

Inter-Cloud Computing and Networking for Secure Social Infrastructure

Atsuhiro GOTO

Institute of Information Security (IISec)
Global Inter-Cloud Technology Forum (GICTF)

GICTF

Shonan Meeting Oct 14-17, 2012

1

Who am I?



GICTF

Shonan Meeting Oct 14-17, 2012

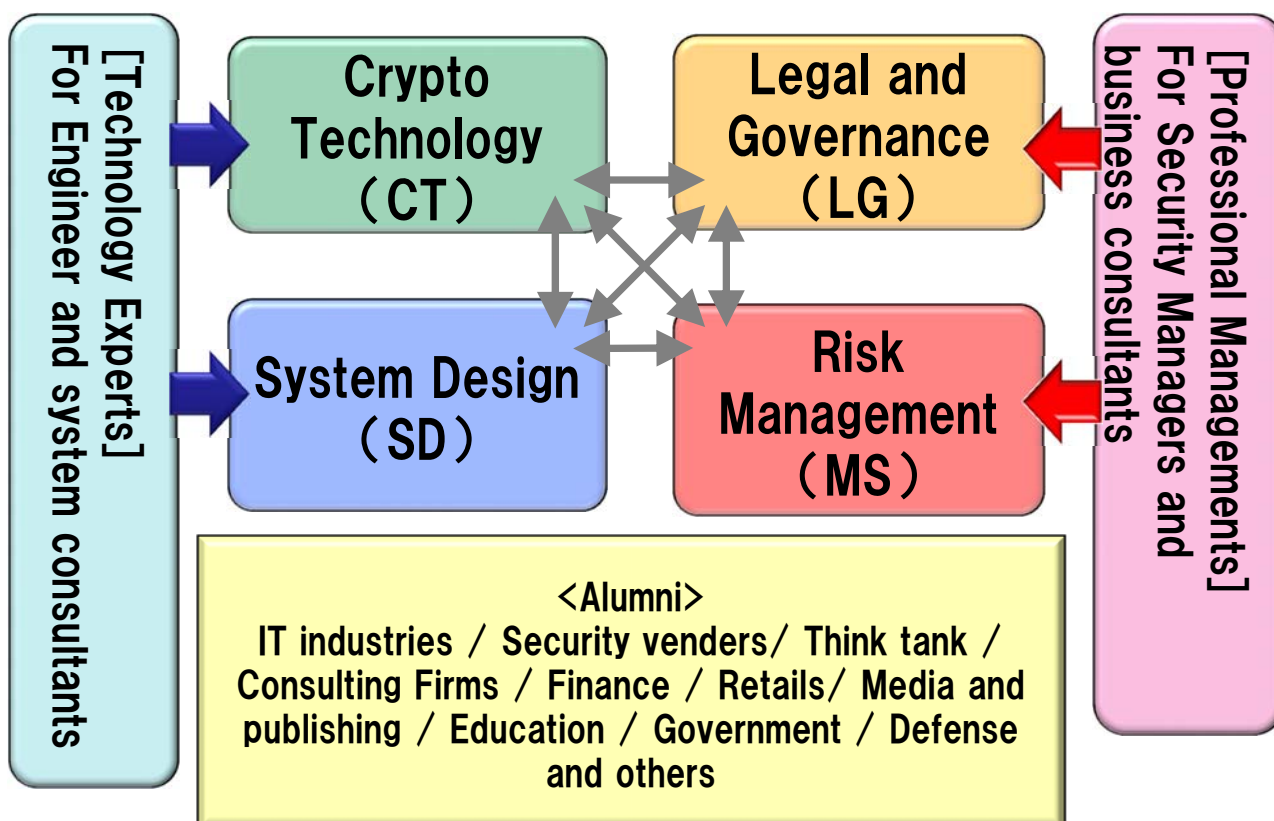
2



President Prof. Tanaka

Graduate School	Information Security		
Department	Information Security		
Program	Master's Program	Doctoral Program	
Degree	Master's Degree in Informatics	Ph. D. in Informatics	
Quota	40 students/year	8 students/year	
Length of study	2 years	1 year	3 years
Required credit	30 credits or more	46 credits or more	8 credits or above

Model Courses



Security Experts



- Aiming Security Experts from Industry and Governments (60%+)
- Toward future CIO/CISO



