

Fog-Based Machine Learning for IoT

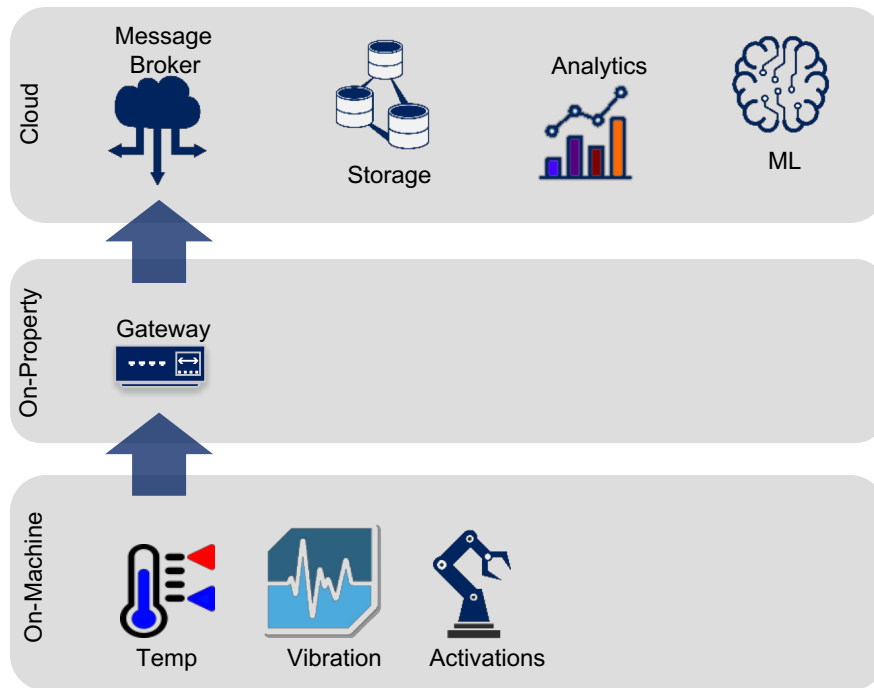
Ed Kuzemchak

CTO – Software Design Solutions, Inc.

