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What You Need to Know to
Buy PCs for Your Company

7 key PC refresh considerations for modern technology, applications, and workplaces

Introduction

The choices organizations make when purchasing desktop and laptop computers have never been more important. Hybrid work models are here to stay, making it essential to provide employees with devices that empower them to effectively and dynamically get work done and communicate with colleagues and customers.

The employee experience is top of mind for many organizations:

- 51% of IT leaders said improving employee productivity/collaboration is their No. 1 objective.[1] That's up from the No. 9 spot in 2019.
- 82% of CIOs said they have interest in employee experience technologies.[2]

IT organizations are under increasing pressure not only to provide employees with adequate compute power and flexibility but also to secure devices — no matter where individuals and their devices are located. Lack of physical access creates new needs for remote management, problem diagnosis, and repair. Time is of the essence, as employees whose computers are out of commission are effectively unproductive.

As PCs and devices become more critical to employee productivity, the importance of performance has also grown. Consider these facts:

- Hybrid workers often participate in videoconferences multiple times per day, while having a dozen or more browser windows and applications open simultaneously.
- Computers that slow down, freeze, or behave unpredictably impact productivity and morale. For example, 58% of IT leaders have said that "poor technology" is causing between two and four hours of lost productivity every day.[3]
- Improved device security has a positive impact on productivity, due to fewer breaches and faster recovery times.[4]
- 91%: the engagement rate among people who are given productivity-enabling tech.[5]
- A recent IDC survey found that 85% of respondents agreed that higher employee engagement translates into a better customer experience, higher customer satisfaction, and increased revenues.[6]

The bottom line is that by providing the best PC technology to get work done, IT can have a direct impact on a company's overall job satisfaction rate — and thus the organization's overall success.

Read on to explore the issues that are critical considerations and reasons for a PC refresh, including:

- Improved productivity via Windows 11
- Security
- Artificial intelligence (AI)
- Sustainability
- Remote management
- Better performance
- Greater mobility

7 Key Considerations on IT's Radar

Refresh is becoming a necessity: It's simple: legacy devices can't keep up with modern work demands. IT leaders should be planning now for a PC fleet refresh to ensure no loss of productivity or weakened security.

Security: No matter where they work, employees require safe access to the cloud, as well as secure devices.

Artificial intelligence (AI): Use of AI technologies and capabilities can accelerate user PC processing, as well as provide proactive malware detection capabilities to mitigate security risks.

Sustainability: Organizations and boards of directors are placing a higher priority on environmental, sustainability, and governance (ESG) goals; IT teams have an opportunity to add sustainable efficiencies with their PC fleets to help reach these objectives.

Remote management: With employees working from multiple locations, IT needs easier ways to diagnose and fix user devices and update devices with software and security patches.

Remote management: The hybrid workforce requires PCs with seamless connectivity, fast processing, improved memory, and greater storage so they can more easily collaborate and multitask. IT is on the hook to deliver these great user experiences with reliable device performance.

Greater mobility: The more dispersed the workforce, the more organizations require devices with best-in-class connectivity for on-the-go collaboration.

1. Refreshed devices for modern work

The choice of PC or device has clear implications for both employee productivity and security. Older devices are often ill-equipped for modern workloads, reducing productivity. Legacy devices have fewer hardware-based prevention capabilities, thus increasing the overall attack surface. Additionally, older PCs aren't optimized with the latest performance technology for modern work, including collaboration solutions. For example, PCs that are three years old typically don't provide the speed and capacity necessary for localized AI processing (read more in The Age of the AI PC section).

These issues, combined with the transition to Windows 11, make now the ideal time to refresh devices. Intel and Microsoft have together reimagined the business user's experience to provide increased productivity and comprehensive security. Windows 11 Pro devices on Intel vPro® offer advanced features, such as:

- Flexible system intelligence that intuitively adapts to complex workflows and assigns the right task to the right core at the right time.
- Uninterrupted collaboration with automatic connections to the strongest signals, while also prioritizing the most critical features when low bandwidth is detected.
- An integrated foundation with virtualized-based security and hardware-based AI threat detection right out of the box.

