# Internet of Everything

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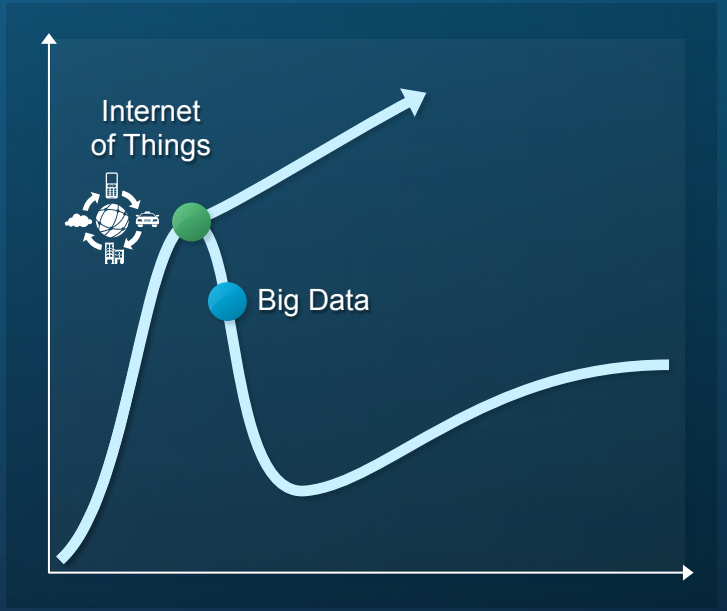
It’s Big  It’s Different  It’s Now!

# From Hype to Reality…. “Up and to the Right”

Forbes

“It’s Official: The Internet of Things Takes Over Big Data As The Most Hyped Technology.”

8/18/2014

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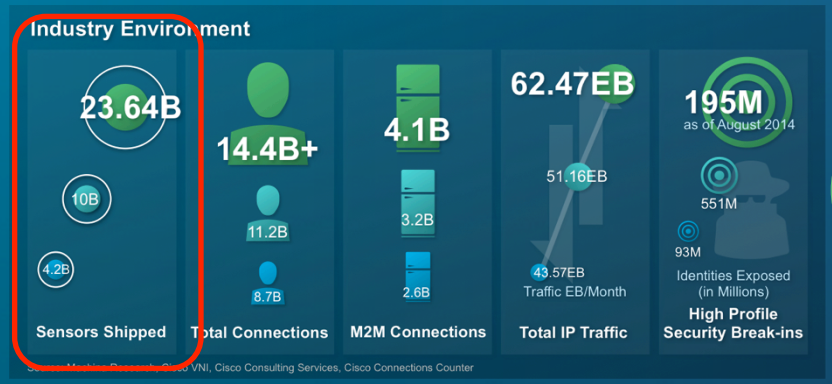
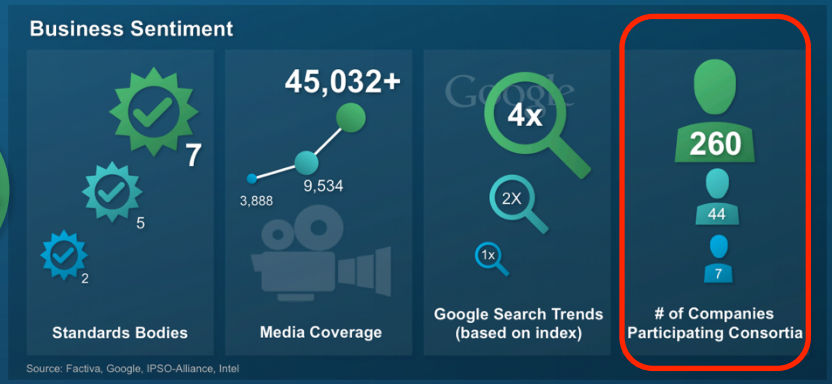
# IoT Acceleration Dashboard
## 2012-2014




2014

2013

2012

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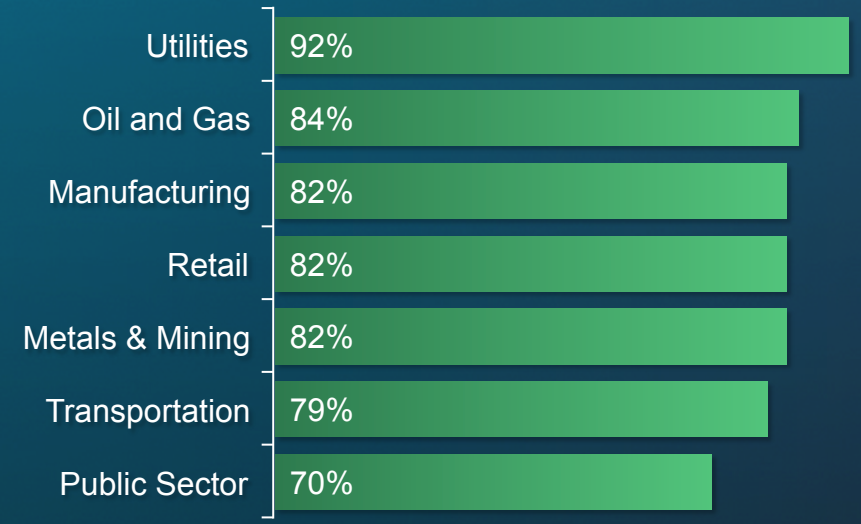
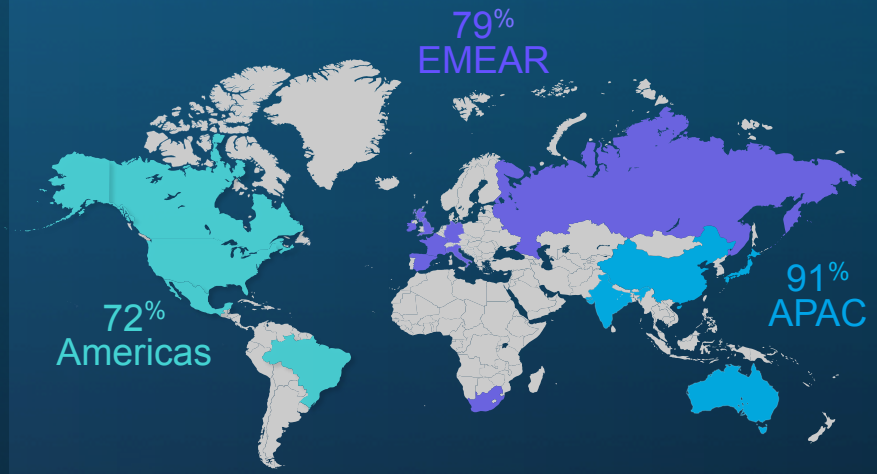
# Awareness of the IoT Opportunity Is Pervasive…