ed@softwaredesignsolutions.com

www.softwaredesignsolutions.com

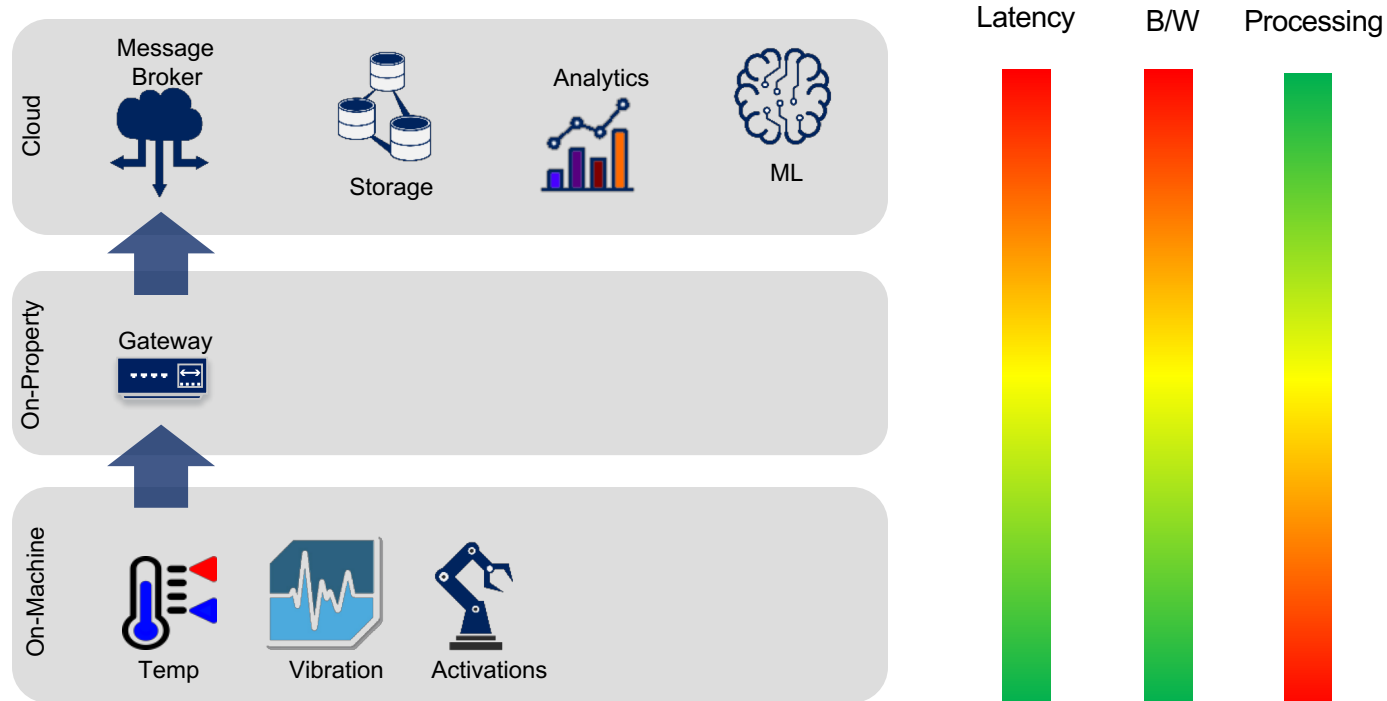
Typical IoT Architecture



