Boost PC performance: How more available memory can improve productivity

With more memory available, system performance of three Dell devices increased, which can translate to a better user experience

Any computer system uses a mix of random access memory, or RAM, and secondary long-term storage such as solid-state drives (SSDs) to store user and system data. RAM provides temporary storage for the operating system and applications and other data the user is accessing at any given point. Having multiple applications open at once taxes RAM. Complex programs, such as those designers rely on, place an obvious burden on RAM, but browsers are also memory-hungry, especially when users keep many tabs open.

The more RAM in a PC, the greater its capacity to store temporary data, resulting in a smoother user experience. The fast pace of modern business, where employees experience frequent interruptions and regularly switch from one task to another, makes having adequate RAM more important than ever. Without it, users waste valuable time waiting for their systems to retrieve information from slower storage, and productivity and momentum can suffer.

At PT, we performed hands-on testing to quantify the impact of different amounts of RAM on PC performance, which can in turn affect user productivity. Using the Procyon® Office Productivity benchmark, which includes real-world Microsoft 365 tasks,[1] we examined the performance of three Dell™ PCs in two scenarios: first, with all of each PC's memory available to run the benchmark, and second, with each PC's available RAM split between this benchmark and a second one. With more memory available, all three PCs achieved better performance and took less time to complete the benchmark. This indicates that equipping PCs with greater RAM capacity could enable a smoother user experience, sustained focus, and greater productivity. It also suggests that upgrading the RAM in existing PCs could be a sustainable alternative to purchasing new PCs.

	Increased everyday performance	Save time completing day-to-day tasks
Dell Latitude 5440	80.7% higher score*	27.4% less time*
Dell Precision 3470	28.3% higher score**	14.1% less time**
Dell OptiPlex Tower Plus 7010	22.2% higher score**	6.9% less time**

**with 32 GB of available memory vs. the same device with 16 GB of available memory*
***with 64 GB of available memory vs. the same device with 32 GB of available memory*

How we tested

We tested the following devices:

- Dell Latitude 5440 with two 16GB DDR4 SODIMM modules
- Dell Precision 3470 with two 32GB DDR5 SODIMM modules
- Dell OptiPlex Tower Plus 7010 with four 16GB DDR5 UDIMM modules

In our baseline scenario, we ran the Procyon Office Productivity benchmark with no simultaneous workload, allowing the PCs to take full advantage of their memory while under load. This might reflect a typical workday of editing documents, opening slide decks, and accessing spreadsheets without multitasking or intensive applications running in the background.

In the multitasking scenario, we looked at how a system might perform with limited memory available—perhaps while users jump between different apps, edit 3D graphics, compile code, or navigate multiple browser tabs—while performing those same productivity tasks. In our tests, PassMark BurnInTest served as a stand-in for these memory-hungry activities. We configured BurnInTest to utilize 50 percent of each system's memory, leaving the other 50 percent available for system processes and the Procyon Office Productivity benchmark. For more details, see the ***science behind the report***.

Get better everyday performance with more available memory

Procyon Office Productivity rewards faster system responsiveness. When a system achieves a higher overall score, you could expect to load documents, export Excel sheets, edit PowerPoint decks, and search your inbox faster.[2] When the systems were able to utilize more RAM to run the benchmark—32 GB for the Latitude 5440 and 64 GB for the Precision 3470 and OptiPlex Tower Plus 7010—they consistently delivered higher Procyon Office Productivity scores.

With insufficient available system memory, you might experience lengthy wait times or even program crashes. Although you might be able to close some programs to help other processes run faster, this isn't always a desirable option for essential apps. Our test results indicate that with more memory available on your system, you could expect better performance on these everyday productivity tasks. So, instead of letting memory limitations interrupt your focus, you could improve performance by selecting a system with more RAM or making the more sustainable choice of adding more RAM to existing systems.

