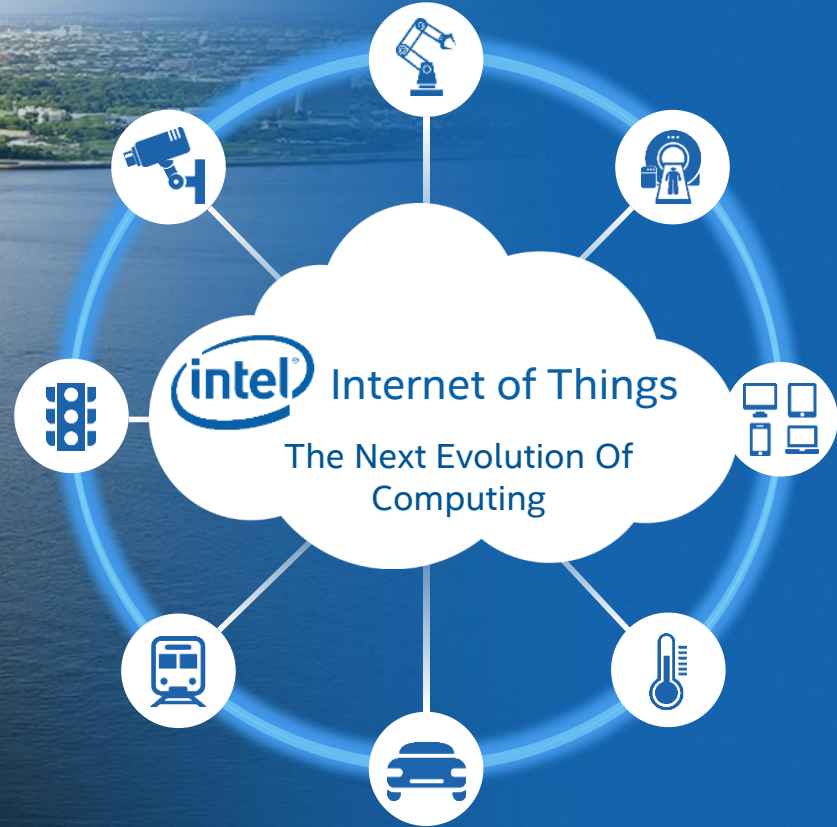




Intel: a Thought Leader Helping IoT Scale Out

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Intel EMEA IoT Technical Manager
Eclipse Days, Grenoble, Mar 30-31, 2015



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A Look Ahead: Confident Predictions