In this meeting

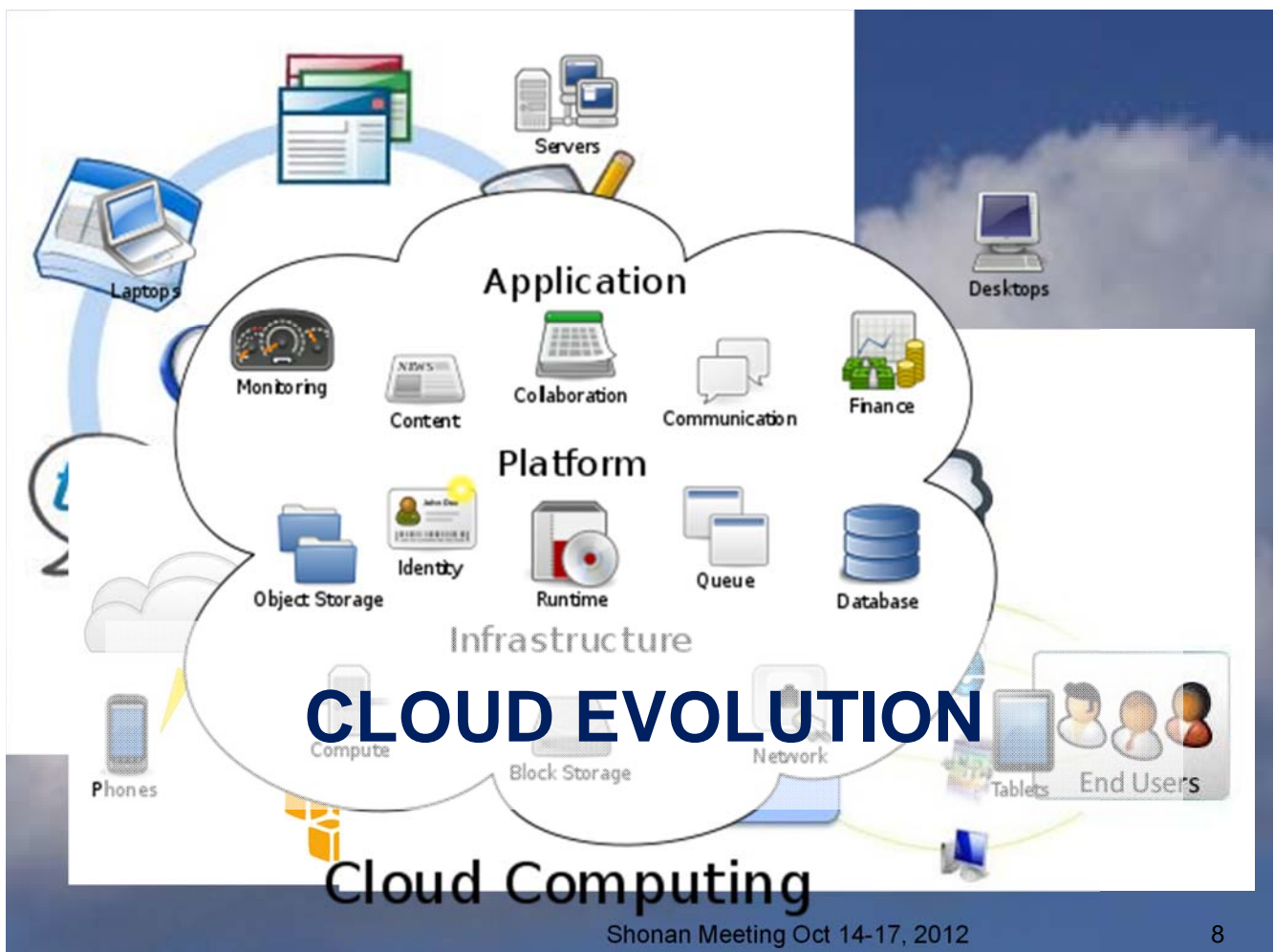
- Ms. Rika Hayashi from E-Learning venture
- Mr. Takamichi Asou, developing new sensor services in NTT East
- Mr. Hiroki Hada working at SOC, NTT Communications

- Cloud Evolution
- Inter-Cloud for Life-line Services
- Inter-Cloud technology Development & GICTF overview
- Summary