Are “very aware” or “somewhat aware” of IoT




**88% IT Execs / 75% LoB**

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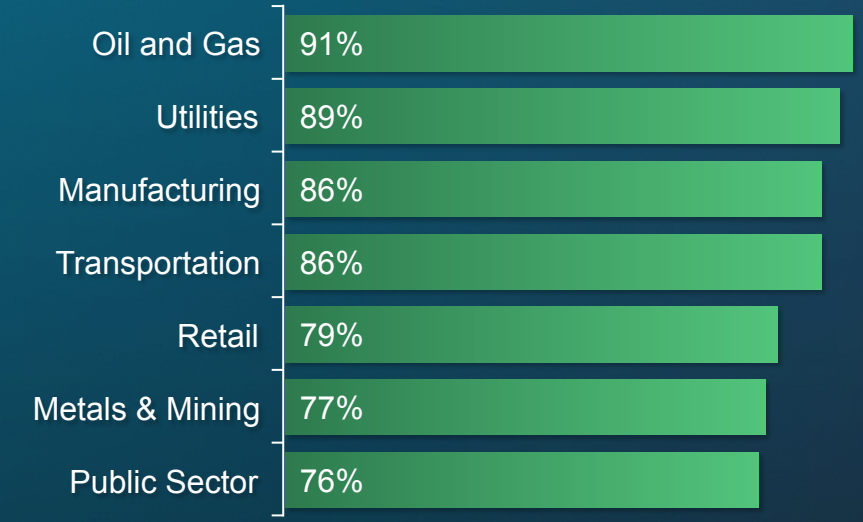
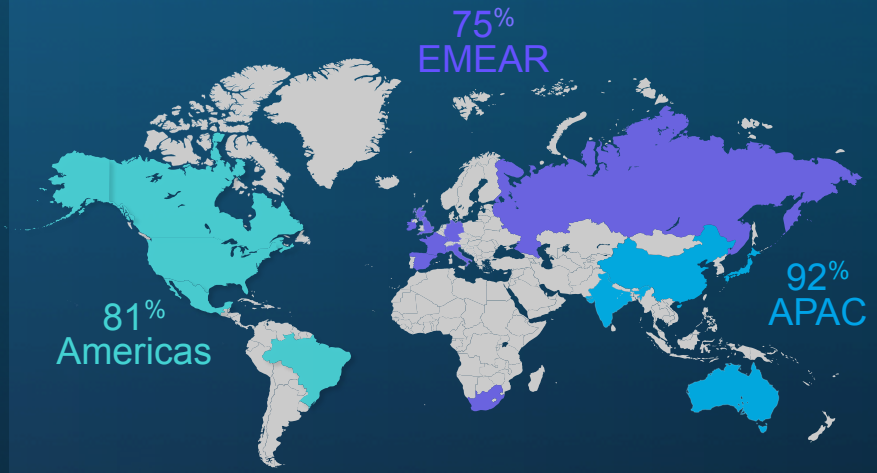
# …and Organizations Are Going To Invest

Investments to increase “somewhat” or “significantly” over 3 years




**82% IT Execs / 74% LoB**

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# Cisco IoE Position and Leadership

## Network Platform

Cloud

Intelligent Network

Data Center

Fog Computing

## Technology Portfolio

Connectivity

Security

Management

App Enablement

## Solution Portfolio

Manufacturing

Utilities

Transportation

Smart Cities

Sport Venues

## Innovation Centers

London, UK

Rio de Janeiro, BR

Songdo, KR

Toronto, CAN

Barcelona, SP

## Investment Fund

$250 M

Alchemist Accel.

Ayla Networks

EVRYTHNG

## Global Partner Ecosystem

Rockwell

Schneider

ITRON

AGT

Emerson

Honeywell

## Standards Development

IEEE

IETF

3GPP

IIC

Wi-SUN

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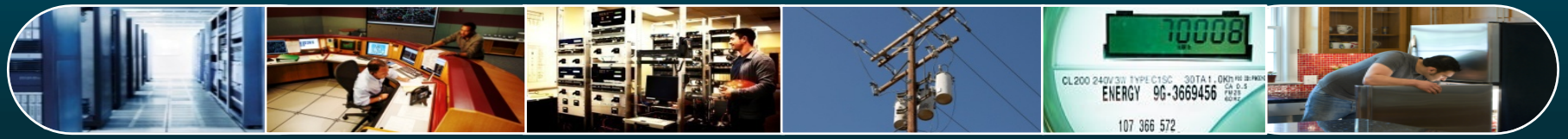
# Our Definition

**Consists of networks of sensors attached to objects and communications devices, providing data that can be analyzed and used to initiate automated actions**



# IoE: Creating Value by Connecting the Unconnected

## Networked Connection of People, Process, Data, and Things

**People**

Connecting People in More Relevant, Valuable Ways

**Process**

Delivering the Right Information to the Right Person (or Machine) at the Right Time

**Internet of Things**

Connecting Physical Devices and Objects to the Internet and Each Other for Intelligent Decision Making

