The science behind the report:

Dell Pro Max: Proven performance across demanding design, engineering, creative, and power user apps

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Dell Pro Max: Proven performance across demanding design, engineering, creative, and power user apps.

We concluded our hands-on testing on Nov 18, 2025. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on Nov 14, 2025 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to http://facts.pt/calculating-and-highlighting-wins. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Results, in minutes and seconds, of our design workflow testing.

	Dell Pro Max with NVIDIA RTX PRO 2000 Blackwell Generation GPU	Dell Precision 3591 with NVIDIA RTX 2000 Ada Generation GPU
SOLIDWORKS®		
Visualize/render assembly	4:09	5:12
Calculate mass/high accuracy	0:19	0:26
Calculate interference	0:10	0:13
Import IGES/engine	1:07	1:34
AutoCAD®		
Render kitchen scene	21:00	28:21
Orthographic section plane	0:37	0:49
Place assembly	0:26	0:39
Import IGES/cylinder head assembly	0:37	0:50

	Dell Pro Max with NVIDIA RTX PRO 2000 Blackwell Generation GPU	Dell Precision 3591 with NVIDIA RTX 2000 Ada Generation GPU
Oracle Crystal Ball		
Workforce with queuing	11:38	16:08
Multi-zone reserves	0:20	0:40
Inventory system	0:29	0:41
Sales projection	0:17	0:24
Portfolio allocation revisited	0:14	0:22

Table 2: Results of our engineer workflow testing. Times are in minutes and seconds.

	Dell Pro Max 16 Plus with NVIDIA RTX PRO 5000 Blackwell Generation GPU	Dell Precision 7680 with NVIDIA RTX 5000 Ada Generation GPU
CATIA		
Rendering an engine model (GPU)		
Total samples	109,601	94,922
Samples/second	30.44	26.37
Importing a file	10:51	32:17
SOLIDWORKS		
Visualize/render assembly	1:11	1:29
Calculate mass/high accuracy	2:11	2:18
Calculate interference	4:02	4:30
Import IGES/engine	2:05	2:15
Ansys® Fluent		
CPU Solver — 16x CPU processes (double precision)	0:59	1:34
GPU Solver — 1x CPU processes (double precision)	0:21	0:32
GPU Solver — 1x CPU processes (single precision)	0:10	0:13

Table 3: Results of our creative workflow testing.

	Dell Pro Max 16 Premium with NVIDIA RTX PRO 3000 Blackwell Generation GPU	Dell Precision 5690 with NVIDIA RTX 3500 Ada Generation GPU
Adobe® Premiere® Pro (m:ss)		
Generate proxies	0:53	1:46
Encode 1080p video	2:52	4:17
Encode 4K video	4:08	6:18
Maxon ZBrush (sec)		
Run ZRemesher (2x)	16.6	17.2
Run Decimation Master (pre-process current)	11.0	12.6
Generate best preview render	3.7	3.9
Open hi poly model project	3.7	3.9
DaVinci Resolve Studio (sec)		
Encode 4K video	72.7	63.8
Encode 1080p video	62.4	48.1
Generate optimized media	40.4	33.4

Table 4: Results of our power user workflow testing. Times are in hours, minutes, and seconds.

	Dell Pro Max 14	Dell Pro 14 Plus
SQL query execution		
Intel processor-based configurations		
Complete a data analysis query (geometric mean)	0.48	0.36
Complete data analysis queries (total)	19	14
AMD processor-based configurations		
Complete a data analysis query (geometric mean)	0.38	0.33
Complete data analysis queries (total)	13	12
C++ compilations		
Intel® processor-based configurations		
Building Mozilla Firefox from source	0:23:04	0:59:20
Building Unreal Engine 5 from source	1:26:19	3:46:25
AMD processor-based configurations		
Building Mozilla Firefox from source	0:23:40	0:31:30
Building Unreal Engine 5 from source	1:19:47	2:41:02

System configuration information

Table 5: Detailed information on the systems we tested.

