Cloud Computing of Taiwan
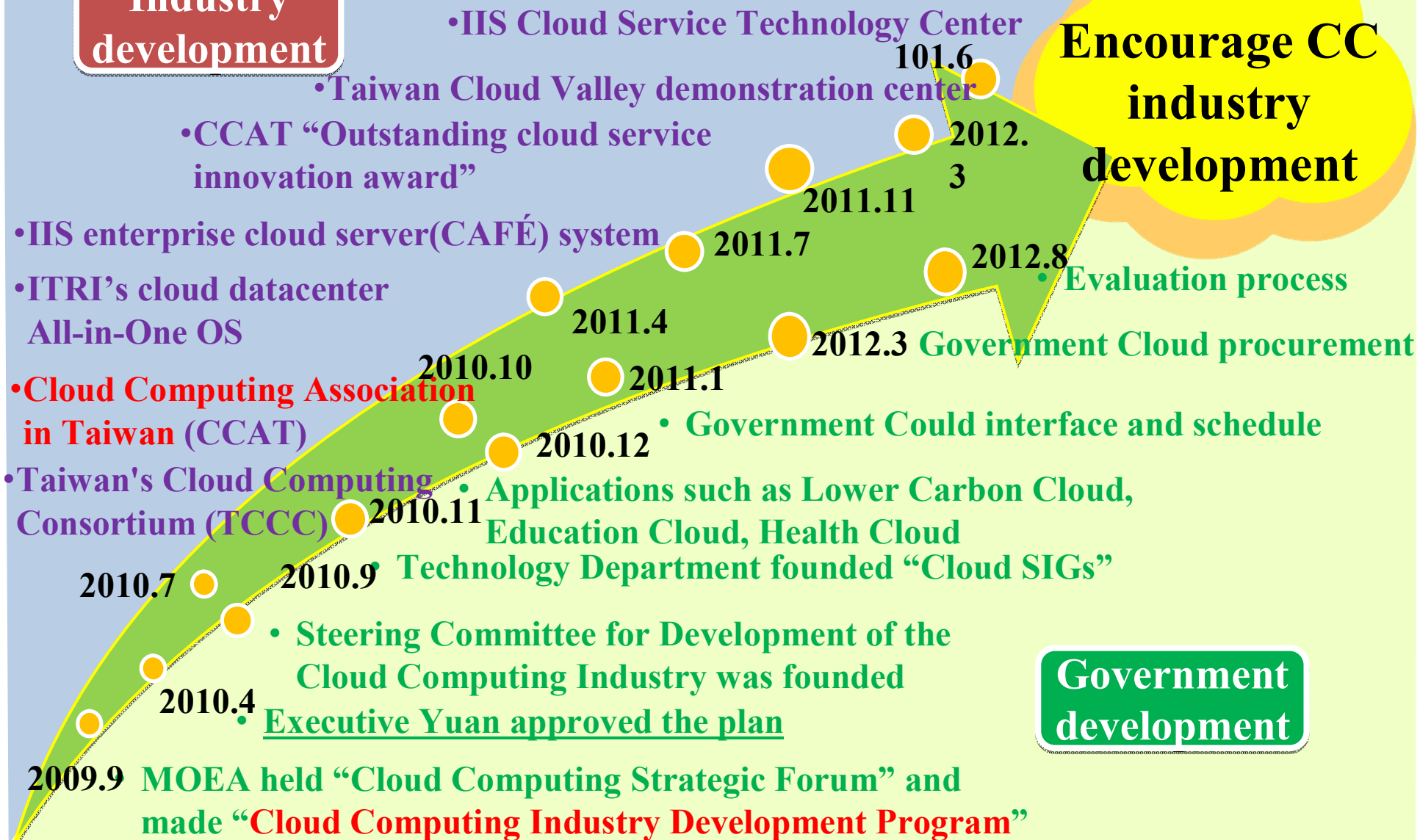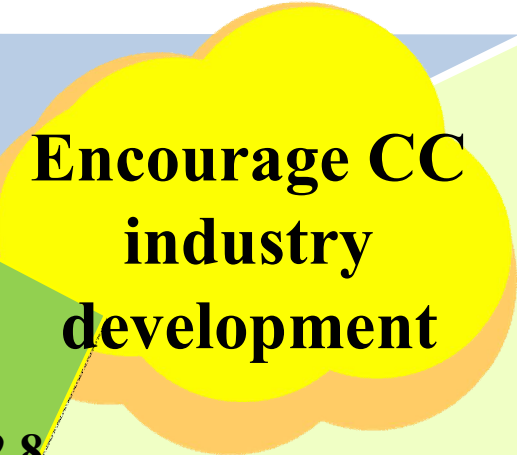
Pin-Jung Chiang

Information & Communication Security Lab.

ChungHwa Telecom.

