing unit (GPU), and neural processing unit (NPU) architecture into a single chip.[1] What benefits does this cutting-edge technology bring to the table?

To find out, we used industry-standard benchmarks to compare AI, 3D rendering, and content creation workload performance on a next-gen HP ZBook Power 16-inch G11 Mobile Workstation PC powered by an Intel® vPro® with Intel Core Ultra 7 processor 165H to that of its 15.6-inch G10 predecessor powered by an Intel Core i7-13800H processor. We found the new Intel Core Ultra processor-powered HP ZBook Power 16-inch G11 Mobile Workstation PC delivers wins in every category, helping separate the champions from the also-rans.

How we tested

To measure the benefits of upgrading to the newest 16-inch HP ZBook Power G11 Mobile Workstation PC, we equipped both Windows 11 Pro systems with 32 GB of memory, 512 GB of storage, and the closest discrete NVIDIA® graphics available at the time of testing:

HP ZBook Power 16-inch G11

Mobile Workstation PC

- Intel vPro with Intel Core Ultra 7 processor 165H
- Integrated Intel Arc™ graphics
- Integrated Intel AI Boost
- Discrete NVIDIA RTX™ 500 Ada graphics
- 83-Whr battery

HP ZBook Power 15.6-inch G10

Mobile Workstation PC

- Intel vPro with Intel Core i7-13800H processor
- Integrated Intel Iris® Xe graphics
- No NPU component
- Discrete NVIDIA RTX A500 graphics
- 83-Whr battery

To evaluate system performance from many angles, we used these industry-standard benchmarks and AI tools:

- 3DMark® Fire Strike Extreme
- 3DMark Time Spy Extreme
- Cinebench 2024
- Geekbench AI
- ResNet-50
- SPECworkstation® 3.1
- Stable Diffusion

The results we report reflect the specific configurations we tested. Any difference in the configurations—as well as screen brightness, network traffic, and software additions—can affect these results. For a deeper dive into our testing parameters and procedures, see the ***science behind the report***.

About the HP ZBook Power 16-inch G11 Mobile Workstation PC

The HP ZBook Power 16-inch G11 Mobile Workstation PC is powered by Intel Core Ultra processors with dedicated AI-accelerated capabilities across the CPU, GPU, and NPU architecture.[2] The HP ZBook Power 16-inch G11 offers Intel CPUs up to an Intel Core Ultra 9 CPU (with integrated Intel Arc graphics and Intel AI Boost) and optional Intel vPro; discrete NVIDIA graphics up to RTX 3000 GPU; 64 GB of memory, and up to 4 TB of storage.[3] Learn more at: **https://www.hp.com/us-en/shop/pdp/hp-zbook-power-g11-mobile-workstation-pc-customizable-9a670av-mb**.

About the Intel Core Ultra 7 processor 165H

The Intel Core Ultra 7 processor 165H employs integrated CPU, GPU, and NPU architecture. The CPU architecture has six performance-cores, eight efficient-cores, and two low power efficient-cores. The GPU architecture (Intel Arc graphics) has eight Xe-cores and ray-tracing capabilities. The NPU architecture (Intel AI Boost) supports OpenVINO™, WindowsML, DirectML, and ONNX RT AI software.[4] Learn more at: **https://www.intel.com/content/www/us/en/products/sku/236851/intel-core-ultra-7-processor-165h-24m-cache-up-to-5-00-ghz/specifications.html**.

Boost productivity

Whether your day is filled with problem solving, 3D modeling and rendering, or using AI or machine learning (ML) applications, system performance is key to your success.

The SPECworkstation 3.1 benchmark measures CPU, graphics, I/O, and memory bandwidth for diverse professional applications.[5] Each SPECworkstation 3.1 workload uses different tools to measure performance of industry-specific workflows. The Product Development workload uses Rodinia, WPCcfd, CalcuilX, CATIA, Creo, NX, Solidworks, and Showcase tools. The Financial Services workload uses a Monte Carlo simulation algorithm as well as Black-Scholes and Binomial options pricing model algorithms.[6]

Put the pedal to the metal for everyday work

Higher is better

■ HP ZBook Power 16 G11   □ HP ZBook Power 15.6 G10

Product Development overall score

29.4% higher

3.47
2.68

Graphics overall score

11.8% higher

3.58
3.20

Financial Services overall score

11.9% higher

3.28
2.93

GPU Compute overall score

28.4% higher

3.25
2.53

Figure 1: SPECworkstation 3.1 overall scores. Higher is better. Source: Principled Technologies.

Speed content creation and graphics-intensive efforts

The level of system performance that business, creative, and technical professionals require depends on their specific workflows.

The 3DMark Fire Strike Extreme benchmark is a DirectX 11 test that stresses both CPU and GPU.[7] The 3DMark Time Spy Extreme benchmark is a DirectX 12 test that stresses graphics cards and multi-core processors.[8] Better real-time graphics performance can translate to faster 3D graphic rendering and smoother viewing experiences.

Add horsepower for graphics-intensive workloads

Higher is better

■ HP ZBook Power 16 G11   ☐ HP ZBook Power 15.6 G10

3DMark Fire Strike Extreme score

37.6% higher	6,651
	4,833

3DMark Time Spy Extreme score

44.7% higher	2,851
	1,970

Figure 2: 3DMark results. Higher is better. Source: Principled Technologies.

