Microsoft

Azure Stack Edge

Ev Moreno
Edge Platform Technical Evangelist
evmoreno@microsoft.com

IoT in Action

Azure Stack portfolio

Extend Azure to consistently build and run hybrid applications across cloud, datacenter, and edge

Azure Stack HCI

Hyperconverged solution

- Scalable virtualization and storage
- Remote branch office
- High-performance workloads

Azure Stack Edge

Cloud-managed appliance

- Machine learning at the edge
- Edge compute and IoT solutions
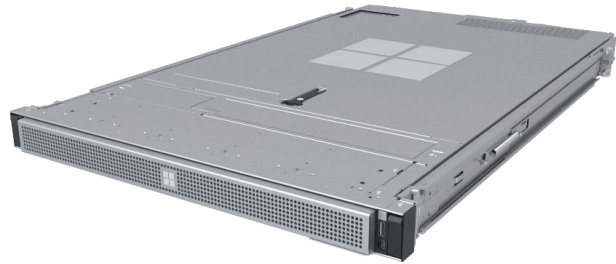- Network data transfer to cloud

Azure Stack Hub

Cloud-native integrated system

- Disconnected scenarios
- Data sovereignty
- Application modernization

Azure Stack Edge

An Azure-managed, edge appliance that brings the compute, storage, and intelligence of Azure right to where you need it

Hardware-accelerated machine learning

Accelerate ML inferencing using on-board GPU or FPGA to get results close to the data source

Edge compute

Run VMs, containers, and Azure services at the edge locations

Azure-managed appliance

Order and manage your appliance and workloads through the Azure portal

Cloud storage gateway

Transfer data to Azure over the network while retaining local access to blobs and files

Choose the appliance model best suited for the job

Commercial (C) series

Enterprise-ready form factors for use
within a traditional business setting

Rugged (R) series

Ruggedized, portable, battery-operated
form-factors for harsh field conditions

Cloud managed using Azure IoT Hub

IoT Edge modules
Run Azure services directly on any device. AI, Azure ML, Azure stream analytics, Azure functions, SQL or bring your own code

Secure
Designed for security from the ground up and only secure devices get certification

Open source & cross platform
Open source and supports Linux, Windows and an expanding set of OS's