Background and Application

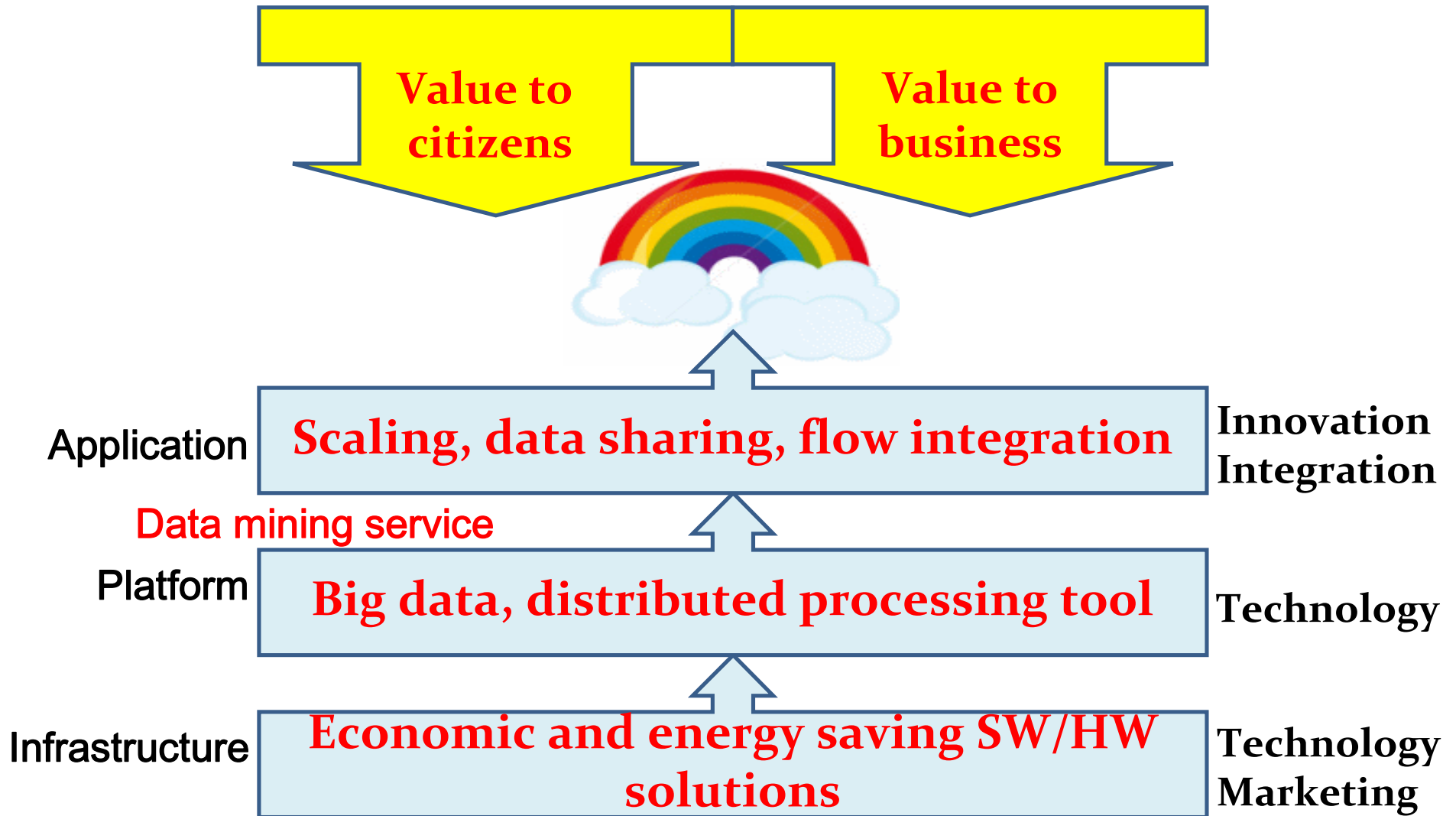- Trend of resource sharing in internet
  - ✓ Problem: application servers require high SW/HW costs, but the utilization was less than 30%
  - ✓ Problem: the peak / off-peak loading changes dramatically, and can't relocate resources
- Service coherence and economies of scale
  - ✓ gmail, facebook, Amazon, salesforce.com, …
- Real case
  - ✓ New York Times: scanning 11 millions news during 1851~1922 to 1.5TB data, storing them on Amazon EC2 just cost US$1,000
- Why Cloud? Sharing data through internet for value-added service

