



Microsoft



EDGE-TO-CLOUD INDUSTRIAL SOLUTION

How to start and scale globally

HPE AT-A-GLANCE



FACTS AND FIGURES*

- Technology Solutions for more than **75 years**
- > **60.000 employees** globally,
> **2700** in DACH geo
- **32%** employees are **women**
- **30.9 billion** USD net revenues,
> **60% non-US net revenues**,
3 billion USD net revenue in Germany
- **15 HPE sites** in the DACH geo

* For FY2018



SEGMENTS

- **INTELLIGENT EDGE**
Solutions for the OT/IT convergence, mobility and workplace services and IoT
- **HYBRID IT & POINTNEXT SERVICES**
Modern technologies for the datacenter, private and public cloud solutions; support, operational, advisory and professional services
- **FINANCIAL SERVICES**
Flexible financing and consumption based offerings



OUR VALUES

- **PARTNERSHIP FIRST**
We believe in the power of collaboration – building long term relationships with our customers, our partners and each other.
- **BIAS FOR ACTION**
We never sit still – we take advantage of every opportunity.
- **INNOVATORS AT HEART**
We are driven to innovate – creating both practical and breakthrough advancements.

INDUSTRIAL IOT USE CASES

By 2022,

75%

of enterprise-related data will be created
outside the traditional data center¹



Condition Monitoring/OEE



Predictive Maintenance



Predictive Quality



Track & Trace



Inventory Optimization



Mobile Operations



Flexible Production



Digital Twin



Machinery as-a-service

¹ Source: Gartner- Market Insight- G00367646- 10/8/2018

JOINT APPROACH: EDGE TO CLOUD INDUSTRIAL SOLUTION

Speed

Easy to start and scale
without risk to address IT &
OT requirements

Scalability

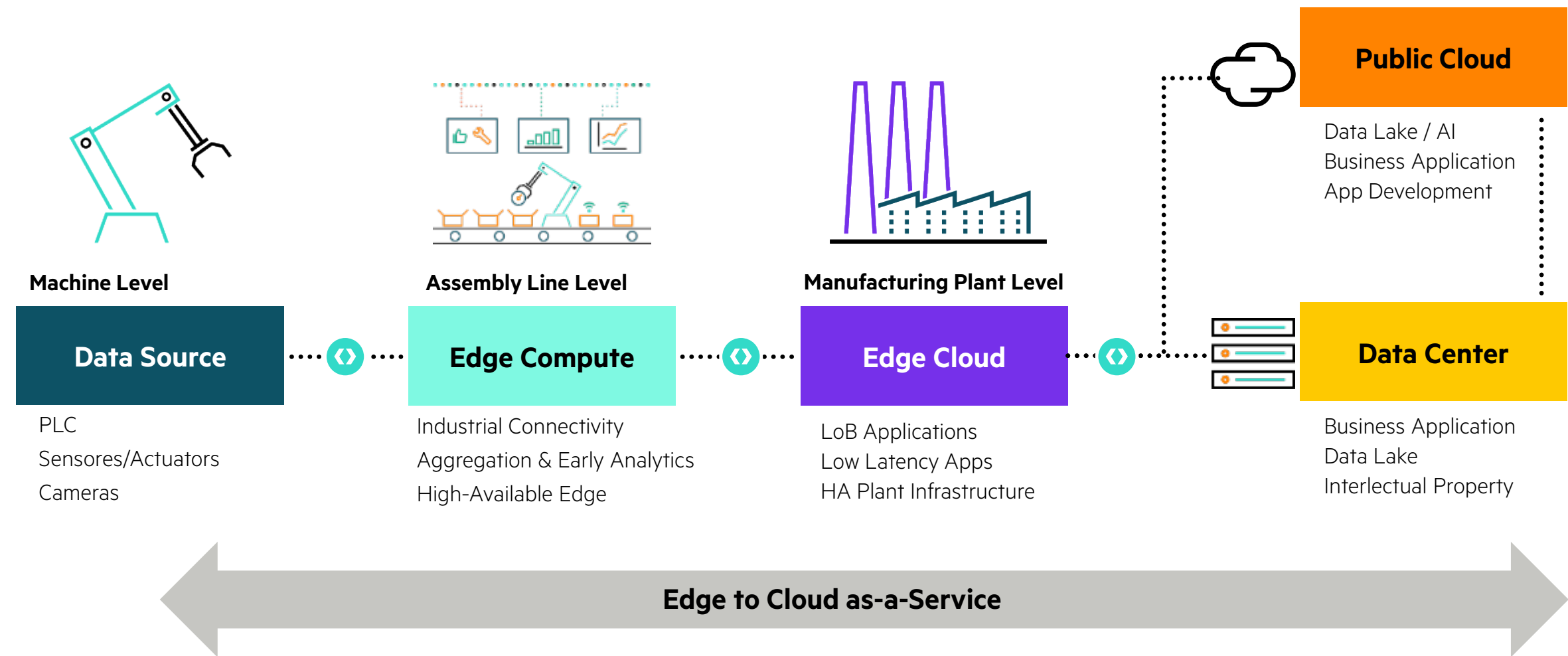
Modular architecture
that scales in multiple
dimensions

