11th Gen Intel® Core™ & Intel Atom® x6000E Series Processors Briefing Deck

Christine Boles
Vice President, Internet of Things Group
GM, Industrial Solutions Division
Intel Corporation

John Healy
Vice President, Internet of Things Group
GM, Platform Management and Customer Engineering
Intel Corporation

Intel Industrial Summit 2020

Under Embargo until September 23rd, 2020 06:00 PST

Join Us at Intel Industrial Summit 2020

- An immersive, global digital event
- Launching new products and edge software reference designs
- Over 40+ partners participating in the summit
- Over 40+ keynotes, panels and sessions across 5 regional tracks
- 9 demos
- Timing and registration links:

	DATE/TIME:	
AMERICAS:	**9/23/2020**	9:00AM-11:00AM PST
EMEA:	**9/23/2020**	2:00PM-4:00PM GMT +1
AP/PRC:	**9/24/2020**	9:00AM-11:00AM GMT +8
JAPAN:	**9/28/2020**	1:00PM-3:30PM GMT +9

	DATE/TIME:	
AMERICAS:	**9/24/2020**	9:00AM-11:00AM PST
EMEA:	**9/24/2020**	2:00PM-4:00PM GMT +1
AP/PRC:	**9/25/2020**	9:00AM-11:00AM GMT +8
JAPAN:	**9/29/2020**	1:00PM-3:30PM GMT +9

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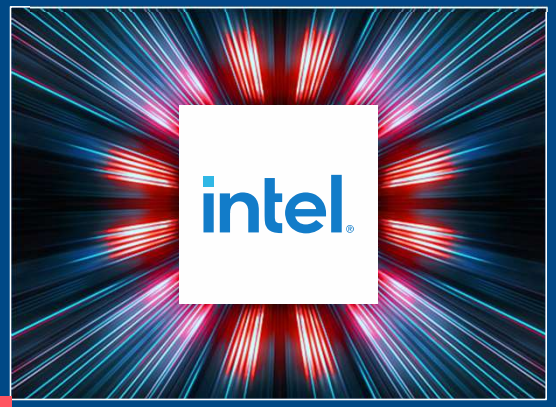
Intel Industrial Summit partners represented at the event as of 9/10/2020.

Our IOT Strategy

HIGH PERFORMANCE



ENABLE THE EDGE

VISION / AI INFERENCE

COMMON AND SEAMLESS DEVELOPER EXPERIENCE + SOFTWARE

SCALING THE ECOSYSTEM TO DELIVER MARKET READY SOLUTIONS

A strategy to Address the Needs of Vertical Markets

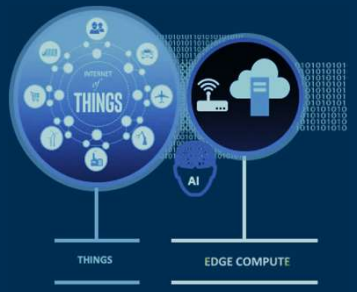
Solve key vertical market challenges

Partner with market leaders in vertical segments

Differentiate with silicon, system design, and developer experience

Solving Challenges to the Edge

2017	2018	2019	2020	2021+
PIVOTING TO **COMPUTE-HUNGRY WORKLOADS** AT THE EDGE	FOCUSING ON KILLER APPS **VISION, EDGE AI** & TESTING ACROSS **VERTICALS**	SCALING **DEPLOYMENTS** & CONVERGING **WORKLOADS**	LAUNCHING **EDGE-NATIVE** PRODUCTS & DEMOCRATIZING **EDGE**	DISTRIBUTED Workloads **Network & Edge**



