



vmware®

Pulse™

Meeting at the Edge

VMware Internet of Things...
Are you In Control of Your IoT?

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CTO | Internet of Things

Disclaimer

- This presentation may contain product features that are currently under development.
- This overview of new technology represents no commitment from VMware to deliver these features in any generally available product.
- Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.
- Technical feasibility and market demand will affect final delivery.
- Pricing and packaging for any new technologies or features discussed or presented have not been determined.

The Internet of Things is **Taking Off**



The Shift to the **Edge**

Mainframe



Centralized
1960-1970

Client-Server



Distributed
1980-2000

Mobile-Cloud



Centralized
2005-2020

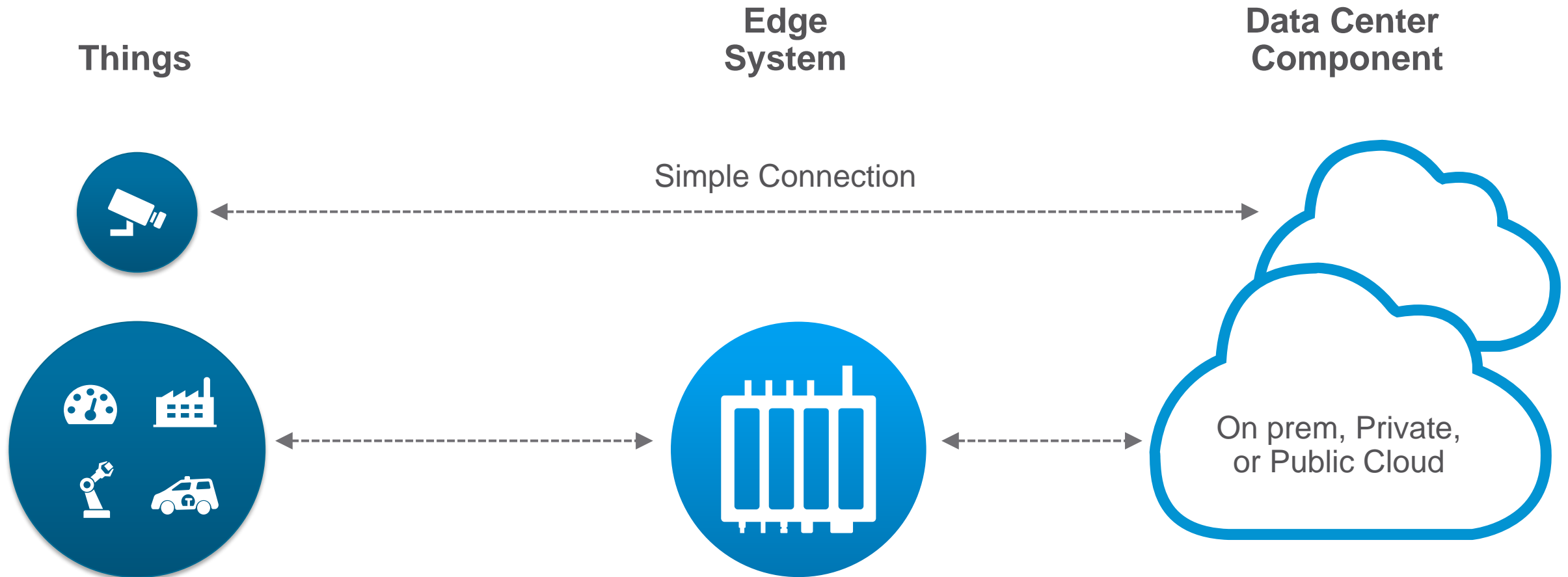
Edge Intelligence



Distributed
2020-

Architecting an IoT Solution

An IoT architecture looks simple but is exponentially complicated by diversity, scale and bi-directionality



