The science behind the report:

Dell OptiPlex 7070 Micro Desktop: Save time and get better performance on office tasks

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 OptiPlex 7070 Micro Desktop: Save time and get better performance on office tasks.

We concluded our hands-on testing on April 24, 2020. 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 March 27, 2020 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

Table 1: Results of our testing

Tests	Dell OptiPlex™ 7070 Micro Desktop	HP EliteDesk 705 G4 Mini PC	Lenovo® ThinkCentre® M75s SFF
Benchmark tests			
SYSmark® 2018			
Overall rating (Higher is better)	1146	993	1121
Productivity (Higher is better)	1113	931	1010
Creativity (Higher is better)	1391	1208	1355
Responsiveness (Higher is better)	972	871	1029
WebXPRT 3 (Chrome browser)			
Overall (Higher is better)	180	156	175
Photo enhancement (ms, lower is better)	368	461	413
Organize album using AI (ms, lower is better)	2815	3118	2780
Stock option pricing (ms, lower is better)	188	219	193
Encrypt notes and OCR scan (ms, lower is better)	2319	2445	2176
Sales graphs (ms, lower is better)	504	562	501
Online homework (ms, lower is better)	1668	2071	1849

Tests	Dell OptiPlex™ 7070 Micro Desktop	HP EliteDesk 705 G4 Mini PC	Lenovo® ThinkCentre® M75s SFF
Hand timing tests (seconds, lower is better)			
Boot	17.0	15.1	12.8
Shut down	7.2	5.5	5.9
Sleep	4.8	4.2	6.4
Launch Microsoft Outlook	5.4	5.6	5.0
Open video file attachment in Outlook	1.7	1.6	1.5
Open image file attachment in Outlook	1.3	1.5	1.4
Launch Microsoft Teams	5.6	5.6	5.3
Open Microsoft PowerPoint attachment in Teams	159.6	170.5	176.5
Open Microsoft Word document	4.5	5.1	4.6
Perform word replacement in Word	1.4	1.5	1.4
Open Microsoft Excel spreadsheet	17.9	22.9	21.7
Perform large calculation in Excel	2.4	3.7	3.4
Open PowerPoint slide deck	37.0	37.0	33.6
Export PowerPoint slide deck as a PDF	11.4	12.3	10.8
Open OneNote®	1.6	1.8	1.6
Insert a spreadsheet into OneNote	19.4	23.8	22.8
Open Adobe® Acrobat® Reader document	1.1	1.2	1.0
Export Acrobat Reader document to Word	160.3	159.2	151.1
Open Adobe Photoshop®	11.9	12.9	11.7
Import and save 50 RAW images to JPEG	192.7	224.2	217.5
Open Adobe Photoshop Lightroom® Classic	15.4	18.8	17.8
Create a photo merge panorama in Lightroom Classic	84.3	82.9	82.1
Open Adobe Premiere Pro	13.6	13.6	11.6
Render 4K RED video file to H.264 in Premiere Pro	172.4	204.0	184.1