Security

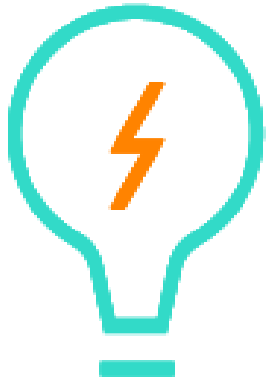
Security by design
from Edge-to-Cloud



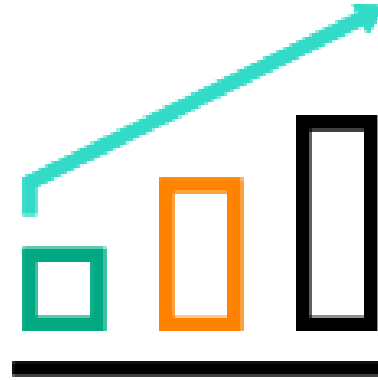
INDUSTRIAL IOT BLUEPRINT



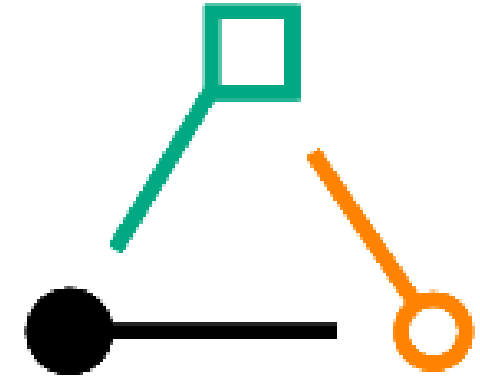
A SCALABLE APPROACH



Easy and secure
Starting Point



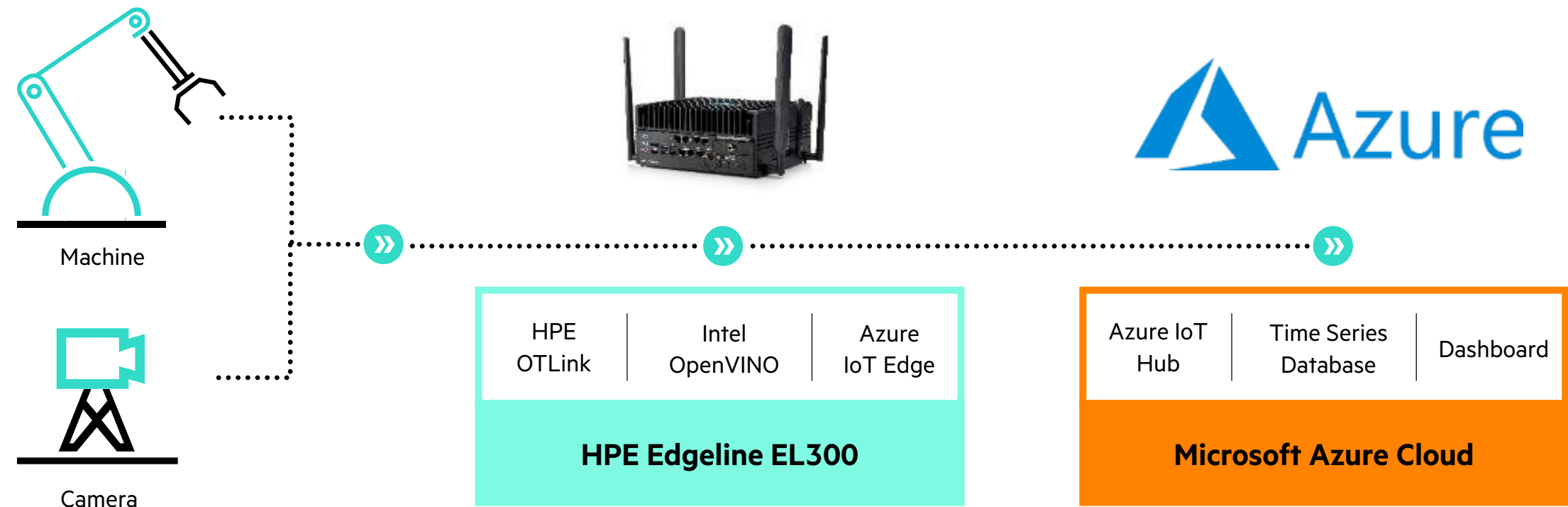
Grow Architecture in Use
Cases, Geography
and Data



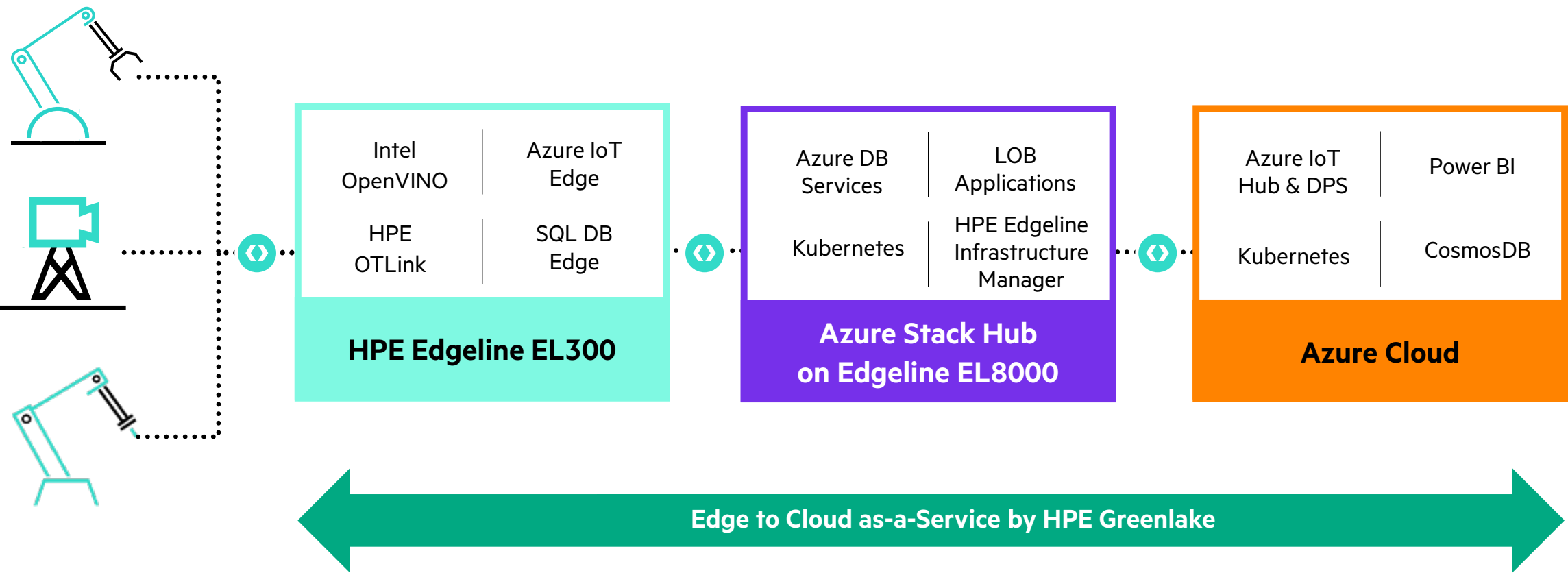
**Global Manufacturing
Architecture** from Edge
to Cloud as-a-Service