3-Tier Architecture

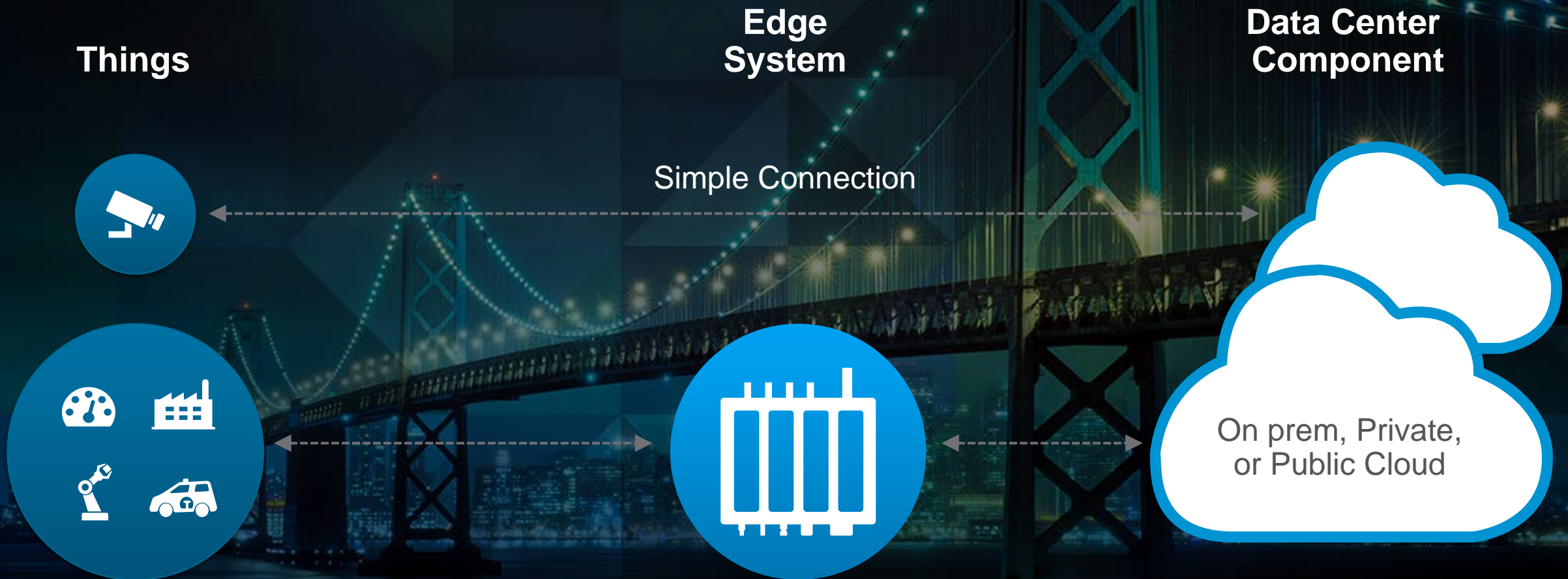
Gateway / Edge System Overview

- ***What is a gateway / edge system?***
 - An Internet of Things (IoT) gateway is a device which serves as the connection point between IoT devices and the cloud. This gateway can be a hardware appliance or virtual.¹
- ***Why are gateways important?***
 - Decoupling and control point between sensitive IoT devices and the cloud or data center.
 - Used to connect "simple" devices with no operating systems, like sensors, to the network.

¹ Source: <http://whatis.techtarget.com/definition/IoT-gateway>

Architecting an IoT Solution

- An IoT architecture looks simple but is exponentially complicated by diversity, scale and bi-directionality

