



# GIoTS & IOT Week 2017: IOT Reality Check

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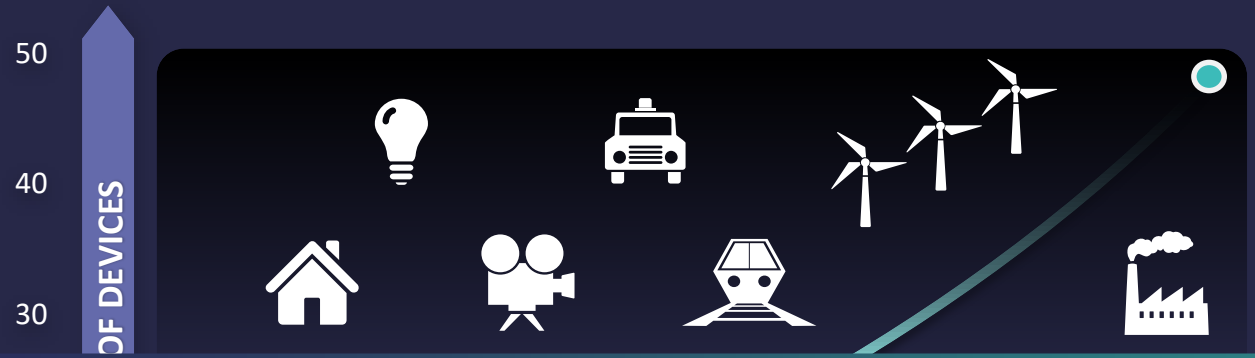
# What Is the Internet of Things?

*"**The Internet of Things** is the intelligent connectivity of physical devices driving massive gains in **efficiency, business growth, and quality of life**."*

# IoT Is Here Now – and Growing!

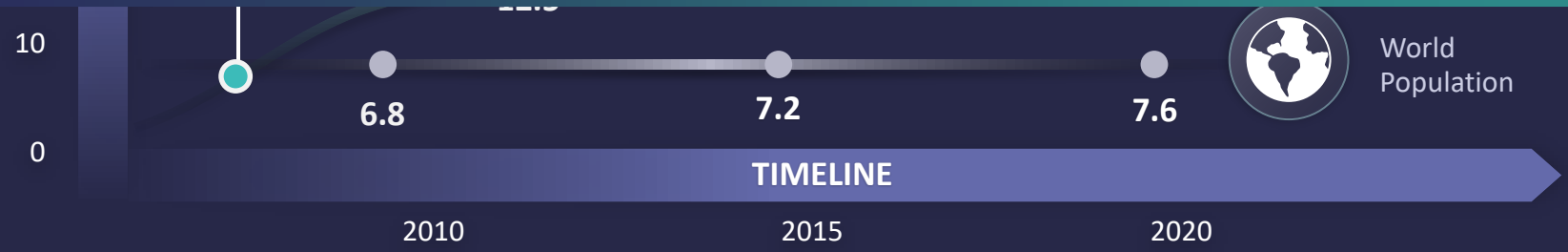



**50 Billion**

"Smart Objects"

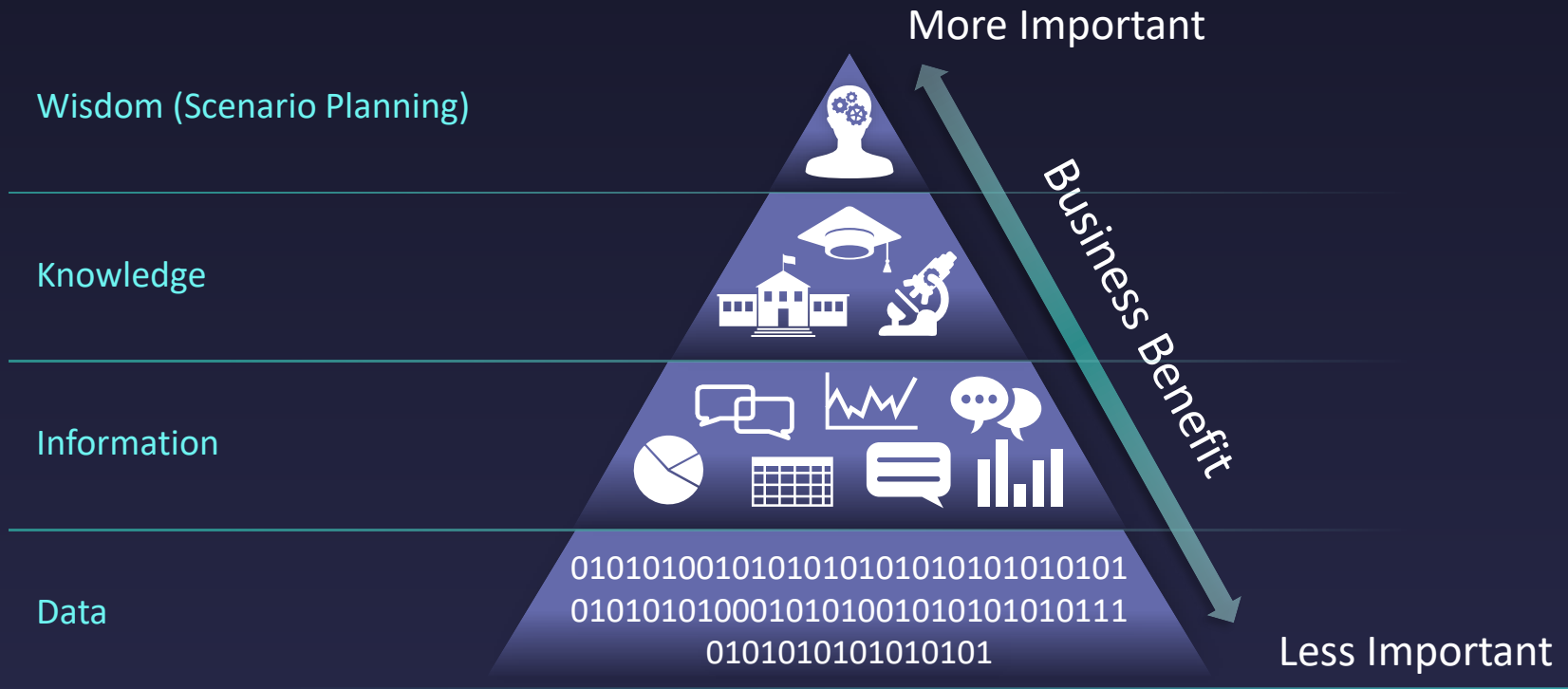
**Rapid Adoption Rate of Digital Infrastructure:**