CC industry development

Industry development
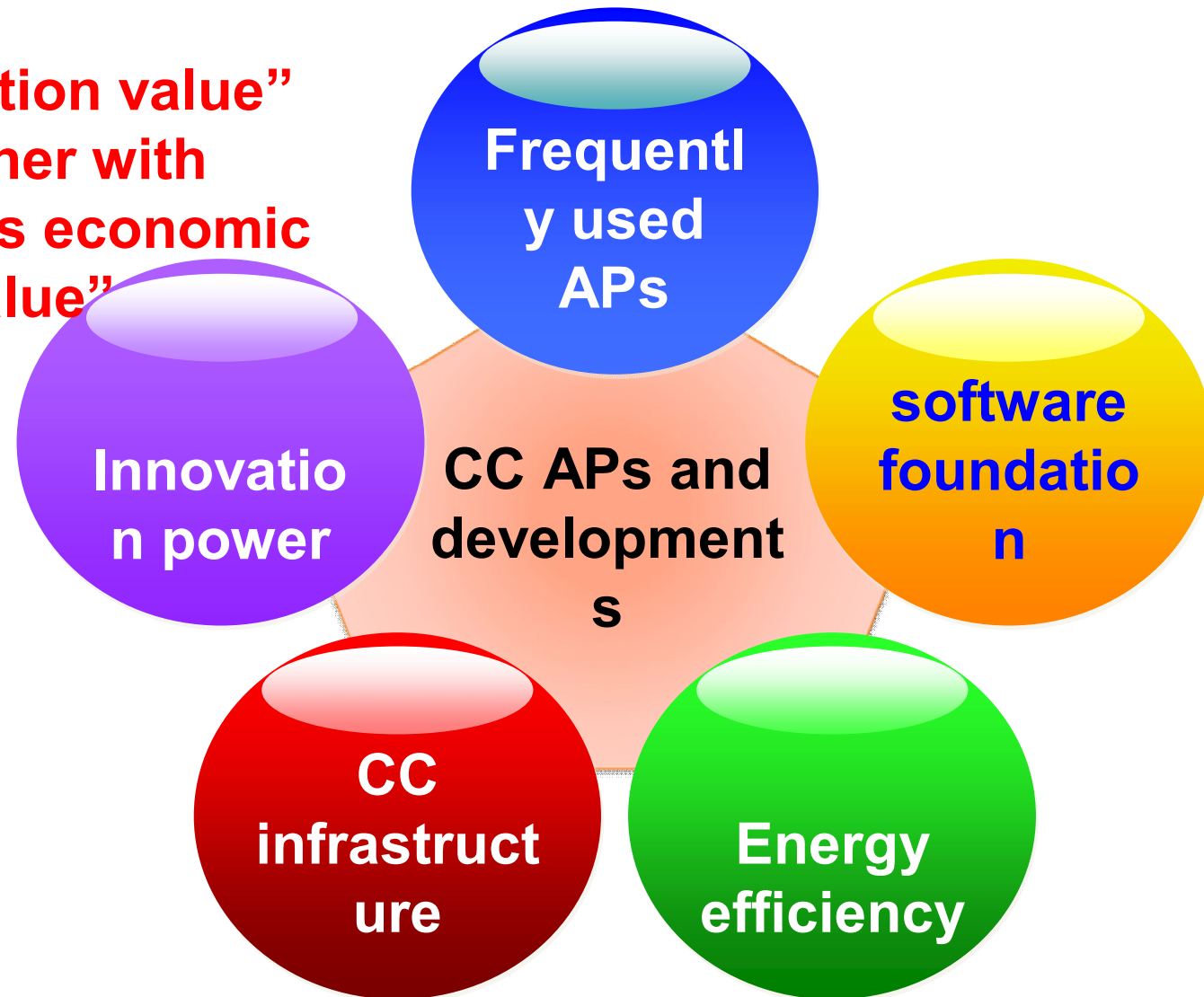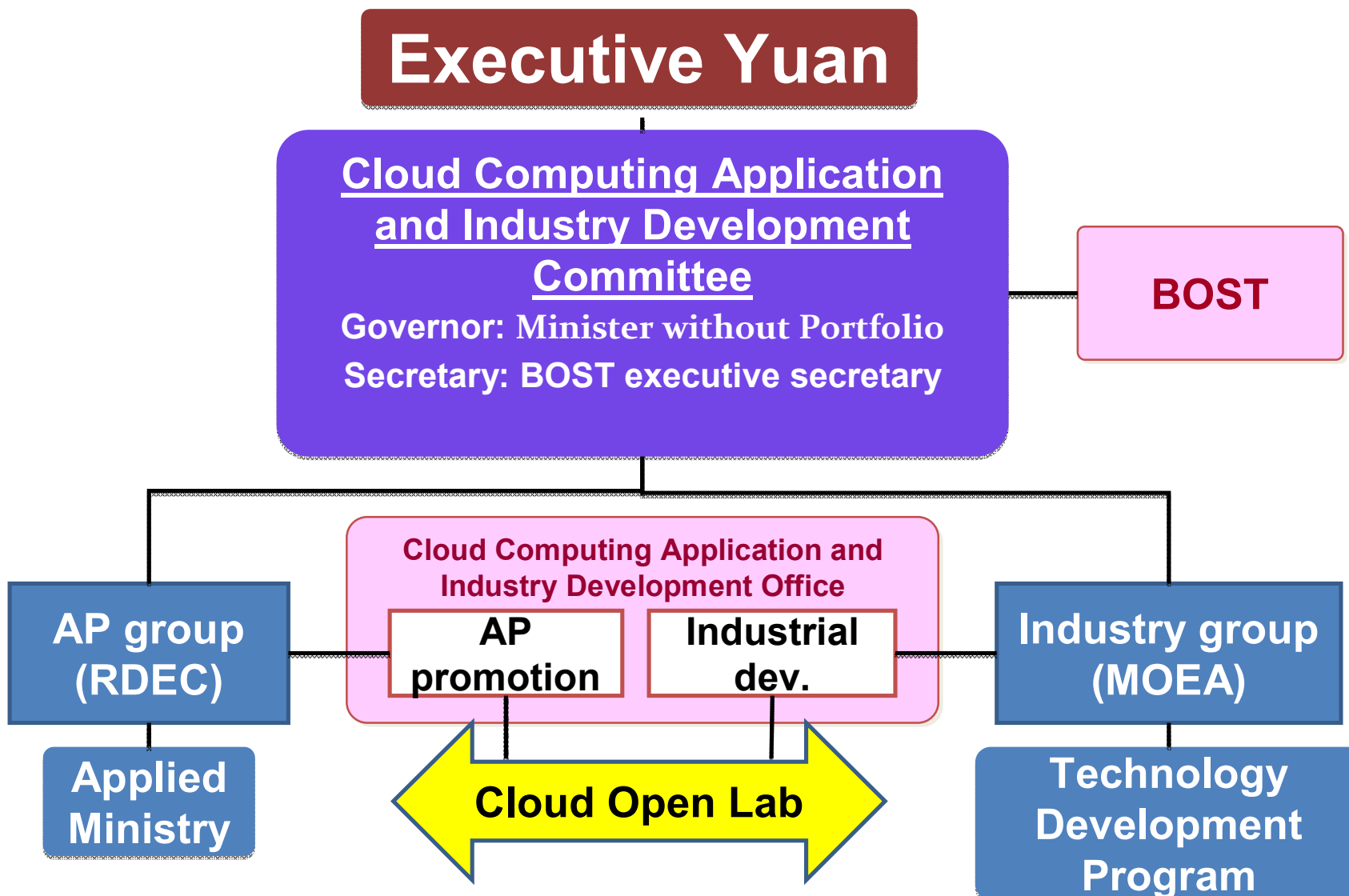
Encourage CC industry development