System configuration information

System configuration information	Dell OptiPlex 7070 Micro Desktop	HP EliteDesk 705 G4 Desktop Mini PC	Lenovo ThinkCentre M75s SFF
Processor			
Vendor	Intel®	AMD	AMD
Name	Core™ i5	Ryzen™ 5 Pro	Ryzen 5 Pro
Model number	9600T	3400G	3400G
Core frequency (GHz)	2.3-3.9	3.7-4.2	3.7-4.2
Number of cores	6	4	4
Memory			
Amount (GB)	8	8	8
Type	DDR4	DDR4	DDR4
Speed (MHz)	2,666	2,666	2,666
Graphics			
Vendor	Intel	AMD	AMD
Model number	UHD 630	Radeon™ RX Vega 11	Radeon RX Vega 11
Storage			
Vendor	Toshiba	Western Digital	Samsung
Model number	KBG40ZNS256G	PC SN720 SDAPNTW-256G-1006	MZVLB256HBHQ-000L7
Amount	256 GB	256 GB	256 GB
Type	M.2 PCIe NVMe	M.2 PCIe NVMe	M.2 PCIe NVMe
Connectivity/expansion			
Wired internet	Intel I219-LM	Realtek PCIe Gbe	Realtek PCIe Gbe
Wireless internet	Intel Wireless-AC 9560	Intel Wireless-AC 9260	Realtek 8822CE Wireless
Bluetooth	5.0	5.0	5.0
USB	**Front** 1 USB 3.1 Gen 2 Type-C 1 USB 3.1 Gen 1 Type-A (charging) **Rear** 2 USB 3.1 Gen 1 Type-A 2 USB 3.1 Gen 2 Type-A	**Front** 1 USB 3.1 Gen 2 Type-C 1 USB 3.1 Gen 1 Type-A (charging) 1 USB 3.1 Gen 1 Type-A **Rear** 4 USB 3.1 Gen 2 Type-A	**Front** 2 USB 3.1 Gen 1 Type-A 2 USB 3.1 Gen 2 Type-A **Rear** 2 USB 2.0 Type-A 2 USB 3.1 Gen 1 Type-A
Video	2 DisplayPort	2 DisplayPort	2 DisplayPort
Operating system			
Vendor	Microsoft	Microsoft	Microsoft
Name	Windows 10 Pro	Windows 10 Pro	Windows 10 Pro
Build number or version	10.0.18363	10.0.18363	10.0.18363

System configuration information	Dell OptiPlex 7070 Micro Desktop	HP EliteDesk 705 G4 Desktop Mini PC	Lenovo ThinkCentre M75s SFF
Dimensions			
Height (in)	1.4	1.3	3.5
Width (in)	7.1	6.9	10.6
Depth (in)	6.9	6.9	13.4
Weight (lbs.)	2.4	2.6	10.1
BIOS			
BIOS name and version	Dell 1.3.1	HP R26 Ver.02.03.02	Lenovo M2CKT29A

How we tested

We tested all the systems while connected to a Spectrum Internet® Ultra with up to 400 Mbps download speeds and a NETGEAR® Nighthawk X6 AC3200 Tri-Band WiFi Router.

Setting up the system

Capturing driver information from the OEM factory image

1. Connect an external HDD to the system.
2. On the external drive, create a directory named Drivers.
3. Hold the Shift key, and restart the system.
4. Choose Troubleshoot→Advanced options→Command prompt.
5. Type `DISM /image:C: /export-driver /destination:D:\drivers` (Note: In this scenario the external drive is labeled D; however, this name may be different depending on the configuration of the system).

Installing Windows 10 Pro

1. Connect an external HDD to the system.
2. In the BIOS, disable SecureBoot.
3. Install a clean version of Windows 10 Pro onto the test system.
4. Follow the on-screen instructions to complete installation, using the default selections when appropriate.
5. Open Device Manager, and use the OEM factory drivers captured onto the external HDD to install any missing drivers.
6. Go to either https://www.intel.com/content/www/us/en/support.html or https://www.amd.com/en/support to install the latest chipset and graphics drivers available.
7. Run the Windows Update, and install all updates available.
8. Launch the Windows Store app, and install all Store app updates.
9. Verify the date and time are correct, and synchronize the system clock with the time server.
10. Disable Automatic Windows Update.
11. Right-click the Windows Start button.
12. Select Computer Management.
13. Select Services and Applications.
14. Select Services.
15. Scroll down, and double-click Windows Update.
16. Click Stop.
17. From the Startup type drop-down menu, select Disabled.

Capturing an image

1. Connect an external HDD to the system.
2. Right-click on the desktop, and select Personalize→Home→Update & security→Backup→More options→See advanced settings→System Image Backup→Create a system image.
3. Verify that the external HDD is selected as the save drive, and click Next.
4. Verify that all drives are selected to back up, and click Next.
5. Click Start backup.
6. At the Do you want to create a system repair disc screen, select No, and close the dialogs.