System configuration information	Dell Precision 7680	Dell Pro Max 16 Plus MB16250	Dell Precision 3591	Dell Pro Max 16 MC16250
Processor				
Vendor	Intel	Intel	Intel	Intel
Model number	13th Gen Intel Core™ i9-13950HX	Intel Core Ultra 9 285HX	Intel Core Ultra 9 185H	Intel Core Ultra 9 285H
Core frequency (GHz)	2.2-5.5	2.8-5.5	2.3-5.1	2.9-5.4
Total number of cores	24	24	16	16
Number of Performance-cores	8	8	6	6
Number of Efficient-cores	16	16	8	8
Number of Low Power Efficient-cores	0	0	2	2
Number of threads	32	24	22	16
Cache (MB)	36	36	24	24
Memory				
Amount (GB)	128	128	64	64
Type	Non-ECC CAMM	CAMM Dual channel	DDR5, Single channel	DDR5 CSoDIMM Dual Channel
Speed	3,600 MT/s	6,400 MT/s	5,600 MT/s	6,400 MT/s
Graphics				
Vendor	NVIDIA®	NVIDIA	NVIDIA	NVIDIA
Model number	RTX 5000 Ada Generation Laptop GPU	RTX PRO 5000 Blackwell Generation Laptop GPU	RTX 2000 Ada Generation Laptop GPU	RTX PRO 2000 Blackwell Generation Laptop GPU
Driver	32.0.15.8092	32.0.15.7349	32.0.15.7344	32.0.15.7314
Storage				
Amount (TB)	1	8	1	1
Type	Samsung® PM9F1 M.2 2280 Gen 4 PCIe NVMe® x4	(2x) SanDisk PC_ SN08000S SED	KIOXI ABG6	Hynix® PC811 SED SK M.2 2280 Gen4 PCIe NVMe
Connectivity/expansion				
Wireless internet	Intel® Wi-Fi® 6E AX211 160MHz	Intel Wi-Fi 7 BE200 320MHz	Intel Wi-Fi 6E AX211 160MHz	Intel Wi-Fi 6E AX211 160MHz
Bluetooth	5.3	5.4	5.3	5.3
USB	2x Thunderbolt™ 4 / USB 4.0 (40Gbps) 1 x USB 3.2 Gen 2 2x USB 3.2 Gen 1	2x Thunderbolt™ 5 (80Gbps) 1x Thunderbolt 4 (40Gbps) 2x USB 3.2 Gen 1	2x Thunderbolt™ 4 / USB 4.0 (40Gbps) 2x USB 3.2 Gen 1	2x Thunderbolt™ 4 (40 Gbps) 2x USB 3.2 Gen 1
Video	1 x HDMI™ 2.0a	1x HDMI 2.1	1x HDMI 2.1	1x HDMI 2.1

System configuration information	Dell Precision 7680	Dell Pro Max 16 Plus MB16250	Dell Precision 3591	Dell Pro Max 16 MC16250
Battery				
Type	Lithium-ion	Lithium-ion	N/A	Lithium-ion Polymer
Rated capacity (Wh)	93	96	97	96
Cells	6	6	6	6
Display				
Size (inches)	16	16	15.6	16
Type	UHD+ (2,880 x 1,800) 60 Hz, 100% DCIP3, 400 nits, wide-viewing angle, OLED	UHD+ (3,840 x 2,400) 120Hz, OLED, 100% DCI-P3, 500 nits, Low Blue Light, VESA HDR TrueBlack 1000	FHD (1,920 x 1,080) 60Hz, IPS, Anti-Glare, 250 nit, 45% NTSC	FHD+ (1,920 x 1,2000) 60Hz, WVA, Anti-Glare, 300 nit, 45% NTSC
Resolution	3,840 x 2,400	3,840 x 2,400	1,920 x 1,080	1,920 x 1,080
Touchscreen	Yes	Yes	No	No
Operating system				
Vendor	Microsoft	Microsoft	Microsoft	Microsoft
Name	Windows 11 Pro	Windows 11 Pro	Windows 11 Pro	Windows 11 Pro
Build number or version	24H2 Build 26100.6584	24H2 build 26100.6584	24H2 build 26100.6584	24H2 build 26100.6584
BIOS				
BIOS name and version	Dell v1.23.6	Dell 1.3.3	Dell 1.17.1	Dell 1.7.0
Dimensions				
Height (inches)	0.98	1.22	0.97	1.01
Width (inches)	14.02	14.17	14.09	14.09
Depth (inches)	10.18	10.18	9.19	10.08
Weight (pounds)	5.75	5.63	3.96	4.65

Table 6: Detailed information on the systems we tested.

System configuration information	Dell Pro Max 16 Premium	Dell Precision 5690
Processor		
Vendor	Intel®	Intel
Model number	Core™ Ultra 9 285H	Core Ultra 9 185H
Core frequency (GHz)	2.7-5.4	2.3-5.1 GHz
Total number of cores	16	16
Number of Performance-cores	6	6
Number of Efficient-cores	8	8
Number of Low Power Efficient-cores	2	2
Number of threads	16	22
Cache (MB)	24	24
Memory		
Amount (GB)	64	32
Type	LPDDR5x	LPDDR5x
Speed	8,400 MT/s	7,467 MT/s
Integrated graphics		
Vendor	Intel	Intel
Model number	Arc Pro 140T	Arc
Discrete graphics		
Vendor	NVIDIA®	NVIDIA
Model number	RTX PRO 3000 Blackwell	RTX 3500 Ada
VRAM	12GB GDDR7	12GB GDDR6
Storage		
Amount	2x 4TB	1TB
Type	NVMe SSD	NVMe SSD
Connectivity/expansion		
Wired internet	N/A	N/A
Wireless internet	Intel Wi-Fi 7 BE201, 801.11be	Intel Wi-Fi 7 BE200, 802.11be
Bluetooth	5.4	5.4
USB	N/A	1 USB 3.2 Gen 2 Type-C
Thunderbolt	2x Thunderbolt 5 (USB Type-C) 1x Thunderbolt 4 (USB Type-C)	2x Thunderbolt 4
Video	1x HDMI	1x HDMI

