Unlocking Internet of Things Value
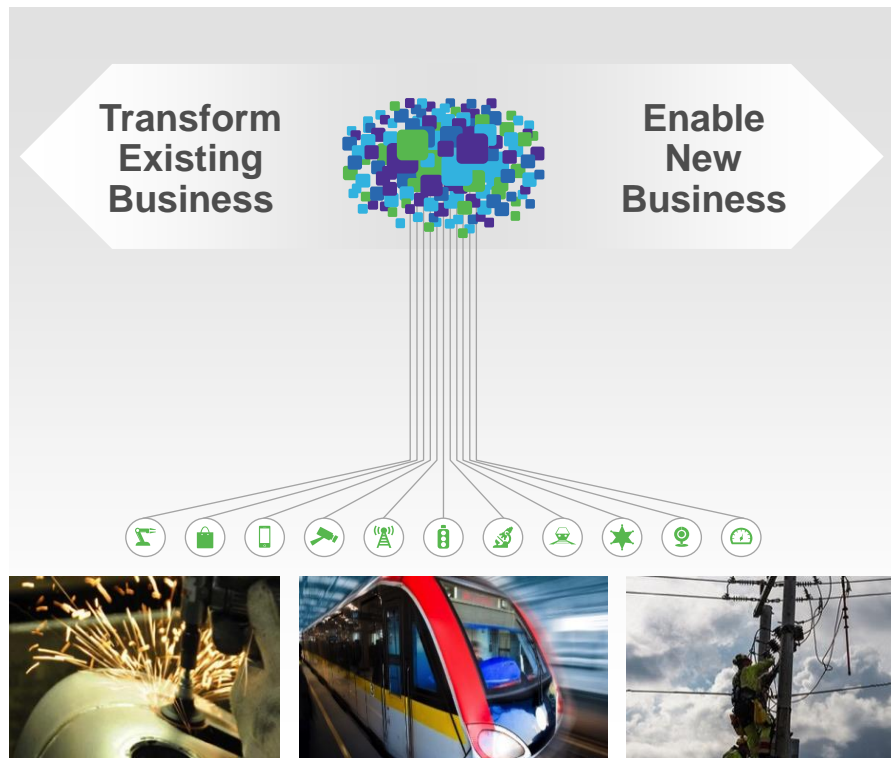
António Feijão

IoT Business Development Manager

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IoT Unlocks Digital Business Value

Transform Existing Business

Enable New Business

Where is the value

50 Billion smart devices by 2020 will connect the unconnected

IT and OT convergence, hyper-connectivity across organizations

<1% of data currently used, more can be used for **optimization and prediction**

Interoperability across silo'ed systems required to capture **40% of IOT value**

Source - McKinsey: The Internet of Things: Mapping The Value Beyond The Hype

The Promise of a Connected World is Complex

Connecting, managing & securing devices across a multitude of communication standards

Aggregating data from trillions of heterogeneous sources

Providing real time visibility across every device at any time

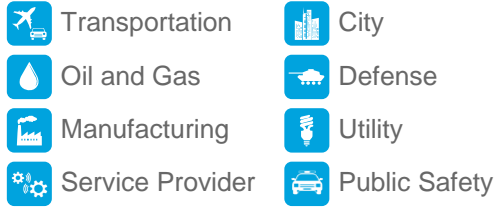Automating actions based on unique business rules