## The New Essential Infrastructure



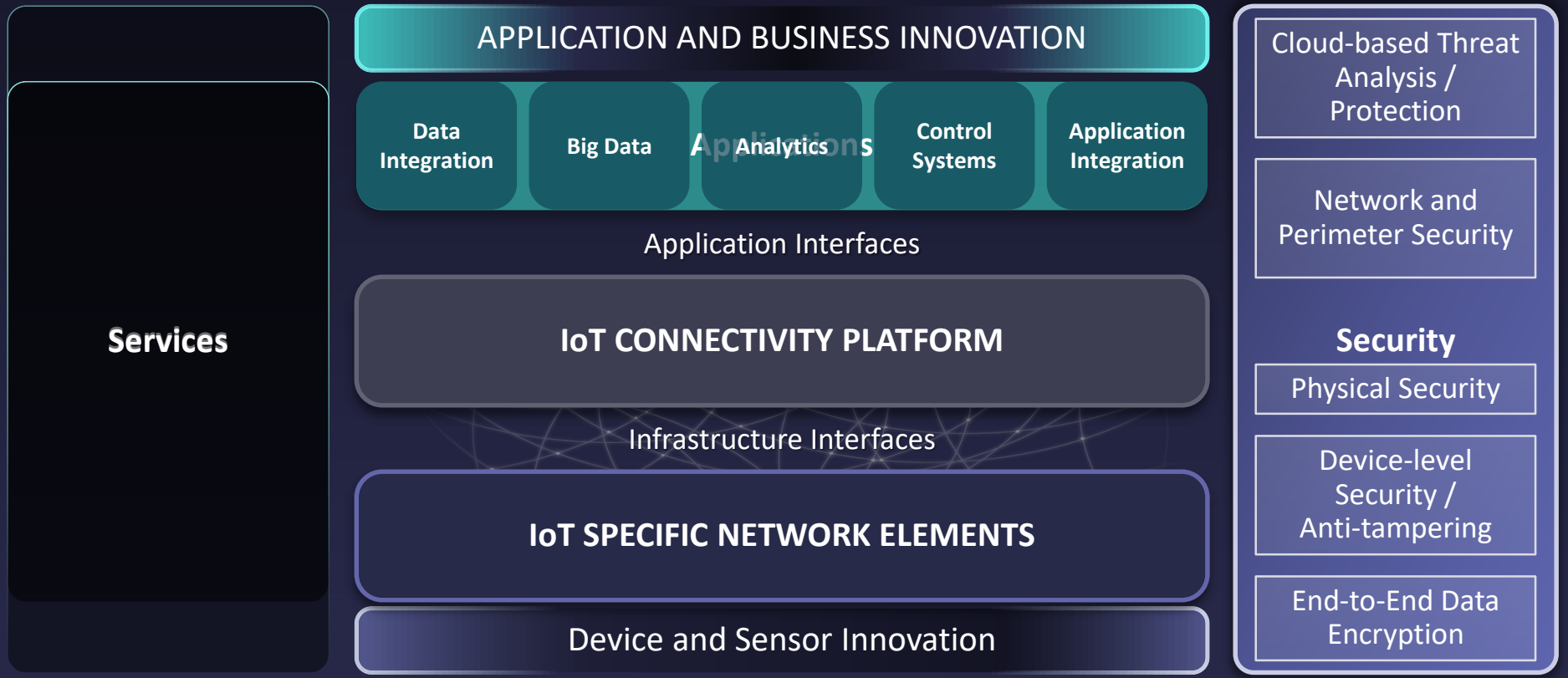

Source: Cisco IBSG, 2011

# IoT Transforms Data into Wisdom



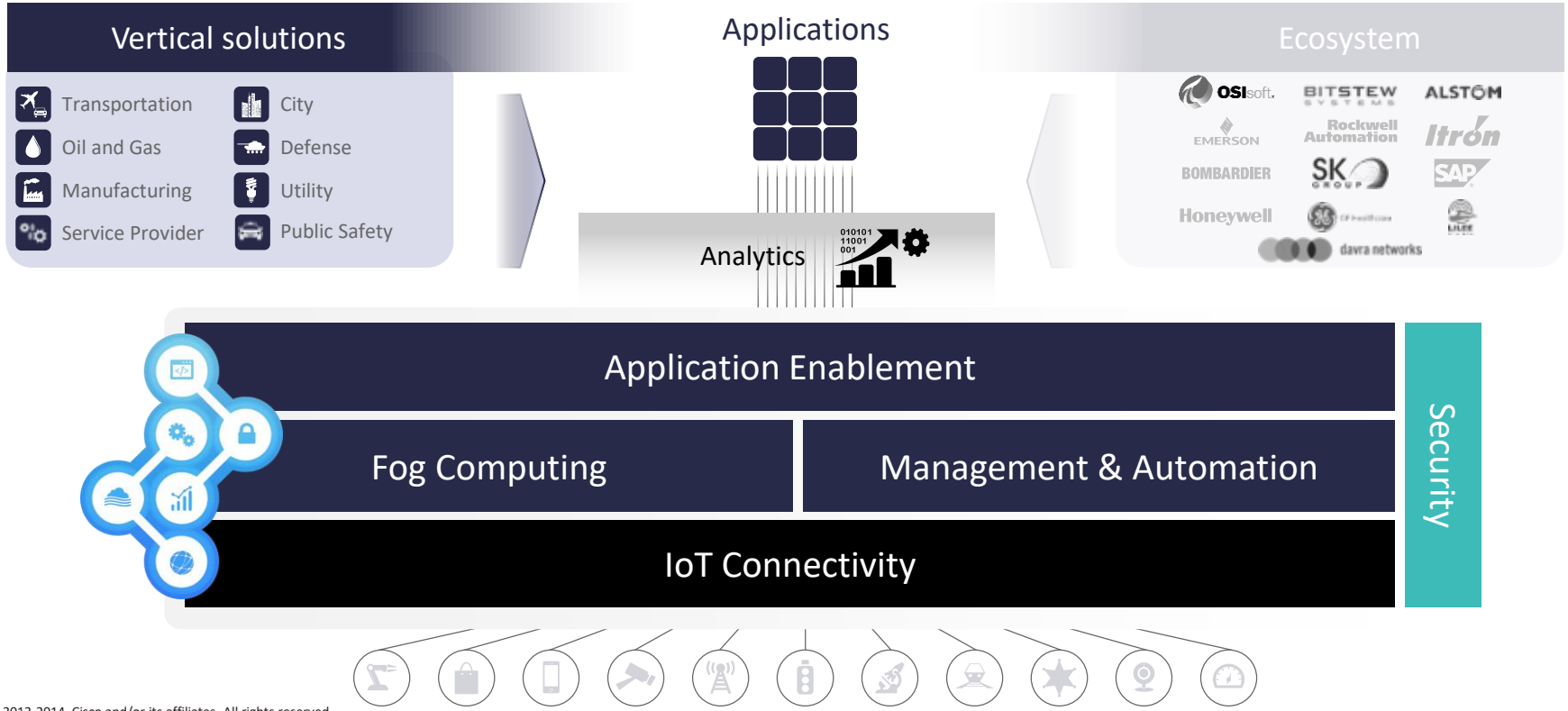

Big Data becomes Open Data for Customers, Consumers to Use

# But It Also Adds Complexity



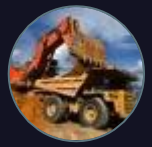
# Cisco IoT Architecture:

## Secure IT & OT Convergence



# What Industries Are We Focused On?


Manufacturing


Mining


Energy-Utility


Oil and Gas


Transportation


City


Defense

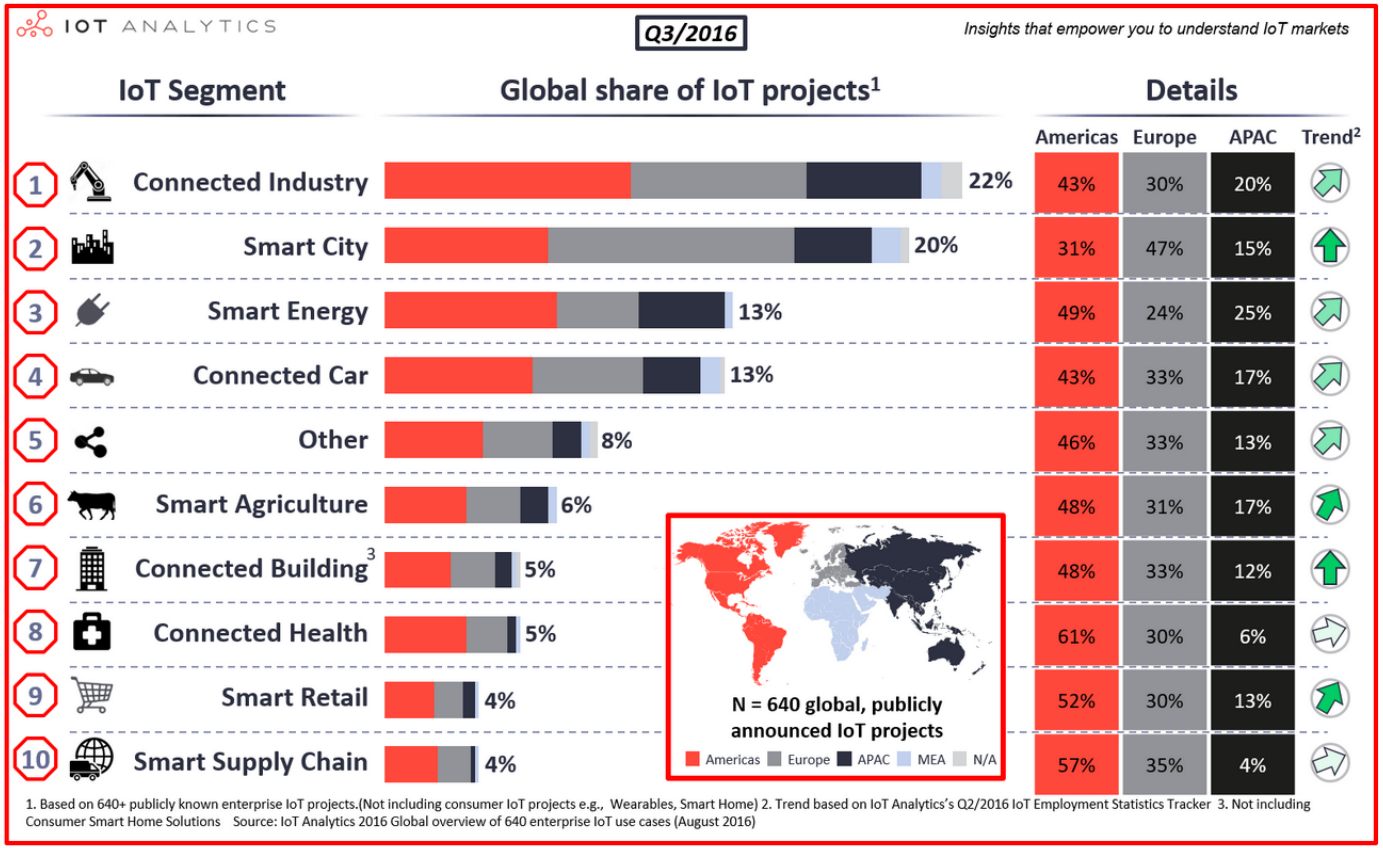

SP/M2M



REAL TIME SCALE BIG DATA/ANALYTICS SECURITY



# IOT projects



# The Data Aggregation Challenge

**1.1 Billion**

Data points generated by sensors **daily**

**500 Gigabytes**

Data generated by an offshore oil rig **weekly**

**1000 Gigabytes**

Data generated by an oil refinery **daily**

**10,000 Gigabytes**

Data generated by a jet engine every **30 minutes**

**2.5 Billion Gigabytes**

Data generated worldwide **daily**

**90% of the world's data**

Has been created in the last **2 years!**

# It’s a Game Changer in all technical domains

Architecture

Addressing

Security

RF Allocation / Planning

Gateways

Low Power

Determinism

Wireless

Standardization

Regulation

Privacy

Deployment models

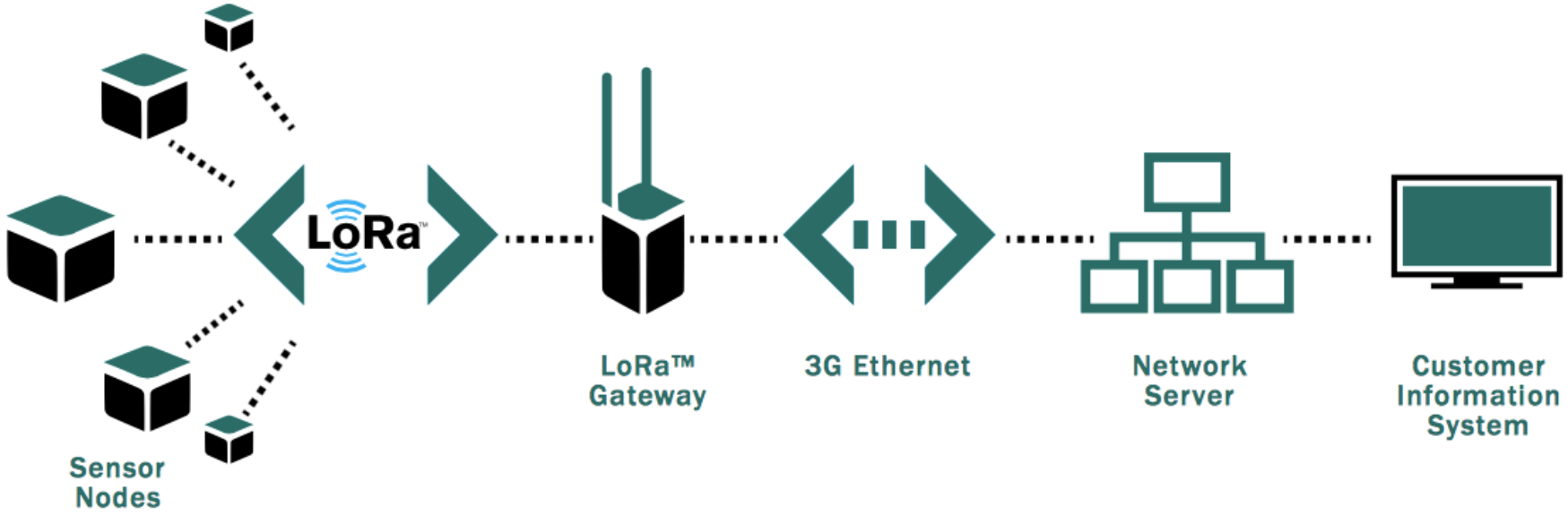
Sustainability

Analytics