Restoring an image

1. Connect an external HDD to the system.
2. Press and hold the Shift key while Restarting the system.
3. Select Troubleshoot.
4. Select Advanced options.
5. Select System image recovery.
6. Select the User account.
7. Enter the system password, and click Continue.
8. Verify that the external HDD is selected, and click Next.
9. Once the recovery has completed, click Finish.

Measuring performance: Benchmarks

WebXPRT 3

Setting up the test

1. Download and install Chrome browser from https://www.google.com/chrome/.

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`, and press Enter.
    • Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Open the web browser under test and go to http://www.principledtechnologies.com/benchmarkxprt/webxprt/.
7. Click Run WebXPRT 3.
8. At the Ready to test your browser screen, click Continue.
9. Click Start.
10. When the test completes, record the results.
11. Click the option to rerun WebXPRT 3.
12. When the test completes, record the results.
13. Repeat steps 11 through 12 once more, and record the median result.

SYSmark 2018

Avoiding antivirus software conflicts

SYSmark 2018 is not compatible with virus-scanning software, so we uninstalled any such software present on the desktop PCs before we installed the benchmark.

Avoiding pre-installed software conflicts

SYSmark 2018 installs the following applications, which its test scripts employ:

Productivity

- Adobe Acrobat Pro DC
- AutoIT 3.3.14.2
- BowPad64-2.3.3 installer
- Google® Chrome®
- Microsoft Excel 2016
- Microsoft OneNote 2016
- Microsoft Outlook 2016
- Microsoft PowerPoint 2016
- Microsoft Word 2016
- Microsoft Windows Zip

Creativity

- Adobe Photoshop CC 2017
- Adobe Photoshop Lightroom Classic CC
- CyberLink PowerDirector® 2015

Responsiveness

- Adobe Acrobat Pro DC
- Adobe Lightroom Classic CC
- Adobe Photoshop CC 2017
- CyberLink PowerDirector 2015
- Google Chrome

- Microsoft Excel 2016
- Microsoft OneNote 2016
- Microsoft Outlook 2016
- Microsoft PowerPoint 2016
- Microsoft Word 2016

If any of these applications already exist on the system under test, they could cause problems with the benchmark due to software conflicts. To avoid any such issues, we uninstalled all conflicting pre-installed software applications—including different versions of any of the programs SYSmark 2018 uses—before we installed the benchmark.

Using the SYSmark built-in Configuration Tool

This tool supports three levels of configuration:

1. Only makes changes that are REQUIRED for the benchmark to run.
2. Additionally, makes changes that are RECOMMENDED for repeatable results.
3. Additionally, makes OPTIONAL changes that help ensure best results.

The Configuration Tool makes the following configuration changes at each of the three levels:

Level 1 - Required

- Disables User Account Control (UAC)
- Sets DPI Scaling to 100%
- Disables Low Battery Actions
- Disables Network Proxies
- Disables System Sleep and Hibernate
- Disables Windows Update

Level 2 - Recommended

- Disables User Account Control (UAC)
- Sets DPI Scaling to 100%
- Disables Low Battery Actions
- Disables Network Proxies
- Disables System Sleep and Hibernate
- Disables Windows Update
- Create BAPCo power scheme
- Sets Power Plan Type to High Performance
- Sets CPU High Performance
- Disables Disk Defrag
- Disables Windows Error Reporting
- Disables Windows Lock Screen
- Disables Windows Pop-ups
- Disables Screen Saver and Monitor Timeout
- Disables Windows Sidebar/Gadgets
- Disables Desktop Slideshow
- Disables Windows Defender
- Disables Windows Firewall
- Sets Font Smoothing

Level 3 - Optional

- Disables Hard Disk Timeout
- Disables System Restore
- Ignores Laptop Lid Close

We chose the official BAPCo 'Run Benchmark' default as outlined in the BAPCo SYSmark2018 User Guide (http://bapco.com/wp-content/uploads/2018/10/BAPCo_SYSmark2018_user_guide.pdf) which runs the benchmark using the Required and Recommended options.