Billing customers on subscriptions with customizable meters and terms

Making all of this simple to administer at hyper scale

Cisco's IoT Framework: Applications Centric

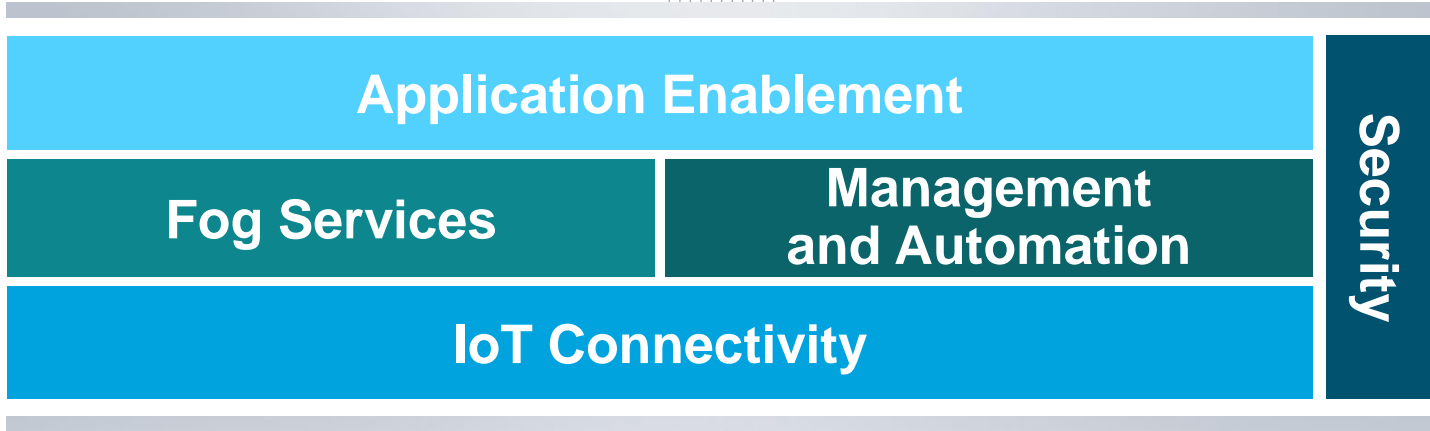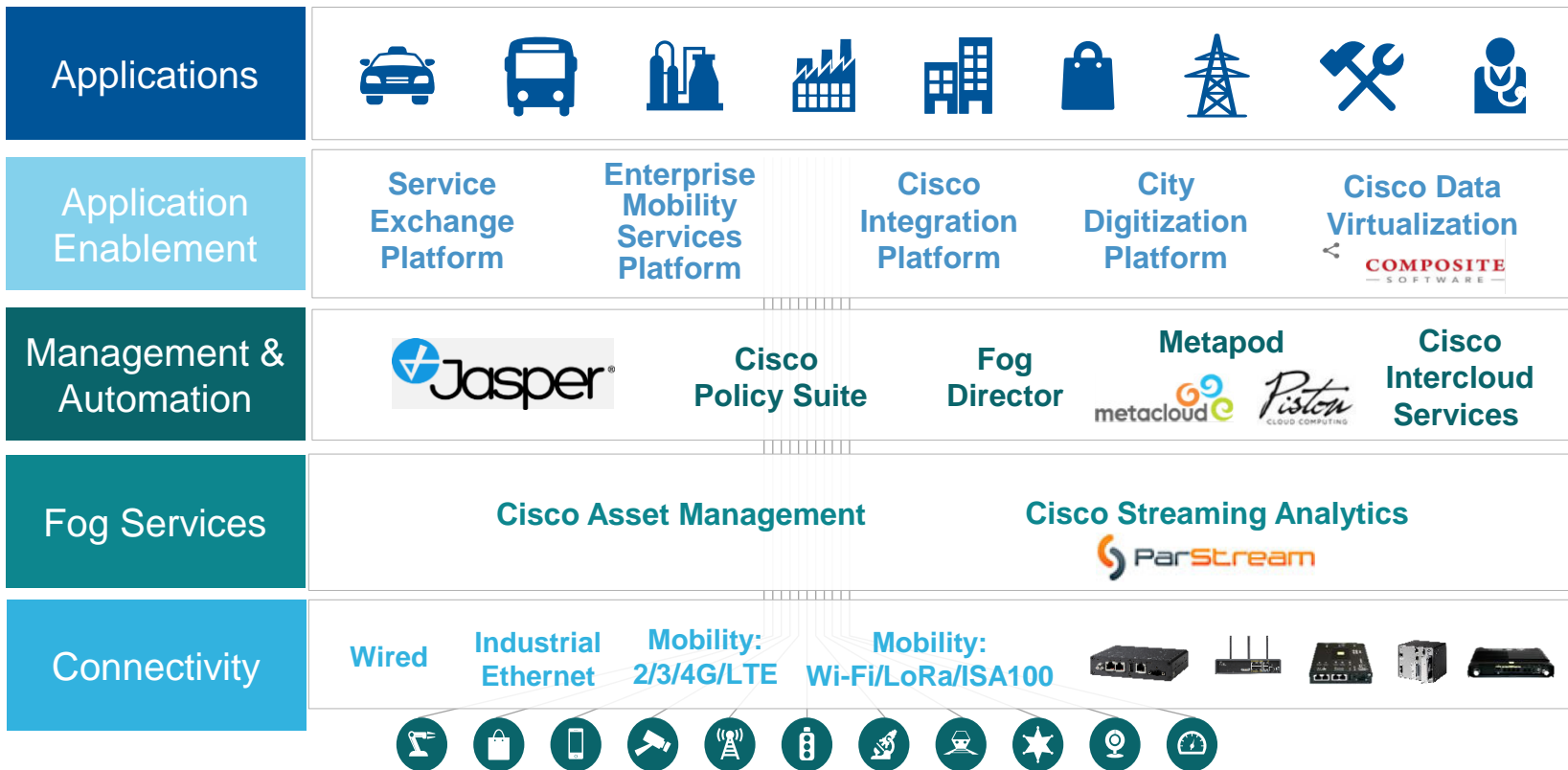## Secure, Scalable, IT / OT Consistency, Validated Architecture & Solutions