GICTF

Shonan Meeting Oct 14-17, 2012

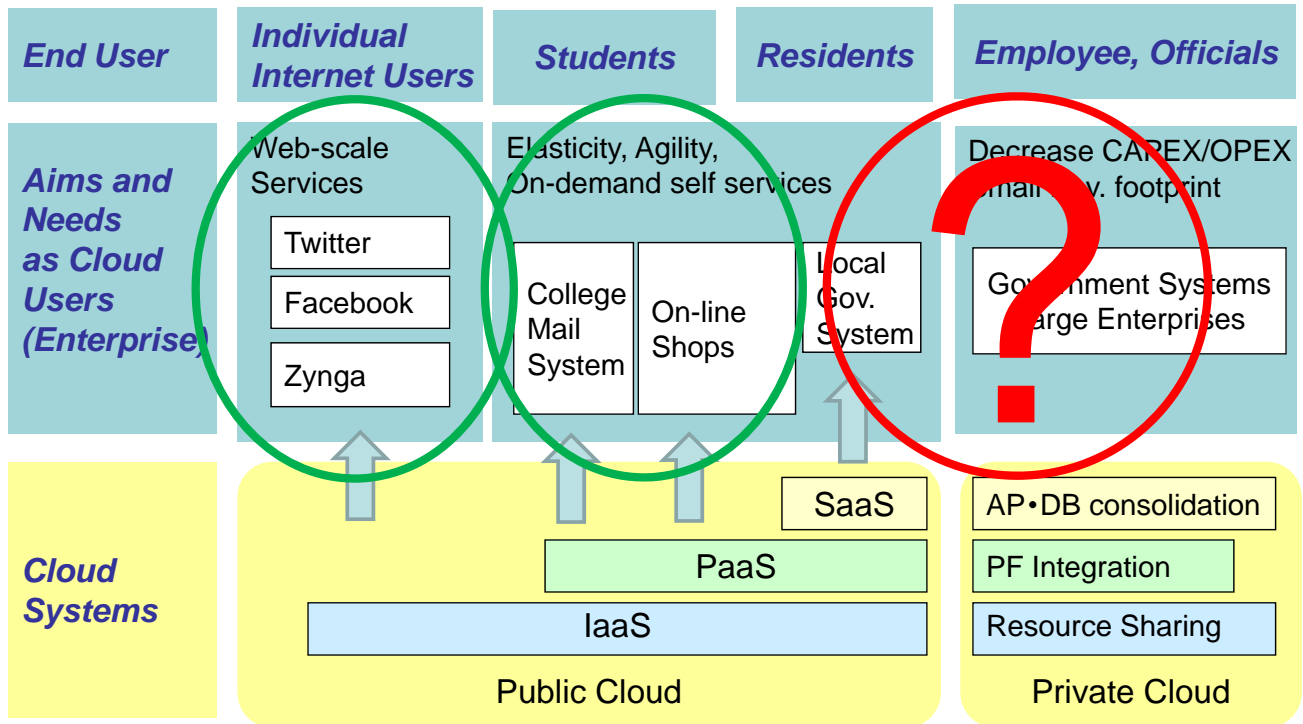
7



Shonan Meeting Oct 14-17, 2012

8

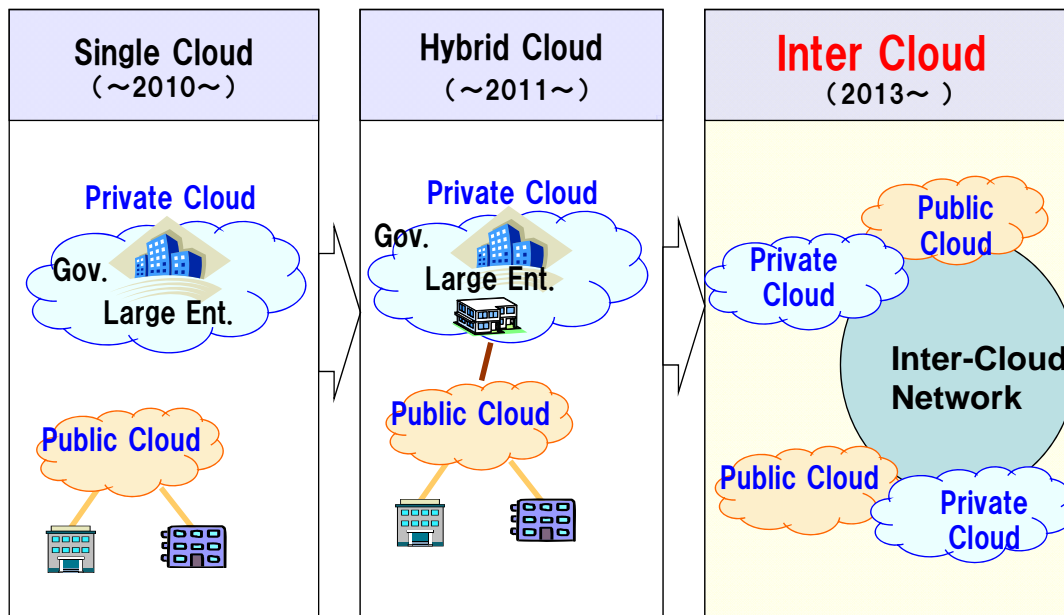
Clouds Today



Cloud Application and Requirement Today



Evolution of Cloud Computing



GICTF

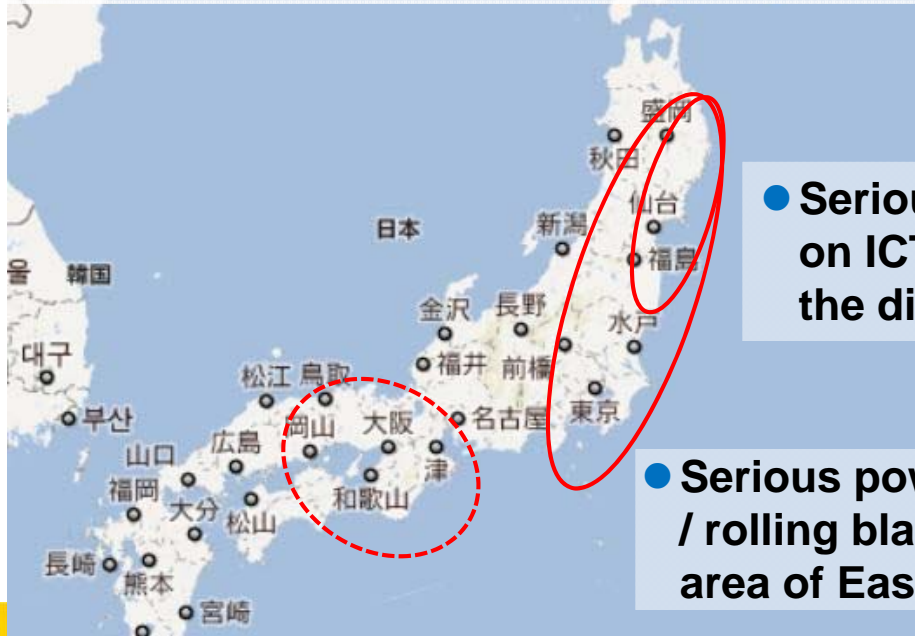
Shonan Meeting Oct 14-17, 2012

11



Lessons learned from Tohoku earthquake

Flexibly reassigning resources among cloud providers and network providers on a global scale



● **Serious damage on ICT facilities in the disaster area**

● **Serious power shortage / rolling blackout in wide area of East Japan**

GICTF

Shonan Meeting Oct 14-17, 2012

13

Secure inter-cloud for "Lifeline services"

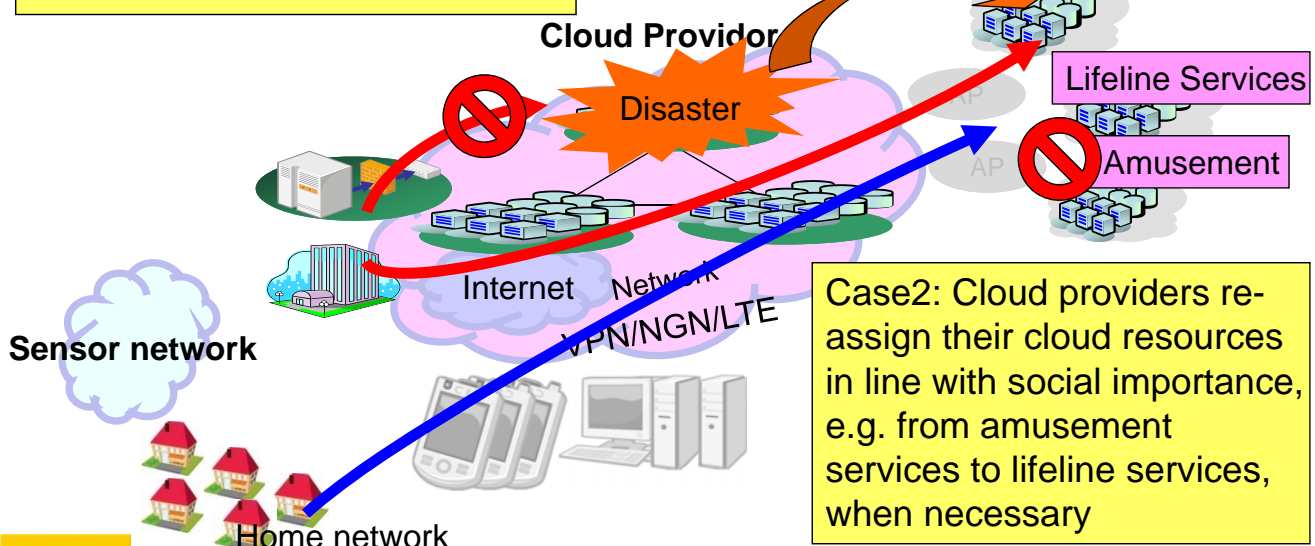
Case1: Migrate lifeline services by accommodating cloud resources among cloud/network providers when disaster or massive breakdown occurs

Lifeline Services (administrative, financial, medical care, etc.)