**Data**

Using Data for Decision Making

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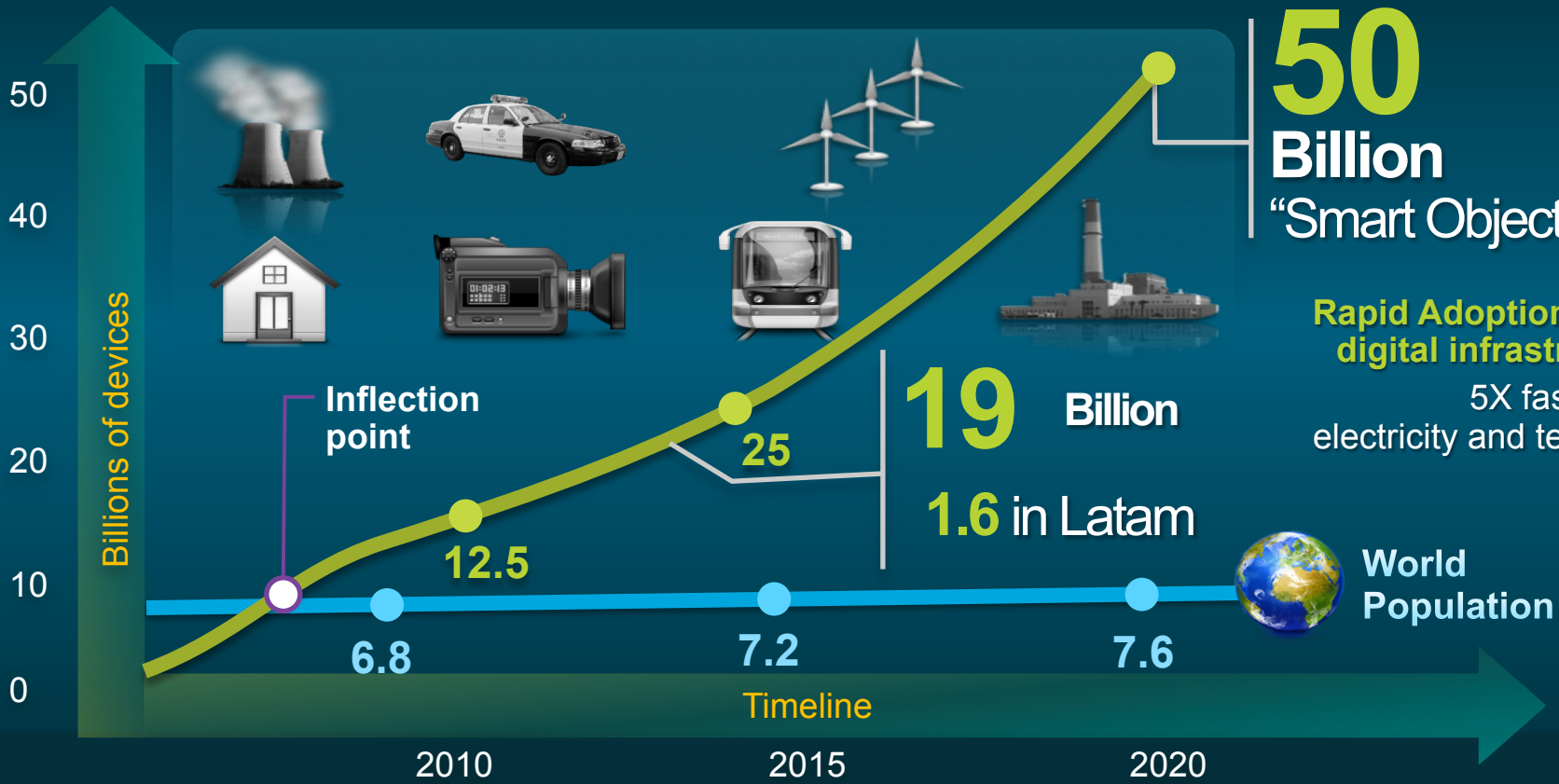
# Increasingly Everything will be Connected to Everything

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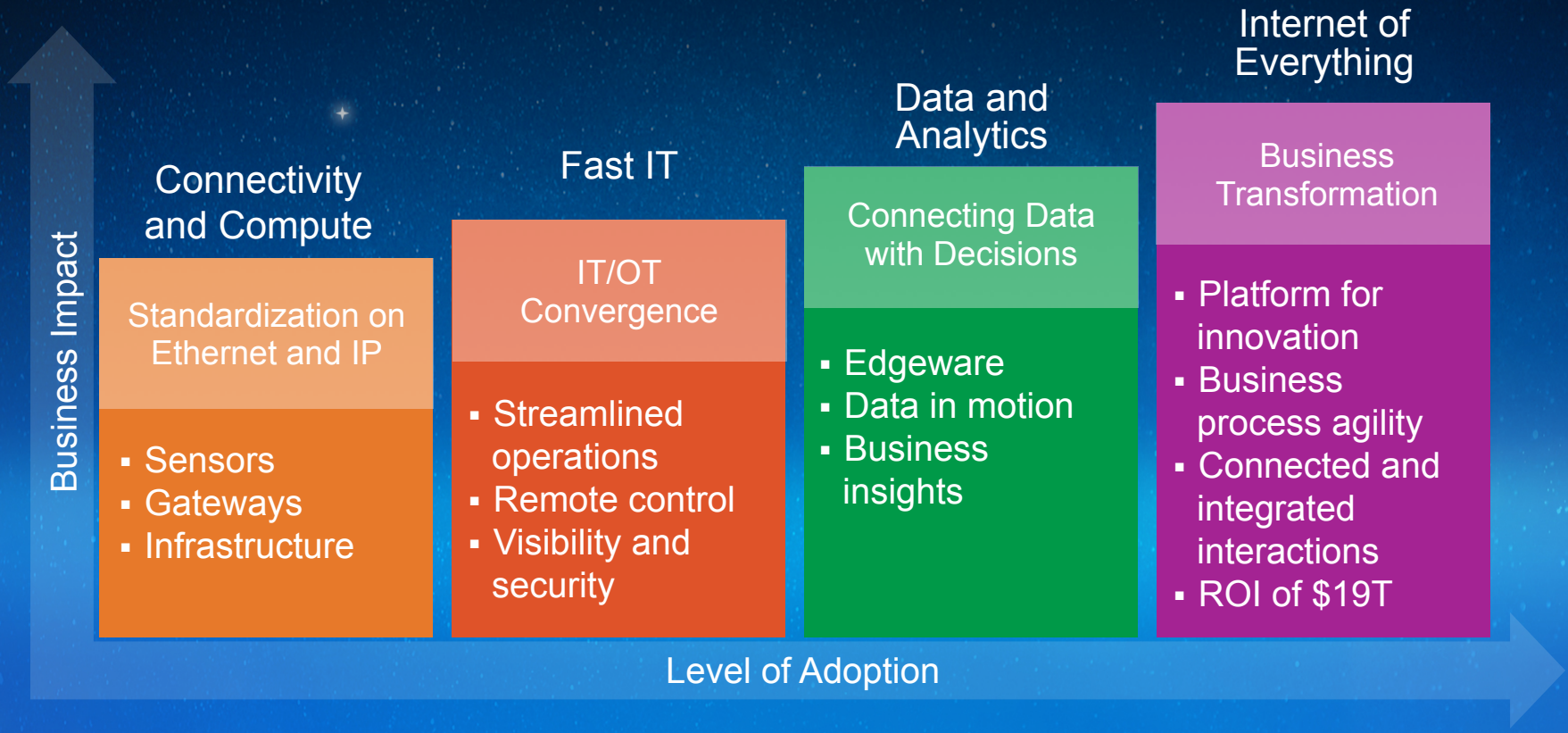
# IoE Journey to Value



# Cisco's Leadership

## Key Players in the Market

### Internet of Everything (IoE)[1]

### Internet of Things (IoT) [2]

### Today's technology trends[3]

[1] Cisco Strategic Marketing Organization [2] Postscapes [3] Gartner, Through the Nexus Looking Glass and Beyond: Microsoft, Google and Apple, David Mitchell Smith, November 2013