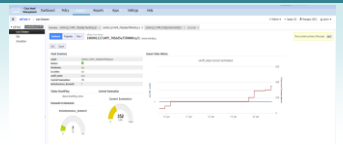
Learning Machines

# LPWA Low Power and Wide Area

# IoT LoRa Achitecture



# LoRaWAN™ Use Cases Applicability

| | | | |
|---|---|---|---|
| Smart water/ gas metering | Public lighting | Smart building | Smart parking |
|  |  |  |  |
| Assets Tracking | Smart Agriculture, i.e. leak detection and irrigation | Water level and flood management | Fault management |
|  |  |  |  |
| Security services, i.e. Smoke detectors | Smart energy and fast demand response | Waste management | Traffic management |
|  |  |  |  |

# Addressing and Gateways

# Where are we?

IPv6 for the IOT is a must (same as radio technologies)

➔ ETSI ISG IP6 best practices documents

IPv6 up to the end device

➔ Close but not yet there

➔ IETF 6lowPan, 6lo, LPWAN, IPWave

Gateways ➔ will be your (our) next nightmare:

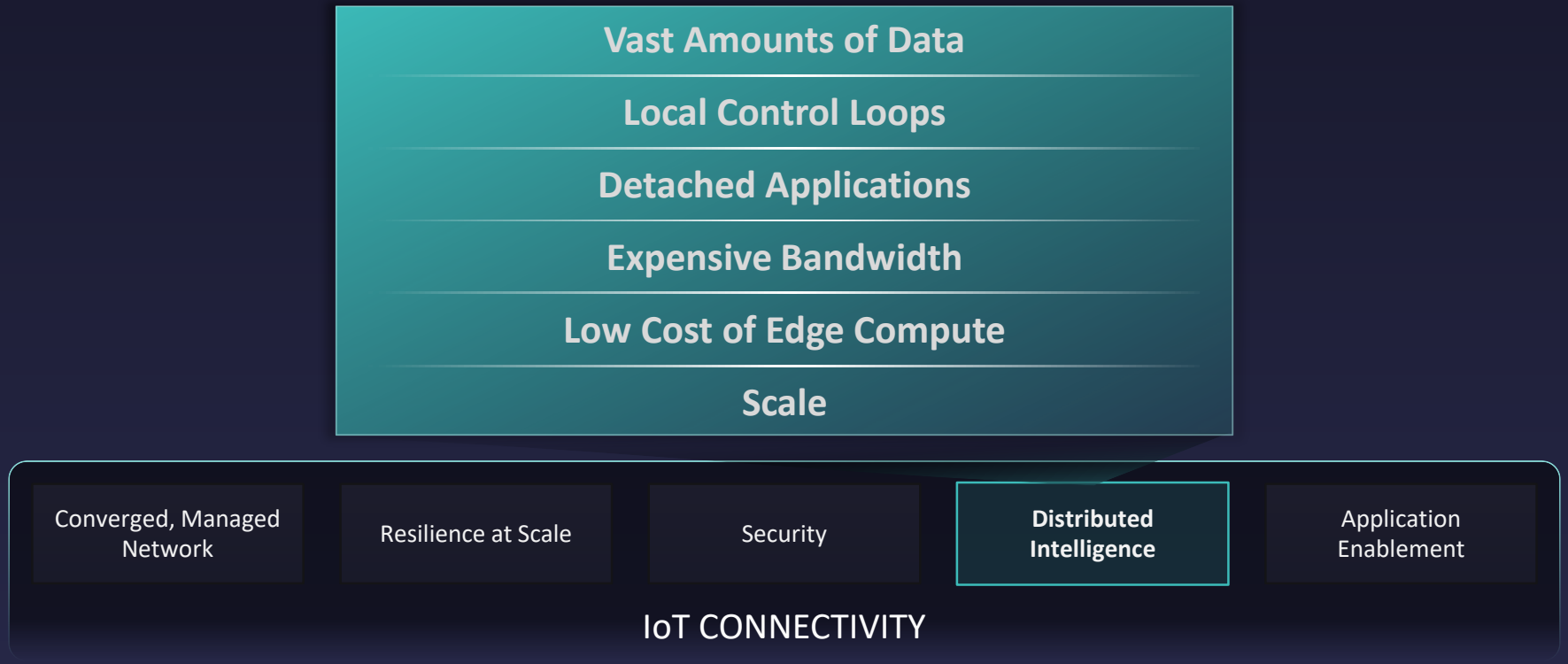
Manageability (maintenance, configuration, deployment…)

Energy consumption

Security: Breaking end to end security, Network entry point.