System configuration information	Dell Pro Max 16 Premium	Dell Precision 5690
Battery		
Type	Lithium-ion	Lithium-ion
Size	Integrated	Integrated
Rated capacity (Wh)	96	99.5
Display		
Size (inches)	16.0	16.0
Type	OLED	OLED
Resolution	3,840 x 2,400	3,840 x 2,400
Touchscreen	Yes	Yes
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 11 Pro	Windows 11 Pro
Build number or version	24H2 (10.0.26100 Build 26100)	24H2 (10.0.26100 Build 26100)
BIOS		
BIOS name and version	Dell Inc. 1.3.2, 8/26/2025	Dell Inc. 1.15.1, 7/24/2025
Dimensions		
Height (inches)	0.83	0.87
Width (inches)	13.93	13.92
Depth (inches)	9.46	9.46
Weight (pounds)	4.82	4.43

Table 7: Detailed information on the systems we tested.

System configuration information	Dell Pro Max 14 MC14250	Dell Pro 14 Plus PB14250
Processor		
Vendor	Intel®	Intel
Model number	Core™ Ultra 7 265H	Core Ultra 7 268V
Core frequency (GHz)	1.7-5.3	2.2-5
Total number of cores	16	8
Number of Performance-cores	6	4
Number of Efficient-cores	8	N/A
Number of Low Power Efficient-cores	2	4
Number of threads	16	8
Cache (MB)	24	12
Memory		
Amount (GB)	32	32
Type	DDR5	DDR5
Speed	7,467 MT/s	8,533 MT/s
Integrated graphics		
Vendor	Intel	Intel
Model number	Arc Pro 140T	Arc 140V
Storage		
Amount (TB)	1	1
Type	NVMe SSD	NVMe SSD
Connectivity/expansion		
Wired internet	1x RJ45 (1 Gbps) Ethernet	N/A
Wireless internet	802.11ax Intel Wi-Fi 6E AX211	802.11be Intel Wi-Fi 7 BE201
Bluetooth	5.4	5.4
USB	2x USB 3.2 Gen 1 Type-A	2x USB 3.2 Gen 1 Type-A
Thunderbolt	2x Thunderbolt 4 (USB Type-C)	2x Thunderbolt 4 (USB Type-C)
Video	1x HDMI 2.1	1x HDMI 2.1
Battery		
Type	Lithium-ion	Lithium-ion
Size	Integrated	Integrated
Rated capacity (Wh)	72	55

System configuration information	Dell Pro Max 14 MC14250	Dell Pro 14 Plus PB14250
Display		
Size (inches)	14	14
Type	LCD	LCD
Resolution	1,920 x 1,200	1,920 x 1,200
Touchscreen	No	No
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 11 Pro	Windows 11 Pro
Build number or version	24H2 (10.0.26100 Build 26100)	24H2 (10.0.26100 Build 26100)
BIOS		
BIOS name and version	Dell, Inc. 1.7.0, 8/14/2025	Dell Inc. 2.6.1, 8/26/2025
Dimensions		
Height (inches)	0.97	0.79
Width (inches)	12.32	12.3
Depth (inches)	8.95	8.80
Weight (pounds)	3.95	3.09

Table 8: Detailed information on the systems we tested.

System configuration information	Dell Pro Max 14 MC14250	Dell Pro 14 Plus PB14250
Processor		
Vendor	AMD	AMD
Model number	Ryzen™ AI 9 HX PRO 370	Ryzen AI 9 HX PRO 370
Core frequency (GHz)	2-5.1	2-5.1
Total number of cores	12	12
Number of Performance-cores	4	4
Number of Efficient-cores	8	8
Number of threads	24	24
Cache (MB)	24	24
Cache (MB)	24	12
Memory		
Amount (GB)	64	32
Type	LPDDR5	LPDDR5
Speed	8,000 MT/s	7,500 MT/s

