



INTEL EDGE INSIGHTS SOFTWARE

RAPID DEPLOYMENT OF TIME SERIES AND VIDEO ANALYTICS

Developer Relations Division, Intel®



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MARTIN KRONBERG

- Intel Evangelist 5 years – Intel Architecture, Graphics, and Software
- Global Workshops
- Conferences
- Videos – Intel Software YouTube
- Industrial
- Connected Logistics
- Cloud Service Providers
- Computer Vision



**SEASON 3
IN THIS EPISODE:**

- What are reference implementations
- How do they work
- What hardware can you use to deploy them
- How you can use them in developing your own IoT solutions



INTEL EDGE INSIGHTS SOFTWARE WORKSHOP

TODAY'S SCHEDULE

Introduction to EIS and
Intel Developer Program

Industrial Reference Implementations and the
IEI* Tank Developer Kit

Building and Deploying Visual Industrial
Solution on the Edge Insights Software Stack

Offloading Tasks to HDDL Accelerator Cards

Building and Deploying Time Series Industrial
Solution on Edge Insights Software



INTEL EDGE INSIGHTS SOFTWARE

RAPID DEPLOYMENT OF ANALYTICS PIPELINES

Industrial Solutions Division, Intel



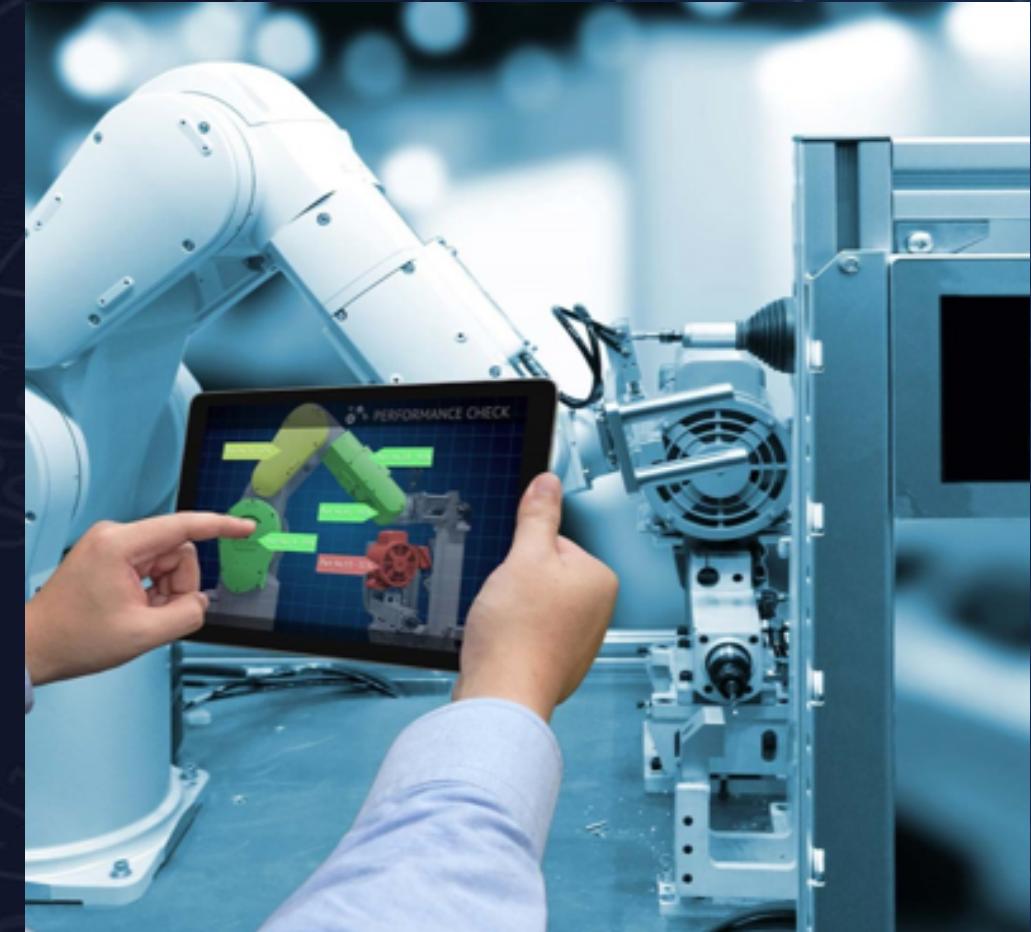
TRANSFORMATION IN THE INDUSTRIAL MARKET

Smart Factory - Industry 4.0 :

- AI
- Robotics
- Big Data Analytics
- Workload Consolidation
- Immediate (near real-time) **insights**.

