**PT**

Deploy operating systems and drivers to PCs with a single process regardless of processor

We compared the time and effort two deploy operating systems on laptops with AMD and Intel processors and with two different management approaches

Managing PC fleets can be a time-intensive task, and the recent increase in remote work has complicated it further. According to Forbes Advisor, over 40 percent of employees work remotely part-time or full-time.[1] When your IT teams are deploying PCs to new employees or replacing broken or outdated systems, they need a simple, quick process that makes it easy to get the system directly to the employee no matter their location. Some experienced IT administrators may worry that a mixed-CPU PC environment, containing some systems with AMD processors and others with Intel® processors, will increase the costs and challenges. Or, they may wonder if completely changing from Intel processor-powered PCs to AMD processor-powered PCs would add extra deployment burdens.

We explored these concerns by testing the process of deployment with two pairs of laptops from HP and Lenovo, each pair containing one laptop powered by AMD and one powered by Intel. Because different teams use different deployment and management tools, we performed two different deployments using different tools in the Intune family of products: a traditional approach, and a modern approach with Windows Autopilot. We found that while the two deployment tools required slightly different amounts of effort, the processors did not—within each approach, the deployment process was identical regardless of processor and the amount of hands-on time was almost identical. Additionally, in tests with Windows Autopilot, we found that the AMD-processor powered laptops took less system time during deployment. Read on to learn more about our findings.
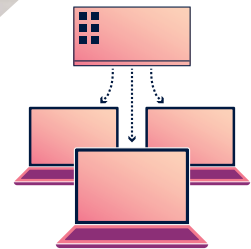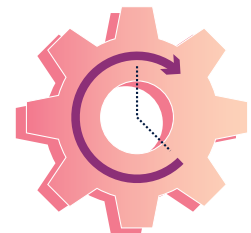
Use the same process
to deploy AMD and Intel processor-powered systems

Plan on the same amount of hands-on time
to deploy AMD and Intel processor-powered systems

Wait less for systems to complete deployment
with AMD processor-powered laptops using Windows Autopilot*

*on the systems we tested: a Lenovo ThinkPad T14 with an AMD Ryzen 7 PRO 7840U processor vs. the same device with an Intel Core i7-1365U vPro processor and an HP EliteBook 845 G10 with an AMD Ryzen 7 PRO 7840U processor vs. an HP EliteBook 840 G10 with an Intel Core i7-1365U vPro processor

How we tested

Whether they support enterprises or small- or medium-sized businesses (SMBs), IT teams have endless to-do lists. Operating system deployment and driver installation have the potential to be easy checkboxes. When these tasks are simple and consistent across devices with different processors, your administrators can spend more of their valuable time on the complex business problems that require real brainpower.

To highlight the similarities in the deployment process between AMD and Intel processor-powered systems, we performed our testing on two pairs of laptops:

Lenovo systems:

- **Lenovo® ThinkPad® T14 Gen 4 laptop** with AMD Ryzen™ 7 PRO 7840U processor
- **Lenovo ThinkPad T14 Gen 4 laptop** with Intel Core™ i7-1365U vPro processor

HP systems:

- **HP EliteBook 845 14" G10 Notebook** with AMD Ryzen 7 PRO 7840U processor
- **HP EliteBook 840 14" G10 Notebook** with Intel Core i7-1365U vPro processor

We completed two phases of testing. In the first phase, we assessed how much time and effort it took to deploy Windows 11 Pro operating systems and install drivers on the AMD and Intel processor-powered systems using a more traditional process with Microsoft Configuration Manager. We created an environment simulating an organization managing four laptops on premises. We deployed a Microsoft Active Directory and Configuration Manager deployment server and used those services to complete OS deployment and driver installation. We plugged each laptop into a deployment switch and powered it on, at which point it connected to the deployment server. The server then pushed an OS onto the target laptop.

In addition to testing a traditional approach to deployment with Microsoft Configuration Manager, we wanted to look at the deployment experience of organizations embracing newer cloud-based management tools from Microsoft. As Microsoft Intune expands its cloud management offerings, it says that its "cloud-based unified endpoint management solution…has become a market leader."[2] In the second phase of our testing, we simulated an organization using cloud-based modern device management tools. We reset the systems to factory default and deployed operating systems using Microsoft Autopilot, supported by Microsoft Intra ID and Intune. Our administrator added the device identification information to our Intune instance, configured our organization settings, and then simulated a user login to each device.