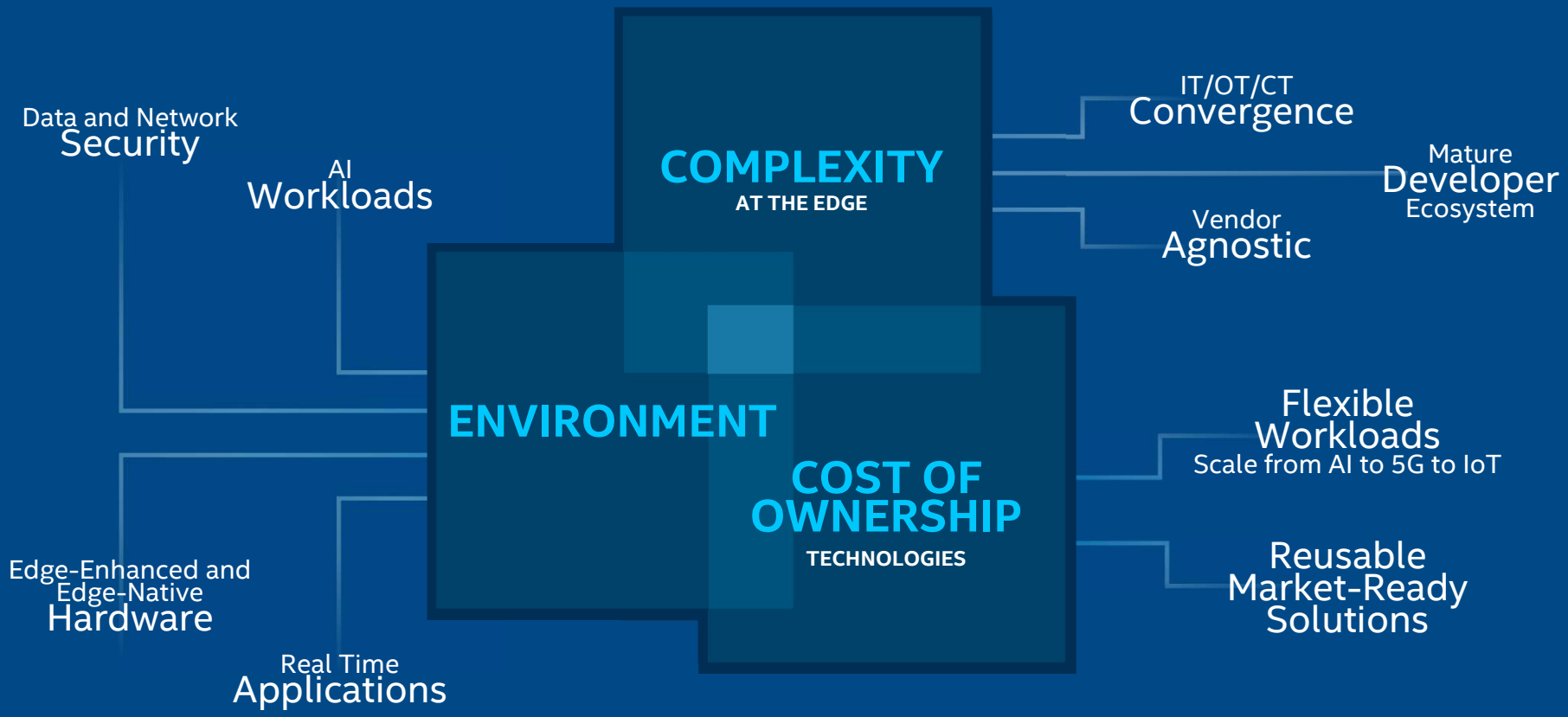
OpenVINO™

intel. MOVIDIUS™ | intel. ARRIA 10 | intel. ATOM | intel. CORE i7 | intel. XEON

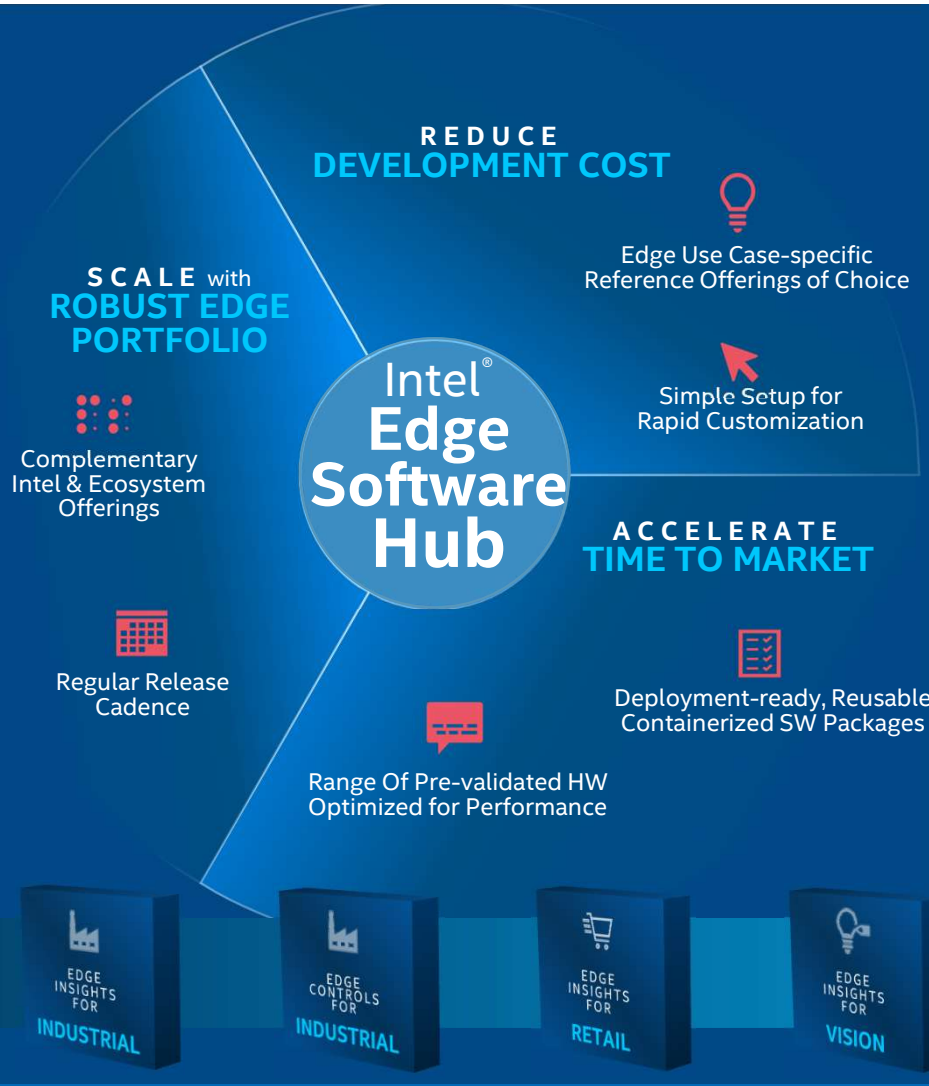
Workload Convergence

AI INFERENCE
NETWORK
MEDIA

Solving Key IoT Edge Challenges



Introducing...



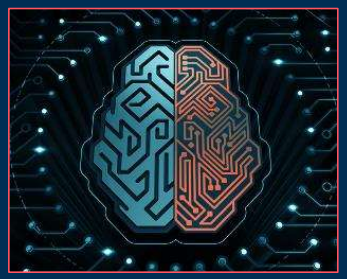
intel.com/edgesoftwarehub

EDGE USE CASE-SPECIFIC
PACKAGES

Get to Market Faster

EDGE INSIGHTS FOR INDUSTRIAL + EDGE CONTROLS FOR INDUSTRIAL

Software Reference Design



Artificial Intelligence

Distributed Compute

Real-Time Operation

Flexible Workload

intel ATOM · intel CORE i7 · intel XEON · intel MOVIDIUS · intel STRATIX 10 · intel ARRIA 10 · intel OPTANE · 5G

AXIOMTEK · Microsoft · Audi · TM ROBOT · ADVANTECH · Kinco · QUEST BORN TO ENGINEER · HITACHI · ExxonMobil

> "Developers can have flexible development framework to adopt the leading-edge technologies from IT"
>
> *Hitachi, General Manager, Control System Platform Division*

For more information, visit intel.com/industrial

Intel Solutions Optimized for Edge

