



Getting the Most out of Your PC Investment in the Public Sector

Best Practices for the Public Procurement of PC Client Devices

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Executive Overview

The technology procurement landscape is complicated, and the government’s job of spending public funds optimally and transparently creates immense pressures, especially when critical missions and citizen services hang in the balance. These pressures lead to ambiguity without clear direction amidst disparate industry advice. However, if you follow a few key learnings from the leading worldwide technology provider, Intel, you’ll be on track to optimize your procurement process.

Background

As a PC technology provider for over 50 years, Intel has seen many different public procurement processes and their corresponding outcomes. Intel has recognized three reoccurring themes in procurement processes which have helped government agencies and departments meet, or even exceed, their PC procurement objectives and within or even under budget. This document will review those best practice concepts and cut through the noise to simplify your journey towards an optimal PC procurement outcome.

Intel's Public PC Procurement Best Practice Observations:



PCs are a critical part of modernization / digital transformation efforts - think of the client device as a strategic procurement element, not just something to refresh at the lowest cost, but rather an asset that can help you meet your goals.



Not all PC characteristics should be considered equally- device security and system performance should be foundational considerations, and needs can vary by device usage.



Use your RFP structure / procurement process to ensure your needs are met at the best value – aim for vendor-neutral device specifications along with clear award scoring methodology to incentivize fair and open competition aligned with stated objectives.

Check out **TABLE 1** for a summary of Intel's procurement recommendations aligned to the above concepts

OBSERVATIONS:

PC Clients are a Critical Part of Modernization and Digital Transformation

As the world progresses into the Fourth Industrial Revolution where technology becomes an integral part of life, many governments around the globe are undertaking massive digital transformation and modernization efforts. Whether your department or agency is exploring artificial intelligence (AI), Internet of Things (IoT), or even preparing students to be the workforce of the future, the PC is a critical element in those endeavors. PCs are needed even more today for the creation, interpretation, and processing of data required to provide citizen services and deliver mission outcomes to public and private stakeholders.

A common connection point between the emerging technologies and information and communication technology (ICT) trends is data, and PCs are still at the center. Consequently, the PC is a critical element of transformation models; deploying or designing digital modernization frameworks would be remiss to not include the client device in the overall project scope and project objectives. In fact, according to Intel's "Optimize End-User Computing with Comprehensive Modernization" white paper, "**optimizing the [end user computing] environment often starts with reexamining and refreshing the client fleet...making it easier to adopt transformative innovations, stay abreast of regulatory changes, and deploy the latest operating systems**" which is a timely assertion given Microsoft's* imminent plans to end support for Windows 7.^{1,2}

[Read the Modernization White Paper here.](#)

[Learn more about Microsoft EOL here.](#)

Not only is the PC critical for advancing transformation initiatives and goals, but even steady-state environments might not be so ... steady. It is essential to make sure that your devices continue to be an asset rather than a hindrance by refreshing your fleet in a timely manner. The "if it isn't broken, don't fix it" mentality for devices that are responsible for citizen and defense services (and their data) around the globe, gets to be a harder and harder position to take without calculated risks. Waiting too long between device refreshes can lead to increased total-cost-of-ownership impacts primarily due to increased support costs, productivity loss, and increased security vulnerability exposure. Intel's IT department recommends a 3-year refresh cycle when the devices are meeting your department needs on a day to day basis.³

[For more refresh details check out the Intel IT white paper, "Business Investment Strategy for Device Refresh" here](#)

[Learn more about the total-cost of ownership concept as it relates to the Intel® vPro™ Platform here.](#)

The PC is a strategic IT asset that can impact your ability to meet mission goals and serve your citizens at the levels needed to be relevant in an increasingly competitive and data-driven global environment.



