

vmware®

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# Meeting At The Edge With VMware IoT

VMware Pulse IoT Solutions



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EMEA



EDGES OF THE BUSINESS

# Why VMware



# VMWARE VISION

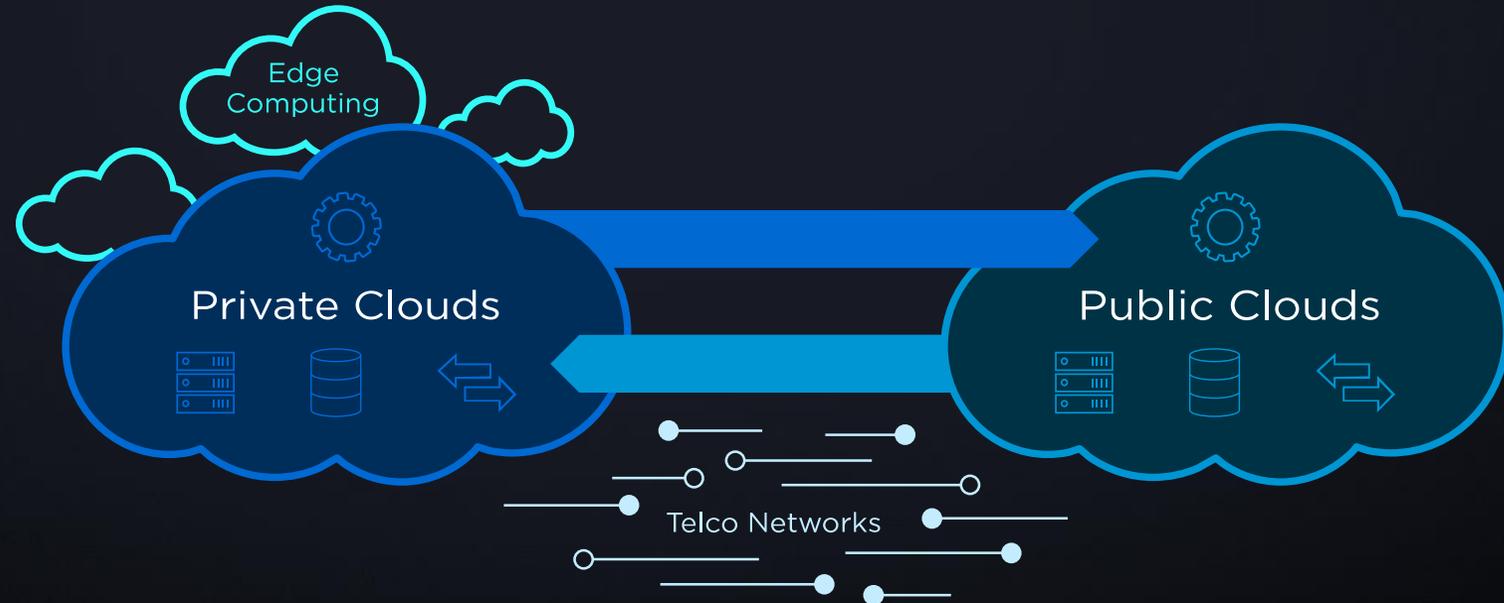
ANY DEVICE



ANY APPLICATION



ANY CLOUD



# The Internet of Things is here



**279 Million**  
Connected Vehicles  
by 2021



**\$12.9B**  
Spend on IoT  
By 2020



**30%**  
Medical Devices Lost  
Every Year



**7-8TB**  
Per day



Jet Engine  
produces  
1TB/flight

SECURITY