Devices on Intel vPro® powered by Intel® Core™ feature a performance-based hybrid architecture that is 2.3 times faster than three-year-old PCs,[7] and Windows 11 Pro includes enhancements that provide 61% longer battery life with more responsive system performance.[8]

Now's the time for a PC refresh, says Frank Ford, head of the global cybersecurity practice at Bain & Co., who said avoiding it can cause "ripple effects" over the next few years. "If an organization lets a refresh fall [by] the wayside," Ford said, "it won't be long before employees are stuck with machines that are five or six years old. Such a situation could have serious implications for productivity, security, and employee experience."

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2. Securing devices, wherever they sit

Security remains an ongoing IT concern as cyberattacks continue to evolve and escalate:

- Attacks increased 38% in 2022, with most incidents focused on remote workers using collaboration tools.[9]
- Ransomware attacks increased 74% in the second quarter of 2023, compared to the first quarter.[10]
- The cost of an average data breach is now $4.45 million this year, up 15% over the past three years.[11]
- Proliferating vulnerability points created by the shift from managed corporate computers to a dispersed fabric of home-based devices have made the task of securing devices more challenging.

The nature of attacks is also changing. Software-based security is no longer enough to protect an organization from all threats. Despite improvements over the years, software updates and patches cannot catch or detect all threats in real time.

For example, attackers have widely used a technique called "ROP/JOP/COP" — Return-Oriented Programming/Jump-Oriented Programming/Call-Oriented Programming — in which they manipulate existing pieces of executable software code to pull together malicious code. A recent survey among developers found that 60% to 80% of vulnerability exploits are due to the ROP/JOP/COP technique.[12]

The growing volume and intensity of ransomware attacks provide evidence of how cybercriminals can infiltrate a single PC and spread out laterally across the network, ultimately infecting hundreds of endpoints and servers. In fact, most ransomware attacks no longer originate with phishing emails but come after attackers have already penetrated the network and spent hours or days determining how to do the most damage. In addition, dwell time, or the amount of time between when an attack infiltrates and when it starts executing, has shortened significantly of late. This makes the traditional "patch and update" models of protection insufficient.

Hybrid work models have increased the number of attack vectors by orders of magnitude. Corporate firewalls are effective at protecting workers on the business network, but IT has virtually no visibility into devices outside the physical workplace. Although organizations are now moving past the virtual private networks (VPNs) put in place when COVID-19 started, legacy software security tools are still in abundance. Without a hardware + software approach toward security, IT teams will languish in the complexity trenches of managing multiple endpoint solutions.

Attack vectors also constantly change. Cybercriminals are increasingly targeting their victims' hardware to enable them, in some cases, to take control of PCs without users even knowing. Over the past two years, there has been a surge of attacks on PC basic input/output system (BIOS) software and the similar unified extensible firmware interface (UEFI).

"Antivirus software has come so far in identifying risks that the bad guys have been looking at the easier ways to get in, which is through firmware and BIOS," said Patrick Bohart, Director of Security Initiatives at Intel.

BIOS/UEFI is embedded in the firmware that is physically attached to the motherboard. Changes at that level can't be detected by software; they must be monitored by other hardware components. A typical BIOS configuration has about 300 settings, providing a bounty of opportunities for exploitation. It's critical to have a firmware upgrade plan; one report suggested that attackers could gain control over entire fleets of servers if they are able to exploit firmware vulnerabilities.[13]

Secure at the hardware level

Organizations can fight against low-level attacks and complement software protections, thanks to Intel® Hardware Shield capabilities in processors on the Intel vPro® platform. Capabilities include:

- Out-of-the-box protections with below-the-OS-features such as Intel® Runtime BIOS Resilience and Intel® System Resource Defense, which reduce the risk of malicious code injection in UEFI memory and help to reinforce zero trust below the OS. Intel® Hardware Shield also reduces the risk of malware in system firmware with Intel® BIOS Guard.
- Integrated OS security to protect applications and data, including virtualization technologies to optimize virtual workloads by providing dedicated hardware resources. It also includes Intel® Secure Key to help prevent malware injection and protect user login credentials with hardware-enforced isolation.
- Intelligent security features, such as Intel® Threat Detection Technology (Intel® TDT) that works to detect malicious agents using advanced telemetry capabilities. Intel® TDT also helps IT teams detect the latest ransomware and crypto-mining attacks while offloading security workloads to Intel® Iris® Xe graphics for improved performance.

Another example of rapid change is two new types of attacks that evade traditional defenses: memory-based attacks and control flow subversion. Memory-based attacks target the call stack or memory registers of an application in non-repeating ways. Because there is no clear pattern to memory alterations, these attacks resist traditional signature-based malware protection, which relies on pattern matching.