• IIS Cloud Service Technology Center

• Taiwan Cloud Valley demonstration center

• CCAT "Outstanding cloud service innovation award"

• IIS enterprise cloud server(CAFÉ) system

• ITRI's cloud datacenter All-in-One OS

• Cloud Computing Association in Taiwan (CCAT)

• Taiwan's Cloud Computing Consortium (TCCC)

101.6

2012.3

2011.11

2011.7

2012.8 • Evaluation process

2011.4

2012.3 Government Cloud procurement

2010.10

2011.1

• Government Could interface and schedule

2010.12

• Applications such as Lower Carbon Cloud, Education Cloud, Health Cloud

2010.11

Technology Department founded "Cloud SIGs"

2010.7

2010.9

• Steering Committee for Development of the Cloud Computing Industry was founded

Executive Yuan approved the plan

2010.4

Government development

2009.9 MOEA held "Cloud Computing Strategic Forum" and made "Cloud Computing Industry Development Program"

The Goals and Strategy

| Value to citizens | | Value to business |

Application — **Scaling, data sharing, flow integration** — **Innovation Integration**

Data mining service

Platform — **Big data, distributed processing tool** — **Technology**

Infrastructure — **Economic and energy saving SW/HW solutions** — **Technology Marketing**

CC Development Strategy

"Application value" together with "Business economic value"

Frequently used APs

software foundation

CC APs and developments

Innovation power

CC infrastructure

Energy efficiency

Cloud Computing Industry Development Program

Executive Yuan

Cloud Computing Application and Industry Development Committee
Governor: Minister without Portfolio
Secretary: BOST executive secretary

BOST

AP group (RDEC)

Cloud Computing Application and Industry Development Office

AP promotion

Industrial dev.

Industry group (MOEA)

Applied Ministry

Cloud Open Lab

Technology Development Program

Ministry Cooperation

- **BOST**
  - ✓ **Coordination**
  - ✓ **Flow integration**
- **MOEA**
  - ✓ **Industry and technology development**
  - ✓ **Technology guiding**
- **RDEC**
  - ✓ **Innovation planning**
  - ✓ **Transfer selected targets to cloud service**

- **Cloud Computing Application and Industry Development Office**
  - ✓ **Industry Development**
    - → **Technology development and promotion**
    - → **Construct Cloud Open Lab**
  - ✓ **Application Dev.**
    - → **AP's PMO**
    - → **Shared cloud infrastructure planning**

Evaluation Principal

	For application	For industries
1.AP	A. Application with innovation B. Large scaled application C. Flow re-intergration	
2.Middle ware and platfor m	A. Construct big data platform B. Massively Distributed Processing C. Open Data	A. Middleware for value-added application B. Big data processing toolkit C. Massively Distributed Processing
3.infrastr ucture	A. Using cloud infrastructure B. Maintain QoS while lower cost C. Energy saving	A. R&D cost effective products / solutions B. R&D energy saving products / solutions

Using Research Results

- ● **Eat your own dogfood!**
- ● **G-Cloud driving local ICT upgrades**
- ● **G-Cloud should use local technology**
  - ✓ **Bring the local technology to real world**
  - ✓ **Reduce the cost of G-Cloud**
  - ✓ **Guiding research direction by G-Cloud application**

**From user's
point of view**

**AP group
(RDEC)**

**Industry
Group
(MOEA)**

**From service provider's
point of view**

Cloud Open Lab.

