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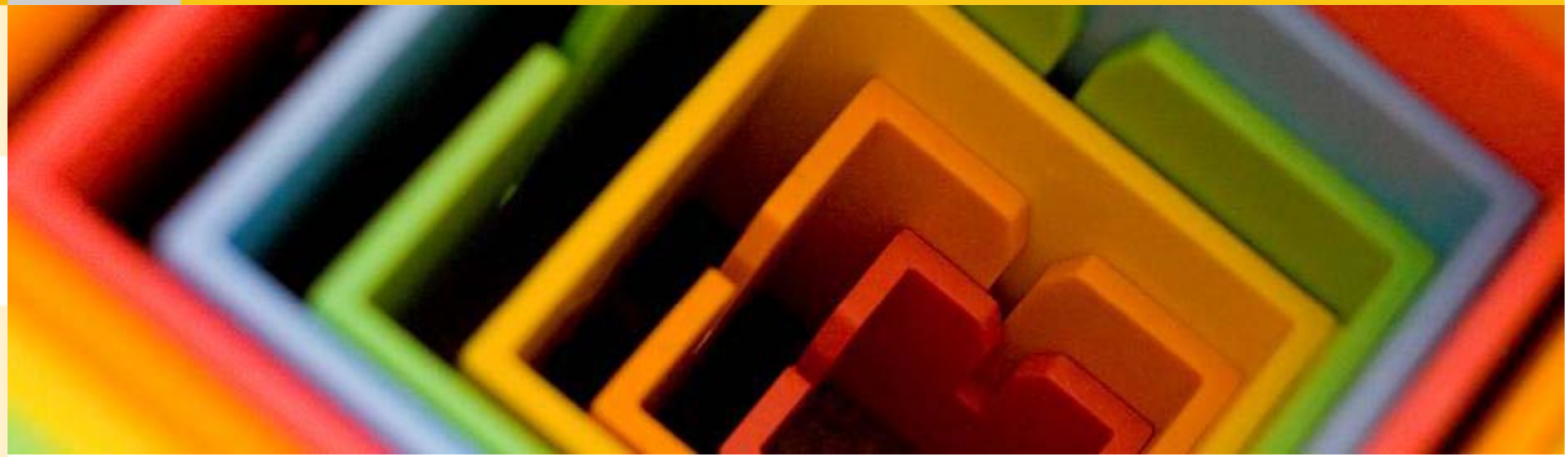
Global Inter-Cloud Technology Forum（GICTF）



05/18/2011
NTT DATA Agilenet L.L.C.
Kenji Motohashi

Agenda

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1. Introduction
2. What is the “GICTF”
3. Use cases for the Inter-Cloud Computing
4. Functional Requirements
5. Global Collaboration

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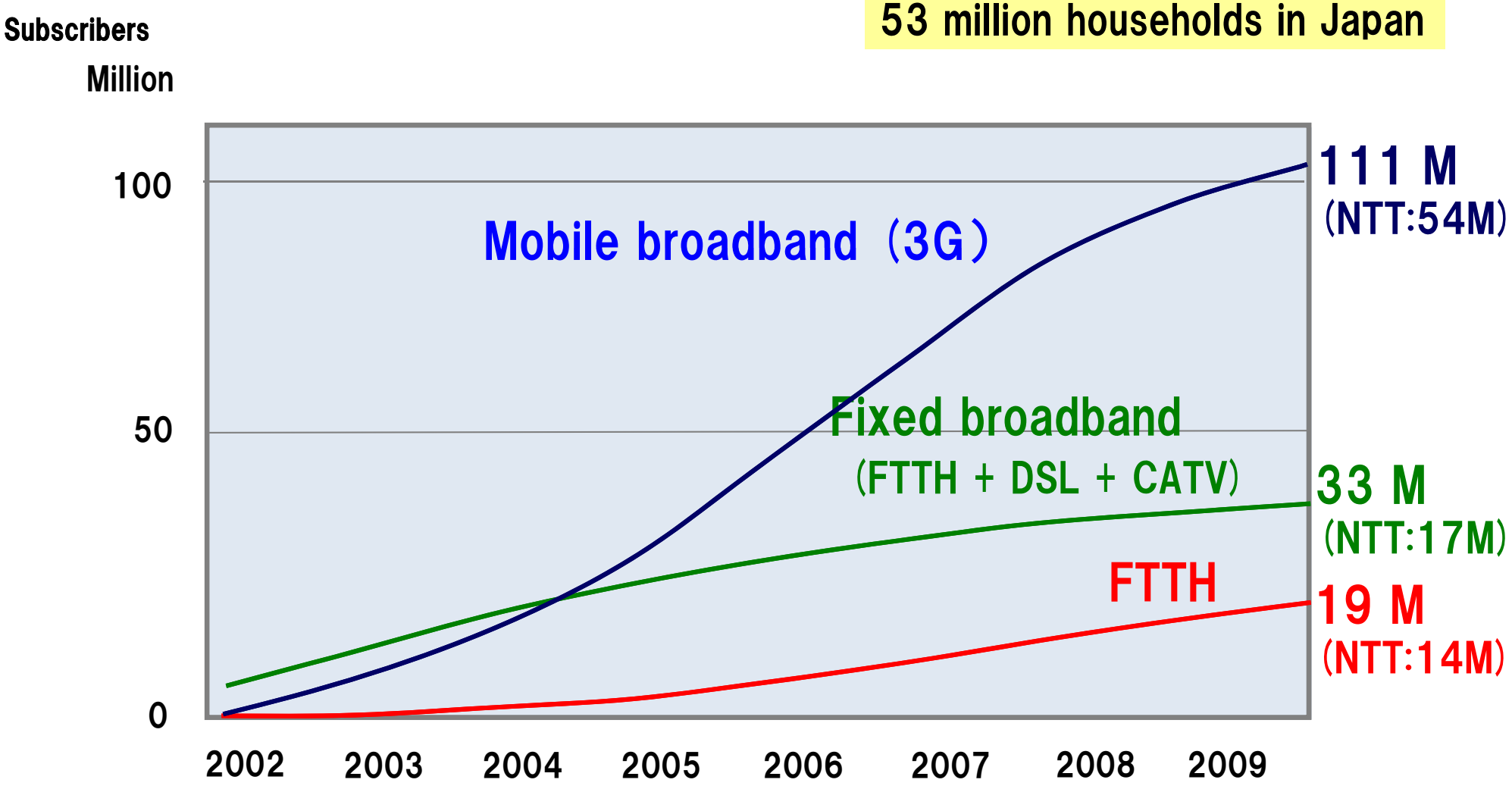
INTRODUCTION