Cloud managed
Remotely configure, update, monitor, and manage IoT Edge devices

IoT solutions

Real-time AI and analytics

Device connectivity and management

Use Cases

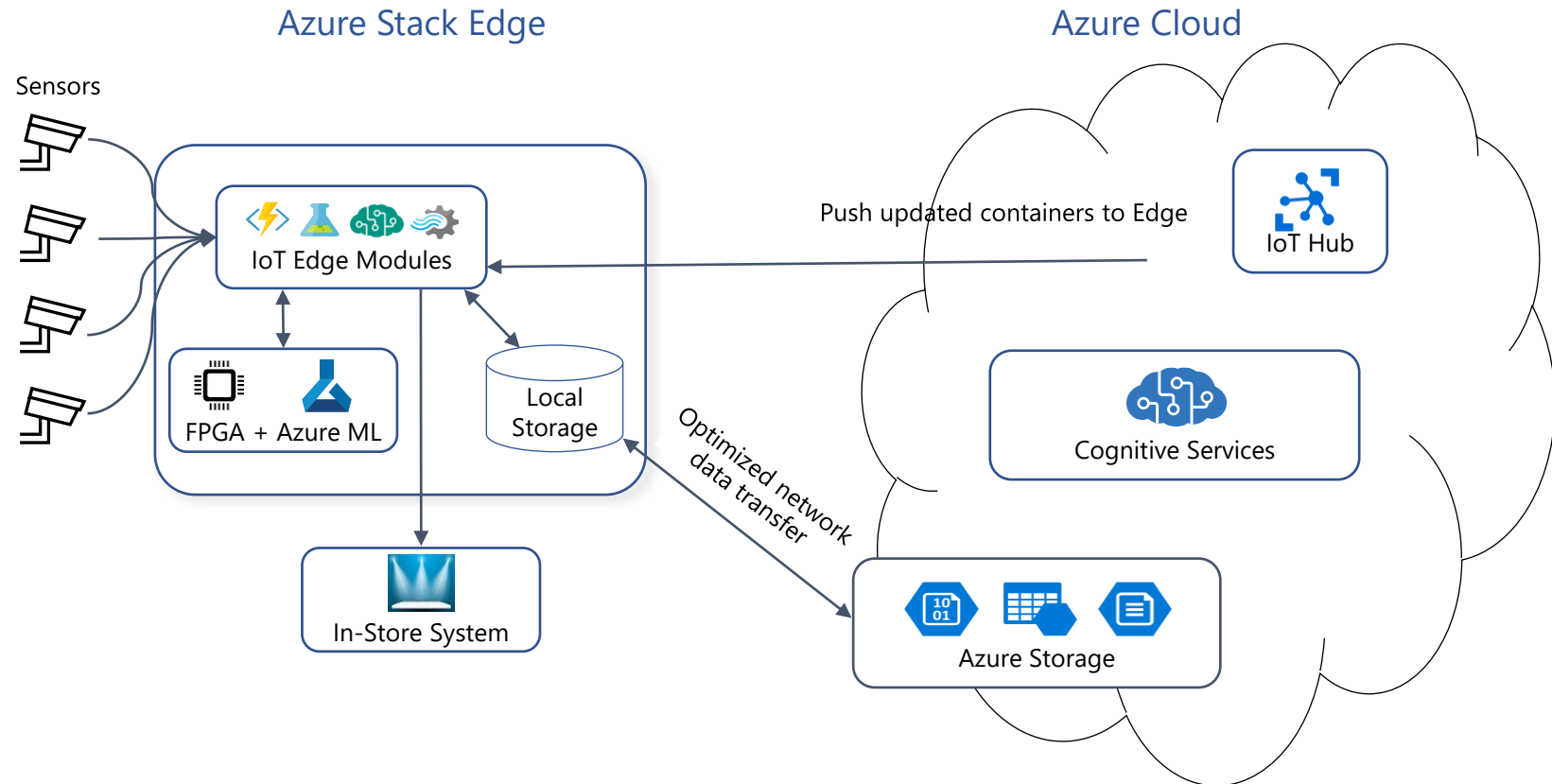# Use case: Retail - Smart customer interactions

Drive additional purchases with targeted advertising based on demographics

What problem does this solve?
- Increase customer connections
- Target advertising to drive additional sales
- Add a new monetization opportunity

What technology does this use?
- IP cameras send data over the local network to Azure Stack Edge
- Containerized application uses Azure Cognitive Services to process images and determine age and gender
- An in-store system displays ads based on resulting demographic data
- Optional: transfer data to Azure for additional analytics

