IT@Intel
The Relevance of Desktop Computing in a Mobile Enterprise

STATIONARY COMPUTING

THEN   NOW

All-In-One

Mini PC

Compute Stick

Workstation
with CRT Monitor
and CPU Tower

Standard Workstation
with LCD Display

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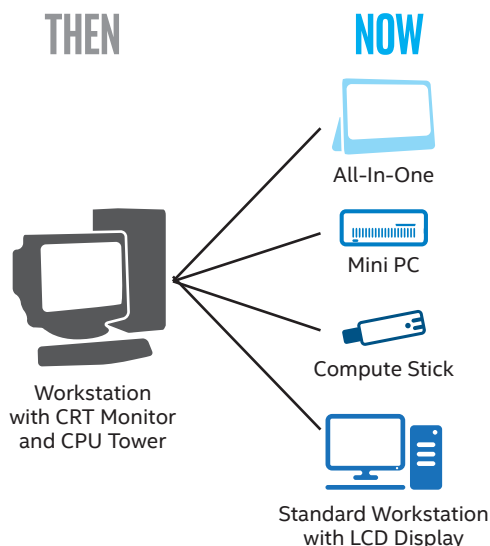
While Intel's PC fleet consists primarily of Intel® architecture-based mobile devices, such as business Ultrabook™ devices, tablets, and a growing number of 2-in-1 devices, familiar desktop-class PCs continue to fill an important role. In fact these PCs are evolving and expanding their relevance in the workplace. Intel IT studies have repeatedly shown that a single device type does not meet the needs of all Intel employees. We believe it is important to offer multiple technology choices, enabling employees to select the best device for their jobs and ways of working.

Historically, desktop-class computing in the enterprise has been defined as a workstation-type PC with a high-performance CPU and one or more monitors. With advances in technology, Intel IT is expanding the role of desktop-class computing beyond the desk. With new form factors, such as mini PCs, All-In-One PCs, and compute sticks, stationary computing devices (also referred to as simply "desktops") in the enterprise can be used in a variety of settings.

We have identified individual, public, and shared use cases for enterprise-level stationary computing devices. In all these use cases, we protect our assets by taking advantage of the remote management and security features of Intel architecture and the Intel® Security software stack. Examples of these features include Intel® vPro™ technology, Intel® Solid-State Drive Pro 2500 Series, McAfee® ePolicy Orchestrator, and anti-malware and host intrusion prevention software. As the integrated hardware and software suite advances with new generations of Intel® processors, we plan to investigate new hardware-enhanced security features.

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Often, "workstation" is defined as an Intel® Xeon® processor-based device. In this paper the term "workstation" refers to a powerful client-side desktop-class device powered by an Intel® Core™ processor.

Background

Intel IT has long believed that "one size does not fit all." Because much of Intel's workforce is highly mobile, mobile devices are the norm for most of Intel's employees; we also offer a mobile workstation.[1] However, stationary computing devices are valued for specific use cases, and those use cases are growing in number. Traditionally, the primary use for stationary computing devices in the enterprise was the desktop PC (one or more monitors connected to a large CPU tower). While this sort of powerful desktop-class workstation still has significant value at Intel, we are redefining the concept of desktop computing to include a wide variety of form factors. With this new definition, desktops take on a new, forward-looking significance—enabling new use cases within the enterprise.

Note: Often, "workstation" is defined as an Intel® Xeon® processor-based device. In this paper the term "workstation" refers to a powerful client-side desktop-class device powered by an Intel® Core™ processor.

As the number of form factors associated with computing—stationary or mobile—at Intel grows, it is important that users are provided with a consistent user experience on their multiple platforms. For more information, refer to the Intel IT's Workspace Moves with Me Initiative sidebar.

Evolving Roles For Stationary Computing Devices

Stationary computing in the enterprise is no longer limited to the traditional desktop-class workstation. Advances in technology have opened up new roles for stationary computing in a wide range of individual, public, and shared use cases. The following sections briefly describe these use cases at Intel.

