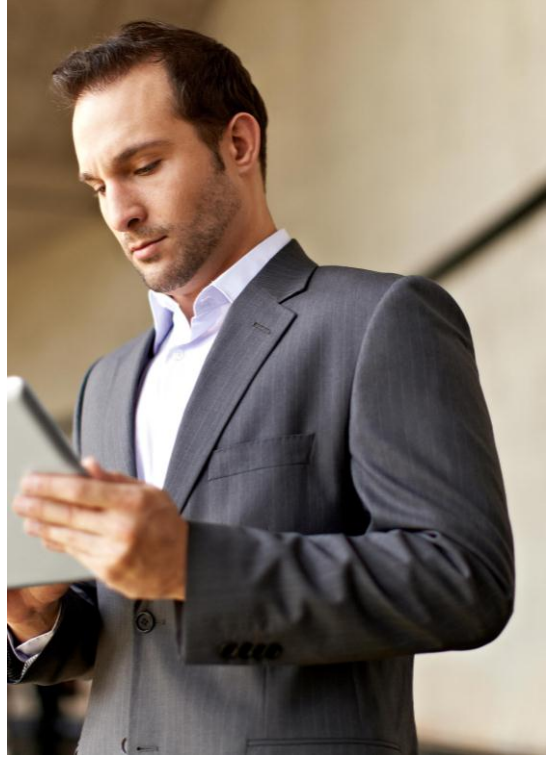
Cisco Connect

Bucharest
April 2013

Innovating with a Trillion Smart Objects



Ian Kennedy

Senior Director, Cisco Europe, Middle East, Africa, Russia

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Defining Innovation

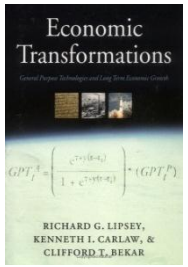
“Change that creates a new dimension of performance”

Peter F. Drucker

“Beyond innovation lies *disruptive innovation*, which actually changes social practices – the way we live, work & learn.”

John Seely Brown

Transforming the Global Social & Economic Landscape



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Changing the
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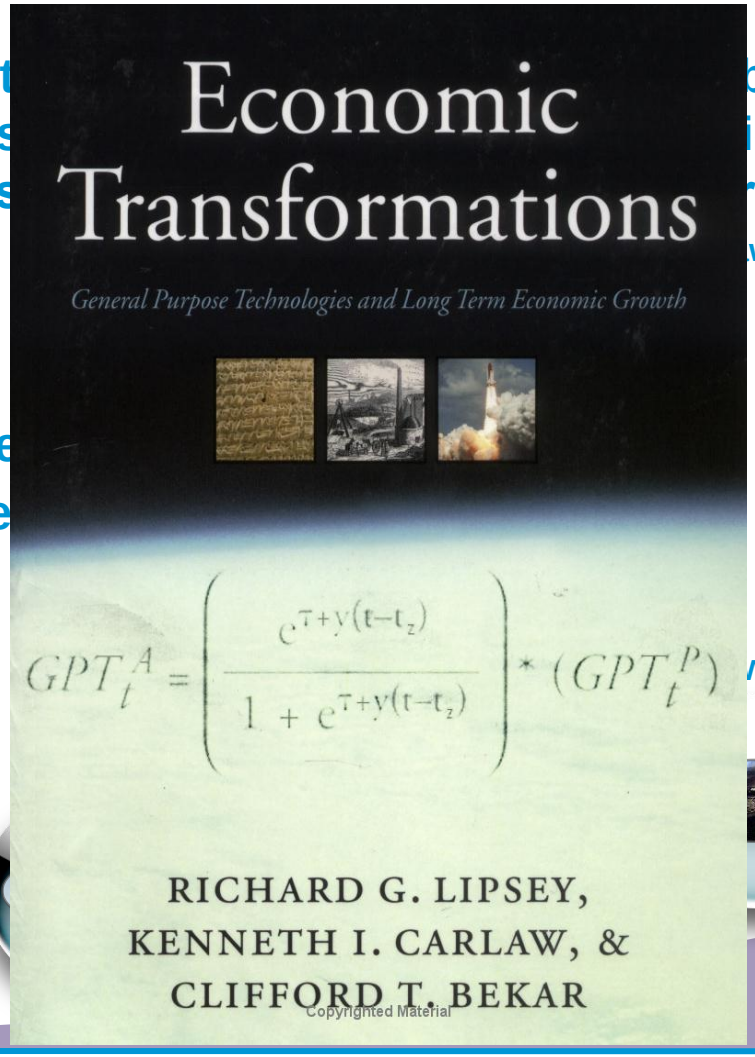