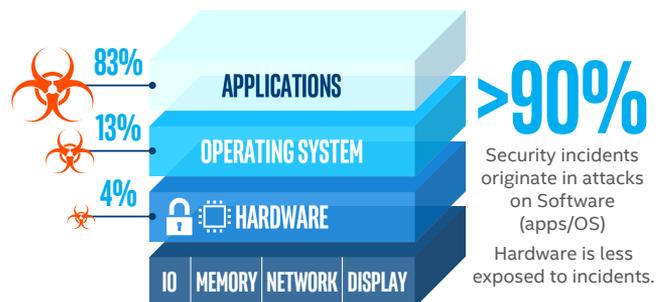
Not all PC Characteristics are Equal

To demonstrate the importance of critical procurement considerations versus nice to have specifications, let's look to a car analogy; when buying a car, there are a lot of features to consider, but most likely you are not evaluating the paint color as more important than the safety rating and/or the car's engine function. The same concept applies in PC procurement; the size of the screen display, among other choices, does not mean much if the device leaves you exposed to increased security vulnerabilities or if the device does not work for its intended usage. Therefore, Intel **recommends device security and system performance as critical procurement characteristics** which should weigh heavily in your process design framework (we will cover the latter concept in the third section of this document).

Why Device Security Matters

News of major security breaches suggests that security can no longer be an afterthought in PC purchase decisions. Cybercrime damages are expected to top \$6 trillion *annually* by 2021, and greater than 90% of hacker groups attack edge devices (for example PC's, personal devices, and IoT). This trend suggests that in designing your next PC purchase, the security of your "edge device" should be of the utmost importance.^{4,5,6,7}

How can your device purchase decision help protect you? Consider this - greater than 90% of security incidents were the result of exploits in software.^{4,5,6,7} Therefore, Intel recommends the latest generation microprocessors which have the most up-to-date architecture, as well as **hardware-based security technologies so that you have critical security measures located where incidents are less likely to occur.** Building these considerations into your PC procurement framework will help to minimize device vulnerabilities and maximize the potential return on your PC investment.



[Learn more about the hardware enabled security provided by Intel technologies here.](#)

Read about **hardware's role in strong authentication in this 2018 whitepaper here.**

Check out **TABLE 2** for device security solutions from Intel aligned with CIO and CISO priorities.

Why System Performance Matters

When it comes to spending public funds optimally and efficiently, it's critical that systems match their intended usage to avoid the inefficient use of limited resources. Just as you probably don't want to drive a jet plane to and from work every day or drive a scooter for a cross-country family vacation, you don't want to buy a PC that does not match its intended use.

Different agencies and departments have varying usages for PCs ranging from simple data entry to powerful workstations in charge of highly complex modeling. The underlying technology needs for the workloads are different, so to spend your budget effectively and efficiently, Intel recommends ensuring your procurement framework outlines the performance needs for the devices in accordance with their usages. While there are hundreds of different device use cases, here are six widely utilized usage personas which help guide an expected device performance level to help ensure your vendor device submissions match their planned usage and user experience and therefore match the necessary resources required.

Common Device Usage Personas

Notebook Personas

Model 1	Model 2	Model 3
 <p>Field Worker</p>	 <p>Department Employee</p>	 <p>Specialized Professional Mobile</p>

Desktop Personas

Model A	Model B	Model C
 <p>Support Worker</p>	 <p>Knowledge Worker</p>	 <p>Specialized Professional Desktop</p>

Intel recommends aligning device usage models with their matching system performance needs. See **Table 1** for additional information on how to drive this alignment.

How do you put your performance needs and expectations into a request for proposal (RFP)? **Intel recommends following the worldwide industry best practice of using system performance benchmarks** as outlined by the BITKOM* technology consortium below:

*"The continuous evolution of computer technology has made it increasingly difficult to compare the performance of individual systems only in terms of technical specifications. For instance, a processor with a higher clock rate does not necessarily provide more processing power. The fact that clock rate (frequency) alone is no longer sufficient to compare the performance of different processors from different manufacturers with distinct internal architecture has led to the development of tests, so-called benchmarks, to improve the comparability of the performance. The restriction to certain technical peculiarities of system components no longer suffices to make an informed decision in the context of an award process."*⁸

The BITKOM industry consortium represents more than 2,000 ICT companies including major technology vendors like Intel and AMD*, as well as government agencies, with the purpose of creating one-voice for optimal public IT procurement frameworks.¹² The consortium has published vendor-neutral procurement frameworks which meet strict European Union (EU) legal standards and which can also scale around the globe as best practices. **The use of system performance benchmarks are BITKOM and Intel's recommended path forward to compare systems as well as align performance needs with device usages.**

Check out **BITKOM's latest 2018 vendor neutral tendering of notebooks here** as well as their **desktop version here (new version coming in early 2019).**

Learn more about **BITKOM** by visiting their site here.



