Realizing the IoE Opportunity with IoT
ASEAN Internet of Things Forum

IoE and IoT
Regional Forum

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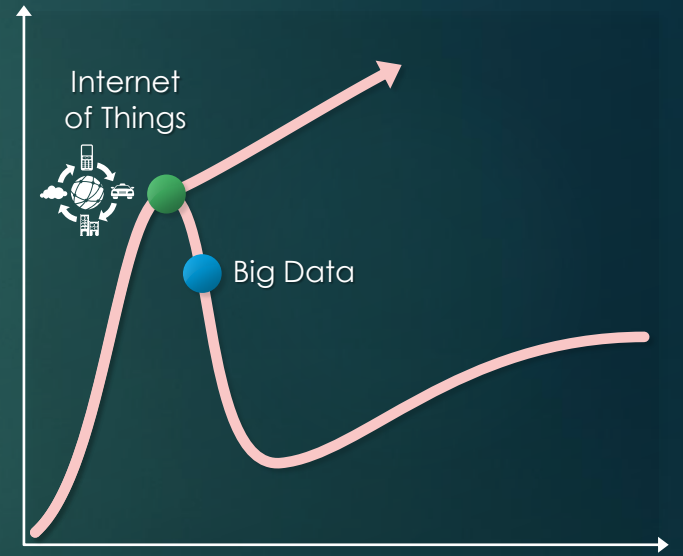
IoE and IoT
Regional Forum

Irfan Ali

Cisco