World GDP

Wheel

Writing

Electricity

ways

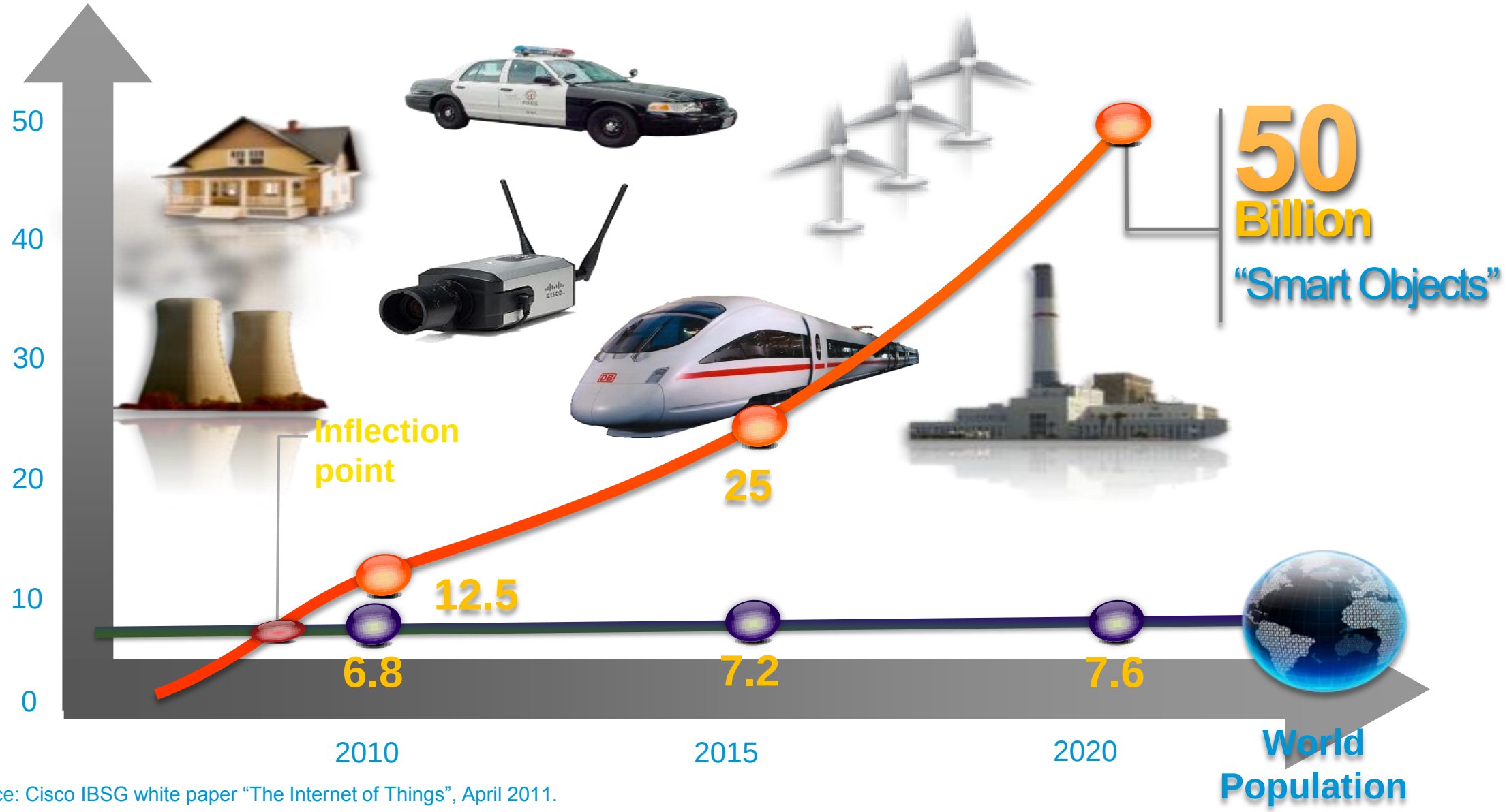
Computers

The Internet

The Internet of
Nano-things
(Biotech; Nanotech)