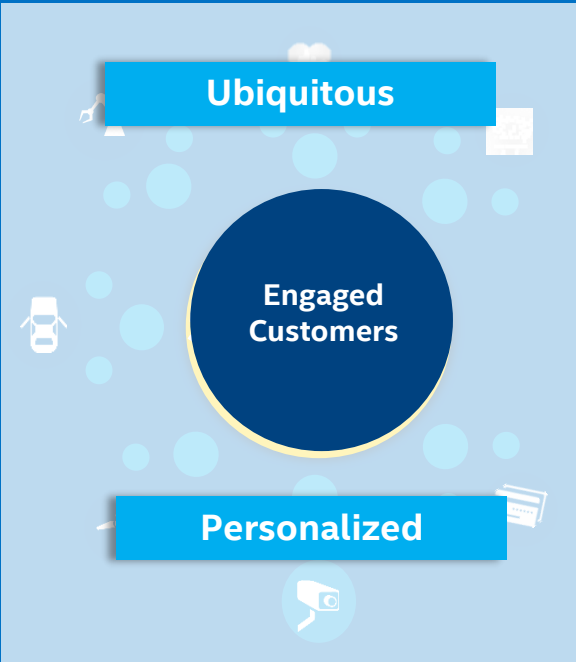


Generate Value with Intelligent Solutions

Ubiquitous

Engaged Customers

Personalized



X

Better Products

New Solutions

New Ventures



=

Higher Productivity


Revenue Growth

Higher Efficiency

Cost Savings

Margin

Value Innovation



THINGS

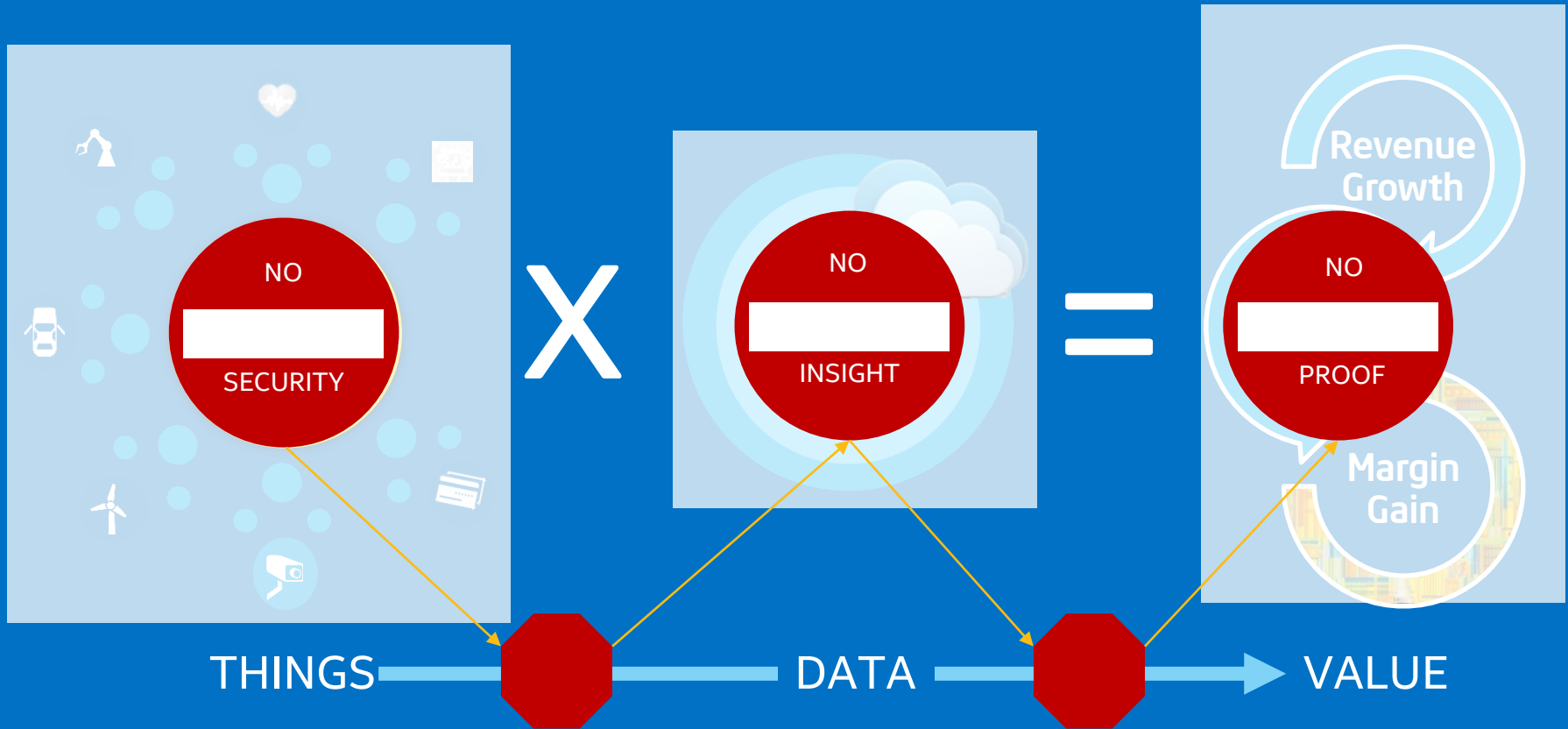


DATA



VALUE

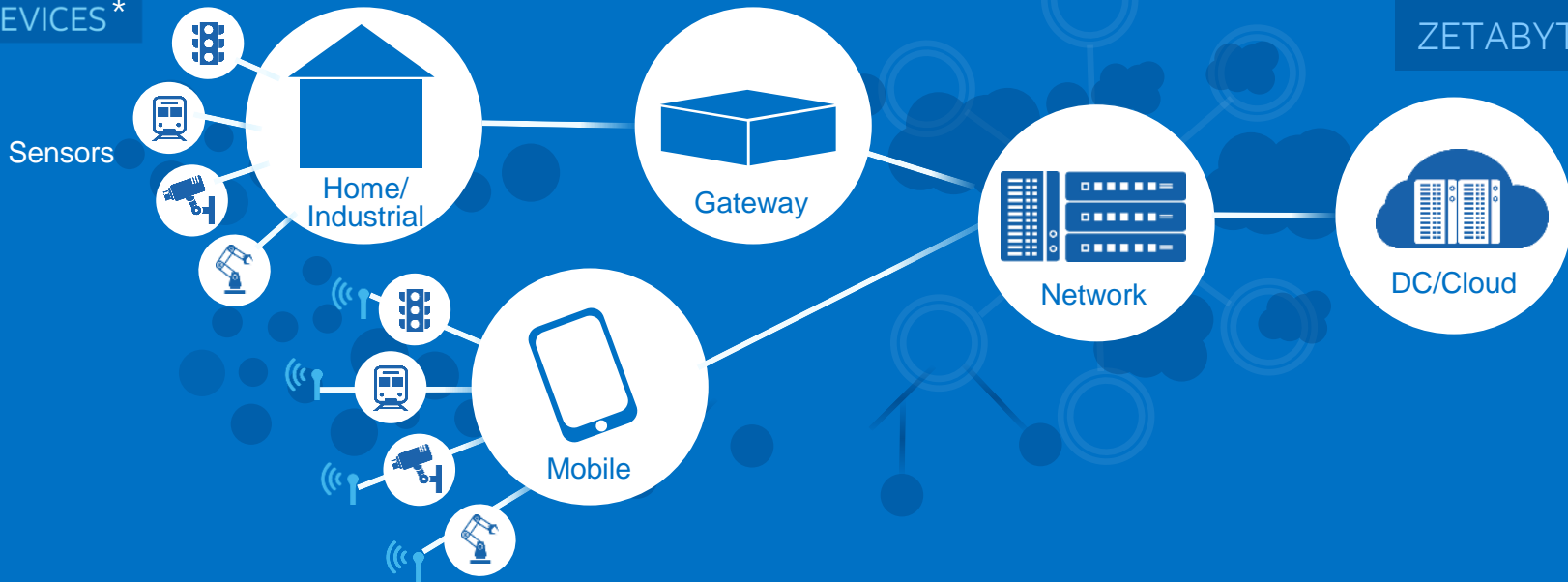
IoT x Big Data = Unprecedented Challenges