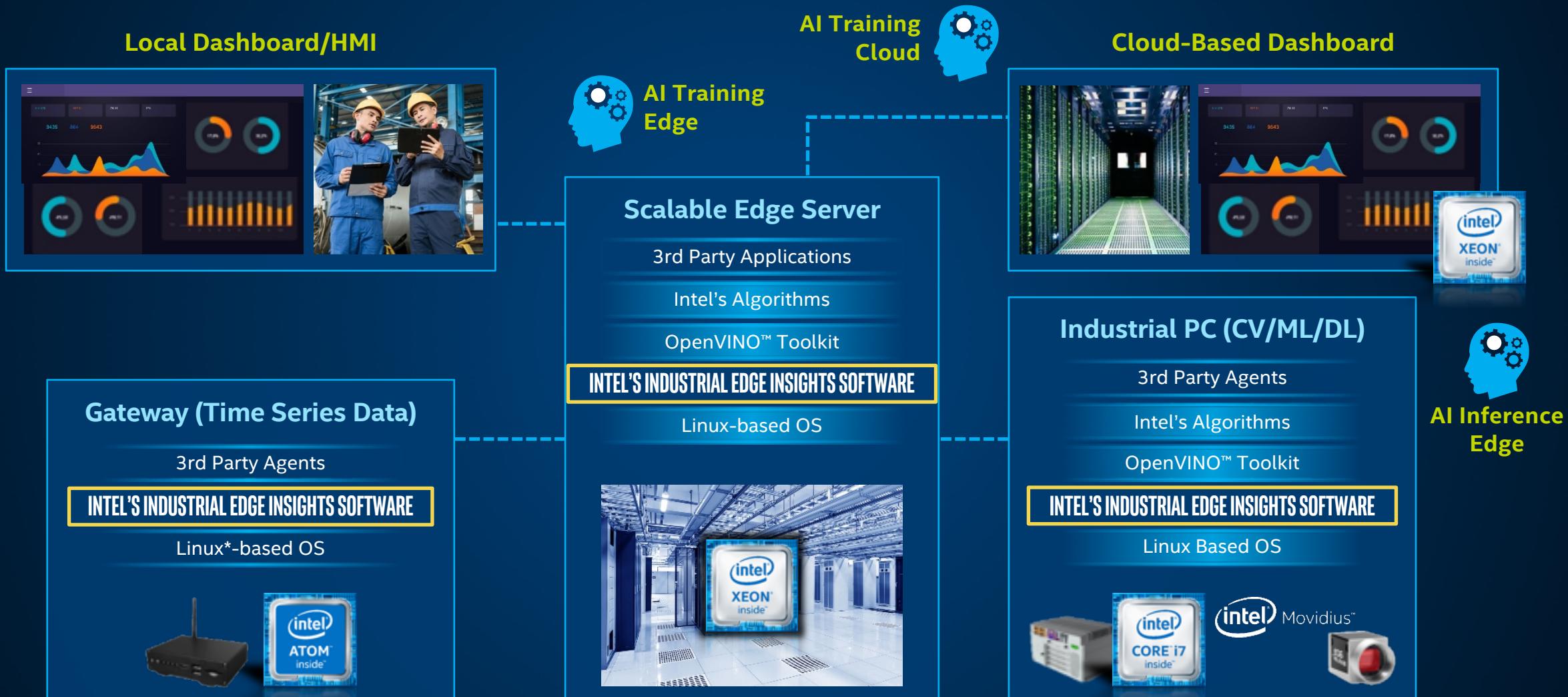
The benefits¹:

- Leaner process
- Maximum flexibility
- Improved predictability
- Increased agility
- Proven productivity



1. "Smart Factory and Its Benefits on Manufacturing Industry," Infinite Uptime August 21, 2018 <https://infinite-upptime.com/blog/smart-factory-benefits-manufacturing/>