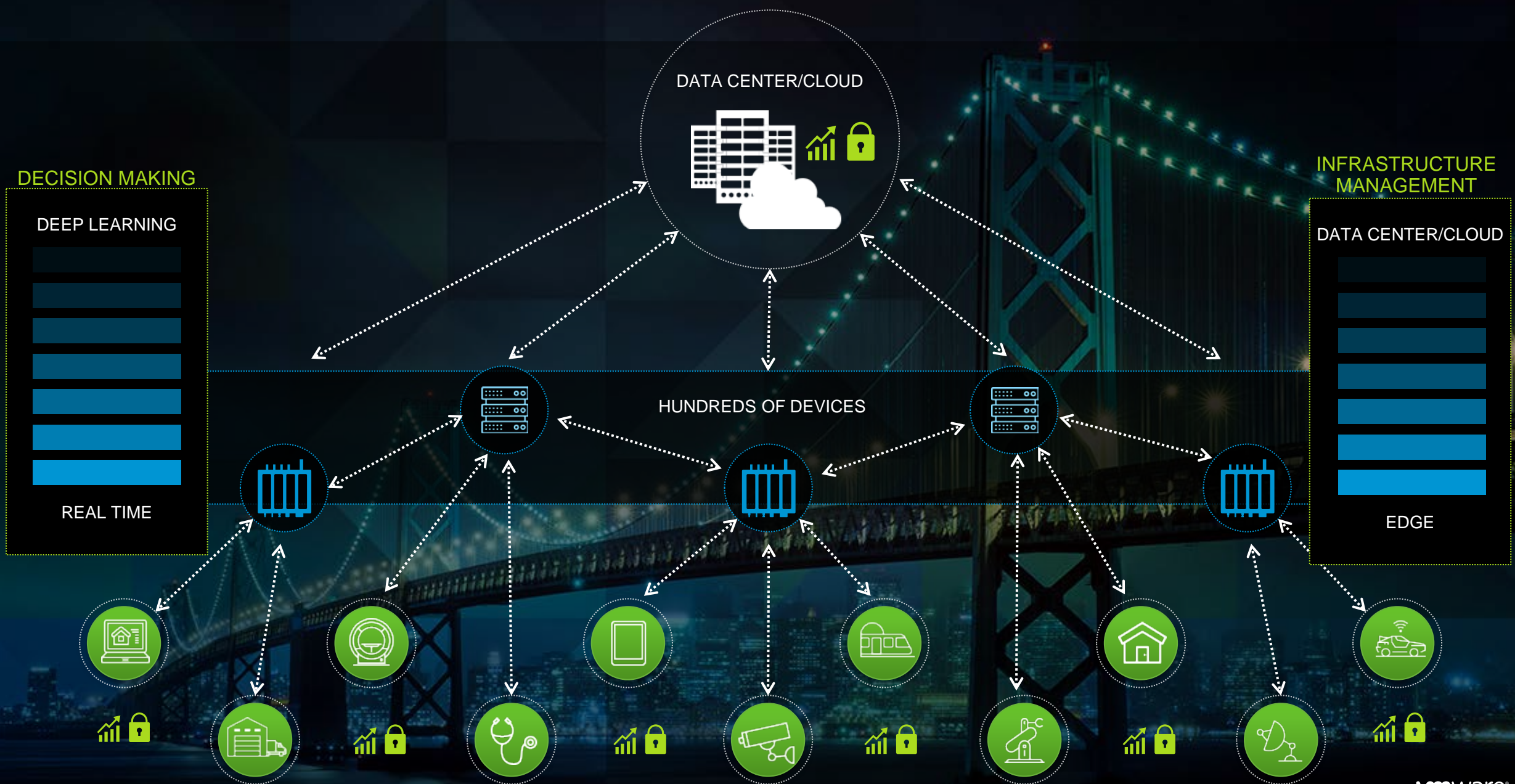


3-Tier Architecture

Gateway / Edge System Overview

- ***What is a gateway / edge system?***
 - An Internet of Things (IoT) gateway is a device which serves as the connection point between IoT devices and the cloud. This gateway can be a hardware appliance or virtual
 - Terminates all '7 layers of OSI comms model'
- ***Why are gateways important?***
 - Decoupling and control point between sensitive IoT devices and the cloud or data center
 - Decouples 'Expected Lifetimes'
 - Used to connect "simple" devices with no operating systems, like sensors, to the network
 - Stand-alone or integrated





1. SECURE/MANAGE/MONITOR THE EDGE



Take Control of the Edge with VMware Pulse

VMware Pulse IoT Center 1.0 ... Generally Available

INSIGHT PLANE



INFRASTRUCTURE PLANE

Pulse IoT Center



LIOTA



LIOTA



LIOTA

Agent
(LIOTA)



Console
(On Premise/ Cloud)