MANAGEMENT

SCALE

# IoT Challenges



OT-IT Disconnect



Security and Privacy  
Concerns



Lack of  
Interoperability



Managing and Scaling  
IoT Infrastructure



High Cost of Getting  
Started with IoT

# Where do We Play?

## INSIGHT PLANE

PREDICTIVE MAINTENANCE



SUPPLY CHAIN AUTOMATION



NEW CUSTOMER EXPERIENCE



## INFRASTRUCTURE PLANE

SET-UP



ONBOARD



MONITOR



MANAGE



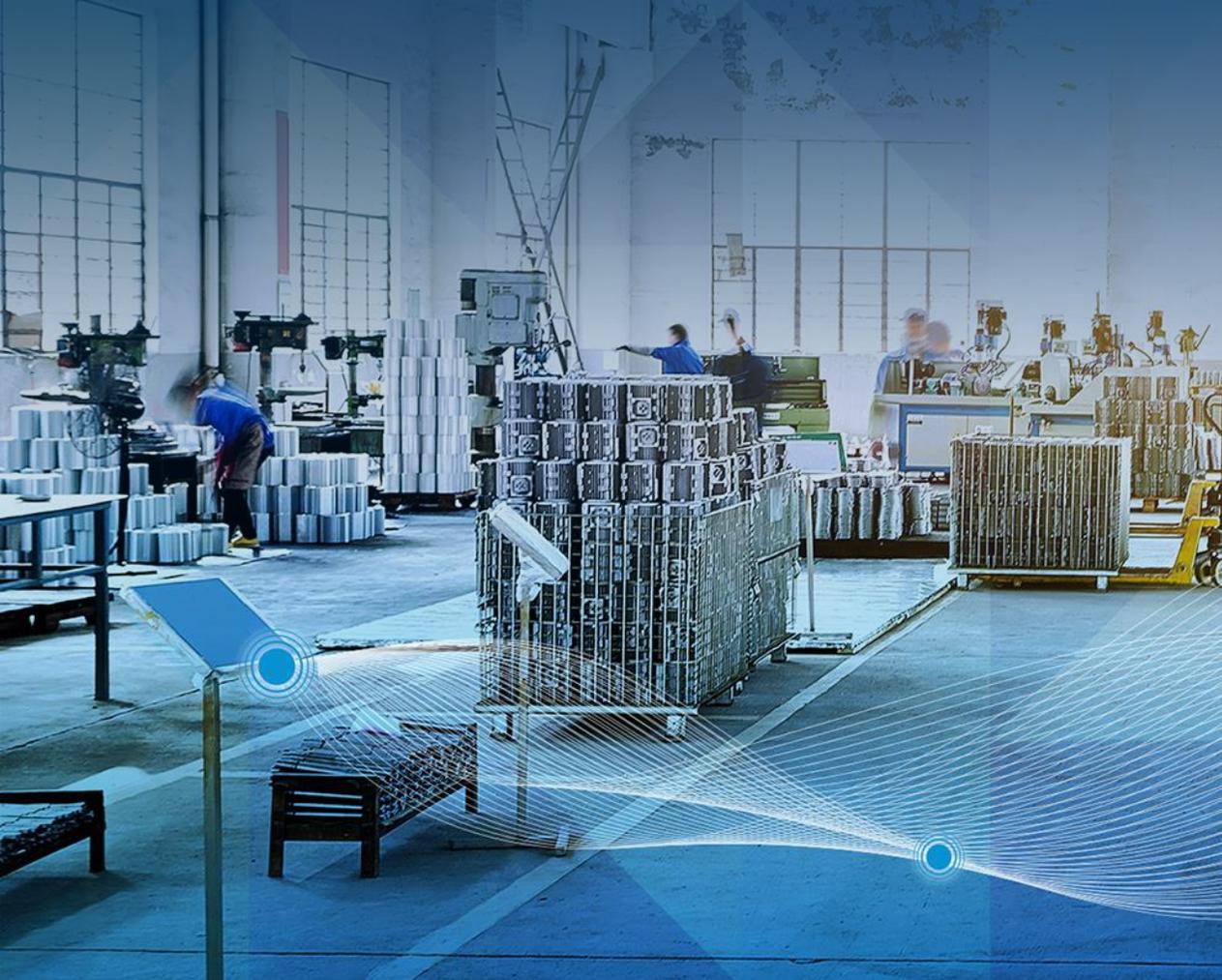
SECURE



ONE IoT INFRASTRUCTURE

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# Take Control of the Edge with VMware Pulse

