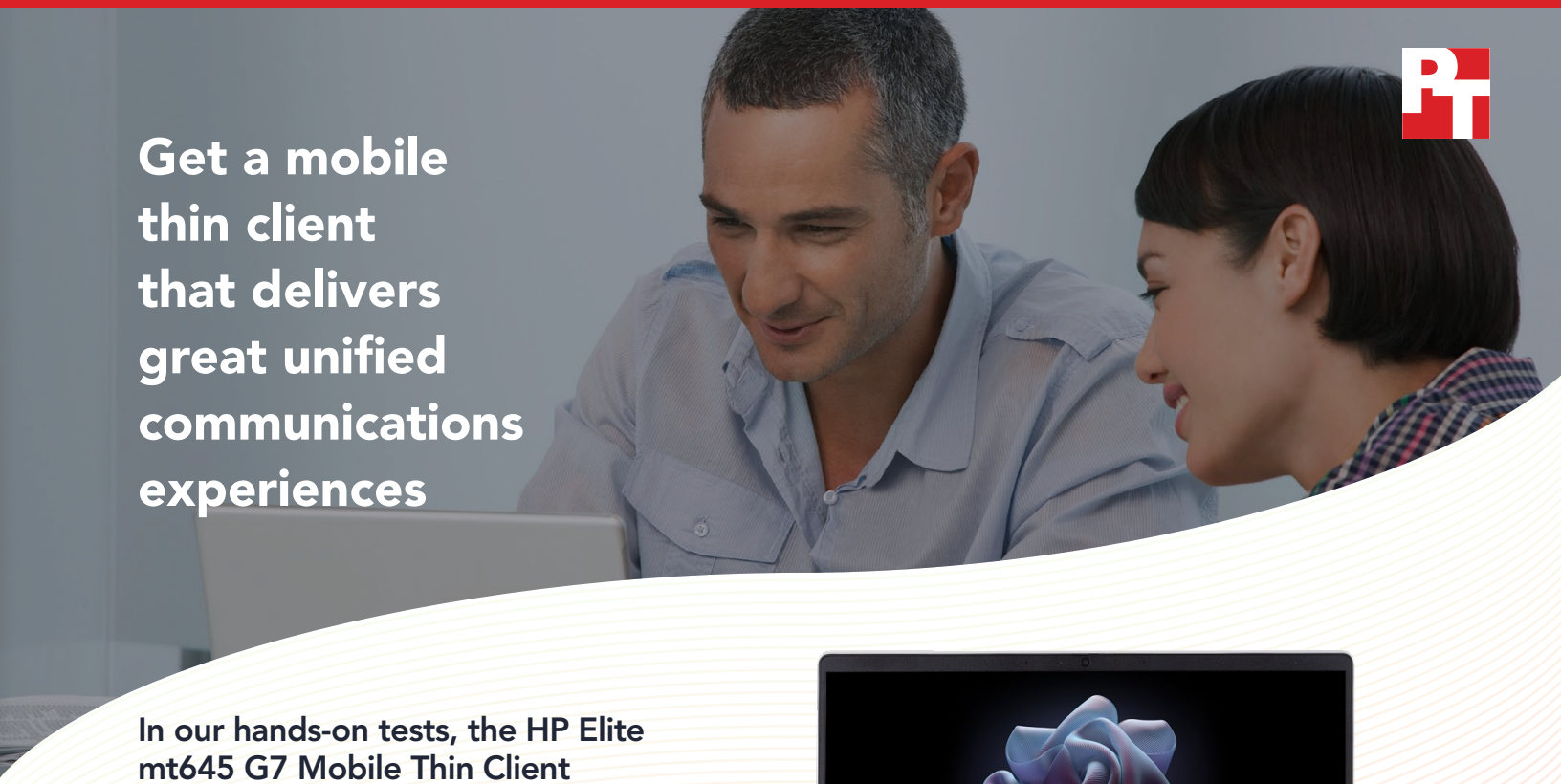

# Get a mobile thin client that delivers great unified communications experiences

**In our hands-on tests, the HP Elite mt645 G7 Mobile Thin Client powered by an AMD Ryzen™ 5 5625U processor provided comparable or slightly better system performance, longer battery life, and comparable unified communications experiences versus a repurposed business laptop with an Intel Core i5 processor**