Interacting with technology, platform and support
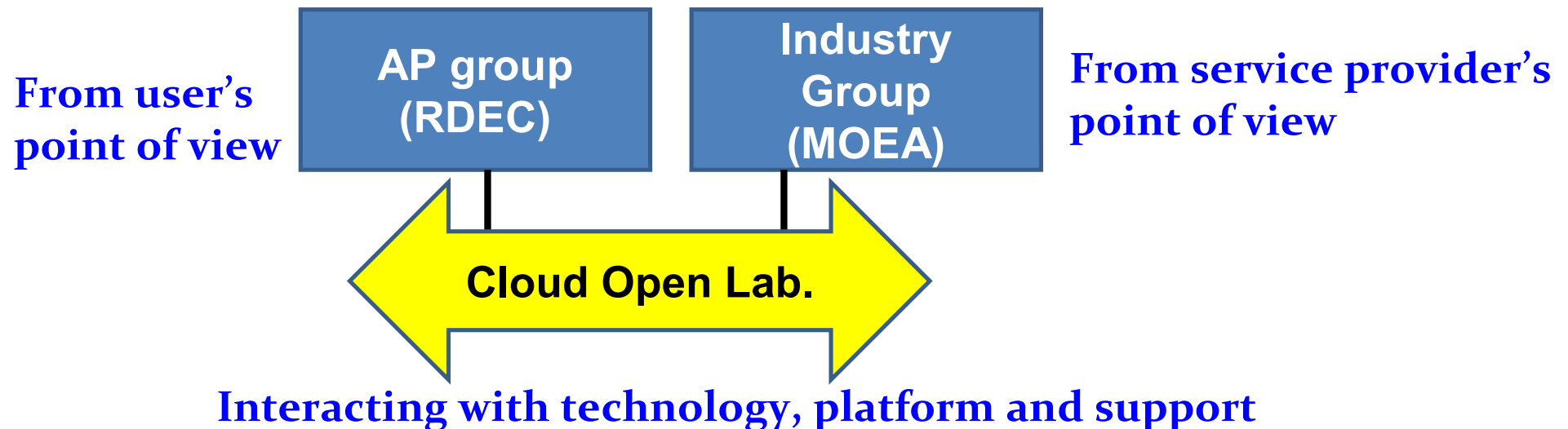
Applications of Government Cloud