> ## Forbes
>
> **It's Official: The Internet of Things Takes Over Big Data As The Most Hyped Technology.**
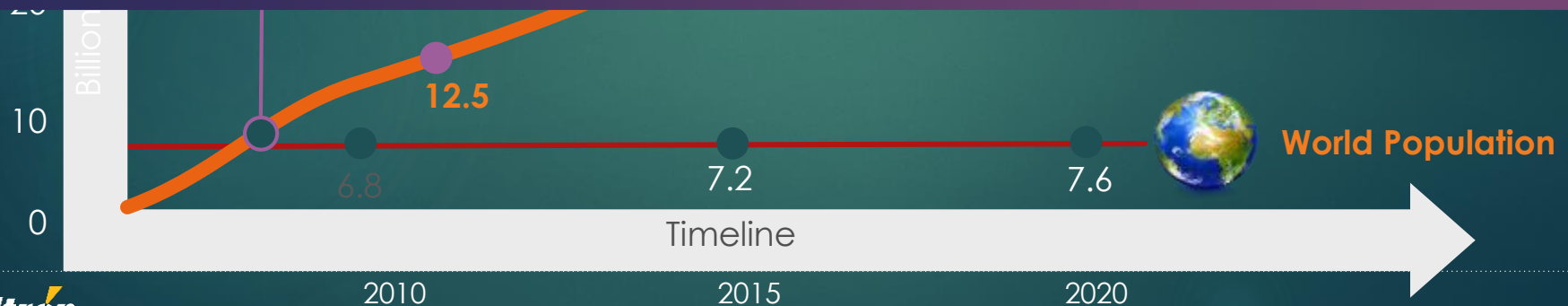>
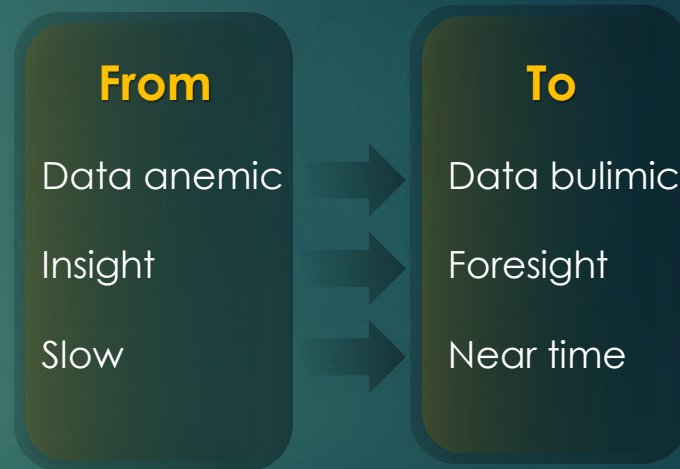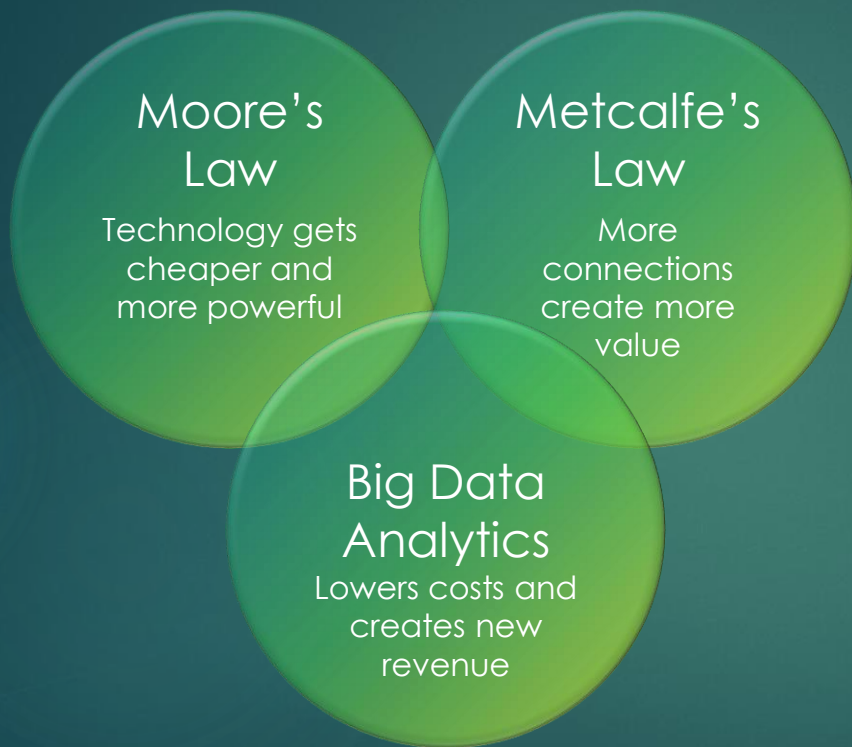> 8/18/2014