**Speed day-to-day tasks with a 49.9% higher overall PassMark rating**

**Work from almost anywhere with over 11 hours and 21 minutes of battery life**

**Deliver a good unified communications experience to end users in Citrix, VMware, and Windows 365 VDI environments**

It may be a bad idea to mix business with pleasure, but how many of us have checked work email on our personal smartphone or used a work device for personal activities? In an article on ZDNet, a former IT pro begs us to stop, reminding us that "cybersecurity incidents can have serious negative consequences for both your employer and you."[1] One way employers can reduce this potential threat is by providing their employees with mobile thin clients, which can be cost-effective, easy to manage, and less vulnerable to malware than traditional laptops.[2] In the past, a thin client was a "stripped-down endpoint that [lacked] the bells and whistles of a traditional PC or laptop." Things are different now.[3]

The HP Elite mt645 G7 Mobile Thin Client is powered by an AMD Ryzen™ 5000 Series processor. Our hands-on tests show this newcomer delivers system performance that matches or exceeds that of a repurposed Dell™ Latitude™ 3420 business laptop with an Intel® Core™ i5 processor and customer-installed thin client operating systems. Plus, we found that the HP Elite mt645 G7 Mobile Thin Client provided unified communications experiences for end users that were comparable to those of the Dell Latitude 3420 in Citrix® Virtual Apps and Desktops™ 7, VMware® Horizon® 8, and Windows 365 Cloud PC virtual desktop infrastructure (VDI) environments.

## How we tested

Despite the prevalence of fast broadband networks, powerful servers, and inexpensive storage, a continuing roadblock to mobile thin client adoption has been a perceived lack of processor power.[4] To determine the system performance gains you could expect from investing in HP Elite mt645 G7 Mobile Thin Clients powered by AMD Ryzen™ 5000 Series processors instead of repurposing traditional laptops with Intel Core i5 processors, we conducted business-application-based system responsiveness testing and unified communications end-user experience comparisons on both types of devices. We conducted Microsoft Teams and Zoom tests in three environments: Citrix Virtual Apps and Desktops 7, VMware Horizon 8 and , Windows 365 Cloud PC.

**HP Elite mt645 G7 Mobile Thin Client powered by an AMD Ryzen™ 5 5625U processor (2.3-4.3GHz), AMD Radeon™ Graphics, Realtek Wi-Fi 6, a Bluetooth® 5.3 wireless card, and a 51Whr battery**

**Dell Latitude 3420 business laptop powered by an Intel Core i5-1135G7 processor (2.4-4.2GHz), Intel Iris Xe Graphics, Intel Wi-Fi 6, a Bluetooth 5.2 wireless card, and a 54Whr battery**

Both mobile devices included integrated graphics, 8 GB of memory (2 x 4 GB), and 256 GB of SSD storage. While the HP Elite mt645 G7 Mobile Thin Client shipped with a Windows 10 IoT Enterprise Long Term Servicing Channel (LTSC) 21H2 operating system and an HP ThinPro OS, we had to install both the Dell ThinOS and Windows 10 IoT Enterprise LTSC operating systems on the Dell Latitude 3420 before we started testing.

To compare system responsiveness from many angles, we ran the following benchmarks:

- PCMark 10 Standard
- PassMark PerformanceTest
- Geekbench 5

We also compared battery life and efficiency by running the PCMark 10 benchmark.

For the unified communications end-user experience comparison, we first set up Citrix Virtual Apps and Desktops 7, VMware Horizon 8, and Windows 365 Cloud PC VDI environments. Then, we compared webcam and audio capabilities on the test devices using Microsoft Teams and Zoom applications.

We also tried to install and run the Geekbench performance benchmark on Linux®-based versions of these devices. Unfortunately, we were able to accomplish this on only the Linux-based HP Elite mt645 G7 Mobile Thin Client. Our detailed results are in the science behind the report.

The benchmark scores, battery life, and unified communications end-user experience results we report reflect the specific configurations we tested. Any difference in the configurations, as well as browsers, screen brightness, network traffic, or software additions, can affect these results. For more information on the test devices as well as our testing parameters and procedures, see the science behind the report.

## About HP Elite mt645 G7 Mobile Thin Client

HP designed this 14-inch mobile thin client for productivity and performance in hybrid work environments. This thin client includes fast, efficient AMD Ryzen™ 5000 Series processors with premium, commercial-grade connectivity and multi-layered security features.

To learn more about HP Elite mt645 G7 Mobile Thin Client, visit https://www.hp.com/us-en/shop/pdp/hp-elite-mt645-g7-mobile-thin-client.