Azure Stack Edge

Azure Cloud

Sensors

IoT Edge Modules

FPGA + Azure ML

Local Storage

In-Store System

Push updated containers to Edge

IoT Hub

Cognitive Services

Optimized network data transfer

Azure Storage

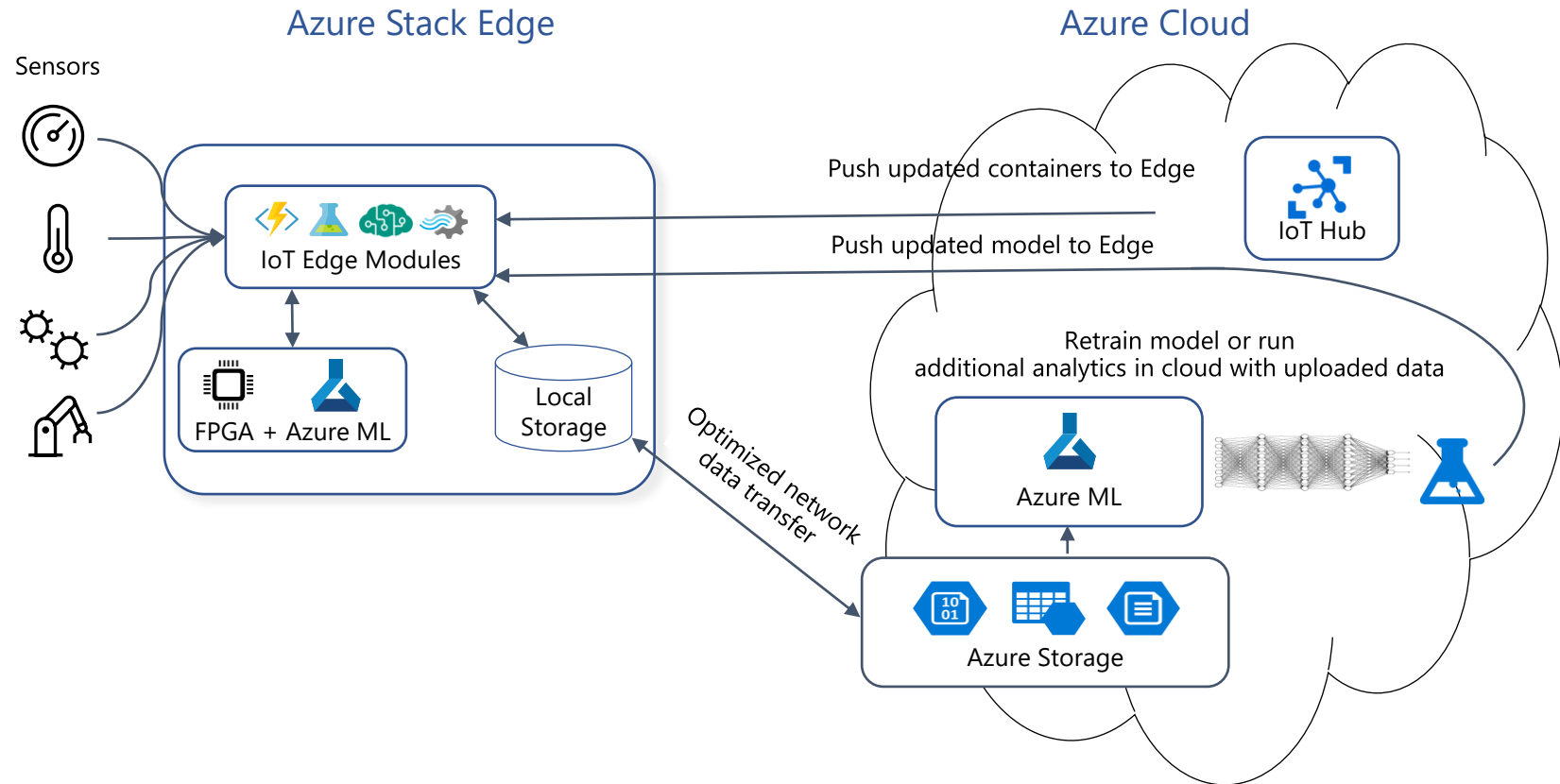# Use case: Manufacturing - Predictive Maintenance

Prevent equipment failures by identifying issues prior to failure and fixing them

What problem does this solve?

- Reduce lost manufacturing time due to broken equipment
- Reduce maintenance overhead with cost-effective preventative maintenance vs unpredictable repair costs

What technology does this use?

- Sensors send data over the local network to Azure Stack Edge
- Containerized application uses a custom machine learning model to identify equipment in need of maintenance
- Optional: transfer data to Azure for storage, to retrain and improve your ML model, or for additional analytics