- Cloud Computing for Social Infrastructure
- Why “Inter-Cloud Computing” ?

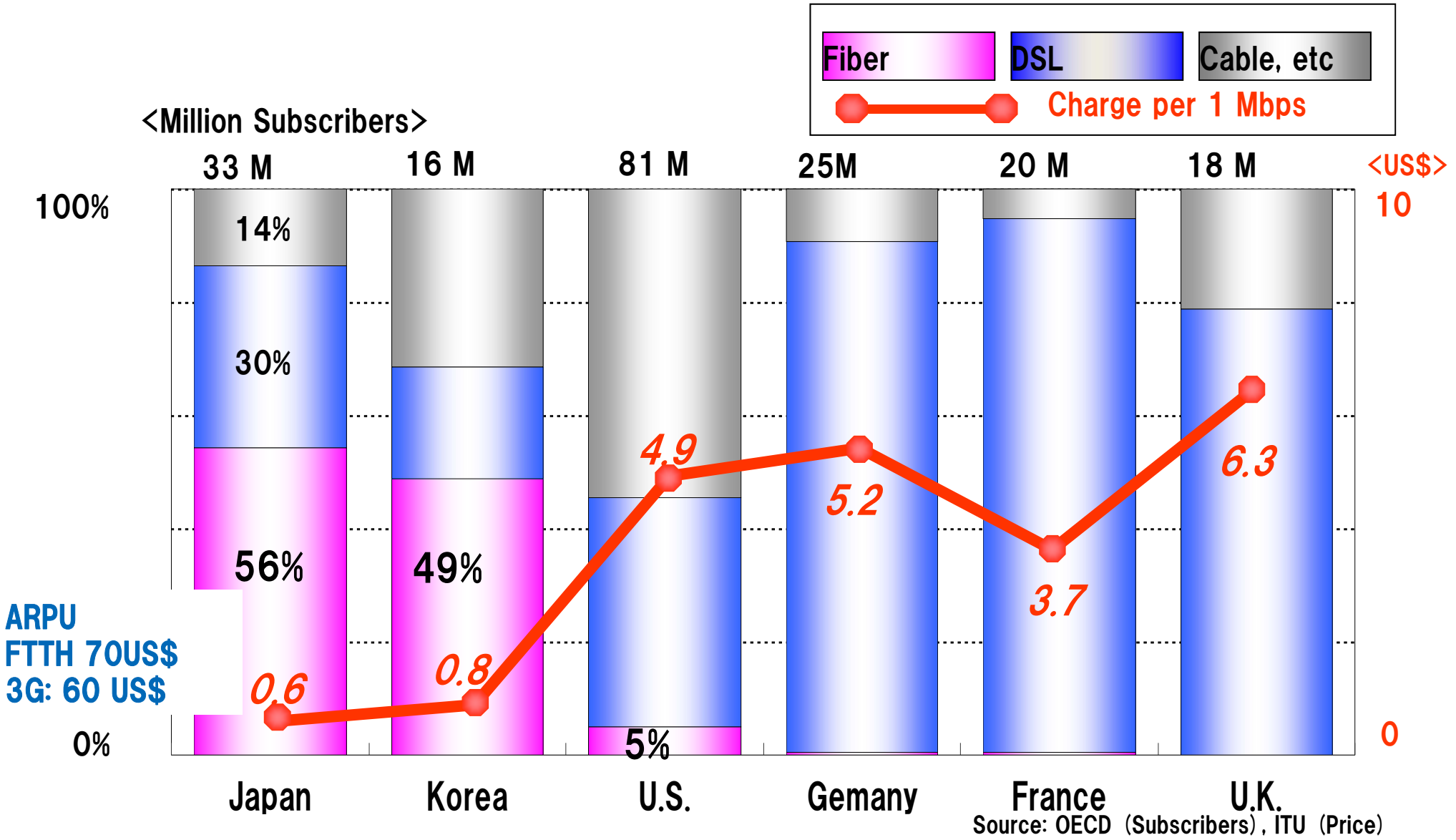
Broadband Subscribers in Japan

53 million households in Japan



Source: Ministry of Internal Affairs and Communications

Broadband Services and Price Trend



Source: OECD (Subscribers), ITU (Price)

