Modernize for...

Higher system performance based on 79.4% higher Procyon AI Computer Vision Benchmark and 37.7% higher SYSmark 30 scores

Significantly longer battery life Up to 12 hrs 7 min in office productivity scenarios; and up to 7 hrs 30 min while video-conferencing

More built-in security features including Dell SafeID and SafeBIOS protection, Intel Threat Detection Technology, and Dell Optimizer intelligent privacy features

Supercharge your productivity by upgrading to a Dell Latitude 7450 AI PC

We examined built-in security features and gains in system performance and battery life you could expect from upgrading to a Dell Latitude 7450 AI PC powered by an Intel Core Ultra processor

AI fever is sweeping the commercial market, as businesses figure out how to best utilize AI technologies that promise to streamline workflows, boost productivity, and personalize experiences. This study examines the improved performance and battery life you could experience with the newest generation of Dell™ Latitude™ laptops redesigned from the processor up. Our hands-on tests show that a Dell Latitude 7450 AI PC powered by an Intel® Core™ Ultra 7 processor 165U could help you better handle the added stressors processor-intensive AI applications introduce into your daily routine. These include advanced security scans that help keep you and your data safe, filters used during virtual meetings, and chatbot technologies that streamline content creation and data analysis.

We compared a 14-inch Dell Latitude 7450 AI PC, powered by Intel vPro® with an Intel Core Ultra 7 processor 165U to a three-year-old version of the same laptop. For both laptops, we compared standard and AI-related system performance, battery life in office productivity and video-conferencing scenarios, user comfort, and built-in security features. We found that the Dell Latitude 7450 AI PC received higher benchmark scores, provided longer battery life in all of our scenarios, delivered a quieter experience under load, and included strong built-in security.

Dell Latitude 7450 AI PC

- Intel vPro with an Intel Core Ultra 7 processor 165U
- 32 GB of DDR-5 memory
- 512 GB of NVMe® storage
- 57-Whr battery
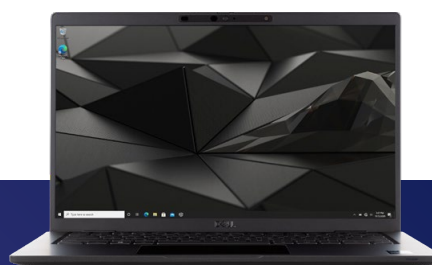
Dell Latitude 7420 laptop

- Intel Core i7-1185G7 (CPU) processor
- 32 GB of DDR-4 memory
- 512 GB of NVMe storage
- 63-Whr battery

How we tested

Earlier this year, Dell Technologies announced Latitude AI PCs with "groundbreaking AI experiences for the modern workplace."[1] The new Latitude AI PCs are powered by Intel Core Ultra processors with Intel vPro—a new, integrated multi-processor platform built on Intel 4 process technology which contains central processing unit (CPU), graphics processing unit (GPU), and neural processing unit (NPU) architectures.[2]

To evaluate the benefits of investing in a new Dell Latitude 7450 AI PC, we compared its performance, battery life, features, and real-world user experiences to those of a three-year-old version of the same laptop:

Dell Latitude 7450 AI PC powered by Intel vPro with an Intel Core Ultra 7 processor 165U with integrated CPU, Intel Graphics (GPU) and Intel AI Boost (NPU), 32 GB of DDR-5 memory, 512 GB of NVMe® storage, and a 57-Whr battery

Dell Latitude 7420 laptop powered by an Intel Core i7-1185G7 (CPU) processor with Intel Iris® Xe Graphics (GPU) and no NPU, 32 GB of DDR-4 memory, 512 GB of NVMe storage, and a 63-Whr battery

To assess standard and AI-related **system performance**, we ran these industry-leading benchmarks:

- CrossMark®
- Procyon® AI Computer Vision Benchmark
- Procyon AI Stable Diffusion Benchmark
- Procyon Office Productivity Benchmark
- PugetBench for DaVinci Resolve
- PugetBench for Premiere Pro
- SYSmark® 30
- WebXPRT 4

To see how long users could complete office productivity tasks, such as writing marketing material or performing calculations, while working unplugged, we ran Procyon and MobileMark **battery life** benchmarks. To see how long the batteries lasted with resource-intensive activities, such as security scans or video-conferencing calls, we conducted Microsoft Teams and Zoom meetings on battery. In all four of these battery life comparisons, the Dell Latitude 7450 AI PC powered by an Intel Core Ultra 7 processor 165U processor outperformed its predecessor. It is worth noting that the Latitude 7450 AI PC we tested contained a 57-Whr battery and the Latitude 7420 laptop contained a battery with more capacity, 63Whr. Dell credits the Latitude 7450 AI PC's greater system efficiency to the Intel Core Ultra processor's hybrid architecture and superior battery management.[3]

We also hand-timed general and AI-related **day-in-the-life workflows**. The general workflows we timed focused on Microsoft 365 and Adobe Creative Cloud tasks, and the AI-related workflow focused on content creation. **For user comfort**, we measured heat and noise output while running a resource-intensive Cinebench 2024 workload.

About the Intel Core Ultra 7 processor 165U

The Intel Core Ultra 7 processor 165U contains integrated CPU, GPU, and NPU architecture designed to intuitively adapt to complex workflows. The CPU architecture has two performance-cores, eight efficient-cores, and two low power efficient-cores. The GPU architecture has two 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/237329/intel-core-ultra-7-processor-165u-12m-cache-up-to-4-90-ghz/specifications.html.