Control flow subversion uses code sequences in authorized modules to divert control flow instructions — which govern the order in which instructions in a program are executed — from the original target address to a new target containing malicious code.

One of the best defenses against these and other attacks is through a multi-layered security approach that defends at both the hardware and software levels.

Hardware-enhanced security features combined with cloud-based remote manageability provide a combination of more protection and visibility. For example, Intel® Control-Flow Enforcement Technology is hardware-based protection against multiple classes of attacks, including memory-based attacks and control flow subversion techniques.

Hardware-based protections augment third-party solutions to help prevent machines from being hijacked and subjected to ransomware or crypto mining. They should be augmented by flexible access controls that enable IT organizations to add such features as biometric and multi-factor authentication. The objective is to harden the system at every potential attack vector, including the physical layer. Secure computing now begins in the factory. Intel's Transparent Supply Chain ensures that the sources of equipment and components have been vetted for validity and security throughout the manufacturing process and at every stage of the journey through the supply chain.[14] This protects against vulnerabilities being introduced — unintentionally or otherwise — into components before they are assembled into a finished PC or at any point along the way between assembly and delivery to the user.

Transparent Supply Chain creates a digital record of the device as it's leaving the manufacturing environment, explains Intel's Bohart.

"It takes snapshots of BIOS, firmware, where it was manufactured, and where it's going," he says. "When the device arrives at the user's home, the provisioning process retakes that snapshot and compares it to the factory. If there's any divergence, the provisioning stops, and IT is alerted."

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3. The age of the AI PC

AI has sparked the imaginations of both users and IT teams. Employees want to use generative AI solutions, for example, to increase their productivity, including powerful content creation assistance. IT teams want to lean on AI/ML to increase self-healing and rapid threat detection capabilities to mitigate security risks and identify vulnerabilities faster.

The arrival of the AI PC represents an inflection point for both AI enthusiasts and everyday users. Intel is at the forefront of this transition with robust architectures for the central processing unit (CPU), graphics processing unit (GPU), and neural processing unit (NPU) to optimize the performance and power efficiency of AI software.

The recently launched Intel AI PC Acceleration Program provides access to Intel's deep bench of engineering talent for targeted software optimizations and tuning based on independent software vendor (ISV) needs, core development tools, and software developer kits like OpenVINO™ as well as go-to-market opportunities.

Working with more than 100 ISVs on more than 300 AI-accelerated features —including Adobe, Audacity, BlackMagic, BufferZone, CyberLink, DeepRender, Fortemedia, MAGIX, Rewind AI, Skylum, Topaz, VideoCom, Webex, Wondershare Filmora, XSplit, and Zoom — Intel will help enhance PC experiences across audio effects, content creation, gaming, security, streaming, video collaboration, and more.

A strategic PC refresh offers enterprises the opportunity to provide users with AI processing capabilities right on their devices for a range of benefits. The list includes accelerated working, writing, creating, and developing; overall improved experience with greater security features; improved productivity in everyday administrative tasks; faster communication around email and meetings; more design cycles for creative teams; and more.

Running AI on the PC also has advantages for the organization, such as enhanced security and compliance by avoiding risks associated with sending these workloads to the cloud. Local AI offload of advanced office, language, and creative tasks can improve the performance-per-watt of the device, resulting in reduced carbon footprint.

AI capabilities can even influence processor design, and the right computers help deliver these benefits. For example, intelligence is built directly into the Intel vPro® platform with Intel® Thread Director, which uses machine learning to schedule tasks — on the right core, at the right time. This feature runs in nanoseconds and provides runtime feedback to the OS for optimal workload decisions based on characteristics such as operating conditions and power settings. As a result, Intel® Thread Director provides dynamic intelligent guidance without user input, for greater efficiencies and performance.

In addition, Intel vPro® has AI-powered security capabilities that can help detect threats, including ransomware, crypto-jacking, and software supply-chain attacks. Intel® Threat Detection Technology (Intel® TDT) provides this proactive security and can also allocate monitoring tasks to the GPU to free up CPU performance.