Cloud Market in Japan

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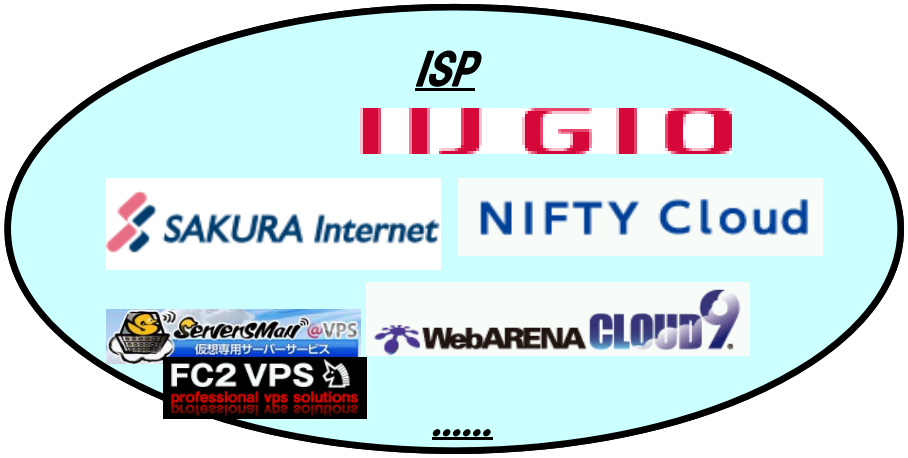

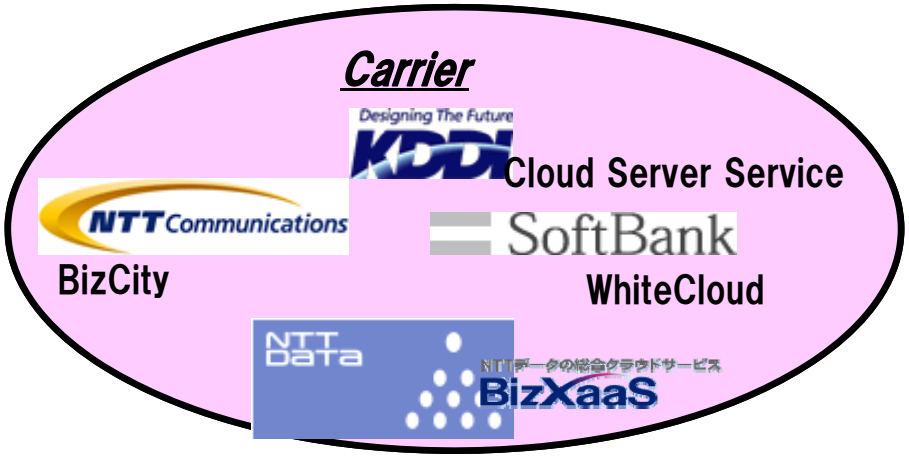

Emerging Services with Cloud Computing

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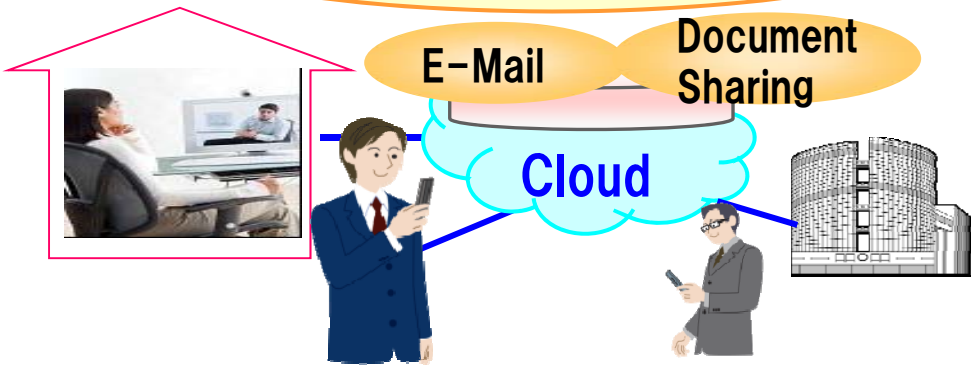
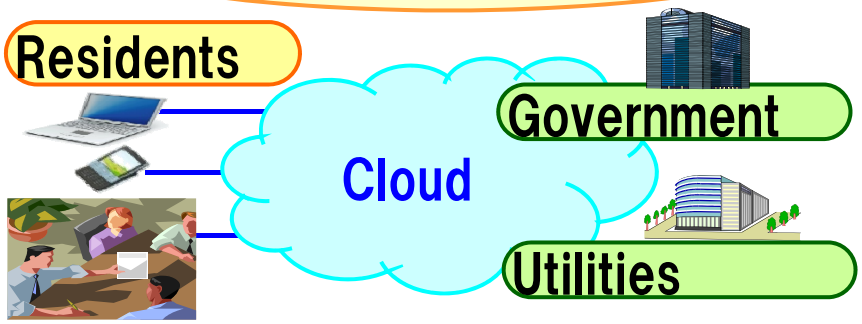
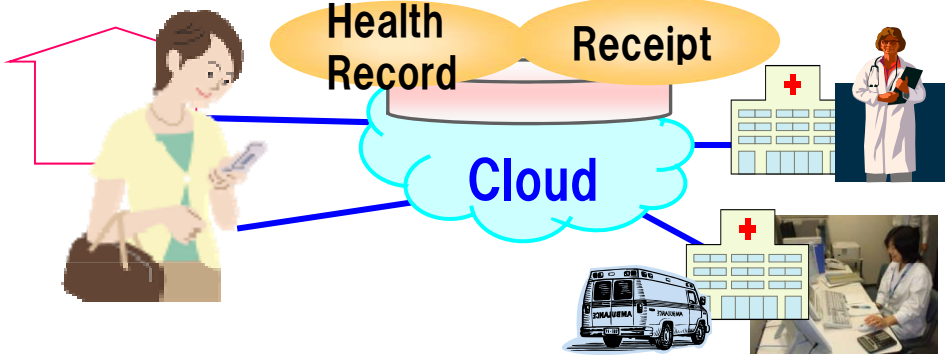
Tele-work



