Dell™ OptiPlex™ 7050 Micro with Intel® Optane™ memory

# Upgrade to Intel Optane memory and save time on everyday tasks

## Adding Intel Optane memory to the Dell OptiPlex 7050 Micro led to faster restart times, application launch times, and file copy times

Benjamin Franklin wasn't talking about computing when he said, "Lost time is never found again," but he certainly could have been. Choosing a more responsive system that lets you complete repetitive tasks more quickly can shave seconds, minutes, and eventually hours off the time you spend doing your daily work. The Dell OptiPlex 7050 Micro, an Intel® Core™ i5-7500T vPro™ processor-based platform, gives you an affordable option that can improve performance over an HDD while maintaining high storage capacity: the Intel Optane memory upgrade.

We compared two Dell OptiPlex 7050 Micro desktops configured identically, with one exception: one had a 1TB HDD alone and the other had a 1TB HDD accelerated with Intel Optane memory. Adding Intel Optane memory to the system improved restart times, sped up times to launch popular applications such as Microsoft® Word and Adobe Acrobat Reader and load documents in them, and even let us copy files faster.

If you're looking to get the most from your day with a more responsive system, upgrading your Dell OptiPlex 7050 Micro with Intel Optane memory can help give you more time to work and play.

Restart in **55%** less time

Launch and load Adobe® Acrobat® Reader® DC in **56%** less time
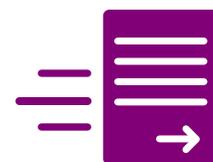
Copy files in **38%** less time

## Intel Optane: Boosting Andrea's efficiency so she can spend more time on the trail

Andrea enjoys the work she does at her small startup. She's responsible for writing and presenting business plans that give her colleagues sales targets to keep the business growing at the right pace.

Even more than she loves her job, Andrea enjoys hiking at the state park just down the road.

Could upgrading her desktop with Intel Optane memory help Andrea spend less time at her desk and more time in nature? Let's head down that path and explore the possibilities.

## Getting back time with Intel Optane memory

When it comes to employee desktops and laptops, organizations have seemingly incongruous goals: they need to give employees systems that let them work efficiently, but management has to meet strict budgets, so they can't necessarily provide the top-tier configuration of a system.

For companies that choose the Dell OptiPlex 7050 Micro, a basic configuration may seem like the best bet for purchasers, but making a simple upgrade at purchase could pay off over time. By putting Intel Optane memory-powered systems into employee hands, organizations could see a more efficient workforce and potentially extend refresh cycles. That's because Intel Optane memory bridges the gap between HDDs and SSDs in ability and cost, keeping high storage capacity while reducing the time it takes to complete common everyday tasks, as we found in our comparison tests.

## Less time to restart with Intel Optane

Restarting a system due to updates isn't quick, and we're forced to do it time and time again. We found that a Dell OptiPlex 7050 Micro with Intel Optane memory saved an incredible 41 seconds on restart compared to a system without the upgrade. Consider the number of times you restart your system each week and count the minutes you get back: the time saved with an Intel Optane system adds up quickly.

Another place to save time is in application responsiveness. Read on to see how much time you could save opening everyday documents such as PDFs.

**55%**
less time

32.9 s

73.4 s
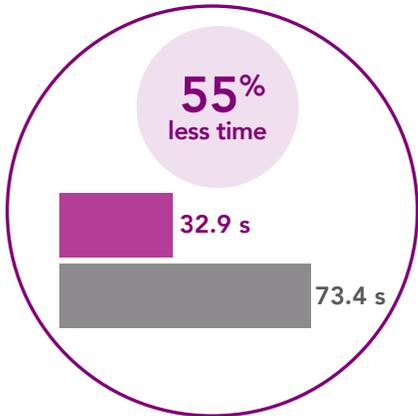
**Restart the system**
*includes shutdown time*
**Time (seconds)**
*lower is better*

**56%**
less time

6.4 s

14.5 s
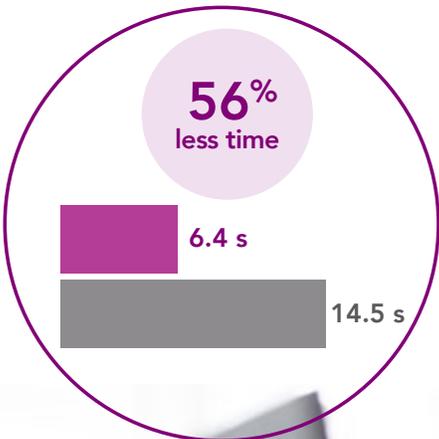
**Open a PDF**
in Adobe Acrobat Reader DC
**Time (seconds)**
*lower is better*