The 3D performance hybrid architecture of Intel® Core™ Ultra processors brings these AI advantages to the next level. It "brings extremely competitive CPU, GPU, and connectivity choices," and its "AI capabilities will be crucial to enable the AI PC of the future," according to a Forbes review.[15]

Intel® Core™ Ultra processors allow AI workloads to run effectively and at speed, right on the machine:

- The CPU provides the right amount of power for quick, latency-sensitive tasks. It includes new-generation performance and efficiency cores, with a third tier of low-power cores to clean up background tasks that degrade the battery.
- The GPU allows for computationally intensive tasks for greater graphics performance. For example, it optimizes for power efficiencies based on media and display requirements to improve battery life.
- The integrated neural processing unit (NPU) is a vital accelerator for sustained AI tasks. It is a purpose-built, efficient engine that can offload long-running AI activities. Or, as applications become infused with AI routines running in the background, the NPU can get those tasks to a more power-efficient island.

Especially as AI workloads become more complex, hardware and processing capabilities will become more critical for efficiency, performance, and sustainability. Intel continues to invest in innovation around AI, providing more compute with lower power consumption.

Basing your next enterprise upgrade cycle around an AI PC is important for sustainability, worker productivity, and organizational competitiveness.

4. Green design comes to PCs

At a time when environmental concerns are more pronounced, responsible makers of computers and components are doing everything they can to reduce the carbon footprint of their products.

The issue is top-of-mind for customers as well. Nearly two-thirds of respondents to a recent Forrester Consulting[16] survey of IT leaders found that expanding sustainability initiatives is a critical or high-priority goal and was the most often cited "critical" priority. Top sustainability goals include reducing emissions, ensuring responsible supply chains, achieving net-zero waste, and harnessing renewable energy. The study also found that organizations classified as "high maturity" firms are more likely to avoid partners that don't engage in sustainable practices, invest in end-of-life refurbishing, or demonstrate corporate transparency.

Sustainability begins in the factory. The manufacturing stage of a laptop's lifecycle is responsible for more than 80%[17] of the carbon footprint generated. Factories are major users of power and water, and the manufacturing process for computer products also involves chemicals that could be toxic if introduced into the environment. Reducing emissions involves three critical steps: making the manufacturing process more sustainable, providing for optimum power efficiency while the device is in use, and enabling responsible end-of-life asset retirement.

Green energy initiatives are showing great promise in reducing electrical consumption. For example, Intel has designated a net-zero goal of 2040 for Scope 1 and Scope 2 greenhouse gas emissions. Already, the company has made progress in its manufacturing and supply-chain sustainability objectives:

- Named America's second-most sustainable company in 2023, according to Barron's.[18]
- 107% of used water treated and returned to communities or the environment, and restored through watershed projects in 2022.[19]
- 93% use of renewable electricity globally, including 100% in the US, Europe, Israel, and Malaysia operations in 2022.[20]
- 67%, approximately 112K tons, of manufacturing waste upcycled.[21]

Intel is also incorporating energy efficiencies into its hardware. As of July 2023, Intel-based OEM notebooks can exceed Energy Star 8.0 efficiency requirements by up to 68%.[22] The 13th Gen Intel® Core™ Processors are 2.8 times more product energy efficient than the 10th Gen Intel® Core™ Processors.[23]

In addition, Intel® Active Management Technology (Intel® AMT) provides an intelligent solution to reduce the need for organizations to send repair technicians out on the road for maintenance — even if the PC's operating system is down. For example, large-scale businesses can save up to 28 tons of carbon emissions per year when using a zero-dispatch strategy with the help of Intel AMT.[24]

"We calculated that a single unplanned round trip to repair a laptop is the equivalent of two years of energy use for that same laptop in terms of greenhouse gas emission," said Roberta Zouain, Sustainability Lead for Client Segments, Intel.[25] That's where tools like AMT can help with more sustainable IT operations.

If sustainability is a concern for your organization, look for companies that are part of the Environmental Protection Agency's Green Power Partnership. The Global Electronics Council's EPEAT Registry also scores individual products according to their sustainability performance.

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5. Remote management for ease and efficiency

A global workforce, a mix of device types, and data-intensive applications make managing a modern PC fleet complicated, costly, and time-consuming. Business continuity is at risk when IT doesn't have full visibility into all the devices accessing the corporate network. The proliferation of equipment types, operating systems, and special-purpose devices has made proactive remote management more challenging.