Development of G-Cloud

Financial Cloud

Environmental Cloud
FY101-105

Traffic Cloud
FY101-104

Police Cloud
FY101-104

Food Cloud
FY101-102

Health Cloud
FY102-105

E-invoice Cloud
FY100-102

EPA

MOTA

NPA

DOIT

DOH

MOF

| Planing | Testing | Procurement | Promotion |

MOC

MOE

NFA

MOI

COA

RDEC

Cultural Cloud
FY101-104

Education Cloud
FY101-103

Disaster Relief Cloud
FY101-105

Map Cloud
FY101-102

Agriculture Cloud
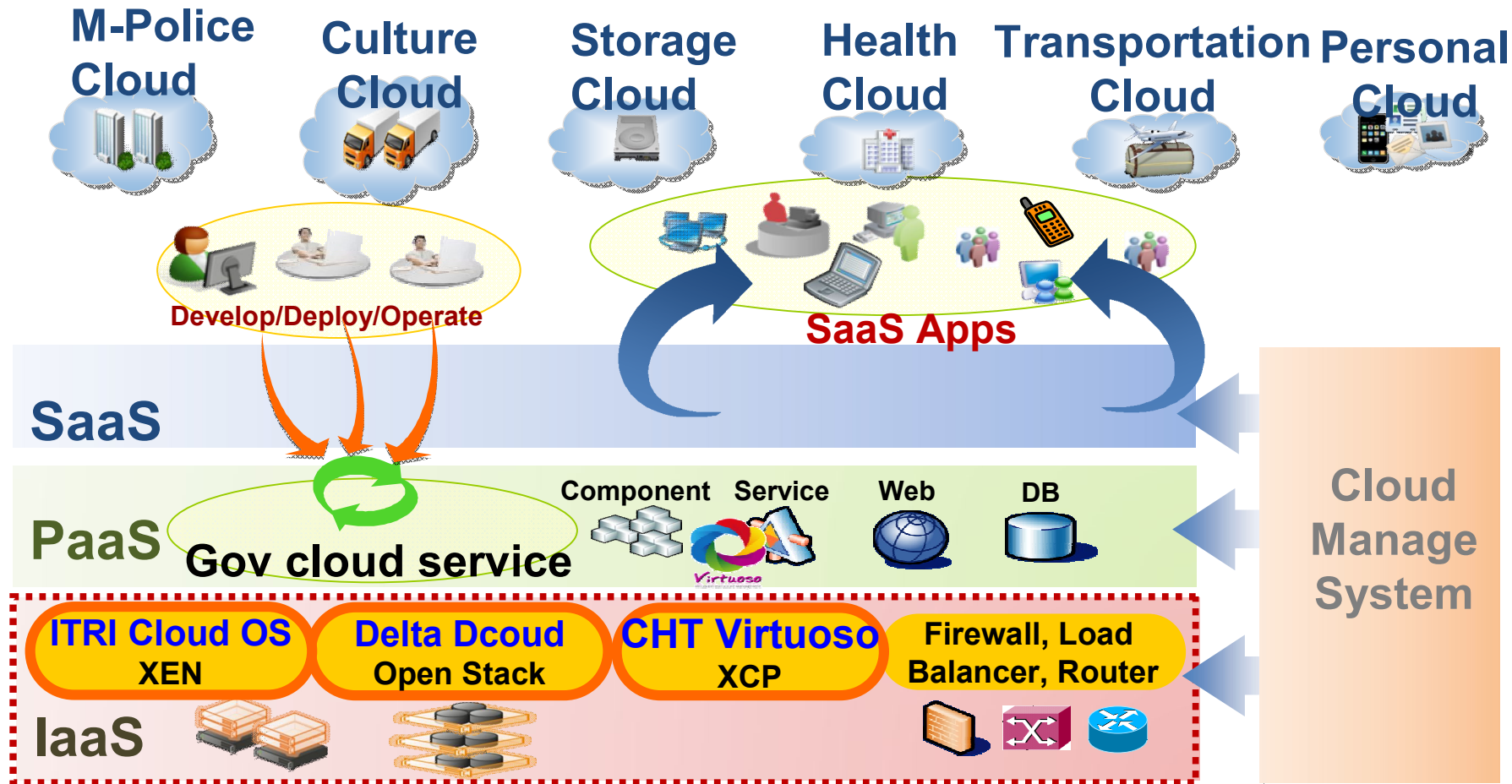FY102-105

E-Gov
FY101-105
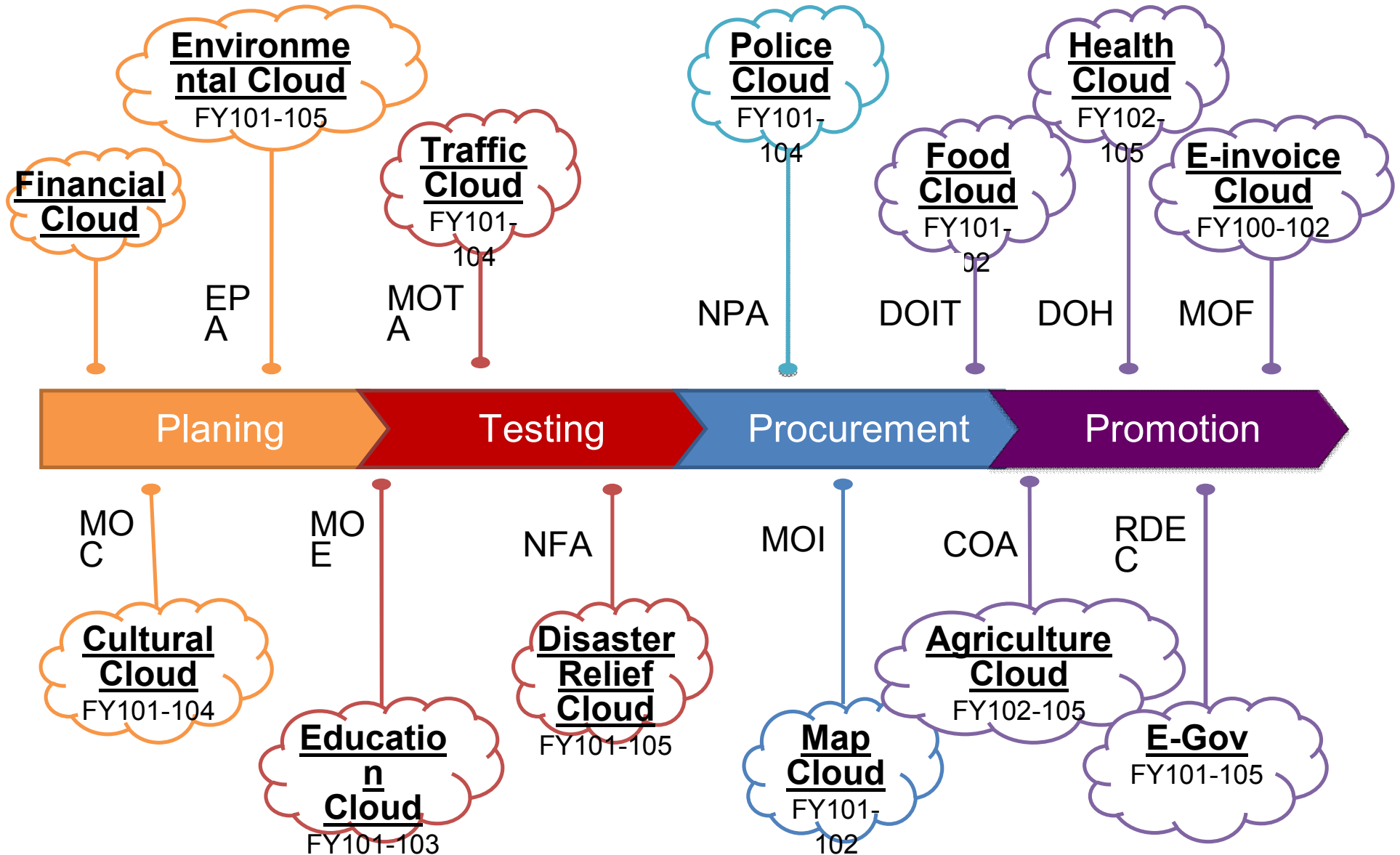
Cloud Service Architecture
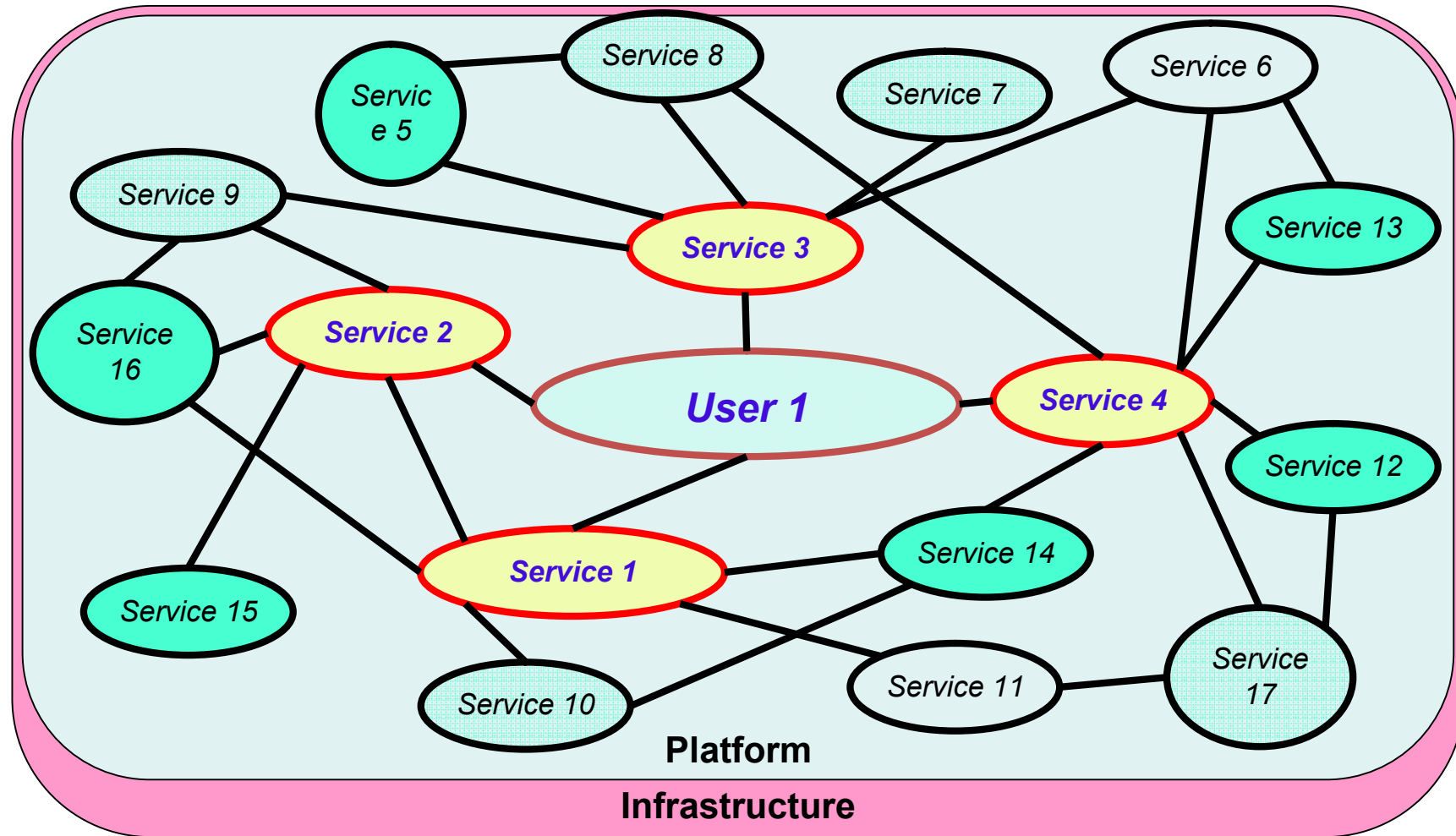
G-Cloud Infrastructure