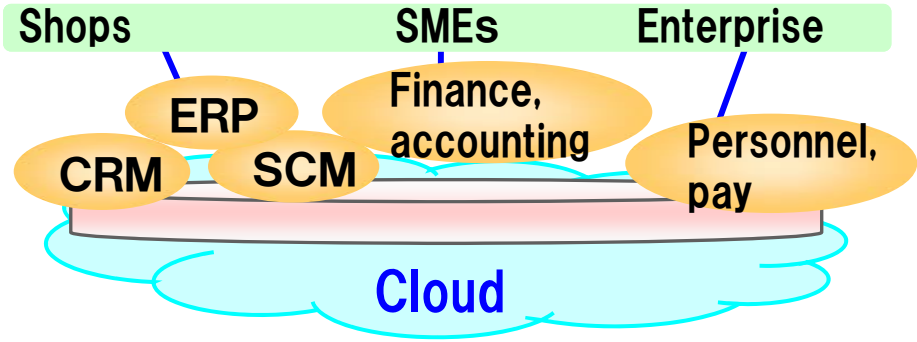
E-Government



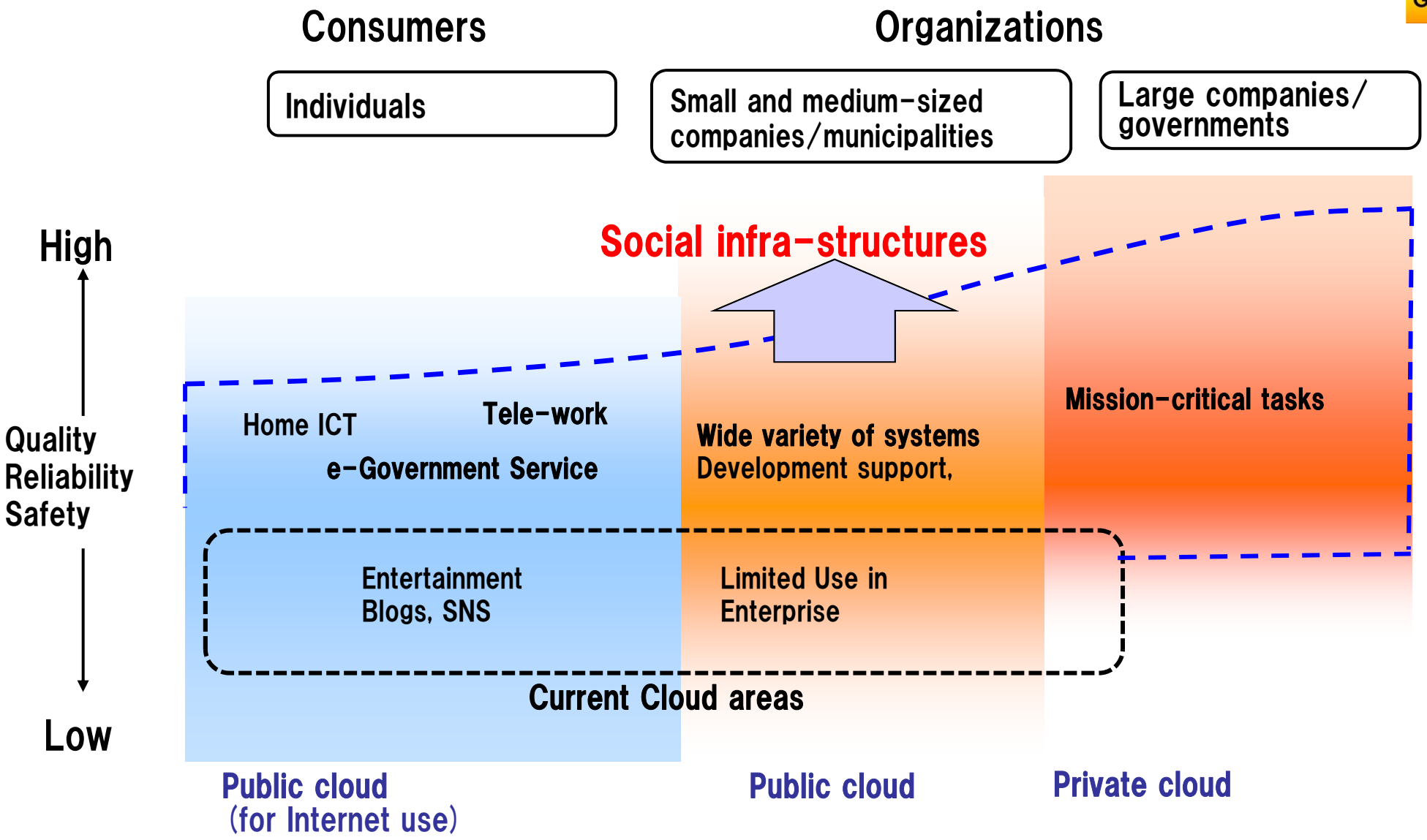
EHR/PHR



Business Solution



Safe and Secure Cloud is promising



Why we focus on “Inter-Cloud computing”?