About the Dell Latitude 7450 AI PC

The Dell Latitude 7450 AI PC we tested weighed under 3 pounds, was powered by an Intel Core Ultra 7 165U vPro processor, and contained a 57 Whr battery. Dell Latitude 7000 series laptops running Windows 11 on Intel vPro include many built-in features for on-the-go professionals:

- **Copilot key:** This button activates an AI assistant, which will generate emails and summaries, search for information, and create unique images from text prompts. Microsoft says this evolving AI tool can help users "be more productive, boost creativity, and stay connected to the people and things in your life."[5]

- **HDR technology:** This AI-based feature makes you camera-ready by taking several multi-exposure high dynamic range (HDR) pictures at once and blending them to "accurately capture image detail in challenging lighting conditions, such as windowed offices and conference rooms."[6]

- **Security and privacy:** Dell Optimizer optional Intelligent Privacy features help keep sensitive data private no matter where you're working. Onlooker Detection notices when there are people behind you and texturizes the screen. Look Away Dim notices when you shift your focus away from the screen and, to protect privacy and save battery life, darkens the screen.[7]

The Latitude 7450 AI PC we tested was powered by an Intel Core Ultra 7 165U processor, which directs low-latency AI tasks to the CPU element, media and visual AI rendering tasks to the GPU element, and sustained AI and offload AI tasks to the NPU element of the three-part multi-processing unit.[8]

Built for anywhere work

The best laptops are frictionless. The less time you have to wait for webpages to load, a spreadsheet to open, or videos to render, the fewer micro-frustrations you'll experience the multiple times a day you open those apps or step away from your computer to take a break. Higher benchmark scores, no matter which aspect of performance that benchmark measures, typically translate to smoother performance and faster responsiveness in that particular area.

Modernize for better general system responsiveness

For C-suite executives, travelers, and on-the-go-professionals who want a premium experience, higher general benchmark scores provide a good base-level overview about how a device is going to handle the myriad of tasks you encounter daily.

CrossMark models diverse tasks such as applicant and file launches; multitasking; web browsing; document, photo, and video editing; and scientific simulation, forecasting, modeling within a spreadsheet application.[9] **Procyon Office Productivity Benchmark** uses Microsoft 365 applications to measure system performance in office productivity tasks.[10] **PugetBench for Premiere Pro** is a content-creation benchmark that measures video encoding, processing, and GPU effects performance in frames per second (FPS).[11] **SYSmark 30** uses real applications and simulated user input to measure the response times of business-oriented workflows, media-centric tasks, and multitasking.[12] **WebXPRT 4** is a browser benchmark that mirrors day-to-day online activities, including online homework, photo manipulation, face detection, and image classification tasks.[13]
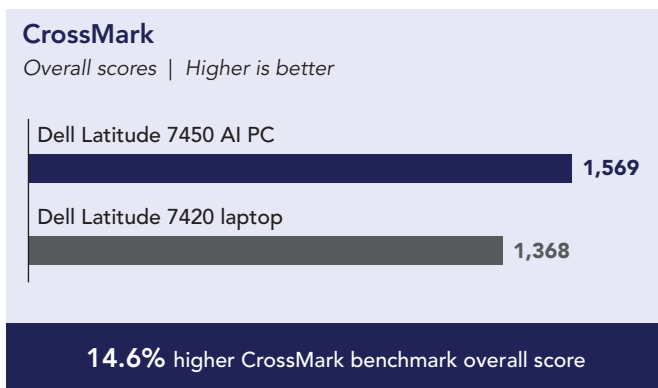
CrossMark
Overall scores | Higher is better

Dell Latitude 7450 AI PC
1,569

Dell Latitude 7420 laptop
1,368

14.6% higher CrossMark benchmark overall score

Figure 1: CrossMark benchmark overall scores. Higher is better. Source: Principled Technologies.

Procyon Office Productivity Benchmark
Total scores | Higher is better

Dell Latitude 7450 AI PC
6,287

Dell Latitude 7420 laptop
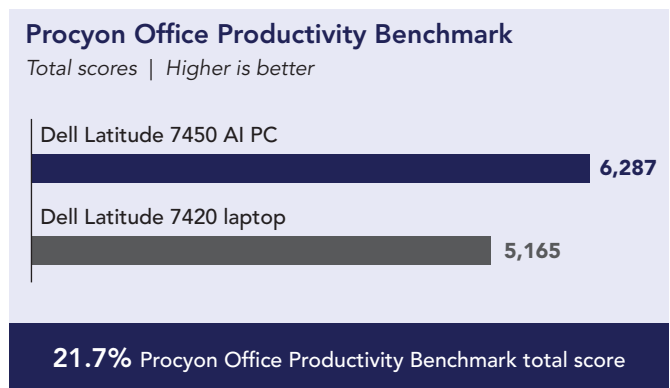**5,165**

21.7% Procyon Office Productivity Benchmark total score

Figure 2: Procyon Office Productivity Benchmark total scores. Higher is better. Source: Principled Technologies.