Other cloud providers

Lifeline Services

Amusement



Case2: Cloud providers reassign their cloud resources in line with social importance, e.g. from amusement services to lifeline services, when necessary

GICTF

Shonan Meeting Oct 14-17, 2012

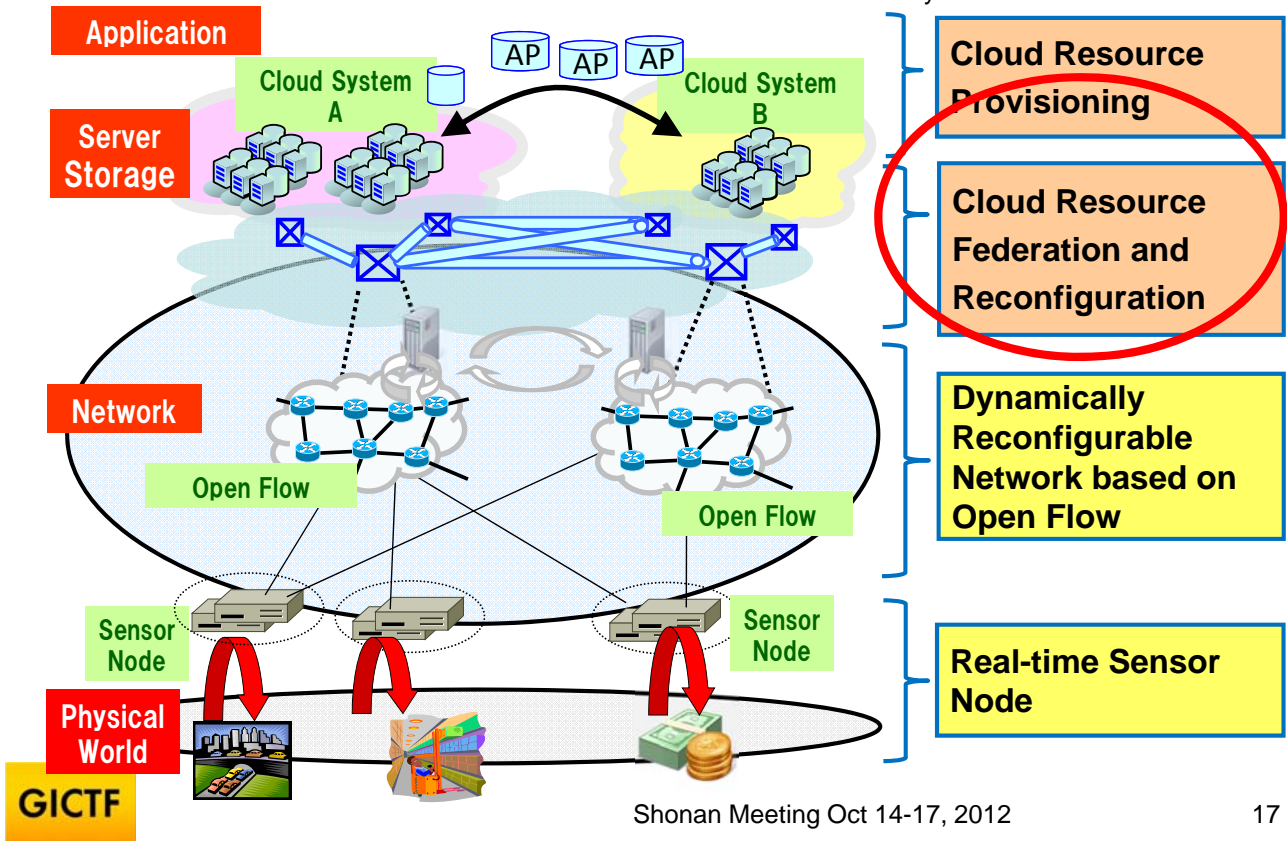
14

- Cloud service adoption in the field of mission critical applications and social life-line services
 - E-government systems, Medical applications (EHR, PHR)
 - Telecommunication and utilities management systems
 - Requirements:
 - Nation-wide disaster tolerant
 - Flexible resource re-assignment in line with social importance
- ⇒ ***Collaborative inter-cloud computing and networking*** for secure social infrastructure
- ⇒ Provide legal and regulatory system