REQUIREMENT

- INTEROPERABILITY
- MISSION-CRITICAL SYSTEMS
- CLOUD TO EDGE TO END POINT SYSTEMS
- AI AT THE EDGE
- REGULATORY SAFETY REQUIREMENTS
- LOW-LATENCY APPLICATIONS

TECHNOLOGY

- COMPUTE PERFORMANCE
- GRAPHICS & MEDIA
- VIRTUALIZATION
- SECURITY
- MANAGEABILITY
- VISION / AI
- FUNCTIONAL SAFETY
- REAL TIME

FULL STACK

SOFTWARE

oneAPI · OpenVINO · Open Visual Cloud · EDGE SW HUB

COMPUTE

intel. ATOM · intel. CORE i7 · intel. XEON

AI/CV INFERENCE ACCELERATORS

intel. MOVIDIUS · intel. STRATIX 10 · intel. ARRIA 10

CONNECTIVITY

Wi Fi · ETHERNET · 5G

SOLUTION

- SMART KIOSK
- INTERACTIVE WHITEBOARD
- PREDICTIVE ANALYTICS
- ANOMALY DETECTION
- PEOPLE DETECTION
- TRAFFIC CONTROL

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

Common and Seamless Developer Resources

Find it all at the Intel® Developer Zone: software.intel.com/iot

SOFTWARE DEVELOPMENT TOOLS

oneAPI Toolkits

OpenVINO™

AND MORE

- Intel® System Studio
- Intel® Distribution for Python*
- Intel® Time Coordinated Computing Tools
- Intel® Edge Software Hub