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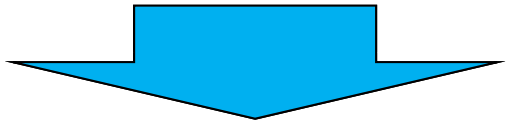
1. Cloud Computing for Social Infrastructure
2. Various Functional requirements
3. Various Quality requirements
   - Availability, Security, Cost, Green, et al



- Can “Single Cloud” solve them? Can satisfy all?
- “Inter-Cloud computing” should be promising

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WHAT IS “GICTF”?

- Promotes the global standardization of inter-cloud system interfaces through collaboration between academia, government, industry *and*.

OGF

DMTF distributed management task force, inc.

SNIA

CSA cloud security alliance

OMG OBJECT MANAGEMENT GROUP

tmforum

OASIS

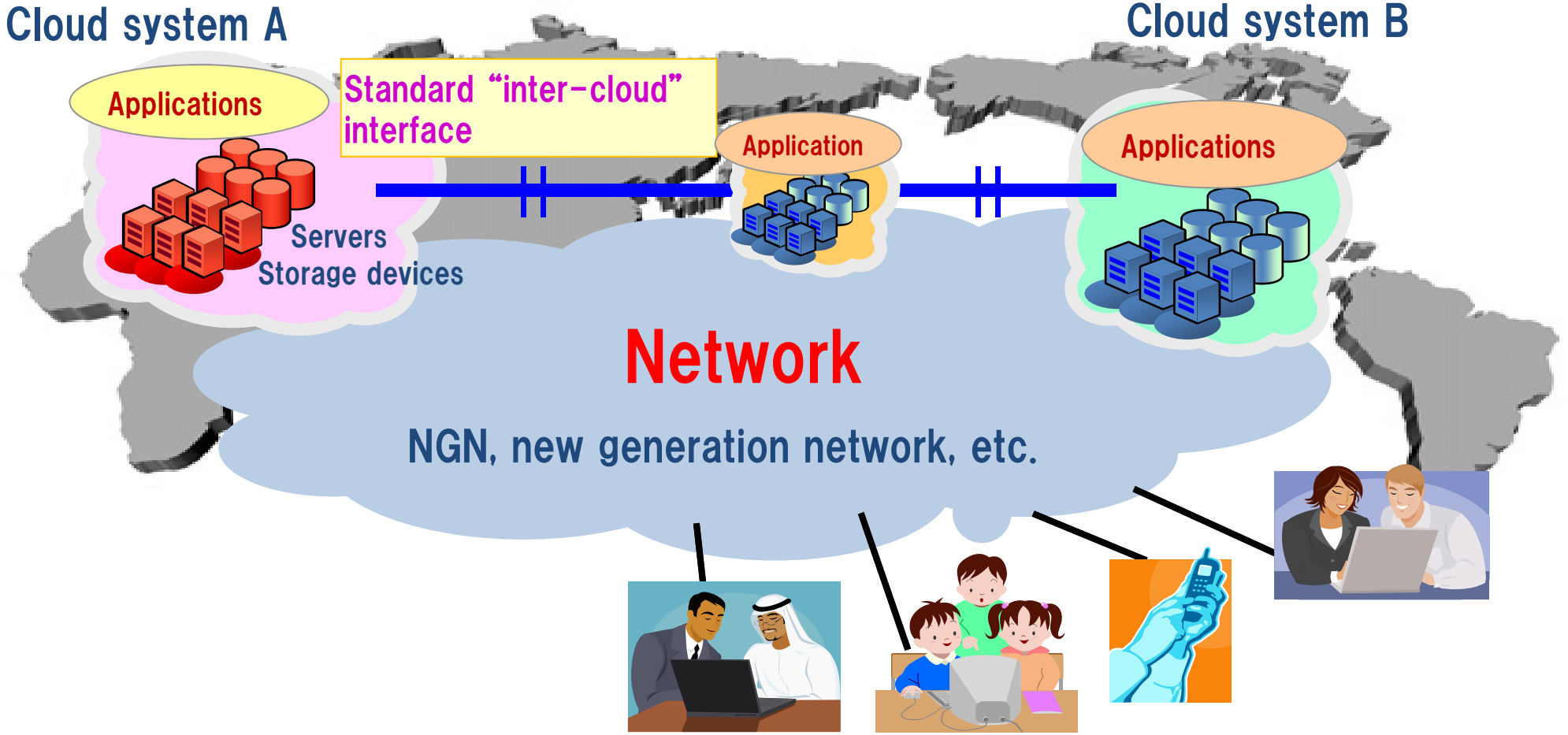
Open Cloud Consortium

CLOUDCOMPUTINGINTEROPERABILITYFORUM

GICTF: A technology forum for the “Inter-cloud” era

Promotes the global standardization of inter-cloud system interfaces through collaboration between academia, government and industry

Established on July 17th 2009



Global Inter-Cloud Technology Forum (GICTF)