SOLUTIONS

- Transportation
- Oil and Gas
- Manufacturing
- Service Provider
- City
- Defense
- Utility
- Public Safety

APPLICATIONS

ECOSYSTEM

Itron · Schneider Electric · Rockwell Automation

Honeywell · BITSTEW SYSTEMS

BOMBARDIER · ALSTOM · Lilee

EMERSON · GE · SAP · SK GROUP

davra networks

Application Enablement

Fog Services

Management and Automation

IoT Connectivity

Security

CISCO

Cisco's IoT Framework Components

Applications

Application Enablement
- Service Exchange Platform
- Enterprise Mobility Services Platform
- Cisco Integration Platform
- City Digitization Platform
- Cisco Data Virtualization — COMPOSITE SOFTWARE

Management & Automation
- Jasper
- Cisco Policy Suite
- Fog Director
- Metapod — metacloud, Piston CLOUD COMPUTING
- Cisco Intercloud Services

Fog Services
- Cisco Asset Management
- Cisco Streaming Analytics — ParStream

Connectivity
- Wired
- Industrial Ethernet
- Mobility: 2/3/4G/LTE
- Mobility: Wi-Fi/LoRa/ISA100

Things and Sensors

Security Components
- Intrusion
- Mobility
- Identity
- Threat
- Access Policy

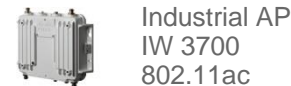# IoT Networking and Security Portfolio

Network Connectivity

Industrial Switching

IE 2000, 3000 CGS2000

IP67

IE 4000

IE 5000

Industrial Routing

CGR 2000

ASR 903

ASR 902

Industrial Wireless

Field AP 1552

Mfg WGB/AP (Rockwell)

Industrial AP IW 3700 802.11ac

Mobile IP Gateway

Field Network

CGR 1000

819H

IR509

IR910

IR829

IR809

Embedded Networks

ESS Switches

5900 ESR

5921 Software Router

Security

IP Cameras

VSM

Physical Access Manager

IR Portfolio

IE Portfolio Software Defined Segmentation (TrustSec)