SYSmark 30
Overall ratings | Higher is better

Dell Latitude 7450 AI PC
1,718

Dell Latitude 7420 laptop
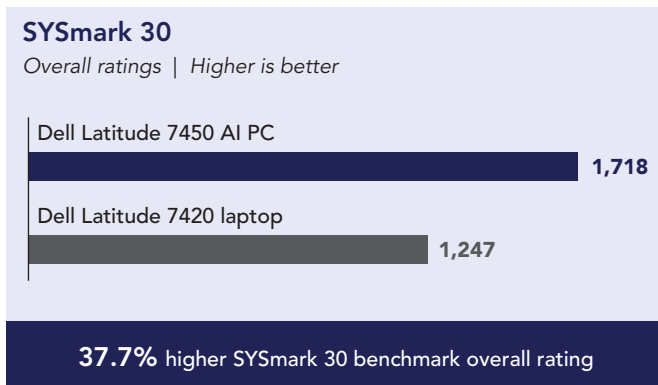**1,247**

37.7% higher SYSmark 30 benchmark overall rating

Figure 3: SYSmark 30 benchmark overall ratings. Higher is better. Source: Principled Technologies.

WebXPRT 4
Overall scores | Higher is better

Dell Latitude 7450 AI PC
315

Dell Latitude 7420 laptop
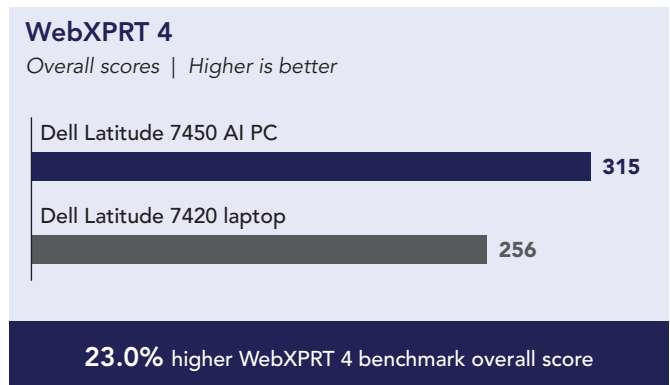**256**

23.0% higher WebXPRT 4 benchmark overall score

Figure 4: WebXPRT 4 benchmark overall scores. Higher is better. Source: Principled Technologies.

PugetBench for Premiere Pro
Overall scores | Higher is better

Dell Latitude 7450 AI PC
2,399

Dell Latitude 7420 laptop
1,530

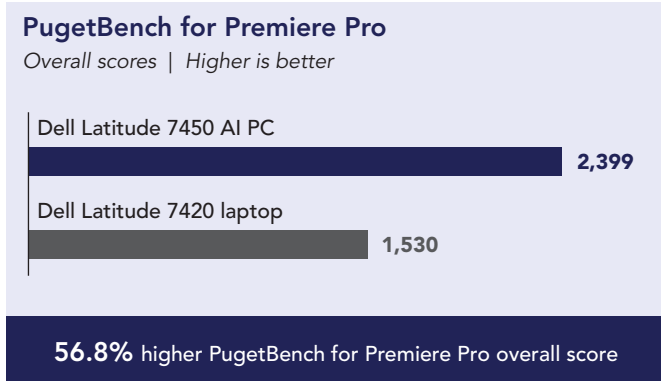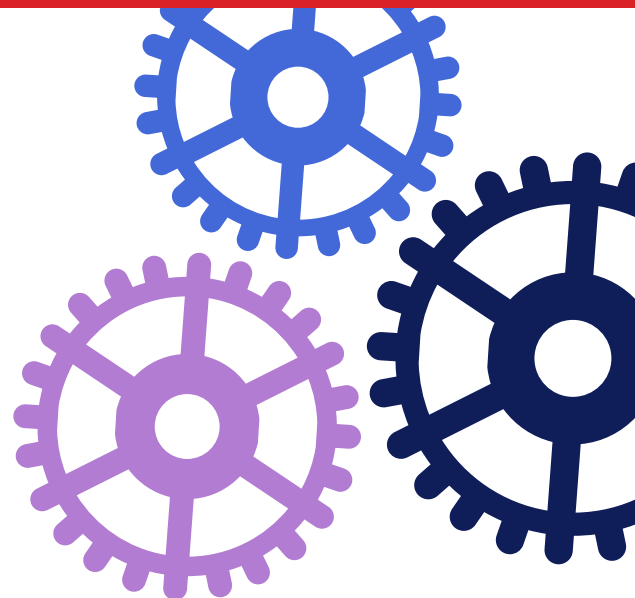**56.8%** higher PugetBench for Premiere Pro overall score

Figure 5: PugetBench for Premiere Pro benchmark overalll score (FPS) results. Higher is better. Source: Principled Technologies.

Modernize for better responsiveness on AI tasks

The Intel Core Ultra 7 processor 165U in the premium Dell Latitude 7450 AI PC we tested splits AI tasks between the CPU, GPU, and NPU components. But will this innovative multi-processor platform help you fuel transformation in the AI era? Our AI-related performance results paint a clear picture: The new Dell Latitude 7450 AI PC with an Intel Core Ultra 7 processor 165U delivered significant bumps in performance in all of our tests.

