



DELIVERING LEADING-EDGE COMPUTING TECHNOLOGY TO THE DEFENSE INDUSTRY

Solutions from Intel and its ecosystem partners provide high levels of computing performance and security while lowering system cost.

Intel: Established Supplier to the Defense Industry

Long-term Defense Supplier

Over 30 year history



Large Ecosystem

Over 400 companies



High Performance

Multi-core processors



Long-Term Availability

7 to 15 years



Extended Temperature

-40°C to 85°C¹



Defense Industry Challenges

It's a world of extremes for electronic systems employed in many defense applications. These systems must perform in harsh temperature and weather conditions; meet stringent size, weight, and power (SWaP) specifications; and withstand the test of time, often measured in tens of years.

Beyond satisfying these demanding requirements, suppliers to the defense industry are also under pressure to deliver systems well-suited for 21st century, net-centric operations. This modern day approach to warfare enhances situational awareness and military response through the ability to collect and share data from intelligent sensors and distributed computers in the field. As net-centric operations evolve, the defense industry expects more from electronic system suppliers, including:

Better security – Defense system developers are on a constant lookout for better ways to protect sensitive data, prevent intellectual property (IP) theft, and help

thwart malware attacks. It is important to implement multiple layers of security that better safeguard edge devices and establish trusted data that can be more safely shared across defense networks.

Greater compute performance –

Command and control (C5 ISR) effectiveness can be greatly enhanced through the use of state-of-the-art artificial intelligence, machine learning, deep learning, and image processing. For example, these computing technologies have led to a new generation of unmanned, autonomous vehicles that navigate, plan the best route, complete missions without boundaries, and avoid collisions – all without the need for external guidance.

Lower system cost – Historically, the defense industry has paid a premium to procure systems from specialized suppliers in order to meet their needs for ruggedness, guaranteed long-term supply, and other specifications. Today, these requirements are being met at lower cost by suppliers offering commercial, off-the-shelf (COTS) solutions that employ open standards, improve interoperability, and ease system upgrades.

Intel has a long history of supplying electronic components to the defense industry. The following describes some of the ways Intel helps support net-centric operations and the growing demands for more secure, high performance, and cost-effective connected computing and communications systems.

Enhanced Security for Edge-to-Cloud Solutions²

Intel security solutions provide end-to-end protection for computer equipment and networks. These solutions help deliver trusted data through a tight integration of hardware- and software-

based security technologies that help safeguard valuable data and computing devices against malware attack, tampering, and theft. These Intel technologies include:

- **Intel® Enhanced Privacy ID (Intel® EPID)** helps establish a chain of trust between edge devices and the cloud. This solution allows cloud-based defense applications to authenticate a device for a given level of access while allowing the device to remain anonymous.
- **Intel® AES New Instructions (Intel® AES NI)** improve on the Advanced Encryption Standard (AES) algorithm. These instructions accelerate data encryption to help better protect confidential data at rest and in flight without the typical performance penalty associated with software-only security solutions.
- **Intel® Software Guard Extensions (Intel® SGX)** helps protect selected code and data from disclosure or modification. Defense applications can use these instructions to establish private regions of code and data that are better shielded against direct malware attacks.

High Performance Edge Devices

Imaging, analytics, encryption, and new application requirements are driving the need for edge devices with high levels of performance and computing headroom, which can be satisfied with Intel® processors. Edge device manufacturers can also take advantage of high performance Intel processors to consolidate multiple systems onto one board, thus reducing the total cost of operation (TCO) of their solution. Some of the Intel products and features pertinent to the defense industry include:

- **Intel Atom® and Intel® Core™ processor families** are the foundation for a wide range of edge devices that accommodate various price/

performance points and execute a common set of code. These processors are an ideal choice for real-time and non-real-time defense applications with stringent SWaP requirements.

- **Extended temperature support**, from -40°C to 85°C, is available for select Intel® processors. With the ability to withstand temperature extremes, Intel processors enable edge device suppliers to develop high performance, ruggedized devices that can be deployed in the harshest field conditions.
- **Long product availability** for select Intel® processors helps increase the longevity of defense equipment. Newer processors are available for 15 years, whereas older processors are available for a minimum of seven years.

Cost-Effective Solutions

Intel ecosystem partners are delivering flexible, cost-efficient, COTS solutions based on Intel technology. These solutions can help make technology investments last longer because they incorporate next-generation computing and communications technologies.

- **Commercial, off-the-shelf (COTS) solutions** reduce development costs, increase flexibility, and shorten deployment time. When device suppliers use COTS boards and other commercially-available solutions, they can save time and development expense, and also provide hardware scalability and flexibility to their customers.
- **Competitively-priced solutions** from Intel's large ecosystem help keep costs low. With more than 400 members, this vibrant ecosystem, called the Intel® Internet of Things (IoT) Solutions Alliance, provides long lifecycle hardware and software product management.

- **Software reuse**, made possible by Intel's backward compatible instruction set, can dramatically cut down on software development costs. Intel processors, which cover a wide array of performance points, are able to execute applications written for earlier generations of processors.

Addressing Defense Industry Challenges

Intel and its ecosystem of hardware and software vendors offer standards-based, modular, rugged, network-ready solutions for defense applications, backed by Intel's 30+ years of experience in delivering world-class computing and communications solutions.

System developers and integrators can benefit from this broad selection of interoperable, COTS solutions at multiple levels of integration, along with software tools designed to shorten development time and costs. Those tasked with addressing the emerging trends in the defense industry can satisfy their high performance, SWaP, and tool needs when they design with Intel solutions.

For more information about Intel solutions for the defense industry, please contact your Intel account owner or distributor partner.

1. Extended temperature of -40°C to 85°C is supported on select Intel® processor SKUs.
2. No computer system can be absolutely secure. Intel does not assume any liability for lost or stolen data or systems or any damages resulting from such losses.

© 2019 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Atom, Intel and Intel Core are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others.

