

# **Cloud computing 2015**

## **Panel CLOUD/SERVICES**

**From Services to Data Centers: What Do We Have  
to Consider for Standardizing in Cloud  
Computing?**

**Yong Woo LEE, Ph.D.**  
**Professor, University of Seoul**  
**President, Smart (U-City) Consortium for Seoul, Korea**  
**Director, Seoul Grid Center**  
**Chair, The Korean National Committee for ISO JTC1/SC22**

**2015. 3. 23**

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# Panelists

- Dr. Ali Bashir, Osaka University, Japan
- Dr. Cengiz Orencik, Sabanci University, Turkey
- Dr. Yong Woo LEE, University of Seoul, Korea

# Topics – Cloud Computing Standards

1. Who works for them?
2. What is current shape?
  1. NIST's approach. 2. ISO. etc..
3. Do we need cloud standards now?, That is, is it proper time to have it?
4. Why?
5. What benefit? Vs. What disadvantage?
6. What obstacles?
7. Essential things to be considered: What do you think to be considered for standards.
8. Pitfalls.
9. Any suggestion welcomed!

# Who works for cloud standards? (1)



# Who works for cloud standards? (2)

- American National Institute of Standards and Technology (NIST).
- “The mission of is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security.”

# Who works for cloud standards? (3)

- Welcome to the Cloud Standards Wiki !
- [http://cloud-standards.org/wiki/index.php?title=Main\\_Page](http://cloud-standards.org/wiki/index.php?title=Main_Page)

# Cloud Computing Standards

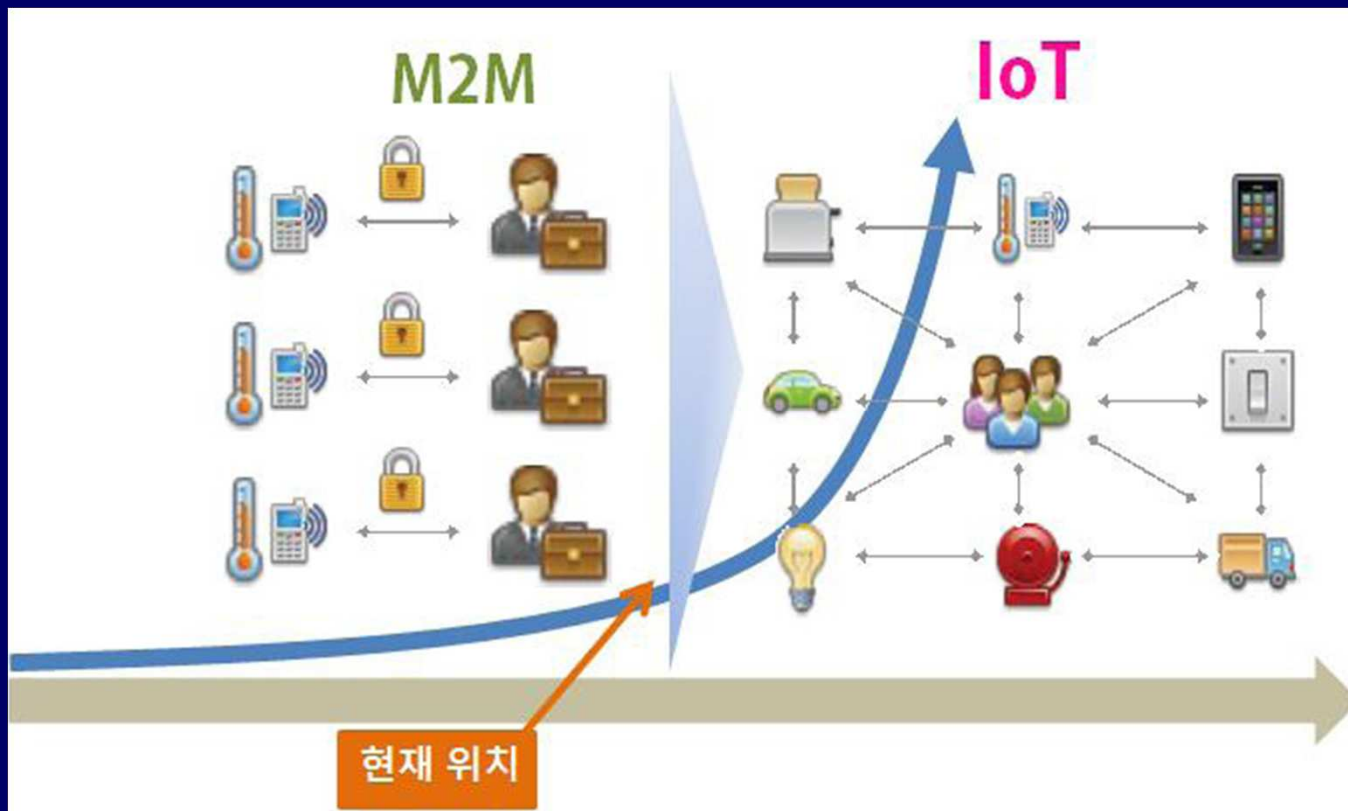
- Essential for smart devices in IoT/IoE.