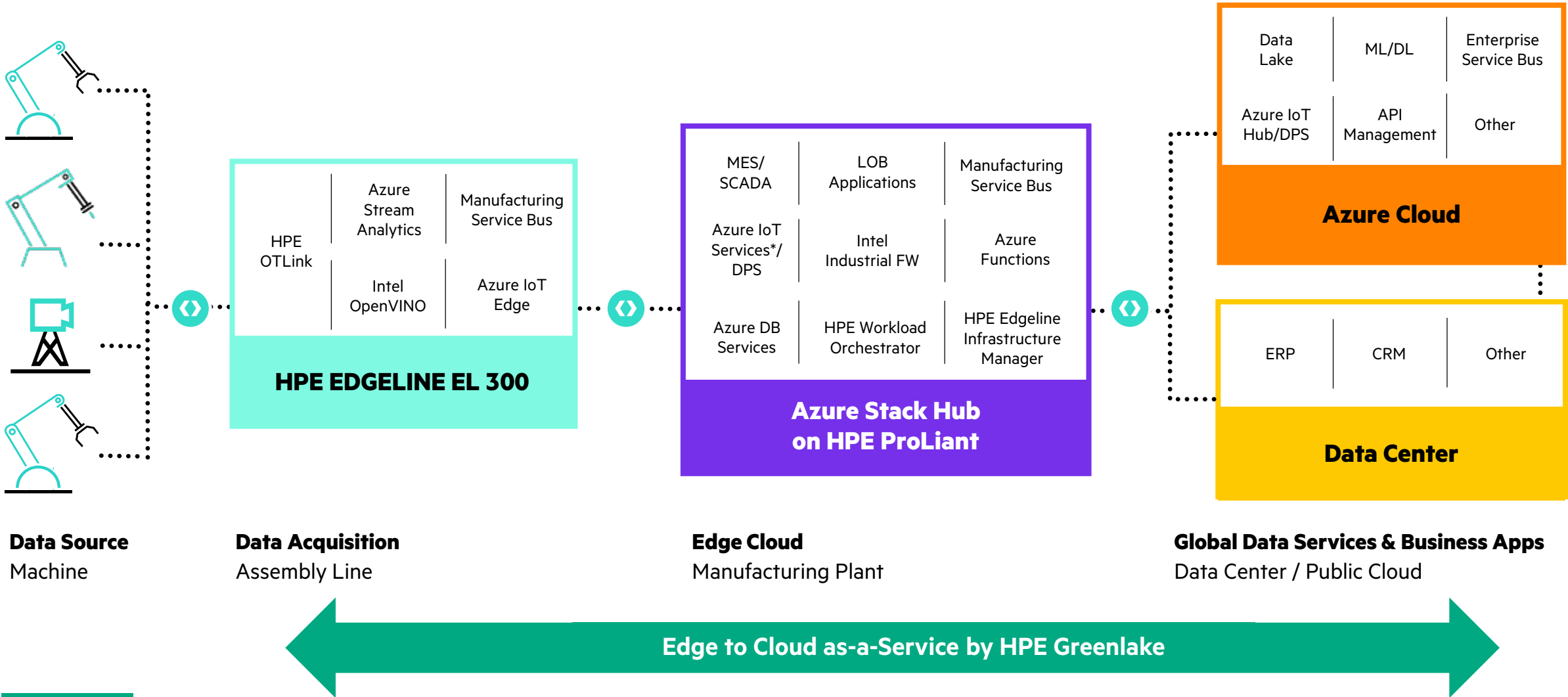
START ARCHITECTURE



SCALE ARCHITECTURE

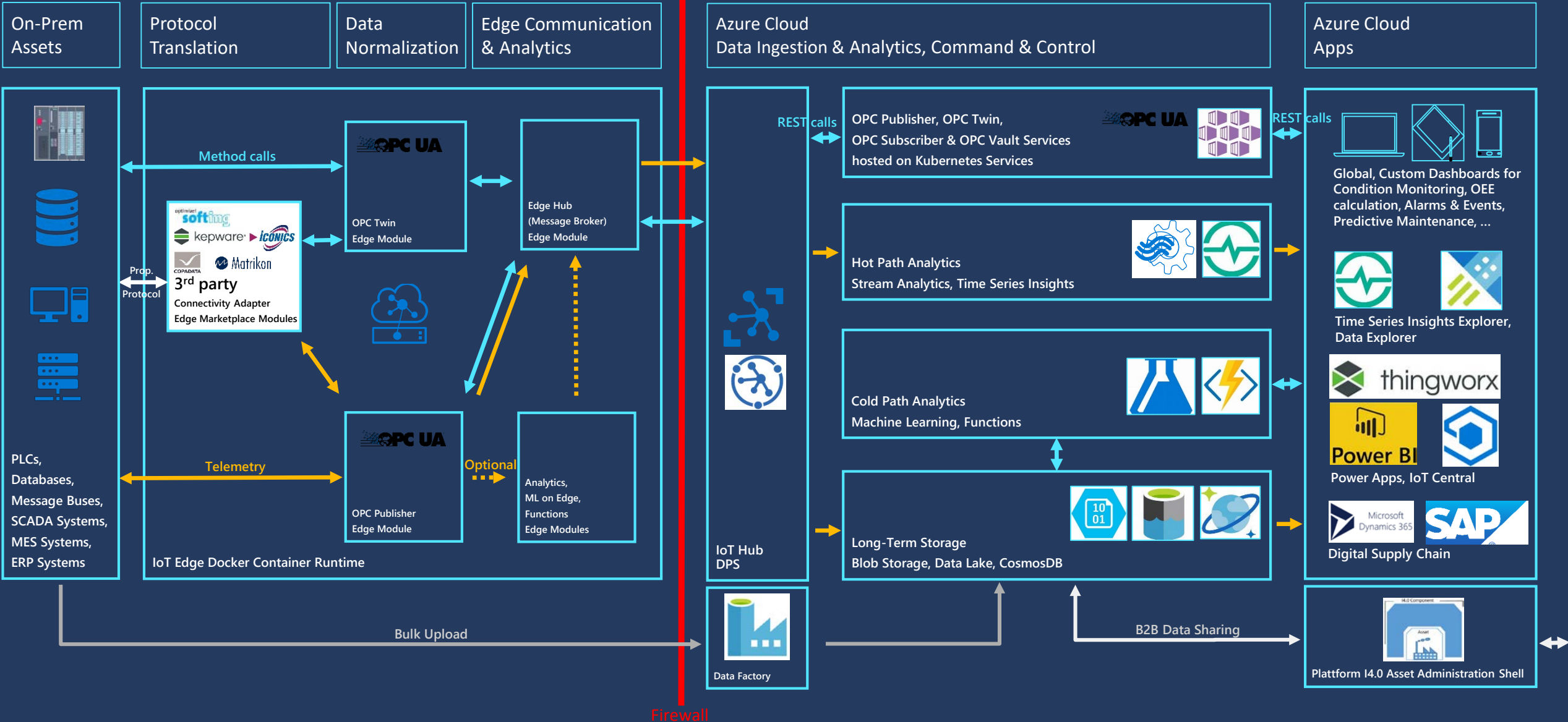


GLOBAL MANUFACTURING ARCHITECTURE

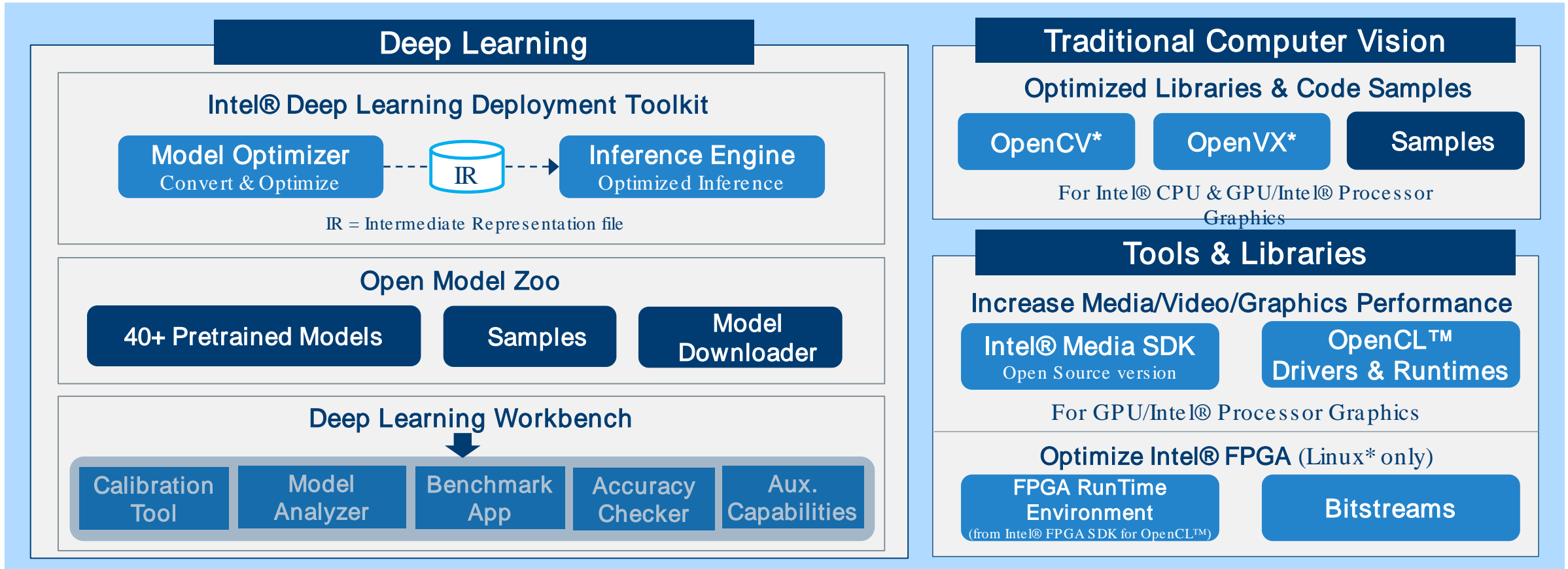


Azure Industrial IoT Platform Architecture

(ISA95 compatibility layers not shown for simplicity)



What's Inside Intel® Distribution of 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), macOS* 10.13 & 10.14 (64 bit)

Intel® Architecture-Based
Platforms Support



Intel® Vision Accelerator
Design Products &
AI in Production/
Developer Kits

An open source version is available at 01.org/openvinotoolkit (some deep learning functions support Intel CPU/GPU only).

EDGE LINE EL300

Dimensions

- Width: 232mm (9.14")
- Height: 190.5mm (7.5)
- Depth: 100mm (3.94")

Mechanicals

- -30C to +70C
- Passive cooling
- IP50 enclosure
- All I/O is on bottom
- 4 RF ports (2 additional reserved for future use)

Power Options

- DC 12 Volts (Standard)
- 9-36 Volts DC with Ignition Trigger



Main Unit Features

- Intel i5 Compute
 - Intel i7/Atom in May 2020
- 4GB, 8GB and 16 GB Memory Options
- Dual 1GbE (RJ45)
- Management via dedicated 1 GbE RJ45
- Four USB Ports
- DP and HDMI Ports
- SD Slot
- Mic, Line In and Line Out
- AC and DC Power (Option)
- Single RS-232
- Wi-Fi/BT and LTE Connectivity
- Daughter Card Options
 - 4 Port 1GbE Ethernet with TSN support
 - 2 X CANbus A/B/FD 2.0
 - 2 x Serial RS 232/422/485
 - 8 bit configurable GPIO – supports DIO, ADC, DAC