Setting up the test

1. Install SYSmark 2018 with the default options.

Running the test

1. Launch SYSmark 2018.
2. Click on the Settings gear icon.
3. For iterations, enter `3`
4. Verify that Conditioning Run is enabled.
5. Enable Process Idle Tasks.
6. Enter a name for the benchmark run.
7. Click the Back button to return to the main menu.
8. Click Run Benchmark.
9. When the benchmark finishes, record the SYSmark 2018 benchmark results.

Measuring performance: Hand-timed tests

Launching Outlook and opening an attached video and image file

Setting up the test

1. Create an Outlook account.
2. Send an email with a 2MB image attachment to the Outlook account you created.
3. Send an email with a 10MB video file attachment to the Outlook account you created.
4. Close Outlook.
5. Shut down the system.

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`, and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Outlook.
7. Stop the timer when Outlook has loaded, as indicated by Connected to Microsoft Exchange appearing in the taskbar, and record the results.
8. Navigate to the email with a video attachment.
9. Click the drop-down arrow on the video attachment, and click Open.
10. Start the timer, and click Open.
11. Stop the timer when video playback begins, and record the results.
12. Navigate to the email with an image attachment.
13. Click the drop-down arrow on the image attachment.
14. Start the timer, and click Open.
15. Stop the timer when the image fully loads, and record the results.
16. Shut down the system.
17. Repeat steps 1 through 16 twice more, and record the median result.

Setting up the test

1. Launch Microsoft Teams and perform initial setup by entering Microsoft user account and password.
2. Click on the Files tab, and verify that the test PowerPoint file is shown.
3. Close Microsoft Teams.
4. Press the Windows Key, and type `Startup Apps`, and press Enter.
5. Disable Microsoft Teams from automatically starting.
6. Shut down the system.

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`, and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Teams.

7. Stop the timer when Teams has fully loaded, and record the results.
8. Navigate to shared PowerPoint file.
9. Simultaneously start the timer and open the shared PowerPoint file.
10. Stop the timer when the PowerPoint file has loaded, as indicated by all 33 slides appearing in the side bar, and record the results.
11. Shut down the system.
12. Repeat steps 1 through 11 twice more, and record the median result.

Opening a Microsoft Word document and performing a word replacement

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`, and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Word by clicking on the test Word document.
7. Stop the timer when the Word document has fully loaded, as indicated by the words Page 1 of 38 10473 words appearing, and record the results.
8. Press Ctrl+H to bring up the Find/Replace dialog box.
9. In the Find What field, type `I`.
10. In the Replace With field type, `TEST`.
11. Simultaneously start the timer and select Replace All.
12. Stop the timer when every I has been replaced.
13. Close the Word document. Do not save changes.
14. Shut down the system.
15. Repeat steps 1 through 14 twice more, and record the median result.

Opening a Microsoft Excel spreadsheet and performing a large calculation

Setting up the test

1. Launch Microsoft Excel.
2. Click File→Options→Trust Center→Trust Center Settings→Macro Settings. Select Enable all macros, and click OK.
3. Close Microsoft Excel.
4. Shut down the system.

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`, and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Excel by clicking on the test Excel spreadsheet.
7. Stop the timer when the Excel spreadsheet has fully loaded, and record the results.
8. Press Ctrl+R to start the calculation.
9. Record the output.
10. Close the Excel spreadsheet.
11. Shut down the system.
12. Repeat steps 1 through 11 twice more, and record the median result.

Opening a Microsoft PowerPoint slide deck and exporting to PDF

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch PowerPoint by clicking on the test PowerPoint slide deck.
7. Stop the timer when the PowerPoint slide deck has loaded, as indicated by all 33 slides appearing in the side bar, and record the results.
8. Click File→Export→Create PDF/XPS.
9. Start the timer and click Publish.
10. Stop the timer when the PDF has been created, and record the results.
11. Shut down the system.
12. Repeat steps 1 through 11 twice more, and record the median result.