# IoE

- “Companies and organizations explain the Internet of Things in various ways, but the Internet of Things, or IoT, is most commonly described as an ecosystem of technologies monitoring the status of physical objects, capturing meaningful data, and communicating that information through IP networks to software applications.”
- “The recurring themes in all definitions of the Internet of Things include smart objects, machine to machine communication, RF technologies, and a central hub of information.”
- See more at <http://blog.atlasrfidstore.com/internet-of-things-and-rfid#sthash.maX6z58Z.dpuf>



# Korea thinks



# IoE by Intel

## Intelligent Systems for a More Connected World

**WHAT ARE INTELLIGENT SYSTEMS?**

Intelligent Systems are devices that transform how we travel, shop, make things and more.

**7 Connected Devices per Person**  
By 2020 each person will own an average of 7 connected devices<sup>1</sup>.

**COMMUNICATIONS**

**Connected**  
Shares data through Internet and the cloud

**Managed**  
Can be remotely monitored, updated and power controlled

**Secured**  
Protects data against malware, theft and tampering

**#2 Data Breach**  
Medical data disclosure is the second most breached source of data<sup>2</sup>.

**MEDICAL**

**71% of Shoppers are Multi-Channel...**  
based on respondents planning their 2011 holiday shopping<sup>3</sup>.

**RETAIL**

**23.6M Connected Cars**

23.6 million cars will have Internet access by 2016, rising from 8.7 million in 2010<sup>4</sup>.

**VEHICLES**

**30% Annual Growth Rate**  
Projected increase in connected machine-to-machine devices over the next 5 years<sup>5</sup>.

**INDUSTRIAL**

1) Cisco, "The Internet of Things: How the Next Evolution of the Internet is Changing Everything", April 2011  
 2) Bloor Research, "Security challenges in the US healthcare sector" White Paper, December 2010, http://www.mcgraw-hill.com/us/resources/white-papers/wp-bloor-healthcare-security.pdf  
 3) Deloitte U.S., 2011 Annual Holiday Survey, http://www.deloitte.com/assets/Docum-UsIneStates/Local%20Assets/Documents/Consumer%20Business/us\_retail\_AnnualHolidaySurvey\_2011\_pc\_102611.pdf  
 4) McKinsey Global Institute analysis, "Big data: The next frontier for innovation, competition, and productivity," June 2011  
 5) Wall Street Journal, http://online.wsj.com/article/SB10001424052702304066504576349763614933844.html, estimate from research firm, Frost & Sullivan

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# IoT by iStockphoto/chris\_lemmens



# Cloud Computing Standards

- Essential for the smart city.

# Smart City



- A future city
  - Is a ubiquitous City
  - converges ICT & City.
  - allows the citizens to use the services anytime, anywhere and with any accessing devices.
  - covers a wide range of areas.

# Cloud Computing Standards

- Essential for the E-government.