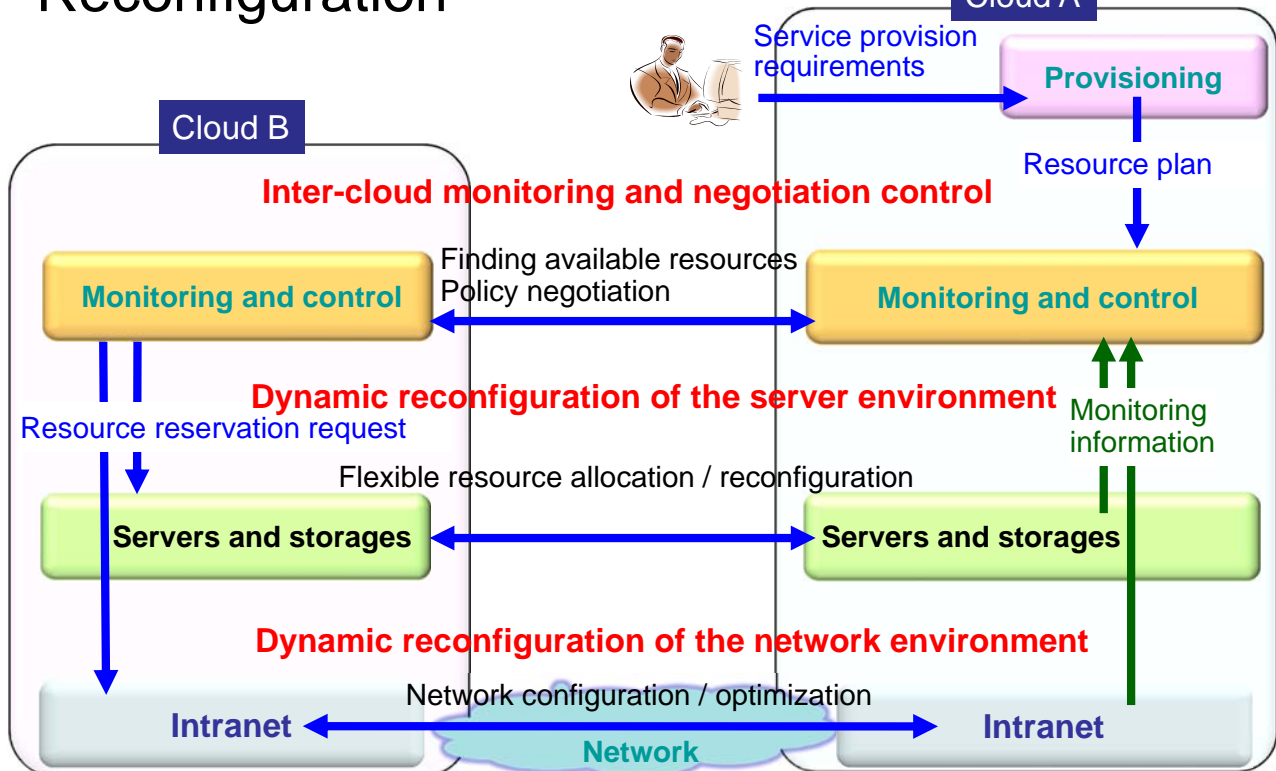


Highly Reliable Inter-Cloud Systems R&D* (2009-2012)

*Funded by MIC



Cloud Resource Federation and Reconfiguration

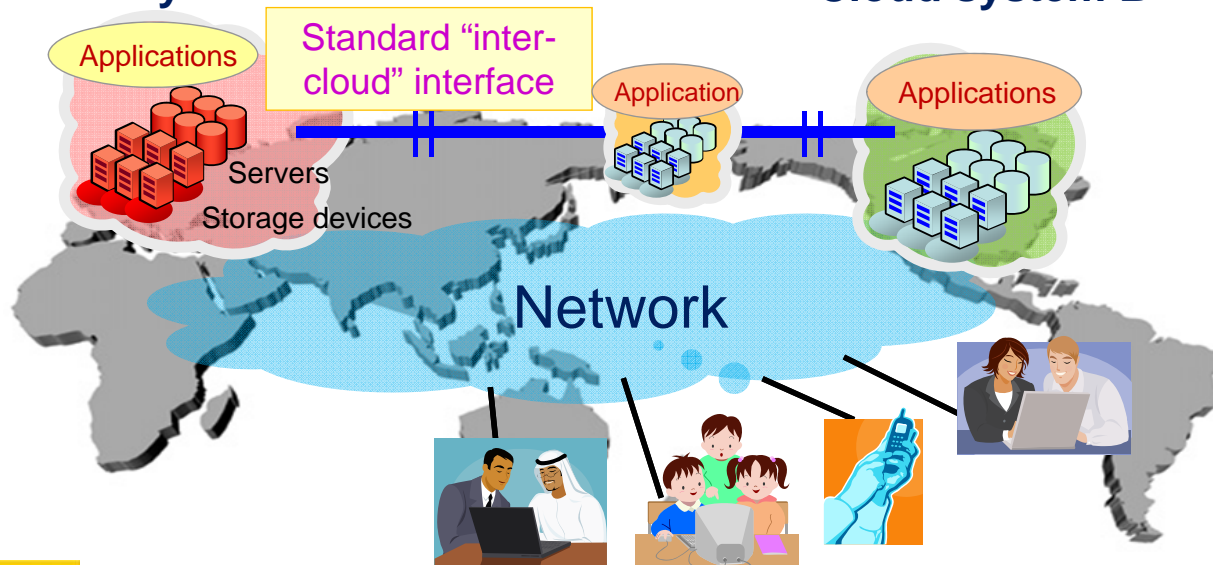


GICTF Mission

- Promotes the global open inter-cloud technologies and standardization through collaboration among academia, government and industry

Cloud system A

Cloud system B



GICTF

Shonan Meeting Oct 14-17, 2012

19

GICTF Organization

86 members from industry
NTT, KDDI, NEC, Hitachi, Fujitsu,
Toshiba, Microsoft, IBM, Oracle,
Cisco, VMware, IJ, BIGLOBE,
NICT, NII, NRI, etc. ,
38 members from academy

General Assembly

Chair: Tomonori Aoyama
Vice Chair Atsuhiko Goto

Board of Directors

Technology Task Force

1. Share related technology information among members
2. Identify technical needs related to secure cloud interworking applicable to e-Government, etc.
3. Develop a standard set of specifications and propose it to relevant standards bodies