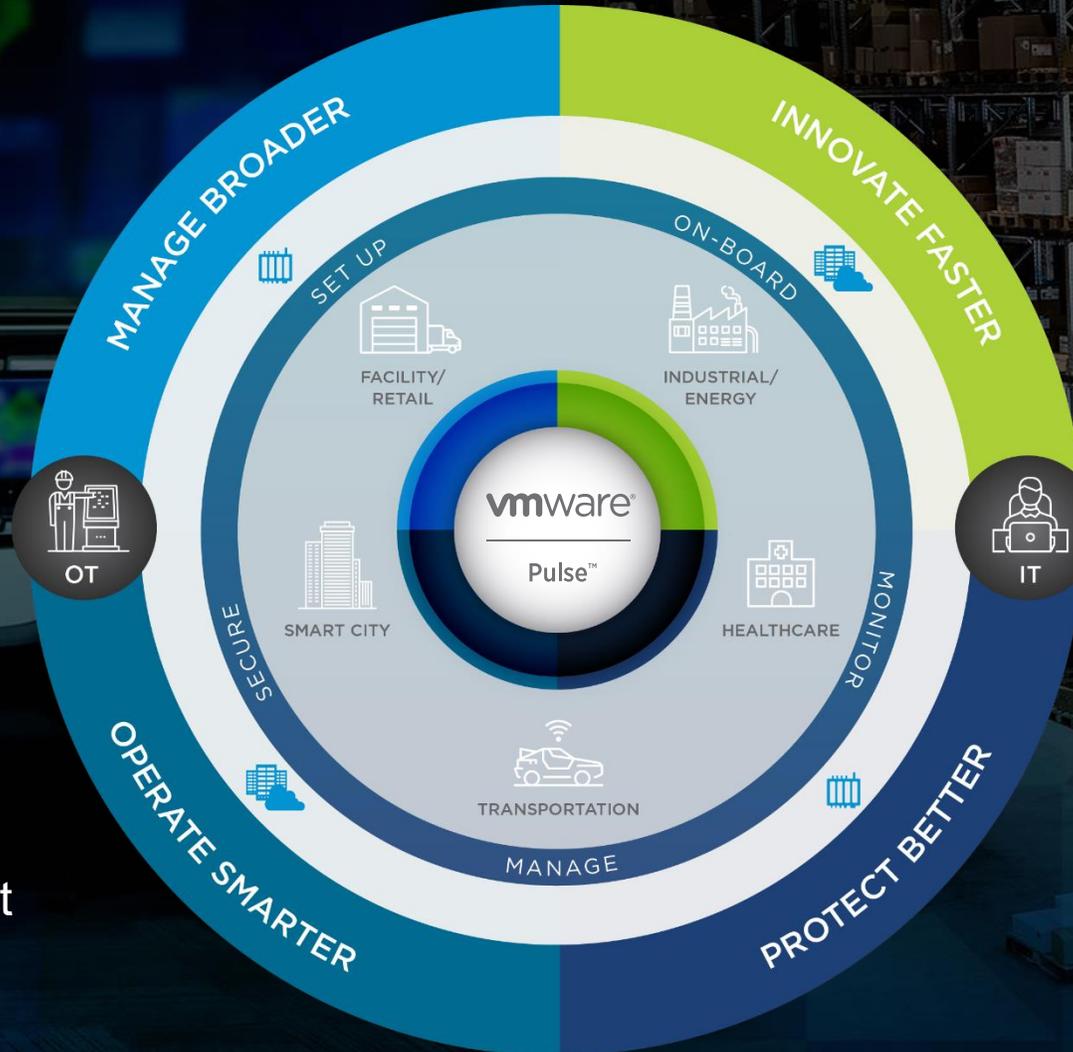
# Take Control of the Edge

## Simplify the Complexity

Manage millions of things as easily as managing one

## Improve Reliability

Provide accurate and real-time visibility of 'thing' health and act on anomalies as they arise



## Accelerate ROI

Streamline and accelerate how IoT gets deployed and scaled

## Provide Peace of Mind

Secure IoT infrastructure across things, edge, network, and applications

# VMware Pulse IoT Center

## APPLICATION PLANE



### ONBOARD

- Liota Agent on edge systems to enable data orchestration
- Automatically detect edge systems and on board and provision over the air
- Map edge systems to connected devices

### MONITOR

- Collect telemetry data about infrastructure health
- Detect anomalies in real-time with high accuracy
- Set rules to automatically fix OTA when possible

### MANAGE

- Manage software OTA of any edge type and connected end points
- Set rules to automatically upgrade/fix in flexible package combination
- Set rules to automatically fix OTA when possible

### SECURE

- Secure across IoT use case – things, network, data, people
- Create segmented data flows with network virtualization
- Have complete visibility of all things