# Government Integrated Data Center

- Separately managed information systems are consolidated by establishing NCIA

Information systems of government agencies integrated and managed together



## Seamless & Flawless Operation Achieved

- Stable integrated IT management for 24 / 7
- Monthly system failure time : 67min ▶ 1.15min



## IT Management Improved

- 67% of employees licensed for ITIL (IT Infra. Lib.)
- Number of systems managed per person : 1.8 ▶ 13



## Security Environment Consolidated

- 8-layer protection / 4-step analysis against intrusion
- Cyber attack / intrusion detection system equipped
- Dual system for natural disaster relief



## Cloud Computing Standards

- Essential for Mobile computing.
  - 5<sup>th</sup> Generation : 50 Gigabps speed.
  - Giga Korea soon.
  - 2018 in Winter Olympic Game in Korea.

# Smart City & Internet of Things & E-government & Mobile computing

서울시 IT 콤플렉스



- Requires limitless computing power : IaaS
- Various software in mobile devices : SaaS
- Smart city deals with huge volumes of data usually and a wide range of data in real time mode usually.
- Human beings are a factor.

# Conclusion

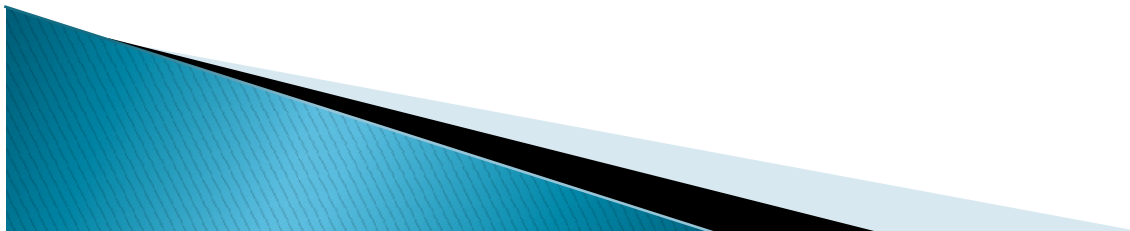
# Data Security and Privacy in the Cloud

Dr. Cengiz Orencik  
Sabanci University, TURKEY

Cloud Computing 2015  
Nice, France - March 22-27, 2015

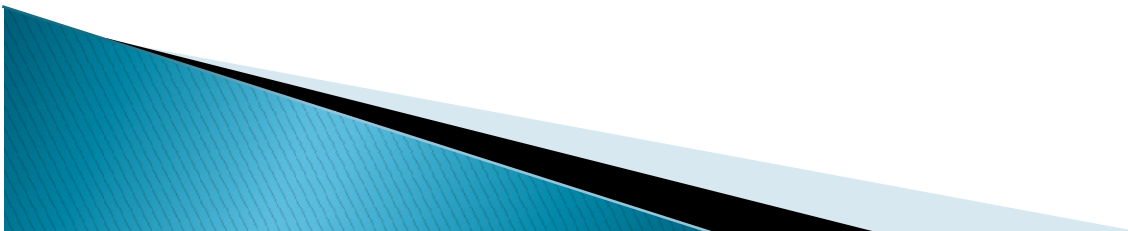
# Cloud Computing

- ▶ Users rely on external providers for storing, processing and accessing their own data
  - + high configurability
  - + 7/24 available services
  - + Scalable infrastructure
  - + Reduce costs
- ▶ Users lose control of their data
  - Security and privacy issues



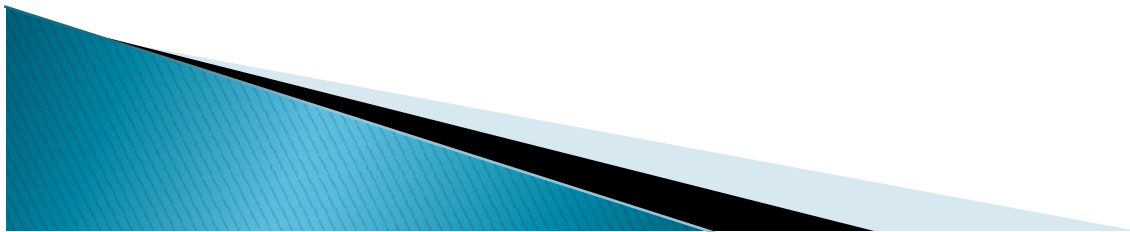
# CSPs security measures

- ▶ Encrypt user data
  - Functional but no protection
  - Protect only storage against outsiders
  - Full trust to CSP
- ▶ User encrypts data
  - Protects data
  - Limited functionality