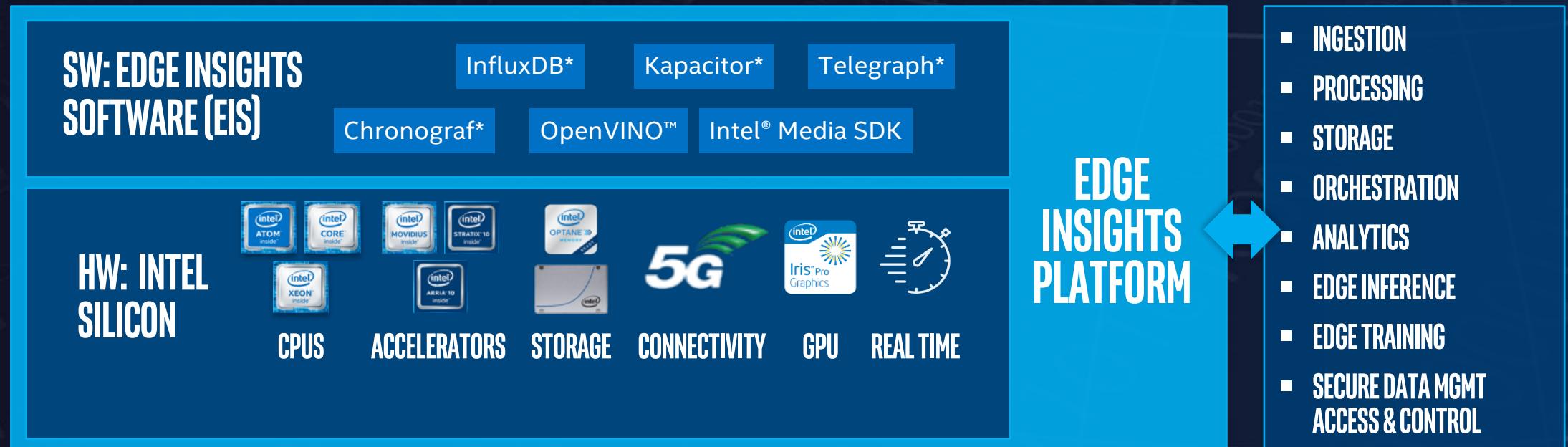
ANALYTICS PIPELINES FOR SMART MANUFACTURING



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INDUSTRIAL EDGE INSIGHTS SOFTWARE

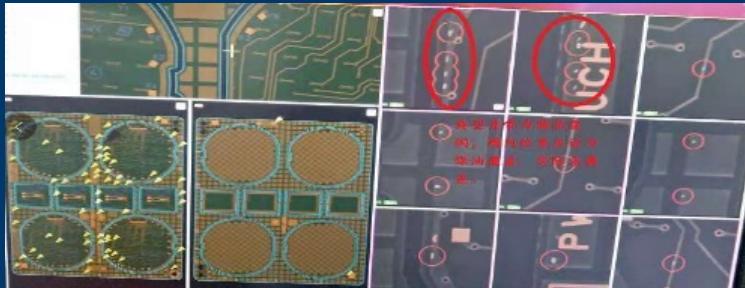
Edge Insights Platform is both HW and SW designed to enable secure ingestion, processing, storage, orchestration and management of data, and near real-time (~10mS) event-driven control, across a diverse set of operating systems (OS) and industrial protocols.



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INDUSTRIAL EDGE INSIGHTS PLATFORM USE CASES

DEFECT DETECTION



Package, part, or surface defects detection using AI and vision technology

- Inline quality control/assurance
- Reduce production losses and cost
- Reduce customer returns

PREDICTIVE ANALYTICS



Predicting future outcomes based on historical data

- Predict product quality
- Predict equipment maintenance
- Prevent costly maintenance
- Predict yield fluctuation

MANUFACTURING PRODUCTIVITY



Identifying opportunities/processes to improve on

- Monitor and improve factory production efficiency
- Monitor and identify production line constraints
- Monitor worker safety

APPLICABLE FOR BROWNFIELD AND GREENFIELD SITES AND INFRASTRUCTURES

INTEL INDUSTRIAL EDGE INSIGHTS SOFTWARE

A SOFTWARE STACK FOR RAPID DEPLOYMENT OF TIME SERIES AND VIDEO ANALYTICS

PRODUCT VENDORS

It provides validated and tested smart manufacturing software ingredients for fast development and deployment and rapid time-to-market