There are plenty of reasons Andrea has to restart her system throughout the workday: her many apps have frequent updates, and occasionally a website problem forces her to restart. Without Intel Optane memory, it would take Andrea 1 minute and 13 seconds to restart her computer, which can feel like an eternity when she has important deadlines to meet. If Andrea's system had the Optane upgrade, she could cut that time in half, getting back to work in just over 32 seconds. The faster system could save her minutes each day, which can help Andrea stay focused and complete her latest presentation.

Andrea could shave 8 seconds off the time it takes to open a PDF—something she does frequently. Those seconds add up, and saving that time means Andrea can finish her work and head to the park.

**41%**
**less time**

16.9 s

28.9 s
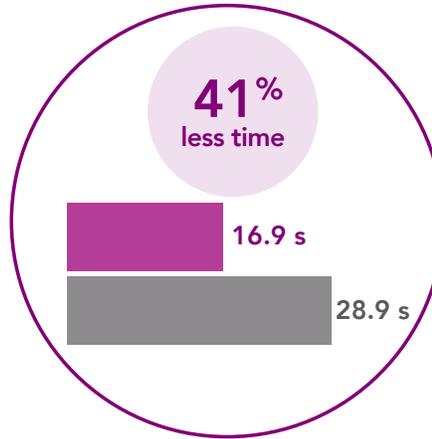
**Open a file**
in Adobe Photoshop®
**Time (seconds)**
*lower is better*

**50%**
less time

17.5 s

35.2 s
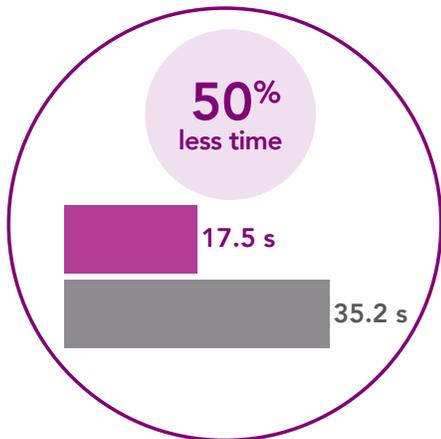
**Open a file**
in Adobe Premiere®
**Time (seconds)**
*lower is better*

## Open common apps faster

Adobe Acrobat and Microsoft Office are two popular software suites that can have users launching, editing, closing, and relaunching documents and applications as they cycle through their work tasks. Our tests showed that the upgraded Dell OptiPlex 7050 Micro launched each of these applications and loaded our test documents quicker than the basic configuration.

Andrea's job doesn't require her to work in Adobe Creative Suite, but some of her colleagues use those programs constantly. With Intel Optane memory, they could expect to save up to 18 seconds when opening files, which gives them time to meet Andrea for lunch.

**32%**
**less time**

2.7 s

3.9 s
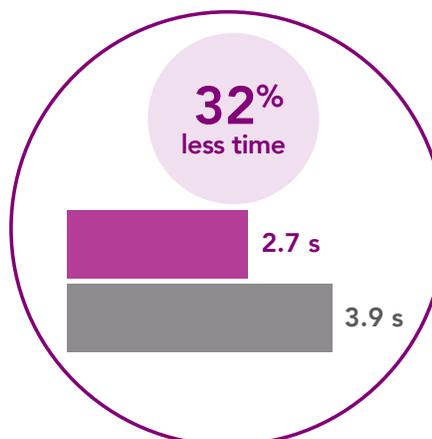
**Open a presentation**
in Microsoft PowerPoint®
**Time (seconds)**
*lower is better*

Many professionals and consumers use PDFs to share information. The configuration with the Intel Optane memory upgrade let us launch a PDF eight seconds quicker. When you're looking at several documents in a day, a system that gets you to your apps more quickly can save a significant amount of time.

The Dell OptiPlex 7050 with Intel Optane also opened up popular Microsoft Office applications faster. By opening Word and Excel documents quicker, the Intel Optane upgrade offers users the ability to streamline workflows and bank time to focus on work.

