INTRODUCTION
INDUSTRIAL IOT

Software and Services Group
IoT Developer Relations, Intel

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IIOT WORKSHOP OVERVIEW

INTRODUCTION

1. Intel Dev Program and Products
2. Introduction to Intel and the IIoT

Each Module contains a lecture and a hands-on lab exercise that builds towards an model of an IIoT infrastructure based on a formalized architecture.

Industrial IoT Workshop Content:

https://goo.gl/Stt9mD

CONTROL

3. Physical Sensors and Actuators
4. Communications and Protocols

OPERATIONS

5. Workload Consolidation
6. Security

INFORMATION

9. Predictive Analytics and Data Modeling

INTRODUCING THE UP2 GROVE IOT DEVELOPMENT KIT

High-Performance Features

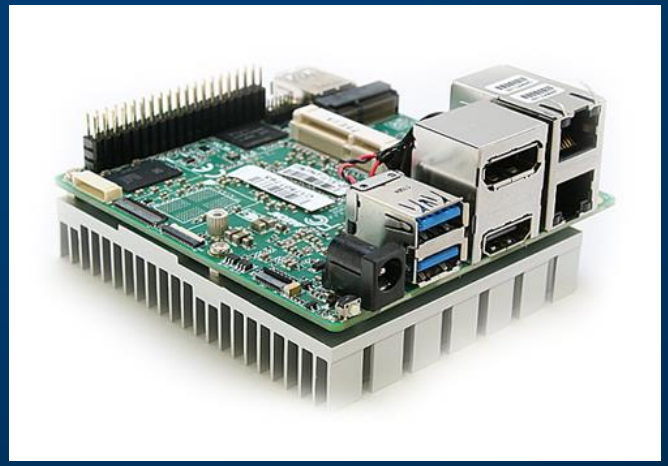
- Fast CPU and graphics capabilities
- Multiple displays, Dual network ports
- Many I/O expansion options

Integrated Software

- Preinstalled Ubuntu* 16.04
- Over 400 sensor libraries
- Integration for major third-party cloud providers

Development

- Develop simply with Arduino Create*
- Optimize code with Intel® System Studio



INDUSTRIAL REVOLUTION 4.0

1ST

1760'S

Steam, Water Mechanized Production

2ND

1860'S

Electrification, Oil, Mass Production

3RD

LATE 1900'S

Invention of the Microchip

4TH

NOW

Invention of the computerized network

VISIBILITY LEVERAGED FOR DECISION MAKING

"While manufacturers have long had access to data collected on the plant. floor, it's typically been locked away in proprietary manufacturing software silos, restricting their ability to leverage it for decision making, according to Matt Wells, product general manager for automation software at GE Digital, based in San Ramon, Calif. That changes with IoT, which makes it far easier to collect and manage large amounts of manufacturing data not just in a single factory, but across multiple production sites through the cloud, he said. When paired with analytics, companies will gain better insights, allowing them to optimize plant operations, reduce quality defects and perform preventative maintenance, according to Wells."

Matt Wells, product general manager for automation software at GE Digital, based in San Ramon, Calif.

INDUSTRIAL IOT

Industrial processes are taking on a dual nature, one physical and the other digital. Together Industry 4.0 runs on Cyber-Physical machines.

WHAT?

Sensors are connecting our tools to their physical environment. The Internet of Things is connecting our tools to each other, and large scale computing is connecting our tools to us through optimization of process and analytics.

WHY?