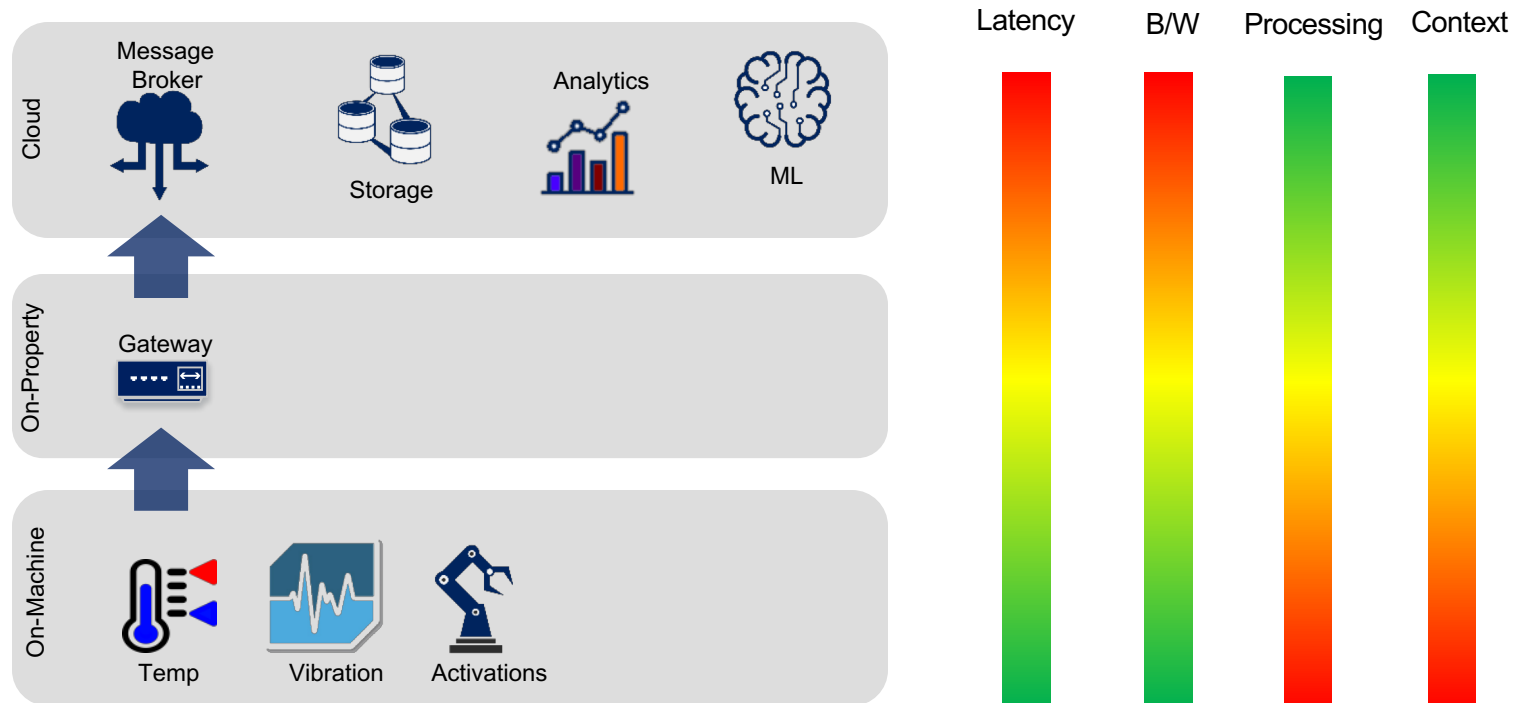
Communication Latency and Bandwidth



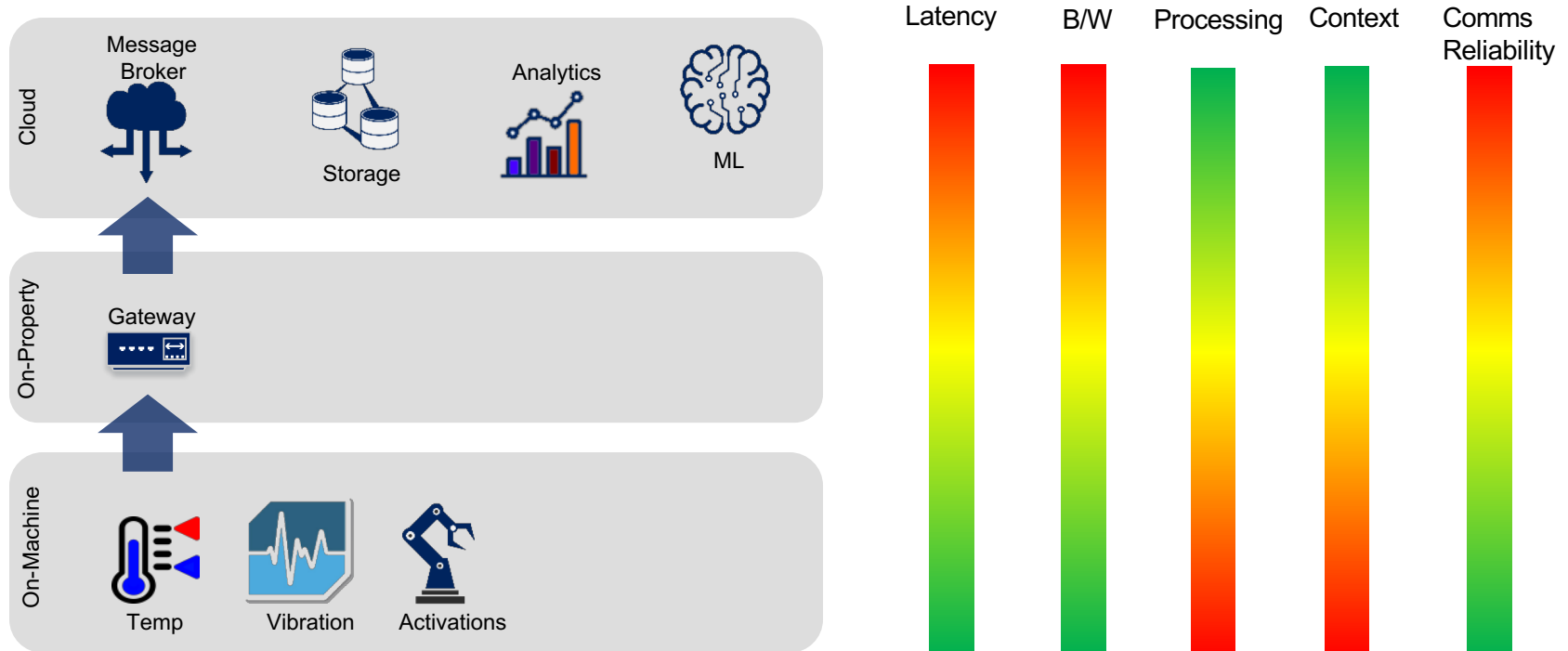
Processing Power