The applications that Andrea uses to create her business plans, crunch numbers, and communicate with colleagues align with the standards of many offices: Microsoft Office, including Word, Excel, PowerPoint, Access, and Outlook, in addition to her Adobe programs. She's constantly switching between documents and programs, so Andrea would surely welcome any time she could save when launching and loading her latest projects. Even the slight edge in time savings could improve her overall user experience, and the seconds she can save with a faster system can help her finish work faster.

**10%**
less time

4.8 s

5.3 s
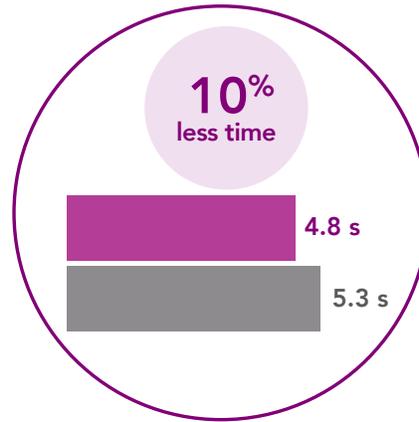
**Open an application**
Microsoft Outlook®
**Time (seconds)**
*lower is better*

**22%**
less time

8.4 s

10.7 s
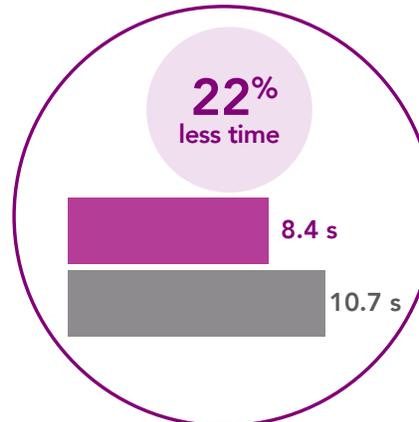
**Open a document**
in Microsoft Word
**Time (seconds)**
*lower is better*

**4%**
less time

41.8 s

43.6 s
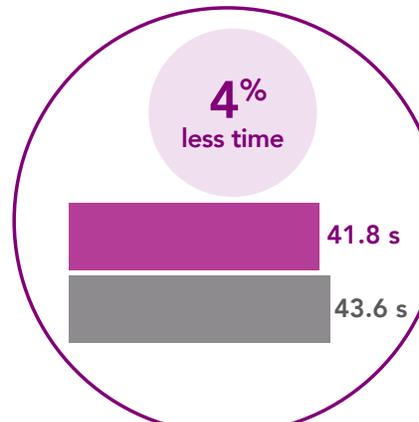
**Open a spreadsheet**
in Microsoft Excel®
**Time (seconds)**
*lower is better*

**5%**
less time

1.6 s

1.7 s
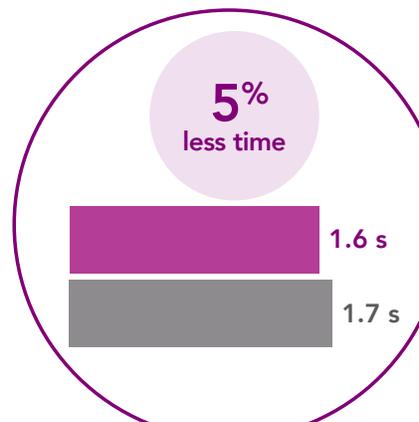
**Open a database**
in Microsoft Access®
**Time (seconds)**
*lower is better*

## Copy files in less time

Depending on the size of file you need to copy, this task could present itself as the perfect opportunity to grab another cup of coffee. Upgrading the Dell OptiPlex 7050 Micro with Intel Optane memory would force you to cut your coffee break shorter, because we found that it can copy files significantly faster than the basic configuration. But really, that's good news: a more responsive system can help you get right to work, so you can spend less time waiting and more time being productive.