Intel is delivering integrated, scalable hardware and software solutions specifically designed to meet diverse market needs from devices to the cloud

The Internet of Things is Everywhere

50B
DEVICES*



44
ZETABYTES**

COST OF
SENSORS
PAST 10 YEARS

2X



COST OF
BANDWIDTH
PAST 10 YEARS

40X



COST OF
PROCESSING
PAST 10 YEARS

60X

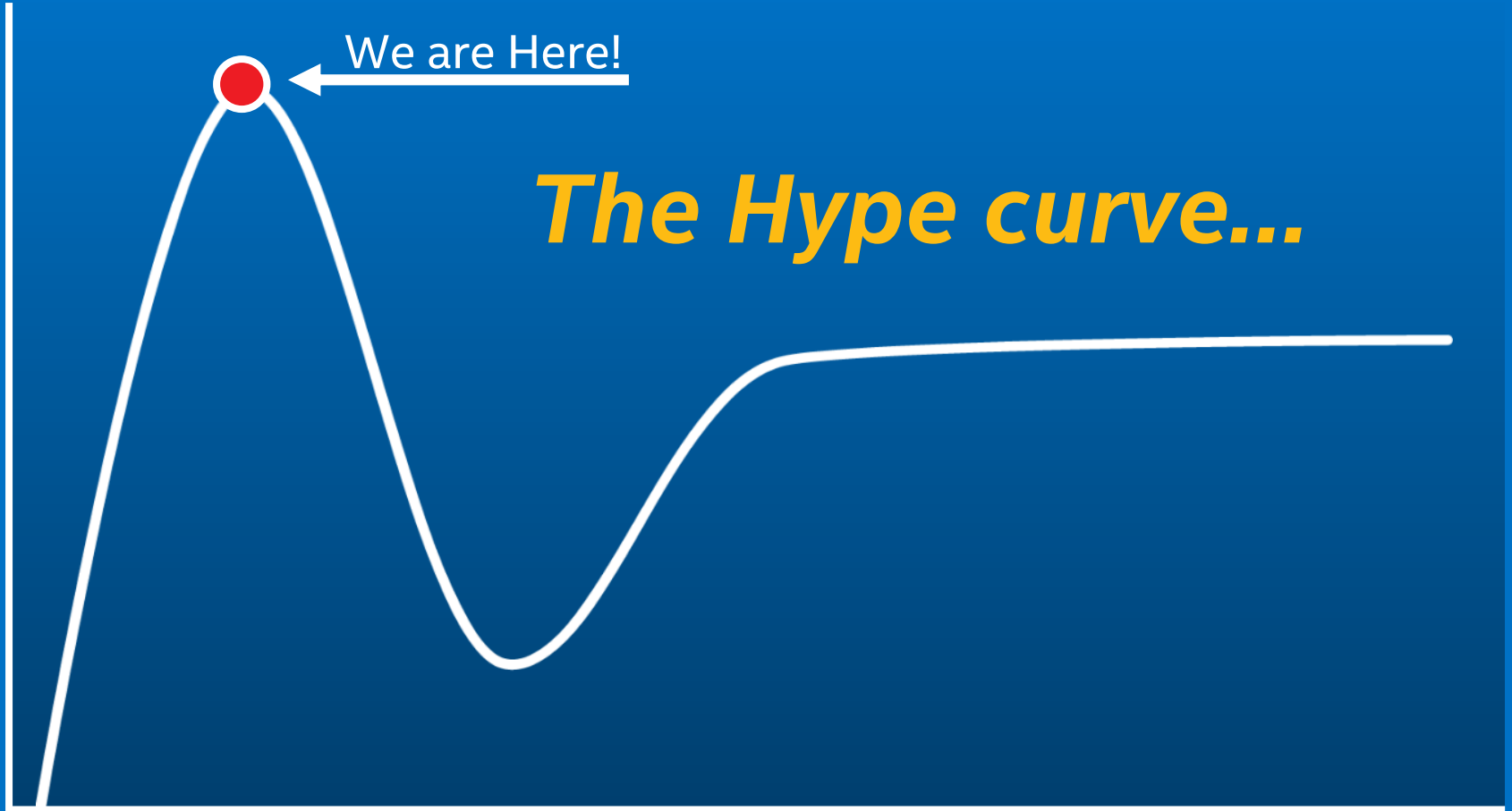


* IDC

** IMC/EDC: The Digital Universe of Opportunities

*** Goldman Sachs





Essential Tenets of Edge to Cloud IoT Solutions



Services: Infrastructure to Monetize HW, SW, and Data Management from Edge to Cloud
– Managing Systems and Monetizing the Value Data Provides Customers