AZURE STACK HUB ON EDGELINE 8000

- Address latency and connectivity requirements by processing data locally in Azure Stack Hub and then aggregating it in Azure for further analytics, with common app logic across both. You can even
- Deploy Azure Stack Hub disconnected from the internet without connectivity to Azure. Think of factory floors, cruise ships, and mine shafts as examples.
- HPE Edgeline 8000 based Azure Stack Hub solution provides the smallest certified footprint (can deploy in less than 6U)
- With expanded temperature (0-55C), humidity (95%), vibration, shock, and other environmentals, the HPE EL8000 based Azure Stack Hub solution is optimized for a variety of edge and hybrid deployment models
- Partnering with Avanade for full Azure Stack services offerings



Edgeline 300



StoreFabric
SN2010M



Edgeline 8000



CONNECTING THE EDGE TO THE CLOUD WITH HPE AND ABB

Deliver on-premises Cloud services from your Secure Edge Data Center



Data sovereignty, security and compliance

Protect your data and IP, meet compliance needs



Performance

Support high performance analytics, large data and low latency apps



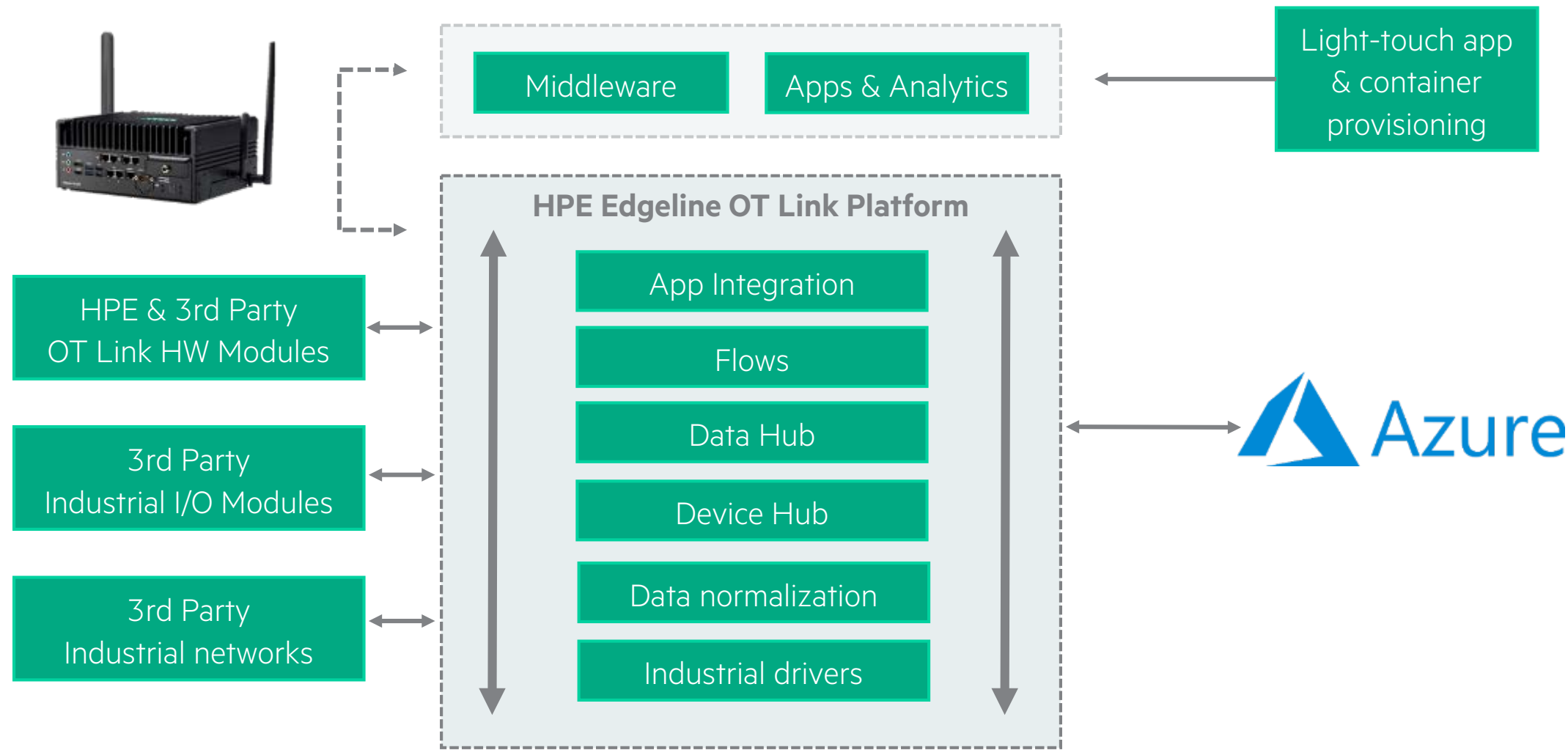
Edge and disconnected applications

Provide connectivity for disconnected apps



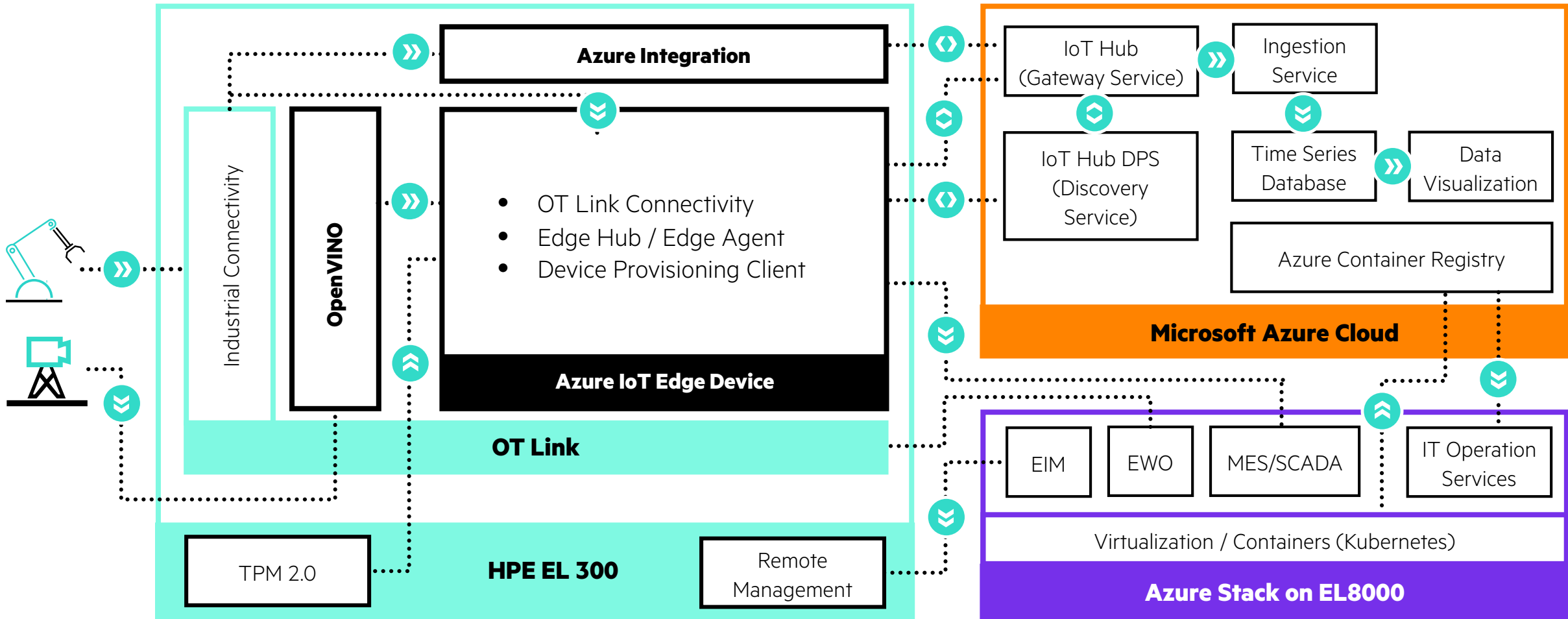
HPE ProLiant for Microsoft Azure Stack

HPE EDGELINE OT LINK PLATFORM

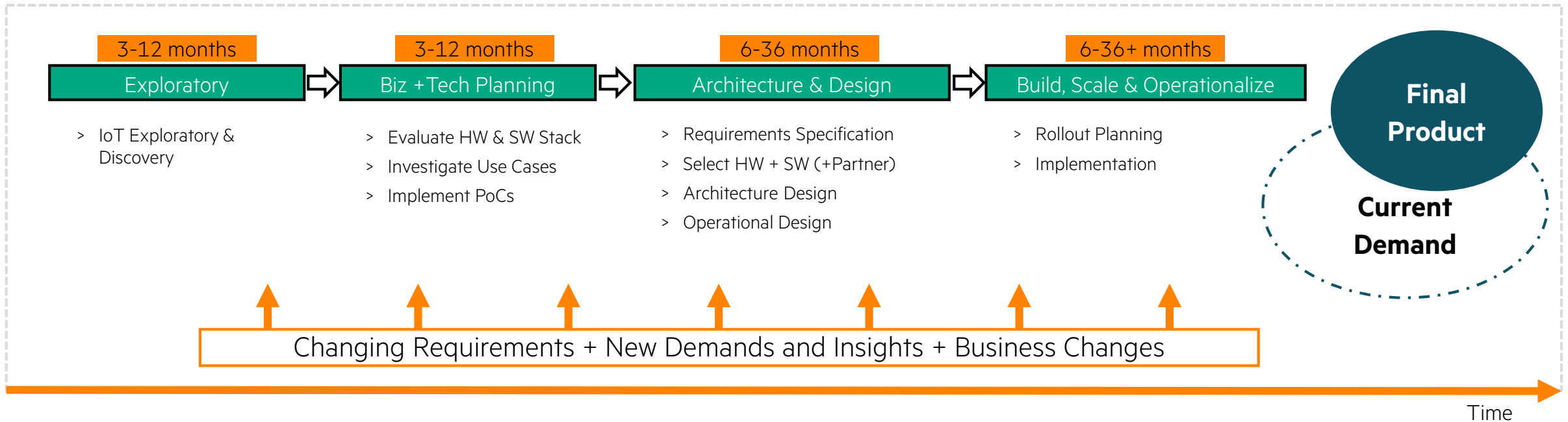


TECHNICAL ARCHITECTURE

Scale Architecture



TYPICAL IIOT PROJECT APPROACH



Issues seen with this approach:

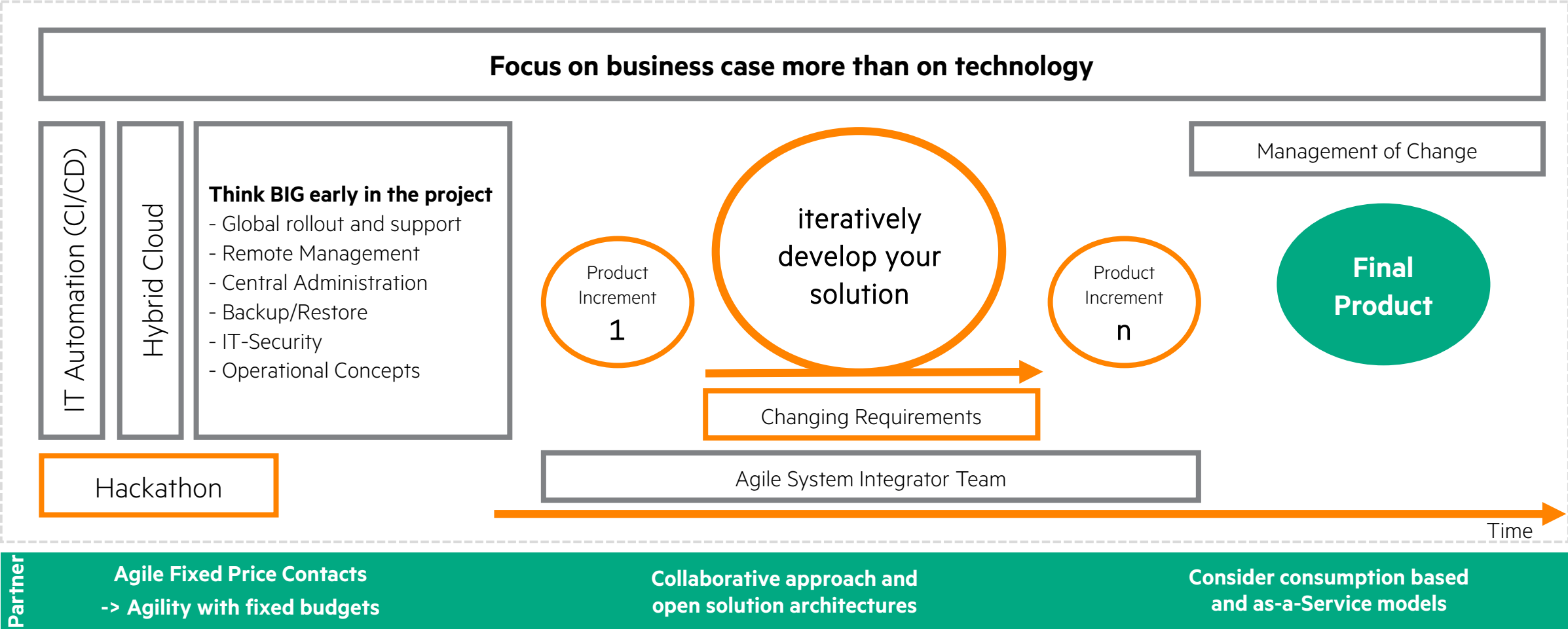
Quick results raise expectation of easy implementation

PoCs block a lot of resources
->delays

T&M exposes high risk
vs.
Fixed price based spec is based on many assumptions

Results are shown late in the development process

BEST PRACTICES TO SPEED UP YOUR IIOT ADOPTION



CALL TO ACTION

- Join the HPE Hackathon session tonight
 - Connect a PLC with HPE OT Link to Microsoft Azure
- Contact your representatives from Intel + Microsoft and HPE for more information
- Happy to discuss your experiences and thoughts on adoption of IIOT projects
 - Jochen.Mohr@hpe.com HPE Pointnext Services – Solution Architect



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THANK YOU

RESOURCES

General

- HPE Edgeline and Microsoft Azure: Designing cutting-edge video analytics solutions from the intelligent edge to the cloud | [Link](#)

Microsoft

- Microsoft Azure IoT | [Link](#)
- Microsoft Azure IoT Edge | [Link](#)
- Microsoft Azure Hub | [Link](#)

HPE

- HPE Proliant for Microsoft Azure Stack | [Link](#)
- Azure Stack Hub on HPE Edgeline EL8000 | [Link](#)
- HPE Secure Edge Data Center for Microsoft Azure Stack | [Link](#)
- HPE Edgeline converged Edge Systems and OTLink | [Link](#)
- HPE Greenlake consumption-based IT | [Link](#)

Intel

- Intel OpenVINO Computer Vision Solutions | [Link](#)



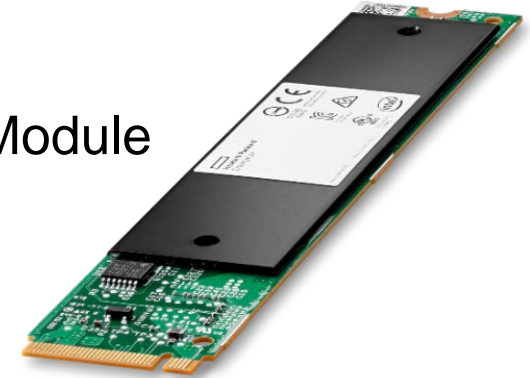
DATACENTER SCALE TECHNOLOGIES, ENGINEERED FOR THE EDGE

HPE Edgeline EL300



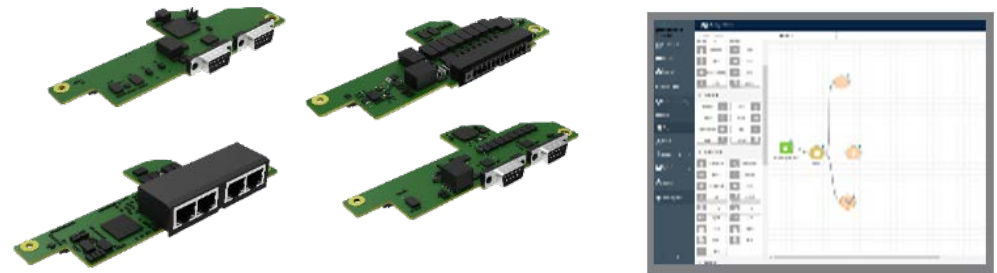
- Rugged X86 Performance
- Datacenter Grade Management
- Expansion via OTLink Ecosystem