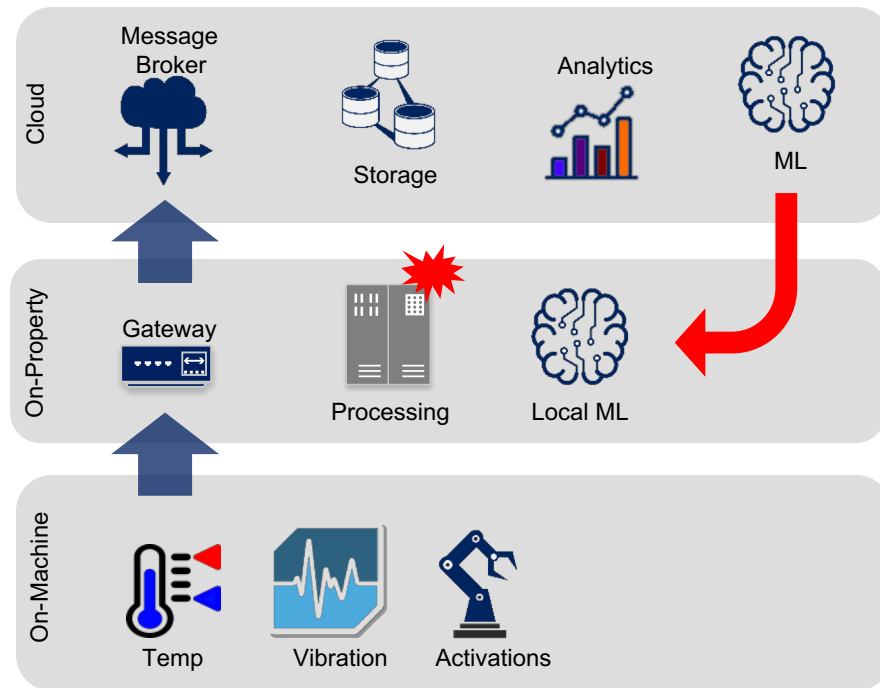
Information Context



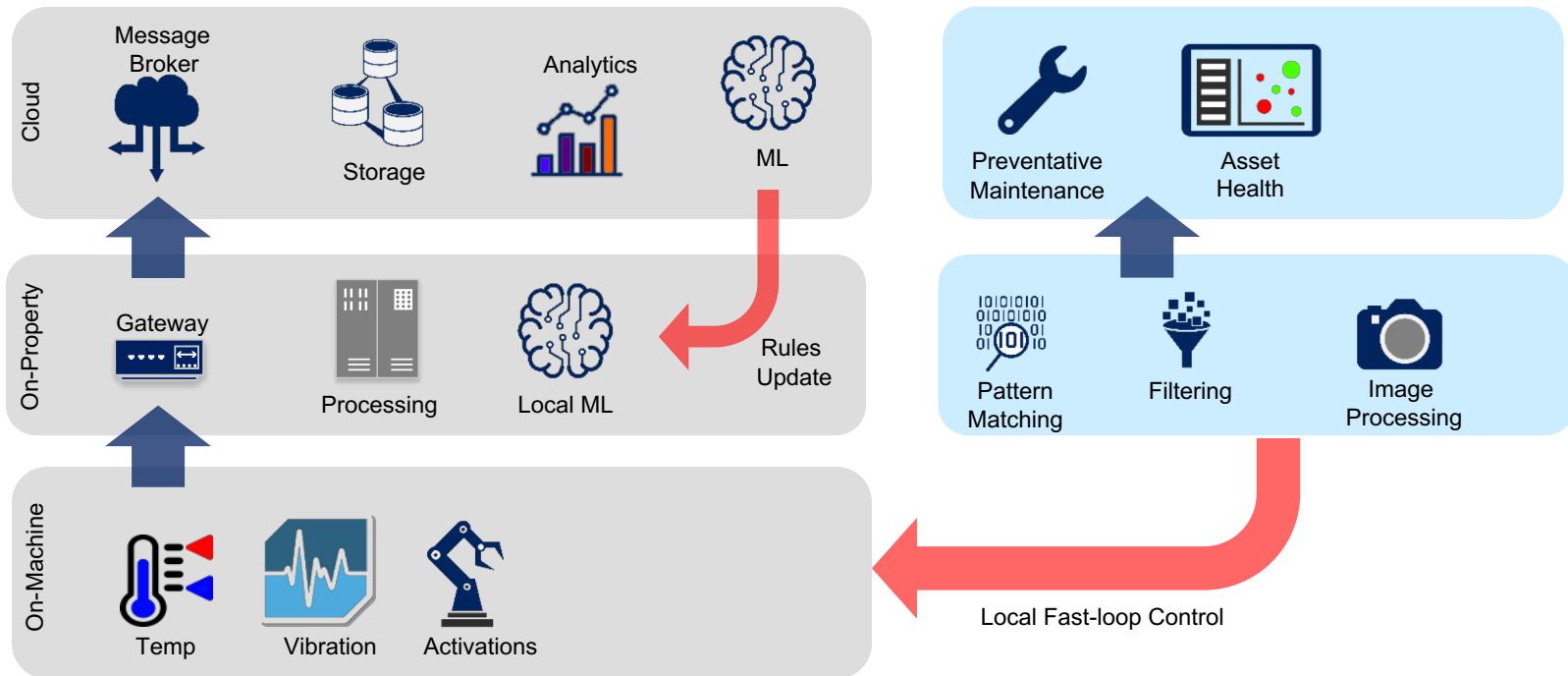
Communication Reliability