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GICTF

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

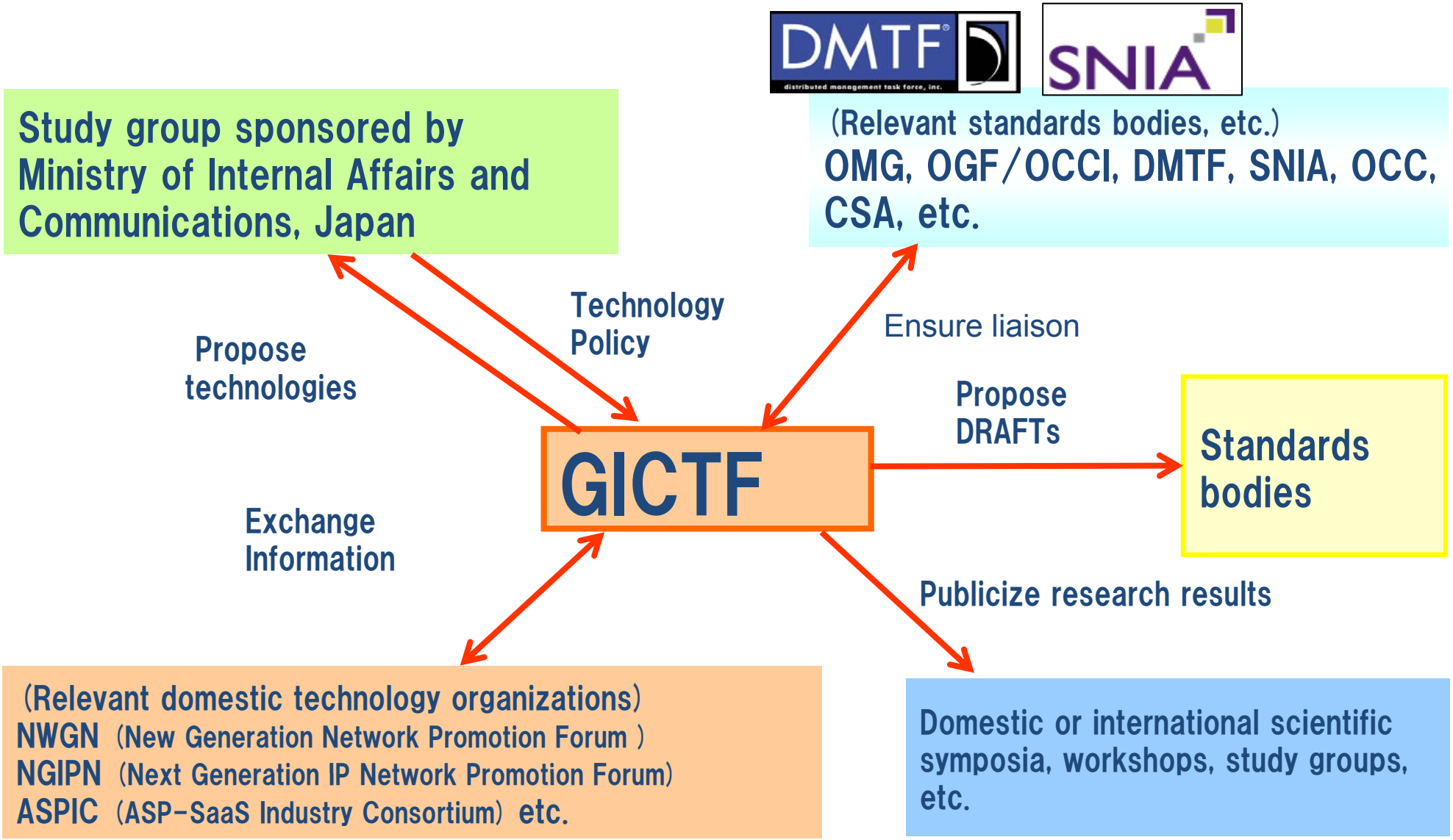
Main activities:

- Identify technical needs for secure "inter-cloud technology" applicable to e-Government, etc.
  - the first white paper *"Use case and functional requirements for Inter-Cloud Computing"* Aug 2010
- Develop a standard set of specifications for inter-cloud collaborating globally with relevant standard bodies
- Raise awareness of users both in industry, government and communities

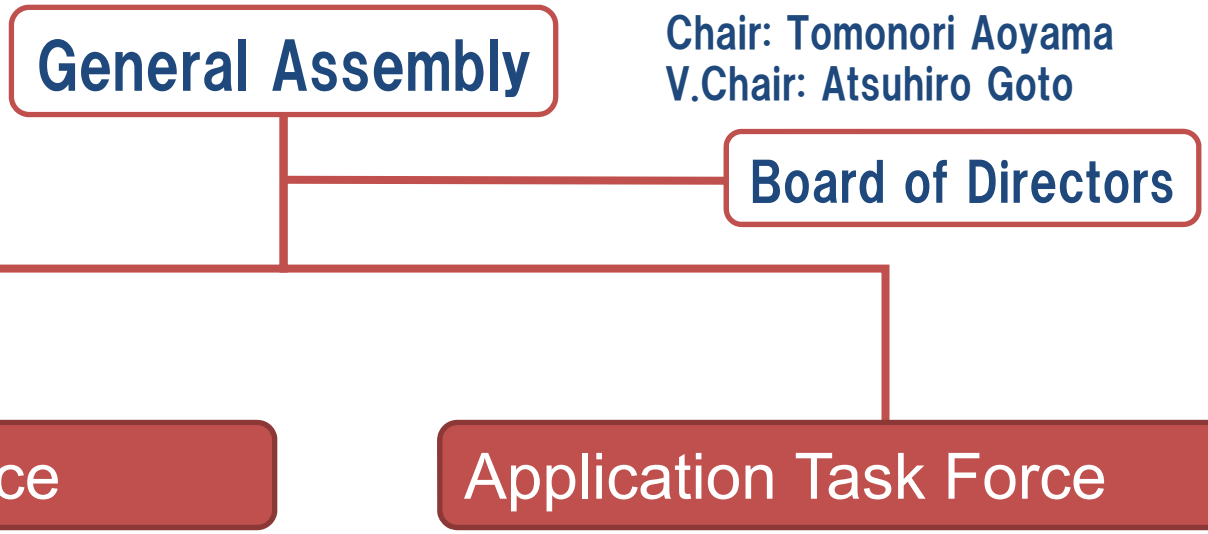
Membership (as of April 2011)