HPE Edgeline VPU Module with Intel Myriad X



- New levels of acceleration for visual sensors

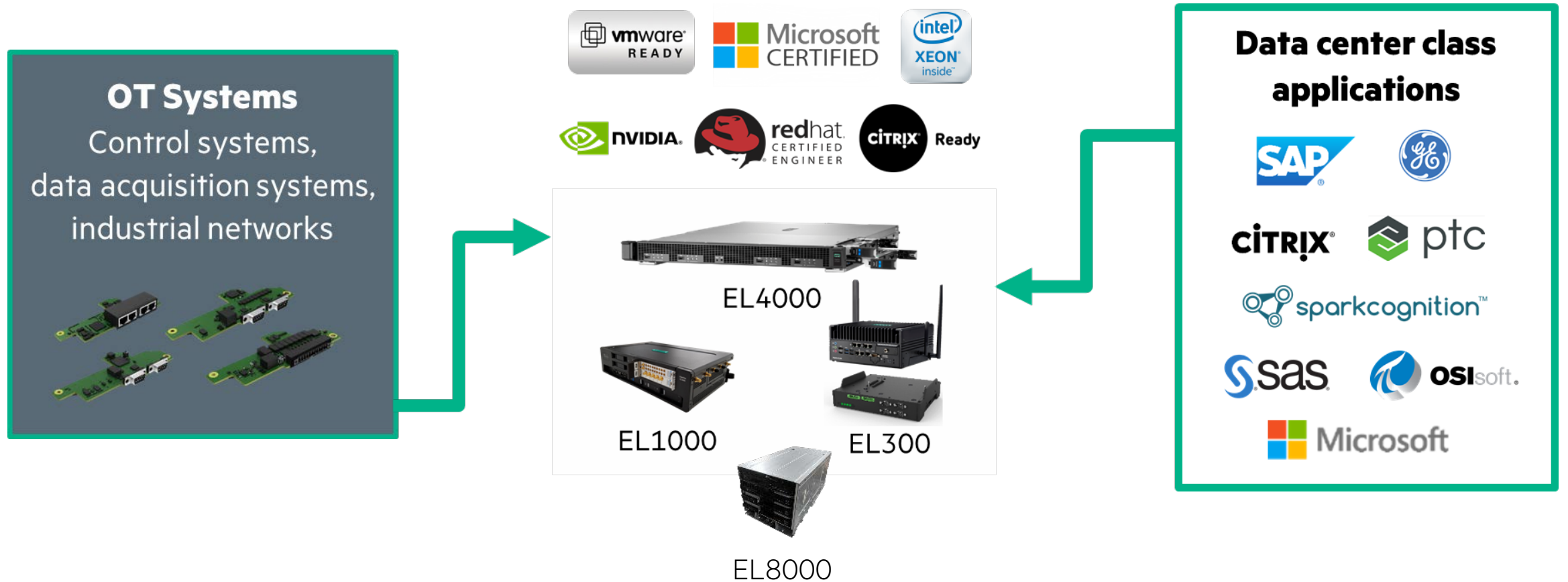
HPE OTLink Platform and Ecosystem



- Industrial network connectivity with ease

HPE EDGELINE CONVERGED EDGE SYSTEMS

The industry's first system to physically converge enterprise-class IT and operational technology (OT*),



*OT = Operational Technology = control systems, data capture systems, industrial networks

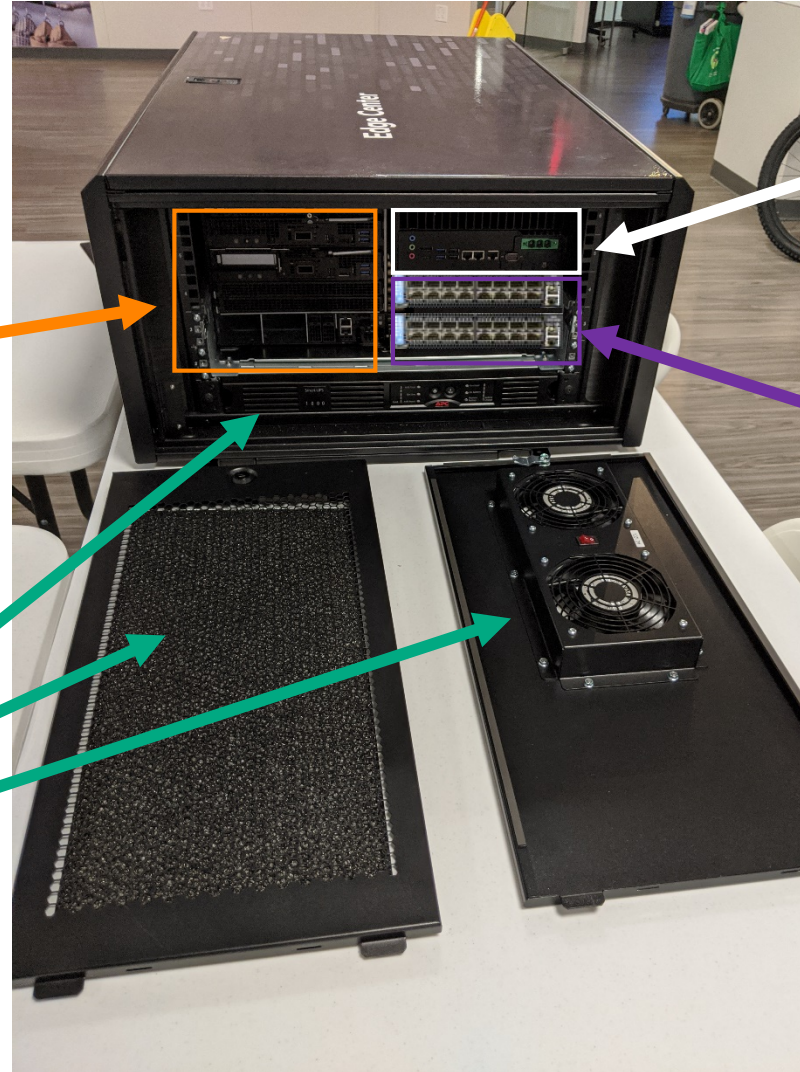
AZURE STACK HUB ON EDGELINE 8000 – COMPONENT DETAILS

- Edgeline 8000:

- 0 to 55C operating temp
- 4 nodes w/
 - Intel Xeon Gold 6212U, 2.40GHz
 - 256 GB memory
 - 16 TB NVMe storage
 - 512 SATA boot drive
 - Dual power supplies

HPE Edge Center 6 (Optional):

6U Wall mountable enclosure
Integrated filtration
Passive cooling
3 KVA 1U Lithium Ion UPS
Sensor options: Temp, humidity, access, camera, etc.



Edgeline 300:

-30 to 70C operating temp
HLH server

HPE StoreFabric SN2010M:
2 Switches covering ToR and BMC
Half rack design
18-ports of 10/25 GbE
4-ports of 40/100 GbE
Reconfigurable via breakout cables