System configuration information	Dell Pro Max 14 MC14250	Dell Pro 14 Plus PB14250
Integrated graphics		
Vendor	AMD	AMD
Model number	Radeon™ 890M	Radeon 890M
Storage		
Amount (TB)	2	1
Type	NVMe SSD	PCIe Gen4 NVMe SSD
Connectivity/expansion		
Wired internet	1x RJ45 (1 Gbps) Ethernet	1x RJ45 (1 Gbps) Ethernet
Wireless internet	802.11be MediaTek Wi-Fi 7 MT7925	802.11be MediaTek Wi-Fi 7 MT7925
Bluetooth	5.4	5.4
USB	2x USB 3.2 Gen 1 Type-A	2x USB 3.2 Gen 1 Type-A
Thunderbolt	2x Thunderbolt 4 (USB Type-C)	2x Thunderbolt 4 (USB Type-C)
Video	1x HDMI 2.1	1x HDMI 2.1
Battery		
Type	Lithium-ion	Lithium-ion
Size	Integrated	Integrated
Rated capacity (Wh)	72	55
Display		
Size (inches)	14	14
Type	LCD	IPS
Resolution	2,560 x 1,600	2,560 x 1,600
Touchscreen	No	No
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 11 Pro	Windows 11 Pro
Build number or version	24H2 (10.0.26100 Build 26100)	24H2 (10.0.26100 Build 26100)
BIOS		
BIOS name and version	Dell 1.4.2	Dell 1.7.2
Dimensions		
Height (inches)	0.97	0.83
Width (inches)	12.32	12.3
Depth (inches)	8.95	8.80
Weight (pounds)	3.95	3.44

How we tested

Testing AutoCAD 2026

We downloaded and installed AutoCAD 2026 via the Autodesk website with default settings unless otherwise noted. For the architectural render test, we downloaded an example scene from the Autodesk website. For the mechanical assembly tests, we downloaded a complex engine assembly in Initial Graphics Exchange Specification (IGES) format from GrabCAD.

Rendering an architectural scene

1. In a browser, navigate to https://www.autodesk.com/support/technical/article/caas/tsarticles/ts/6XGQklp3ZcBFqIjLPjrnQ9.html, and download the drawing Visualization - Condominium with skylight.
2. Launch AutoCAD 2026.
3. Click Open…
4. Browse to the downloaded file, select it, and click Open.
5. In the top-left of the viewport, click Custom View → Custom Model Views → Render View_330pm.
6. Right-click in a blank spot in the application menu bar, and click Show Tabs → Visualize.
7. Select the Visualize tab.
8. In the Render panel, click the drop-down menu under Render to Size, and select 5,100 x 3,300px.
9. Change the render preset from Medium to High.
10. Click the Render to Size button.
    a. If a window appears prompting to install Medium Resolution textures, select yes.
    b. Close the explanation page opened in a browser.
    c. Let the render finish, and wait for notification that the automatic texture download has completed.
    d. Close AutoCAD, let the installer complete the texture configuration, then restart the procedure at step 2.
11. After the new Render window opens, expand the bottom pane of the Render window.
12. When the render is complete, record the Render Time value.
13. Close AutoCAD.
14. Wait 10 minutes before re-running.
15. Repeat steps 2 through 14 twice more and record the median result.

Importing an IGES assembly

1. In a browser, navigate to https://grabcad.com, and download a complex assembly in IGES format.
2. Extract the IGES file from the zip archive.
3. Launch AutoCAD 2026.
4. Click New.
5. Click the AutoCAD menu button in the top left.
6. Click Import → Other Formats.
7. From the Files of type: drop-down menu, select IGES.
8. Browse to the extracted file, and select it.
9. Click Open, while simultaneously starting the timer.
10. When the Import File Processing Complete notification appears in the bottom-right of the window, stop the timer, and record the value.

Placing an imported assembly

1. Hover over the viewcube, and, when the Home icon appears, click it to set the viewport angle.
2. In the top left corner, change the view type from 2D Wireframe to Realistic.
3. Simultaneously start the timer and click the link in the Import File Processing Complete notification.
4. When the viewport refreshes and displays the model, stop the timer and record the value.

Creating an orthographic section plane

1. Click Home to go to the updated camera location.
2. In the command pane, type `SECTIONPLANE` ↵ Simultaneously start the timer and press Enter.
3. Stop the timer and record the value when the viewport refreshes with the sectioned model view.
4. Close AutoCAD, and return to Importing an IGES assembly, Step 3.

Testing Ansys Fluent 2025 R2

We downloaded and installed the Ansys suite via the Ansys licensing portal with default settings unless otherwise noted. We used a simplified simulation configuration provided by our vendor to keep the calculation time within a reasonable threshold and to use the same simulation configuration for CPU and GPU tests.

Running a CFD simulation

1. Launch ANSYS Fluent.
2. Set the Fluent Launcher to the correct application modes:
   - Solution
   - Capability Level: CFD Enterprise
   - Dimension: 3D
3. Set the solver options based on scenario:
   - Native GPU Solver, 1 Solver Process (Single Precision GPU)
   - Native GPU Solver, Double Precision, 1 Solver Process (Double Precision GPU)
   - Double Precision, 16 Solver Processes (CPU only)
4. Set a working directory.
5. Click Start.
6. Select File → Read → Case.
7. Browse to the test case file, and click OK.
8. When the console indicates the case is done loading, double-click Solution → Initialization in the left side tree.
9. Leave the defaults as set, and click Initialize.
10. When initialization is complete, click at the bottom of the Console pane, type the following, and press Enter:(benchmark '(iterate 100))
    - This will perform an initial setup and load all graphing modules before solving.
11. When the test is done, run Initialize again, and click OK to acknowledge the previous results will be deleted.
12. Wait 10 minutes, and perform steps 10 and 12 again three times, and record the elapsed-time value.
13. When a scenario is complete, exit Fluent, and start it again, changing the solver parameters as appropriate for the next scenario.