Cisco ISE

ISA 3000

Cisco ASA H

AMP, Sourcefire Defense Center, Cloud Security

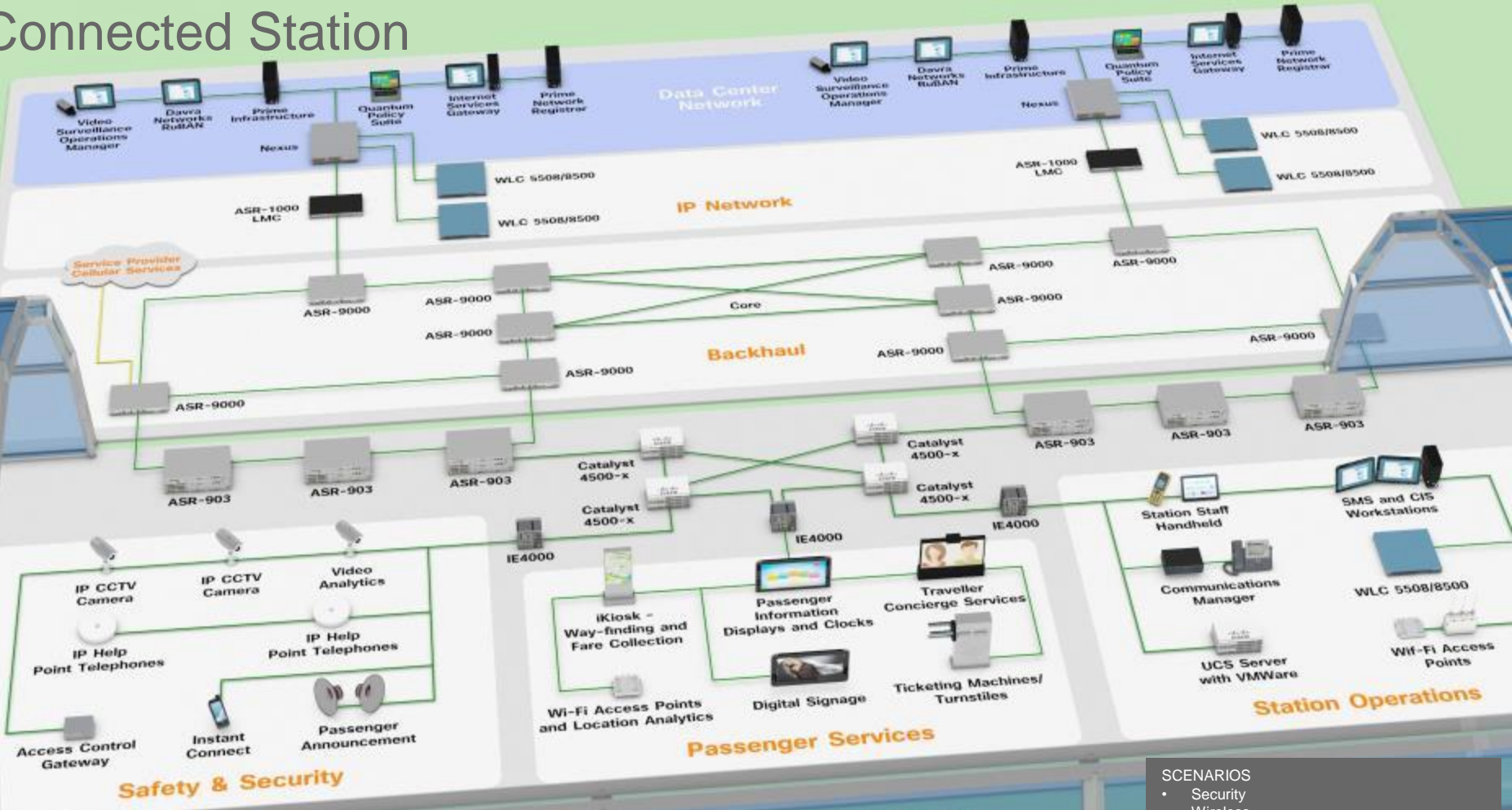# Example: Connected Transportation Solutions