OT User



IT User

ONBOARD >

MONITOR >

MANAGE >

SECURE

Security Requirements for Edge IoT Systems





Powering the
Connected Car



Keeping the
Magic Going



Smart Hospitals



Smart Surveillance



Smart Warehouse



The Internet
of Trains



The Branch
of the Future



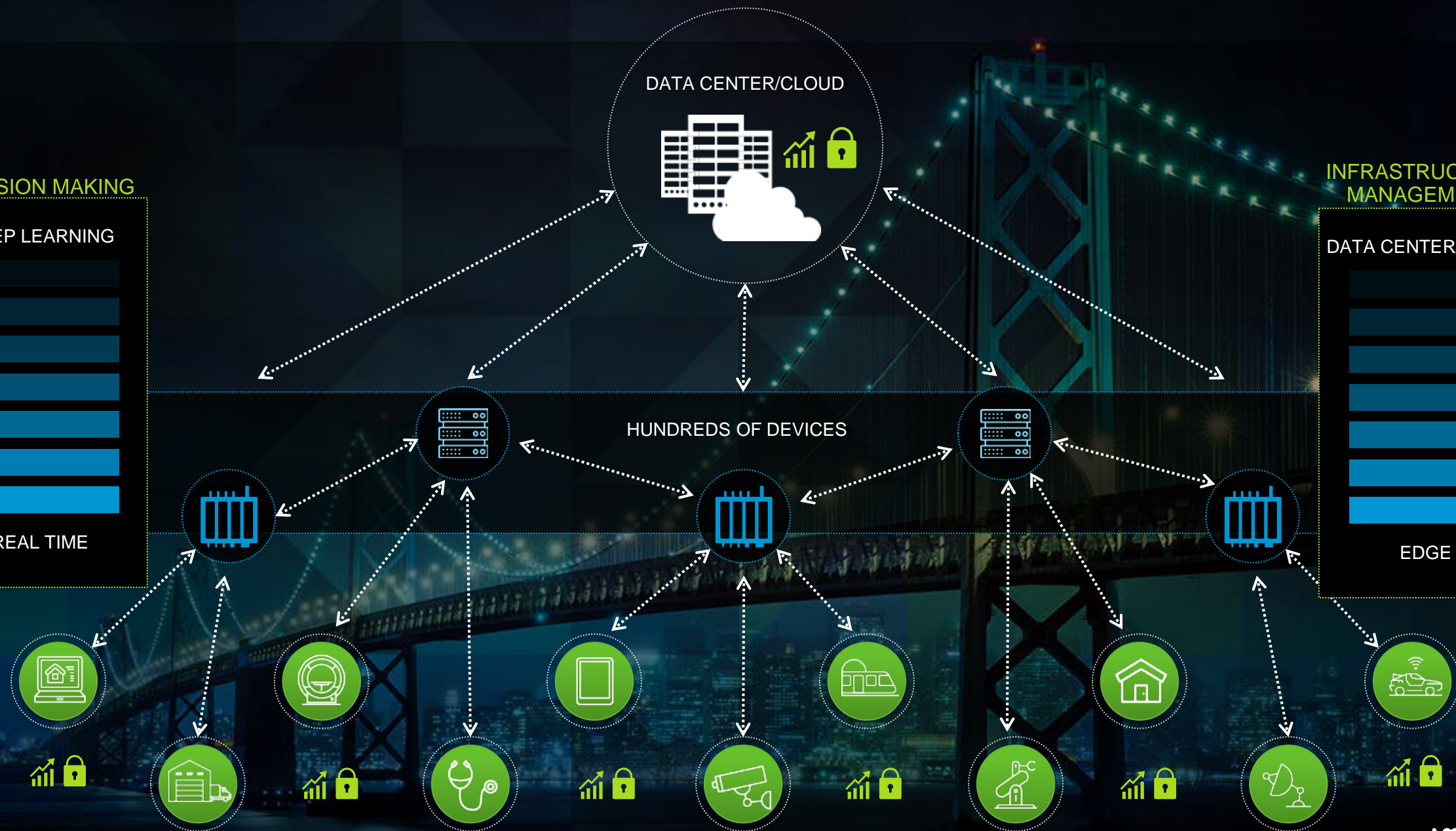
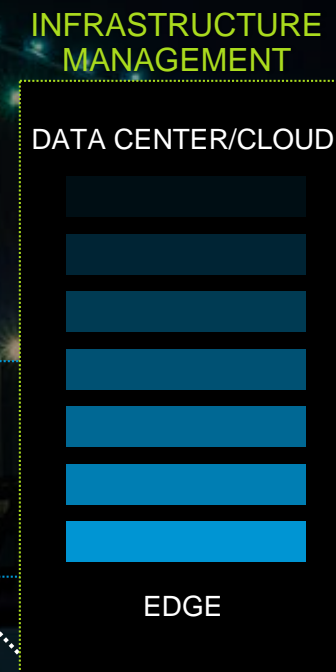
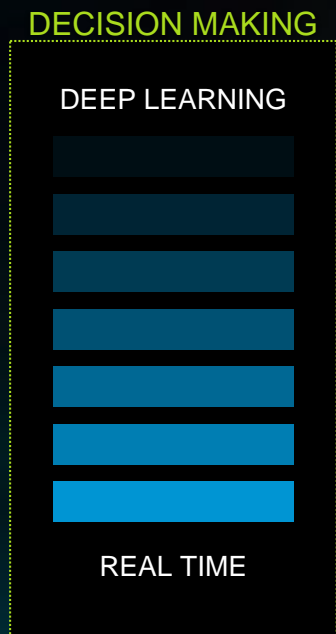
Smart Weather
Forecasting