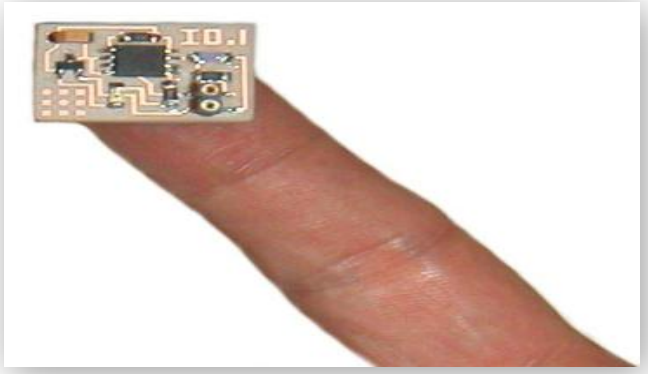
Time

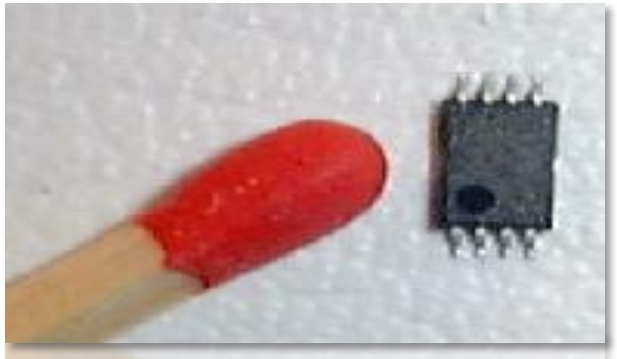
Internet of Things – “Industrialization of the Internet”



Source: Cisco IBSG white paper “The Internet of Things”, April 2011.

What is a Smart Object?





“Trying to determine the market size for the Internet of Things is like trying to calculate the market for plastics, circa 1940.

At that time, it was difficult to imagine that plastics could be in everything.”

Prof. Michael Nelson, Georgetown University

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Smarter Physical Networks – The Rise of Autonomy