About Dell Branded memory

The Dell Latitude 5440, Dell Precision 3470, and Dell OptiPlex Tower Plus 7010 systems used Dell Branded memory. Dell Branded memory "has gone through rigorous quality assurance and quality control testing to ensure it will work with your specific Dell System so it is fully compatible and supported by Dell. Getting unqualified or generic products from other vendors can cause downtime that can seriously cost your business and put your entire system at risk."[3]

Learn more: ***https://www.delltechnologies.com/asset/en-us/products/electronics-and-accessories/technical-support/client-peripherals-dell-parts-eguide.pdf***.

The Dell Latitude 5440

We saw the biggest boost in performance on the Dell Latitude 5440. We tested a system with 32 GB of RAM, limiting available memory to 16 GB in the multitasking scenario. As Figure 1 shows, when the system could take full advantage of its memory, it offered significantly better performance on office tasks. When you spend less time waiting for your system to complete office tasks, you may be able to maintain focus longer and get more done during the workday.

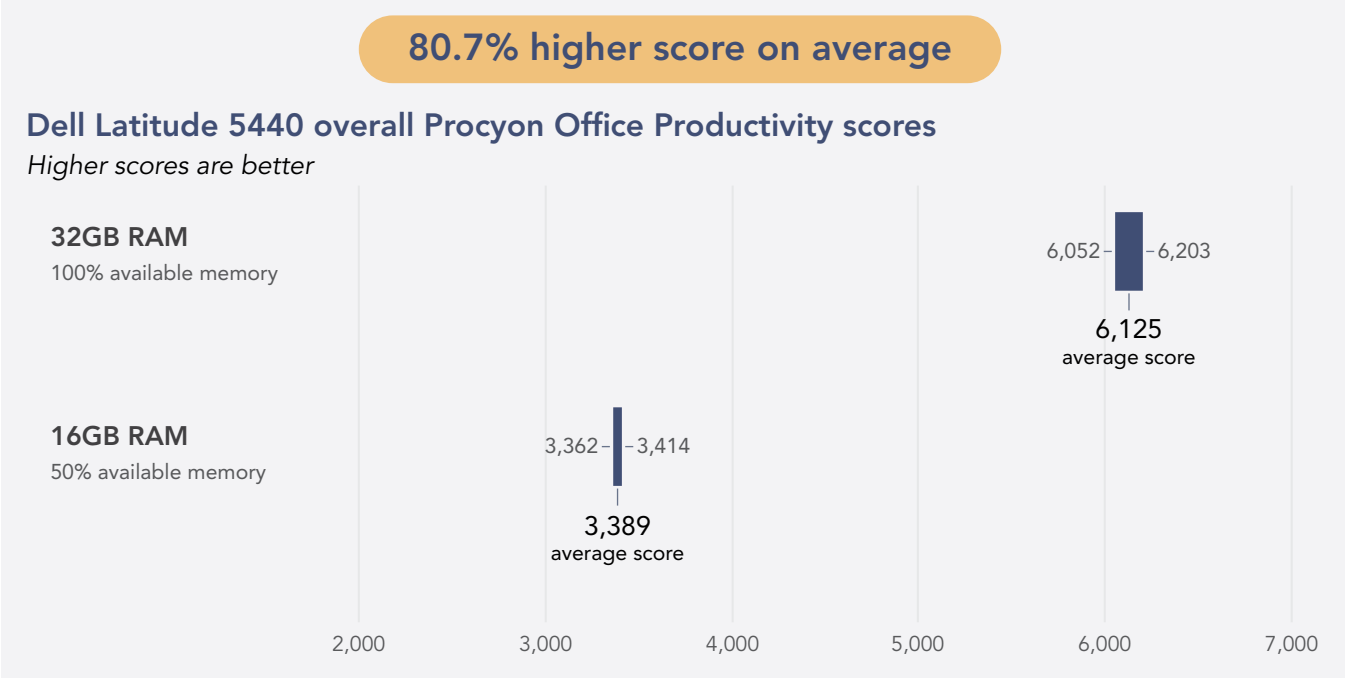


Figure 1: Procyon Office Productivity benchmark overall scores on the Dell Latitude 5440 with 32 GB of available memory and 16 GB of available memory. We show the range of three runs for each configuration. Higher scores are better. Source: Principled Technologies.