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# Smart Cities

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# Cities Have Traditionally Addressed These Issues in Silos

## Every city department makes investments independently resulting in:

- No sharing of infrastructure costs and IT resources
- No sharing of intelligence/information, e.g., video feeds, data from sensors, etc.
- Waste and duplication of investment and effort
- Difficulty in scaling infrastructure management

**Traffic management**

**Public safety**

**City lighting**

**Pollution/ environment**

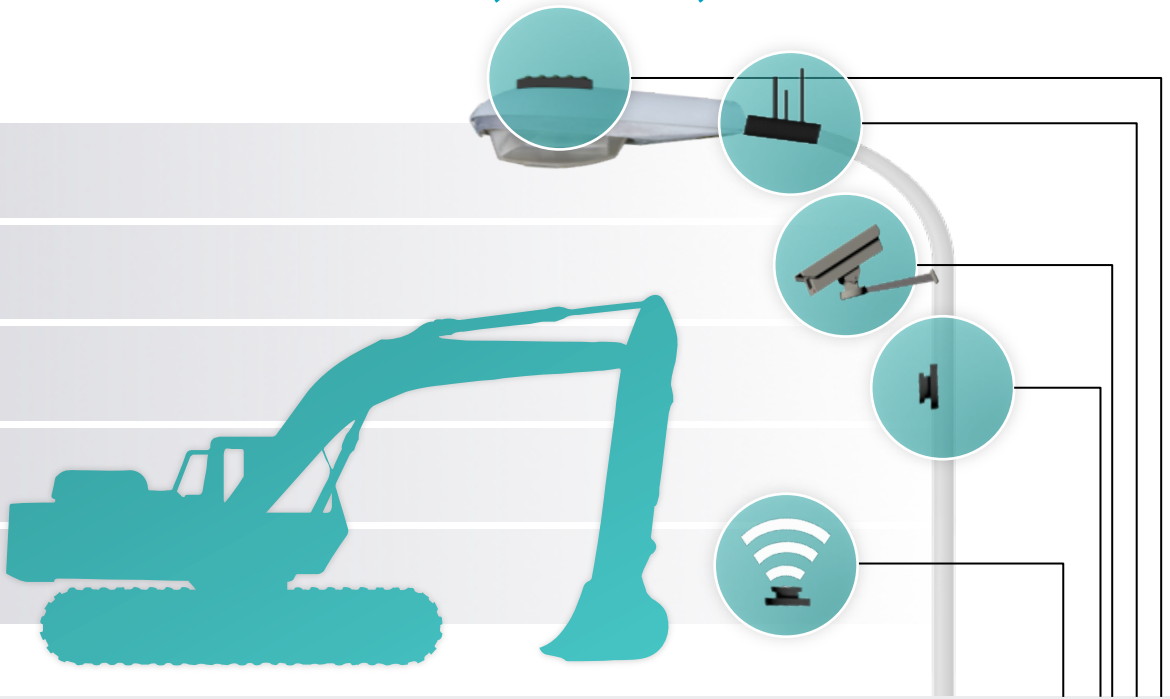
**Waste management**

**Parking optimisation**

This fragmented approach is inefficient, has limited effectiveness, and is not economical

# Incremental Decision Making Leads to Duplicate Investment in Infrastructure, Labor, Network

- Individual Trenching
- Surveillance Camera
- Traffic Analytics
- Parking System
- Networks and Antennas



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Transportation

Utilities

# Convergence

Safety and Security

Environment

Cities need a CONVERGED approach that breaks these silos that lowers TCO and unlocks new use cases

# What do we mean by ‘Convergence’ for Cities

## Unified Management

### 1 Smart+Connected City **Parking**

Give citizens live parking availability information to reduce circling and congestion

### 2 Smart+Connected City **Traffic**

Monitor and manage traffic incidents to reduce congestion and improve livability

### 3 Smart+Connected City **Safety & Security**

Automatically detect security incidents, shorten response time, and analyze data to reduce crime

### 4 Smart+Connected City **Location Services**

Provide view of people flow data to aid planning and leverage location data for contextual content and advertising

### 5 Smart+Connected City **Street Lighting**

Manage street lighting to reduce energy and maintenance costs

## Common Data & Data Models

## Shared Network

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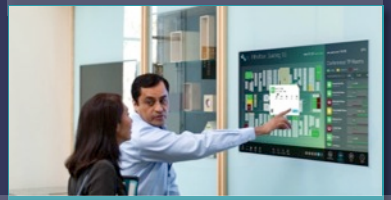
# Solution & Use Cases Overview

| | Smart+Connected Spaces | S+C City Parking | S+C City Traffic | S+C City Operations Center |
|---|---|---|---|---|
| |  | | | |
| Business Outcome | **Productivity Improvement** | **Parking Revenues** | **Citizen Mobility** | **Control Room Optimization** |
| Key Capabilities | **Workplace Transformation**<br>▪ Room & Workstation Scheduling<br>▪ Integration with CTG portfolio<br>▪ Integration with EN | **Parking Asset Value Enhancement**<br>▪ Live Parking availability information for citizens<br>▪ Live violation reporting for enforcement officers<br>▪ Analytics for city planners | **Traffic Incident Management**<br>▪ Live Detection of traffic incidents<br>▪ Verification of incident type for response<br>▪ Analytics for planners | **Unified Management of City Infrastructure**<br>▪ Integrated Control<br>▪ Screen Layout Formation<br>▪ Input Collection<br>▪ Transmission/Distribution<br>▪ Multi-Display Operations |
| Solution BOM | ▪ SCS SKUs<br>▪ CUCM, CUPS, Jabber,<br>▪ Collab. Endpoints, TMS, MCU<br>▪ IEP, IEM, Edge 340<br>▪ UCS (B/C)<br>▪ MSE | ▪ SCS SKUs<br>▪ Video and video infrastructure<br>▪ Connected Grid router<br>▪ City Wi-Fi architecture<br>▪ Partner sensor, gateway & apps<br>▪ Application Integration | ▪ Video and video infrastructure<br>▪ Ruggedized switching<br>▪ UCS<br>▪ Partner sensor, gateway and applications, analytics engine | ▪ SCS SKUs<br>▪ Cisco Cameras, UCS, VSM, Video Storage & Collaboration<br>▪ Partner sensor, gateway and applications, analytics engine |