Procyon AI Computer Vision Benchmark provides insights into how well on-device AI inference engines can tackle computer vision scanning and identification activities such as language translation, facial and object recognition, inventory management, and medical imaging.[14,15] **Procyon AI Stable Diffusion Benchmark** uses a set of standardized text prompts to measure text-to-image performance of on-device AI accelerators.[16] **PugetBench for DaVinci Resolve** uses 4K and 8K video samples to measure GPU, video processing, and AI-based content creation features performance.[17]
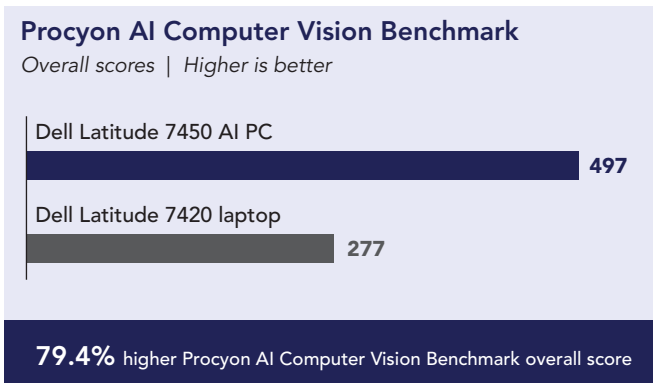
Procyon AI Computer Vision Benchmark
Overall scores | Higher is better

Dell Latitude 7450 AI PC
497

Dell Latitude 7420 laptop
277

79.4% higher Procyon AI Computer Vision Benchmark overall score

Figure 6: Procyon AI Computer Vision Benchmark overall scores. Higher is better. Source: Principled Technologies.

Procyon AI Stable Diffusion Benchmark
Overall scores | Higher is better

Dell Latitude 7450 AI PC
57

Dell Latitude 7420 laptop
37

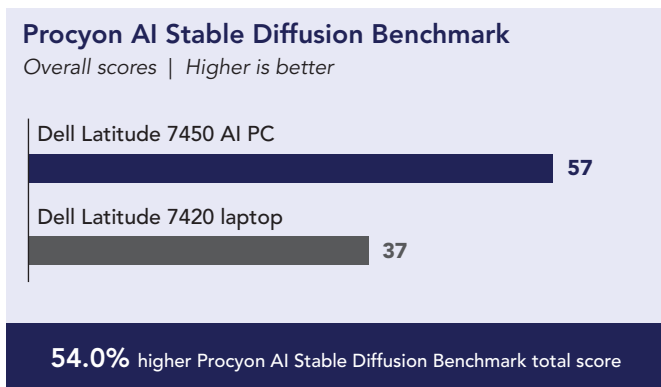**54.0%** higher Procyon AI Stable Diffusion Benchmark total score

Figure 7: Procyon AI Stable Diffusion Benchmark total scores. Higher is better. Source: Principled Technologies.

PugetBench for DaVinci Resolve
Overall scores | Higher is better

Dell Latitude 7450 AI PC
390

Dell Latitude 7420 laptop
285

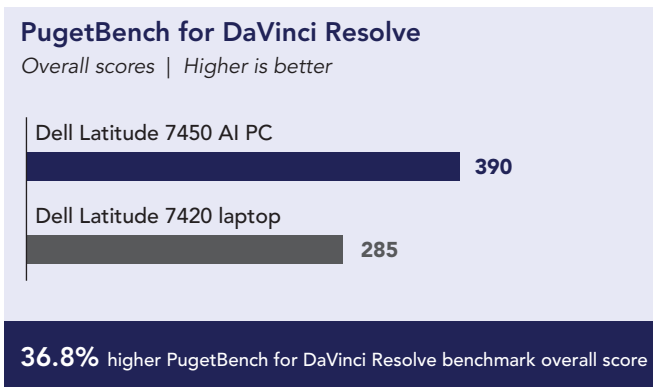**36.8%** higher PugetBench for DaVinci Resolve benchmark overall score

Figure 8: PugetBench for DaVinci Resolve benchmark overall scores. Higher is better. Source: Principled Technologies.

Modernize for significantly longer battery life

We conducted multiple different battery life comparisons: two based on general use and two based on remote collaboration scenarios. We set both laptops to balanced mode—not best power efficiency—for these tests. Notably, the Latitude 7450 AI PC contained a lower capacity battery than its predecessor: 57-Whr versus 63-Whr. We calculated system efficiency by dividing the battery life (H:MM) by the battery capacity (Whr).

To measure general-use battery life, we ran **MobileMark 30** and **Procyon Battery Life Benchmark**, tests, which use real applications to gauge battery life in office productivity and video playback situations.[18,19] For these tests, we set the power plan modes in both PCs to "Best performance."
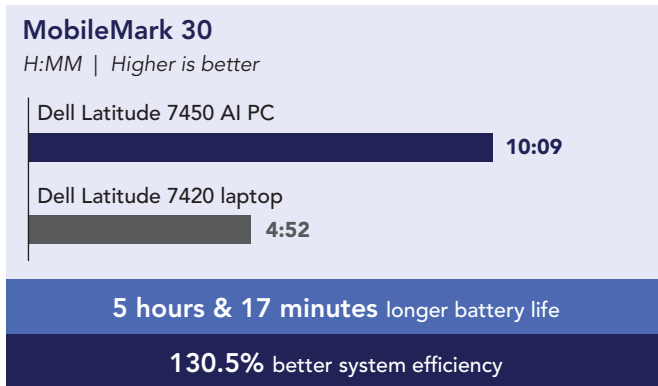
MobileMark 30

H:MM | Higher is better

Dell Latitude 7450 AI PC
10:09

Dell Latitude 7420 laptop
4:52

5 hours & 17 minutes longer battery life

130.5% better system efficiency

Figure 9: Battery life, in hours and minutes, according to the MobileMark 30 benchmark. More time is better. Source: Principled Technologies.