About the Dell Latitude 5440 laptop

Equipped with Intel® vPro® with a 13th Gen Intel Core™ processor, the Dell Latitude 5440 also features NVIDIA® MX550 discrete graphics card options, next-generation batteries with ExpressCharge, and "improved temperature and acoustic performance."[4]

Learn more: ***https://www.delltechnologies.com/asset/en-us/products/laptops-and-2-in-1s/technical-support/latitude-5x40-spec-sheet.pdf.external***.

Figure 2 shows how the Dell Latitude 5440 with all its memory available was able to complete this benchmark in 27.4 percent less time than it needed while other activities used half of the memory. This time savings could improve productivity by allowing a user to complete their tasks faster under multitasking conditions.

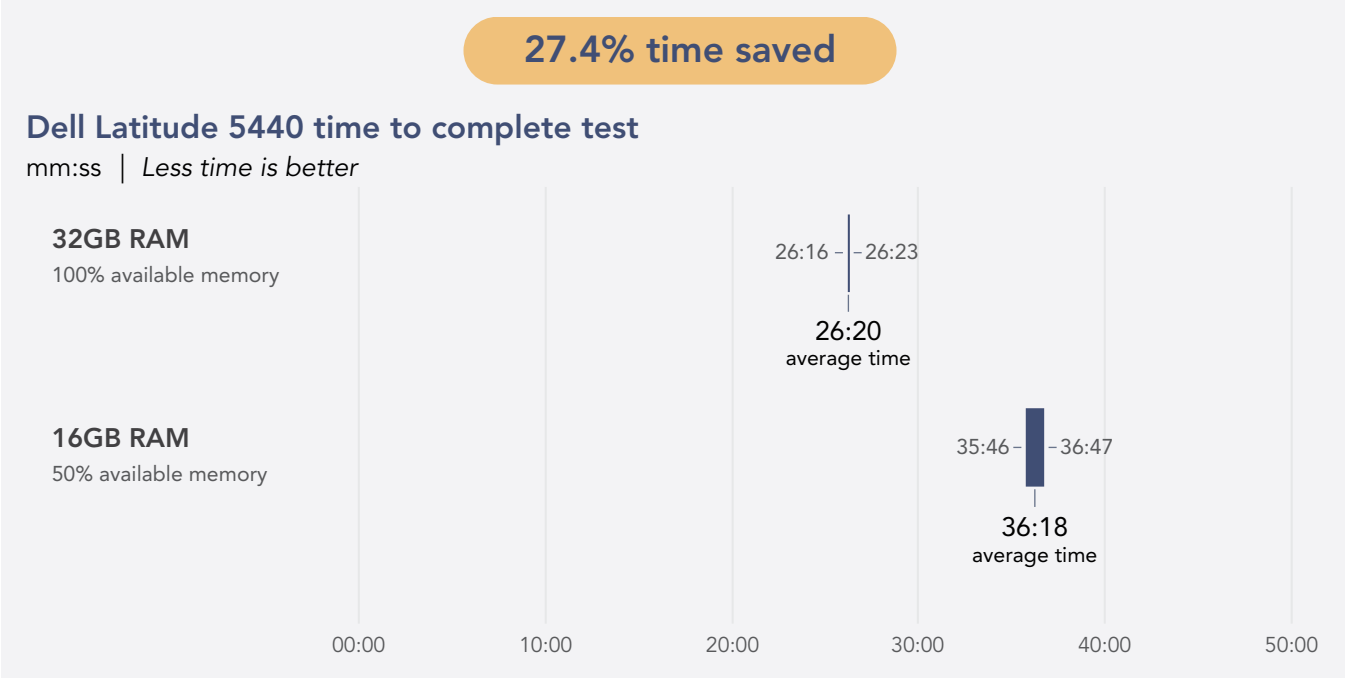
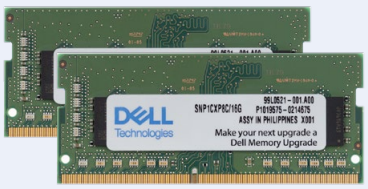


Figure 2: Time to complete the Procyon Office Productivity benchmark on the Dell Latitude 5440 with 32 GB of available memory and 16 GB of available memory. We show the range of three runs for each configuration. Less time is better. Source: Principled Technologies.