ECOSYSTEM PROGRAM

- Co-marketing
- Match making
- Co-selling

intel. IoT Solutions Alliance

intel. IoT Solutions Alliance
Industrial Solution Builders Specialist

intel. IoT Solutions Alliance
Video Specialist

intel. market ready

HARDWARE

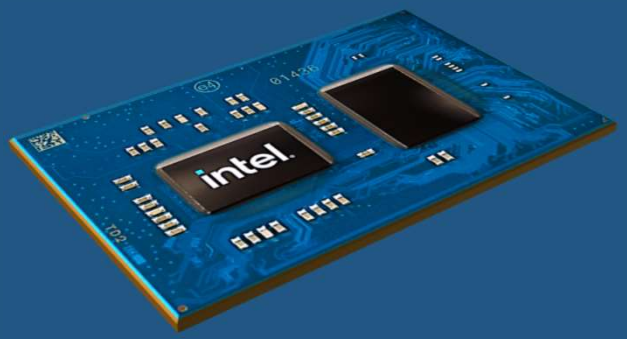
- IoT developer kits
- Intel® Vision Accelerator Design
- Intel® DevCloud for the Edge

TRAINING

- Virtual/F2F workshops
- Webinars
- Self-guided developer resources
- Forums/Support
- Education/Certification – Udacity*/Coursera*

Silicon Enhanced for IoT Edge

INTEL® ATOM® x6000E SERIES PROCESSORS



COMPUTE PERFORMANCE

MANAGEABILITY

GRAPHICS & MEDIA

REAL TIME

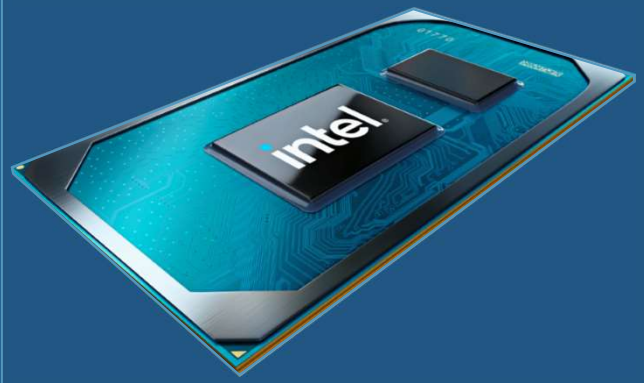
VIRTUALIZATION

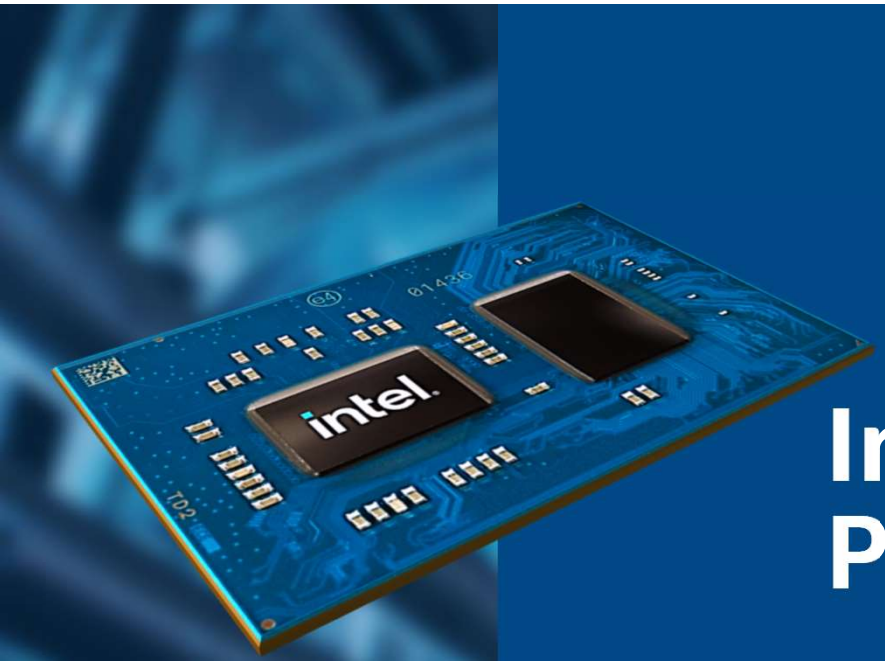
SECURITY

VISION/AI

FUNCTIONAL SAFETY

11TH GEN INTEL® CORE™ PROCESSORS





Intel® Atom® x6000E Series Processors Overview

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Intel Industrial Summit 2020