IoT Is Here Now – and Growing!

50 Billion "Smart Objects"

Adoption rate of digital infrastructure:

Application Centric Essential Infrastructure

12.5

World Population

6.8   7.2   7.6

Timeline

2010   2015   2020

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Convergence Leading to IoT

Moore's Law
Technology gets cheaper and more powerful

Metcalfe's Law
More connections create more value

Big Data Analytics
Lowers costs and creates new revenue

From	To
Data anemic	Data bulimic
Insight	Foresight
Slow	Near time

LOWER RUNNING COSTS – SELL THE DATA STREAM – AMPLIFY THE PRODUCT – CREATE NEW VALUE*

*Frog design: IoT Signals

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The Opportunity: Turning Big Data into Wisdom

Big Data Doubles Every Two Years

- 90% of world's data created in last 2 years
- More new data generated in 2012 than prior 5,000 years
- By 2020, 40% of data will come from sensors
- WalMart collects 2.5 petabytes of data hourly from customer transactions

More Important

Wisdom (Scenario Planning)

Knowledge

Information

Data

Less Important
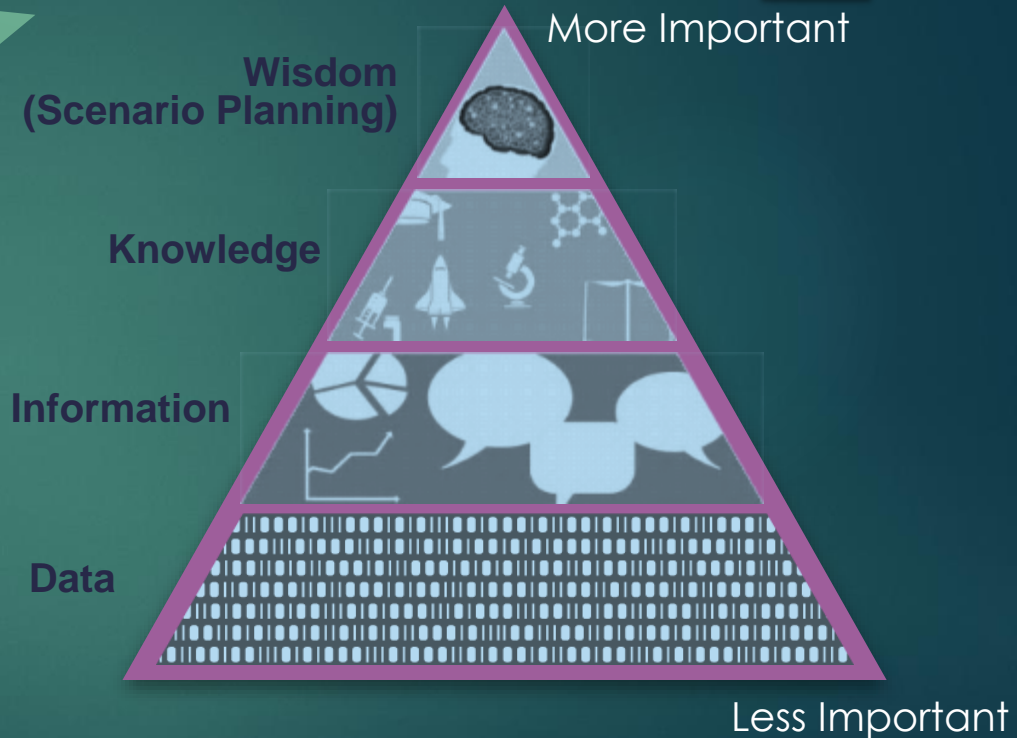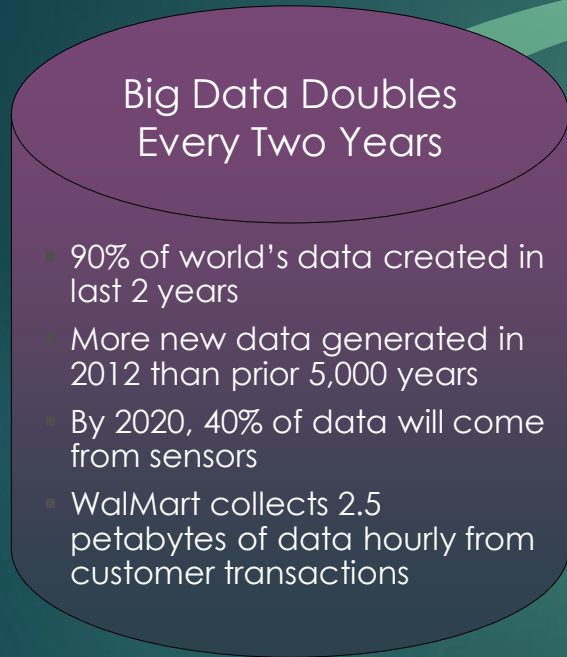
Big Data becomes Open Data for Customers, Consumers to Use

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The Internet of Everything - $19T Value at Stake

39% of the world's population is connected

Technology powers **80%** of business processes

People

Process

Things

Data

13B Connected things

More data in 1 year than in previous **5000**

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What Fuels Internet of Everything Value at Stake?

$19 TRILLION*

Asset Utilization	Employee Productivity	Supply Chain/Logistics	Customer Experience	Innovation