About the memory modules this PC used

The Dell Latitude 5440 used two Dell Branded 16GB DDR4 SODIMM modules. These 3200 MT/s single-rank, unbuffered modules are compatible with a wide range of Dell systems.[5]

Learn more: ***https://www.dell.com/en-us/shop/dell-memory-upgrade-16-gb-1rx8-ddr4-sodimm-3200-mt-s/apd/ab371022/memory***.

The Dell Precision 3470

Testing the Dell Precision 3470 yielded similar results. As Figure 3 shows, leaving all 64 GB of memory available while running the Procyon Office Productivity benchmark enabled the system to achieve a 28.3 percent higher score on average than it did when we simulated multitasking with programs that took up 32 GB of memory. With the ability to complete these tasks faster, you could enjoy a smoother user experience while you multitask throughout the day.

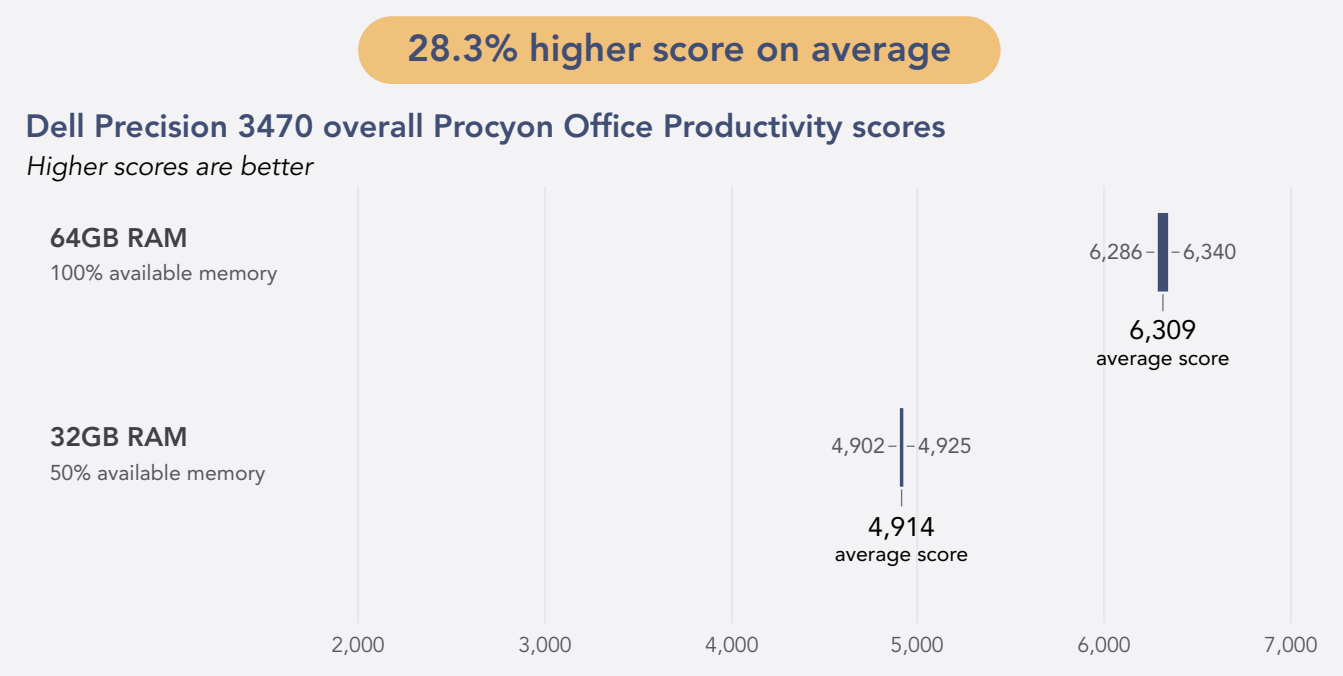


Figure 3: Procyon Office Productivity benchmark overall scores on the Dell Precision 3470 with 64 GB of available memory and 32 GB of available memory. We show the range of three runs for each configuration. Higher scores are better. Source: Principled Technologies.