Procyon Battery Life Benchmark

H:MM | Higher is better

Dell Latitude 7450 AI PC
12:07

Dell Latitude 7420 laptop
5:27

6 hours & 40 minutes longer battery life
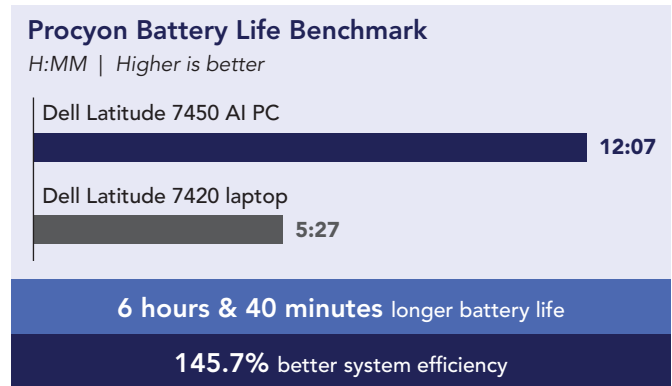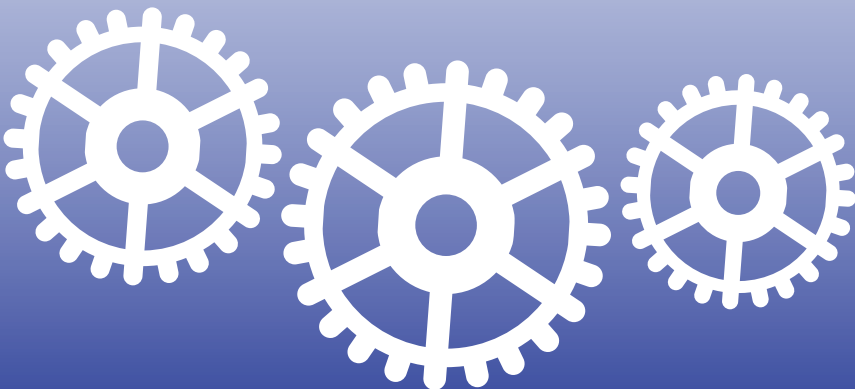
145.7% better system efficiency

Figure 10: Battery life, in hours and minutes, according to the Procyon Battery Life Benchmark. More time is better. Source: Principled Technologies.

To measure video-conferencing battery life, we measured battery consumption while running Microsoft Teams and Zoom applications. For these tests, we set the power plan modes in both PCs to "Balanced performance."
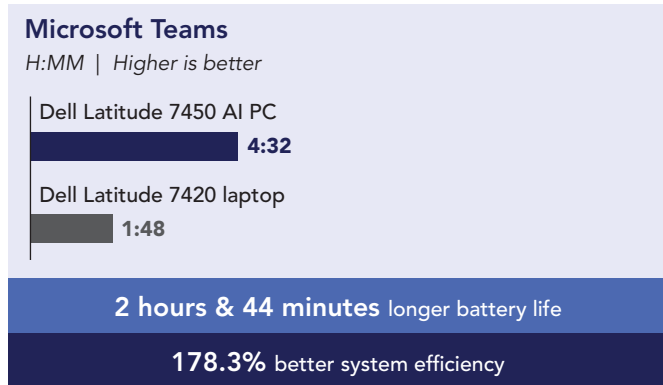
Microsoft Teams
H:MM | Higher is better

Dell Latitude 7450 AI PC
4:32

Dell Latitude 7420 laptop
1:48

2 hours & 44 minutes longer battery life

178.3% better system efficiency

Figure 11: Battery life, in hours and minutes, while running Microsoft Teams. More time is better. Source: Principled Technologies.

Zoom
H:MM | Higher is better

Dell Latitude 7450 AI PC
4:38

Dell Latitude 7420 laptop
1:53

2 hours & 45 minutes longer battery life
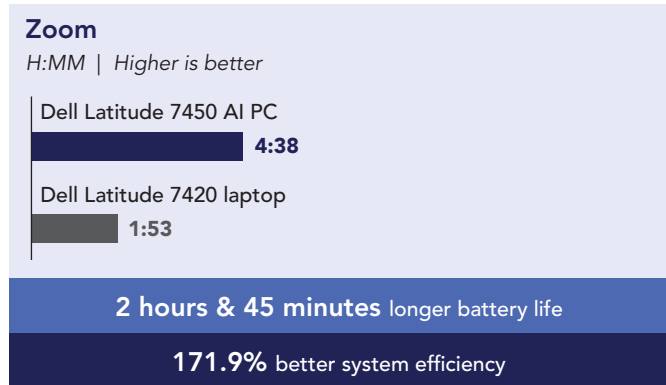
171.9% better system efficiency

Figure 12: Battery life, in hours and minutes, while running Zoom. More time is better. Source: Principled Technologies.

In all four comparisons, we found the Intel Core Ultra 7 processor 165U powered Latitude 7450 AI PC with its 57-Whr battery delivered significantly longer battery life and was more power-efficient than the three-year-old Latitude 7420 with its 63-Whr battery. According to Dell, "combining the benefits of the NPU to offload capabilities like auto-framing, background blur and eye-tracking with the power efficiency of Intel Core Ultra processors" contributes to this longer battery life.[20]

About the CPU, GPU, and NPU

The use cases for generative artificial intelligence (GenAI) are expanding.

According to Intel, Intel Core Ultra processors, with their integrated CPU, GPU, and NPU architectures, are designed to enhance Dell Latitude 7450 AI PC experiences by optimizing "the performance and power efficiency of AI software."[21] The GPU splits up individual computer vision-based tasks across multiple processors—enabling parallel computing and speedy graphics output. If you add a NPU to the mix, you can reduce the AI load on the CPU and GPU.