### Keep confidential data safe

HP Elite Mobile Thin Clients securely store data offsite, and end users can work with only data and applications to which they have authorized access. They also can't download new software. Only IT personnel with server-level permissions can add programs to the networked systems.[5]

### About AMD Ryzen 5 5625U processors

AMD Ryzen™ 5 5000 Series processors are built on "Zen 3" cores with AMD Radeon™ Graphics. This model includes PCIe® 3.0 connectivity and AMD Enhanced Virus Protection (NX bit).[6]

## Mobile thin client benefits aren't limited to cloud workers

You might think that only healthcare, financial services, and call centers environments can benefit from investing in HP Mobile Thin Clients. However, according to the TechTarget website, "Any organization that works with highly sensitive data or must meet strict compliance guidelines should consider using mobile thin clients because they allow users to securely access resources from any location."[7]

Plus, unlike traditional laptops, HP Mobile Thin Clients are relatively inexpensive, plug-and-play investments that don't need large amounts of local storage or software licenses tied to individual devices to get the job done. These hardware and potential software cost savings, along with the associated cost savings of managing a single server instead of a fleet of laptop operating systems, could be a potential boon for organizations of all shapes and sizes. An added bonus is that server-hosted software reduces the risk of hacks and leaks "because each user is limited to what they can do at the local level. Users can't download new software with local permissions, and they can't change data."[8]

## Deliver a good unified communications experience to end users

Video conferencing is a critical business tool that has become even more important in remote and hybrid work environments. Achieving good performance in VDI environments can be challenging because unified communications solutions such as Microsoft Teams and Zoom put a lot of resource strain on virtualization platforms.[9] For our unified communications end-user experience comparison, we first set up Citrix Virtual Apps and Desktops 7, VMware Horizon 8, and Windows 365 Cloud PC VDI environments. Then, we compared webcam and audio capabilities on the test devices using both the Microsoft Teams and Zoom applications:

- Microsoft Teams + Citrix Virtual Apps and Desktops 7
- Microsoft Teams + VMware Horizon 8
- Microsoft Teams + Windows 365 Cloud PC
- Zoom + Citrix Virtual Apps and Desktops 7
- Zoom + VMware Horizon 8
- Zoom + Windows 365 Cloud PC

An important metric in video and audio quality is bitrate, a term that describes the amount of data transferring in a given time, but many other factors also matter in VDI environments:

1. A higher video bitrate translates to a higher quality video—but a higher-quality video requires more bandwidth. See the callouts on the next page.
2. Unreasonably high bitrate can put additional strain on hardware and data bandwidth, which may lead to glitching.
3. Different screen resolutions need different bitrates.
4. One-on-one (1:1) meetings have different bandwidth requirements than group meetings.

We followed all VDI platform and Microsoft Teams and Zoom app optimization recommendations before we conducted our 1:1 unified communications end-user experience tests. We compared the relevant quality of service (QoS) measurements from each VDI environment. These measurements report the bitrate results in kilobits per second (kbps), the jitter and latency results in milliseconds (ms), and frames per second (FPS). We found that both devices performed comparably overall in the Microsoft Teams and Zoom apps on Citrix Virtual Apps and Desktops 7, VMware Horizon 8, and Windows 365 Cloud PC VDI environments.

See the science behind the report to dive into each specific VDI environment and our line-by-line results.

## Microsoft Teams bandwidth requirements

1:1 audio calls = 30kbps

1:1 audio calls with screen sharing = 130kbps

1:1 quality video calls = 500kbps

1:1 720p HD video calls = 1.2Mbps

1:1 1080p HD video calls = 1.5Mbps

Group video calls = 500kbps/1Mbps

HD group video calls (540p videos on 1080p screen) = 1Mbps/2Mbps[10]

## Zoom bandwidth requirements

1:1 audio voice over Internet Protocol (VoIP) = 60 – 80kbps (receiving)

1:1 Zoom Phone calls = 60 – 100kbps

1:1 audio calls with screen sharing = 50 – 75kbps

1:1 video calls with screen sharing = 50 – 150kbps

1:1 quality video calls = 600kbps*

1:1 720p HD video calls = 1.2Mbps*

1:1 1080p HD video calls = 3.8Mbps/3.0Mbps*

Group video calls = 1.0Mbps/600kbps*

720p HD group video calls = 2.6Mbps/1.8Mbps*

1080p HD group video calls = 3.8Mbps/3.0Mbps*[11]

**(sending/receiving)*

# Meet or exceed productivity objectives

Because there is no single type of organization that uses VDI for its remote workers, we conducted a range of industry-standard benchmark tests that measure different aspects of system performance. Together, these results provide a picture of the kind of day-to-day responsiveness end users are likely to experience in a variety of situations. In this section, we show what our hands-on benchmark tests revealed.