Azure Stack Edge

Sensors

IoT Edge Modules

FPGA + Azure ML

Local Storage

Azure Cloud

Push updated containers to Edge

Push updated model to Edge

IoT Hub

Retrain model or run additional analytics in cloud with uploaded data

Azure ML

Optimized network data transfer

Azure Storage

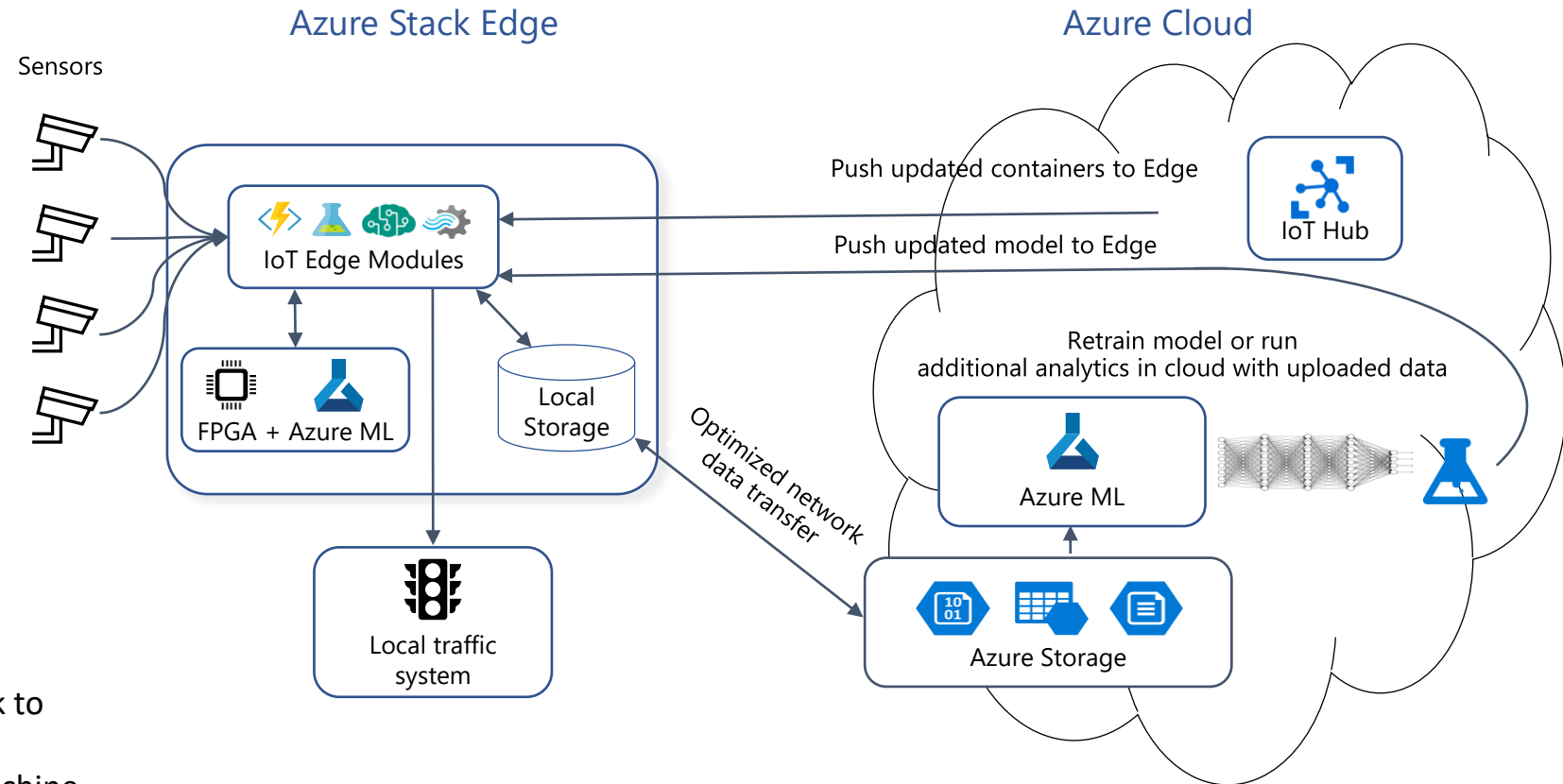# Use case: Smart City - Intelligent Crosswalks

Improve crosswalk safety by extending crossing time as needed

What problem does this solve?
- Reduce risk of harm to pedestrians from insufficient time to cross
- Reduce risk of vehicle accidents with improved traffic light management

What technology does this use?
- IP cameras send data over the local network to Azure Stack Edge
- Containerized application uses a custom machine learning model to identify pedestrians in need of additional crossing time
- Optional: transfer data to Azure for to retrain and improve your ML model or for additional analytics

Azure Stack Edge

Sensors

IoT Edge Modules

FPGA + Azure ML

Local Storage

Local traffic system

Azure Cloud

Push updated containers to Edge

Push updated model to Edge

IoT Hub

Retrain model or run additional analytics in cloud with uploaded data

Azure ML

Optimized network data transfer

Azure Storage

Demo – FPGA Video Inferencing at the Edge

The art of the possible
with intelligence edge

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Working code samples

1. Deploy Azure ML hardware accelerated models to Azure Stack Edge
2. Deploy an edge void detection solution (empty shelves)
3. Deploy edge-based footfall analysis

evmoreno@microsoft.com

#Project15 AI for Good, AI for Earth