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# Public Safety

# Solution Overview

| | Connected Law Enforcement | Connected Schools | Connected Border | Connected Defense |
|---|---|---|---|---|
| | | | | |
| Business Outcome | **Operational Efficiency** | **Campus Security** | **Operational Efficiency** | **Operational Efficiency** |
| Key Capabilities | **Real-Time Situational Awareness**<br>▪ First Net Compatibility<br>▪ Streaming Video<br>▪ Seamless Connection of disparate radios | **Emergency Response**<br>▪ CCTV<br>▪ Audio Sensors<br>▪ Analytics | **Distributed Intelligence**<br>▪ Streaming Video<br>▪ Seamless Connection of disparate radios<br>▪ Analytics<br>▪ CCTV<br>▪ Application Integration | **Real-Time Situational Awareness**<br>▪ Operational Picture<br>▪ Seamless Connection of disparate radios<br>▪ Analytics<br>▪ Surveillance |
| Solution BOM | ▪ Ruggedized Camera<br>▪ 5915 and 5921<br>▪ UCSe SFF compute<br>▪ WiFi, LTE & Adhoc radios<br>▪ VSM, IPICS | ▪ Ruggedized Camera<br>▪ VSM, IPICS<br>▪ WiFi | ▪ Ruggedized Camera<br>▪ 5915 and 5921<br>▪ UCSe SFF compute<br>▪ WiFi, LTE & Adhoc radios<br>▪ VSM, IPICS<br>▪ Application Integration | ▪ Ruggedized Camera<br>▪ 5915 and 5921<br>▪ UCSe SFF compute<br>▪ WiFi, LTE & Adhoc radios<br>▪ VSM, IPICS |

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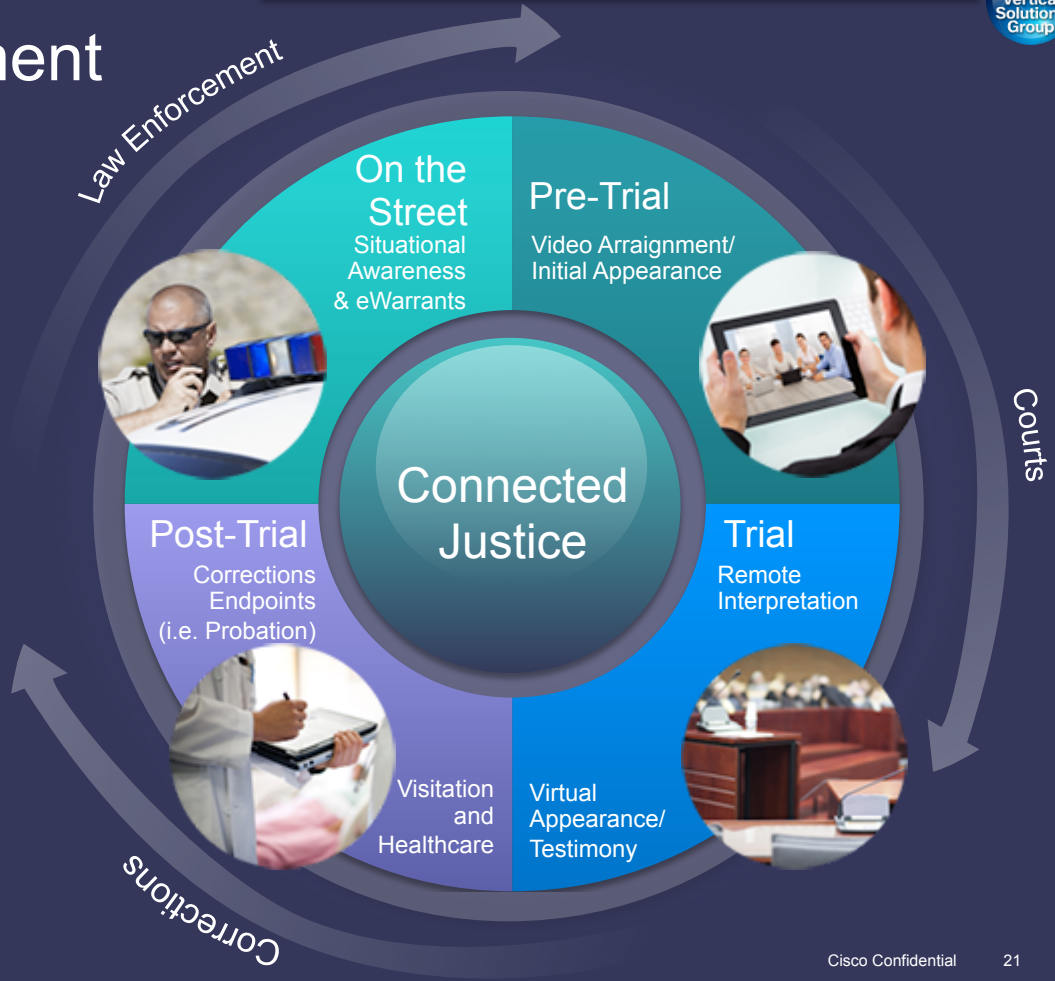
# Connected Law Enforcement

- Mobile Portion of Connected Justice
- Key Growth Area for Police
- Technology Used to Increase Efficiency

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# Healthcare Solutions

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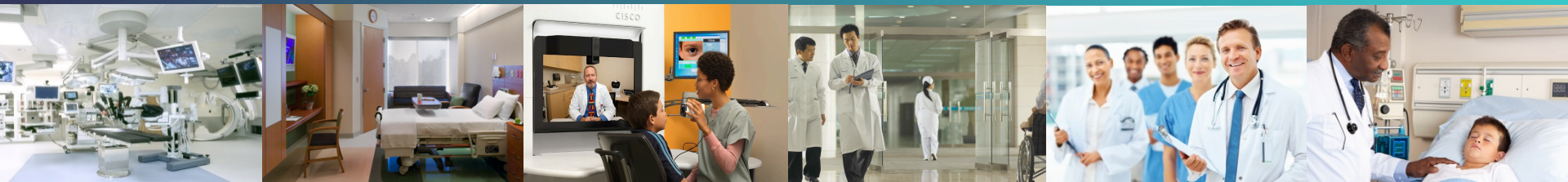
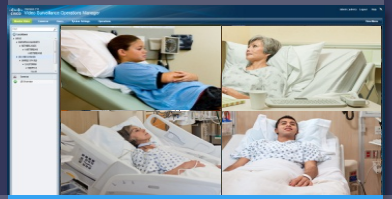
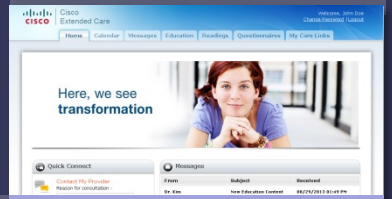