It provides optimized video and time-series data ingestion and an analytics framework on a single platform that is validated and tested by Intel

It is a \$0 license to use and distribute, which helps our partners to scale their business with minimum development investment

END USERS

Products with the software ingredients provide end users with incredible advanced insights and analytics to perform tasks such as:

- Detecting defects using AI, ML, and DL
- Performing predictive analytics
- Enhancing their productivity and scale
- Optimizing their industrial processes
- Reducing maintenance and upkeep cost

JWIPC RRK: EDGE INSIGHTS RFP READY KIT



AI-Ready AIO Gateways/Industrial PCs

- Intel's Industrial Edge Insights Software
- Intel® OpenVINO™ toolkit
- AliOS Things* and Link Edge* Ready
- Intel® Atom™, Intel® Core™, Intel® Xeon™ Processors
- Fan or Fanless, Rugged Configurations
- 2-4x PCIe* (Altera® or Intel® Movidius™ technology)
- 2-4x COM 6x USB3.0
- 2.5”HDD Hot Plug
- 2-4x Ethernet (PoE)
- Ubuntu*, CentOS*, Windows*, or Yocto* Ready¹

1- OpenVINO™ Toolkit OS Support: CentOS* 7.4 (64 bit), Ubuntu* 16.04.3 LTS (64 bit), Microsoft Windows* 10 (64 bit), Yocto Project* version Poky Jethro v2.0.3 (64 bit)

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IEI* TANK-870-Q170



The IOT Client Foundational Kit will provide **manageability**, **performance**, and a **scalable rapid path to market** solution that will support advanced **computer vision** and **deep learning** usages.

http://eshop.usa.ieeworld.com/usa/items.php?CA=2&sub_CA=24

<https://software.intel.com/en-us/blogs/2018/06/13/introducing-the-tank-aiot-developer-kit>

PCIE SLOTS THAT WILL SUPPORT HDDL-F (FPGA) AND HDDL-RC (MYRIAD X)

Intel® Core™ i5, Intel® Core™ i7, Intel® Xeon™

Fanless

8GB of RAM

1TB HDD

2x PCIe x8

Dual LAN with TSN support

WIFI

I/O Ports: 4x USB 3.0, 4 x USB 2.0, 4x RS-232, 2x RS-232/485, 8-bit DIO, 1x Line-out, 1x Mic-in

Operating Temp: -20°C~60°C

VISION ACCELERATION KIT + HDDL-R

POWERED BY IEI*

- Specialized Processors designed for high-performance machine vision at low power
- 8 VPUs x 16 SHAVE cores (Streaming Hybrid Architecture Vector Engine)
- Supports multiple network topologies (GoogLeNet, ResNet, etc.)
- Two Memory Banks (DDR4, 8GB in total)
- Preinstalled Intel® Distribution of OpenVINO™ toolkit
- Get started quickly with samples