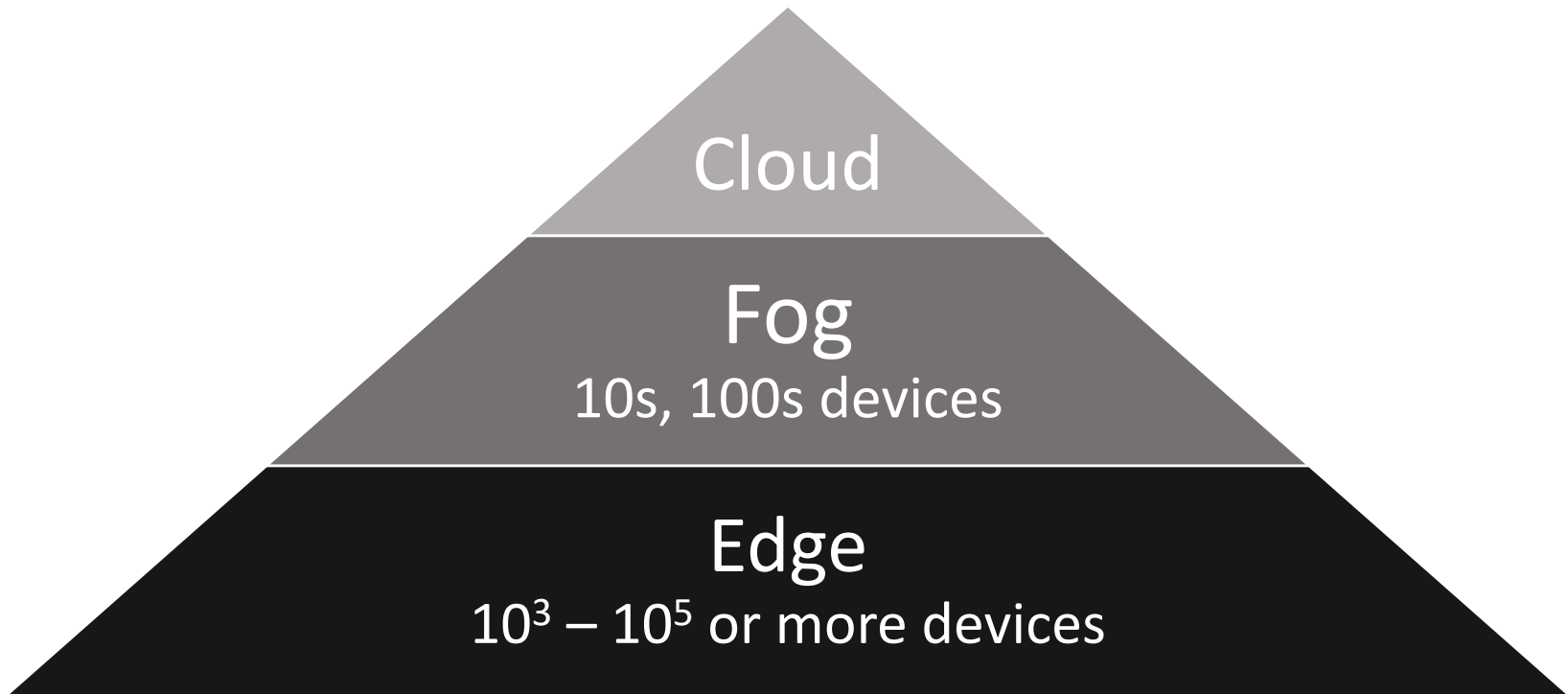
Fog Processing On-Property



Local Processing with Global Context



Number of Devices



What is an Edge Node? (IMO)