Remote endpoint management has become an essential capability for all IT organizations. The new hybrid work environment is accelerating the adoption of this technology. Grand View Research expects the global unified endpoint management market to grow more than 32% annually to nearly $24 billion by 2027.[26] Investments are being fueled by the bring-your-own-device trend, the internet of things, and, more recently, hybrid work.

Remote endpoint management encompasses such features as:

- Automatic distribution and logging of software and security updates to protect against threats
- Remote management over both wired and wireless connections
- Cradle-to-grave device lifecycle management
- Predictive diagnostics to catch problems before they happen
- Running diagnostics and making repairs in the background without disrupting users
- Remote control, even when devices are in standby or sleep mode
- Rebuilds and asset tracking over the network
- Secure power-on for patching and maintenance

Intel® Active Management Technology (Intel® AMT) on the Intel vPro® platform supports all these features. It enables IT administrators to remotely manage PCs, including out-of-band devices, and the ability to control keyboard, video, mouse (KVM) over internet protocol-based devices. In addition, Intel® AMT provides quick backup and full visibility when recovering remotely. Also, Intel® Endpoint Management Assistant (Intel® EMA) offers the ability to download and install patches on user machines without any user involvement and to interface with Intel's cloud-based management console, so IT can even access devices beyond the corporate firewall.

Fleet stability

Given the wide range of devices that IT organizations must support today, it isn't surprising that most prefer to minimize the number of configurations they use. An ad hoc provisioning and maintenance process creates risks for unexpected driver variations or PCs that aren't equipped with the latest patches and software updates. The result is increased management complexity and hardware support costs.

Even small changes can create inconsistencies and vulnerabilities that have unintended consequences down the line. When purchasing PCs for a large organization, look for guarantees that product configurations will be frozen for a fixed period and that any changes — no matter how small — will be communicated in advance.

Intel® Stable IT Platform Program (Intel® SIPP) addresses the need for fleet stability by aiming to make no major platform changes to hardware, driver, or firmware for 15 months, thus significantly reducing the risk of upgrade incompatibility. Intel® SIPP has been a cornerstone of the company's strategy to support corporate customers since 2003 and over time has been extended to include additional technologies such as Ethernet, wireless connectivity, Thunderbolt 4, and memory.

Under Intel® SIPP, business PCs undergo rigorous design and testing for compatibility with the Intel vPro® platform. This ensures consistency across OEM-built devices. Intel also engages regularly with OEMs and operating system makers on updated tests and feedback loops.

For example, one way to help ensure stability is with an imaging process that provides a reliable and consistent set of hardware and software features that can be applied to all new machines before they are shipped to users. The goal is to ensure that all devices can be quickly and easily maintained, repaired, or replaced.

Imaging has other benefits. It enables IT managers to know the exact configuration of every PC in the field so they can optimize support resources and minimize parts inventories. Security is enhanced because patches can be applied to every affected system, often through an automated process. For example, the Intel® AMT One-Click Recovery can initiate an HTTPS boot to re-image the device.[27] Training and maintenance are also more efficient because fewer system configurations are involved.

In addition, organizations can gain insights into a device's usage and overall health throughout the PC lifecycle thanks to Intel® Platform Service Record. This functionality allows IT admins to easily access a PC's history to make better and faster decisions around upgrades, repurposing, and retirement of the device.

PC manufacturers make modifications and updates to their products all the time, often as a cost-saving move when lower-priced components become available. These changes are not always communicated to customers, even if they are enterprise IT departments.

Intel SIPP addresses these issues, ensuring enterprises retain stability in their PC fleet, while also adding greater IT and user efficiencies.

6. Better performance for modern applications

The right hardware can create optimal PC user experiences — combining high performance, vivid graphics, and the flexibility to work anywhere. Here are some key factors to consider in making PC choices that users will love.

Performance today is influenced by many factors beyond the CPU. It's also a function of the number of cores used, CPU threading, cache utilization, and the speed of memory and interconnects. An integrated GPU can juice performance by offloading tasks from the CPU.

"Including a GPU gives you better form, fit, and function," said Mike Nordquist, Vice President and General Manager of Commercial Client Planning and Architecture Intel. "The PC runs cooler, is less noisy, and is more stable."

Other factors that influence overall PC performance include video processing and network support. Look for native support for the AV1 video encoding format, which eliminates the need for an outboard video processor, thereby dramatically speeding up video encoding and decoding, helping improve battery life, and lowering heat generation.