Application Task Force

1. Identify technical needs related to secure cloud interworking
2. Promote widespread use of cloud interworking technology

http://www.gictf.jp/index_e.html

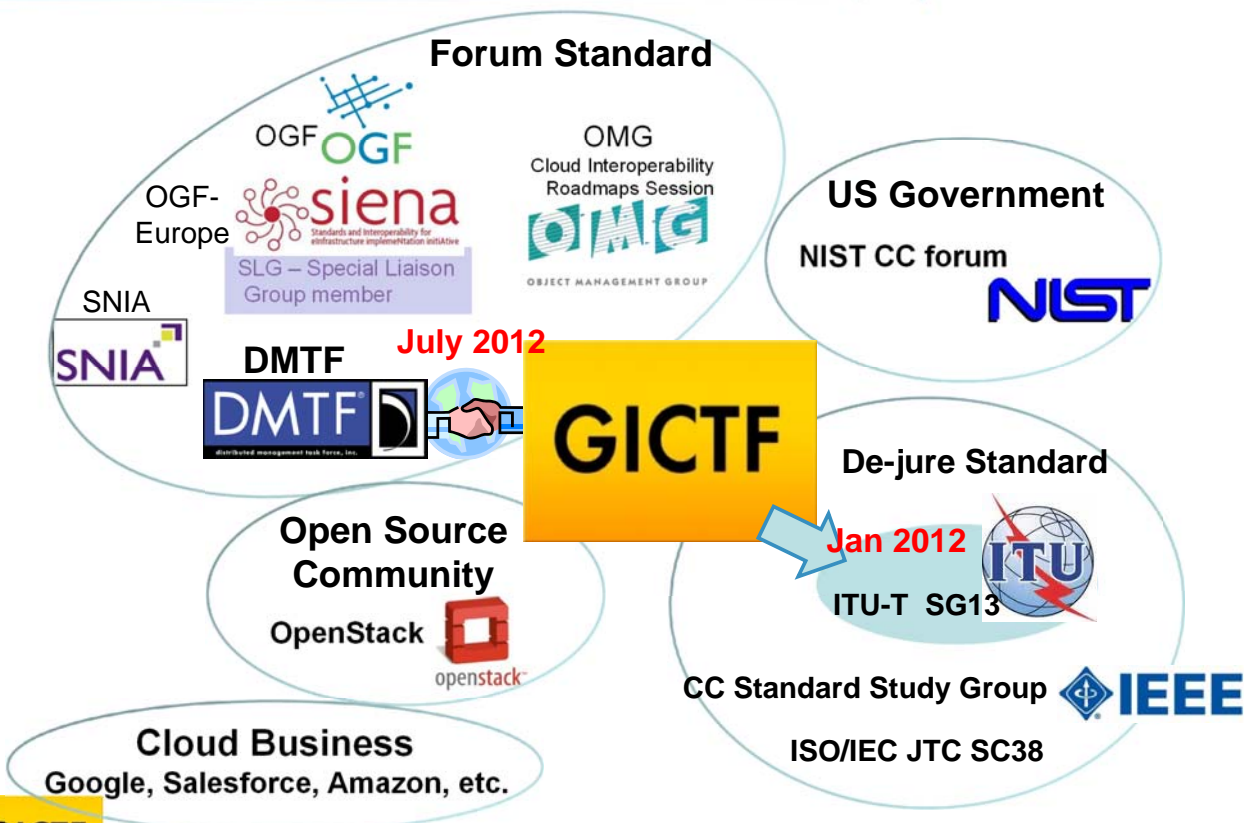
GICTF

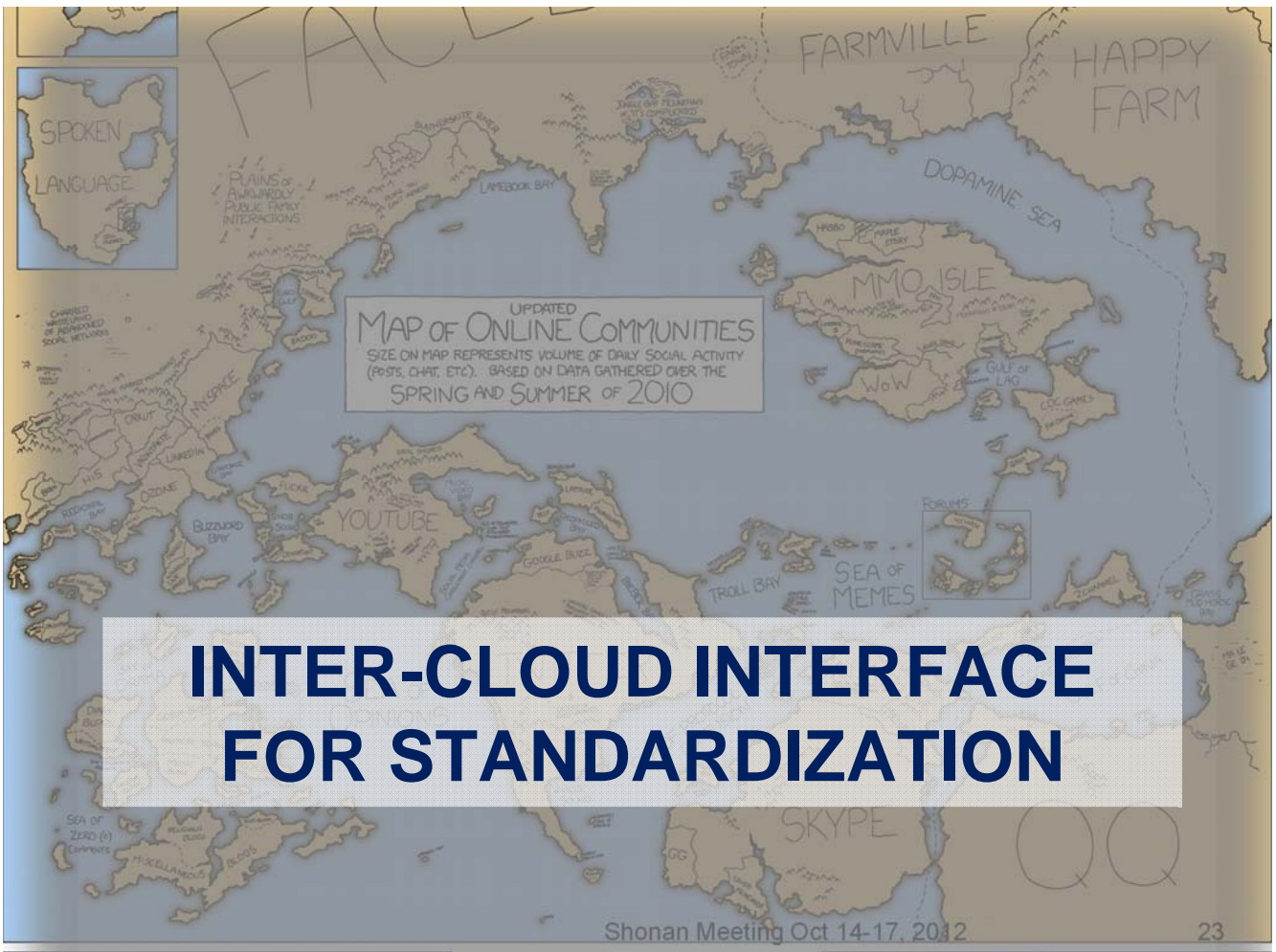
Shonan Meeting Oct 14-17, 2012

20

- Use case and functional requirements for Inter-Cloud Computing” Aug 2010
⇒ *proposed to ITU-T FG Cloud, other fora and orgs.*