About the Dell Precision 3470 mobile workstation

The Dell Precision 3470 is "[ideal] for engineering, federal, finance, research and Microsoft Office power users driven to produce results and strive for efficiency," according to Dell.[6] Its 14-inch, 400-nit display with up to FHD 100% sRGB can help users see more of their work, while its FHD IR camera offers an AI-based proximity sensor for privacy and noise cancellation. Creative users may also enjoy its larger click pad and touchscreen.[7]

Learn more: ***https://www.delltechnologies.com/asset/en-us/products/workstations/technical-support/precision-3470-spec-sheet.pdf***.

Figure 4 shows how long the Dell Precision 3470 needed to complete the benchmark under the two conditions. Having all its memory available reduced the time the system needed by 14.1 percent.

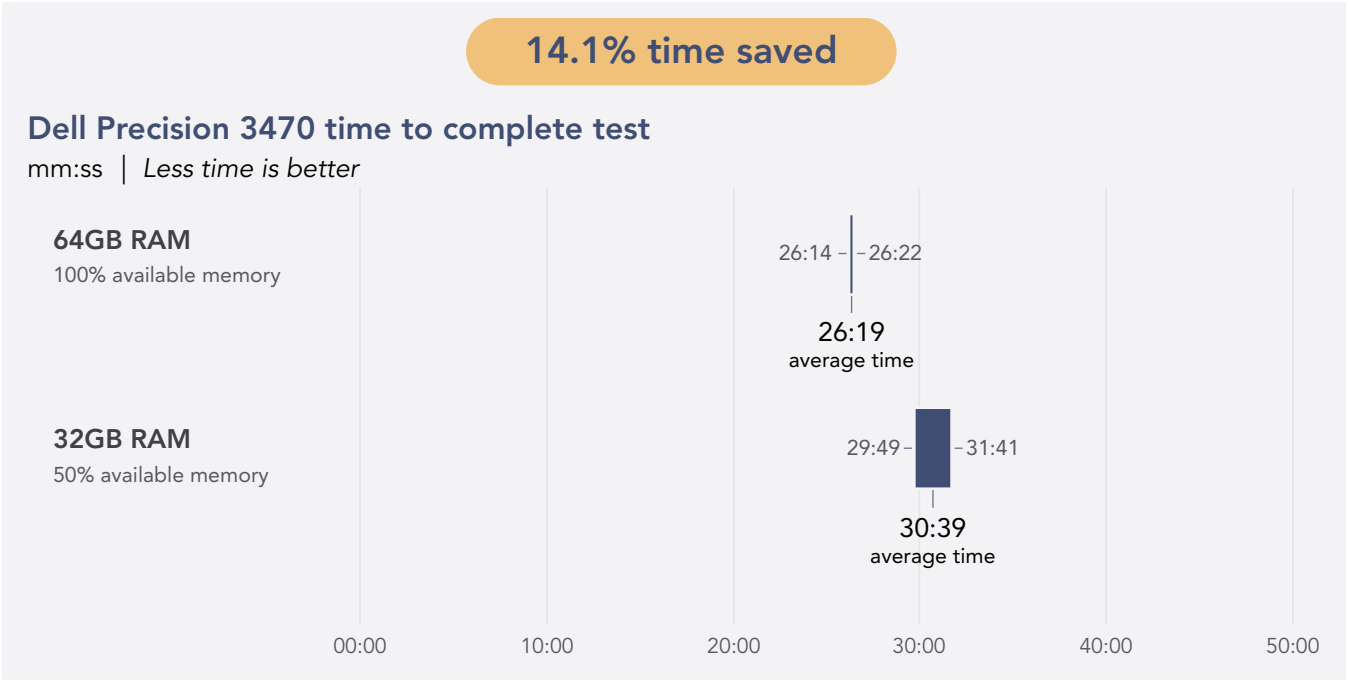


Figure 4: Time to complete the Procyon Office Productivity benchmark on the Dell Precision 3470 with 64 GB of available memory and 32 GB of available memory. We show the range of three runs for each configuration. Less time is better. Source: Principled Technologies.