Edge Node



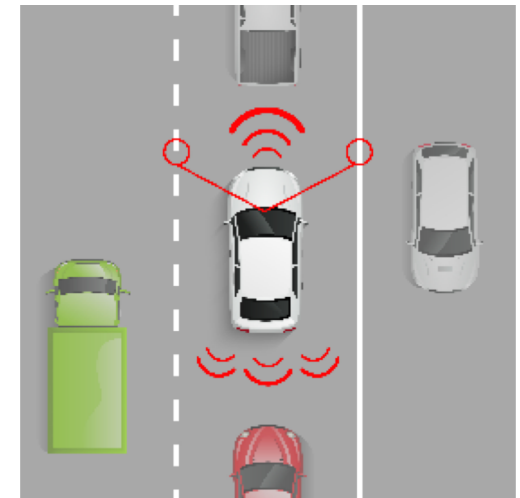
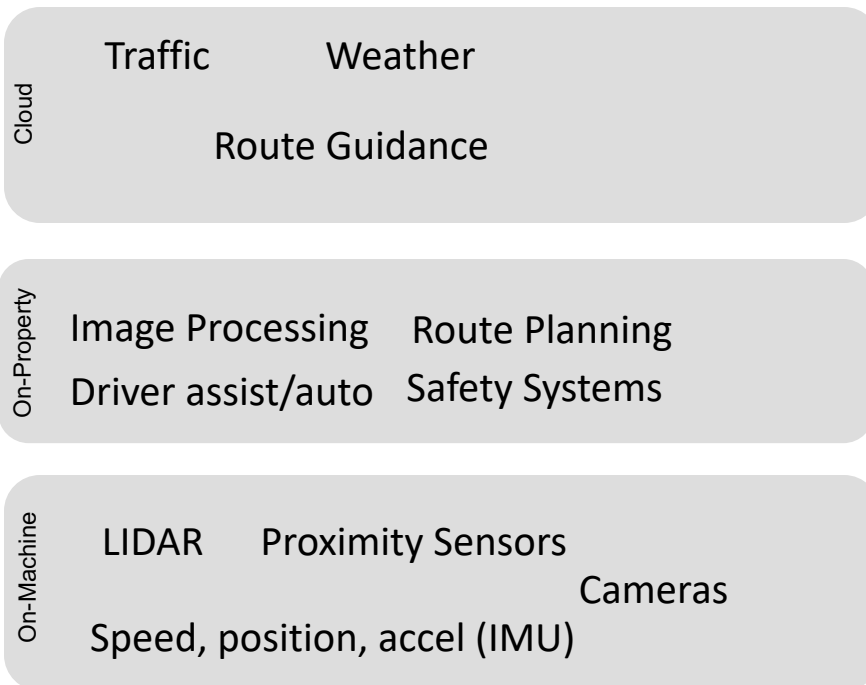
Maybe



Not Edge Node



Example: Connected Car



- Mission Critical / Life Critical
- Fully capable w/o cloud
- Plenty of power available to sensors
- Harsh environment

Example: Smart Agriculture

Cloud

Weather Mapping
Historical Trend Alerts
Yield Mapping and Analytics

On-Property

Soil moisture management
Frost detection / mitigation

On-Machine

Moisture Temperature
Soil pH, NPK Light Levels



- Harsh, remote environment
- Geographically spread
- Sensors – battery or solar, wireless
- Limited BW to cloud
- Gateway/FOG may have AC, or hefty solar

Example: Smart Retail

Cloud

Inventory Mgmt Supply Chain Integration
Historical Trends Consumer Analytics

On-Property

Image Processing Shopper Tracking
Product Recognition Loss Prevention

On-Machine

Cameras Traffic Counters
Motion Sensors
Gaze detection Inventory sensors



- Cost-sensitivity on edge nodes
- Myriad of products, packaging
- Consumer (shopper) usability
- Consumer data driven

How are SDS/AVI involved in IoT and ML?

Cloud

- Asset Tracking and Management
- Big Data Analytics
- Predictive Maintenance
- Consumer Products

On-Property

- Embedded Linux Gateways
- Custom Gateway Hardware
- Image Processing (CPU/GPU)
- Security Image Classification

On-Machine

- Firmware
- PCB Design
- Prototyping
- System Design
- Legacy Integration

- Manufacturing
- Transportation
- Medical
- Retail
- Military
- Energy
- Consumer
- Wearable
- Semiconductor

Contact Us

Ed Kuzemchak - CTO

ed@softwaredesignsolutions.com
www.softwaredesignsolutions.com
embeddedandiot.com

bit.ly/EdSensorsMidwest