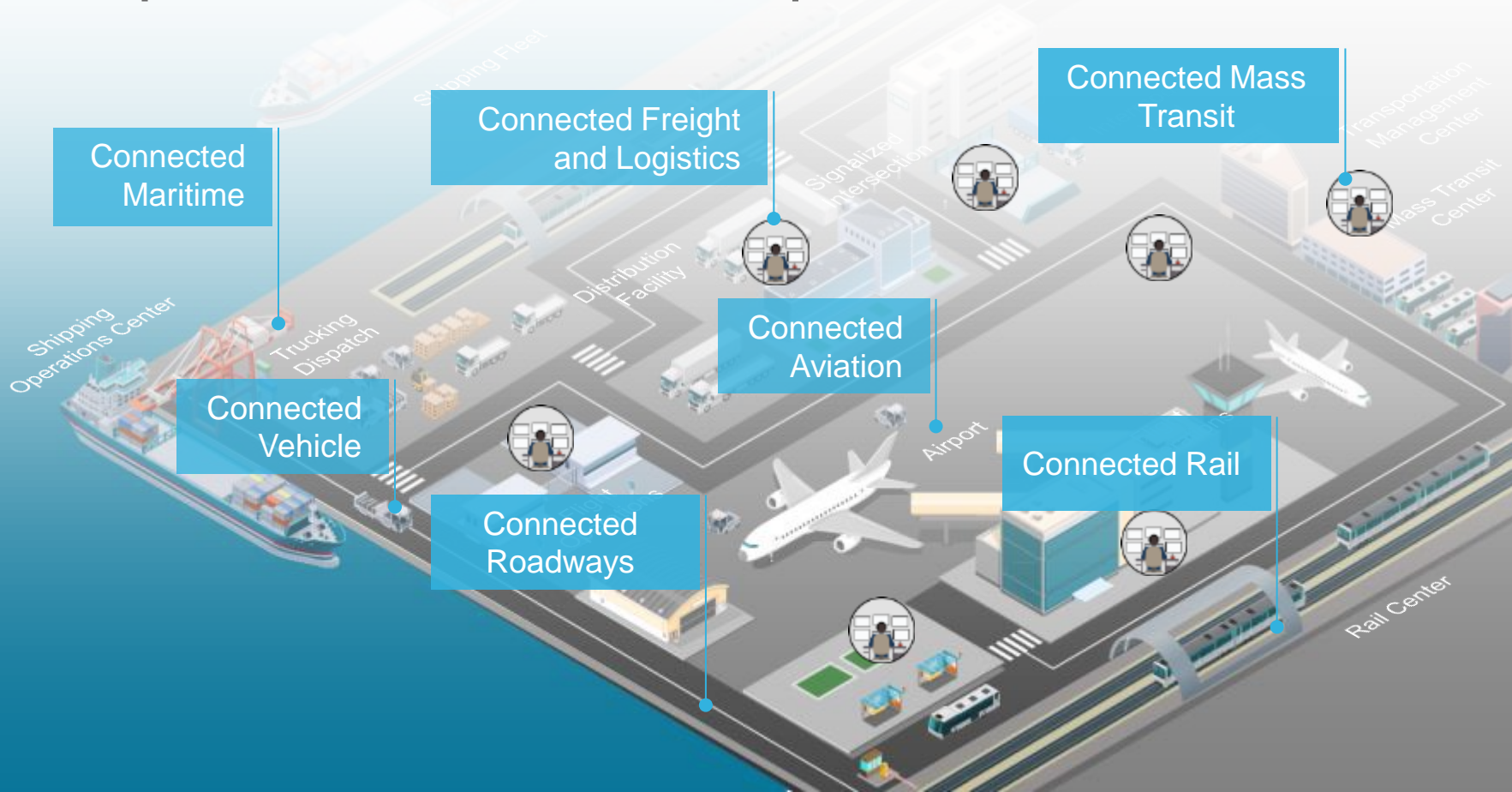
Connected Train
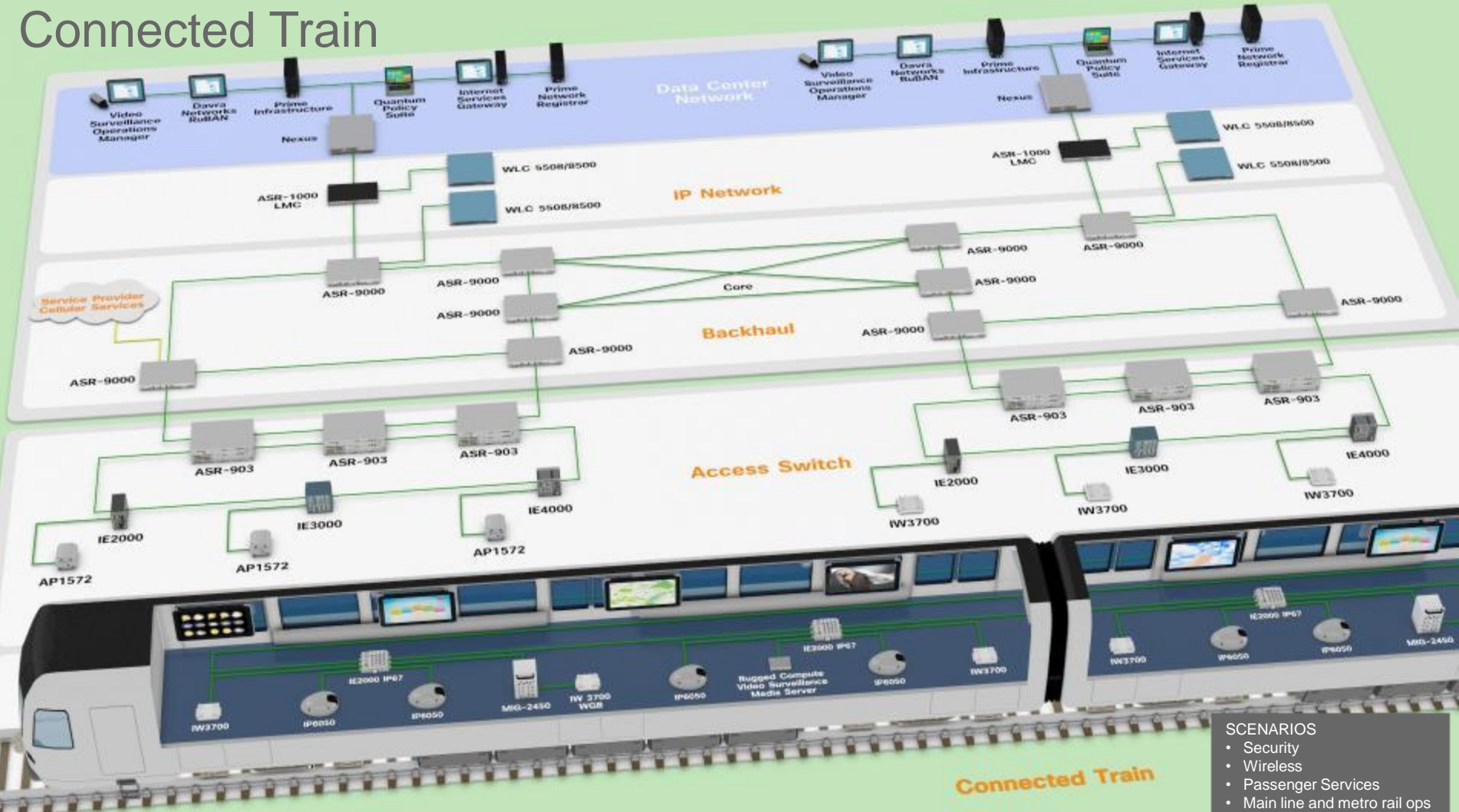
SCENARIOS
- Security
- Wireless
- Passenger Services
- Main line and metro rail ops