The Internet of Everything has the potential
to grow global corporate profits by 21% in 2022
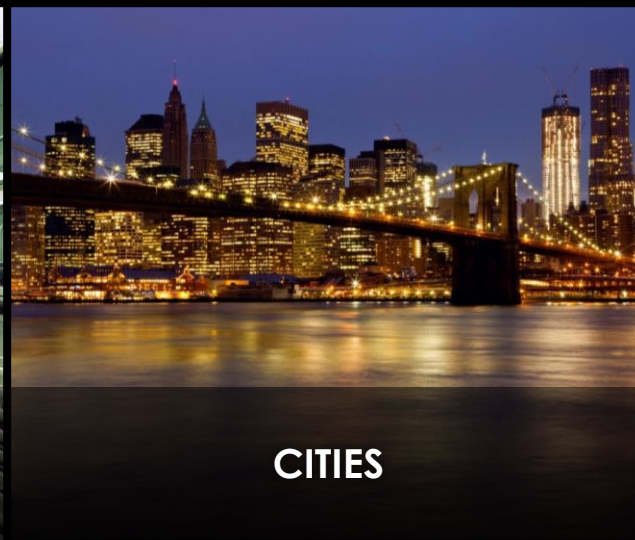
*2013–2022

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OIL & GAS

MANUFACTURING

ENERGY

TRANSPORTATION

CITIES

VENUES/RETAIL

IoE is Driving Powerful Business Outcomes

Improved Experiences	Fuel Innovation	Increase Efficiency	Create New Markets	Unlock Intelligence	Minimize Risk
25-50% Faster Checkout	**+400%** Production	**20%** Improvement	**+$3M** Revenue	**+$68M** Revenue	**10K** Students

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Global Utility CxO…

What's on your Mind

Align Markets & Regulation to Public Policy

Asset Optimization…Improving Reliability & Utilization

Workforce Productivity…Safety, New Skills, Knowledge Transfer

Investment Protection…Business & Technology Alignment

Security, Security, Security

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Energy Trends

- **Solar power**
  - Technological innovations, smart govt regulations, Chinese industrialization and creative financing. Solar panels becoming cheaper and more accessible

- **Energy Storage (Batteries at scale – Grid and Home)**
  - Ability to unlock greater potecial for renewable power

- **Upgrading the Grid**
  - Required to take advantage of new methods of generating and distributing electricity

- **Power to the poor**
  - 2B people don't have access to electricity. Best way to fight poverty is to provide electricity

Source: April edition of Foreign Affairs – Energy's hottest sector

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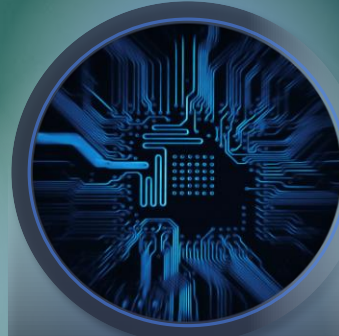
Intelligent Energy…

OBSERVABLE

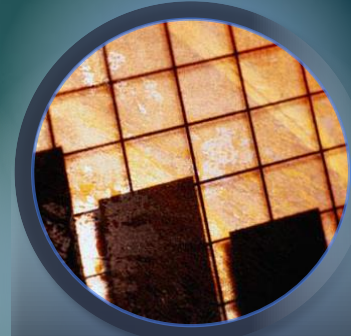Full determination of grid state— deep situational awareness

AUTOMATED

Rapidly adapt to changing conditions with minimal human Supervision

INTELLIGENT

Ability to carry out necessary actions across the grid via M2M Intelligence

TRANSACTIVE

Dynamically linking diverse and distributed market participation

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Smart Utilities

▶ Industry undergoing a major overhaul

Reliability

134%

Increase in large grid outages in 2005-2009 vs the previous 4 yrs

Peak Capacity

30%

of '05-'09 peak capacity for New York and New England was wasted, being used for <12% of the time

Investment

$1T

Expected investment in grid transmission and distribution through 2030

Response time

60-100x

faster response times will be required to balance supply and demand with renewable sources

Source: University of Minnesota, MIT The future of electric grid, Resnick Institute