CAUTION, not all benchmarks are good benchmarks (just like not all consumer reviews of cars should be considered truthful). Intel and BITKOM recommend using benchmark tests that are:

1. **Relevant** and representative of the actual intended usage of the device
2. **Reproducible**, not predicting an outcome and up-to-date
3. **Reliable**, with unbiased and quality input⁸

For Intel-recommended benchmarks, which also align with the BITKOM benchmark guidance, explore the white paper, **"The Role of Benchmarks in the Public Procurement of Computers."**

For the usage personas outlined previously, Intel's recommendation is to use the SYSmark® benchmark which not only meets the criteria for trusted benchmarks but is also grounded in real-world business applications and workloads, meaning the SYSmark benchmark measures the system performance in scenarios most reflective of actual device usage.¹³ **Table 1** reflects an example of how you can use SYSmark system benchmark scores to set measurable and enforceable performance expectations by device usage model, helping ensure the optimal use of limited resources.

The SYSmark benchmark was developed and continues to be managed by a non-profit industry consortium, BAPCo*, which is currently working with over 60 countries to create informed PC procurement specifications.^{13,14} BAPCo even has a government network program where qualifying government agencies or associations can provide benchmark development feedback, obtain free licenses, and receive priority technical support.¹⁴

Learn more about the [BAPCo Government Network program here](#).

To learn more about the new [2018 SYSmark benchmark](#), read the white paper here.

Achieve the optimal value from public funds by prioritizing device security and system performance benchmarks above other component features.



Use Your RFP Structure to Ensure You Get the Optimal Value for What You Need

Once PC procurement is treated as a strategic investment decision, with device security and system performance as paramount considerations, adopt evaluation criteria for your RFP that are based on these considerations so that you receive proposals meeting or even exceeding your expectations.

Setting up your procurement cycle for success begins with making sure that you set a budget aligned with your priorities and objectives. Then your RFP structure should enforce your objectives; from minimum requirements which all device submissions should meet, to maximum system costs. The RFP scoring system can be a useful tool that sets you up to achieve optimal value systems from your vendors by creating requirements that work together in concert to provide you with the best solution for the cost. **TABLE 1** provides an example.

Conclusion

Intel believes that client procurement outcomes for the public sector are maximized when the PC is treated as critical for mission and citizen services outcomes, and when hardware-based device security and system performance benchmarks are built into RFP structures as key decision elements.

Where to find resources found in this document:

Intel White Paper: Optimize End-User Computing With Comprehensive Modernization	https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/optimize-end-user-computing-white-paper.pdf
Microsoft End of Life Plans for Windows 7	https://www.microsoft.com/en-us/windowsforbusiness/end-of-windows-7-support
Intel IT White Paper, Business Investment Strategy for Device Refresh	https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/enterprise-mobility-pc-upgrade-strategy-guide.pdf
Intel White Paper: The Economic Case for the Intel® VPro™ Platform	https://www.intel.com/content/www/us/en/architecture-and-technology/vpro/total-cost-of-ownership-white-paper.html
Intel Website: Hardware Enabled Security Powered by Intel® Technology	https://www.intel.com/content/www/us/en/security/hardware/hardware-security-overview.html
Intel White Paper: Hardware's Role in Strong Authentication	https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/hardware-for-strong-authentication-white-paper.pdf
BITKOM Website	https://www.bitkom.org/EN
BITKOM: Vendor Neutral Tendering of Notebooks	https://www.itk-beschaffung.de/EN/Guidelines/Vendor-neutral-tendering-notebooks
BITKOM: Vendor Neutral Tendering of Desktop PC's	https://www.itk-beschaffung.de/sites/beschaffung/files/2018-11/DesktopPC_VendorNeutral_V4_042015%5B1%5D_0.pdf
BAPCo System Benchmark Performance Dashboard	https://results.bapco.com/dashboard
BAPCo Government Network Program	https://bapco.com/contact/bgn/
SYSmark White Paper: 2018 Benchmarks	http://bapco.com/wp-content/uploads/2018/08/SYSmark_2018_White_Paper_1.0.pdf
Intel White Paper: The Role of Benchmarks in the Public Procurement of Computers	https://www.intel.com/content/www/us/en/government/role-of-benchmarks-white-paper.html

Table 1: Intel's optimal value PC specification recommendations.