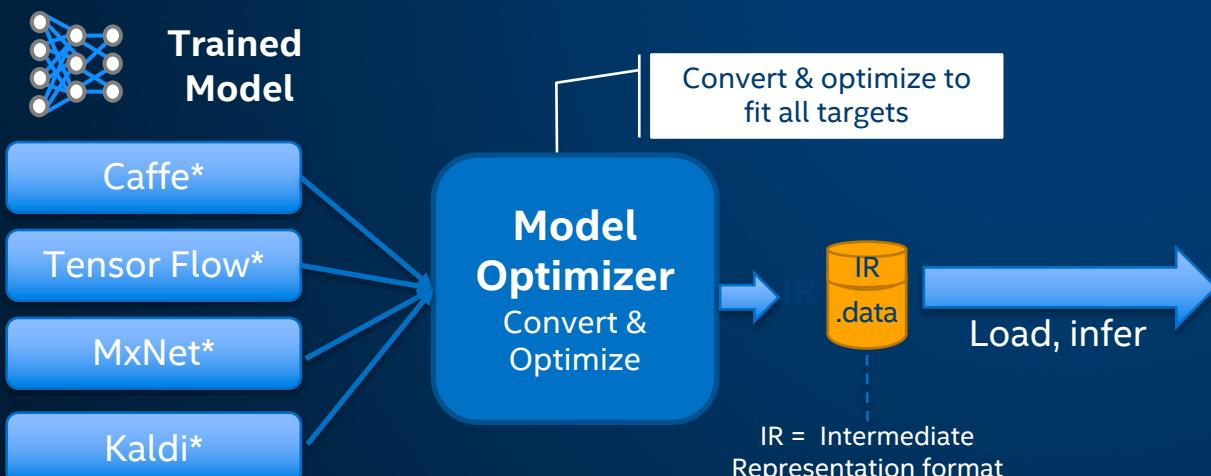
TANK-870-Q170

INTEL® DEEP LEARNING DEPLOYMENT TOOLKIT

TAKE FULL ADVANTAGE OF THE POWER OF INTEL® ARCHITECTURE

Model Optimizer

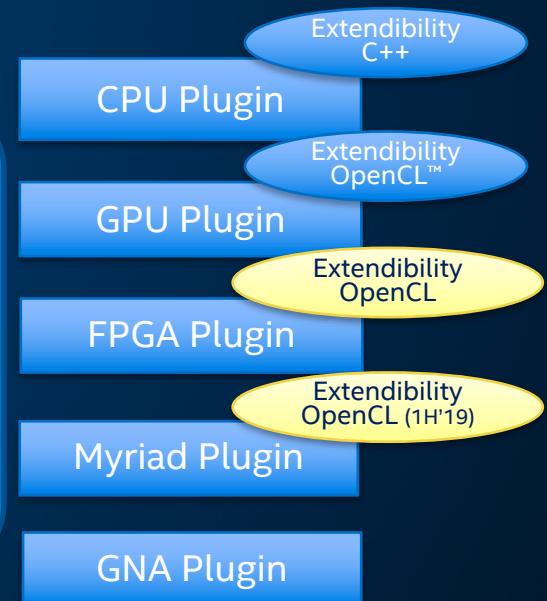
- **What it is:** Preparation step -> imports trained models
- **Why important:** Optimizes for performance/space with conservative topology transformations; biggest boost is from conversion to data types matching hardware.



GPU = Intel CPU with integrated graphics processing unit/Intel® Processor Graphics

Inference Engine

- **What it is:** High-level inference API
- **Why important:** Interface is implemented as dynamically loaded plugins for each hardware type. Delivers best performance for each type without requiring users to implement and maintain multiple code pathways.