## Speed day-to-day tasks

Where remote and hybrid workers complete their assignments may be flexible, but getting the job done quickly and efficiently rarely is. While some of the performance gains are modest, these marginal savings add up over time.

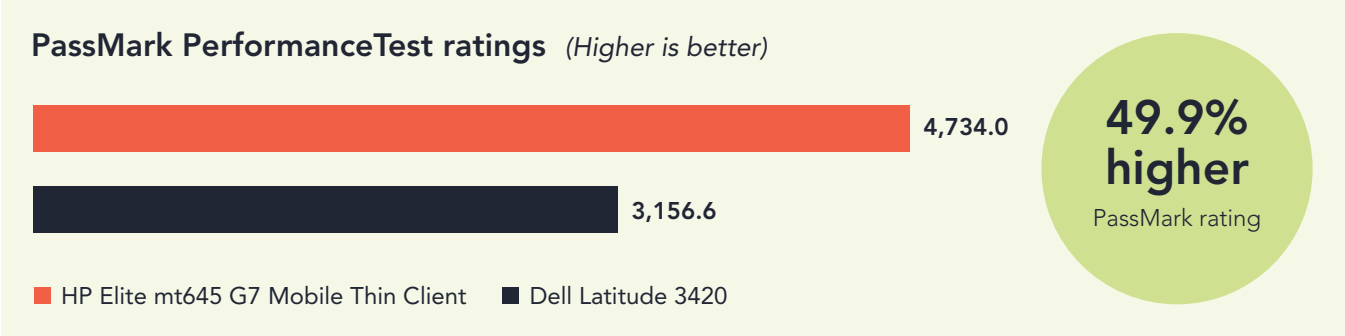


Figure 1: PassMark PerformanceTest ratings. Higher is better. Source: Principled Technologies.

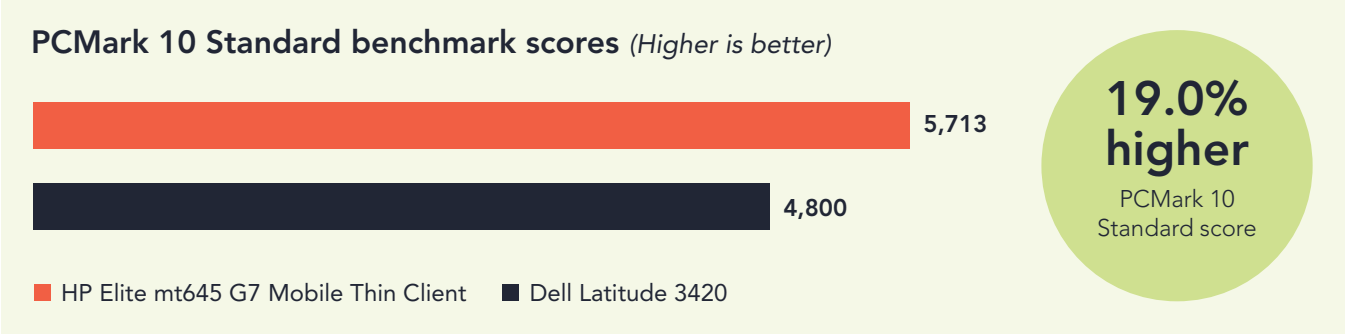


Figure 2: PCMark 10 Standard benchmark scores. Higher is better. Source: Principled Technologies.

## Unlock resource-intensive app potential

Your employees may not play games on these mobile devices—but the Geekbench resource-intensive benchmark scores can provide good insights on overall performance. For example, higher Geekbench single-core and multi-core scores can translate to speedier system response times with demanding productivity apps such as PowerPoint and Excel. And higher GPU scores can translate to speedier system response times when using computer-aided design (CAD) programs, MATLAB scientific simulation software, and product development and design applications.