The New Intel® Atom® x6000E Series Processers
(Elkhart Lake)

BUILT FROM THE GROUND UP TO SUPPORT THE RAPID DEVELOPMENT AND THE GROWING COMPLEXITY OF IOT INFRASTRUCTURES

- Powering applications in Industrial & Energy, Public Safety, Retail & Hospitality, Health & Life Sciences…
- Achieve new levels of performance, graphics & media processing in a compact form factor
- Enables Real time computing solutions for time sensitive, worst-case execution time operations
- Delivers new capabilities to meet strict functional safety requirements for critical applications

Intel® Atom® x6000E Series Processors Value Vectors

NEXT-GEN, LOW POWER CPU PERFORMANCE

- Scalable performance with two and four core options
- Significant gen-gen performance gains

FAST GFX & MEDIA PROCESSING

- Intel® UHD Graphics with 16 or 32 Execution Units
- Smooth / Rich images on up to three independent displays at 4kp60
- Superior video encoding & decoding

REAL TIME TECHNOLOGY

- Provides worst-case execution time operations within each core and across networks of IoT devices
- Intel Time Coordinated Computing, integrated 2.5GbE with Time Sensitive Networking capabilities

FUNCTIONAL SAFETY CAPABILITY

- Integrated Intel® Safety Island to enable faster and easier development of Functional Safety solutions

IMPROVED I/O CAPABILITY

ENHANCED OS OFFERING

RELIABLE COMPUTING

ENHANCED SECURITY EXECUTIONS

Gen Over Gen Performance Improvements

Source: Intel. Claims based on a) SPEC CPU 2006 metric estimates based on Pre-Si projections and b) 3DMark11 estimates based on Pre-Si projections, using Intel® Pentium® J4205 as prior gen.
See next slide for configuration details. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

System Configurations for Measurements:

Intel® Pentium® J6425 vs Intel® Pentium® J4205

Intel Configurations: Performance results are based on projections as of September 1st, 2020

Processor:	Intel® Pentium® J6425 PL1=10W TDP, 4C4T Turbo up to 3.0GHz
Graphics:	Intel Graphics Gen 11 gfx
Memory:	16GB LPDDR4-3200
OS:	Windows* 10 Pro
Compiler version:	IC18

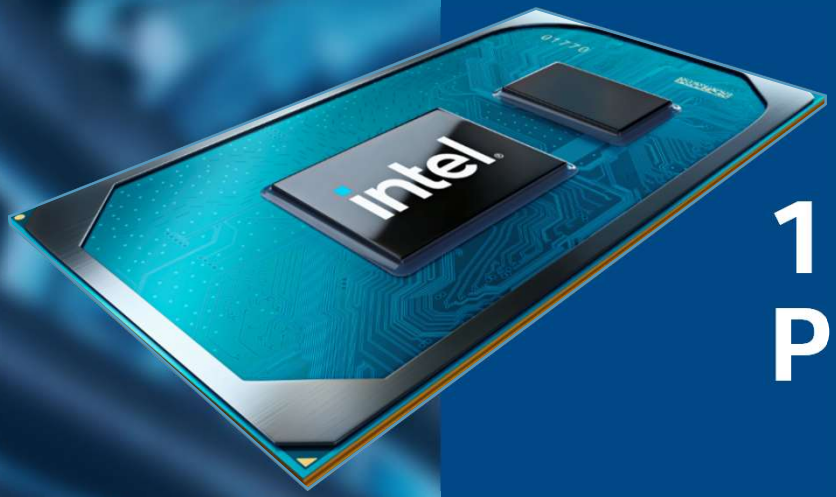
Processor:	Intel® Pentium® J4205 PL1=10W TDP, 4C4T Turbo up to 2.6GHz
Graphics:	Intel Graphics Gen 9 gfx
Memory:	16GB LPDDR4-2400
OS:	Windows* 10 Pro
Compiler version:	IC18

SPEC* CPU2006 is a benchmark from the SPEC consortium that measures device performance and throughput using compute intensive application subtests. SPECint*_base2006 measures how fast a device completes a single integer compute task. SPECint*_rate_base2006 measures throughput, or how many integer compute tasks a device can accomplish in a given amount of time.

Note: SPEC CPU2006 has been retired by SPEC.