Testing Dassault Systèmes SOLIDWORKS 2025

We downloaded and installed SOLIDWORKS via the 3DEXPERIENCE support portal with default settings unless otherwise noted. For all tests, we downloaded a complex engine assembly in IGES format from GrabCAD. (We used two different complexity assemblies for the Pro Max 16 comparison and the Pro Max 16 Plus comparison to match relative performance levels.)

Importing an IGES assembly

1. In a browser, navigate to https://grabcad.com, and download a complex assembly in IGES format.
2. Extract the IGES file from the zip archive.
3. Start SOLIDWORKS.
4. Select File → Open.
5. Change the file type filter to IGES.
6. Select the extracted file, and click Open while simultaneously starting the timer.
7. Stop the timer and record the value when the loading dialog disappears.

Calculating part interference

1. Click the Evaluate tab.
2. Click Interference Detection.
3. In the Selected Components box, ensure the component is highlighted.
4. Simultaneously start the timer and click Calculate.
5. Stop the timer, and when the results pane populates, record the value.
6. To exit the Interference Detection panel, click the red X.

Calculating assembly mass

1. On the Evaluate tab, click Mass Properties.
2. Click Options…

3. Drag the Accuracy level slider to Higher (slower).
4. Simultaneously start the timer and click OK.
5. When the Mass properties details are updated in the window, stop the timer and record the value.
6. Close SOLIDWORKS, and return to Importing an IGES assembly, Step 3.

Rendering assembly in Visualize

1. Launch SOLIDWORKS Visualize.
2. Select File → Open.
3. Browse to the assembly to render.
4. Click Open.
5. Accept default import settings if prompted.
6. Select Tools → Render.
7. Select Image.
8. Set the Image Preset to 4K High Quality.
9. Click Next.
10. Select Include Alpha, and ensure the format is set to PNG.
11. Leave the Size page at defaults.
12. Set Renderer Selection to Accurate (orange circle).
13. Set Termination Mode to Quality.
14. Ensure render passes is set to 1500 and Enable Denoiser is set to On.
15. Click Next.
16. Click Render.
17. Expand the details in the left pane of the Output Viewer.
18. The Render Device should indicate GPU if a qualified GPU is present.
19. When the render completes, record the Elapsed Time.
20. Close Visualize, wait 10 minutes, and repeat from Step 1.

Testing Dassault Systèmes CATIA R2025

We downloaded and installed CATIA via the 3DEXPERIENCE support portal with default settings unless otherwise noted. For all tests, we downloaded a complex engine assembly in IGES format from GrabCAD.

Importing an IGES assembly

1. Launch CATIA Part Design.
2. Click the plus sign icon in the upper-right corner of the UI.
3. Select Import…
4. Change the Format to IGES3D (*.igs).
5. In the Filename, click the folder icon.
6. Browse to the engine assembly file, select it, and click Open.
7. Uncheck the Save Report box.
8. Simultaneously start the timer and click OK.
9. When the display updates after the Operation Report window appears, stop the timer and record the value.

Rendering an assembly

1. Open the assembly to be rendered.
2. In the bottom toolbar, click the View tab.
3. Click the Iso view button.
4. Click the drop-down menu next to the hexagonal iris icon, and select Stellar Rendering Log.
5. Click the drop-down menu again, and select Stellar (GPU) to render the scene with the GPU renderer.
6. The render process will run for 60 minutes. When it is complete, record the number of samples.
7. To determine the samples-per-second rate, divide the total samples by 3,600 seconds.

Testing Adobe Premiere 2025

We downloaded and installed Adobe Premiere Pro via the Adobe Creative Cloud app with default settings unless otherwise noted. For the render/encoding tests we used a 5-minute sample timeline comprised of clips from various 4K video source files with effects and transitions added. For the proxy media generation test, we used a folder of 10 4K stock footage clips totaling 14.6 GB in size.

Rendering a 5-minute 4K video sequence

1. Launch Premiere Pro.
2. Click File → Open Project, and open the sample project.
3. Click Export.
4. Select the High Quality 2160p 4K preset.
5. Select H.264 for Format.
6. Start the timer, and click Export.
7. When the video has fully exported, stop the timer, and record the result.
8. Click File → Close Project.
9. Click Edit → Preferences → Media Cache, then click Delete next to Remove Media Cache Files. Select Delete all media cache files (requires restart), and click OK.
10. Wait for Premiere Pro to relaunch, then close the application, wait at least 10 minutes, and repeat steps 1 through 9 two more times.