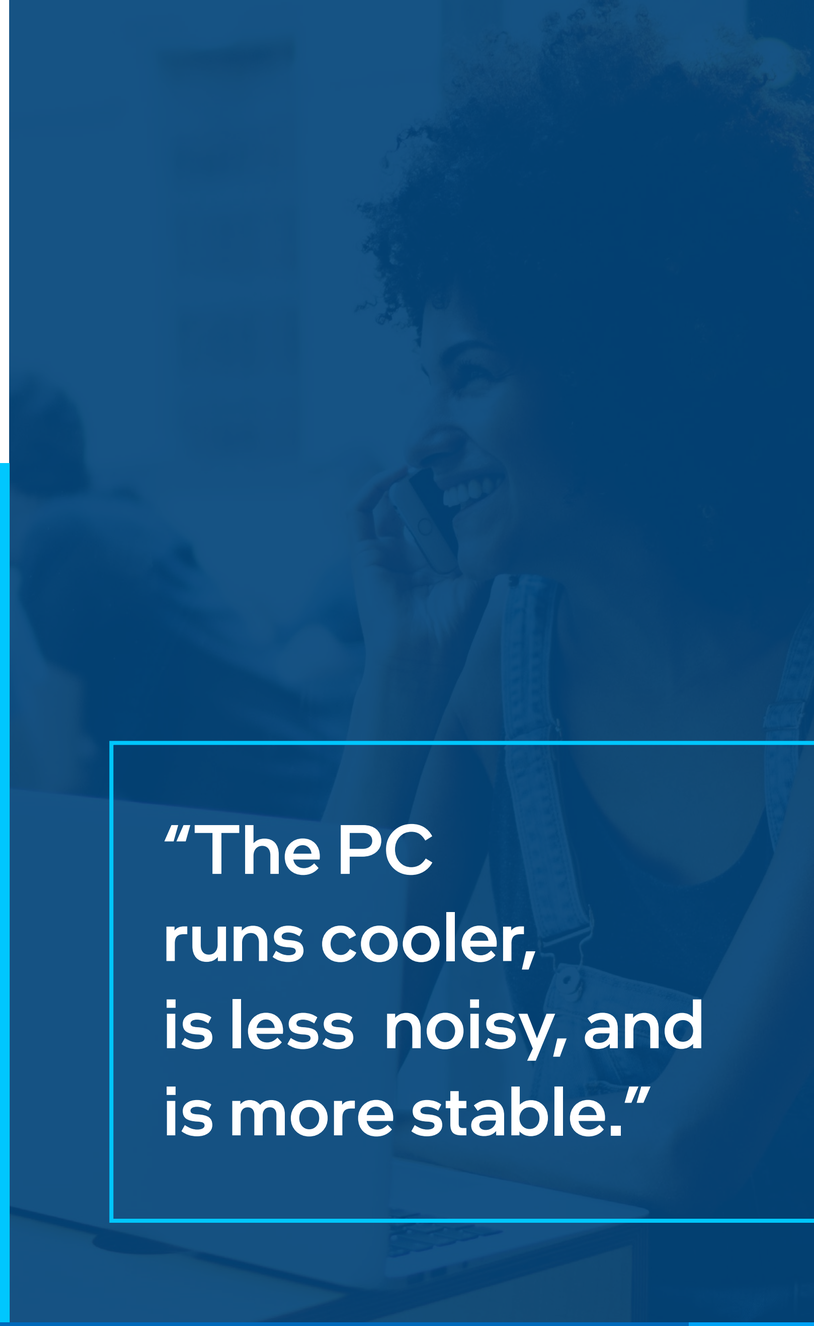
In addition, seek built-in support for multiple high-resolution monitors on the microprocessor, which gives users a choice in how they configure displays. For example, Thunderbolt 4 technology enhances usability by supporting both high-resolution displays and high-performance data transfers through a single port with connectivity that allows multiple devices to be added through daisy-chaining. Thunderbolt is eight times faster than standard USB 3.0 and can charge devices simply and quickly.

Wi-Fi 6/6E is now being widely adopted and should be the standard supported by any new PCs. This high-speed wireless protocol provides greatly improved video conferencing with ultra-low latency, ultra-reliable connectivity, and up to six times faster speeds at the office (and nearly three times faster speeds at home). Wi-Fi 6 also uses network slicing to allow signals to be dedicated to certain endpoints. That eliminates one of the biggest performance problems of previous Wi-Fi generations — the need to share bandwidth.