IoE Vertical Solutions

GTM

| Industries	Verticals	Solutions & Use Cases			
Public Sector	Connected City	SCC Infrastructure Management (City WiFi, **Parking**, **Lighting**, Location, Traffic Safety & Security)		Workspaces (Smart Spaces & REGS)	
	Connected Public Safety	Connected Schools	Connected Border	Connected Law Enforcement	Connected Defense
Manufacturing	Connected Factory	Connected Factory Energy Mgmt.	Connected Factory Wireless	Connected Factory Security	Connected Factory Automation
Energy and Minerals	Connected Utilities	Connected Mobile Workforce	Connected AMI	Connected Substation Automation	Connected Distribution Automation
	Connected Oil & Gas	Connected Pipelines	Connected Refinery	Secure Ops	Connected Oilfield
	Connected Mining	Asset Visibility & Monitoring	Connected Predictive Maintenance	Connected Mine Remote Operations	Secure Ops
Transportation	Connected Transportation	Connected Roadways	Connected Trains	Connected Stations	Connected Trackside
B2C	Connected Retail	Store-in-a-box	CMX digital Experience	Remote Expert/ Mobile Advisor	Digital Media Store Experience
	Connected Sports and Entertainment	Connected Stadium	Connected Stadium Wi-FI	StadiumVision	StadiumVision Mobile
	Connected SP /M2M	Remote Tower Management		Fleet/Asset Management	
	Connected Health	Virtual Patient Observation	Patient Wayfinding	Patient Media Experience	Cisco Health Presence
	FSI	Omni-channel Customer Interaction	Pervasive Employee Collaboration	In branch experience	Energy Management

IoE Sales, BT

Ecosystem partners

CCS

Services (AS,TS)

Soln SKUs (IVSG)

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 ▪ Reduced downtime ▪ Zero touch deployment ▪ Converged NWs (cost) ▪ Rapid Fault Isolation (uptime)	▪ Flexibility in network design ▪ Media Agnostic network services ▪ Scalability and interoperability	▪ Data Uploaded in Seconds with 4G/LTE ▪ Handles Multiple Wireless Laptops, Smartphones, Tablets Simultaneously ▪ Machine-to-Machine Communications for Background, Telogis, Next Step Tasks while Field Crews are Working	▪ Upgrade legacy SCADA systems ▪ Scale network to support growing number of telemetry devices ▪ NERC/CIP, IEC 61850-3 and IEEE 1613 compliance
Solution BOM	▪ CGR 1240, CGR 1120 ▪ CG-NMS ▪ Endpoint Reference Design ▪ Advanced Services	▪ 819 ▪ Head End in a Box	▪ 819 ▪ Head End in a Box	▪ CGR 2010, CGS 2520, ASR 903