About the memory modules this PC used

The Dell Precision 3470 used two 32GB DDR5 SODIMM modules, each with 4800 MT/s. These Dell Branded modules are compatible with many other Dell systems.[8]

Learn more: ***https://www.dell.com/en-us/shop/dell-memory-upgrade-32-gb-2rx8-ddr5-sodimm-4800-mt-s/apd/ab949335***.

The Dell OptiPlex Tower Plus 7010

As Figure 5 shows, the Dell OptiPlex Tower Plus 7010 achieved a higher overall score with its full memory available than it did with half the memory available in the multitasking scenario. In other words, if your work generally uses up 32 GB of memory on this PC, you could see diminished performance as you tackle emails, spreadsheets, and slide decks on top of the work that takes up half the memory. But if you had 64 GB of memory available, you could enjoy faster performance on these everyday tasks.

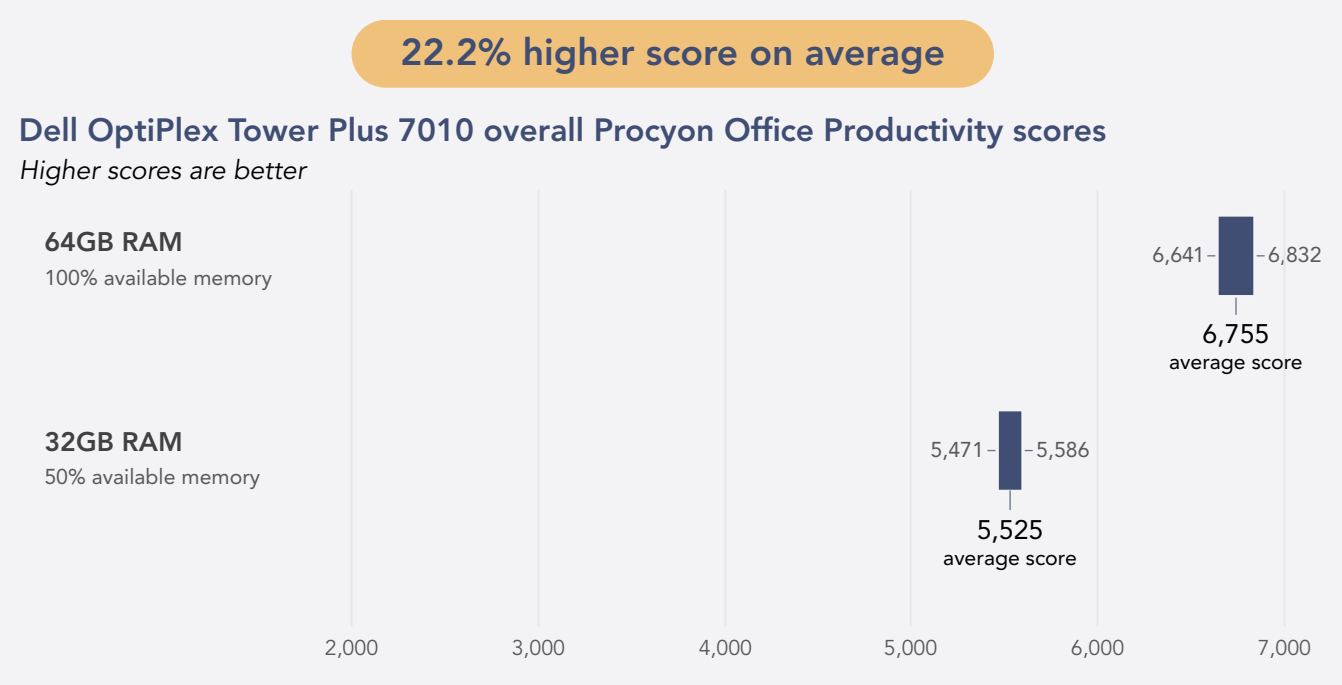


Figure 5: Procyon Office Productivity benchmark overall scores on the Dell OptiPlex Tower Plus 7010 with 64 GB of available memory and 32 GB of available memory. We show the range of three runs for each configuration. Higher scores are better. Source: Principled Technologies.