**38%** less time

43.2 s

69.5 s

**Copy a file**
Time (seconds)
*lower is better*
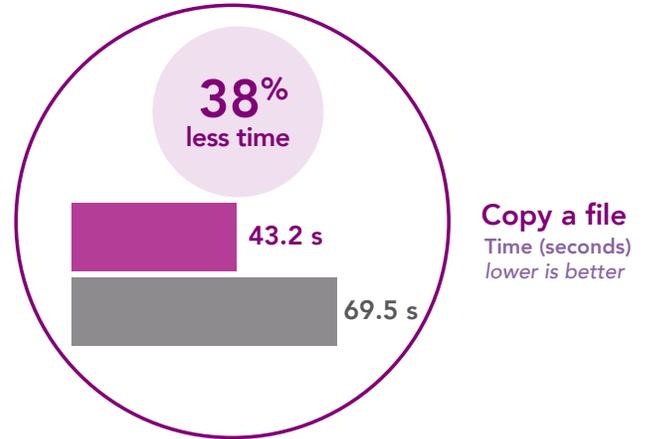
Upgrading to a more responsive system with Intel Optane memory can improve Andrea's workday, because she gets to spend less time waiting on her system to complete basic tasks, which can curb frustration. And the upgrade can help keep her boss happy as well, because it means Andrea completes her work faster than she would otherwise. Ultimately, because Andrea restarts, copies files, and opens Microsoft and Adobe applications over and over, she's likely to save a lot of time over her workday, week, month, and year. That can help give her a head start on checking out that new hiking trail she's been wanting to try.

## Find the time to upgrade to Intel Optane memory

We expend so much energy trying to make each minute count in many areas of our life—why wouldn't we take the same approach to our computing experience? Time stuck waiting on a system could be better spent solving problems, working, or even playing.

We found that upgrading an Intel Core i5-7500T vPro processor-based Dell OptiPlex 7050 Micro with Intel Optane memory provided a simple way to improve system responsiveness in several key areas that users repeat every day. By reducing the time it takes to restart, open applications, and copy files, upgrading to Intel Optane memory can give users a way to reclaim precious time and become more efficient.

On October 19, 2017, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on November 27, 2017.

## Appendix A: System configuration information

We tested two Dell OptiPlex 7050 Micro desktops that were identical, with one exception: one contained the optional 16GB Intel Optane memory upgrade. All other specs were the same.

| System configuration information | |
|---|---|
| Processor | |
| Vendor | Intel |
| Name | Core i5 |
| Model number | 7500T |
| Core frequency (GHz) | 2.7 - 3.3 |
| Number of cores | 4 |
| Cache | 6 MB L3 |
| Memory | |
| Total memory in system (GB) | 8 |
| Type | DDR4 |
| Speed (MHz) | 2,400 |
| Graphics | |
| Vendor | Intel |
| Model number | HD Graphics 630 |
| Storage | |
| Amount | 1 TB |
| Drive information (speed, interface, type) | 7,200 RPM HDD |
| Connectivity/expansion | |
| Wired internet | Intel I219-LM |
| USB ports | 1 x USB 3.1 Gen 1 Type-C, 5 x USB 3.1 Gen 1 |
| Video | 1 x DisplayPort 1.2, 1 x HDMI |
| Display | |
| Size (inches) | 22 |
| Type | LED backlit |
| Resolution | 1,920 x 1,080 |

| System configuration information | |
| --- | --- |
| Operating system | |
| Vendor and name | Microsoft Windows® 10 Pro |
| Build number or version | Build 16299 (1709) |
| BIOS | |
| BIOS name and version | Dell 1.6.5 |

# Appendix B: How we tested

## Measuring system responsiveness

**Measuring time to restart**

1. Boot the system and bring up an administrative command prompt:
    a. Type `CMD`
    b. Right-click the Command Prompt app to open App options.
    c. Click the Run as administrator button.
2. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
3. Do not interact with the system until the command completes.
4. After the command completes, wait 5 minutes before running the test.
5. Press the Windows key.
6. Click the Power button.
7. Simultaneously start the timer and click Restart.
8. When the taskbar appears, stop the timer.
9. Record the result as the Restart time.
10. Shut down the system.
11. Repeat steps 1 through 10 two more times, and report the median of the three runs.

## Measuring time to open applications

**Setting up the Microsoft Office and Adobe tests**

1. Install Microsoft Office 365 with default options.
2. Launch Word, Excel, PowerPoint, Access, and Outlook, and verify that there are no additional setup steps to take.
3. Install Adobe Acrobat Reader DC, Adobe Photoshop CC 2018, and Adobe Premiere CC 2018 with default options.
4. Launch Acrobat, Photoshop, and Premiere and verify that there are no additional setup steps to take.
5. Copy all test files to the desktop.