A consistent process, year after year

In addition to performing fleet-wide laptop upgrades, organizations must periodically purchase new laptops for employees and replace broken systems. If the existing laptops all have the same type of processor, IT may have concerns about branching out into systems with a different processor type or managing a mixed-CPU Windows environment.

We've looked at this dilemma in reports going back to 2018. In 2018, we compared Windows 10 image deployment processes for equivalent systems equipped with AMD and Intel processors. We repeated our testing in 2021. In both of those studies, we found that administrators could use the same process to deploy a Microsoft Windows 10 (or Windows 10 Pro) image to AMD and Intel processor-based systems. To learn more, read the 2018 report at https://www.principledtechnologies.com/AMD/PRO_processors_image_deployment_competitive_0518.pdf or the 2021 report at https://www.principledtechnologies.com/AMD/Ryzen-5-PRO-deployment-competitive-combined-0321.pdf.

This year's study was the first where we included the Windows Autopilot approach. While hands-on time was nearly identical, we saw system time savings with the AMD-processor powered systems. See page 5.

Use the same effort and similar time to deploy a laptop regardless of processor with a traditional Configuration Manager deployment

Deploying the operating systems

Different employees need different things from their laptops, and as your organization grows, you may wish to purchase a range of devices with processors from different vendors or change vendors completely. If you choose to move into a mixed-CPU environment—or if you opt for an entirely new fleet of systems with different CPUs— you want to make sure that you're not signing up for a new, complicated deployment process.

Our results indicate that you don't have to worry. In our testing with Configuration Manager, it took the same effort to deploy an operating system regardless of processor (see Figure 1). Both HP laptops required the same 28 steps, while both Lenovo laptops took 30 steps. In neither case did the processor inside the laptop affect the effort we put in for deployment.

The time required to deploy an OS was also very similar within each pair of laptops. The difference between the two HP systems was 10 seconds, with the AMD processor-powered system being faster to deploy. Only 4 seconds separated the two Lenovo systems, this time with the AMD processor-powered device slightly slower. And when we look at just the time our admin had to work with the devices hands-on, the time differences remain very small. Taken together, our results just how little a difference the processor made in the deployment process.

Deploying one laptop using Configuration Manager
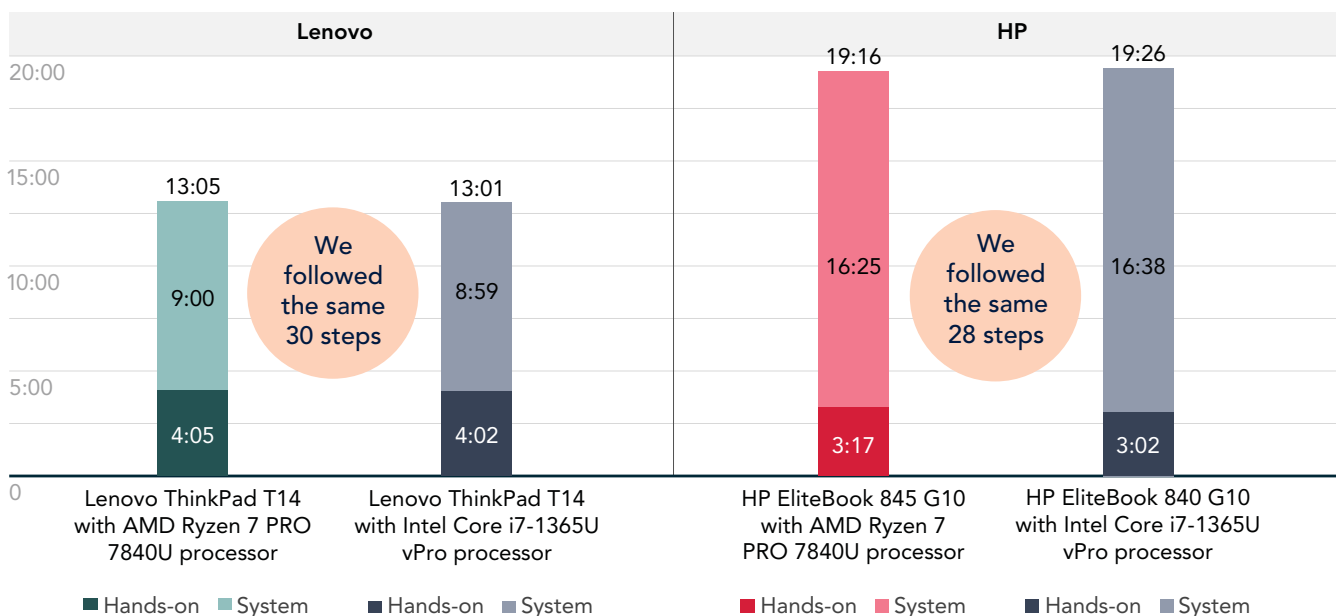
Time (mm:ss) | Lower is better