- 75 enterprises: NTT, KDDI, NEC, Hitachi, Fujitsu, Toshiba Solution, Microsoft, IBM, Oracle, Cisco, BIGLOBE, IIJ and others
- Independent administrative institution, National laboratory
- University professors, etc.
- Ministry of Internal Affairs and Communications of Japan (Observer)

Liaison between GICTF and other related bodies



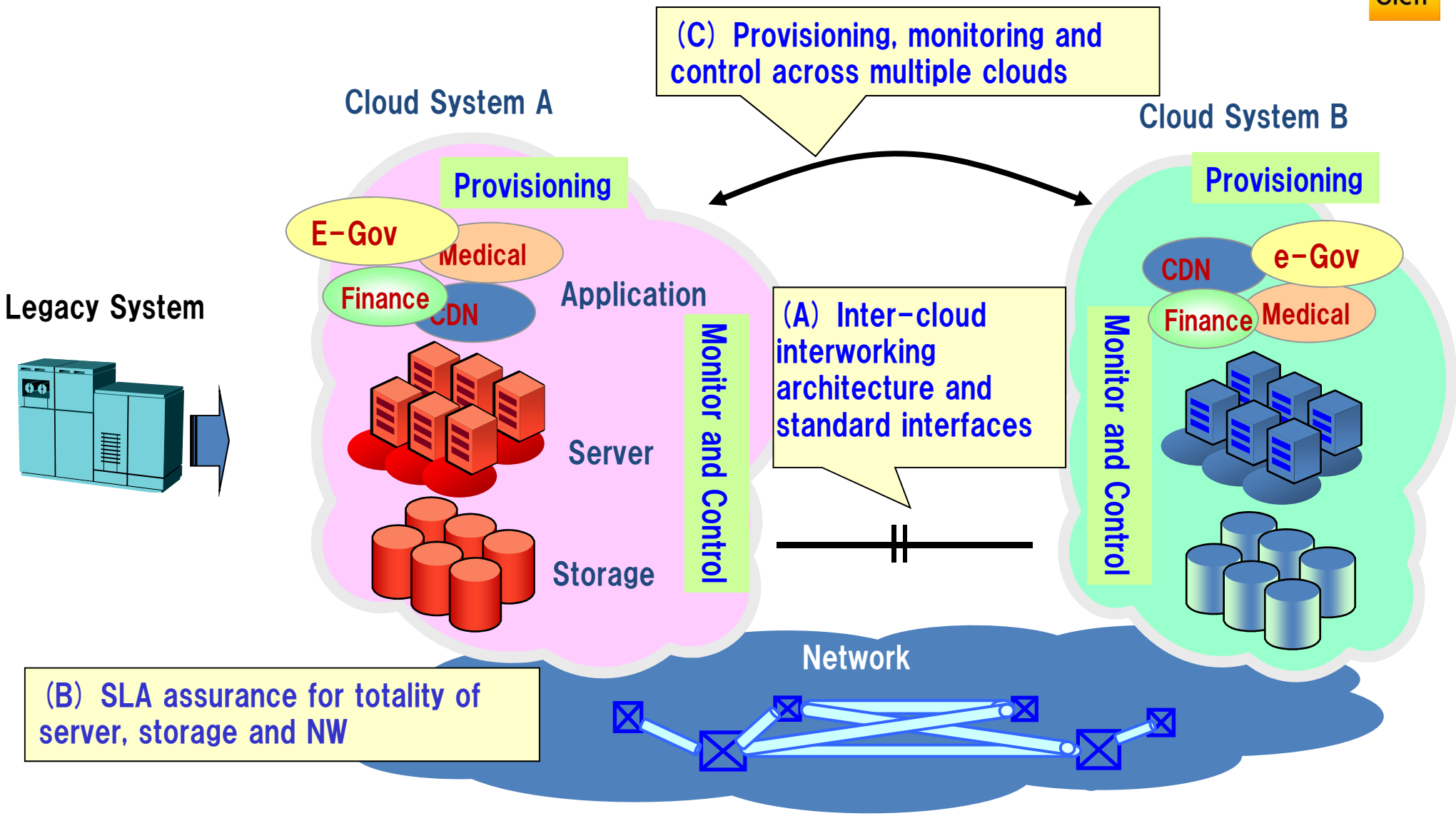
GICTF Organization



1. **Exchange and share information** with relevant standards bodies, academia and communities
2. **Identify technical needs** related to secure inter-cloud technology applicable to e-Government, etc.
3. **Develop a standard set** of specifications applicable to e-Government, etc. and propose it to relevant standards bodies

1. **Identify technical needs** related to secure inter-cloud technology
2. **Promote widespread use** of inter-cloud computing technology

Key Issues in Technology Task Force



Discussion issues for inter-cloud computing (1/2)