Customer Value Visualized by Broad Analytics Infrastructure from Edge to Cloud
– Real-Time, Insightful, and Secure Analytics



Seamless Data Ingestion, Compute Processing, and Control from Edge to Cloud
– Broad Protocol Normalization Support, Real-Time Data Streaming, Closed-Loop Control Systems, OTA Device Management



Edge Devices and Gateways Securely Discovered by Cloud in Seconds
– Broad OS and Comms Support, HW-level Identity, APIs + API Management



Edge Devices and Gateways Setup from Box to Cloud in Minutes
– Enabled by Interoperable “Building Block” Architecture with Robust yet Efficient Middleware Agents



Security as the Foundation with Embedded HW and SW-Level Protection
– Secure Boot, Identity Protection, Whitelisting, & Encryption from Edge to Cloud

Intel: Thought Leader



Reference Architecture + Frameworks and Testbeds = Interoperability



Industry Standards + Open Source Solutions = Interoperability



OIC Board of Directors



Challenges Slowing IoT Growth

Security, Privacy, and Compliance

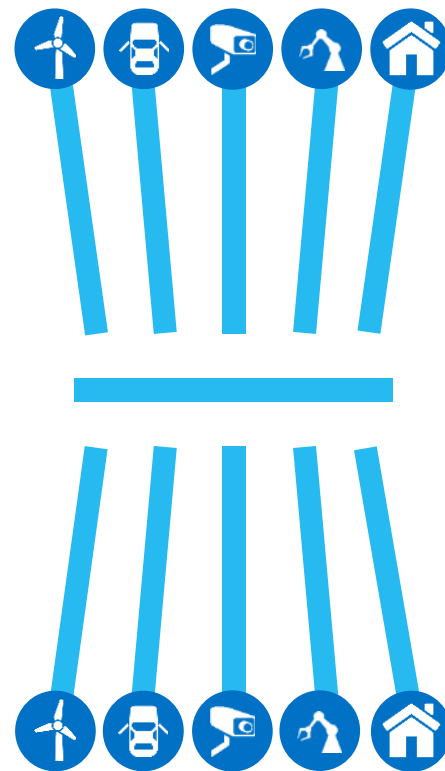
Fragmentation of Vertical Markets

IT/OT and Legacy Infrastructure Integration

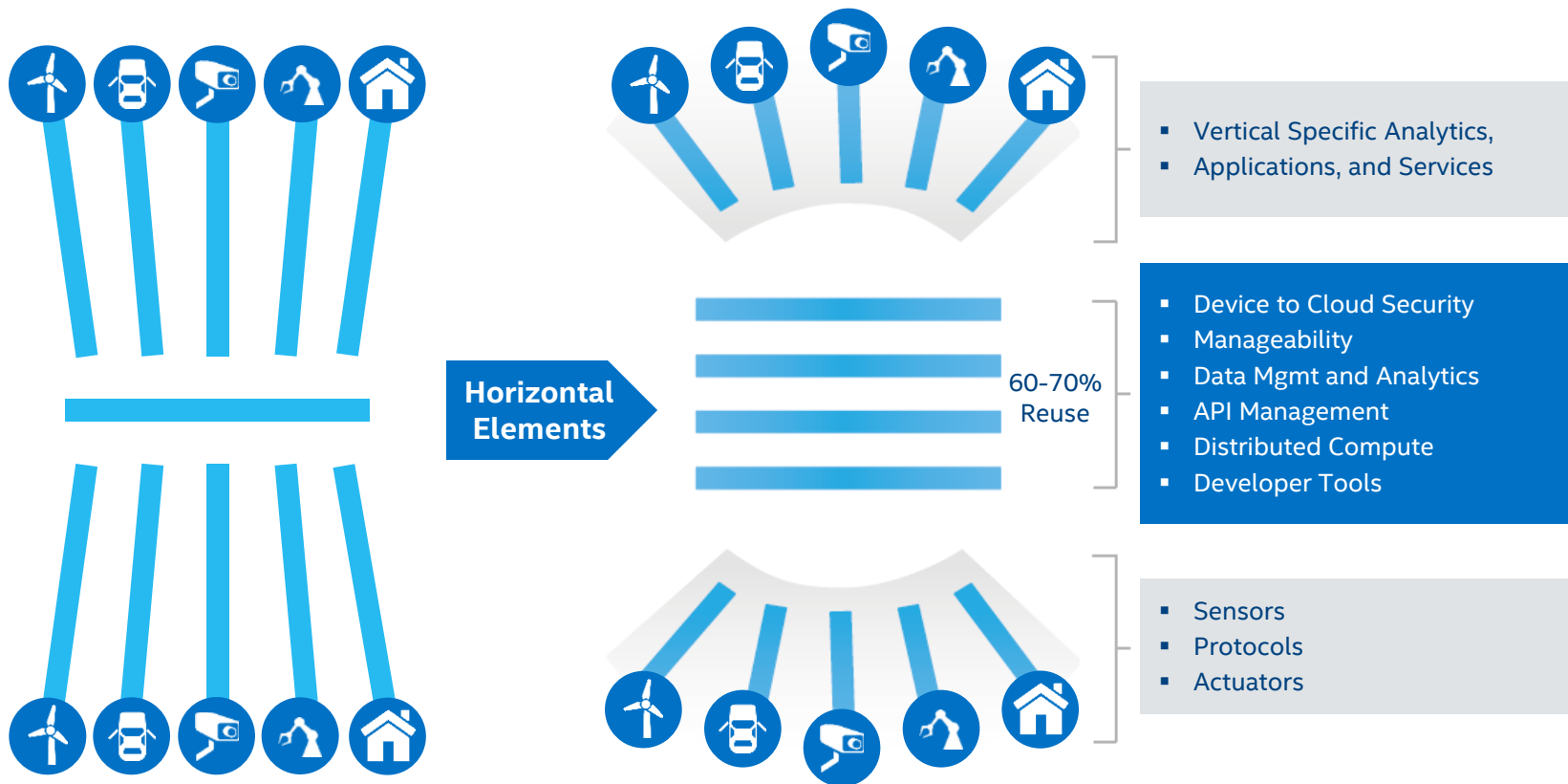
Connectivity

Underutilized Data

Interoperability and Standards



A Horizontal Platform Helps IoT to Scale Out



Intel® IoT Platform (December 2014)

Value Proposition

Security: Intel ensures a chain of trust is rooted in silicon and linked throughout the software.

Manageability: Intel enables discovery, provisioning and management from edge to cloud.

Connectivity: Intel supports signal, control, data, and application flexibility on open standards-based networks.

Performance: Intel provides standard hardware platforms optimized for workload, performance, and cost.