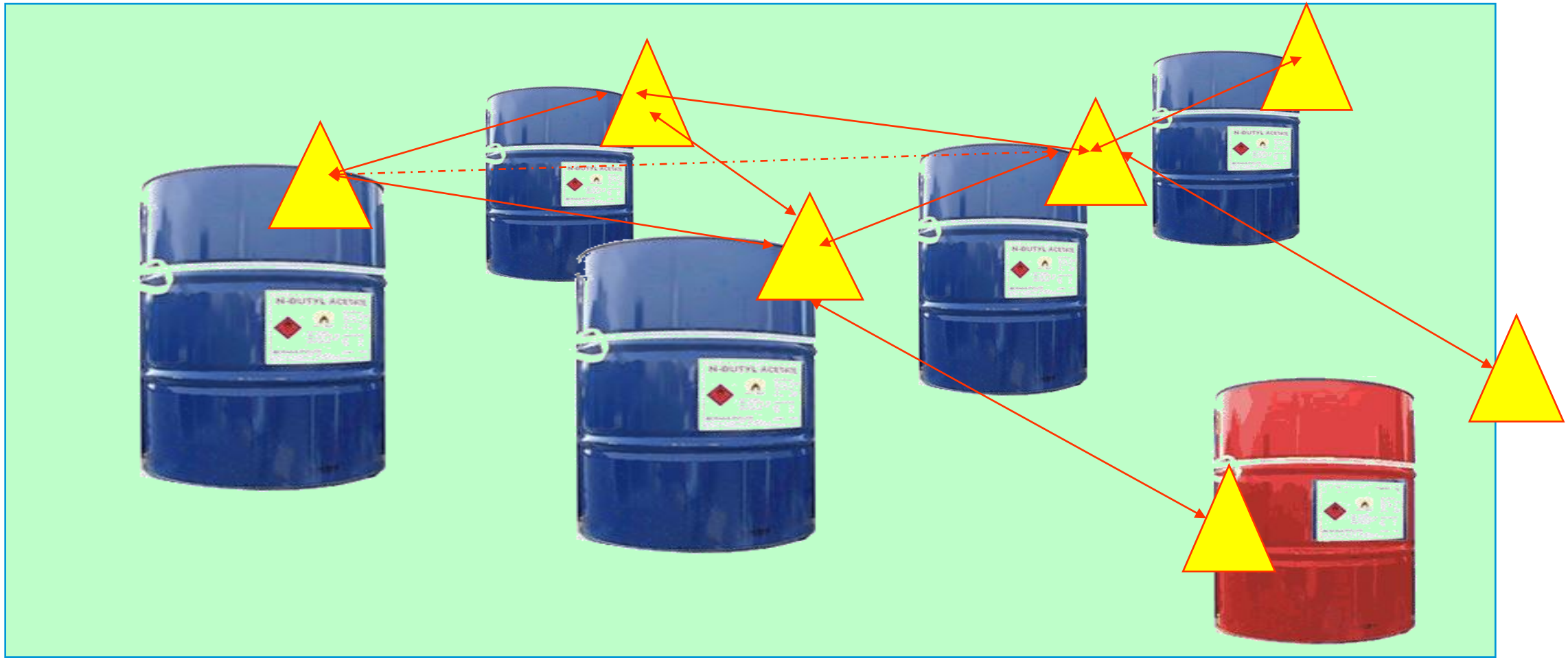
Remote Monitoring for Safety & Security

Big Data/Analytics for Insights & Predictions

Plant / Mining Automation, Autonomy & Cooperation

Integrated Transport & Energy Systems

Collaborative “Things”



1. Self-detection exceeded volume limit
2. Confirmation of safe storage environment
3. Prohibited storage combinations

Information Society Technologies

Specifications

Komatsu 960E

Engine:Komatsu SSDA18V170
Arrangement:V18
Power:3500hp
Transmission: 2xGDY108
Wheelbase:6.65m
Length:15.60m
Width:9.19m
Height:7.37m
K.Weight:1,270,000 lbs (580t)