Connected Station
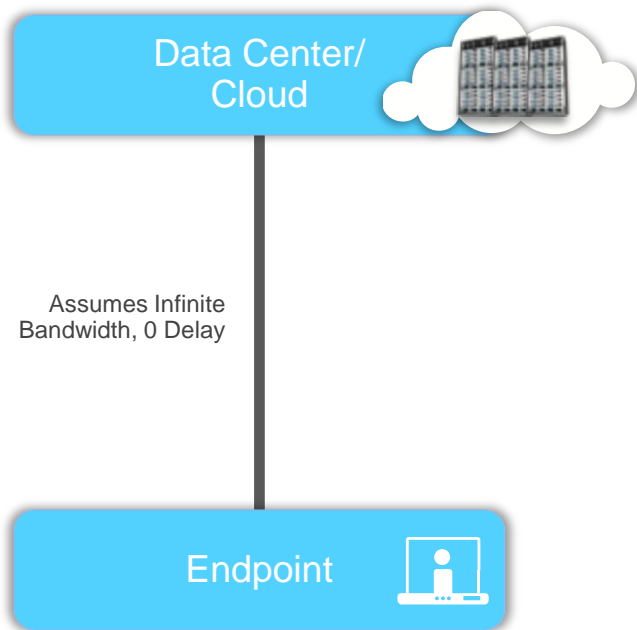

SCENARIOS
- Security
- Wireless
- Integrate multiple in-station networks
- Expanded retail offerings and promotion

Fog Systems: Application Centric Infrastructure
Take Processing and Storage to the Data Using the Intelligent Network Fabric
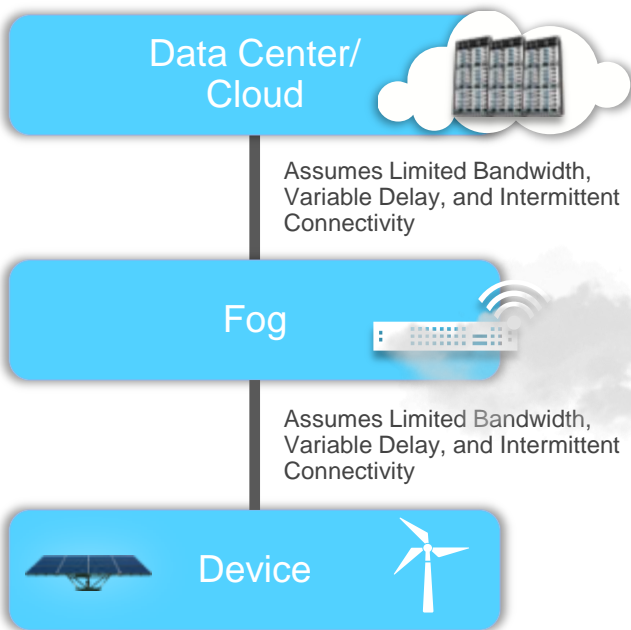
Traditional Computing