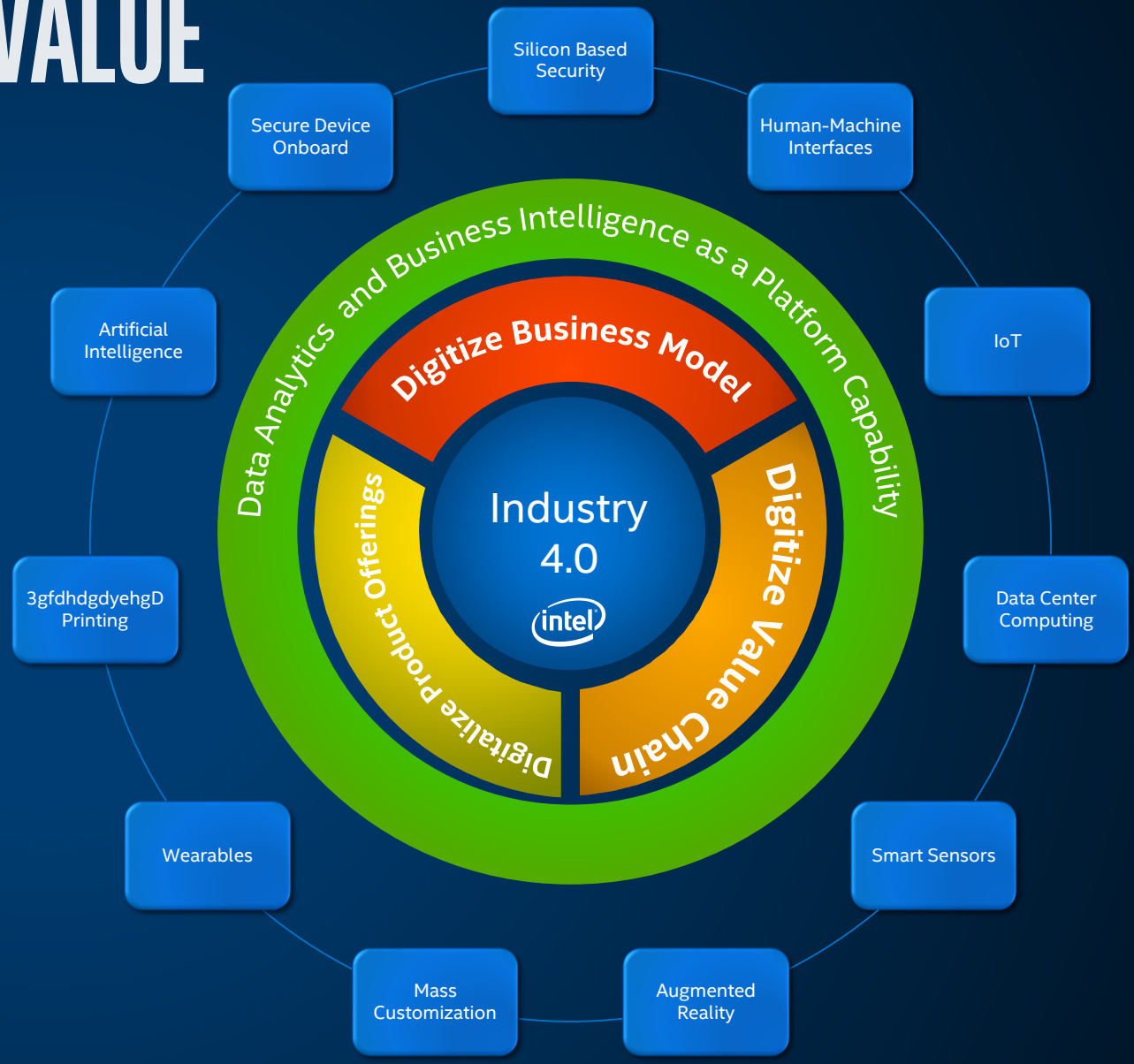
IIoT is about decoupling devices from applications and gaining visibility into business processes. When each manufacturing device can provide data about it's use and status then manufacturing processes can be dynamically configured and reconfigured by a data-driven, software processes. Manufacturing will be able to move faster, be more flexible, meet higher work safety standards and fulfill higher quality standards.

HOW?

Working through Industrial Consortiums and Open Industrial Standards to connect current industrial processes to physical sensors, secure protocols, new safety standards, virtualization, real-time automation and machine learning will able visibility and optimization of current business processes.