**Opening a PDF in Adobe Acrobat DC**

This test times how long it takes to open a 38-page PDF file in Adobe Acrobat DC.

1. Boot the system and bring up an administrative command prompt:
    a. Type `CMD`
    b. Right-click the Command Prompt app to open App options.
    c. Click the Run as administrator button.
2. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
3. Do not interact with the system until the command completes.
4. After the command completes, wait 5 minutes before running the test.
5. Simultaneously open the PT Adobe Reader Test.pdf file and start the timer.
6. When the file is loaded into Reader (as indicated by the right-hand task column fully loading), stop the timer, and record the result as the Acrobat Reader PDF load time.
7. Move on to the Adobe Photoshop CC 2018 test below.

## Opening files in Adobe Photoshop CC 2018

This test times how long it takes to open a 1.0 GB PSD file in Adobe Photoshop.

1.  Simultaneously open the PT Photoshop test.psd file and start the timer.
2.  When the file is loaded into Photoshop (indicated by the cursor changing from "spinning circle" to "+"), stop the timer, and record the result as the Photoshop file load time.
3.  Move on to the Adobe Premiere CC 2018 test below.

## Opening projects in Adobe Premiere Pro CC 2018

This test times how long it takes to open a 130 MB project in Adobe Premiere Pro CC 2018.

1.  Simultaneously open the PT Premiere Test.prproj file and start the timer.
2.  When the project is loaded into Adobe Premiere Pro, stop the timer, and record the result as the Premiere Pro project load time.
3.  After completing these tests, shut down the system.
4.  Move on to the Microsoft Word test below.

## Opening a document in Microsoft Word

This test times how long it takes open a 100MB Word document.

1.  Simultaneously open the PT Word Test.docx file, and start the timer.
2.  When the file is loaded into Word (indicated by Page 1 of 153 appearing in the bottom taskbar), stop the timer and record the result as the Microsoft Word document launch time.
3.  Move on to the Excel test below.

## Opening a spreadsheet in Microsoft Excel

This test times how long it takes to open a 174MB Excel spreadsheet.

1.  Simultaneously open the PT Excel Test.xlsm file and start the timer.
2.  When the file is loaded into Excel, stop the timer, and record the result as the Excel launch time.
3.  Move on to the PowerPoint test below.

## Opening a presentation in Microsoft PowerPoint

This test times how long it takes to open a 33-slide 180MB PowerPoint presentation in Microsoft PowerPoint.

1.  Simultaneously open the PT PowerPoint Test.pptx file and start the timer.
2.  When the PowerPoint deck has loaded (indicated by the last slide appearing in the left side column), stop the timer, and record the result as the PowerPoint presentation load time.
3.  Move on to the Access test below.

## Opening a database in Microsoft Access

This test times how long it takes to open a 892MB database in Microsoft Access.

1. Simultaneously open the PT Access Test.accdb file and start the timer.
2. When the database has loaded (indicated by the All Access Objects appearing in the left-side column), stop the timer, and record the result as the Access database load time.
3. Close Microsoft Access.
4. Move on to the Outlook test below.

## Opening Microsoft Outlook

This test times how long it takes to open Microsoft Outlook.

1. Simultaneously open Microsoft Outlook and start the timer.
2. When Outlook has loaded (indicated by All folders are up to date appearing in the bottom taskbar), stop the timer, and record the result as the Outlook load time.
3. Close Microsoft Outlook.
4. Repeat all application time tests, starting with Adobe Acrobat Reader, twice more, and report the median of the three tests for each application.

## Measuring time to copy files

This test measures how long it takes to copy a 640MB corpus from the Desktop to the Documents directory.

1. Boot the system and bring up an administrative command prompt:
   a. Type `CMD`
   b. Right-click the Command Prompt app to open App options.
   c. Click the Run as administrator button.
2. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
3. Do not interact with the system until the command completes.
4. After the command completes, wait 5 minutes before running the test.
5. Right-click on the 640MB corpus test file located on the Desktop, and select Copy.
6. Open the Documents directory and right-click in the documents directory.
7. Simultaneously click Paste and start the timer.
8. Stop the timer when the 640MB directory has been successfully copied to the Documents directory.
9. Delete the file from the Documents directory.
10. Shut down the system.
11. Repeat steps 1 through 10 two more times, and report the median of the three runs.

This project was commissioned by Dell Technologies.

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