Figure 1: Total time (mm:ss) to deploy one laptop using Configuration Manager. Hands-on time refers to the time it took us to start the installation process on the target PC, and system time refers to the time it took our task sequence to install the OS, install drivers and applications, and configure the system. Lower is better. Source: Principled Technologies.

Installing drivers

As part of readying new devices for end users, IT typically installs company-approved drivers and applications as well as the operating system. To get a sense of what similarities or differences we might see between PCs when performing this task, we assessed how long it took to add driver packages to each laptop. We added the packages to Configuration Manager before deploying the OS images, allowing the automated sequence in Configuration Manager to finish all OS updates and customizations on the PCs.

On all four devices, adding drivers took the same three steps, meaning that the process was identical regardless of processor or OEM. The task took more time on the HP devices than the Lenovo devices, but within each pair of devices, there was little difference in time investment between the AMD processor-powered laptop and its Intel processor-powered counterpart. When we set aside the time the systems were working on their own and look at just hands-on admin time, the time differences are very small—less than two seconds across all four laptops. No laptop required more than 25 seconds of hands-on time.

Adding drivers to the boot image and driver package
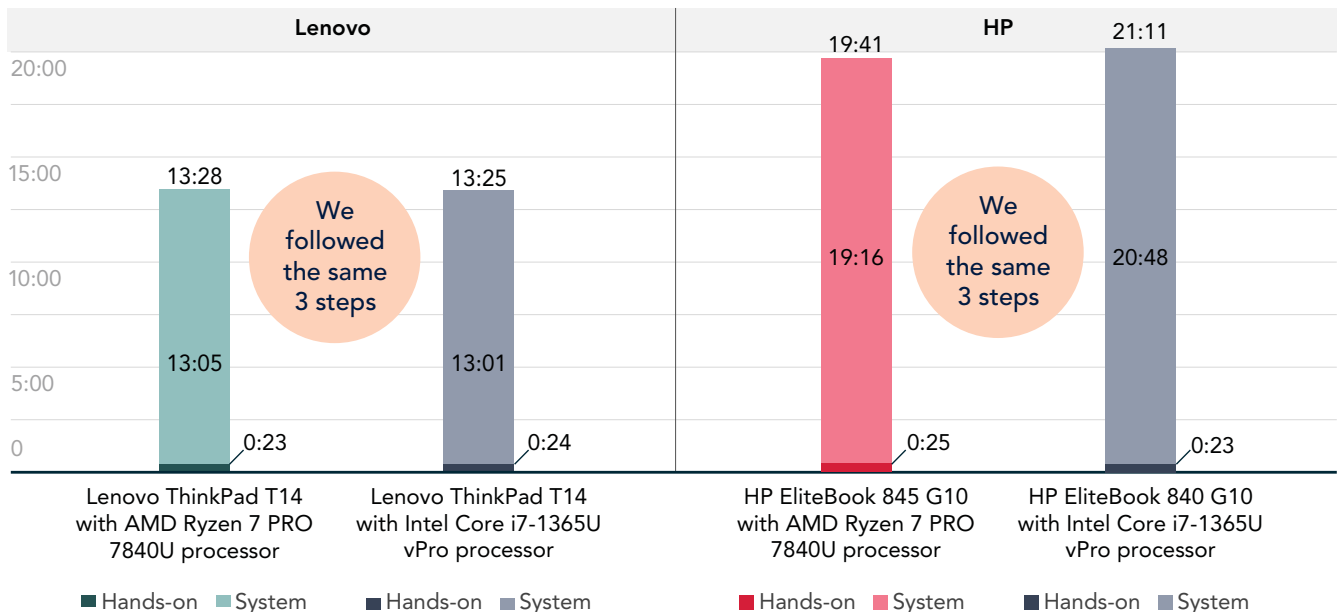
Time (mm:ss) | Lower is better