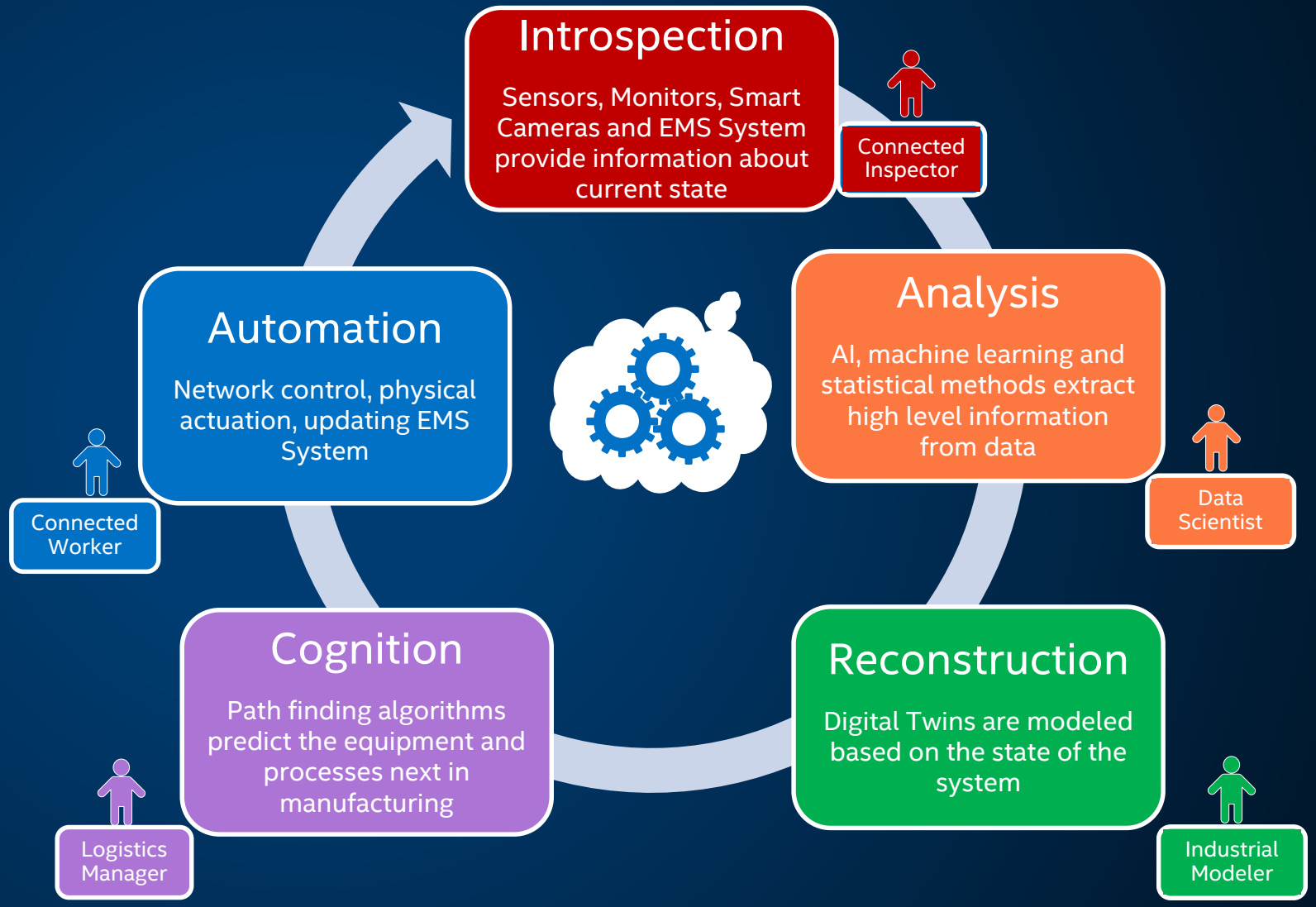
TECHNOLOGY ENABLES NEW VALUE

- *People, products and machines continuously communicate to optimize process and value chains.*
- *Digitalization of highly vertical processes and equipment. Integration of reusable horizontal capabilities backed by industry consortiums*
- *The product holds the information to its own production and guides itself through Industry 4.0 factories.*
- *Digital business models enable new revenue streams including direct to customer data and product services*
- *Deepen relations with customers through data analytics and mass customization*
- *First movers are set to outpace their competitors*