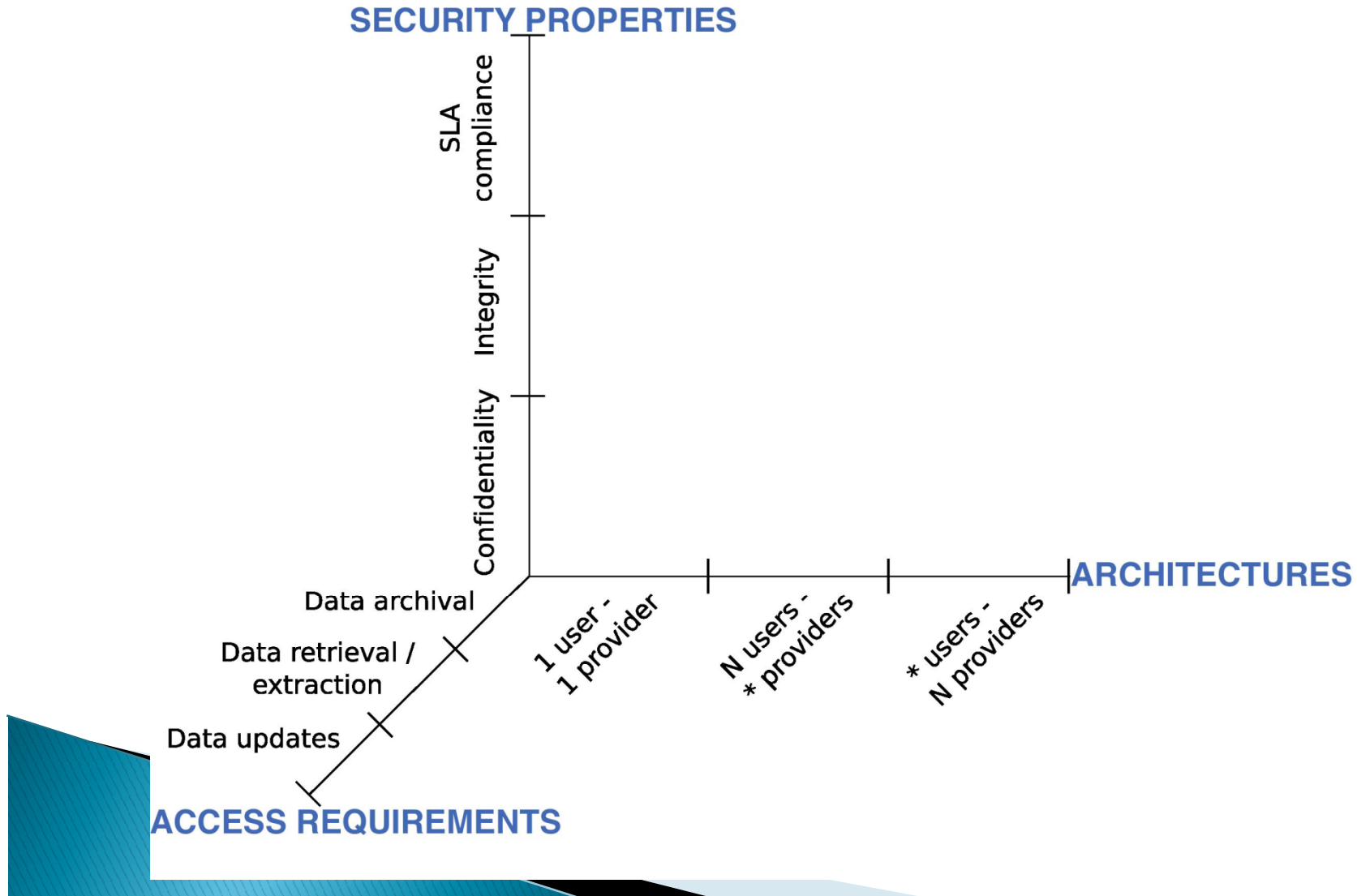


# Standardization of cloud security

- ▶ Immature & newly emerging
- ▶ Hard to achieve
- ▶ Trusted/ Untrusted CSP
- ▶ Different requirements