Interoperability: Intel enables applications and services to scale across diverse platforms using secure APIs.

Analytics: Intel develops algorithms, architectures, and tools for predictive analytics.



Reusable Building Blocks for Faster TTM

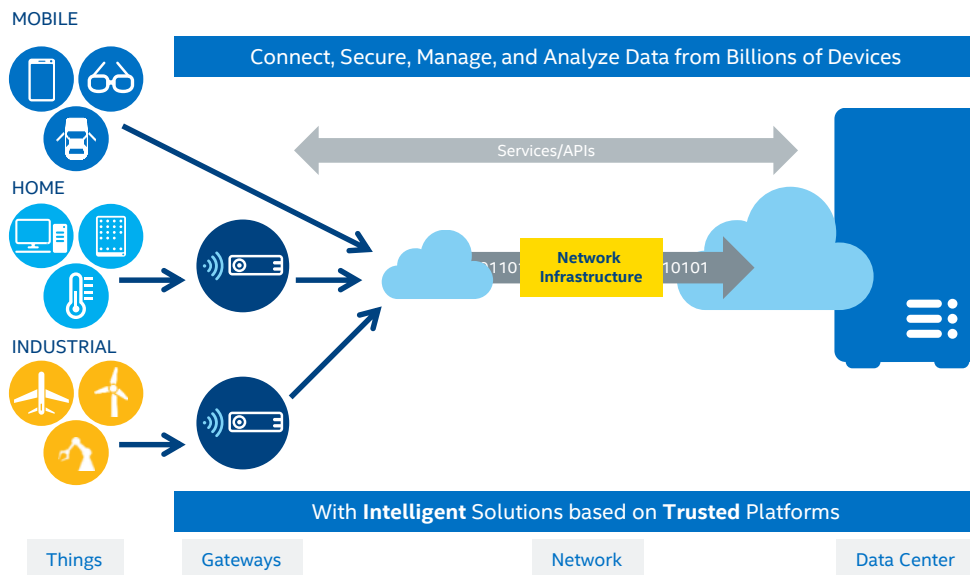
Actionable Intelligence from the Edge to the Cloud

Secure, Open and Scalable Compute



Intel® IoT Platform is About...

- **Re-usable, pre-configured, pre-validated building blocks** that the ecosystem can use to design and deploy IoT solutions across different vertical markets
- **Seamless and secure** connected devices; delivering trusted data to the cloud, and delivering value through analytics and enabling new services
- **Interoperable hardware, software and services portfolio** spanning from the edge to the cloud
- **Standardized hardware platforms** that are optimized for workload, performance, and cost



IoT Platform Capabilities

IoT solutions bring increased intelligence and value over time

“Things” easily connect, communicate and work together

Connect



“Things” and networks are monitored, secure and managed

Secure & Manage



Analyze, expose, and manage data to provide business insights

Analyze & Expose



Predict how the devices or processes perform and take actions

Predict



Innovate, optimize end to end systems, autonomous behavior

Optimize



Product Experience - Consistency - Interoperability

The Intel® IoT Platform is an end-to-end reference model and family of products from Intel—that works with third-party solutions—to provide a foundation for seamlessly and securely connecting devices, delivering trusted data to the cloud, and delivering value through analytics.