CYCLE OF CONTINUOUS SMART MANUFACTURING

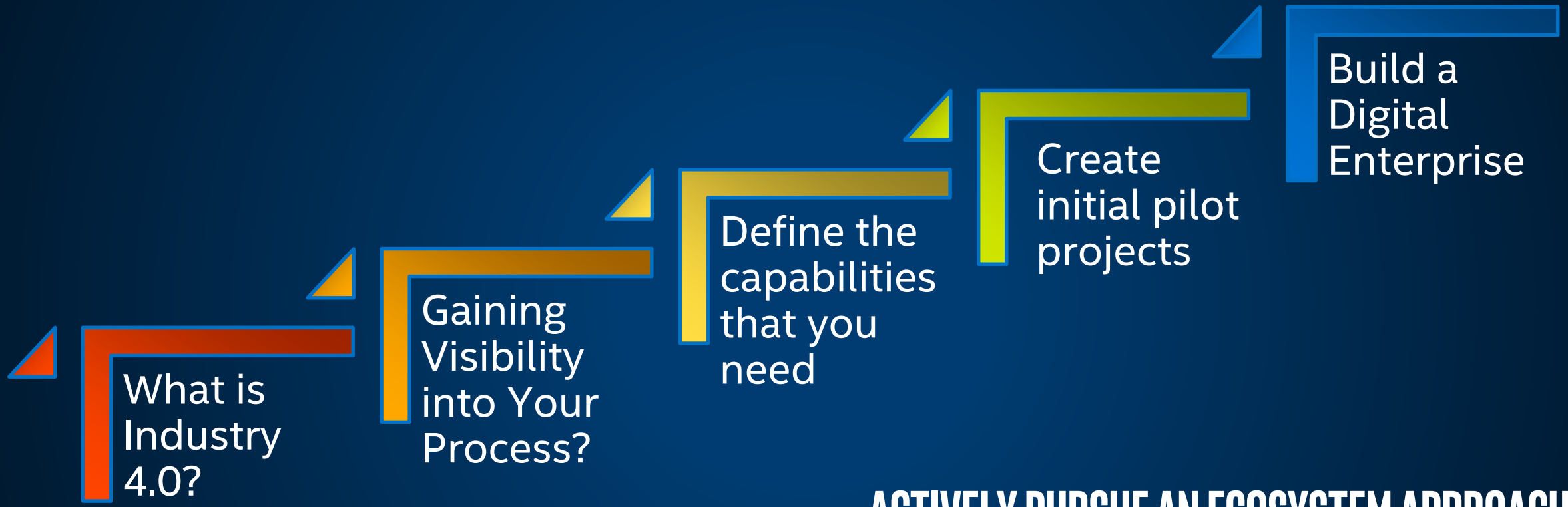
Digitization and integration of vertical and horizontal value chains enables continuous visibility and feedback with the processes across an organization



INDUSTRIAL 4.0 PILOT OPPORTUNITIES

Digital Business Models	Engineering	Vertical Integrations	Horizontal Integrations	Smart Maintenance	Digital Workforce	Digital Sales & Marketing
Hardware Optimization Service Model	Agile Prototyping	Machine Automation	Integrated E2E Planning and Execution	Predictive Maintenance	Integrate ERP Systems	Digital Customer Relations Management
Pay as you Go Models	Simulation & Digital Twin Modeling	E2E Product Lifecycle Management	Visibility into Supply Chain	Simulation of Digital Twin	Digital Finance and Accounting	Customer Service Portals
Complete Platform Management Model	Scalable Device Management	Smart Building Management	Smart Warehousing and Logistics	Augmented Reality	Connected Agile IT	Dynamic Pricing
Big Data Analytics	Virtualization	Energy Optimization	Digital Parts and Equipment Sourcing	Wearables	Augmented Reality	Personalized Marketing
Performance Management	Xeon to FPGA Embedded Technology	Connected Logistics	Intrinsic E2E Security	FUSA	UX Interface Support	E-Payment Systems

THE PATH TO INDUSTRY 4.0



ACTIVELY PURSUE AN ECOSYSTEM APPROACH!