# Challenges







# Panel on Clouds/Services

Cloud Computing, Nice, France, 2015

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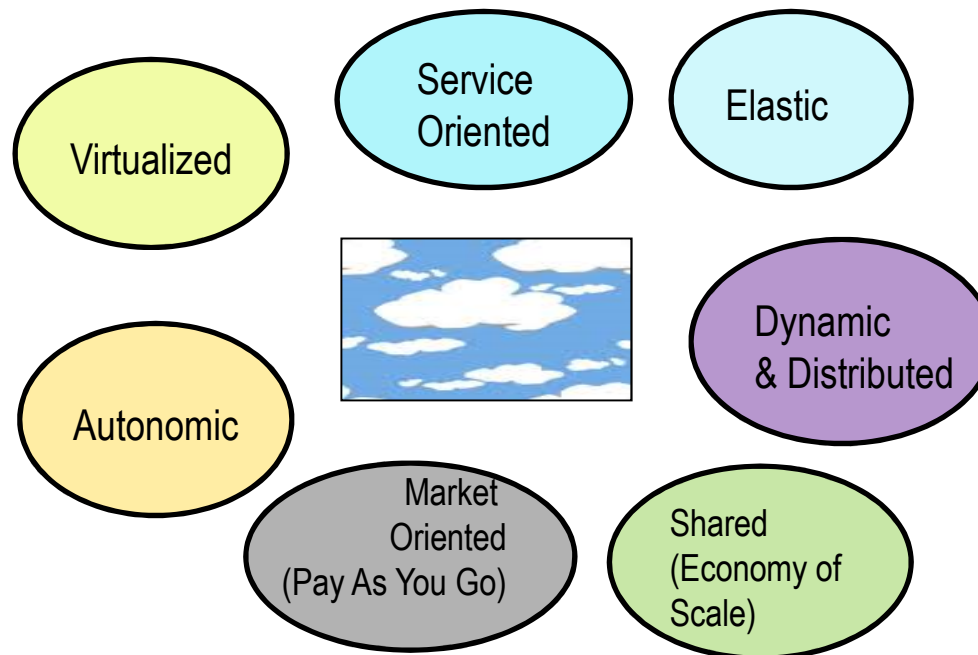
## Challenges in Enabling Internet of Things(IoT) for Clouds

**Dr. Ali Kashif Bashir.**  
Graduate School of Information Science and Technology,  
Osaka University  
([ali-b@ist.osaka-u.ac.jp](mailto:ali-b@ist.osaka-u.ac.jp))  
**2015.03.23**