IoT Computing Model

Data Center/ Cloud

Assumes Infinite Bandwidth, 0 Delay

Endpoint

Latency-Critical
Responsiveness
Required

Resiliency

Security

Data Grows Faster Than Bandwidth

Data Center/ Cloud

Assumes Limited Bandwidth, Variable Delay, and Intermittent Connectivity

Fog

Assumes Limited Bandwidth, Variable Delay, and Intermittent Connectivity

Device

CISCO

Essential Elements for Fog Applications
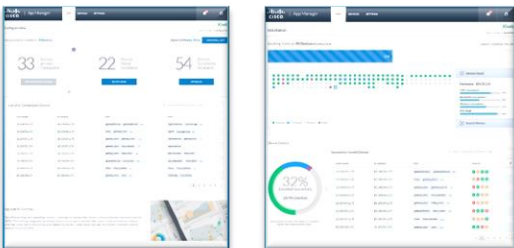
Fog-ready Network Infrastructure

Application Execution Environment
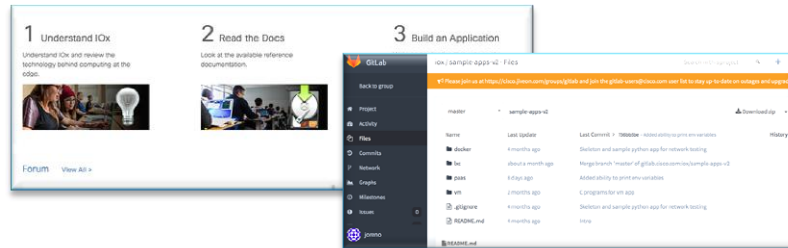

Cisco IOx

| Cisco IOS | Linux |

Fog Application Management

Developer Tools

Customer Example – Manufacturing
Cisco IoT System with Fog, IOx Applications

Challenge
- Common data collection and control
- Increase manufacturing line availability
- Improve workflow and factory processes

Solution
- Mazak SmartBox
- Cisco IE 4000 Ethernet switch
- Fog application

Business Outcomes
- Continuous OEE improvement
- Predictive maintenance

cisco

Customer Example – Cell Tower Asset Monitoring
Cisco IoT System with Fog, IOx Applications

Challenge

- No visibility for hurricane planning
- Costly to manage remote sites
- Losses due to asset theft

Solution

- Operations dashboard and business intelligence in Cisco cloud (Connected Assets solution)
- Fog application (Azeti Sonarplex)
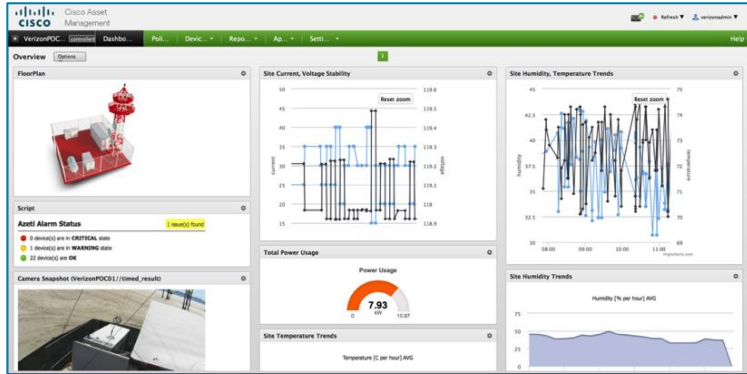- Cisco IR 829 router (IOx)

Business Outcomes

- Reducing workload for routine site checks
- Complete visibility into assets
- Knows exactly how long towers survive on battery
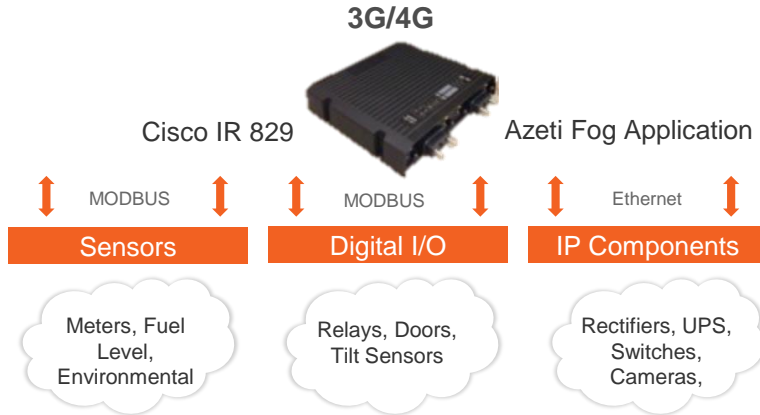
Deployment Architecture