- **G-Cloud focused on AP development, not on the infrastructure**
  - ✓ Reduce information budget by CC technology
  - ✓ Flow re-integration for better efficiency
- **Higher system availability**
  - ✓ Design "Cloud Data Center Operation Guidelines" to achieve better QoS
- **Energy saving program**
  - ✓ Government procurement and renting should comply to energy saving standard
  - ✓ Saving more than NT$400 millions (US$13 million) for academic's data centers

G-Cloud Infrastructure

**M-Police Cloud** **Culture Cloud** **Storage Cloud** **Health Cloud** **Transportation Cloud** **Personal Cloud**

Develop/Deploy/Operate

SaaS Apps

SaaS

PaaS **Gov cloud service**

Component Service Web DB

Cloud Manage System

ITRI Cloud OS XEN **Delta Dcoud** Open Stack **CHT Virtuoso** XCP **Firewall, Load Balancer, Router**

IaaS

Energy Saving Program

- **"Data center energy consumption measurement and energy efficiency management" program**
  - ✓**Bureau of Energy, MOEA in charge, cooperate with RDEC, Ministry of Education and Architecture and Building Research Institute**
  - ✓**Measuring the data centers' energy efficiency of sampled government agencies and schools**
  - ✓**Create energy efficiency measurement SOP**

Following Plan: Open Data

- **Legislation in several country like US, UK, etc.**
- **Opening government collected data for other AP**
  - ✓ **Trigger higher economic value than invested**
  - ✓ **Encouraging innovation of AP in private sector**
- **Open data should be used without charging**
  - ✓ **Data collected according to legislated process should not be charged while using**
  - ✓ **Charging on open data is an obstacle for application innovation**
- **NICI announced "Providing Public Data for Value-added Development of the Private Sector Development Guidelines"**
- **With open data, cloud application spread faster and experienced**

Government Open Data

Vision of open data AP

Gov.
efficiency

economic   sensible

Open data value added AP
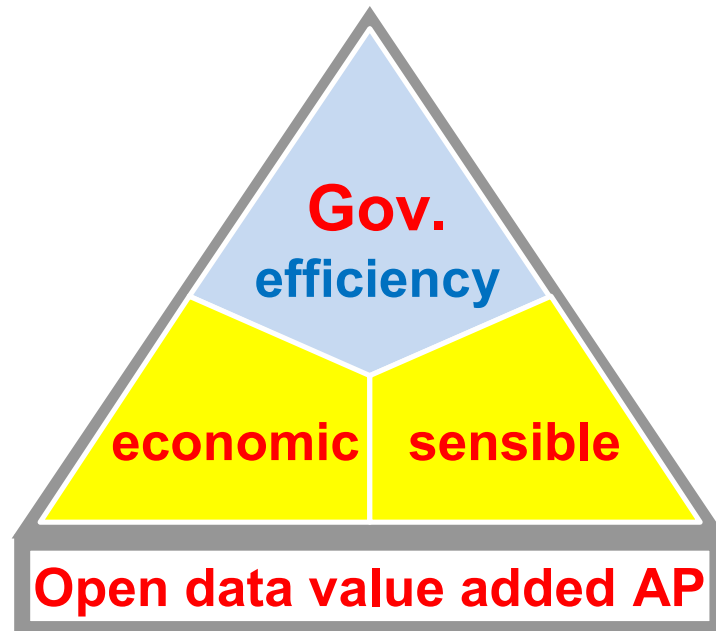
Obstacle of gov open data

- **Machine to machine interface standardize**
- **Lack of legitimate regulation on the open data**
  - ✓**Current regulation on data reusing**
    - →**Taiwan Geospatial One Stop platform**
    - →**Operation Guidelines for the Research Data Supply of IOT, MOTC**

Authorization and charging

- Authorization mechanism of open data
  - ✓ Only few gov agencies have regulation
- Charging on open data reusing
  - ✓ According to the law, authority may exempt the fee
  - ✓ Royalties

E-Government to G-Cloud

Service type	Current APs	Cloud APs
Exchange	•E-doc. exchange •Email exchange	•Cloud storage and exchange •Cloud email service
Integration	•HR manage sys. •Property sys. •Budget sys. •Data exchange sys.	•Cloud HR manage sys. •Cloud property manage sys •Cloud budget manage sys •Cloud service platform
Security	•Single sign on •IDS, email scan •Web privacy check	•Cloud authentication (certificate + open id) •Cloud IDS/IPS •Cloud web privacy check

Thank You !