3DMark* 11 is a benchmark from Futuremark* that measures DX 11 gaming performance. There are four DX 11 graphics tests with three quality presets: Entry, Performance, Extreme. Reported metrics: Graphics Score (GPU), Physics Score (CPU), Combined Score (GPU & CPU) and an overall 3DMark Score (higher is better for all Scores). Scaling efficiencies: Graphics tests are GPU dominant, sensitive to graphics and CPU frequency, core count and memory

Performance numbers are Pre-Si projections and are subject to change. Results reported may need to be revised as additional testing is conducted. The results depend on the specific platform configurations and workloads utilized in the testing, and may not be applicable to any particular user's components, computer system or workloads. The results are not necessarily representative of other benchmarks.



11th Gen Intel® Core™ Processors Overview

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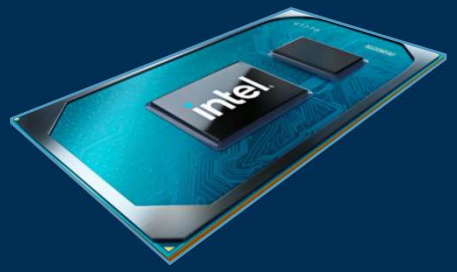
Intel Industrial Summit 2020

11th Gen Intel® Core™ Processor Family
(Tiger Lake-UP3)



BUILT FROM THE GROUND UP TO SUPPORT THE RAPID DEVELOPMENT AND THE GROWING COMPLEXITY OF IOT INFRASTRUCTURES

- Achieve new levels of performance: CPU, Graphics/Media/Display, AI & Deep Learning
- Powering applications in Industrial & Energy, Public Safety, Retail & Hospitality, Health & Life Sciences…
- IoT-Centric capabilities: In-Band ECC, Extended Temperatures, Functional Safety
- Real Time Compute: Intel® Time Coordinated Computing, Time Sensitive Networking

11th Gen Intel® Core™ Processor Value Vectors

HIGH CPU PERFORMANCE

- Total Compute Capabilities for workload consolidation: CPU/GPU/AI
- 4 Cores scalable from 12/15/28W operation in a single SKU
- Intel® Deep Learning Boost

FAST GFX & MEDIA PROCESSING

- Intel® Iris® Xe Graphics with 96 Execution Units
- 4 independent displays: up to 4x4K60 HDR / 2x8K60 SDR
- 2nd Video Decode Box added for video ingestion

REAL TIME TECHNOLOGY

- Provides real time compute within each core and across networks of IoT devices
- Intel® Time Coordinated Computing, Time Sensitive Networking
- Cache Quality of Service, Virtual Channels, Time Aware I/O

FUNCTIONAL SAFETY CAPABILITY

- Intel Functional Safety Essential Design Package collaterals to enable faster and easier development of Functional Safety solutions

Thunderbolt™4/ USB4 | PCIe Gen4

I/O

IMPROVED I/O CAPABILITY

Win10 IOT Ent | VxWorks | Linux / Yocto | KVM, RTS

ENHANCED OS OFFERING

In-Band ECC | Extended Temperatures

RELIABLE COMPUTING

Boot Guard | Total Memory Encryption

ENHANCED SECURITY EXECUTIONS

Gen Over Gen Performance Improvements

Up to **23% SINGLE THREAD**
Compute performance
Intel® i7-1185G7E improvement over Intel® Core™ i7-8665 UE[1]

Up to **19% MULTI THREAD**
Compute performance
Intel® i7-1185G7E improvement over Intel® Core™ i7-8665 UE[1]

Up to **2.95X**
Graphics performance
Intel® i7-1185G7E improvement over Intel® Core™ i7-8665 UE[2]

1 Source: Intel. Performance claim based on SPEC CPU 2017 metrics estimated by measurements on Intel internal reference platforms.
2 as measured by 3DMark*11 Performance estimates based on measurements of intel internal reference platforms
See next slide for system configuration details. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks

System Configurations for Measurements:

Intel® i7-1185G7E to Intel® i7-8665UE

Intel Configurations: Performance results are based on Intel measurements as of August 27th, 2020.

Source: Intel. Performance claim based on SPEC CPU 2017 metrics estimated by measurements on Intel internal reference platforms completed on August 27, 2020. Graphics claim based on 3DMark11_V1.0.4 Graphics Score estimated by measurements on Intel internal reference platforms on August 27, 2020.