- “Technical Requirements for Supporting the Inter-cloud Networking” Apr 2012
- “Inter-cloud Interface Specification Draft (Cloud Resource Data Model)” May 2012
⇒ *proposed to ITU-T SG13.*
- “Inter-cloud Interface Specification Draft (Inter-cloud Protocol)” May 2012
⇒ *proposed to ITU-T SG13*

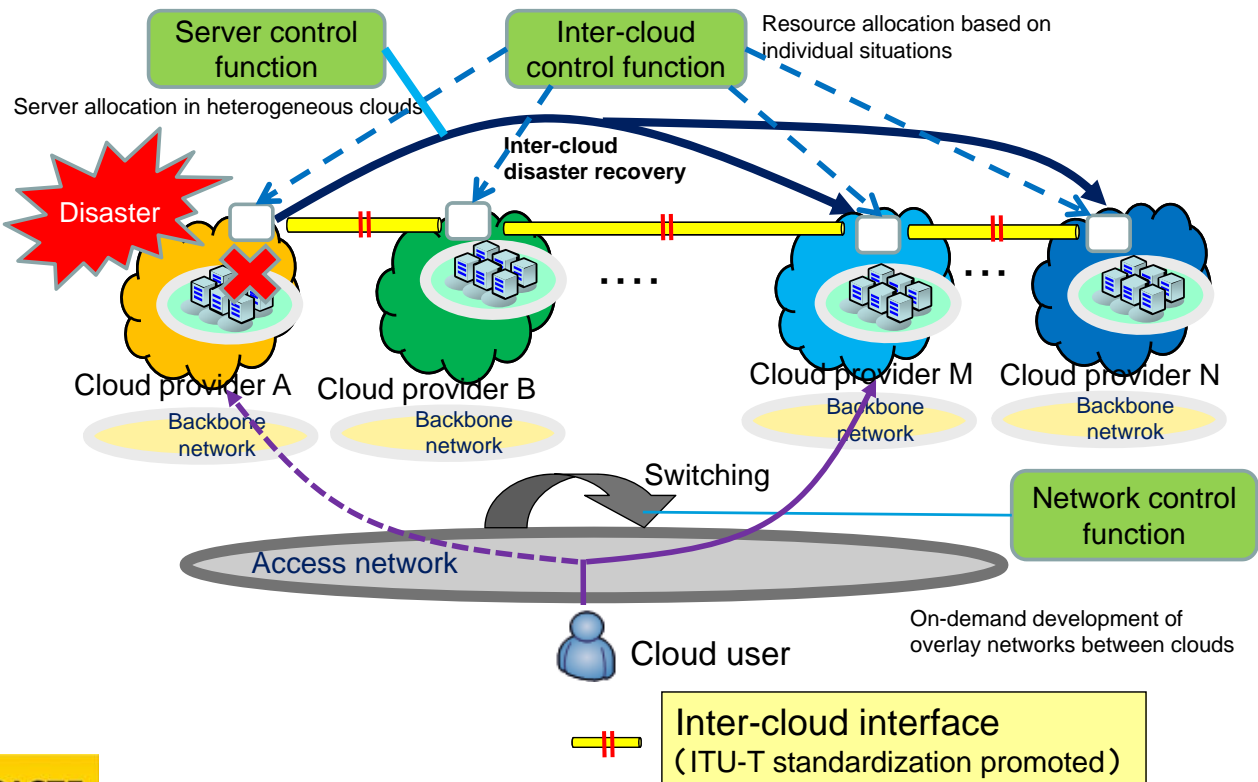
Inter-cloud related SDOs





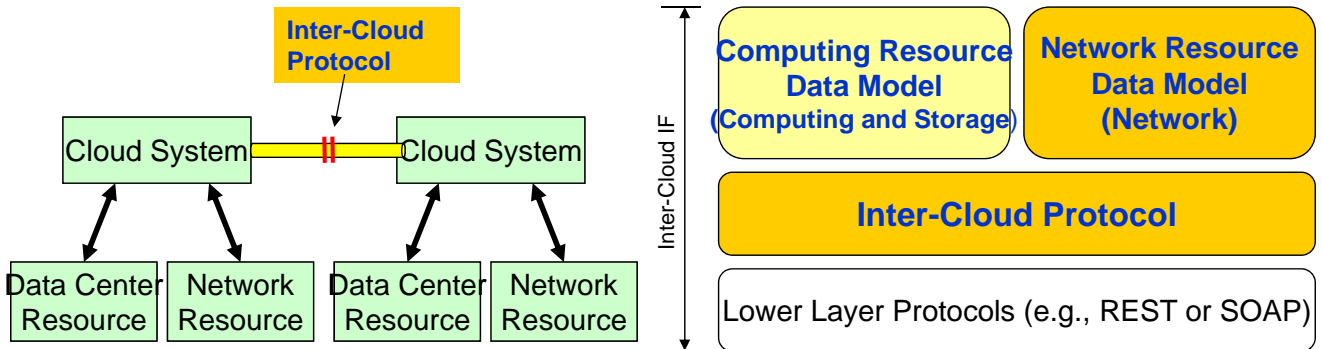
INTER-CLOUD INTERFACE FOR STANDARDIZATION