About the Dell OptiPlex Tower Plus 7010 desktop

The Dell OptiPlex Tower Plus 7010 features a 13th Gen Intel Core processor, Windows 11 Pro, and a wide variety of ports and slots. With built-in Dell Optimizer AI-based software and the ability to support up to four displays, OptiPlex systems are also a sustainable option, with EPEAT Gold and ENERGY STAR® certifications.[9]

Learn more: ***https://www.delltechnologies.com/asset/en-hk/products/desktops-and-all-in-ones/technical-support/optiplex-tower-spec-sheet.pdf***.

Figure 6 shows the amount of time it took for the Dell OptiPlex Tower Plus 7010 to execute the benchmark with different amounts of memory available. With all its memory available, it needed 6.9 percent less time.

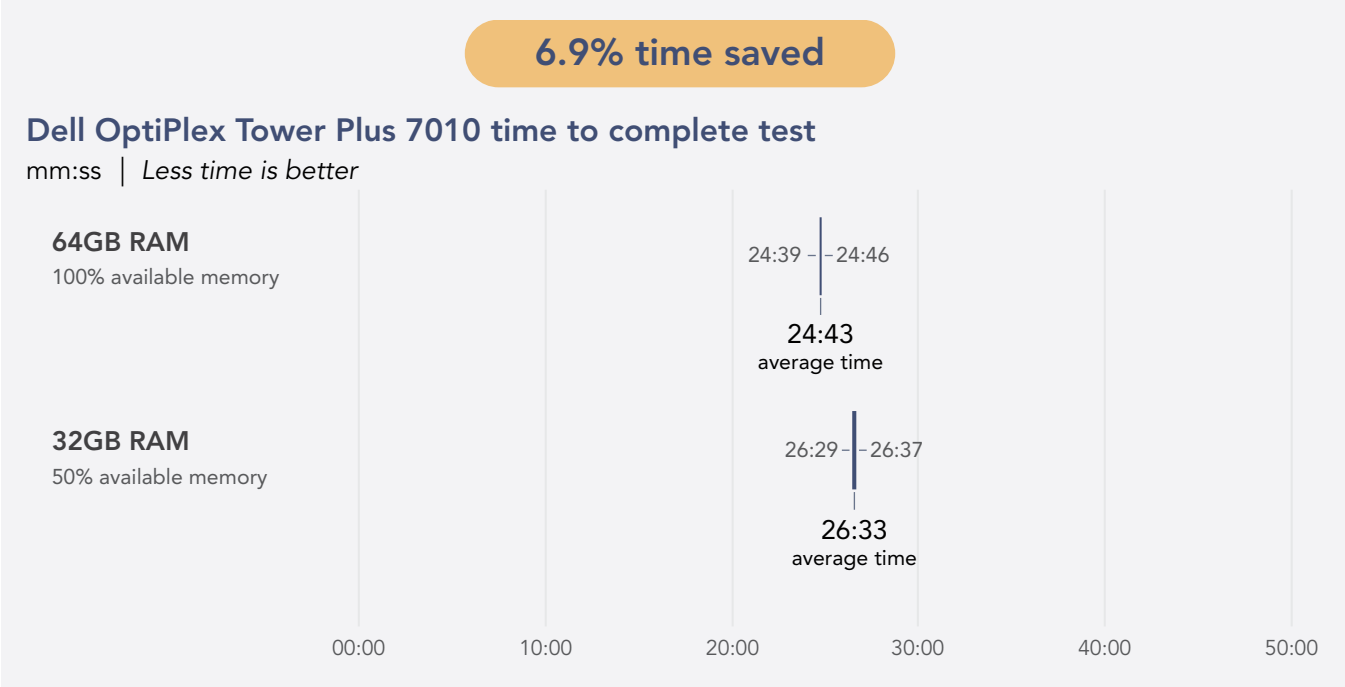
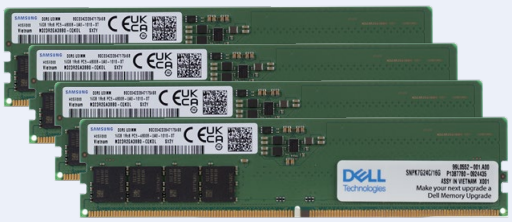