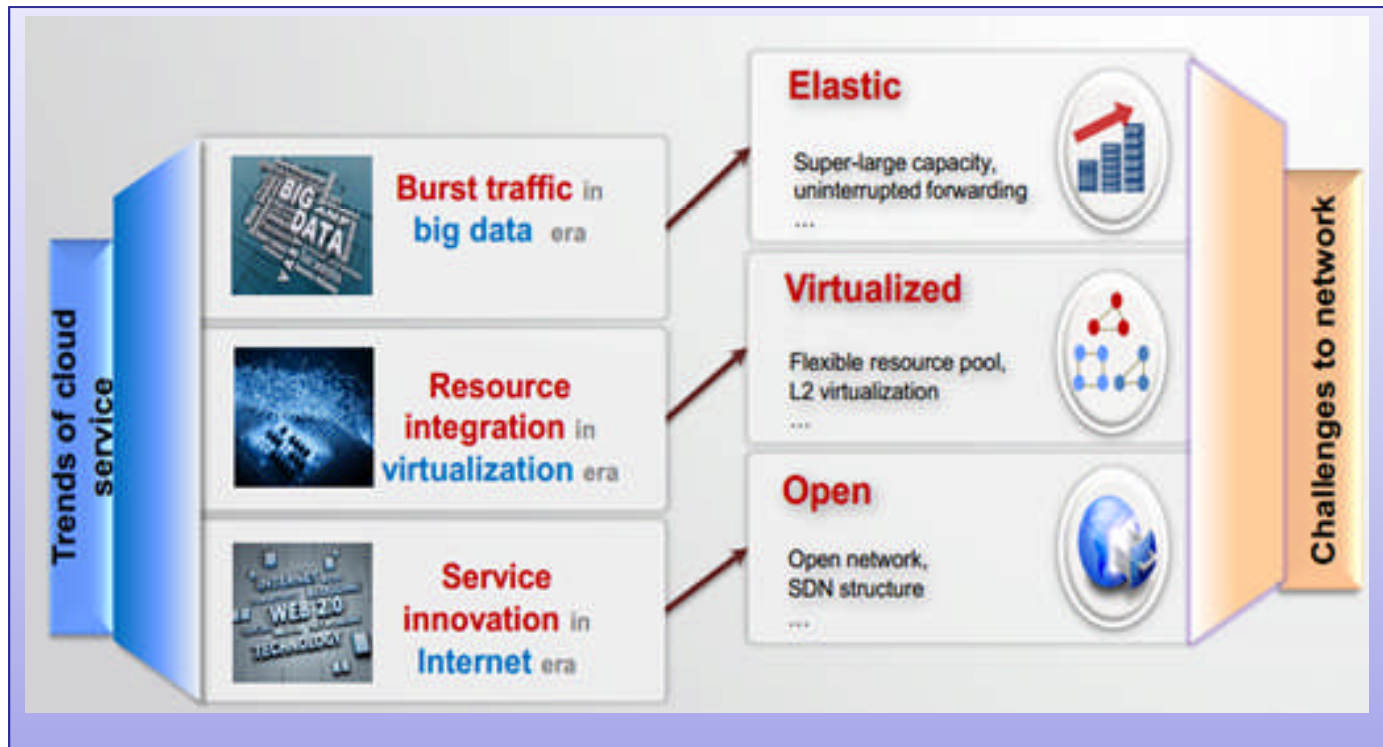
Acknowledgment: Ignario M. Llorente, Project director of OpenNebula.

# Cloud Computing?

Network based computing that takes place over the Internet.



# Trends in Cloud Services



# IoT over clouds

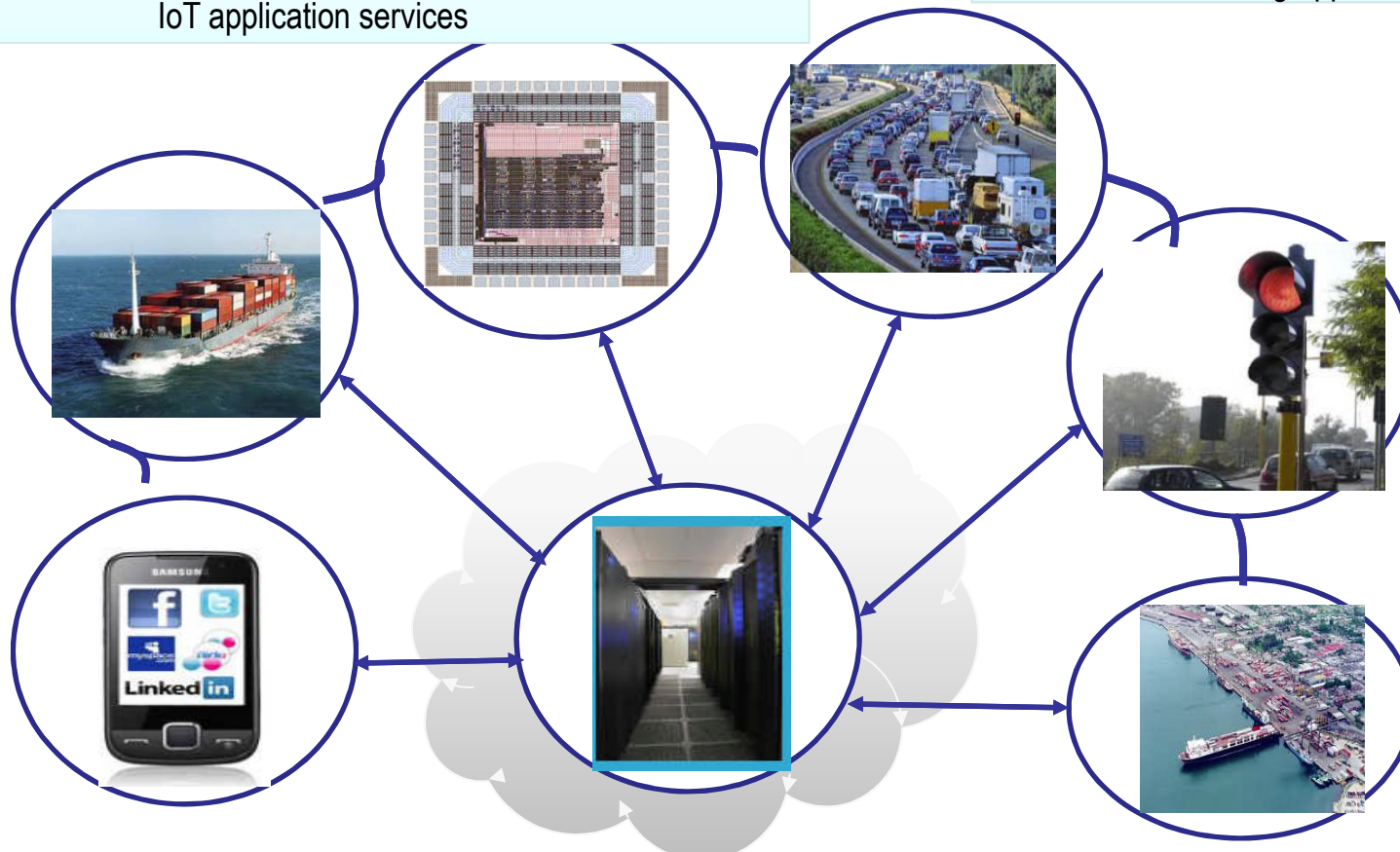
**1. Instrumentation:** Edge technologies allow objects to participate in IoT