CPU is optimal for AI tasks that are time sensitive, such as identifying incoming mail as spam or speech-to-text translation.

GPU is best for AI-enhanced content creation and data-filtering tasks, including media, 3D, and rendering use cases.

NPU is great for AI-based tasks such as facial or fingerprint recognition, and blurring backgrounds during video-conferencing meetings.

Modernize for better real-world experiences

We've shown you the performance of moving to a new Dell Latitude 7450 AI PC. Now it's time for personalization. On-the-go professionals should also consider a laptop's ability to handle video-conferencing meeting essentials and to provide a comfortable experience when running heavy workloads. The tasks in the following day-in-the-life workflows are representative of a sequence of typical tasks a user might tackle on their to-do list and not necessarily to flow from one task to another. We hand-timed all tasks as part of each workflow and report the total time elapsed. You can check the breakout times of each individual task in the science behind the report.

General day-in-the-life workflows

Your typical workday probably involves hundreds of tasks, such as launching applications, opening browser tabs, and, for many, manipulating large project files. We hand-timed a series of four common tasks in Microsoft 365 apps to create a productivity workflow and three common tasks in Adobe® Creative Cloud® apps to create a content-creation workflow. The new Dell Latitude 7450 AI PC, enabled by an Intel Core Ultra 7 processor 165U, shaved noticeable time off both workflows. Imagine these wins happening over and over for a day, a week, a month.
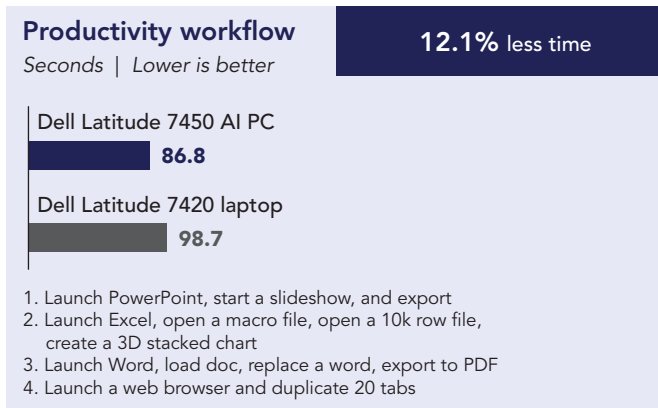
Productivity workflow
Seconds | Lower is better

12.1% less time

Dell Latitude 7450 AI PC
86.8

Dell Latitude 7420 laptop
98.7

1. Launch PowerPoint, start a slideshow, and export
2. Launch Excel, open a macro file, open a 10k row file, create a 3D stacked chart
3. Launch Word, load doc, replace a word, export to PDF
4. Launch a web browser and duplicate 20 tabs

Figure 13: Time to complete a Microsoft 365 workflow. Time in seconds. Less time is better. Source: Principled Technologies.

Content creation workflow
Seconds | Lower is better

31.3% less time

Dell Latitude 7450 AI PC
290.5

Dell Latitude 7420 laptop
396.7

1. Launch Lightroom Classic, Panorama
2. Launch Photoshop, process neff images, preview HDR, create HDR image, create panorama
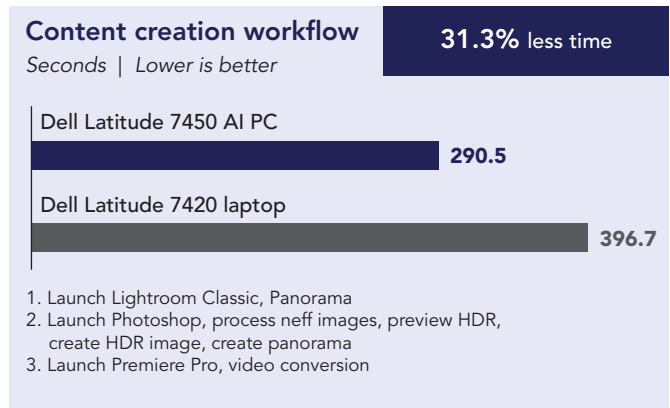3. Launch Premiere Pro, video conversion

Figure 14: Time to complete an Adobe Creative Cloud workflow. Time in seconds. Less time is better. Source: Principled Technologies.

AI-related day-in-the-life workflow

The use of AI tools can help you expand your horizons—whether you're a newbie or a seasoned professional. Investing in a powerful laptop will help make sure your new and emerging AI-enhanced content creation workloads don't stop you in your tracks. We tested three AI-powered content creation tools to see how both laptops handled an AI-enabled workflow faster.

Audacity software enables users to record and edit audio.[22] We used the Audacity Generator to generate audio into a new track. Generative Expand in Photoshop uses AI to extend images, create a bigger background, and increase aspect ratio.[23] GNU Image Manipulation Program (GIMP) enables users to create original artwork.[24]

Content creation workflow
Seconds | Lower is better

43.0% less time

Dell Latitude 7450 AI PC
162.2

Dell Latitude 7420 laptop
232.1

1. Audacity track generation
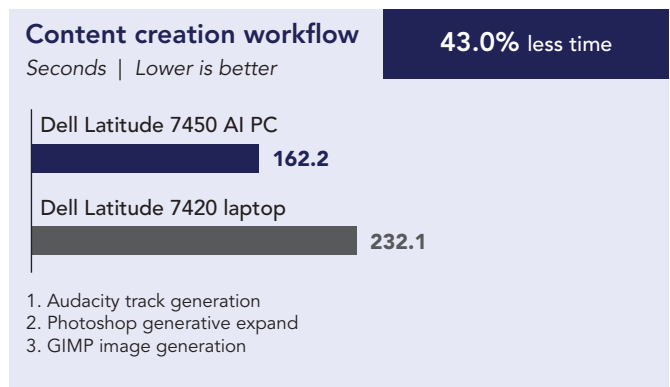2. Photoshop generative expand
3. GIMP image generation

Figure 15: Time to complete an AI-related content creation workflow. Time in seconds. Less time is better. Source: Principled Technologies.