VISUALIZE DATA AND MONETIZE INSIGHT
Provide actionable information
Automate operations
Create services

CONNECT THINGS AND DEVICES
Capture sensor data
Machines take action

GATEWAYS
✓ Hardware verification
✓ Software verification

CLOUD MANAGEMENT

TURN DATA INTO INSIGHT
Process and store data
Perform cloud analytics
Manage devices and policies
Manage networks

DATA CENTER

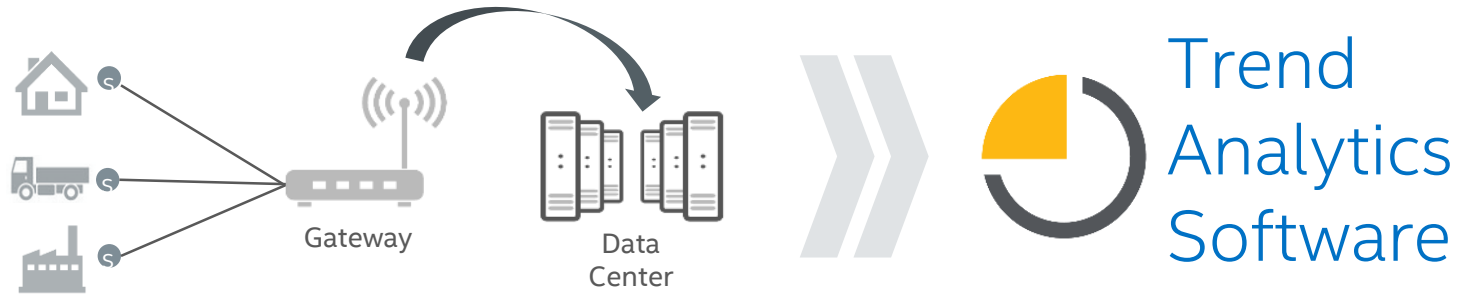
ANALYTICS & APIS

STORAGE

INTELLIGENCE AT THE EDGE
Filter data
Perform edge analytics
Data informs and directs devices

END-TO-END SECURITY
Secure hardware, software, and data
Secure device management
Secure policy management
Safeguard scalable compute

Analytics: The Road to New Revenue



Use Cases

- Electrical energy consumption analysis
- Vibrational analytics to predict machine failure

Current Customers



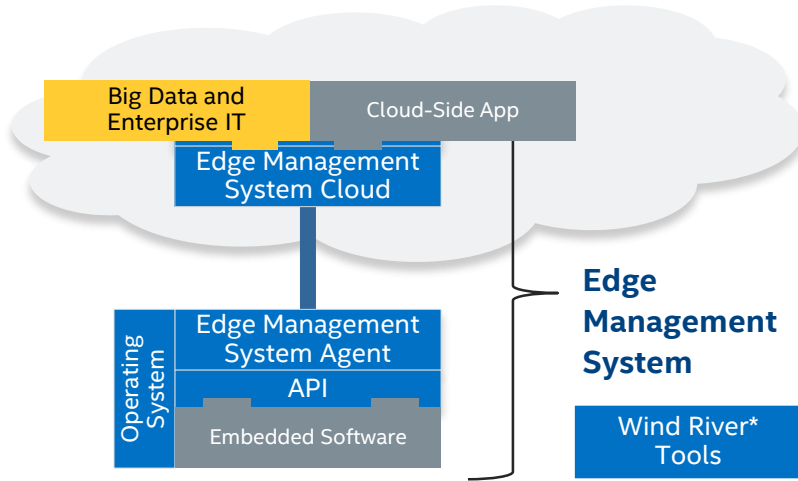
Compatibility

- Enhances accuracy of Business Intelligence Applications (i.e. SAP, Oracle & IBM) – with more accurate input data
- TAS is not Business Intelligence Analytics, it is providing analytics about the device conditions (probability of failure, energy consumption, etc.)

Actionable business intelligence to open new revenue streams
Changing the conversation from BOM to value

Wind River* Edge Management System

Centralized console for securing and managing edge devices and data



Highlights

- Telemetry and data services
- Device management
- Security
- Device-side API and Cloud-side API development tools
- Accelerating sales with Sample Code, Professional services

- Intel has entered the IOT Edge Management category and we are leading with this solution to customers
- EMS is sold as a standalone offering through Wind River*
- The Intel® IoT Gateway includes the EMS agent, or can be bypassed during configuration if a customer desires an alternate 3rd party cloud service