Cisco Connected Utility GridBlocks™
An IoT Approach To Grid Modernization

**Reference Model**

Applications
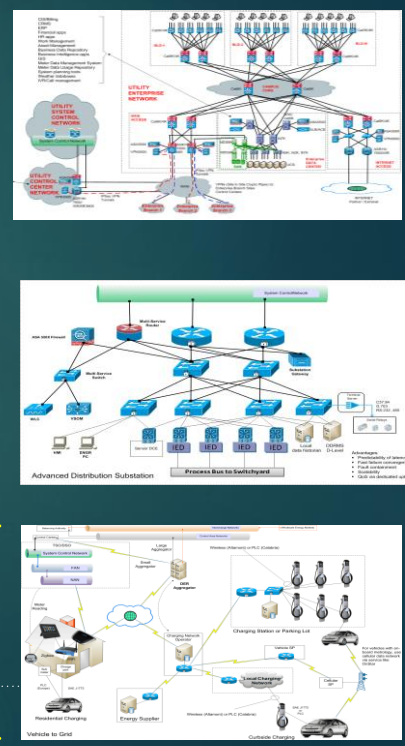
Use Cases

Architectures
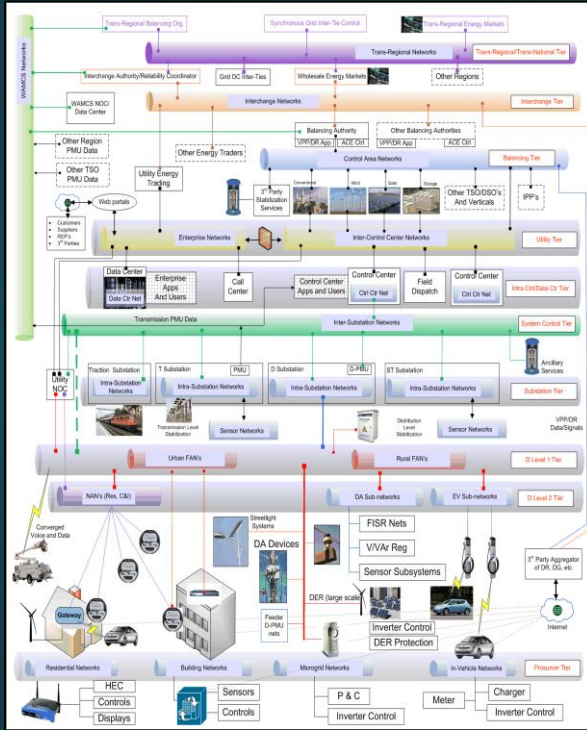
Applications:
- supervisory control and data acquisition (SCADA)
- Wide Area Monitoring
- Substation Automation
- Tele-Protection
- System Integrity Schemes
- Substation Physical Security
- Remote Workforce Management
- Remote Configuration
- Advanced Meter Reading
- Dynamic Line Rating
- Fault Isolation and System Restoration (FISR)
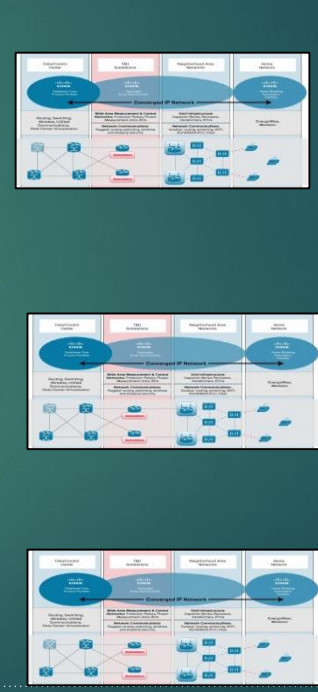
Utilities: Grid Automation and Smartgrids

OPPORTUNITY

Monitoring and Control of Grid Assets

OUTCOMES

Fiscal: Cut Energy Theft by 75%

OPEX: $11 savings/year per customer

(eg. BCH $22M w/2M customers)

INFRASTRUCTURE SOLUTION

Cisco FAN w/PLC or RF mesh

Oilfield: Production Measurement & Control

OPPORTUNITY
Production Monitoring & Control of Oilfield Pumpjacks

OUTCOMES
OPERATIONAL SAFETY
2% INCREASED PRODUCTION
10% LOWER OPEX

INFRASTRUCTURE SOLUTION
Cisco FAN w/ RF Mesh Gateways

Pipelines: Compliance Monitoring

OPPORTUNITY

Video Monitoring of Pipeline for Compliance

OUTCOMES

ENVIRONMENTAL RISK

50% LOWER OPEX

INFRASTRUCTURE SOLUTION

Cisco Video Surveillance via 4G

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Cisco IoE/IoT Position and Leadership

Network Platform

- Cloud
- Intelligent Network
- Data Center
- Fog Computing

Technology Portfolio

- Net Connectivity
  - Routing, Switching, Wireless
- Security
  - Cyber and Physical
- Net Management
- App Enablement
  - Fog Computing

Investment Fund

- $250M so far
- Alchemist Acceleration
- Ayla Networks
- EVERYTHNG
- etc.

Innovation Centers

- London, UK
- Rio de Janeiro, BR
- Songdo, KR
- Toronto, CAN
- Barcelona, SP

IoT World Forum

Internet of Things World Forum
Hosted by CISCO

- 2nd Year
- Chicago
- Oct 14-16
- 1,500 Attendees

Global Partner Ecosystem

- Rockwell Auto.
- Schneider Electric
- Itron
- AGT
- Emerson
- Honeywell
- Black and Veatch

Standards Development

- IEEE
- IETF
- 3GPP
- IIC
- Wi-SUN

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Your **Internet of Things** Strategy—Where are You?

Business Process Innovation

Technology Architecture

IT's Role in IoT— Org Structures

Process and Cultural Changes

Security and Privacy

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THANK YOU