Figure 6: Time to complete the Procyon Office Productivity benchmark on the Dell OptiPlex Tower Plus 7010 with 64 GB of available memory and 32 GB of available memory. We show the range of three runs for each configuration. Less time is better.
Source: Principled Technologies.



About the memory modules this PC used

The Dell OptiPlex Tower Plus 7010 used four Dell Branded 16GB DDR5 UDIMM modules. With 4800 MT/s, these x8 chip, single-rank modules are also unbuffered.[10]

Learn more: ***https://www.dell.com/en-us/shop/dell-memory-upgrade-16-gb-1rx8-ddr5-udimm-4800-mt-s/apd/ab883074/***.

Conclusion

When your system has plenty of RAM to meet your needs, you can efficiently access the applications and data you need to finish projects and to-do lists without sacrificing time and focus. Our test results show that with more memory available, three Dell PCs delivered better performance and took less time to complete the Procyon Office Productivity benchmark. These advantages translate to users being able to complete workflows more quickly and multitask more easily. Whether you need the mobility of the Latitude 5440, the creative capabilities of the Precision 3470, or the high performance of the OptiPlex Tower Plus 7010, configuring your system with more RAM can help keep processes running smoothly, enabling you to do more without compromising performance.

1. UL Solutions, "Procyon® Office Productivity Benchmark," accessed April 19, 2024, *https://benchmarks.ul.com/procyon/office-productivity-benchmark*.
2. UL Solutions, "Procyon® Office Productivity Benchmark."
3. Dell, "Dell Memory Upgrade - 32 GB - 2Rx8 DDR5 SODIMM 4800 MT/s," accessed April 19, 2024, *https://www.dell.com/en-us/shop/dell-memory-upgrade-32-gb-2rx8-ddr5-sodimm-4800-mt-s/apd/ab949335*.
4. Dell, "Latitude 5340/5440/5540," accessed April 19, 2024, *https://www.delltechnologies.com/asset/en-us/products/laptops-and-2-in-1s/technical-support/latitude-5x40-spec-sheet.pdf.external*.
5. Dell, "Dell Memory Upgrade - 16 GB - 1Rx8 DDR4 SODIMM 3200 MT/s," accessed April 19, 2024, *https://www.dell.com/en-us/shop/dell-memory-upgrade-16-gb-1rx8-ddr4-sodimm-3200-mt-s/apd/ab371022/memory*.
6. Dell, "Precision 3470," accessed April 19, 2024, *https://www.delltechnologies.com/asset/en-us/products/workstations/technical-support/precision-3470-spec-sheet.pdf*.
7. Dell, "Precision 3470."
8. Dell, "Dell Memory Upgrade - 32 GB - 2Rx8 DDR5 SODIMM 4800 MT/s," accessed April 19, 2024, *https://www.dell.com/en-us/shop/dell-memory-upgrade-32-gb-2rx8-ddr5-sodimm-4800-mt-s/apd/ab949335*.
9. Dell, "OptiPlex Tower," accessed April 19, 2024, *https://www.delltechnologies.com/asset/en-hk/products/desktops-and-all-in-ones/technical-support/optiplex-tower-spec-sheet.pdf*.
10. Dell, "Dell Memory Upgrade - 16 GB - 1Rx8 DDR5 UDIMM 4800 MT/s," accessed April 19, 2024, *https://www.dell.com/en-us/shop/dell-memory-upgrade-16-gb-1rx8-ddr5-udimm-4800-mt-s/apd/ab883074/*.

Read the science behind this report at https://facts.pt/hM7wpvC ▶

Principled Technologies®

Facts matter.®

This project was commissioned by Dell Technologies.