Figure 2: Total time (mm:ss) to add drivers to the boot image and driver package using Configuration Manager. Lower is better. Source: Principled Technologies.

Order systems with Windows Autopilot installed for deployment directly to end users

Many laptop providers offer services, including Windows Autopilot, that allow administrators to skip configuring individual systems and send devices directly to end users. In a study several years ago, we tested the process of ordering and provisioning systems and found that with Windows Autopilot, OEMs or resellers can ship devices directly to end users, who can perform a few steps after booting the system and complete provisioning themselves. In contrast, a traditional manual approach would require shipping the system to IT first for IT to complete provisioning before delivering it to the end user. In a business landscape where many organizations have remote workers, relying on IT to complete provisioning could result in a significant time delay. You can read more of our findings at http://facts.pt/iv0rkuj

Save time and use the same deployment process regardless of processor with Windows Autopilot

While Configuration Manager remains a popular deployment and management tool, many companies are moving to newer tools, such as Windows Autopilot, that allow IT teams to deploy devices directly to end-users. These companies may also worry about the implications of shifting to a mixed-CPU environment or environment with a different type of CPUs. To assuage those concerns, we repeated the deployment with these modern technologies.

We deployed the devices using Microsoft Windows Autopilot, which helps IT teams configure, deploy, and manage Windows devices from the factory forward.[3] Our deployment and management tools for this scenario also included Microsoft Entra ID (previously Azure Active Directory) and the endpoint management solution Microsoft Intune. We did not deploy drivers separately for this comparison, because with Windows Autopilot, drivers are automatically included in the OS installation.

Across all four devices, the process of deploying a laptop was exactly the same, taking the same 17 steps. The processor made no difference in the amount of effort required. As Figure 3 shows, the Intel processor-powered devices we tested required more system time to complete the deployment than the AMD processor-powered devices. The AMD processor-powered Lenovo laptop required 3 minutes and 14 seconds less system time than its Intel processor-powered counterpart, or 40.4 percent less time. Similarly, when it came to system time in the HP laptop comparison, the AMD processor-powered laptop took 3 minutes and 24 seconds less, or 41.2 percent less time. Across the four laptops, the amount of hands-on time our engineer had to spend varied by only 7 seconds. The AMD processor-powered devices cut down on system time in these comparisons; as for hands-on time and effort, the processor didn't enter into the equation.

Deploying one laptop using Windows Autopilot
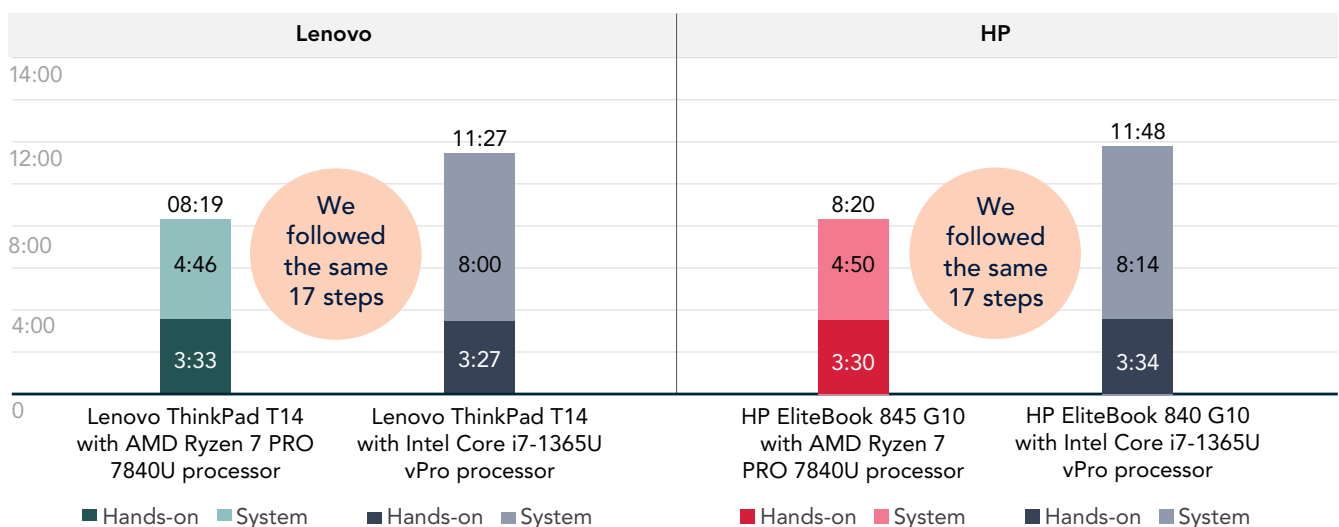
Time (mm:ss) | Lower is better