The Cinebench 2024 benchmark uses the Redshift rendering engine to evaluate CPU and GPU capabilities while running a Cinema 4D scene.[9]

Pull ahead in content creation projects

Higher is better

Cinebench 2024 CPU multi-core score

2.5% higher	928
	905

■ HP ZBook Power 16 G11   ☐ HP ZBook Power 15.6 G10

Figure 3: Cinebench 2024 CPU multi-core scores. Higher is better. Source: Principled Technologies.

The difference between float32, float16, and int8 precision

The Geekbench AI Single Precision score reports float32 precision, which is essential for those, such as medical professionals and data engineers, who want hyper-accurate image analysis and object classification. The Geekbench AI Quantized score reports int8 precision, which is accurate enough for users such as security professionals to determine whether the thing that tripped a vision-sensor is an animal or a human being. The Geekbench AI Half Precision score reports float16 precision, which is less precise than Single Precision but more precise than Quantized.

Set the pace with AI and ML technologies

AI and ML technologies are changing how business, creative, and technical professionals handle challenges. But this advancement can come at a price. AI and ML workloads are data- and processor-intensive activities. Making sure you have a powerful processor under the hood can help you cross the finish line faster.

The Geekbench AI benchmark measures CPU, GPU, and NPU capabilities for machine learning applications.[10] The Single Precision score reports float32 precision, the Half Precision score reports float16 precision, and the Quantized score reports int8 precision.[11] In our testing, we used the Open Neural Network Exchange (ONNX) AI framework and DirectML AI backend for machine learning on Windows.
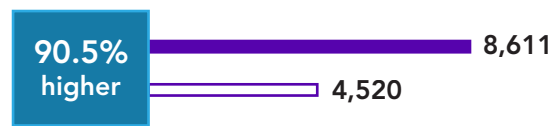
Wait less for valuable insights

Higher is better

■ HP ZBook Power 16 G11   ☐ HP ZBook Power 15.6 G10

Single Precision score

64.8% higher

- 11,175
- 6,779

Quantized score

90.5% higher

- 8,611
- 4,520

Half Precision score

47.7% higher

- 19,718
- 13,343

Figure 4: Geekbench AI ONNX DirectML GPU results. Higher is better. Source: Principled Technologies.

The MLPerf ResNet-50 benchmark measures how many samples per second a system can process using the ResNet model.[12] ResNet models can help users organize and categorize objects, people, and places in images.

Stable Diffusion is a generative AI model that produces photorealistic images from text prompts.[13] For our tests, we measured how long it took for each mobile workstation to generate an image based on identical Stable Diffusion text prompts.

Take a victory lap with image classification tasks

Higher is better

ResNet-50 samples per second

32.1% more

- 4,601.94
- 3,481.82

■ HP ZBook Power 16 G11   ☐ HP ZBook Power 15.6 G10

Figure 5: MLPerf ResNet-50 benchmark results. Higher is better. Source: Principled Technologies.

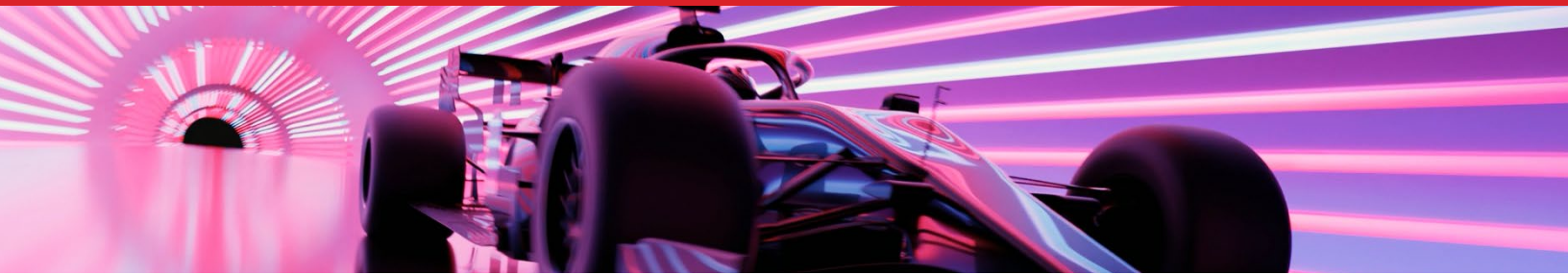## Burn rubber while generating ideas

mm:ss │ Lower is better

Generate a Stable Diffusion image from a text prompt

34.8% less time

- 3:28
- 5:19

■ HP ZBook Power 16 G11   ☐ HP ZBook Power 15.6 G10

Figure 6: Stable Diffusion text-prompt to image-generation results. Time in minutes and seconds. Less time is better. Source: Principled Technologies.

Conclusion

With the right team in your corner and the right tools at your fingertips, you can win the productivity race and cross the finish line faster. In head-to-head AI, 3D rendering, and content creation performance comparisons, an HP ZBook Power 16-inch G11 Mobile Workstation PC powered by an Intel vPro with Intel Core Ultra 7 processor 165H raced circles around its 15.6-inch predecessor. We found upgrading to the newest Intel Core Ultra processor-powered ZBook Power can help you and your team take a victory lap with image classification tasks, burn rubber while creating an image from a text prompt, and speed 3D graphics rendering tasks.

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Read the science behind this report at https://facts.pt/dqdOL5U ▶

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This project was commissioned by HP.