Smart Cities

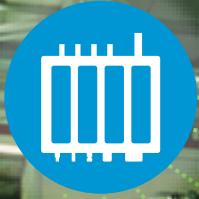
vmware

Pulse™



1. SECURE/MANAGE/MONITOR THE EDGE

2. HCI CLOUD to EDGE



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

EuroTech CTO



Time, Security and Cost are Driving Infrastructure Requirements

Time



Shorten time to value



Easy to buy, configure, manage and monitor

Scalable



POC to production deployment in scale

Efficient 'Edge'
Infrastructure



Minimize latency and bandwidth issues

Security



Greater security



Compliance and data privacy

Easy software update



OT personnel, not IT

Cost



Less Storage Costs



Send to cloud only the right data for deep learning

Optimize network costs



Architecture distributed to optimize performance and cost

Minimize local maintenance



Manage remotely and minimize need to access Edge

Project FIRE

Hyperconvergence At the Edge

Roadmap Only – Subject to Change

Improved Responsiveness

Edge computing enables richer media experiences to create enhanced AR experiences

Reduce Amount of Hardware Needed

Data warehousing is a \$50 billion a year business, but with HCI, we'll be able to reduce costs to a small fraction of that.

Ensure Business Continuity

- Low bandwidth or inconsistent connectivity.
- Cloud is centralized architecture, Edge is distributed architecture

Improved Security

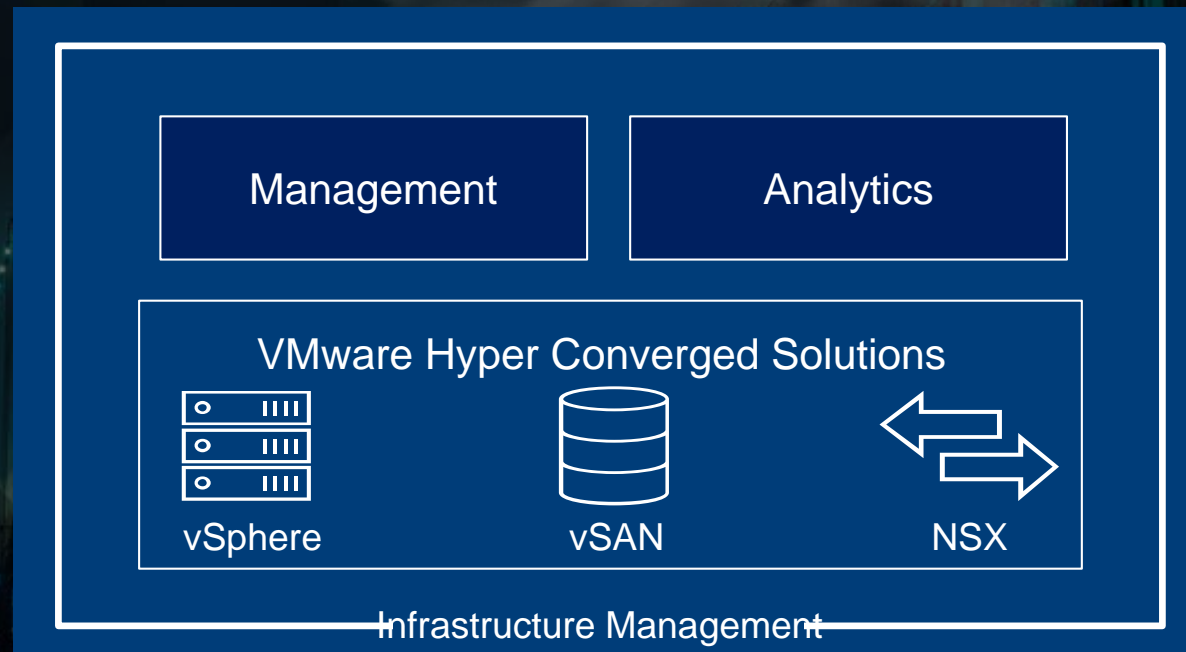
Keep your data on your premises to reduce risk and have complete visibility and control over your information

Data Privacy and Governance

Keep certain data local to maintain privacy as well as promote compliance with regulation.

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.