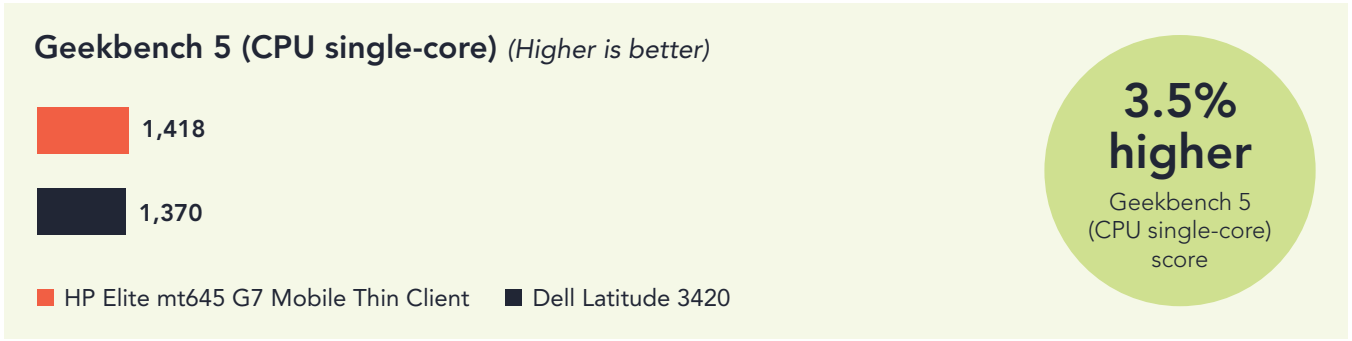


Figure 3: Geekbench 5 (CPU single-core) benchmark scores. Higher is better. Source: Principled Technologies.

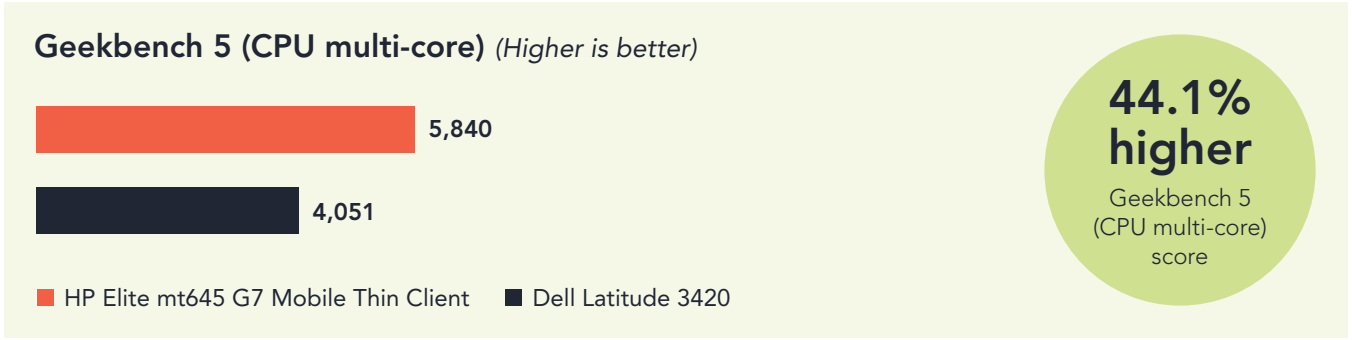


Figure 4: Geekbench 5 (CPU multi-core) benchmark scores. Higher is better. Source: Principled Technologies.

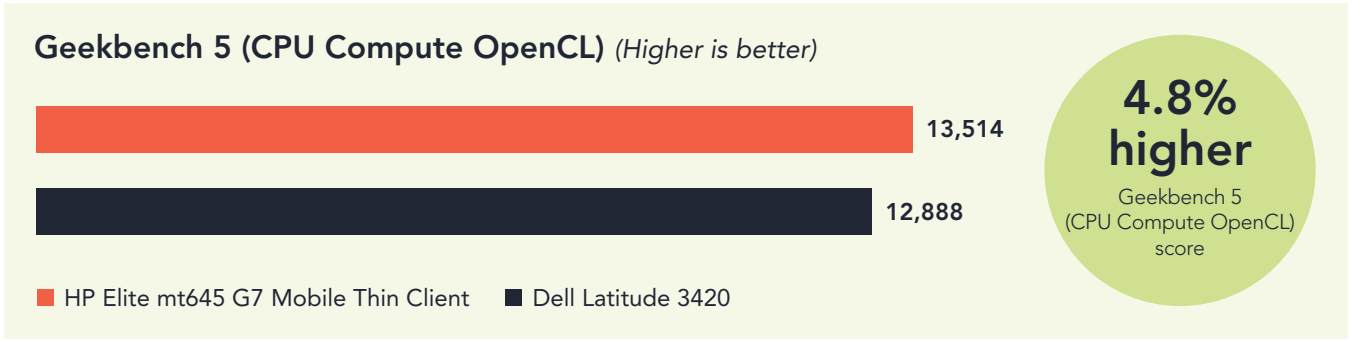


Figure 5: Geekbench 5 (GPU Compute OpenCL) benchmark scores. Higher is better. Source: Principled Technologies.