The below structure is an example only of structuring device security and system performance into an RFP; please evaluate your unique department/agency/procurement objectives

Example structure: highest scoring system within budget = awarded the bid; set overachievement points for the critical device security and system performance.

NOTEBOOK					
SPECIFICATION CATEGORY	EVAL. TYPE	OVERACHIEVEMENT AWARD	DEVICE USAGE MODEL 1 High Mobility, Field Staff 	DEVICE USAGE MODEL 2 Regular Mobility, Department Employees 	DEVICE USAGE MODEL 3 Specialized Professional Mobile 
<i>General Usage Description</i>			<i>Light office productivity needs; entry systems</i>	<i>Optimal productivity & security; flexible, mid-range systems</i>	<i>Highest compute and visual performance for specialized applications, best in class compute & security</i>
<i>Typical Form Factor for Usage Model</i>			<i>2in1</i>	<i>2in1, Notebook</i>	<i>Notebook, Mobile Workstation</i>
System Performance	Min	Extra X points for every X% incremental points beyond the minimum	SYSmark® 2018 System Performance score of min. 750 overall points	TBD - Evaluate your current notebook install base performance and any incremental or different needs you might have for performance. Then check out the BAPCo SYSmark dashboards here dashboard to determine a minimum threshold that meets your device usage needs.	
Device Security	Min	Extra X points for hardware based solution(s)	TBD based on needs / priorities	TBD based on needs / priorities	TBD based on needs / priorities

For additional considerations, reference [TABLE 2](#) and the BITKOM framework.
Check out [BITKOM's* latest 2018 vendor neutral tendering of notebooks paper here](#).

DESKTOP					
SPECIFICATION CATEGORY	EVAL. TYPE	OVERACHIEVEMENT AWARD	DEVICE USAGE MODEL A Entry Performance, Shared Devices 	DEVICE USAGE MODEL B Optimal Performance, Knowledge Worker 	DEVICE USAGE MODEL C High Performance, Specialized Professional Desktop 
<i>General Usage Description</i>			<i>Light office productivity needs; entry systems</i>	<i>Optimal productivity & security; flexible, mid-range systems</i>	<i>Highest compute and visual performance for specialized applications, best in class compute & security</i>
<i>Typical Form Factor for Usage Model</i>			<i>Mini/SFF</i>	<i>Mini Tower</i>	<i>Tower</i>
System Performance	Min	Extra X points for every X% incremental points beyond the minimum	SYSmark® 2018 System Performance score of min. 750 overall points	TBD - Evaluate your current desktop install base performance and any incremental or different needs you might have for performance. Then check out the BAPCo SYSmark dashboards here to determine a minimum threshold that meets your device usage needs.	
Device Security	Min	Extra X points for hardware based solution(s)	TBD based on needs / priorities	TBD based on needs / priorities	TBD based on needs / priorities

For additional considerations reference [TABLE 2](#) & the BITKOM framework.
Check out [BITKOM's* vendor neutral tendering of desktops paper here](#), new version expected early 2019.

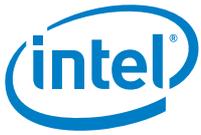
Table 2: Intel technologies to consider for your performance and security needs