Dashboard

All Managed Objects

Average Stats

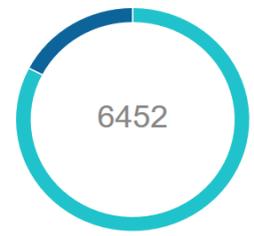
5	Devices per edge system
169	Edge System Alerts per month
84	Device Alerts per month

Common Object Types

Edge System	1123
Weather-Sensor-EMEA	360
Weather-Sensor-LATAM	360
Weather-Sensor-APAC	360
Weather-Sensor-AMER	360

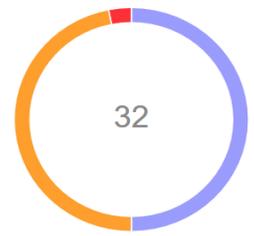
All Managed Objects

Managed Objects



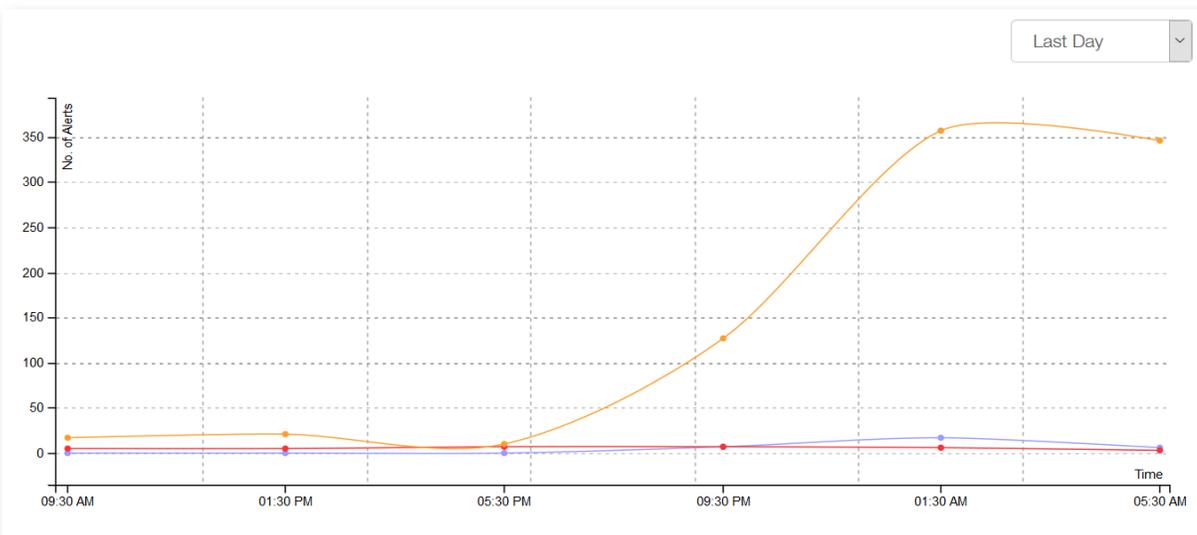
1123 Edge Systems  
5329 Connected Devices

Active Alerts



15 Efficiency  
16 Health  
1 Risk

Alert Trends



Search Managed Objects

Active Alerts

32 Results

- CoffeeMaker High CPU  
CoffeeMaker-AMER-17
- CoffeeMaker High CPU  
CoffeeMaker-AMER-14
- CoffeeMaker High CPU  
CoffeeMaker-AMER-31
- CoffeeMaker High CPU  
CoffeeMaker-AMER-19
- CoffeeMaker High CPU  
CoffeeMaker-AMER-37
- CoffeeMaker High CPU  
CoffeeMaker-AMER-33
- CoffeeMaker High CPU  
CoffeeMaker-AMER-16
- CoffeeMaker High CPU  
CoffeeMaker-AMER-42
- CoffeeMaker High CPU  
CoffeeMaker-AMER-09
- CoffeeMaker High CPU  
CoffeeMaker-AMER-27

- DEVICES
- ACCOUNTS
- GROUPS & SETTINGS

- List View
- Details View
- Lifecycle
- Certificates
- Staging & Provisioning
- Devices Settings



Devices > List View >  
**Dell5000-EMEA-052**  
Linux | 4.4.0 | Ownership: Corporate - Dedicated