Individual Use Case

For several thousand Intel employees, a traditional client-side, tower-based desktop-class workstation powered by a high-performance Intel Core processor serves as their primary computing device (but these employees may also use an Intel® architecture-based Ultrabook™ or 2-in-1 device when they need mobility). Their jobs require devices with numerous storage slots, ample RAM, high-end graphics support, and more computing power than is available on even the most powerful mobile workstations that IT offers.

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[1] We offer mobile workstations to a segment of Intel employees, based on their computing needs. These mobile workstations are more powerful than Ultrabook™ devices, but weigh more.

Three Stationary Computing Use Cases at Intel

Digital signage controlled by an Intel® NUC allow messages to be consistent and quickly changed.

Touch-capabable All-In-One PCs enable faster badge request and check-in process.

Wireless conference rooms enable participants to share content quickly.

Public Use Cases

Mini PCs and All-In-One PCs based on Intel® architecture bring full PC capability to a wide variety of physical environments and support a wide range of use cases. For example, mini PCs can be used to power digital signage and multiple displays. All-In-One PCs are useful in public spaces such as lobbies.

- **Digital signage.** Mini PCs, which include HD graphic capabilities, can support the full-color, high-definition images and videos necessary for digital signage. At Intel, we use the Intel® NUC mini PC to power about 400 digital signs deployed throughout our 170 sites in 66 countries. We plan to add about 100 more digital signs, also powered by Intel NUCs.

- **Hospitality spaces.** We use All-In-One PCs in select Intel lobbies to power the badge request and guest check-in process. Touch capabilities and the All-In-One PC functionality make these devices well suited to the hospitality use case because they are compact and easy to use.

- **Collaboration spaces.** We are creating a model for next-generation conference rooms, using manageable, secure hubs based mostly on Intel NUCs, combined with the new Intel® Unite™ software—enabling conference participants to wirelessly share content and ideas across multiple devices and platforms.

Shared Use Cases

In certain user populations, employees share a pool of desktop PCs.

- **Factory environment.** Some technicians may have tablets or 2-in-1s as their primary devices, and most have access to a shared traditional desktop PC for tasks not well suited to mobile devices (such as tasks that require a larger screen).

- **Flexible desk areas.** Multiple employees can use the same PC, and an employee can use any of the PCs in the flexible desk area.

- **Physical security officers.** Intel's physical security officers use shared desktop PCs in Intel lobbies for badge processing and campus monitoring.

- **Intel labs.** Multiple users interact with a PC that is connected to equipment that is being tested or evaluated.

Manageability and Security Considerations

With stationary computing devices located throughout buildings and across the globe, the ability to remotely manage and secure these devices is critical. Desk-side support visits to fix problems are time-consuming and expensive; non-secure devices potentially put Intel's intellectual property and employees' personally identifiable information at risk.

Remote Management

All the stationary computing devices in use at Intel are based on Intel® processors that feature Intel® vPro™ technology, which is fundamental to remote management of stationary computing devices, especially for the public use cases. Intel® Active Management Technology, a component of Intel vPro technology, can reduce physical touch on the device by enabling remote power control. Intel vPro technology also includes keyboard, video, and mouse remote control, which allows approved Intel IT support staff anywhere in the world to remotely take control of a device, such as a conference room mini PC, to diagnose and repair problems even if the device is powered off or the operating system is unresponsive.

Security

We secure stationary computing devices using several approaches to prevent damage to or loss of these devices. From a hardware perspective, many mini PCs feature integrated VESA (Video Electronics Standards Association) mounting to physically secure the mini PC to VESA-enabled monitors. Security slots allow lock-and-cable security. Software-based security options include the use of directory service group policies, the Intel Security software stack, and application code and network whitelisting. We also use security features of Intel architecture such as Intel vPro technology and Intel® Solid-State Drive Pro 2500 Series. As the integrated hardware and software suite advances with new generations of Intel processors, we plan to investigate new hardware-enhanced security features that help prevent shared devices from being compromised.