NEED	RECOMMENDED INTEL TECHNOLOGY	NON-PROPRIETARY VALUE PROPOSITION	INTEL COMPARATIVE ADVANTAGE
Entry System Processors	Intel® Pentium® processor Intel® Celeron® processor 8th Generation Intel® Core™ i3 processor	Check out the BAPCo system performance results for Intel based systems here Review the latest Intel products here	Great value, excellent price/performance return along with the quality you'd expect from Intel.
Mid-Range System Processors	8th Generation Intel® Core™ i5 processor 8th Generation Intel® Core™ i7 processor		Excellent performance & user experience along with greater stability and security features for business computing.
Premium Business Processors	8th Generation Intel® Core™ i5 vPro™ processor 8th Generation Intel® Core™ i7 vPro™ processor		The vPro platform is a set of hardware & technologies (beyond just the CPU) utilized to build premium business computers. The platform offers performance, stability, manageability, and security features. Learn more here .
Data Protection	Intel® Software Guard Extensions (Intel® SGX)	Silicon-enabled memory encryption that isolates and protects in-use application data and code. Intel accelerators maximize data protection without significant performance reductions, allowing for broad, scalable, nocompromise encryption.	There are other software-based solutions for protection against attacks, but SGX is specific to an application and provides hardware enhanced protection. <i>vPro branded platforms are validated for Intel® SGX. SGX is available on other systems as well.</i>
Threat Detection	Intel® Threat Detection Technology (Intel® TDT)	Silicon-level telemetry and machine learning to help our industry partners improve the detection of advanced cyber threats & exploits.	Intel® TDT maximizes utilization of Intel's CPU & graphics in order to accelerate malware defense applications.
Identity Protection	Intel® Authenticate Solution	Hardware-hardened, IT managed, multi-factor identity management.	Intel offers a solution with: <ul style="list-style-type: none"> • Credentials grounded in silicon. • Integrated methods of deployment within enterprises' manageability environments. • More flexibility to choose from and combine multiple proofs of identity. <i>vPRO branded platforms are validated for Intel® Authenticate. Intel® Authenticate is available on other systems as well.</i>
BIOS Defense	Intel® Runtime BIOS Resilience	Hardware-enhanced protection for system UEFI/BIOS; minimizes risk of malicious code injection by protecting the critical underlying SW responsible for running the PC.	There are software mechanisms for defending against firmware attacks, but they lack the hardware protection of Intel® Runtime BIOS Resilience. <i>Intel® Runtime BIOS Resilience is exclusive to vPro branded platforms.</i>
Platform Protection	Intel® Trusted Execution Technology (Intel® TXT)	Dynamic Root of Trust Measurement (DRTM) that allows a VMM/OS to check system integrity before loading.	Intel® TXT demonstrates Intel's commitment to help secure platforms at all layers in the computing stack.
Platform Protection	Intel® Virtualization Technology (VT-x) & Intel® Virtualization Technology for devices (VT-d)	Hardware virtualization technologies which enable new Windows 10 Enterprise* software capabilities out of the box.	Intel® VT-x, VT-d demonstrates Intel's commitment to help secure platforms at all layers in the computing stack. <i>vPRO branded platforms are validated for VT-x, VT-d. VT-x, VT-d is available on other systems as well.</i>
Platform Stability	Intel® Stable Image Platform Program (SIPP)	Platform validation that aims for zero changes to key system components for at least 15 months or until the next generational release.	Intel® SIPP delivers a more stable platform resulting in predictable transactions for business customers. SIPP's comprehensive offering includes CPU, chipset, firmware, and drivers for LAN/WLAN, Thunderbolt™, memory, and storage components. <i>vPro branded platforms require SIPP eligible processors. SIPP is available on other systems as well. Only time-to-market platforms can support SIPP.</i>
Manageability/ Recovery	Intel® Active Management Technology (Intel® AMT)	Hardware manageability features enabling better discovery, repair, and protection of wired or wireless connected computers regardless of operating system or power state.	Intel® AMT is a superset of the industry standard DASH specification with 10+ years of innovations, including remote KVM which allows a technician to remotely maintain, diagnose, and repair a LAN/WLAN-connected PC as if they were sitting right in front of it. Practical use cases include: wake and patch, system recovery, and remote reimaging. <i>Intel® AMT is exclusive to vPro branded platforms.</i>
Manageability/ Secure Sourcing	Intel® Transparent Supply Chain	Certificate-based mechanism to trace components from manufacturing point to confirm authenticity.	Intel Transparent Supply Chain demonstrates Intel's commitment to help secure platforms at all layers in the computing stack. <i>Intel Transparent Supply Chain is exclusive to vPro branded platforms.</i>

Contact your Intel representative for even more available technologies to meet your needs. Learn more about Intel's solutions by going to: <https://www.intel.com/content/www/us/en/government/public-sector-solutions-overview.html>

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- ¹³ http://bapco.com/wp-content/uploads/2018/08/SYSmark_2018_White_Paper_1.0.pdf
- ¹⁴ <https://bapco.com/contact/bgn/>



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