# Solution & Use Cases Overview

| | Mobility & Security | Patient Media Experience | Virtual Patient Observation | Extended Care/ HealthPresence |
|---|---|---|---|---|
| | | |  |  |
| Business Outcome | **Secure access the resources clinicians need at the point of care** | **Improved and differentiated patient experience** | Increased efficiency and productivity | New care delivery models and greater patient engagement |
| Key Capabilities | Caregiver Enablement<br>▪ Access to care information anywhere on any device (hospital-owned or personal)<br>▪ Role-based secure access for mobile devices | Patient Education and Entertainment<br>▪ Kiosk/signage in public areas for maps and information<br>▪ Health education on devices in exam rooms<br>▪ In-room entertainment | Remote Monitoring of Patients<br>▪ Virtually monitor multiple patients from a central location | **Remote Patient Visits and Engagement**<br>▪ Provide quality care to remote patients<br>▪ Access roader network of specialists<br>▪ Monitor patient wellness at home |
| Solution BOM | ▪ Cisco WLAN Controller/APs<br>▪ Identity Services Engine<br>▪ MDM Integration<br>▪ PRIME management<br>▪ Mobility Services Engine<br>▪ Services for Connected Healh<br>▪ Mobility Services Platform<br>▪ Cisco Integration Platform | ▪ Cisco CUCM<br>▪ Cisco VSOM<br>▪ Cisco IEC 4600 & WLAN/CMX<br>▪ Patient Media Experience SW<br>▪ Video phones & cameras<br>▪ Services for Connected Health<br>▪ Mobility Services Platform | ▪ Cisco CUCM and VSOM,<br>▪ VSOM Software and partners<br>▪ Video phones<br>▪ Cisco IP Cameras & Encoder<br>▪ Observation Camera<br>▪ Services for Connected Health | ▪ Cisco CUCM<br>▪ Cisco CHP/ExC, Software & partners<br>▪ Video phones, IP cameras and encoder<br>▪ 3rd party medical devices<br>▪ Services for Connected Health |

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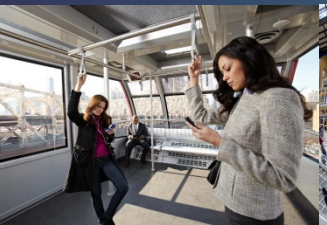
# Transportation



# Solution Overview

| | Connected Train | Connected Trackside | Connected Station | Connected Roadway |
|---|---|---|---|---|
| | | | | |
| Business Outcome | **Increased Ridership** | **Safety Mandate** | **Asset Utilization** | **Safety & Mobility** |
| Key Capabilities | ▪ FOG/Sensors<br>▪ Identity<br>▪ Mobility<br>▪ WAN/Access<br>▪ Security Cyber & Physical | ▪ FOG/Sensors<br>▪ Identity<br>▪ Mobility<br>▪ Collaboration<br>▪ Data Center<br>▪ WAN/Access<br>▪ Cloud<br>▪ Security Cyber & Physical | ▪ FOG/Sensors<br>▪ Identity<br>▪ Collaboration<br>▪ Data Center<br>▪ WAN/Access<br>▪ Cloud<br>▪ Security Cyber & Physical | ▪ FOG/Sensors<br>▪ Identity<br>▪ Mobility<br>▪ Collaboration<br>▪ Data Center<br>▪ WAN/Access<br>▪ Cloud<br>▪ Security Cyber & Physical |
| Solution BOM | • AP 3702E,<br>• AP 3602E<br>• IE2000<br>• IE 2000-IP67<br>• ISR 819H<br>• ISR 819H LTE<br>• Transair LMAS-2450*<br>• IP6050<br>• Nexcom VTS-7120<br>• VMWare ESXi 5.0 | • IE2000<br>• AP1552<br>• WLC5508<br>• ASR1006,<br>• ASR1006<br>• ASR9000<br>• Transair - LMC<br>• WMS, SDR<br>• Prime Infrastructure<br>• Cisco QPS (Broadhop)<br>• IP6050<br>• Cisco UCS , VSM 7.5 | • AP 3702E,<br>• AP 3602E<br>• IE2000<br>• IE 2000-67<br>• AP1552<br>• WLC5508<br>• ASR1006,<br>• Remote Expert<br>• ASR9000<br>• Prime Infrastructure<br>• Cisco QPS (Broadhop)<br>• IP6050<br>• Cisco UCS , VSM 7.5 | • AP 3702E,<br>• AP 3602E<br>• P1: IE2000<br>• IE 2000-67<br>• ISR 819H<br>• ISR 819H LTE<br>• AP1552<br>• WLC5508<br>• ASR1006,<br>• ASR1006<br>• ASR9000<br>• Prime Infrastructure<br>• Cisco QPS (Broadhop)<br>• IP6050<br>• Cisco UCS , VSM 7.5 |

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# Manufacturing

# Solution & Use Cases Overview

| | Connected Factory Automation | Connected Factory Energy Mgmt | Connected Factory Wireless | Connected Factory Security |
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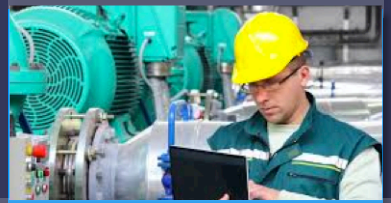
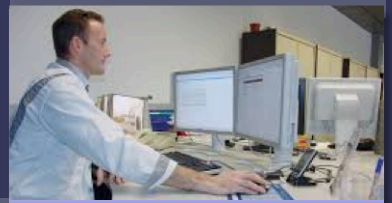
| | | |  |  |
| Business Outcome | **Production Efficiency** | **Energy Efficiency** | **Cost Reduction** | **Secure Production Access** |
| Key Capabilities | **Factory Automation**<br>▪ Rapid Fault Isolation<br>▪ Flexible manufacturing<br>▪ Converged NWs (TCO)<br>▪ REP (resiliency)<br>▪ Zero touch deploy<br>▪ App and Data Integration | **Energy Management**<br>▪ Energywise<br>▪ FAN (Field area NW) for 900MHz wireless mesh | **Factory Mobility**<br>▪ Mobile Controls visibility<br>▪ Wireless tooling<br>▪ Wireless I/O<br>▪ Asset Management<br>▪ Mobile video<br>▪ Mobile Applications | **Factory Security**<br>▪ Identity Services<br>▪ Physical Security<br>▪ In-line machine & controls security<br>▪ Secure Remote Access<br>▪ Data/ App Service Access |
| Solution BOM | ▪ IE2K, IE3K, IE3010<br>▪ Stratix 5700, Stratix 8000<br>▪ Ruggedized SFPs<br>▪ IOT Discovery Workshops | ▪ EnergyWise (JouleX)<br>▪ CGR<br>▪ IR500 | ▪ 1552 AP<br>▪ 2600 AP<br>▪ Stratix 5100 AP<br>▪ WLC<br>▪ IOT Site surveys | ▪ Managed: Secure Ops<br>▪ On premise:<br>▪ Identity Services Engine<br>▪ ASA / Sourcefire<br>▪ 819<br>▪ VSM / IP Cameras |