Inter-cloud interface and control mechanisms



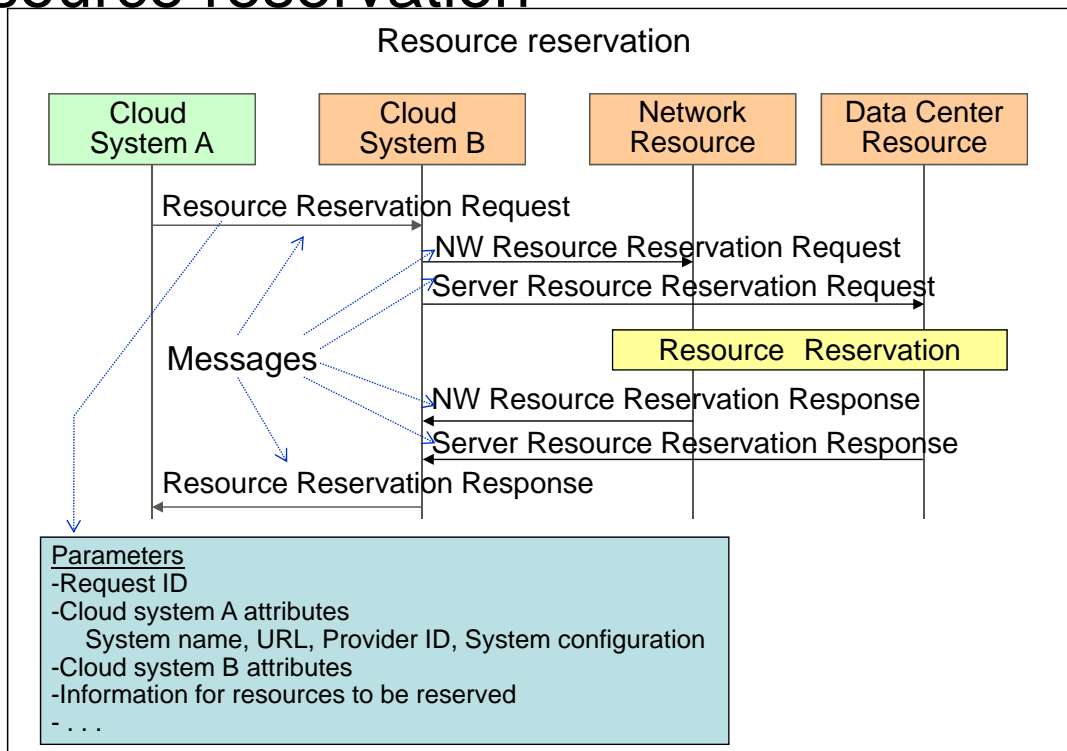
Definition of Inter-cloud Interface

- The interface between two cloud systems administered by different operators, focusing on:
 - Inter-cloud protocol (Information flows and message semantics with associated parameters)
 - Resource data models



GICTF

Information flow example for resource reservation

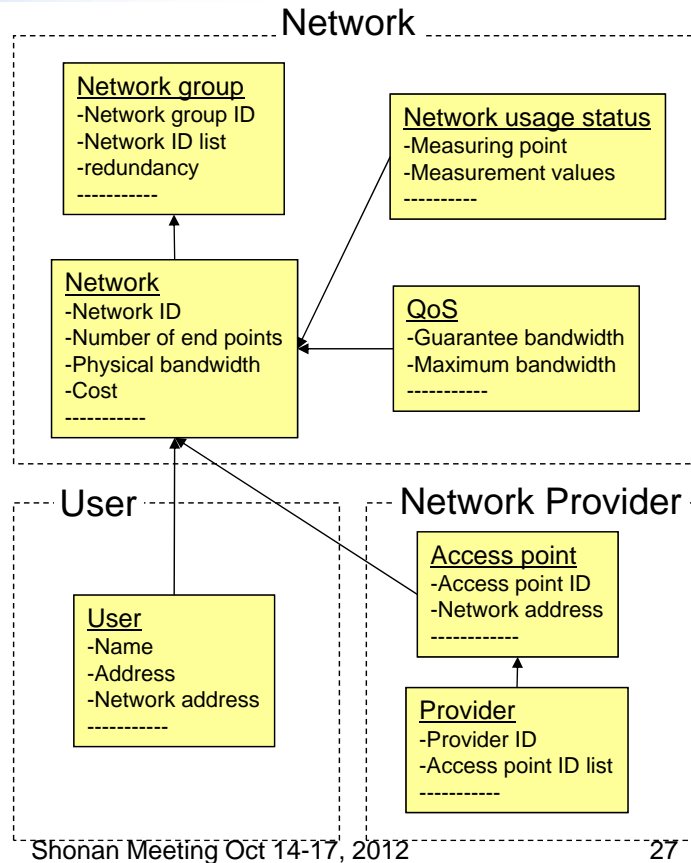


GICTF

Resource Data Model

■ Network resource model

- Three-type network resources:
 - ◆ Network
 - ◆ Network Provider
 - ◆ User
- Definition of classes and sample descriptions in XML



GICTF

Summary

- Inter-cloud computing and networking are essential for achieving 'lifeline' or mission critical social services, and must be based on appropriate global standards.
 - GICTF is contributing to the promotion and standardization of such inter-cloud interface
- ***We should encourage open discussions for social aspects, such as legal and regulatory issues around them.***

GICTF



THANK YOU!