More Actions | 13 / 50  
Recent List

Summary

User More

- DEVICE IS NOT COMPROMISED
- AWCM STATUS: CONNECTED
- ENROLLED 5/31/2018
- LAST SEEN 2 HOUR(S) AGO

### Security

- Managed By MDM

### User Info

USER NAME  
3835608c-f1c5-4c73-ab43-3132b71f65f5

NAME  
3835608c-f1c5-4c73-ab43-3132b71f65f5

EMAIL  
[3835608c-f1c5-4c73-ab43-3132b71f65f5@default.pulse](mailto:3835608c-f1c5-4c73-ab43-3132b71f65f5@default.pulse)

### Device Info

ORGANIZATION GROUP  
/ Stores / EMEA

PHONE NUMBER  
SIM Not Detected

SERIAL NUMBER

UUID  
3FD636B122B64649AAE65B691FC8F221

ASSET NUMBER  
3fd636b122b64649aae65b691fc8f221

PHYSICAL MEMORY  
30.88 MB free of 3.67 GB (0.8%)

VIRTUAL MEMORY  
0 Bytes free of 3.67 GB (0.0%)

### Certificates

- 0 Installed
- 0 Certificates Near Expiration (< 60 Days)

### Proxy Relationships

- 8 Child Count

An aerial night view of a city skyline, likely Los Angeles, with numerous skyscrapers illuminated. The image is overlaid with a semi-transparent grid of blue and green squares. The text "Use Cases and Impact" is prominently displayed in the lower-left quadrant.

# Use Cases and Impact



Powering the Connected Car



Keeping the Magic Going



Smart Hospitals



Smart Surveillance



Smart Warehouse



The Internet of Trains



The Branch of the Future



Smart Weather Forecasting



Smart Cities



# The Magic of Scale



# Powering the Connected Car

**Industry:** Automotive

**Business Problem:**

A car manufacturer is struggling with the rising costs of software related recalls for connected cars

**Use Case:** OTA updates, Operational Analytics

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**How VMware Pulse helps:**

- Manage the Head Unit and ECUs of these cars by deploying security patches, component upgrades and new services over-the-air and in real time.
- Collect telemetry from vehicle components and analyze it in real time to detect anomalies and deliver corresponding admin-defined commands and alerts.

**Customer Benefit:**

Reduce the recall rate and increase the warranty of the cars to eventually enhance customer satisfaction and loyalty in the long term.

# Keeping the Magic Going

**Industry:** Entertainment, Parks and Resorts

**Business Problem:**

A major parks and resorts company has deployed wearables and other sensors across all their properties to better track customer behavior, reduce wait time and optimize customer experience. However, they are finding it hard to cope with the fragmented heterogeneous ecosystem of their IoT deployments which is leading to rising costs of management and operations

**Use Case:** Asset tracking, OTA updates

**How VMware Pulse helps:**

- Reduces the cost of maintaining these connected devices and infrastructure by providing a method to monitor devices remotely and deliver over-the-air updates.
- Ensures all connected devices are up-to-date with security patches and firmware updates.

**Customer Benefit:**

Achieve the gold standard of guest experience for all their visitors, maximize sustainability and improve the productivity of the workforce and operations overall.



# Smart Hospitals

UC San Diego

Department of Radiation Medicine  
and Applied Services

PARTNER



**Industry:** Medical, Higher Education

**Business Problem:**

UCSD's goal is to improve efficiency and eliminate mistakes in the management of patients, staff and equipment. This can be achieved by implementing RFID tracking that will enable locational identification of all parties and equipment.

**Use Case:** Asset tracking, OTA updates to RFID infrastructure, Operational Analytics

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**How VMware Pulse helps:**

- Manage, monitor and secure the gateways that serve as the connection point for RFID tags,
- Provide over-the-air security patches in real time
- Help gain insight into the device lifecycle with real time operational analytics

**Customer Benefit:**

Improve efficiency and eliminate mistakes in the management of patients, staff and equipment and enable improvements in processing, resourcing and equipment usage.