Driver:*Steve Matthews*
Time on Shift: 8.30
Time Off Shift:due 16.00

Truck Displays

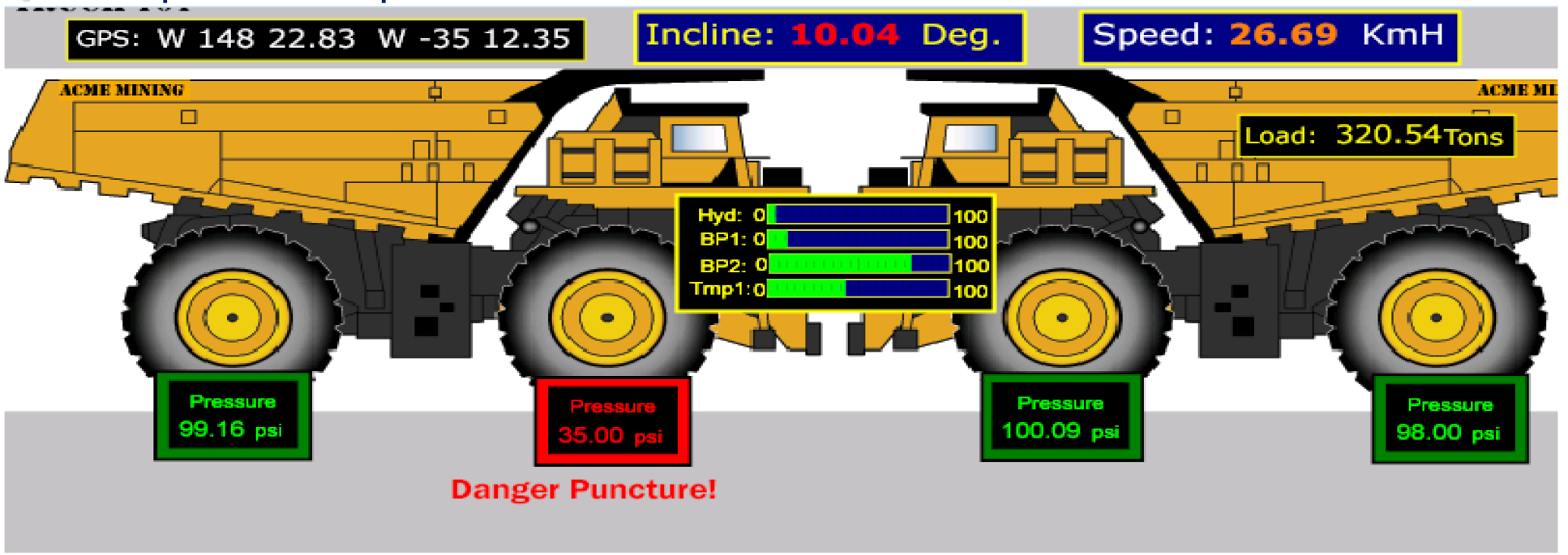
- ACME Mine Trucks
  - Fleet Telemetry

Local Weather

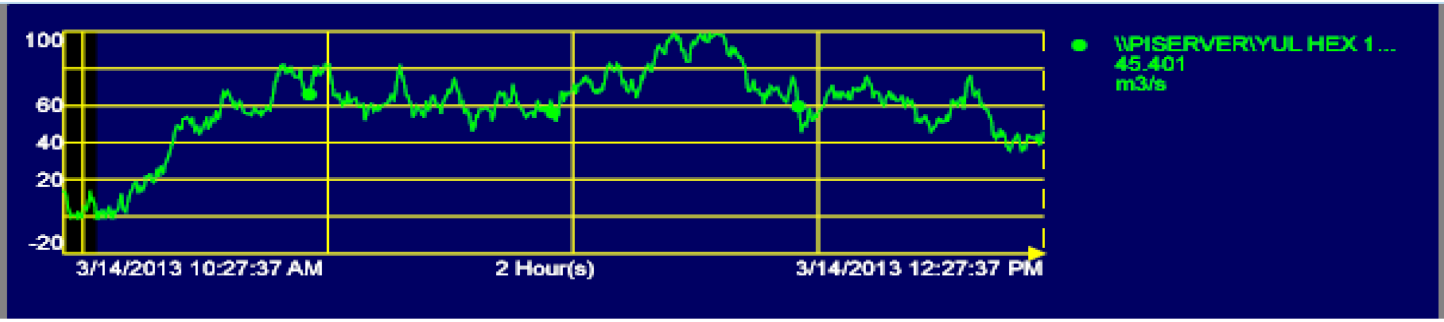
sky NEWS WEATHER

Melbourne weather

Telemetry Environment Key Metrics



Truck Fleet Telemetry



The Impact of Urbanization - From 2010-2025

GDP of City600 will rise by $30T or 65% of Global Growth

Emerging 440Cities will contribute $23T

650M New Consumers in Emerging 440Cities

Additional floor space equivalent to 85% of todays building stock

80Billion m^3 increase in municipal water demand

….energy, telecomms, transport, security….

Source: McKinsey Global Institute, Urban World: Cities & the Rise of the Consuming Class, June 2012

Smart Cities & Homes - The need for a “The City Protocol”*

Energy Savings	Water Consumption	Crime Rates	Traffic	Carbon Emissions
30%	50%	20%	30%	25%

Education: $3/Student/Month

Healthcare: $3/Doctor Visit

* A Certification System for Smart Cities – Announced Aug 2012

“What information consumes is rather obvious: it consumes the attention of its recipients…

…hence **a wealth of information creates a poverty of attention** and a need to allocate that attention efficiently among the overabundance of information sources…”

Herbert Simon
Artificial Intelligence Pioneer
Nobel Prize in Economics

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“Transformation, at its core, is about intelligent information networks, with sensors as their eyes & ears, and computers as their brains.

Networks can identify critical information – and push out that information to those who need to know it, when they need to know it.”