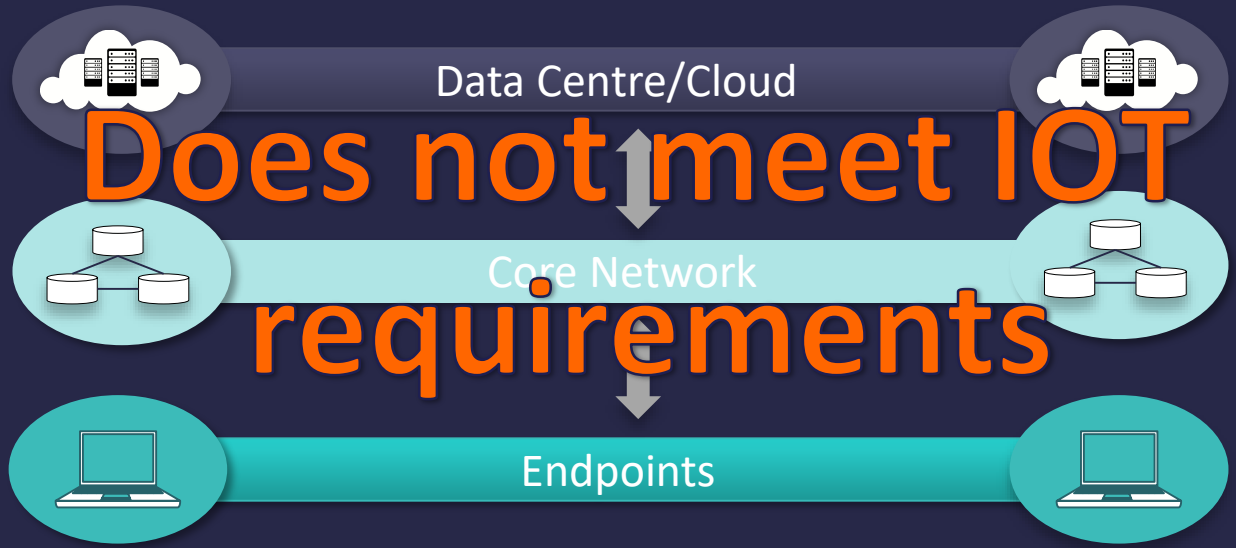
# Distributing Intelligence

# Why Distributed Intelligence?



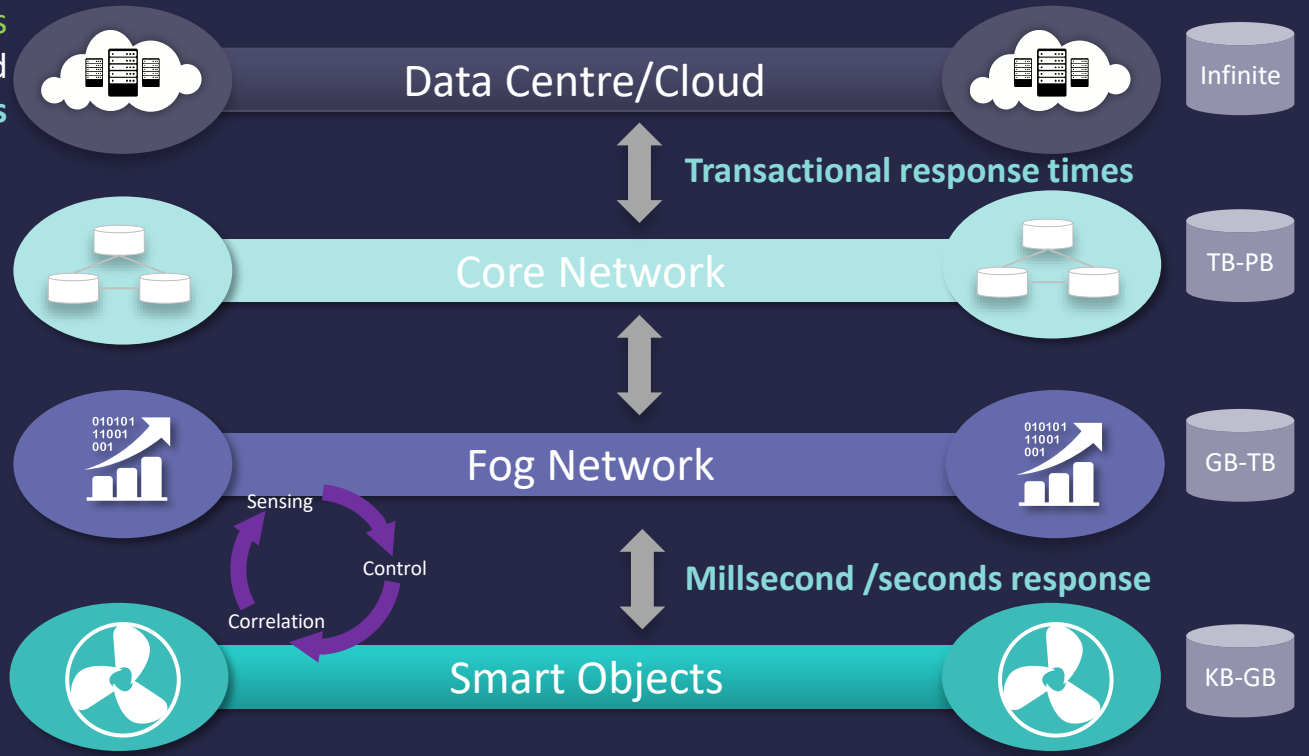
# Traditional Computing Architecture

Terminal-Mainframe, Client-Server, Web



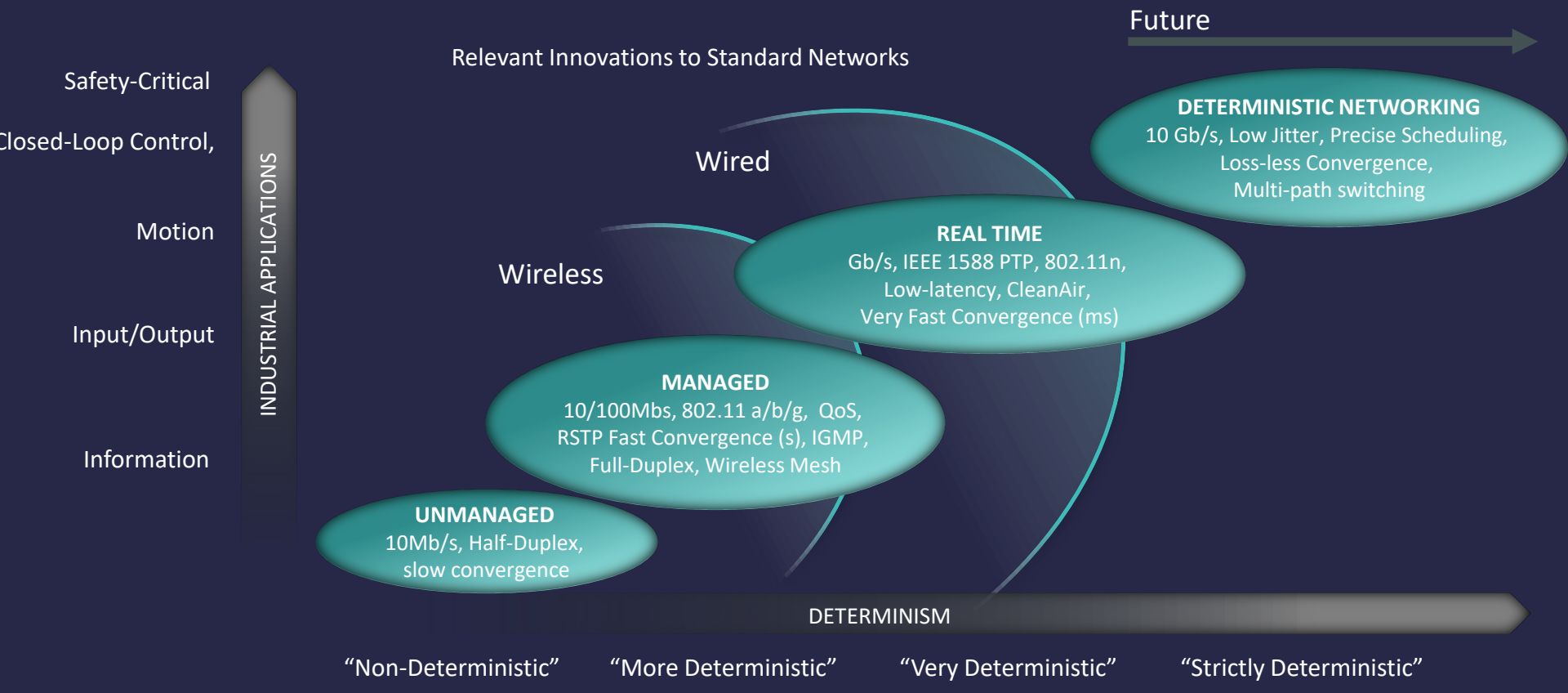
# IoT and Fog Computing Architecture

Data Points, Variety & Velocity, Security, Resiliency, Latency



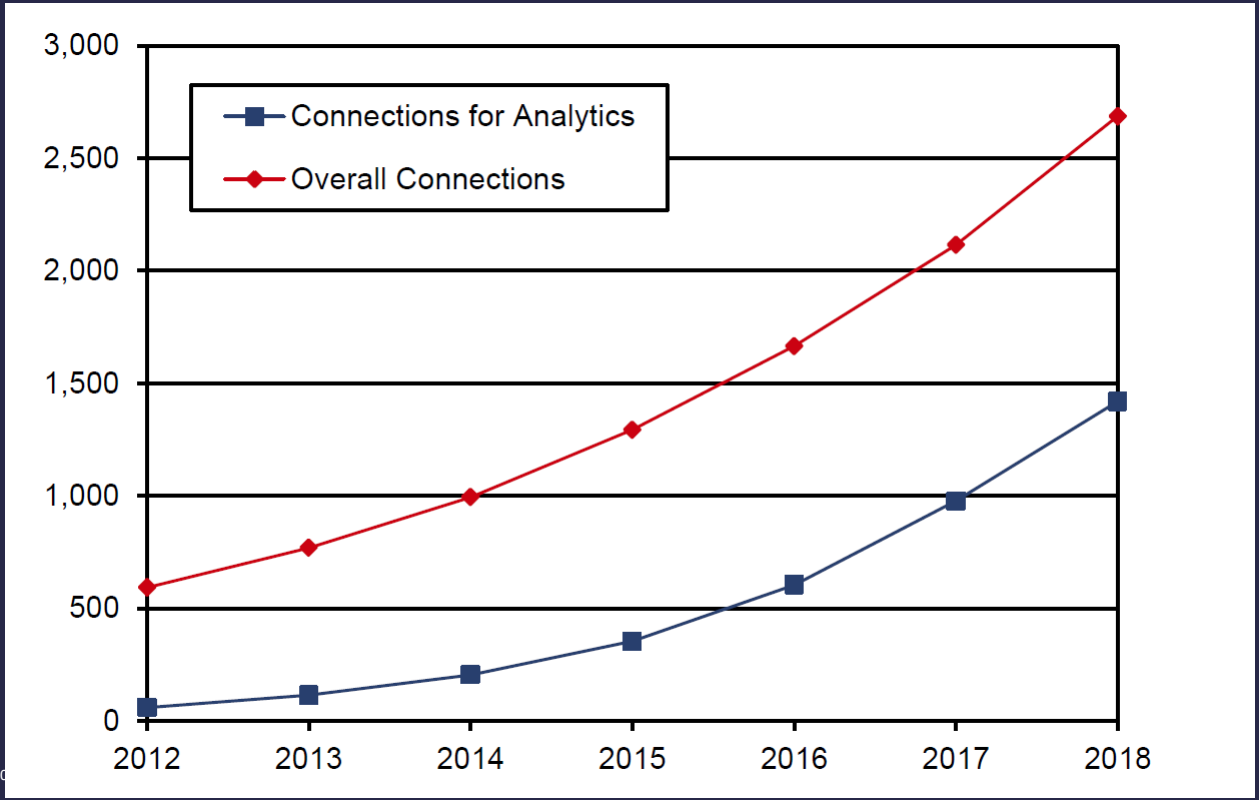
# Need for more determinism

# Industrial Intelligence Requires Evolution



# Analytics

# Analytics vs. Overall M2M connection ratio *




15M to 115M Analytics related connections*

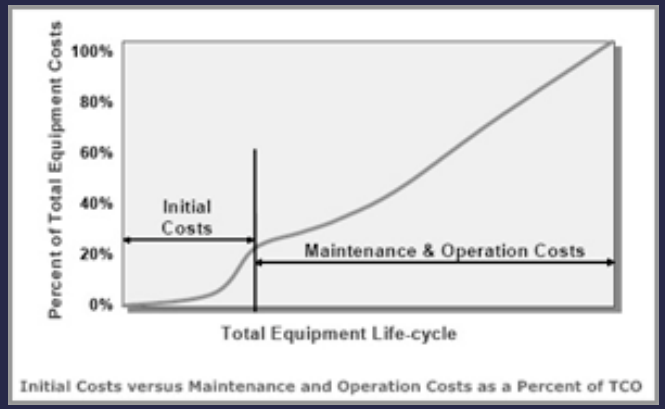