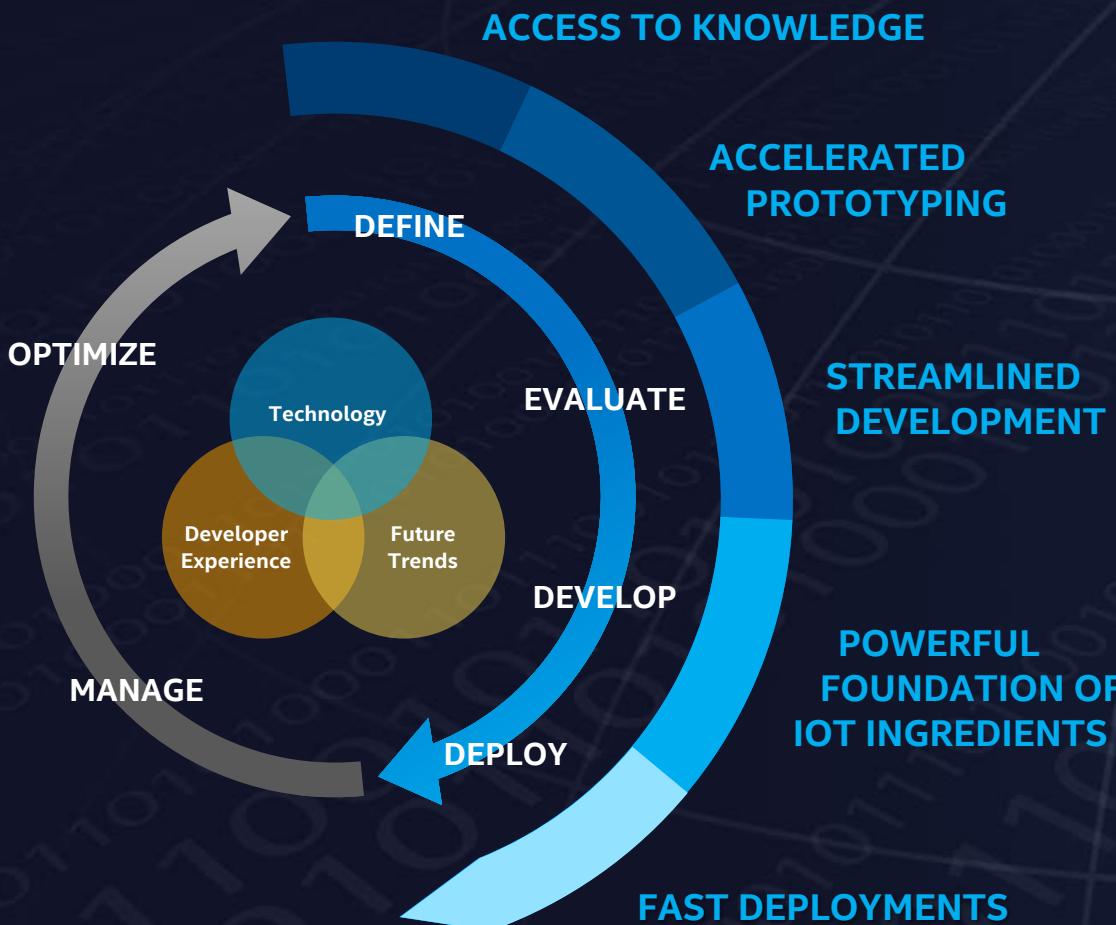


THE INTEL DEVELOPER PROGRAM



ENABLING NEW DEVELOPER OPPORTUNITIES

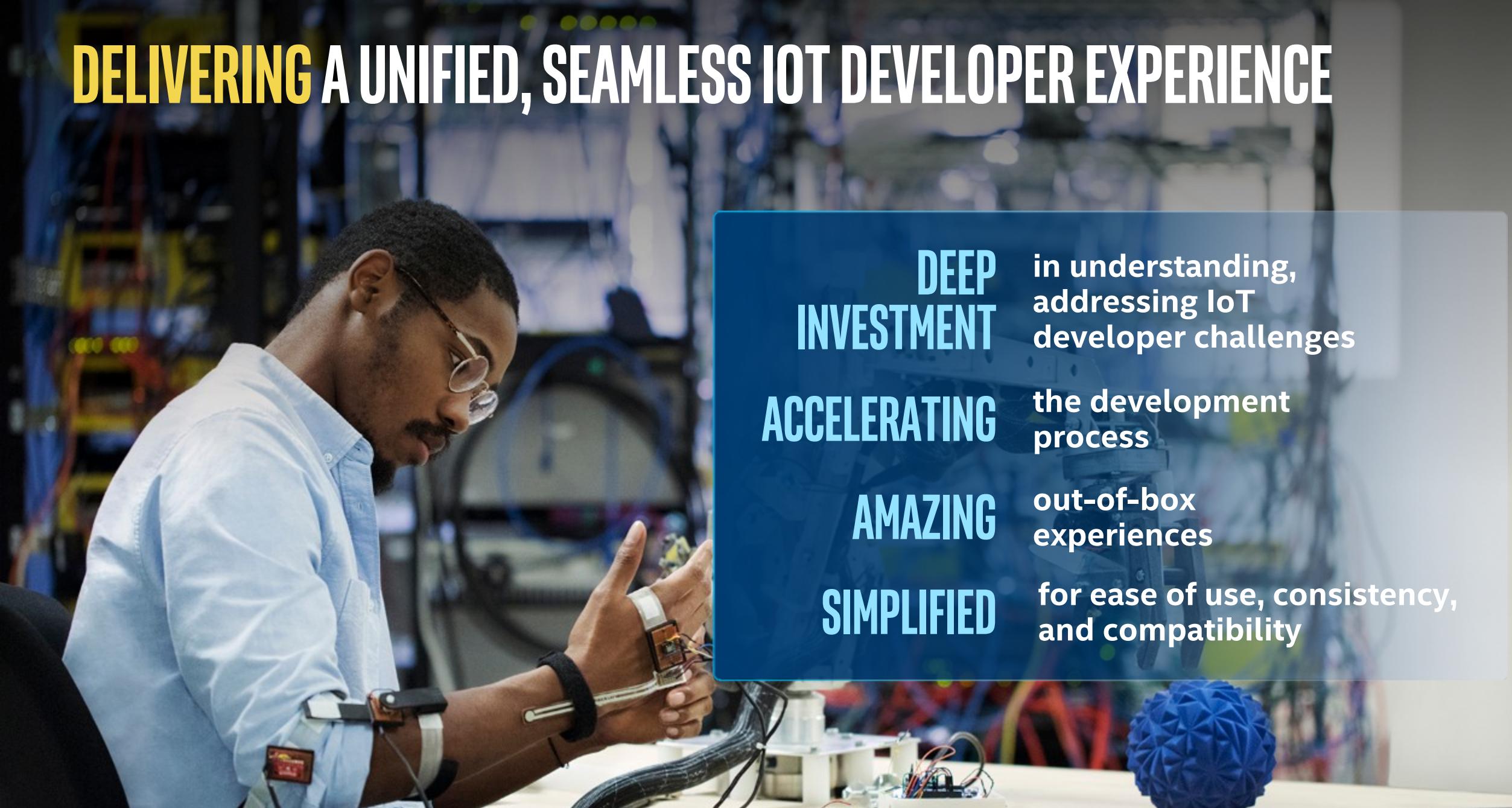
The Developer's Journey



What Intel Brings

- Common and seamless Developer experience
- Start to finish technologies for robust solutions
- Simplified path to develop and deploy products, systems, solutions
- Reusability, extensibility, portability, future proof

DELIVERING A UNIFIED, SEAMLESS IOT DEVELOPER EXPERIENCE



DEEP
INVESTMENT
ACCELERATING
AMAZING
SIMPLIFIED

in understanding,
addressing IoT
developer challenges

the development
process

out-of-box
experiences

for ease of use, consistency,
and compatibility

INTEL DEVELOPER ZONE FOR IOT: CENTRAL RESOURCE FOR E2E SOLUTION SUPPORT

Training, How-Tos,
Documentation, Forums, Support