Dr Ronald D. Sugar
Chairman & CEO
Northrop Grumman Corporation 2003-2010

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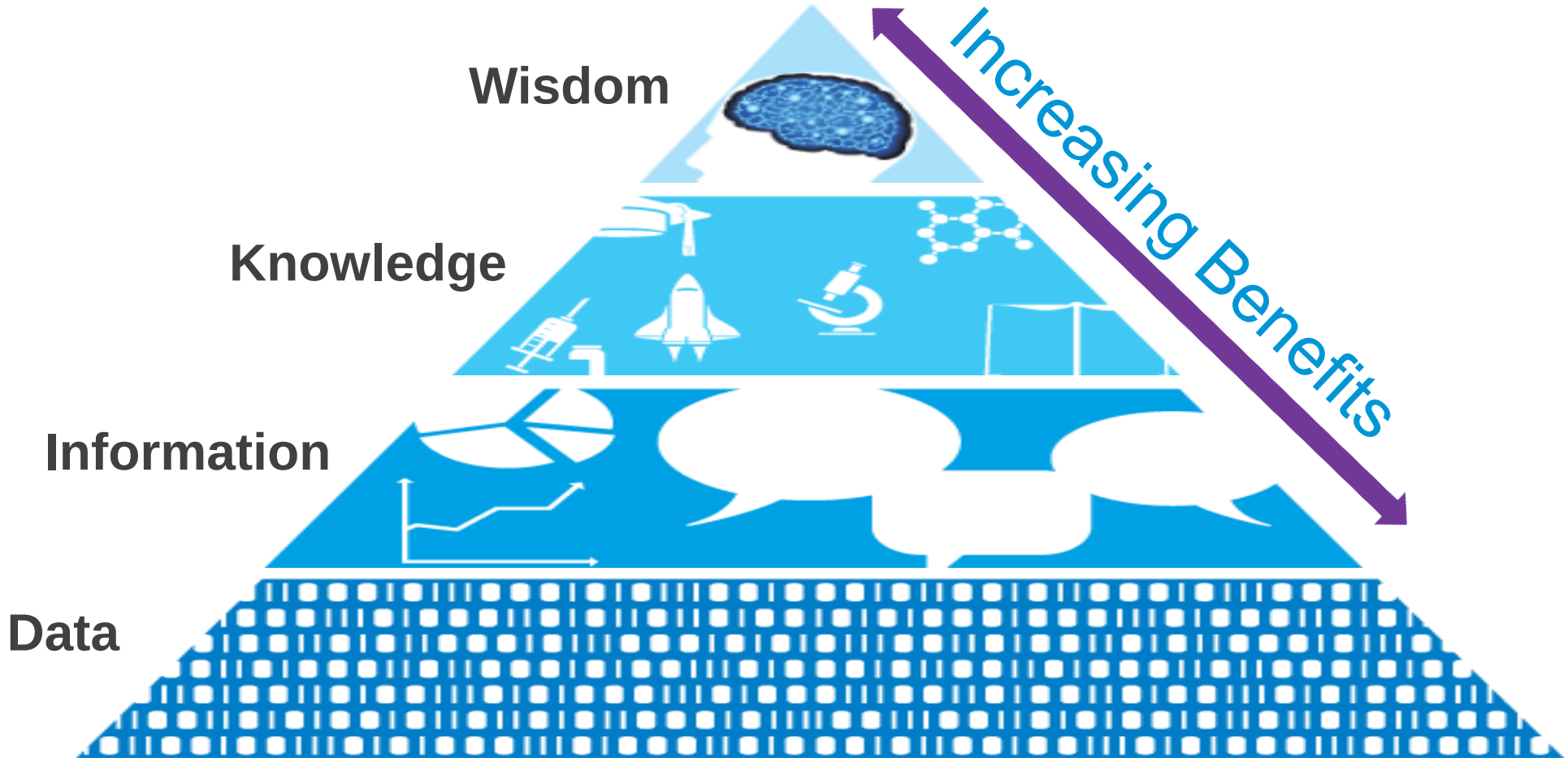
The Opportunity: Turning Data into Wisdom