What's Next

As technology continues to evolve, we envision providing desktop-class computing to more users through an ever-expanding variety of form factors and use cases. Here are some examples:

- **OPS (Open Pluggable Specification) devices,** which allow an easy install or replacement of a PC inside a digital sign or a large screen in a conference room. OPS devices make it easy to build the devices in advance and simply plug them in when needed. These devices have fewer wires, so there is less opportunity to tamper with the device—making it more secure, especially in public use cases.

Share:

Intel IT's Workspace Moves with Me Initiative

With many form factors in use at Intel, employees currently do not have a consistent user experience across devices. For example, if they switch from using a laptop to a smartphone, or from using one PC to another, they do not have access to the same applications and data, and personalizations (such as icons, font size, and themes) are not transferred from one device to the next.

Intel IT's Workspace Moves with Me initiative addresses that issue. By deconstructing the compute environment into discrete layers (apps, content, and personalization), we aim to reconstruct those layers on any device using native device capabilities—enabling us to deliver content and information in a way that is best suited to that device type.

For example, if a user is viewing page 5 of a document on a laptop and has the view set to 150 percent, then switches to a tablet to view the same document, page 5 will still be open and the view will still be set to 150 percent. We also intend to capture what apps are open on a device so that when the user moves to a different compute environment, those same apps will be reopened.

In some cases, such as moving from a laptop to a smartphone, platform limitations will require that we reconstruct only a partial workspace. Although we will use the cloud as a central repository for deconstructed layers, we are not using the Web as a portal—the apps and data will be live on each device and kept in sync automatically using the cloud.

Our Workspace Moves with Me initiative will improve employee productivity and user experience, especially in individual and shared compute use cases. We intend to conduct a proof of concept in late 2015, which will test our workspace engine on PC-to-PC transitions (complete reconstruction) and PC-to-smartphone transitions (partial reconstruction); later we plan to add further capabilities and support more form factors.

- **Compute sticks,** which are fully-functional Microsoft Windows* 8.1 devices in a highly compact form factor. They offer local storage, fair processor performance, and networking capability.

- **Enhanced interaction of devices with their environment** using technology that supports discovery (such as recognizing users as they come near) and communication between personal and public devices (for purposes such as authentication).

Alternative form factors already play a part in enterprise computing at Intel. Through implementation of our Workspace Moves with Me initiative, we anticipate that these devices and technologies will enable Intel employees to have a consistent user experience whether they are using mobile or stationary computing devices. As the consumer marketplace continues to introduce new devices at a rapid pace, we are exploring how to prepare our infrastructure for even more form factors—enabling us to achieve the greatest benefit from all devices.

Conclusion

At Intel, the traditional concept of desktop computing in the enterprise is evolving to include more than a workstation monitor and CPU tower. The desktop-class workstation continues to fill a role at Intel, where it serves the needs of employees who require high-performance computing. In addition, new form factors for stationary computing are empowering a wider variety of use cases than ever, including individual, public, and shared use cases. For example, mini PCs and All-In-One PCs bring PC "smarts" to lobbies and conference rooms. Remote management and security features of Intel architecture, along with the Intel Security software stack, play a significant role in controlling costs and protecting assets, especially for devices in public and shared use cases.

We continue to investigate how new form factors, such as compute sticks, can enable a future workplace where employees use many form factors, as well as many input methods (such as touch, voice, sensor, and gesture) to perform their jobs. We aim to provide users with a seamless, consistent experience across devices while keeping information secure and maintaining users' privacy.

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visit intel.com/IT.

IT@Intel

We connect IT professionals with their IT peers inside Intel. Our IT department solves some of today's most demanding and complex technology issues, and we want to share these lessons directly with our fellow IT professionals in an open peer-to-peer forum.

Our goal is simple: improve efficiency throughout the organization and enhance the business value of IT investments.

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