Testing Configuration:
Processor: Intel® Core™ i7 1185G7E PL1=15W TDP, 4C8T Turbo up to 4.4GHz
Graphics: Intel Graphics Gen 12 gfx
Memory: 16GB DDR4-3200
Storage: Intel SSDPEKKW512GB (512 GB, PCI-E 3.0 x4)
OS: Windows* 10 Pro (x64) Build 19041.331 (2004/ May 2020 Update). Power policy set to AC/Balanced mode for all benchmarks. All benchmarks run in Admin mode & Tamper Protection Disabled / Defender Disabled.
Bios: Intel Corporation TGLSFWI1.R00.3333.A00.2008122042OneBKC: tgl_b2b0_up3_pv_up4_qs_ifwi_2020_ww32_4_01

Processor: Intel® Core™ i7 – 8665UE 15W PL1=15W TDP, 4C8T Turbo up to 4.4GHz
Graphics: Intel Graphics Gen 9 gfx
Memory: 16GB DDR4-2400
Storage: Intel SSD 545S (512GB)
OS: Windows* 10 Enterprise (x64) Build 18362.175 (1903/ May 2019 Update). Power policy set to AC/Balanced mode for all benchmarks. All benchmarks run in Admin mode & Tamper Protection Disabled / Defender Disabled.
Bios: CNLSFWR1.R00.X208.B00.1905301319

SPEC* CPU2017 is a benchmark from the SPEC consortium (www.spec.org) that measures computer performance and throughput using compute intensive application subtests. SPEC2017*_int_base provides a comparison point as to how fast a device completes a series of single integer compute tasks. SPECrate2017*_int_base provides a comparison point for throughput, or how many integer compute tasks a device can accomplish in a given amount of time.

3DMark* 11 is a benchmark from Futuremark* that measures DX 11 gaming performance. There are four DX 11 graphics tests with three quality presets: Entry, Performance, Extreme. Reported metrics: Graphics Score (GPU), Physics Score (CPU), Combined Score (GPU & CPU) and an overall 3DMark Score (higher is better for all Scores). Scaling efficiencies: Graphics tests are GPU dominant, sensitive to graphics and CPU frequency, core count and memory.

Intel® IoT Equipment Makers

200+ EARLY ACCESS PARTNERS ENGAGED ON NEW DESIGNS

100+ PARTNERS ALIGNED TO THE ANNOUNCEMENT

Unparalleled Ecosystem for the Edge

INTEL® IOT SOLUTIONS ALLIANCE

INTEL® AI: IN PRODUCTION

INTEL® NETWORK BUILDERS

INTEL® INDUSTRIAL SOLUTION BUILDERS

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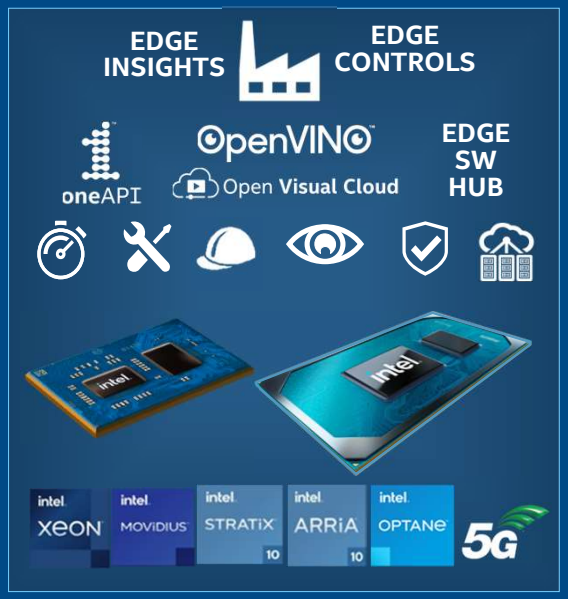
Commitment Brings Completeness

Deliberate Investments



Solve Real Problems

Now & the Future

CONSISTENT DEVELOPER EXPERIENCE FOR IOT APPLICATIONS

Notices & Disclaimers

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors.

Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information, visit www.intel.com/benchmarks.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

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Results that are based on systems and components as well as results that have been estimated or simulated using an Intel Reference Platform (an internal example new system), internal Intel analysis or architecture simulation or modeling are provided to you for informational purposes only. Results may vary based on future changes to any systems, components, specifications or configurations

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Not all features are supported in every operating system.

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Your costs and results may vary.