Intel Security CIP: Critical Infrastructure Protection

March 2015



Framing IOT Security

Anti-Malware



Malware finds
nowhere to run
or hide

Resiliency



Always updated
resilient systems

Identity



Simple access
with enhanced
security

Data Protection



Data safe from
theft or
alteration

With Management and Situational Awareness

End-to-End Security Solution

Critical Infrastructure Example



Device Security

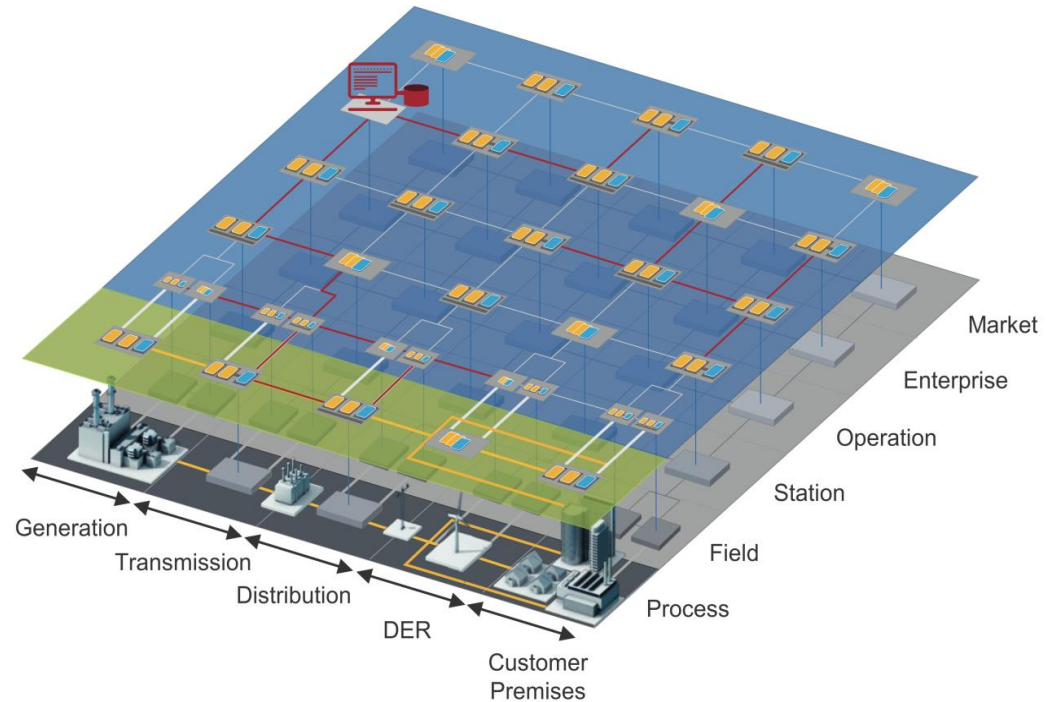
- Physical Security
- Cyber Security
- Identity

Secure Communication

- Machine-to-Machine authentication, authorization, and accounting
- Confidentiality & Integrity

Security Monitoring & Management

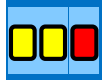
- Security Policy Management
- Security Event Monitoring



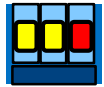
Embedded Security Deployment Models



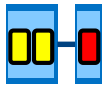
- Process Separation
 - Security in same OS as other components
 - Separate security processes



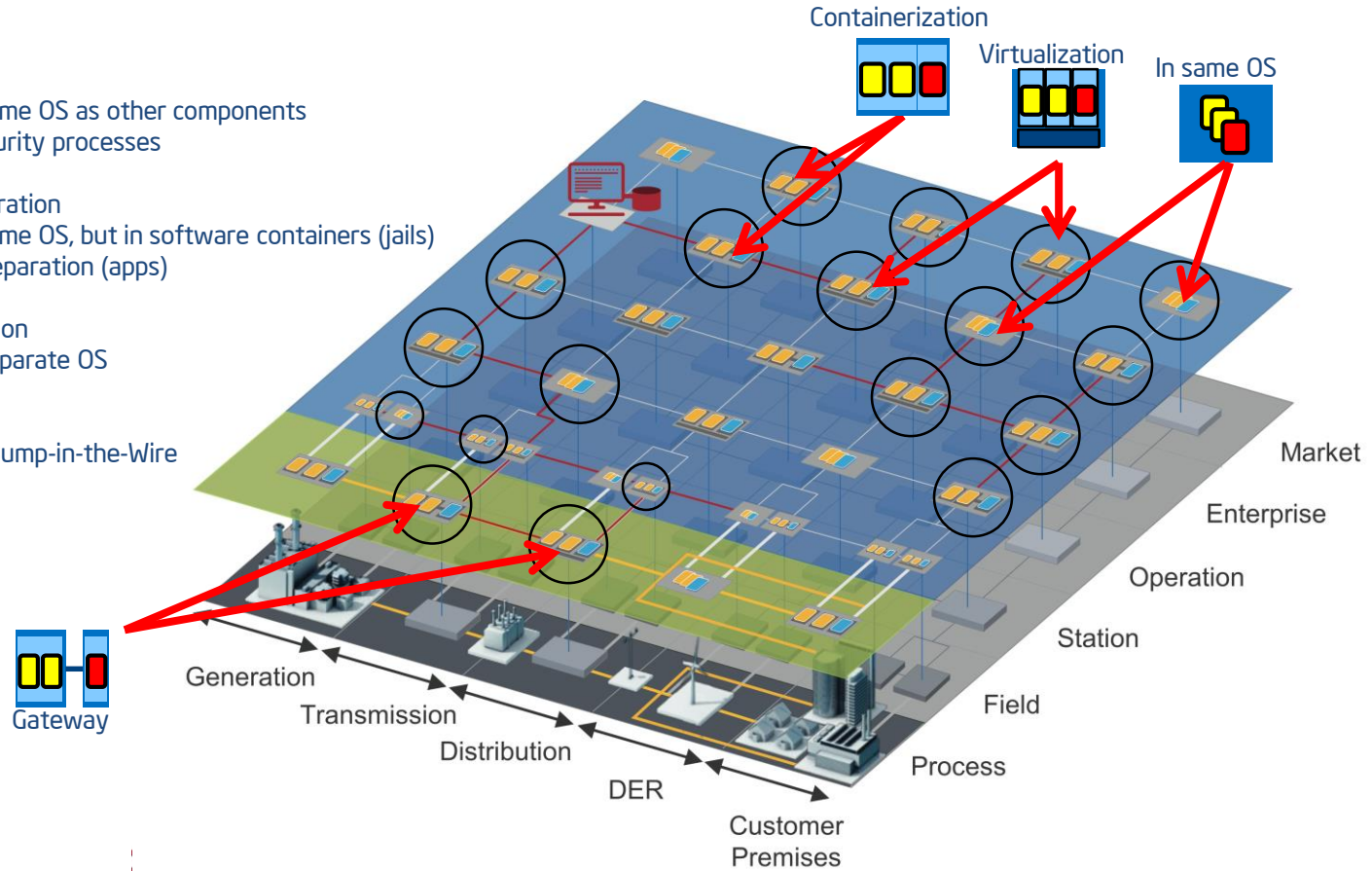
- Containerization Separation
 - Security in same OS, but in software containers (jails)
 - Application separation (apps)