High-Level IOT Architecture

Energy

Smart Cites

Connected Vehicles

Data Center
Hosting IoT analytics

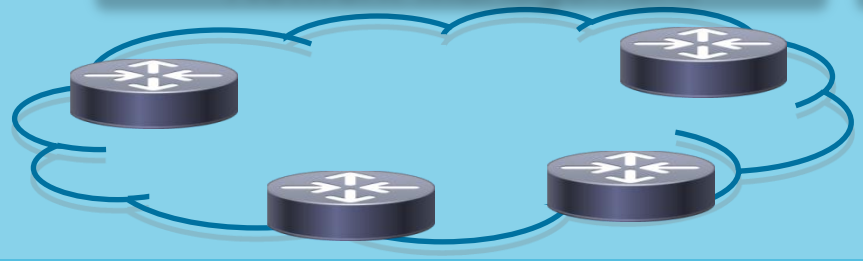
IoT NMS Apps

Network Management

Applications

Core
IP/MPLS, Security, QoS, Multicast

Thousands

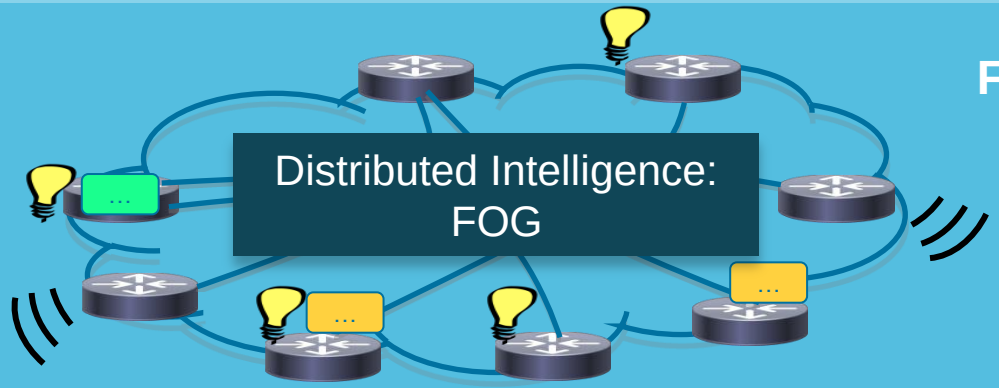


IP/MPLS Core

Multi-Service Edge
3G/4G/LTE/WiFi

Tens of Thousands

Ruggedized Platform Hosted App. Distributed Intel.