**3. Communication:** Networking technologies to interconnect things

**5. Processing:** Cloud Infra. provides storage and computing to address IoT application services

**2. Interconnections**  
M/W's and architectures to share data

**4. Intelligence**  
Decision making application services



# IoT Requirements

IoT Requirements	Cloud Challenges
Dynamic resource demands	Support for application elasticity
Real-time needs	QoS assurance
Expected exponential growth of demand	Cloud infrastructure scalability
Data protection and user privacy	Cloud privacy and security
Efficient power consumption of applications	Efficient energy resource management
Execution of the applications near to end users	Cloud federation

**Cloud Computing is needed to address the dynamic, exponentially growing demands for real-time, reliable data processing of IoT.**

## Research Challenges for Cloud Computing to meet IoT Needs

- **Support for Application Elasticity**
  - Autonomous adaptation of services and context-aware applications
- **Quality of Service Assurance**
  - Efficient resource management to reserve, allocate, track and limit resource utilization
- **Cloud Infrastructure Scalability**
  - Scalable management of network, computing and storage capacity across multiple sites
- **Reliability**
  - Fault tolerance in cloud Infrastructures

# Research Challenges for Cloud Computing to meet IoT Needs

- **Security and Privacy**
  - Advanced secure multi-tenant environments
  - Data integrity and security mechanism
- **Interoperability and Portability**
  - Common and standard interfaces
- **Energy Efficient Cloud Management**
  - Energy efficiency models, metrics and tools at datacenter levels

## Panel Minutes

- **Panelist:** Dr. Ali Kashif Bashir, Dr. Cengiz Orencik, and Professor. Yong Woo Lee.
- **Panel Format:**
  - Professor Lee Introduces the Panelist.
  - Dr. Ali Kashif presented first , followed by Dr. Orencik, and Professor Lee.
  - After the panelist talks, a warm discussion of about 2 hours continues among panelists and audience.
- **Discussion Topics:**
  - Do we need Standardization for the cloud Computing?
  - Impact of standardization at the technology growth?
  - If standardization, then from where to start.
- **Outcomes:**
  - A minimum standard for cloud computing is necessary
  - to provide equal opportunity to all the cloud designers.
  - to stop the technology being misused.
  - Perhaps, security/privacy is the first step to start with.