User comfort

Resource-intensive applications and processes, such as security scans, scientific simulations, and video-conferencing calls where you're sharing your screen or applying filters, can make an under-powered laptop run hot to the touch or roar with fan noise while they're running. The Cinebench 2024 benchmark is a CPU- and GPU-intensive media-rendering benchmark that we used as a stand-in for these more common tasks. While we ran this test with user comfort in mind, it is worth noting that the Dell Latitude 7450 AI PC received a Cinebench 2024 performance score that was over 2 times that of its predecessor. For our tests, the ambient temperatures in the room were between 70.3 and 71.3 degrees Fahrenheit and ambient room noise was 23.8 decibels (dBA).

Thermal & acoustic testing during a Cinebench 2024 sustained performance workload

Performance score
Higher is better

Dell Latitude 7450 AI PC
548

Dell Latitude 7420 laptop
222

147% higher score

External temperatures
Lower is better

Dell Latitude 7450 AI PC
Bottom — **104.6°F**
Keyboard deck — **103.3°F**

Dell Latitude 7420 laptop
Bottom — **105.1°F**
Keyboard deck — **100.0°F**

Average dBA
Lower is better

Dell Latitude 7450 AI PC
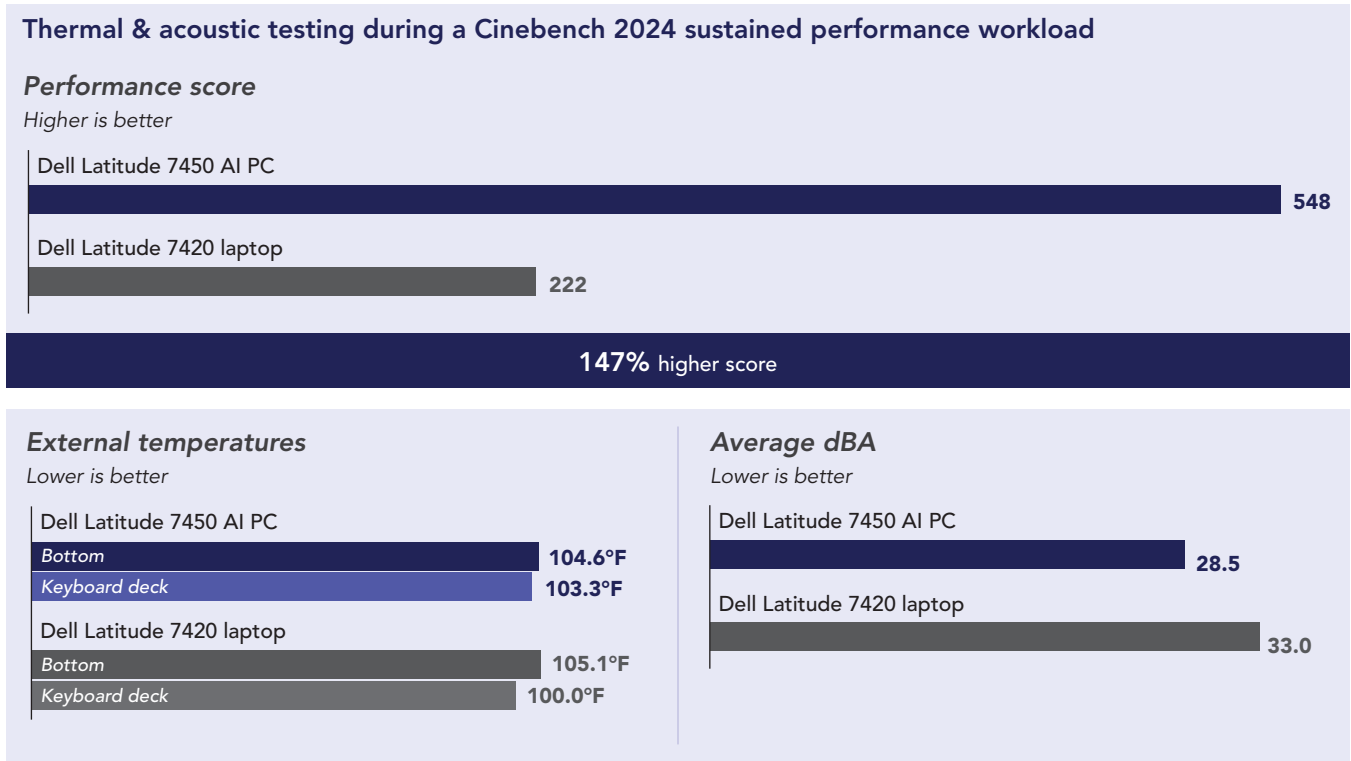**28.5**

Dell Latitude 7420 laptop
33.0

Figure 16: Median performance, thermal and acoustic testing results while the systems were running the Cinebench 2024 benchmark for three 50-min runs. Higher performance scores are better. Lower temperatures and decibels are better. Source Principled Technologies.