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# Smart Surveillance

PARTNER

**SJSU** SAN JOSÉ STATE UNIVERSITY



**Industry:** Higher Education

**Business Problem:**

SJ State University wants to amp up security for students and staff for the university campus. The University plans to deploy V5 systems smart cameras that detect gunshots, smell sulphur, etc. So as to preemptively detect public disturbances like riots, shootings. etc. in real time

**Use Case:** Operational Analytics , Asset tracking, OTA Updates

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**How VMware Pulse helps:**

- Manage, monitor and secure the gateways that serve as the connection point for RFID tags,
- Provide over-the-air security patches in real time
- Help gain insight into the smart camera device lifecycle with real time operational analytics

**Customer Benefit:**

Make their campuses safer for staff and students and be able to vastly improve their emergency response.

*“Although V5 Systems wants to deploy their surveillance cameras on our campus we wouldn’t have any visibility into or management capability for the compute system in the cameras. And, we would like to have it.”*

*— Mike Cook, Director, CIO Organization,  
San Jose State University*



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# Smart Warehouse

**Industry:** Retail

**Business Problem:**

A major retailer wants to create efficiencies in their distribution and shipping processes in store by employing robots to reduce failure due to human error and fatigue. They are starting with managing robots for their distribution centers and retail stores where- one robot is used to scan shelves and identify stock outs and the other robot is used to find in store pick-ups for customers.

**Use Case:** Asset tracking

**How VMware Pulse helps:**

- Manage, monitor and secure all the deployed robots
- Provides a single point solution for all IoT projects across all business units

**Customer Benefit:**

Manage all their IoT use cases within a single pane of glass and have a consistent way of managing and monitoring all connected devices.



# The Internet of Trains

**Industry:** Transportation & Logistics

**Business Problem:**

A transportation company is looking to eliminate/reduce downtime by being able to maintain their equipment well

**Use Case:** Real-time device monitoring, OTA updates

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**How VMware Pulse helps:**

- Monitor IoT gateways and connected air compressors in real-time to determine if devices go offline.
- Deliver operating system and software updates to the gateways.

**Customer Benefit:**

In partnership with VMware, they will have a system to monitor air compressors and other equipment remotely and monitor these to create efficiencies and reduce costs

# The Branch of the Future

**Industry:** Financial

**Business Problem:**

Create the bank of the future and improve customer experience at 5600 retail banks, such as identifying customers as they arrive and anticipating services they might need. In addition, the branch manager has a series of tasks that must be performed each day before the bank can close (vault, teller drawers, etc.), but there is no reliable method to confirm each step was completed.

**Use Case:** Real-time device monitoring, OTA updates

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**How VMware Pulse helps:**

Remotely managing and monitoring the IoT infrastructure (gateways, sensors, beacons, cameras, etc.) to ensure devices are online and secure

**Customer Benefit:**

Pulse provides a single console for managing all the various IoT devices required to enable the bank of the future and ensure bank operations are not interrupted





# Smart Weather Forecasting

**Industry:** Public Sector (Federal)

**Business Problem:**

A Meteorology department wants to use IoT to deploy sensors to get richer data on weather and seasonal patterns to inform the general public as well as for research. The Bureau is deploying 500-1000 weather monitoring sites with multiple sensors that cannot be centrally managed or secured easily since they are in remote, unmanned sites.