Figure 3: Total time (mm:ss) to deploy one laptop using Microsoft Entra ID, Microsoft Intune, and Windows Autopilot. Hands-on time refers to the time it took us to start the installation process on the target PC, and system time refers to the time it took for the Autopilot Provisioning process to complete. Lower is better. Source: Principled Technologies.

You might note that the deployment with Autopilot does require more hands-on time than the Configuration Manager deployment, though the hands-on time per system is consistently less than 3 minutes. This is because when deploying using Autopilot for pre-provisioned deployment, we had to log into each system, export the hardware hash, and import the hashes into our Microsoft Intune console. Organizations could save time here by automating this process, and organizations using an OEM's Autopilot service would not need to complete these steps.

About AMD PRO manageability

AMD PRO manageability is "a unified set of tools to manage systems across the organization"[4] leveraging the benefits of open-standards-based management. The Ryzen 7 PRO 7840U processor-powered devices we tested are capable of Cloud-Based Remote Manageability, which AMD says:

- "Modernizes client management in a protected environment

- Enables endpoint management real-time

- Avoids the need for on-site IT to access endpoint devices

- Saves IT time, lowers cost and reduces downtime for employees"[5]

To learn more, visit https://www.amd.com/en/technologies/security-manageability.

Conclusion

Whether your fleet is in the thousands or the dozens, deploying and managing PCs can be a challenging job, and IT teams can't afford the time for added complications. We performed a series of tests to determine whether deploying PCs was more complex in a mixed-CPU environment. In testing with two different approaches to deployment and devices from two different OEMs, we found no difference in effort between deploying AMD processor-powered laptops and deploying Intel processor-powered laptops. Within each approach, the work also took similar amounts of time, with the hands-on admin time required varying only slightly across laptops. We also found that with Windows Autopilot, the AMD processor-powered PCs we tested took less system time to complete deployment than their Intel processor-powered counterparts. With the identical process and almost the same hands-on time required regardless of processor, our testing shows that you can set aside your concerns about the need for two disparate deployment processes in a mixed-CPU environment. Predictable and nearly identical experiences can translate to IT teams spending less time learning new processes and more time moving your organization forward with helpful user support, strong security procedures, and new tech initiatives.

1. Kathy Haan, "Remote Work Statistics and Trends in 2023," accessed October 9, 2023, https://www.forbes.com/advisor/business/remote-work-statistics/.
2. Michael Wallent, "Introducing the Microsoft Intune product family," accessed November 3, 2023, https://techcommunity.microsoft.com/t5/microsoft-intune-blog/introducing-the-microsoft-intune-product-family/ba-p/3650769.
3. "Overview of Windows Autopilot," accessed October 10, 2023, https://learn.microsoft.com/en-us/autopilot/windows-autopilot.
4. "AMD PRO Manageability," accessed November 3, 2023, https://www.amd.com/en/technologies/security-manageability.
5. "AMD PRO Manageability."

Read the science behind this report at https://facts.pt/HVF5TpY ▶

Principled Technologies®

Facts matter.®

This project was commissioned by AMD.