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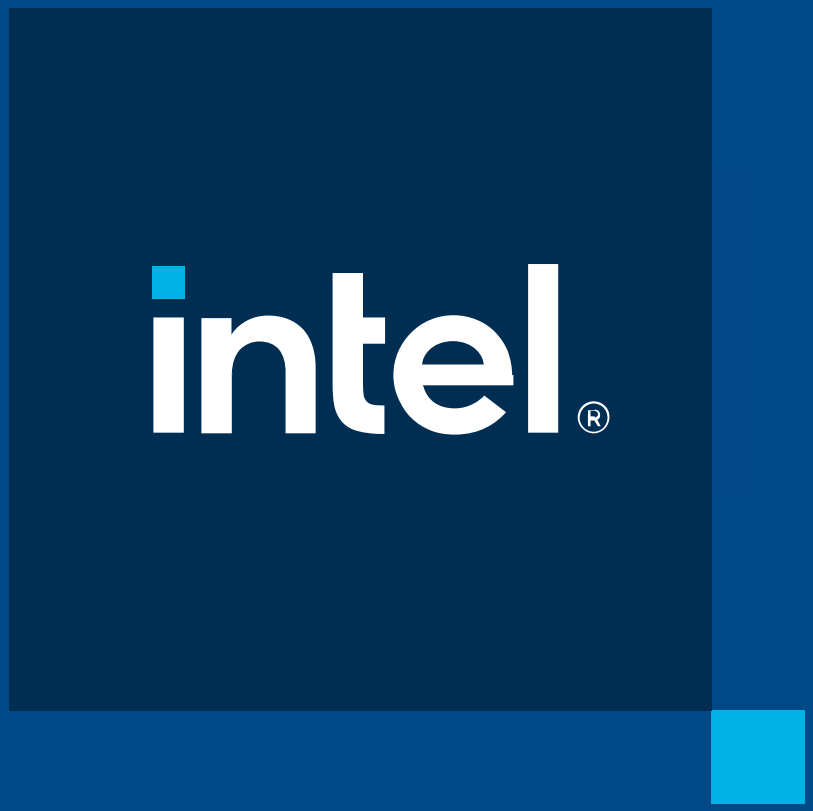
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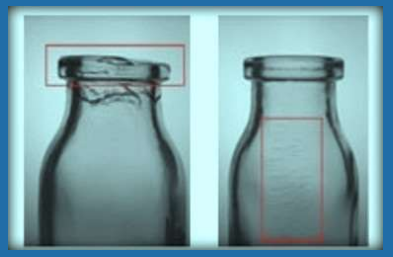
Intel® Edge Insights for Industrial Value Proposition

How can I meet rising requirement on **PRODUCT QUALITY?**

How can I better **PREDICT AND REDUCE DOWNTIME?**

How can I **OPTIMIZE FACTORY OPERATION** for higher throughput?



How can I leverage Latest technology for **BETTER BUSINESS OUTCOMES?**

How can I **STAND OUT IN COMPETITION** in my industry?

Intel® Edge Controls For Industrial Value Proposition

Reduced Downtime
by automated migration of workloads during system upgrades and failures

Integrated Security
minimizes risk of lost production

Faster Deployment
of new services + capabilities

System Interoperability
- Choose the best in class products
- Workloads and applications portability

Scalable
- Ability to run more workloads on existing hardware

It-like Management
Reduces the cost by simplifying SW deployment and management

Respond Rapidly with Intel® IoT RFP Ready Kits

Intel® IoT Request for Proposal (RFP) Ready Kits combine **INTEL-POWERED**, commercially-hardened hardware, software, and support to solve specific customer needs. Intel IoT RFP Ready Kits are purpose-built to optimize IoT deployment.

Pre-Integrated and Proven

- **All-in-one** Hardware, Software, SDKs, APIs, Demos and Instructions
- **1st phase Deployed and Proven** in a Customer Environment
- **Verified Availability, Distribution, Pricing and Support**

Broadly Compatible

- **Customizable and Ultra-Compatible** APIs and Components
- **Potential for Expanded Integration** with Cloud Platforms and Value-Added Services

Offering Benefits for …

- **Equipment and Tech Providers** (ISVs, ODMs, OEMs)
- **Cloud Service Providers** (CSPs like MS, AWS, GCP)
- **Solution Integrators** (Global or Regional)

Market Ready Solutions Overview

EVERY INTEL® IOT MARKET READY SOLUTION IS…

- Tailored to industry-specific business problems
- Pre-integrated and in production today
- Designed to accelerate ROI

VALUE PROPS

MAKING IT EASIER FOR:

- Customers to realize solution value
- Solution partners to get solutions to market
- Integrators to implement solutions