**Use Case:** Single point management, monitoring/alerting, OTA updates

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**How VMware Pulse helps:**

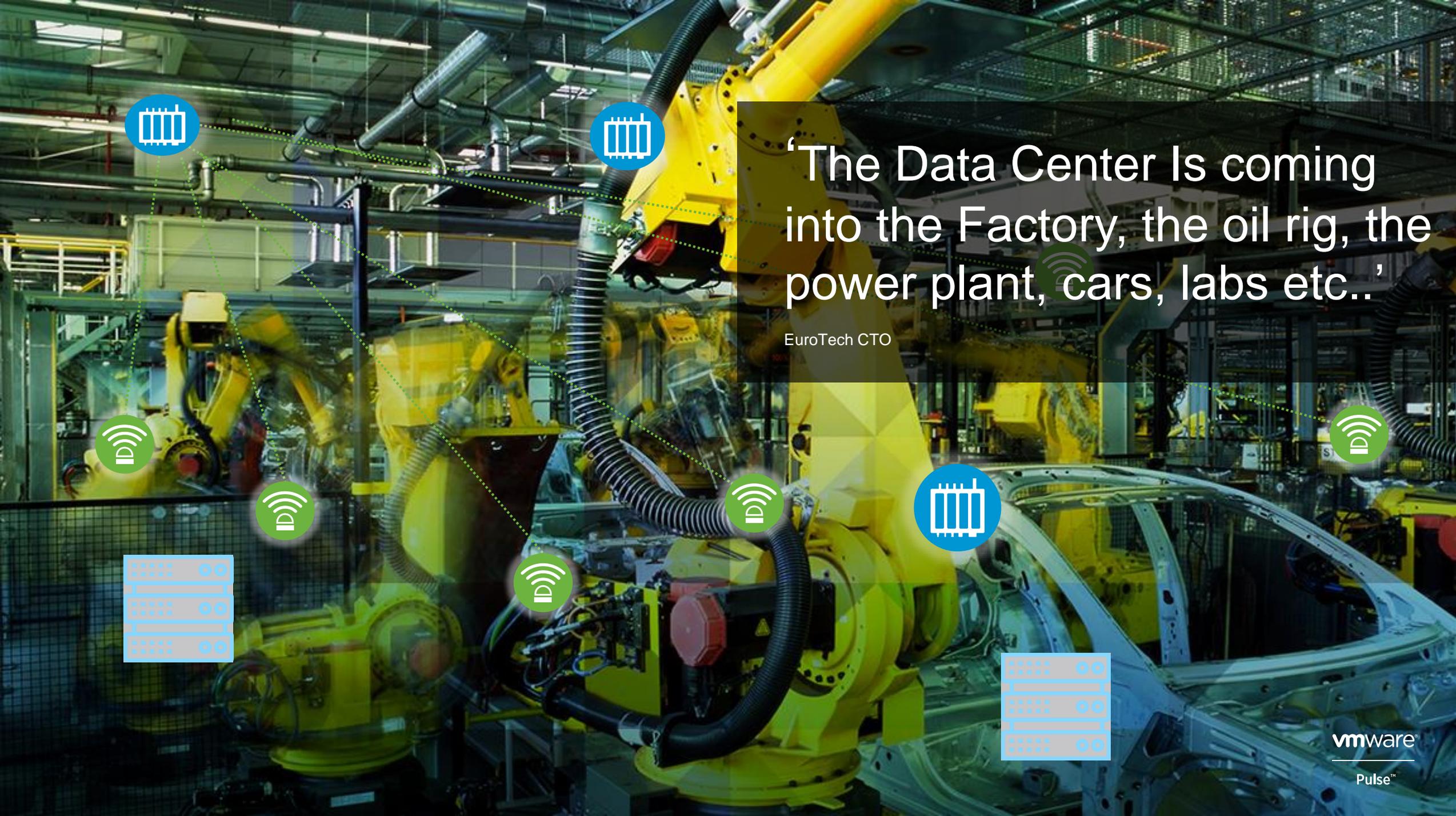
- Provides a secure central control point for gateway devices and respective sensors that exist across multiple weather monitoring sites
- Provide over-the-air security patches in real time
- Help gain insight into the smart camera device lifecycle with real time operational analytics

**Customer Benefit:**

Be able to successfully get standardized images and centralized data from all sensors to provide weather monitoring, forecasting, trending and alerting for the public, weather scientists and international partners

An aerial night view of a city skyline, likely Los Angeles, with numerous skyscrapers illuminated. The image is overlaid with a semi-transparent grid pattern. The sky transitions from a deep blue to a bright orange and yellow near the horizon, suggesting a sunset or sunrise. The city lights are a mix of warm yellow and cool blue.

# Project Fire



‘The Data Center Is coming into the Factory, the oil rig, the power plant, cars, labs etc..’