Encoding/exporting a 5-minute 1080p video sequence

1. Launch Premiere Pro.
2. Click File → Open Project, and open the sample project.
3. Click Export.
4. Select the High Quality 1080p HD preset.
5. Select H.264 for Format.
6. Start the timer, and click Export.
7. When the video has fully exported, stop the timer, and record the result.
8. Click File → Close Project.
9. Click Edit → Preferences → Media Cache, then click the "Delete" button next to the "Remove Media Cache Files" label. Select Delete all media cache files (requires restart), and click OK.
10. Wait for Premiere Pro to relaunch, then close the application, wait at least 10 minutes, and repeat steps 1 through 9 two more times.

Generating proxy media from video source files

1. Launch Premiere Pro.
2. Click File → New Project, input a new project name and location, and click Create.
3. Navigate to the folder containing the 10 source media files, select the entire folder, and click Import.
4. Ensure all source files are selected in the project media browser, then right-click them, and select Proxy → Create Proxies.
5. Set Frame Size to Half, Preset to H.264 MP4 Proxy, and set a location for the proxy files.
6. Start the timer, and click OK.
7. When Adobe Media Encoder has processed all 10 source files and finished generating proxies, stop the timer, and record the result.
8. Navigate to C:/Users/Username/AppData/Roaming/Adobe/Common, and delete the Media Cache, Media Cache Files, and Peak Files folders to clear the Media Encoder cache.
9. Delete the project and associated files in the folder specified in step 2 and the generated proxy files from the folder specified in step 5. Empty the Recycle Bin.
10. In Premiere Pro, click File → Close Project.
11. In Premiere Pro, click Edit → Preferences → Media Cache, and click "Delete Media Cache Files". Select Delete all media cache files (requires restart), and click OK.
12. In Adobe Media Encoder, click Edit → Preferences, click the Media tab, and click Clean.

Testing DaVinci Resolve Studio 20

We downloaded DaVinci Resolve Studio 20 from the Blackmagic Design website and installed it with default settings unless otherwise noted. For the render/encoding tests we used a 5-minute sample timeline comprising clips from various 4K video source files with effects and transitions added. For the optimized media generation test, we used a folder of 10 4K stock footage clips totaling 14.6 GB in size.

Encoding/exporting a 5 minute long 4K video sequence

1. Open DaVinci Resolve Studio.
2. Double-click the sample project from the project browser.
3. Click the Deliver tab icon at the bottom right of the screen (spaceship icon).
4. Click H.264 Master, and set the resolution to 3,840 x 2,160 Ultra HD.
5. Click Add to Render Queue.
6. Start the timer, and click Render All.
7. When the render job completes, stop the timer.
8. Clear the completed job from the render queue, and click Playback → Delete Render Cache → All to clear the render cache.
9. Navigate to the user Videos folder in File Explorer, delete the CacheClip folder and the rendered output video file, and empty the Recycle Bin.
10. Close DaVinci Resolve Studio, restart the system under test, wait at least 10 minutes, and repeat steps 1 through 9 two more times.

Encoding/exporting a 5-minute 1080p video sequence

1. Open DaVinci Resolve Studio.
2. Double-click the sample project from the project browser.
3. Click the Deliver tab icon at the bottom right of the screen (spaceship icon).
4. Click H.264 Master, and set the resolution to 1920 x 1080p HD.
5. Click Add to Render Queue.
6. Start the timer, and click Render All.
7. When the render job completes, stop the timer.
8. Clear the completed job from the render queue, and click Playback → Delete Render Cache → All to clear the render cache.
9. Navigate to the user Videos folder in File Explorer, delete the CacheClip folder and the rendered output video file, and empty the Recycle Bin.
10. Close DaVinci Resolve Studio, restart the system under test, wait at least 10 minutes, and repeat steps 1 through 9 two more times.

Generating optimized media

1. Open DaVinci Resolve Studio.
2. Click File →New Project, and input a project name.
3. Click File → Import → Media, select the 10 4K stock footage clips, and click Change when prompted.
4. Select all 10 imported media files.
5. Right-click the selected media, and simultaneously start the timer and click Generate Optimized Media.
6. Stop the timer when the progress bar disappears and indicates the optimized media has been fully generated.
7. Click Playback → Delete Render Cache → All.
8. Navigate to the user Videos folder in File Explorer, delete the CacheClip folder to delete the previously generated optimized media, and empty the Recycle Bin.
9. Close DaVinci Resolve Studio, restart the system under test, wait at least 10 minutes, and repeat steps 1 through 8 two more times.

Testing Maxon ZBrush 2026

We downloaded and installed Maxon ZBrush via the Maxon App with default settings unless otherwise noted. For this testing, we used a very high polygon sample model.

Open project file

1. Open Maxon ZBrush.
2. In the LightBox project navigation pane, Click Open File, and select the sample project ZPR file.
3. Click Open.
4. Record the elapsed time in seconds for the project to open displayed in the top left status bar.
5. Close ZBrush, then repeat the test two more times.