Be wary of benchmarks

Many PC makers cite benchmark statistics as evidence of machine performance. However, tests in a lab don't accurately represent performance for real-world scenarios. Look for performance measurements that are relevant and address specific needs. For example, the SYSmark benchmark approximates a business/productivity workload on a system — such as how the PC performs while editing videos and running Microsoft Office apps. Other benchmarks that can be used to reflect relevant criteria against performance include:

- CrossMark: enables comparisons across platforms — including Windows, Android, iOS, and macOS — based on real usage. It measures system performance and responsiveness.
- Procyon: a set of benchmarks designed for specific use cases across different industries. For example, the Procyon Office Productivity Benchmark uses Microsoft Office apps to measure PC performance for office productivity work.
- WebXPRT 4: a browser benchmark that compares the performance of web-enabled devices.



"The PC runs cooler, is less noisy, and is more stable."

7. Greater mobility for modern workers

Gartner forecasts global spending on software and IT services to reach $5 trillion in 2024.[28] Meanwhile, IDC expects 261.1 million PC shipments in 2024, a growth of 3.7% year over year.[29] Hybrid work models are accelerating this trend as more users require PCs that can easily move between home and office locations.

Mobile computing has long meant trading off performance and functionality for portability. Older machines limit users' ability to collaborate and multitask. They bog down IT organizations with repairs and performance tuning. Factors such as limited battery life, weight, and processors that sacrifice responsiveness for power efficiency have long inhibited the "work from anywhere" style of today's mobile workforce.

Recent innovations are closing the gap, though. Users should no longer have to compromise on speed or crawl around on airport floors looking for a power source. New laptops are also more than just scaled-down versions of desktop PCs; they are optimized for the requirements of today's highly mobile workforce.

For example, the latest generations of Intel® Core™ processors use a hybrid architecture that increases core efficiency and optimizes workloads by integrating efficient cores (E-cores) with performance cores (P-cores) into a single die.[30] The hybrid design intuitively adapts to how users work to provide smooth performance without disruption during tasks — such as watching a video presentation while taking notes in a word processing app.

Combined with Intel® Thread Director, the processors deliver intelligent workload optimization and powerful performance.[31] For example, Thread Director monitors workloads and energy usage, then uses machine learning to schedule tasks — ensuring the P-cores and E-cores work in concert to avoid performance drag and allowing users to have multiple applications open at once.

Intel innovations from generation to generation have led to significant energy efficiencies and performance gains:

- Up to 16% better general productivity performance with a 13th Gen Intel® Core™ processor.[32]
- Up to 29% when refreshing your 3-year-old devices with 13th Gen Intel® Core™ i7 powered notebooks, compared to a similar notebook released in 2020 powered by 11th Gen Intel® Core™ i7 processors.[33]

These days, mobile users also need platforms optimized for videoconferencing. An onboard Gaussian and Neural Accelerator (GNA) in Intel microprocessors applies neural noise cancellation to reduce background noise and blur videoconference backgrounds for a more secure and professional experience. The availability of these features as part of the microprocessor reduces performance overhead and broadens the range of use case scenarios.

The Intel® Evo™ platform is a recently introduced design specification that OEMs can use to create laptops that meet the requirements outlined above. The specification was derived from extensive research into how people use laptops and aims to address the most common frustrations of mobility. To become Intel® Evo-certified, candidate laptops must meet these criteria:

- Deliver at least nine hours of battery life on a 1,080-pixel resolution screen.
- Wake from sleep in less than one second.
- Perform the same whether plugged in or on battery.
- Deliver at least four hours of battery life from a 30-minute charge.
- Include Wi-Fi 6 and Thunderbolt 4 connectivity.

Devices on Intel vPro®, Intel® Evo Edition, include advanced microphone and camera technology for video collaboration as well as thermally efficient form factors and ultra-light portability. Backed by Intel vPro®, the devices are also stable, secure, and easy to manage.

Cross-industry validation of rigorous use cases and hardware interoperability help keep systems stable, even in variable system environments.