## Work from almost anywhere

Working remotely means employees have the freedom to complete tasks where they want—provided there's a strong internet connection. A mobile device with more than a workday's worth of battery life lets workers avoid being tethered to a plug.

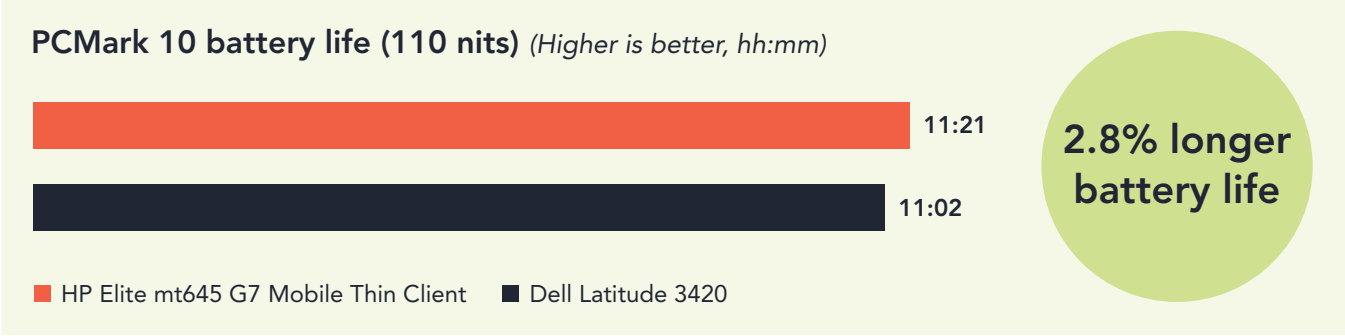


Figure 6: PCMark 10 battery life results. Time (hh:mm). More time is better. Source: Principled Technologies.

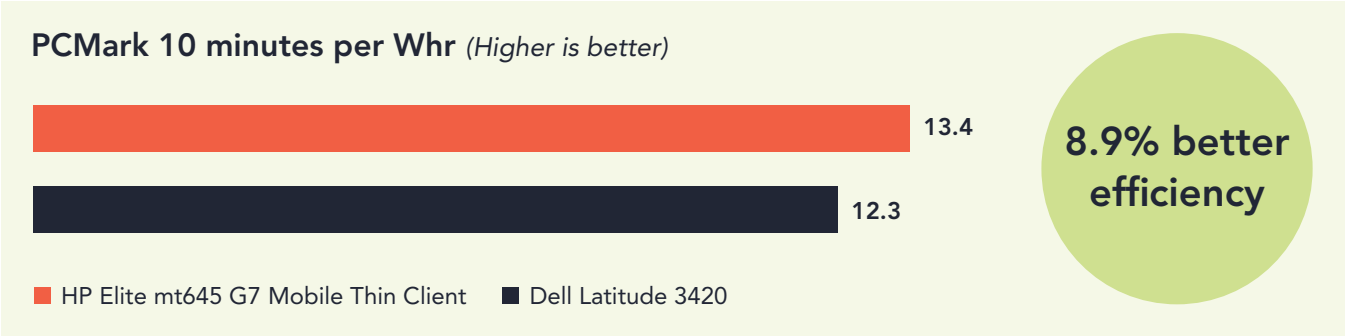


Figure 7: PCMark 10 battery life results. Higher is better. Source: Principled Technologies.

## About the benchmarks

The **PassMark PerformanceTest** benchmark gathers CPU, disk, memory, and 2D/3D graphics performance metrics. It combines these individual component metrics to create a single, overall score: the PassMark rating.[12]

The **PCMark 10 Standard** benchmark contains a set of tests that simulate a wide range of modern office activities, including everyday productivity tasks, web browsing, video conferencing, and CPU-intensive digital media content tasks.[13]

The **Geekbench 5** benchmark tests how well a system can handle demanding tasks such as gaming.[14]

## Conclusion

Choosing HP Mobile Thin Clients over repurposed laptops is a strategy that may open the door to more secure remote data accessibility, potentially easier remote fleet management, cost savings, and increased productivity. Investing in effective HP Elite mt645 G7 Mobile Thin Clients powered by AMD Ryzen™ 5000 Series processors that also provide quality unified communications experiences in multiple VDI environments is a good way to keep end users happy, improve their day-to-day experiences, and facilitate a productivity boost.


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