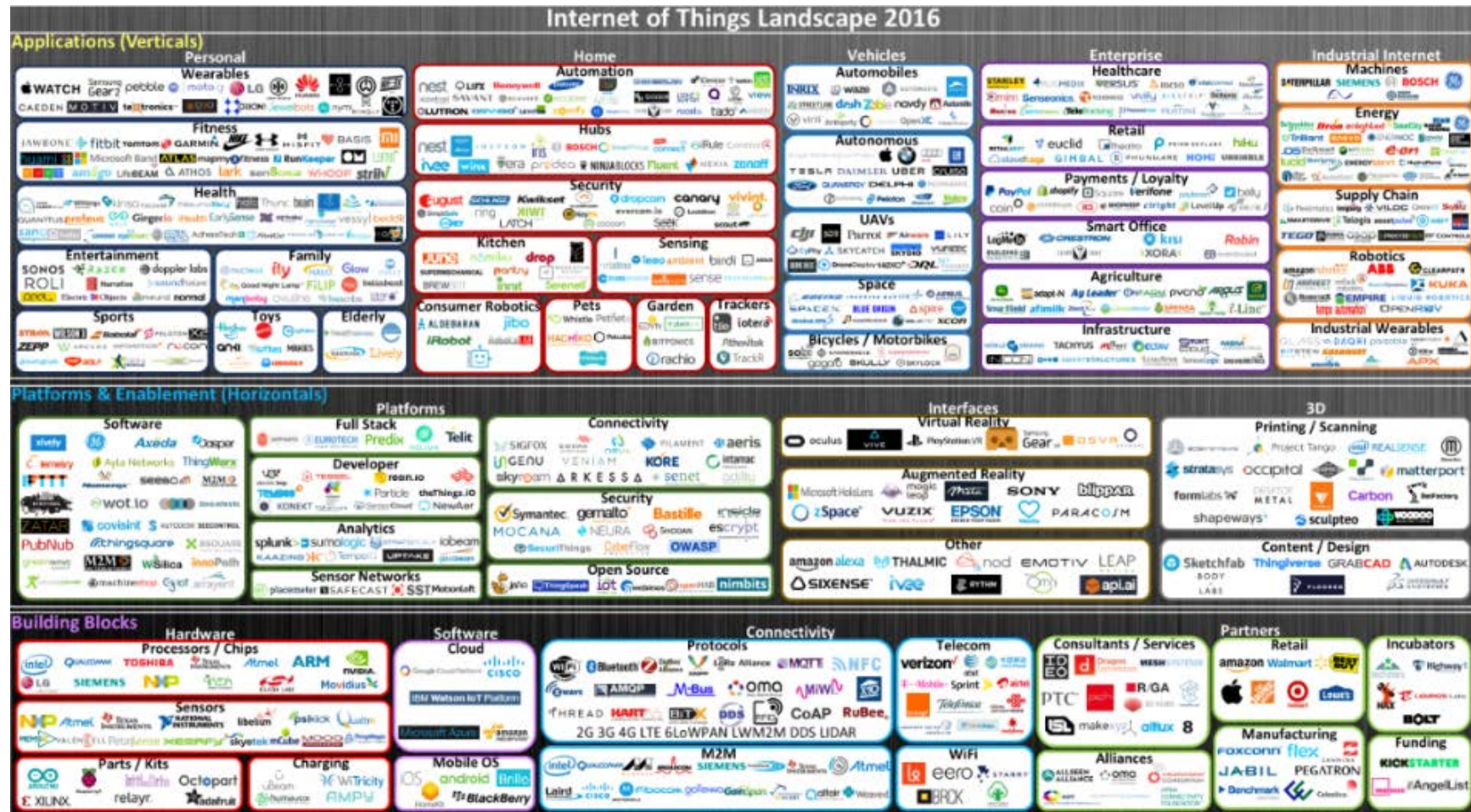
Gateway/Server



Project Introduction

January 2018

Today's Fragmented IoT Ecosystem



Bridging Standards with An Ecosystem of Applications

Any Combination of Standards



Interoperable Edge Applications



Choice of Backend Applications



The End Game

DECISION MAKING MGNT

DEEP LEARNING



REAL TIME

DATA CENTER/CLOUD



INFRASTRUCTURE
MGNT

DATA CENTER/CLOUD



EDGE

MILLIONS OF DEVICES



1. SECURE/MANAGE/MONITOR THE EDGE

2. HCI CLOUD to EDGE

2. VIRTUALIZE THE EDGE/THINGS

Virtualization at the Edge

Virtualized/Software Defined Gateways

Build a unified platform on gateways in IoT systems, to provide software defined edge computing with isolation, enhanced security and multiple tenancy.

Project Asteroid



Q&A