Cisco Cloud

Remote Site

3G/4G

Cisco IR 829   Azeti Fog Application

MODBUS   MODBUS   Ethernet

Sensors   Digital I/O   IP Components

Meters, Fuel Level, Environmental   Relays, Doors, Tilt Sensors   Rectifiers, UPS, Switches, Cameras,

Business intelligence and operations

- Historical trending
- Multi-site correlation
- Single pane of glass management

Ecosystem partner application using Fog Data Services running on IOx-based IR 829

- Local device control
- Accommodates many types of sensors (analog, digital, legacy, etc.)
- Data aggregation/reduction
- VPN secured data link

Customer Example – Fleet Management
Cisco IoT System with Fog, IOx Applications

Challenge

- Lower OPEX through efficient vehicle maintenance
- Increased field productivity
- Improved customer satisfaction
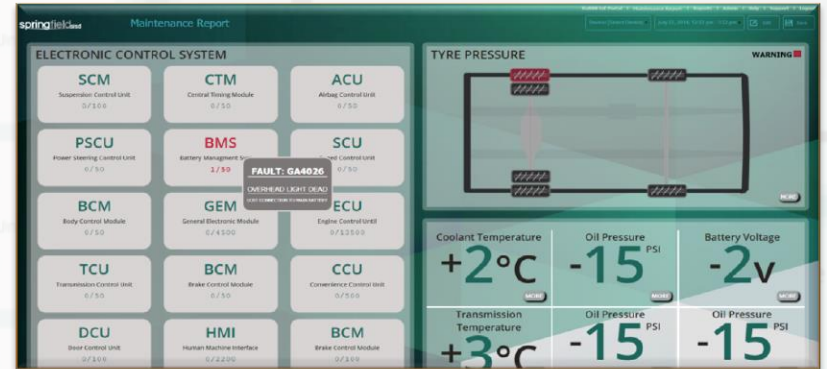
Solution

- Cisco IR 829 – WiFi and 4G connectivity
- Davra RuBan fleet management application
- Vehicle diagnostics and asset tracking

Business Outcomes

- Lower OPEX through efficient vehicle maintenance
- Increased field productivity
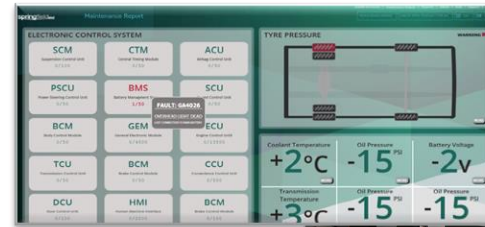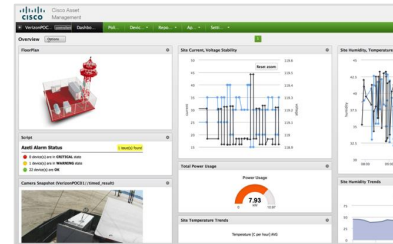- Improved customer satisfaction

Common Denominators of Customer Success

Fog-ready Network Infrastructure

Integrated Security

Management at Scale

Open Source Development Tools

IoT Solutions Partner Ecosystem

Manufacturing	Utility	Oil and Gas	Transportation	City	Workspace
Rockwell Automation	Itron	EMERSON	BOMBARDIER	AGT international	PHILIPS
GE	SIEMENS	Honeywell	Lilee Systems	WORLD W SENSING	EATON COOPER
FANUC Robotics	ALSTOM	ABB	davra networks	sensity	CREE
SAP	OSIsoft	Schneider Electric	CABLEVISION	N3N	MICROCHIP
Mazak	BITSTEW SYSTEMS	YOKOGAWA	Ansaldo STS A Finmeccanica Company	ch2m	Johnson Controls

CISCO

Key Takeaways

Leverage the Value of the Secured Network

Innovate with Cisco: DevNet and Fog IOx

Attain full Value with Management, Automation and Application Enablement Solutions

Build on Proven IoT Solutions and Vertical Use Cases

Application Enablement

Fog Services

Management and Automation

IoT Connectivity

Security