Generating Best Preview Render

1. Open Maxon ZBrush.
2. In the LightBox project navigation pane, Click Open File, and select the sample project ZPR file.
3. Click Open.
4. Start the timer, and press Shift+R to initiate a Best Preview Render (BPR).
5. When the progress bar in the status area in the top left indicates that the BPR is complete, stop the timer, and record the result.
6. Close ZBrush, then repeat the test two more times.

Running Decimation Master pre-process

1. Open Maxon ZBrush.
2. In the LightBox project navigation pane, Click Open File, and select the sample project ZPR file.
3. Click Open.
4. In the top menu bar, Click Zplugin, and click Decimation Master to open its options.
5. Click Pre-process Current.
6. When the progress bar in the status area in the top left indicates that the process is complete, record the elapsed Decimation Master processing time indicated in the status bar.
7. Close ZBrush, then repeat the test two more times.

Running ZRemesher

1. Open Maxon ZBrush.
2. In the LightBox project navigation pane, Click Open File, and select the sample project ZPR file.
3. Click Open.
4. Prepare the timer, expand the Geometry menu in the Tools pane, and click the ZRemesher heading. In the expanded options under Target Polygons Count, click Double.
5. Start the timer, and click the ZRemesher button.
6. When the progress bar in the status area in the top left indicates that the ZRemesher process is complete, stop the timer, and record the result.
7. Close ZBrush, then repeat the test two more times.

Testing C++ compilation

Building Unreal Engine 5 release branch from source

1. Download the Microsoft Visual Studio 2022 Community Edition installer from https://visualstudio.microsoft.com/vs/community/ and install it:
2. Under the installer's Workloads tab, ensure the following components are selected:
   - .NET Multi-platform App UI development
   - .NET desktop development
   - Desktop development with C++
   - Game development with C++
3. In the Installation Details panel on the right, ensure the following components are selected:
   - C++ profiling tools
   - C++ AddressSanitizer
   - Windows 11 SDK
   - Unreal Engine installer

4. Launch Visual Studio 2022, navigate to Tools → Options → Projects and Solutions → Build And Run, set MSBuild project build output verbosity to Detailed, and click OK.
5. Request access to the GitHub repository for the latest Unreal Engine 5 (https://github.com/EpicGames/UnrealEngine) using the steps outlined on https://dev.epicgames.com/documentation/en-us/unreal-engine/downloading-source-code-in-unreal-engine?application_version=5.5.
6. Download the latest Unreal Engine 5 release branch source code ZIP file.Extract the downloaded source archive.
7. Navigate to the base directory of the extracted source files, and run Setup.bat.
8. In the same directory, run GenerateProjectFiles.bat.
9. Double-click the newly created UE5.sln file to open it in Visual Studio 2022.
10. In the drop-down menus below the main toolbar, set the solution configuration to Development Editor and the solution platform to Win64.
11. To open the Solution Explorer pane, click View → Solution Explorer.
12. If a warning appears at the top of the Solution Explorer saying "Based on your solution, you might need to install extra components for a full development experience" or similar, click Install, and click Install again.
13. If a warning appears at the top of the Solution Explorer saying "This solution contains packages with vulnerabilities" or similar, click Manage NuGet Packages, and check the Show only vulnerable box.
14. For each listed vulnerable package, select the package, and in the right pane, check the box next to every project in the list with that package installed.
15. In the Version drop-down menu, select the latest stable release that isn't listed as vulnerable, and click Install, accepting any subsequent confirmation prompts.
16. Right-click the UE5 target under Solution 'UE5' → Engine, and click Build.
17. Wait for the build to complete, and record the total build time from the Output window.
18. For subsequent runs, delete the entire source folder, then repeat steps 4 through 12.

Building Mozilla Firefox from source

1. In a browser, navigate to https://ftp.mozilla.org/pub/mozilla/libraries/win32/MozillaBuildSetup-Latest.exe, download the MozillaBuild utility, and run the installer. Install to the default directory by clicking Install.
2. Launch the MozillaBuild shell by running start-shell.bat in the mozilla-build install directory.
3. Run the following commands to download the source code and install required dependencies, accepting prompts as needed:

```
cd c:/
mkdir mozilla-source
cd mozilla-source
wget https://raw.githubusercontent.com/mozilla-firefox/firefox/refs/heads/main/python/mozboot/
bin/bootstrap.py
python3 bootstrap.py
```

4. Launch the Windows Security app, click Virus & threat protection → Manage settings →Add or remove exclusions, and confirm that the .mozbuild folder in your user directory and the mozilla-build and mozilla-source\firefox folders in your install directory were automatically added to the exclusion list by the script in the previous step. If they were not, add them now.
5. From the list of build options when prompted (Firefox for Desktop), select 2. When prompted to ignore the Dev Drive recommendation, press enter, and accept any subsequent prompts. When prompted whether you will be submitting commits to Mozilla and when prompted to enable build telemetry, type `N`. Close the shell, and restart it by running `start-shell.bat` again.
6. In the new terminal, type the following commands:

```
cd c:/mozilla-source/firefox
git pull origin main
time ./mach build
```

7. When the build completes, record the output total build time (real).
8. Run the following command to run the built version of Firefox, and ensure it works:

```
./mach run
```

9. Run the following command to delete the build files and clean up previous built artifacts so subsequent runs are built from scratch:

```
./mach clobber
```

10. Repeat steps 6 through 10 two more times, restarting the system under test and waiting at least 15 minutes between runs.