EuroTech CTO

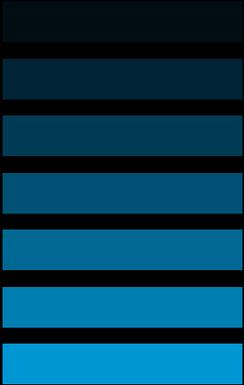
DATA CENTER/CLOUD



MILLIONS OF DEVICES

DECISION MAKING

DEEP LEARNING



REAL TIME

DATA CENTER/CLOUD



HUNDREDS OF DEVICES

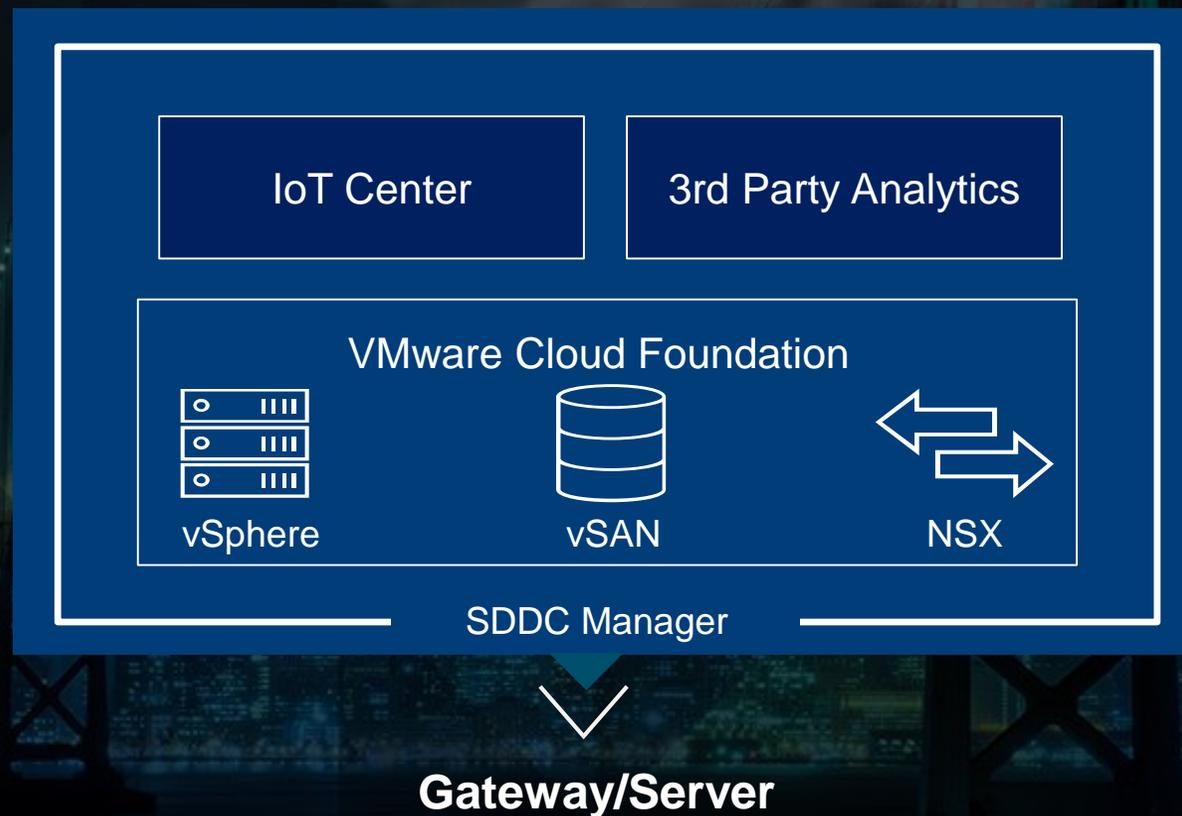


MILLIONS OF DEVICES



# VMware Pulse “Project Fire”

*A ready-to-deploy, pre-validated and pre-integrated solution that supports the new distributed IoT architecture by enabling analytics at the edge using technologies you use and trust.*



An aerial night view of a city skyline, likely San Francisco, with numerous skyscrapers illuminated. The image is overlaid with a semi-transparent grid pattern. The sky transitions from a deep blue to a warm orange and yellow near the horizon, suggesting a sunset or sunrise. The city lights are a mix of white, yellow, and blue.

# Partner Ecosystem

# Delivering Complete Solutions with Our Ecosystem of Partners

Machine/Thing/  
OEM Manufacturer

Gateway/  
Edge System  
Manufacturer

Business Apps/  
Analytics Vendors

IoT Platform

SISO



Examples:



Manage  
Broader

Operate  
Smarter

vmware®  
Pulse™

Protect  
Better

Innovate  
Faster

Temp Min  
Temp Max  
Temp Ambient

# Takeaways



VMware is entering IoT Space and leveraging **core expertise in infrastructure** to IoT devices



VMware's goal is to **partner with IoT Ecosystem** to deliver end to end solutions



VMware's goal is to **deliver new types of on-prem compute needs for IoT** closer to the edge

# Thank You



## Learn More



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