VISION FOR INDUSTRIAL IOT

INTEL TECHNOLOGY FOR INDUSTRIAL IOT/INDUSTRY 4.0

Open Platform

built with interfaces and APIs that enable integration with legacy systems and devices and with platforms from multiple vendors.

Interoperability

is designed into IA CPUs to offer backward compatibility to help SW and application reuse thus reducing development time and resources.

Performance at the Edge

that enables near-real-time analytics, local decision making, and tighter process controls.

Advanced Security

for trusted data from edge to cloud and protection from costly attacks.

Scalability

for varying levels of gateway performance, with a broad range of support from Intel® Quark™, Intel® Atom™, Intel® Core™ and Intel® Xeon® processor D and E families.

Manageability

for secure remote upgrades and services.

Faster, More Flexible Deployment

with a platform that supports your choice of operating systems and ecosystem applications.

INTEL IS PARTNERING WITH THE ECOSYSTEM

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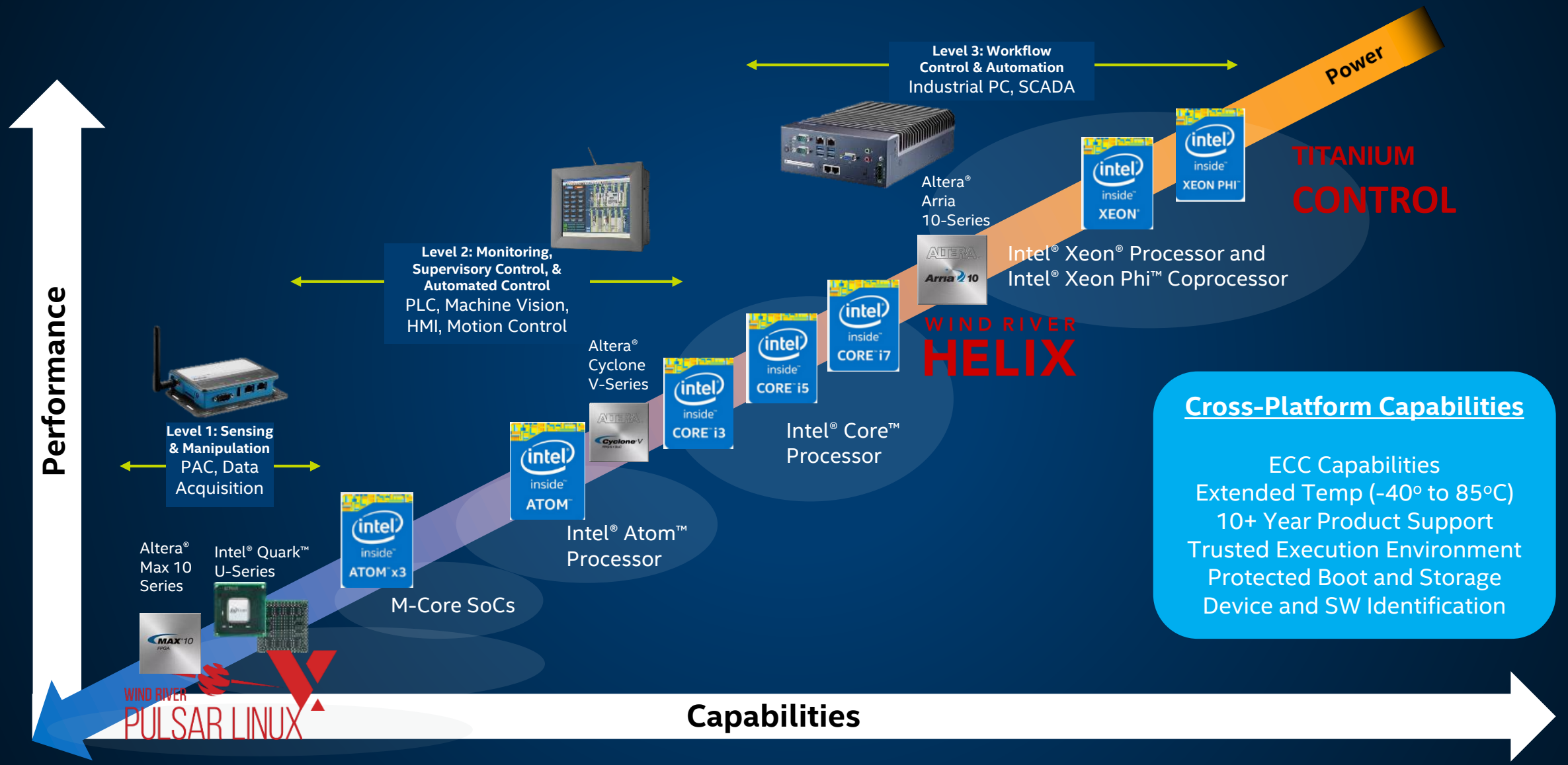
IOT END-TO-END SCALABILITY WITH INTEL