Classical Monitoring only doubles

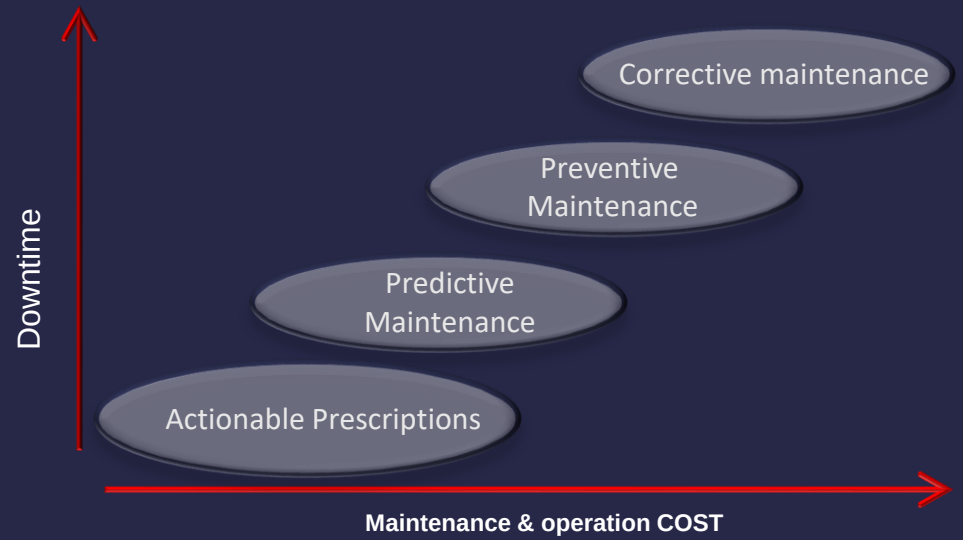
Analytics related M2M connections surge

* Source:
ABI Research

# Industrial Internet Application: OPEX reduction

Maintenance and operation represent 75% of the Total equipment cost




➔ Deployment of Wireless sensors is seen as an efficient solution

# Standardization

# IoT SDOs and Alliances Landscape
# (Technology and Marketing Dimensions)


Source: AIOTI WG3 (IoT Standardisation) – Release 2.0

# Security

# *Is there such a thing as an: "IoT trusted device"?*

# Yes / No: Why?


- IOT devices are uncontrolled
  - Software – firmware
  - Manufacturing process
  - Maintenance process
- IOT devices are easy to compromise
  - Poor access protection (admin/admin, even nothing …)
  - No anti-virus / anti malware
  - Limited (if any) software upgrade capability
- IOT devices have full capability of causing harm
  - They typically have a full (linux) stack
  - Large numbers, Diversity
  - They are frequently granted full network access (unrestricted network access)

Need new security paradigm

# key take away

IOT requires Innovation and new paradigms not only communications:

Distributed Intelligence

Intelligent Networks

Deterministic Networking

Analytics

Security

…

# Thanks You