- Virtualization Separation
 - Security in separate OS



- Physical Separation
 - Gateway or Bump-in-the-Wire



Intel IoT Case Studies: Results

Smart Retail



NCR POS w/ Intel® DPT and vPro for Transactions:
Reducing fraud through e2e encryption.

Potential US Benefits:
100M credit card numbers stolen in 2013

Smart Industry



Intel's Assembly / Test – sensors and analytics help maintain productivity.

Measured Benefits:
\$9M/year

Smart Transportation



Vnomics solution: 6% increase in fuel economy across 100% of fleet = \$15M / Year

Potential US Benefits:
38 Million Tons of CO₂

Smart Buildings



Di-BOSS (Digital Building Operating System) + Cisco Energy Management: Electrical, Steam and Water

Saved \$1M in 1 Building / Year
\$.50/sq ft.

Intel IoT Ignition Labs Enabling First Deployments

- Provide secure scalable platforms
- Collaborate with innovators & partners
- Develop Breakthrough End to End solutions
- Demonstrate and scale globally

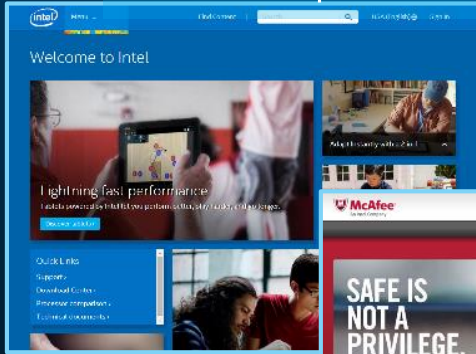
EMEA 2014

- Munich
- Stockholm
- Istanbul
- Swindon



Summary : What's Intel doing for IoT?

Inter-operability



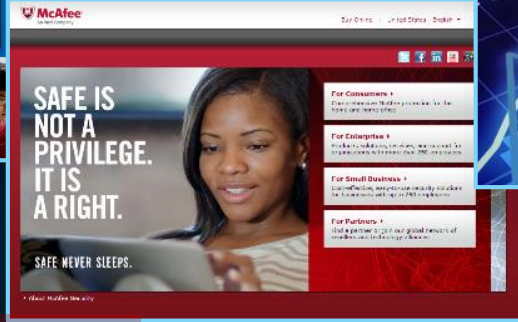
Analytics



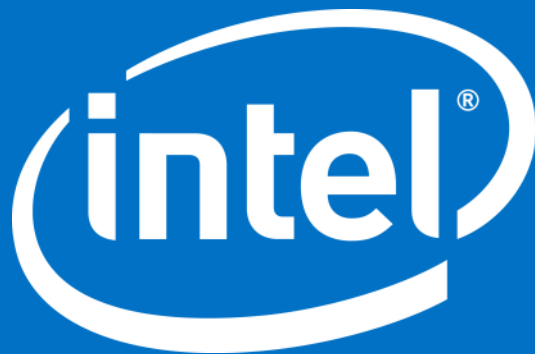
HW Performance



Security



Intel's new offerings and relationships will make it easier for solution providers to move IoT from pockets of pilots to mainstream deployments with a repeatable foundation of building blocks that can be customized for limitless solutions. Data will be unlocked faster to extract meaningful information and value for consumers and businesses



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