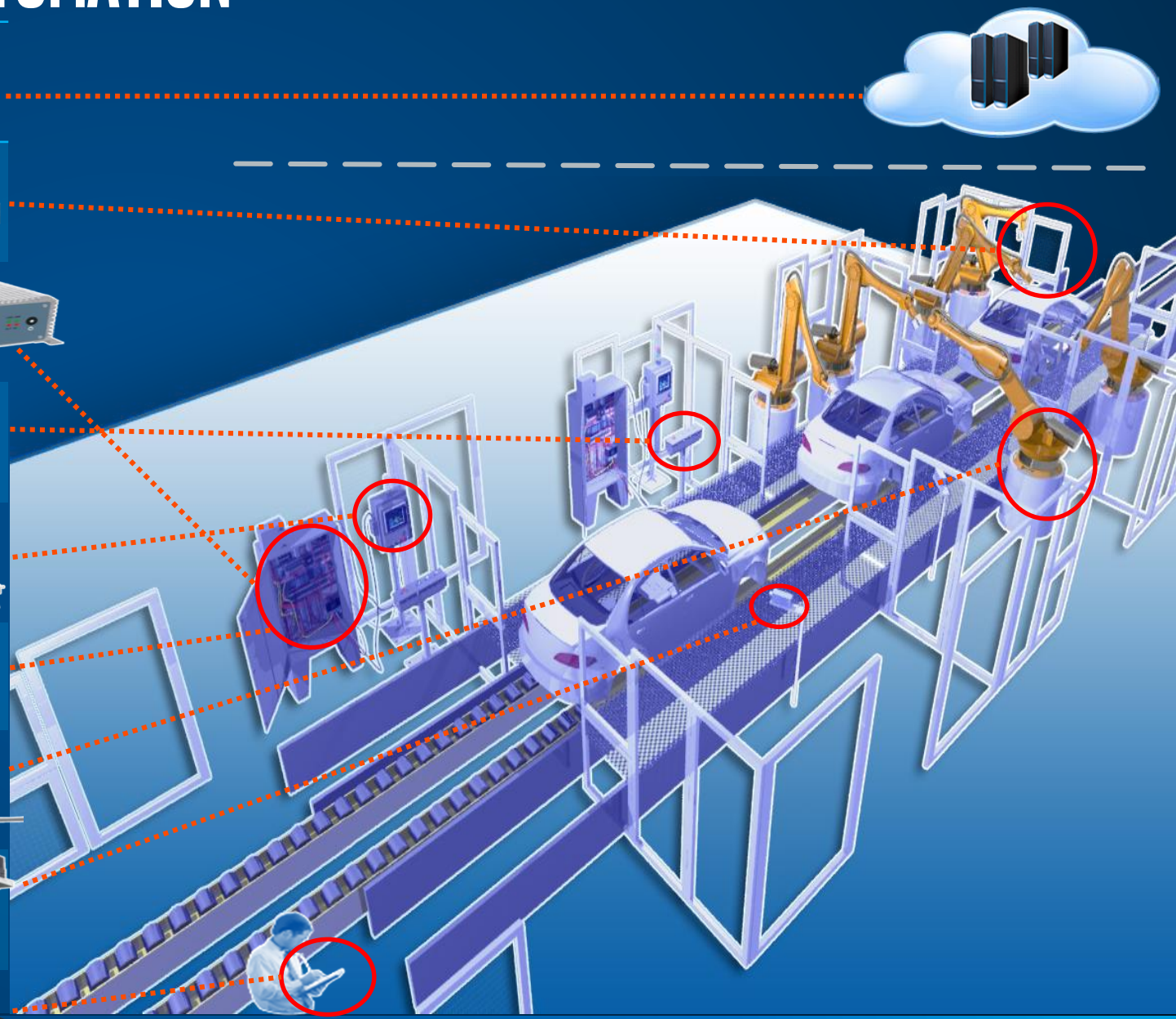


Cross-Platform Capabilities

ECC Capabilities
Extended Temp (-40° to 85°C)
10+ Year Product Support
Trusted Execution Environment
Protected Boot and Storage
Device and SW Identification

INTEL INGREDIENTS IN INDUSTRIAL AUTOMATION

Data Center	**Compute Performance** **I/O intensive**
Factory server	Compute Performance I/O intensive
Industrial PC	Compute Performance Visualization/ UX RT Perf
PLC/PAC	I/O intensive Form Factor Sensitive RT Perf
HMI	Compute Performance Visualization/ UX Form Factor Sensitive
Remote IO	I/O intensive RT Perf
Robots	Compute Performance I/O intensive RT Perf
Machine visions	Compute Performance Form Factor Sensitive
Mobile workforce	Visualization/ UX Form Factor Sensitive



HONEYWELL CONNECTED FREIGHT

ASSET MANAGEMENT SOLUTION

Intel and Honeywell collaborate to develop 1st instantiation of Intel connected logistic platform through close partnership with key 3PL companies. The platform will deliver a cost effective and connected asset management solution.

Solution

- Smart sensor tags with proprietary wireless sensor network
- Intel based gateway with cellular and Wi-Fi connectivity
- Analytics capability
- End to end HW enabled security

Use Cases

- Asset location tracking