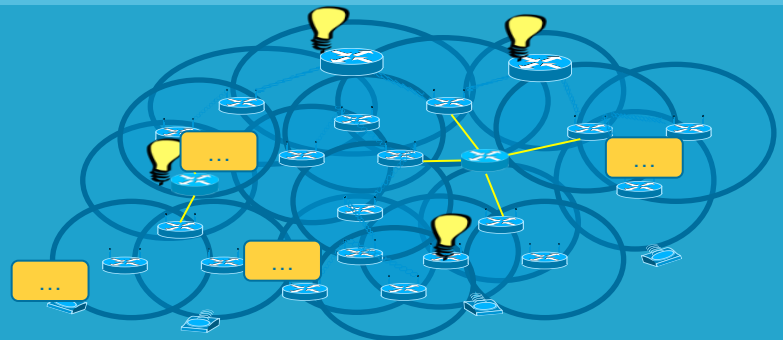


Field Area Network

Embedded Systems & Sensors
Low power & bandwidth, smart things

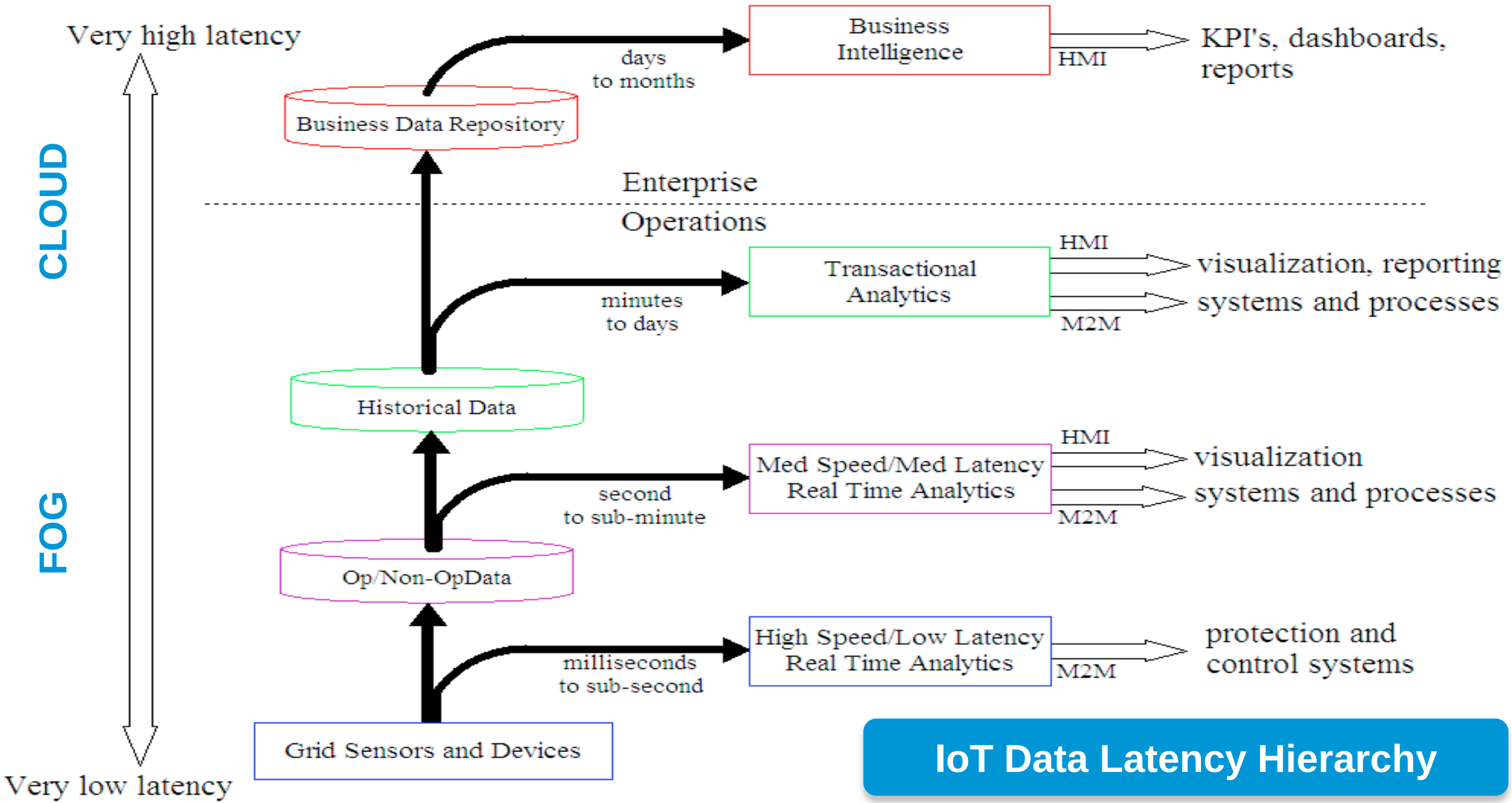
Millions

IoT Access Network
Lightweight IP + OS
Zero Touch Prov.



Smart Objects Network

IoT Innovation


Very high latency
CLOUD
FOG
Very low latency
Business Intelligence
HMI
KPI's, dashboards, reports
days to months
Business Data Repository
Enterprise Operations
Transactional Analytics
HMI
visualization, reporting
systems and processes
M2M
minutes to days
Historical Data
Med Speed/Med Latency Real Time Analytics
HMI
visualization
systems and processes
M2M
second to sub-minute
Op/Non-OpData
High Speed/Low Latency Real Time Analytics
M2M
protection and control systems
milliseconds to sub-second
Grid Sensors and Devices
IoT Data Latency Hierarchy

“ But the future will be far more surprising than most people realise, because few observers have truly internalised the implications of the fact that the rate of change itself is accelerating."

Today, we are wide to continue to

“ Today, we are wide to continue to

Raymond Kurzweil
From “The Singularity is Near”, 2005
Author, Scientist & Futurist

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"The most profound technologies are those that disappear….

…they weave themselves into the fabric of everyday life until they are indistinguishable from it…."

Marc Weiser, 1991
Writing on Ubiquitous Computing

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Thank you.

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