Testing SQL query performance

For this testing, we ran the HammerDB TPROC-H workload locally on each system to simulate heavy-duty SQL query performance, using the HammerDB test harness (scale factor 30, or an approximately 30GB database) to generate the database, and run the workload's standard set of 22 complex analytics queries to simulate a typical online retailer's online analytical processing (OLAP) workload.

Installing and configuring SQL Server 2022 on the system under test

1. In a browser, navigate to https://www.microsoft.com/en-us/sql-server/sql-server-downloads, download the SQL Server 2022 installer, and run it.
2. Click Custom.
3. Click Install.
4. When the download completes and the SQL Server Installation Center opens, click Installation in the left pane.
5. Click New SQL Server standalone installation or add features to an existing installation.
6. Select Evaluation, and click Next.
7. Click the check box to accept the license terms, and click Next.
8. Click Use Microsoft Update to check for updates, and click Next.
9. On the Install Rules page, click Next.
10. On the Azure Extension for SQL Server page, click the Azure Extension for SQL Server checkbox to unselect this feature, and click Next.
11. Check the boxes for the following features, and click Next:
    - Database Engine Services
    - Full-Text and Semantic Extractions for Search
12. Leave the Default instance option selected, and click Next.
13. Leave the default service accounts, and click Next.
14. On the Server Configuration tab, choose Mixed Mode, and enter and confirm a password for the SQL Server system administrator account.
15. Under Specify the SQL Server administrators, click Add Current User.
16. Click Next.
17. Click Install.
18. Click Close.
19. In a browser, navigate to https://learn.microsoft.com/en-us/ssms/install/install, download SQL Server Management Studio, and install it.

Installing Microsoft ODBC Driver 18 for SQL Server

1. In a browser, navigate to https://learn.microsoft.com/en-us/sql/connect/odbc/download-odbc-driver-for-sql-server?view=sql-server-ver17, and download the latest Microsoft ODBC Driver 18 for SQL Server.
2. Double-click the exe file, and click Next.
3. Check the box to accept the terms, and click Next.
4. Click Next.
5. Click Install.
6. Click Finish.

Creating the test database

1. Open SQL Server Management Studio.
2. Click Connect.
3. Right-click Databases, and select New Database.
4. Name the database. We named ours tpch.

Installing HammerDB on the system under test

1. In a browser, navigate to https://www.hammerdb.com/download.html, and download the latest version of HammerDB. We used version 5.0.
2. Double-click the .exe file, and click Next.
3. Click I accept the agreement to agree to the license terms, and click Next.
4. Choose a destination location to install HammerDB, and click Next.
5. Click Next.
6. Click Finish.

Populating the database

1. Open HammerDB, and click Options → Benchmark.
2. Choose SQL Server and TPROC-H.
3. Expand SQL Server → TPROC-H → Schema.
4. Double-click Options.
5. On the Settings tab, choose a scale factor of 30, and set the number of virtual users to 4.
6. Check the box for Clustered Columnstore, and click OK.
7. Double-click Build, then click Yes.

Backing up the database

1. Open SQL Server Management Studio, and connect.
2. Right-click the TPCH database, and click Tasks → Back up…
3. Choose a location to store the backup, and click OK.

Running HammerDB TPROC-H

1. Open the HammerDB GUI on the system under test.
2. Double-click SQL Server, select TPROC-H, and click OK. Click OK again to confirm.
3. Expand the TPROC-H options menu.
4. Expand the Schema submenu.
5. Double-click Options.
6. Change Authentication to SQL Server.
7. Leave SQL User ID as sa, and input the SQL Server User Password you set during SQL Server setup.
8. Click the Settings tab.
9. Set MAXDOP to 0.
10. Set Scale to 30.
11. Click OK.
12. Expand Driver Script, and double-click Load.
13. Expand Virtual User, and double-click Options.
14. Set Virtual Users to 1.
15. Enable Log Output to Temp, Use Unique Log Name, and Log Timestamps, and click OK.
16. Double-click Create, and click OK.
17. Double-click Run.
18. When the run completes, record the geometric mean query time.
19. Before any subsequent test runs, restart the SQL Server service by right-clicking on the MS-SQL instance in SQL Server Management Studio and clicking Restart.

Read the report ▶

This project was commissioned by Dell Technologies.

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