Development Kits, SDKs, Libraries, Sensor
Drivers, APIs, Tools

Code Samples and Tutorials,
End-to-End Reference Implementations

Guides for Productization and
Commercialization



Reference Implementations

Learn about IoT solutions and how developers can use Intel® technology to connect the world.



Industries

Intel is powering IoT for global market opportunities and enabling change across industries.

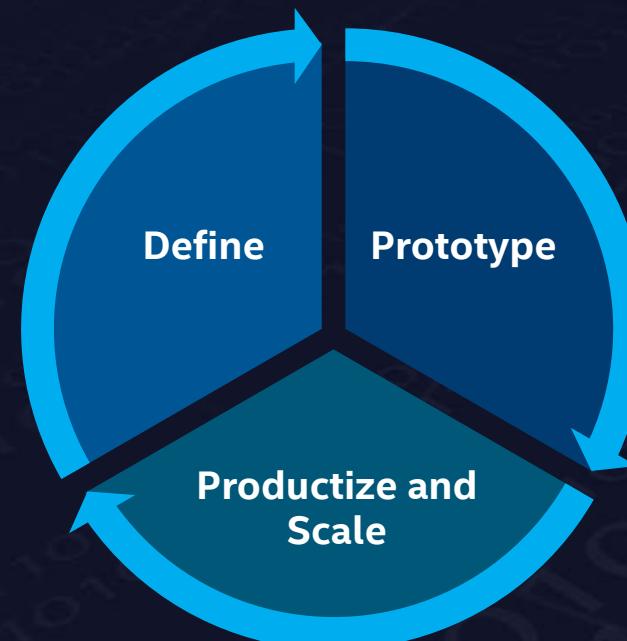
[Smart Video](#) | [Industrial Automation](#) | [Retail](#) | [Smart Home](#)



software.intel.com/iot



ENGAGING THROUGH ALL PHASES OF DEVELOPMENT



EVENTS

Virtual/Tradeshows
(Global IoT DevFest)



WORKSHOPS

Hands-On Training



PROMOTION

Showcase Reference Implementations
IoT Innovators sharing Expertise



ENGAGEMENTS

ISV Engagement
App Enablement
Architecture Conversion