- Condition monitoring: Humidity, shock, tilt, fall, …
- Logistic routing optimization
- Speedier customs clearances
- Customer satisfaction
- Better forecasting

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https://www.honeywellaidc.com/solutions/workflow/connected-freight-solution

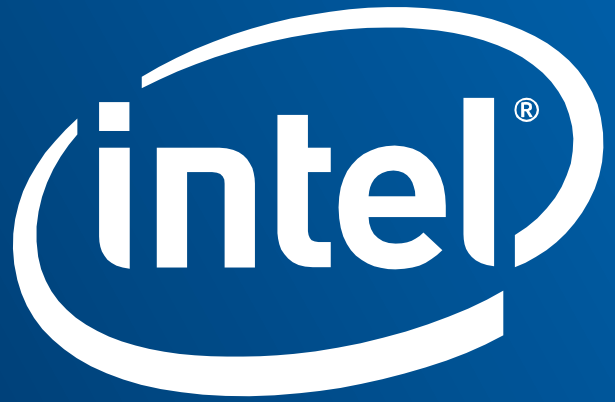
https://www.youtube.com/watch?list=PL6g2Y3N0CFAZUID8MIb48a33Lz3Hq0Y_8&v=zeRLY9ZanXA

CASE STUDY HEADLINES

- Fast Track IoT Smart Building, Industrial and City Solutions with Altiux and Intel
- Altiux Helps Integrated Steel Plant Reduce ACC Energy Consumption by 18%
- Altiux Helps Intelligent Glass Manufacturer Reduce On-site Maintenance Calls
- Alleantia - Achieving the Power of Industry 4.0 with Plug-and-Play Simplicity
- Intel Partner Simularity Delivers AI Software for Asset Monitoring
- Cut Energy Costs with a Smart Real-Time Occupancy Solution from Feedback Solutions and Intel
- The Infiswift IoT platform based on high-performance Intel® architecture enables more efficient agricultural operations.
- Enabling data-driven insight and holistic visibility for Telco, service providers, and the enterprise

http://www.altiux.com/solution-brief-altiux-iot-and-intel.html

WHERE TO GO FROM HERE?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