Launching Microsoft OneNote and inserting a spreadsheet

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch OneNote.
7. Stop the timer when OneNote has loaded, and record the results.
8. Click Add Page.
9. Click Insert→Spreadsheet→Existing Excel Spreadsheet.
10. Browse to the test Excel spreadsheet file, and click Insert.
11. Start the timer and click Insert spreadsheet.
12. Stop the timer when the Excel spreadsheet has been inserted, and record the results.
13. Shut down the system.
14. Repeat steps 1 through 13 twice more, and record the median result.

Opening an Adobe Acrobat Reader document and exporting to Microsoft Word

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Acrobat Reader by clicking on the test PDF document.
7. Stop the timer when the PDF document has fully loaded, and record the results.
8. In the right-hand column expand the Export PDF option.
9. Verify that Microsoft Word is selected, and click Export.
10. Select the Save As directory.
11. Simultaneously start the timer and click Save.
12. Stop the timer when the PDF document has been converted to a Word document.
13. Close the documents. Do not save changes.
14. Shut down the system.
15. Repeat steps 1 through 14 twice more, and record the median result.

Launching Adobe Photoshop CC, importing 50 RAW images and saving to JPEG

Running the test
1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Photoshop.
7. Stop the timer when Photoshop has fully loaded, and record the results.
8. Select File→Scripts→Image Processor.
9. Click the Select Folder button, and select the test file directory.
10. Select 10 as the JPEG Quality.
11. Simultaneously start the stopwatch and click Run.
12. Stop the stopwatch when the spinning circle disappears, and record the result.
13. Shut down the system.
14. Repeat steps 1 through 13 twice more, and record the median result.

Launching Adobe Photoshop Lightroom Classic and creating a Panorama photo merge

Running the test
1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Lightroom.
7. Stop the timer when Lightroom has fully loaded, and record the results.
8. Click the Import button.
9. Select the test file directory, and click Import.
10. Press Ctrl + A to select all the imported photos.
11. Click Photo→Photo Merge→Panorama.
12. Simultaneously start the stopwatch and click Merge.
13. Stop the stopwatch when the progress bar in the top left corner disappears, and record the result.
14. Shut down the system.
15. Repeat steps 1 through 14 twice more, and record the median result.

Launching Adobe Premiere Pro and rendering RED 4K video file

Running the test
1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   - Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer and launch Premiere.
7. Stop the timer when Premiere has fully loaded, and record the results.
8. Select New Project, and give the project a name.
9. Press Ctrl + I to Import the test file.
10. Drag the imported file to the bottom timeline.
11. Select Effects→Lumetri Pesets→Filmstocks.
12. Select Fuji F125 Kodak 2393 (by Adobe), and drag it onto the video timeline.
13. Press Ctrl + M to bring up the Export Media dialog.

14. From the Format dropdown menu, choose H.264.
15. Simultaneously start the stopwatch and click Export.
16. Stop the stopwatch when the progress bar disappears, and record the result.
17. Shut down the system.
18. Repeat steps 1 through 17 twice more, and record the median result.

Boot and Shut down responsiveness

Running the test

1. Prepare the stopwatch.
2. Simultaneously start the timer and press the power button.
3. When taskbar loads, stop the stopwatch, and record the results.
4. Select Windows Start.
5. Type `cmd`, and press Ctrl+Shift+Enter.
6. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   • Do not interact with the system until the command completes.
7. After the command completes, wait five minutes before running the test.
8. Simultaneously start the timer and Shut down the system.
9. Stop the timer when the hard drive light has turned off, and record the results.
10. Repeat steps 1 through 9 twice more, and record the median result.

Sleep responsiveness

Running the test

1. Boot the system.
2. Select Windows Start.
3. Type `cmd`, and press Ctrl+Shift+Enter.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks,` and press Enter.
   • Do not interact with the system until the command completes.
5. After the command completes, wait five minutes before running the test.
6. Simultaneously start the timer, and put the system in Sleep.
7. Stop the timer when the hard drive light has turned off, and record the results.
8. Repeat steps 1 through 7 twice more, and record the median result.

Read the report at http://facts.pt/eg0iff7 ▶

This project was commissioned by Dell Technologies.

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