We found that the Dell Latitude 7450 AI PC powered by an Intel Core Ultra 7 processor 165U delivered a much higher performance score as well as a quieter experience under load than its predecessor. And, while the keyboard deck was slightly warmer during testing, the bottom of the Latitude 7450 AI PC powered by an Intel Core Ultra 7 processor 165U was cooler to the touch than the Latitude 7240 we tested.

If you're working in hoteling or hot-desking environments where there may be multiple laptops running heavy workloads in a small space, you need not worry about excessive sound from the Dell Latitude 7450 AI PC. When multiple sound sources have the same 28.5 decibel magnitude, sound intensity yields only a 3 dBA increase, which means a workspace with two identical Dell Latitude 7450 AI PCs would register just 31.50 dBA.[25] That's pretty quiet—for reference, normal breathing is 10dBA, a soft whisper is 30dBA, and a quiet library is 40dBA.[26]

Dell, Intel, and Microsoft advancements

The new Latitude AI PCs are, according to Dell, designed to "use less power and improve battery life compared to traditional PCs."[27] But that's not all that's improved since the Latitude 7420 laptop we tested launched in 2021.

ISV Certification According to Dell, the new Latitude AI PCs powered by Intel Core Ultra processors support more than 100 Optimized AI Apps and more than 300 AI-optimized experiences.[28]

Collaboration By offloading video-conferencing AI workloads, such as auto-framing, background blur, and eye-tracking, to the NPU, there's a potential for longer battery life and greater system efficiency. The Dell Latitude 7450 AI PC FHD HDR camera options feature Temporal Noise Reduction (TNR) 3 technology designed to enhance video meeting image quality with greater resolution and clarity. Plus, the Dell Optimizer Intelligent Audio feature automatically removes background noise and Dynamic Volume automatically adjusts PC speaker volume during calls.

Built-in security Dell SafeID is a hardware-based security solution that protects user credentials against sophisticated threats.[29] The Latitude AI PCs also include a new built-in BIOS vulnerability detection feature that scans publicly reported security flaws and recommends remediation steps to your IT team.[30] Built-in privacy shutters and the optional ExpressSign-In feature help keep sensitive data safe.[31]

- **Dell Client Command Suite:** IT teams can, according to Dell, securely configure BIOS settings, manage BIOS configurations, and report BIOS configuration status natively in Microsoft Intune; manage and automate BIOS, firmware, drivers, and applications with Dell Trusted Update Experience; and find the correct drivers using Dell Command Deploy.[32]

According to Intel, another area of advancement is the "holistic approach to performance that powers AI workloads and new experiences" companies can unlock by choosing Latitude 7450 AI PCs powered by an Intel Core Ultra processor with Intel vPro.[33] Benefits include:

- **Intel Threat Detection Technology:** Intel vPro helps your IT team detect ransomware and cryptojacking threats as well as software supply chain attacks at the hardware level.[34]

- **Simplified fleet manageability:** Intel vPro enables your IT team to remotely discover, diagnose, repair, and retire PCs.[35]

Near-future capabilities In addition to Microsoft Copilot, which is now available in preview, Windows 11 Pro provides AI-enhanced efficiency, performance, and security. Here are a few examples:

- Intelligent suggestions and recommendation based on current activities

- A snipping and editing tool that allows users to copy or revise text, video, and audio

- AI-enhanced security through App Control for Business[36]

Conclusion

Our hands-on tests show that upgrading to a Dell Latitude 7450 AI PC powered by an Intel Core Ultra 7 processor 165U could help you better handle the added stressors processor-intensive AI-based activities introduce into your daily routine. We found that the Intel Core Ultra 7 processor 165U-powered Dell Latitude 7450 AI PC offered stronger system performance and provided much longer battery life in all of our scenarios than an older Dell Latitude 7420 laptop, which means that moving to the Dell Latitude 7450 AI PC can better help you meet the new challenges that AI introduces.

1. Dell Blog, "Dell Technologies Announces New Latitude AI PCs," accessed August 12, 2024, https://www.dell.com/en-us/blog/dell-technologies-announces-new-latitude-ai-pcs/.

2. Dell Blog, "Dell Technologies Announces New Latitude AI PCs."

3. Dell Blog, "Dell Technologies announces New Latitude AI PCs."

4. Intel, "Intel® Core™ Ultra 7 Processor 165U," accessed August 12, 2024, https://www.intel.com/content/www/us/en/products/sku/237329/intel-core-ultra-7-processor-165u-12m-cache-up-to-4-90-ghz/specifications.html.

5. Microsoft, "Microsoft Copilot," accessed Augist 12, 2024, https://www.microsoft.com/en-us/microsoft-copilot.

6. Dell Technologies, "Latitude 7450 Laptop or 2-in-1," accessed August 12, 2024, https://www.dell.com/en-us/shop/dell-laptops/latitude-7450-laptop-or-2-in-1/spd/latitude-14-7450-2-in-1-laptop.

7. Dell Technologies, "Latitude 7450 Laptop or 2-in-1."

8. Dell Technologies, "Latitude 7450 Laptop or 2-in-1."

9. BAPCo, "CrossMark Whitepaper," accessed August 12, 2024, https://bapco.com/wp-content/uploads/2024/03/crossmark_white_paper_v1.2.pdf.

10. UL Solutions, "Procyon® Office Productivity Benchmark," accessed August 12, 2024, https://benchmarks.ul.com/procyon/office-productivity-benchmark.

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