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# Mining

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# Solution & Use Cases Overview

| | Asset Visibility & Monitoring | Connected Predictive Maintenance | Connected Mine Remote | Mine Secure Operations |
|---|---|---|---|---|
| | | | | |
| Business Outcome | **People, Asset Safety & Productivity** | **Equipment Reliability** | **Lower on site costs, Greater safety** | **Secure Mine Access** |
| Key Capabilities | **Asset Visibility & Monitoring**<br>▪ REP (resiliency)<br>▪ Zero touch deploy<br>▪ Converged NWs (cost)<br>▪ Rapid Fault Isolation (uptime)<br>▪ flexible manufacturing | **Predictive Maintenance**<br>▪ Fog Computing<br>▪ iWAN<br>▪ Mine-in-a-box: on-site aggregation | **Remote Operations**<br>▪ Mobile Controls visibility<br>▪ Asset Mgmt<br>▪ Video Management | **Mine Security**<br>▪ Identity Services<br>▪ Physical Security<br>▪ Controls Security |
| Solution BOM | ▪ 1552, 1532 AP<br>▪ 819, 829<br>▪ IE2K, IE3K, IE3010 | ▪ 819, 829<br>▪ UCS<br>▪ 1532, 1552 AP | ▪ 6050, IP67 Cameras<br>▪ 2600 AP<br>▪ Stratix 5100 AP<br>▪ WLC<br>▪ IOT Site surveys | ▪ Identity Services Engine ASA<br>▪ VSM<br>▪ IP Cameras<br>▪ Industrial Firewall |

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# Oil and Gas

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# Solution & Use Cases Overview

| | Connected Pipelines | Connected Refinery | Secure Ops | Connected Oilfield |
|---|---|---|---|---|
| | | | | |
| Business Outcome | **Incident Resiliency** | **Reduced Downtime** | **Secure Remote Access** | **Operational Excellence** |
| Key Capabilities | **Pipeline Automation**<br>▪ Rapid Leak Detection<br>▪ Multiservice Infrastructure<br>▪ Video Surveillance<br>▪ Supervisory Control<br>▪ Third Party Interference Detection | **Plant Wireless**<br>▪ Industrial WiFi<br>▪ Mobile HMI<br>▪ Asset Tracking<br>▪ People Tracking<br>▪ Man Down | **Secure Ops**<br>▪ Secure Remote Access<br>▪ Asset Discovery/Inventory<br>▪ OS Patching and AV<br>▪ Situational Awareness<br>▪ Identity Services | **Remote Operations**<br>▪ Integrated Operations<br>▪ Collaborative Operations<br>▪ Wellhead Monitoring<br>▪ Remote Asset Monitoring<br>▪ Distributed Analytics |
| Solution BOM | ▪ ONS15454, ASR903/901<br>▪ IE2K/3K, 819H, Cisco Prime<br>▪ HLD/LLD<br>▪ Per km ~ $3-7K<br>▪ Est. deal size $7-20M | ▪ 1552S/1552WU,<br>▪ IPICS<br>▪ Wireless Site Survey<br>▪ Per plant ~ $1M<br>▪ Est. deal size ~ $10M | ▪ Secure Site and Center<br>▪ ASA5500/SourceFire<br>▪ 819H/CGR, Remote Mgt Svc<br>▪ Per site per year ~ $294K<br>▪ Est. deal size ~ 15$M | ▪ ISRG2/ASR/UCS220<br>▪ Physical Security, WebEx<br>▪ Remote Mgmt Services<br>▪ Per site ~ $35-45k per site<br>▪ Est. deal size: $7-25M |

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# IoE Retail

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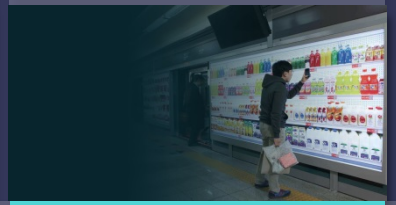
# Solution & Use Cases Overview

| | Store in a Box | CMX Digital Experience | Remote Expert/ Mobile Advisor | Digital Media Store Experience |
|---|---|---|---|---|
| | |  | | |
| Business Outcome | **Increase operational efficiency and mitigate risk** | **Enhance shopper experience** | **Enhance shopper experience and drive revenue growth** | **Enhance shopper experience and drive revenue growth** |
| Key Capabilities | ▪ Platform for innovation and growth<br>▪ Reduce costs via consolidation<br>▪ Integrate store systems with ecommerce<br>▪ Add cloud to store<br>▪ Deliver new services | ▪ New understanding of customer behavior<br>▪ Easy, secure onboarding of mobile devices<br>▪ Wayfinding<br>▪ Targeted advertising and promotions in real time | ▪ Expert advice at the pont of consideration/sale<br>▪ Scale staffing resources<br>▪ Cross sell and upsell<br>▪ Accelerate sales cycle | ▪ More media rich environment for shoppers<br>▪ Highlight products/ promotions to increase sales<br>▪ Promote the brand with video and advertising |
| Solution BOM | ▪ Unified Access<br>▪ Desktop Virtualization<br>▪ Cloud-ready infrastructure<br>▪ ISRG2 Family<br>▪ UCS-E/UCS-C<br>▪ IOS/ASA FW/Sourcefire | ▪ CMX Analytics/Meraki Analytics<br>▪ Cisco Physical Security<br>▪ Social Analytics | ▪ CUCM, UCCE, CVP, IEC 4600<br>▪ Remote Expert Manager<br>▪ Interactive Experience Manager<br>▪ CTS and EX endpoints<br>▪ Mobile Advisor licenses | ▪ CUCM, IEC 4600<br>▪ Interactive Experience Manager<br>▪ Video Endpoints |

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# Service Provider

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# Solution Overview

| | Tower Vision | Fleet Vision |
|---|---|---|
| | | |
| Business Outcome | **RF Technician Productivity** | **Repeat Repair Reduction** |
| Key Capabilities | **Remote Tower Monitor**<br>▪ Safety/Surveillance<br>▪ Technician Collaboration<br>▪ RF Signal Testing<br>▪ Video analytics and policy | **Vehicle Management**<br>▪ GPS Tracking<br>▪ Asset Management<br>▪ Driver Collaboration<br>▪ Wearable Monitoring |
| Solution BOM | ▪ CGR or ISRG2<br>▪ 4500 and 6500 cameras<br>▪ Software license<br>▪ Environmental sensors | ▪ 819H<br>▪ 4500 and 6500 cameras<br>▪ Software license<br>▪ Environmental sensors |