What a modern laptop can do

Partners who are building to the Intel® Evo specification are already shipping units with unprecedented combinations of performance and power efficiency. For example:

- Dell's Latitude 9440 2-in-1 is a notebook and tablet rolled into one. At just 14 inches and made with low-carbon, 75% recycled aluminum, it includes a haptic touchpad and zero-lattice keyboard with mini-LED, battery-saving technology — all while providing power efficiency and high-end performance.
- Lenovo's ThinkPad X1 Carbon Gen 11 provides a one-bar hinge, dual fan and rear venting for energy efficiencies. Intel 13th Gen processors ensure enhanced performance, even when using both of the device's speakers and its high-definition camera. It's also military-grade tough to run in extreme conditions.
- The HP Dragonfly G4 includes Smart Sense functionality to keep the PC cool and quiet without affecting performance. It also features multi-camera capabilities, enhanced by HP Presence, for engaged audience contact . At a starting weight of 2.2 lbs., it is the world's first business notebook to support use of two cameras.

Summary and Recommendations

The process of buying and managing PCs becomes more complex every day. As organizations transform themselves around digital technologies, the choice of reliable, secure, and high-performance PCs will be a critical role for IT organizations.

Buyers should look for suppliers with enterprise track records and technology at the core that is built for enterprise use. Among the factors to consider are the following:

- A supplier that works with an ecosystem of reliable partners to create a PC platform that is built for business, including considerations for device performance, security, and sustainability.
- Visibility across the full supply chain.
- The guarantee of feature-set compatibility for greater PC fleet stability.
- Support of a full range of remote management capabilities, even when devices are out of band or completely turned off.
- Support for the latest communication technologies, like Thunderbolt 4 and Wi-Fi 6/7.
- A diverse range of form factors and user features that are optimized for the hybrid workplace
- The provision of efficient task management using AI capabilities
- Security is provided down to the BIOS level.

Finding a PC built for the rigors of modern business is easy: Simply look for Intel vPro®. It is the business computing foundation of professional-grade PCs that brings together hardware and software technologies to make life easier for IT. It provides hardware-rooted security and manageability capabilities that enable IT to better support and protect users from anywhere, without having to touch the PC. Users can get the performance they need, no matter the task or location — all in an integrated solution with the broadest choice of designs and support for multiple operating systems. And organizations can quickly gain value from a PC refresh.

For example, Forrester Consulting found that the Intel vPro® platform delivers payback in as little as nine months across a composite organization of 100,000 PCs. In addition, 92% of IT professionals who were surveyed said standardizing on Intel vPro® made their laptops and desktops more secure; 74% said the adoption of Intel vPro® had reduced management costs; and 90% said Intel support and add-on solutions enabled by Intel vPro® delivered significant value.[34]

Multiple factors are contributing to the need for businesses of all sizes to strategically refresh their PC fleets. No matter if your organization is tackling the challenges around Windows 10 end-of-life support, battling security without a full arsenal of hardware and software capabilities, or needs to provide better employee device experiences, Intel has the platform that meets and exceeds your expectations.

Equip your organization to do it all with PCs that increase performance, security, productivity, and overall business value. For more information visit: intel.com/vpro

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24 Disclaimer: As measured by a 2023 internal Intel study analyzing common emissions data that factors the estimated energy required to use Intel® AMT remote manageability features as compared with the estimated equivalent fuel needed to dispatch a technician, ship an asset, or have the user visit an office. Please visit www.intel.com/Performance-vPro for more information. Results may vary

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31 Built into the hardware, Intel® Thread Director is provided only in performance hybrid architecture configurations of 12th Gen or newer Intel® Core™ processors; OS enablement is required. Available features and functionality vary by OS

32 Disclaimer: As measured by SYSmark 30 general productivity sub-score on 13th Gen Intel® Core™ i7-1370P vs. 12th Gen Intel® Core™ i7-1280P

33 Disclaimer: Example notebook energy savings calculated using the US EPA "Total Cost of Ownership Calculator Tool for Electronics" https://www.epa.gov/sites/default/files/fec/resources/tco_tool.xlsx using data from the ENERGY STAR certified product finder database for a 13th Gen Intel® Core™ i7-1355U based DELL - P178G: Latitude 7340 released in 2023, vs an 11th Gen Intel® Core™ i7-1165G7 based HP ENVY 13 Laptop released in 2020. DELL - P178G: Latitude 7340 record link is https://www.energystar.gov/productfinder/product/certified-computers/details/2407078/export/pdf ; and HP ENVY 13 laptop link is https://www.energystar.gov/productfinder/product/certified-computers/details/2355186/export/pdf

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