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# IoE Sports and Entertainment

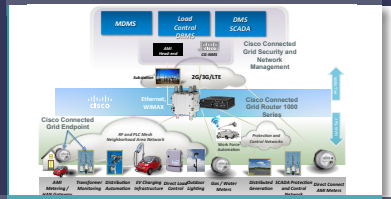
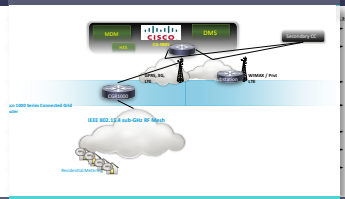
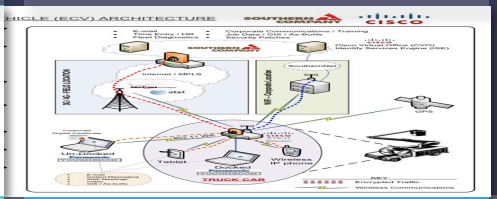
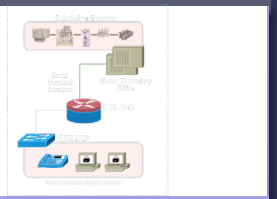
# Solution and Use Cases Overview

| | Connected Stadium | Connected Stadium Wi-FI | StadiumVision | StadiumVision Mobile |
|---|---|---|---|---|
| | | | | |
| Business Outcome | Operational Efficiency | Enhance Fan Experience | Enhance Fan Experience and Revenue Growth | Enhance Fan Experience and Revenue Growth |
| Key Capabilities | ▪ Single platform for innovation and growth<br>▪ Consolidate all forms of operations, communications and entertainment<br>▪ Improve business agility | ▪ Reliable wi-fi broadband connectivity free to fans<br>▪ Data offload for SPs<br>▪ Enanbles more interactive fan services<br>▪ Targeted advertising and promotion opportunities<br>▪ Mobile Applications | ▪ Low latency live video delivery<br>▪ Targeted ads and promotions (scheduled and real time)<br>▪ Dynamic menu boards<br>▪ Directional signage<br>▪ Venue transformation | ▪ Event Statistics<br>▪ Time / Location-Based Ads /Promos<br>▪ Video Replays<br>▪ Unique Camera Angles |
| Solution BOM | ▪ Nexus 7000<br>▪ Cat 6500,<br>▪ 3750X ASA5500/X, ASR Series | ▪ WLAN Controller<br>▪ APs and antennas for high density environment<br>▪ Authentication Server<br>▪ Mobility Services Engine<br>▪ Prime Analytics<br>▪ Mobility Services Platform | ▪ Video Encoders<br>▪ Digital Media Player<br>▪ Connected Stadium (Nexus 7000, Cat 6500, 3750X etc)<br>▪ StadiumVision Director | ▪ Mobile Video Encoders<br>▪ Video Streamer<br>▪ Reporter<br>▪ StadiumVision Mobile SDK<br>▪ StadiumVision Director |

# Utility

IoE Vertical Solutions Group

# Solution Overview

| | Field Area Network | Distribution Automation | Connected Field Workforce | Substation Automation |
|---|---|---|---|---|
| |  |  |  |  |
| Business Outcome | **Cost Reductions New Business Model** | **Cost Reduction** | **Workforce Efficiency** | **Operating Efficiency** |
| Key Capabilities | ▪ Reduced energy theft<br>▪ Reduced downtime<br>▪ Zero touch deployment<br>▪ Converged NWs (cost)<br>▪ Rapid Fault Isolation (uptime) | ▪ Flexibility in network design<br>▪ Media Agnostic network services<br>▪ Scalability and interoperability | ▪ Data Uploaded in Seconds with 4G/LTE<br>▪ Handles Multiple Wireless Laptops, Smartphones, Tablets Simultaneously<br>▪ Machine-to-Machine Communications for Background, Telogis, Next Step Tasks while Field Crews are Working | ▪ Upgrade legacy SCADA systems<br>▪ Scale network to support growing number of telemetry devices<br>▪ NERC/CIP, IEC 61850-3 and IEEE 1613 compliance |
| Solution BOM | ▪ CGR 1240, CGR 1120<br>▪ CG-NMS<br>▪ Endpoint Reference Design<br>▪ Advanced Services | ▪ 819<br>▪ Head End in a Box | ▪ 819<br>▪ Head End in a Box | ▪ CGR 2010, CGS 2520, ASR 903 |

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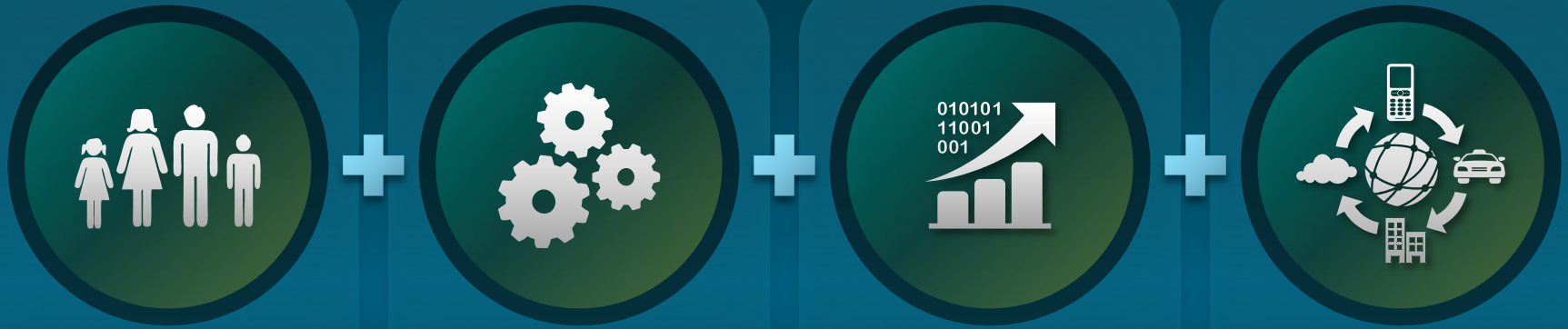
# The Internet of Everything is here..!!




## People

Connecting people in more relevant and valuable ways.

## Process

Delivering the right information to the right person (or machine) at the right time.

## Data

Leveraging data into more useful information for decision making.

## Things

Physical devices and objects connected to the Internet and each other for intelligent decision making.

**People-to-People + People-to-Machine + Machine-to-Machine**

Source: Cisco Internet Business Solutions Group, 2012

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# Thank you

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