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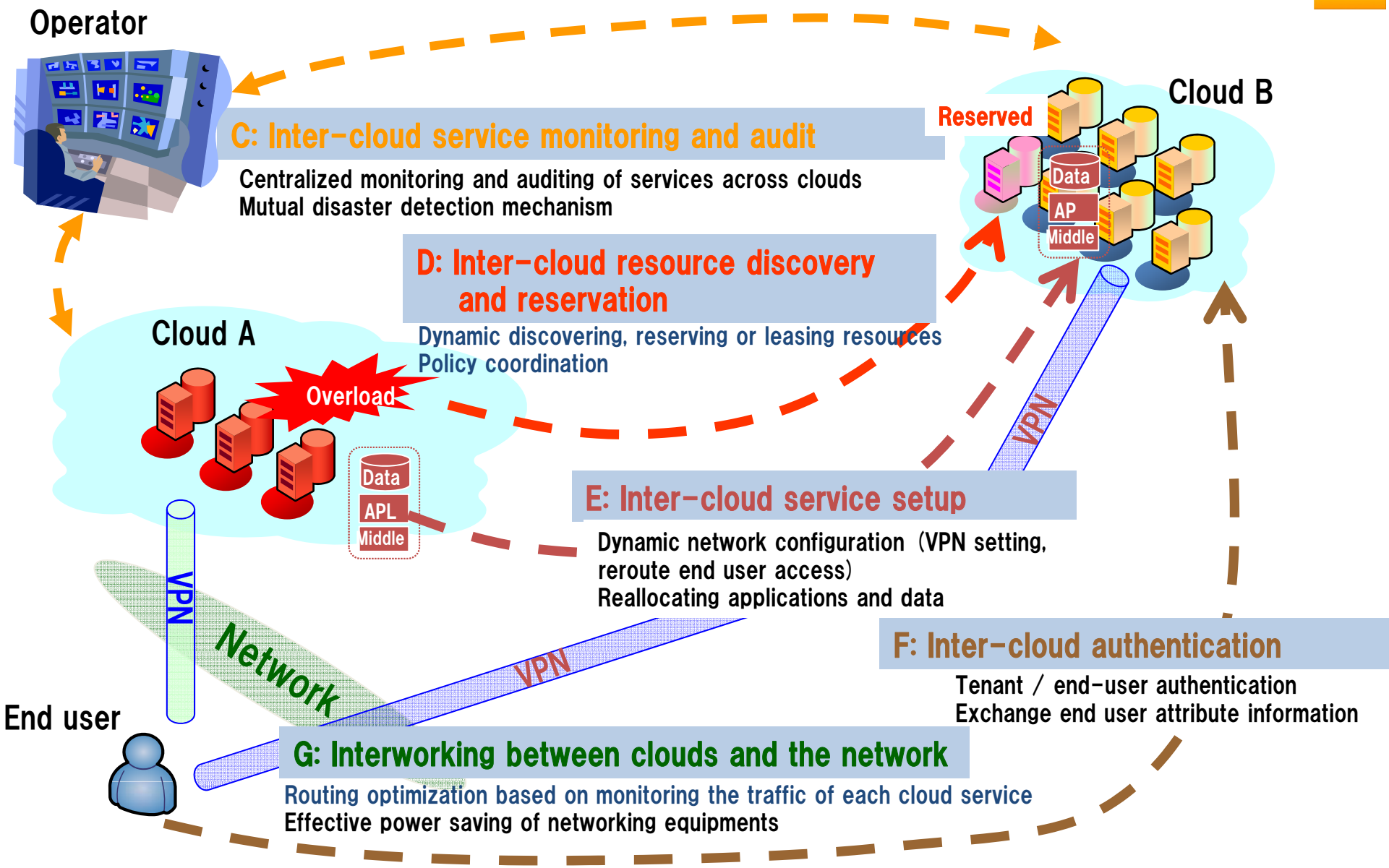
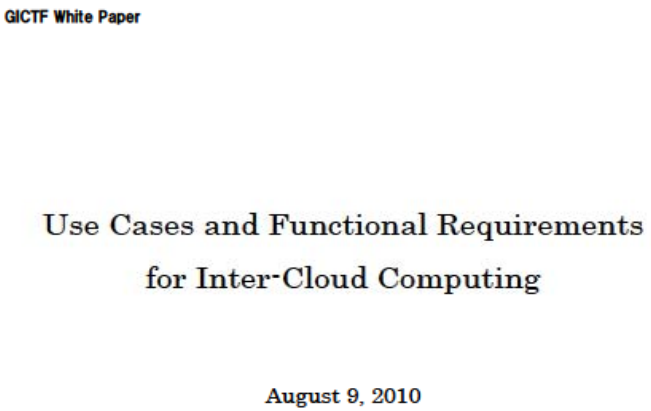
A: Inter-cloud computing use cases	· Scale-out through cloud federation (cloud bursting) · Mutual backup and recovery from a disaster through inter-cloud accommodation · Porting of services to other cloud providers · Service interworking through the simultaneous use of multiple clouds etc.
B: QoS and SLA to be considered in inter-cloud computing	· QoS and SLA items to be guaranteed ***end-to-end*** (totality of server, storage ***and network***) · Security requirements • requirements for cloud systems (data confidentiality, placement of data, tracking and monitoring illegal actions, measures against DDoS / malware etc.) • requirements that involve coordination between the cloud and terminals, etc.

Discussion issues for inter-cloud computing (2/2)



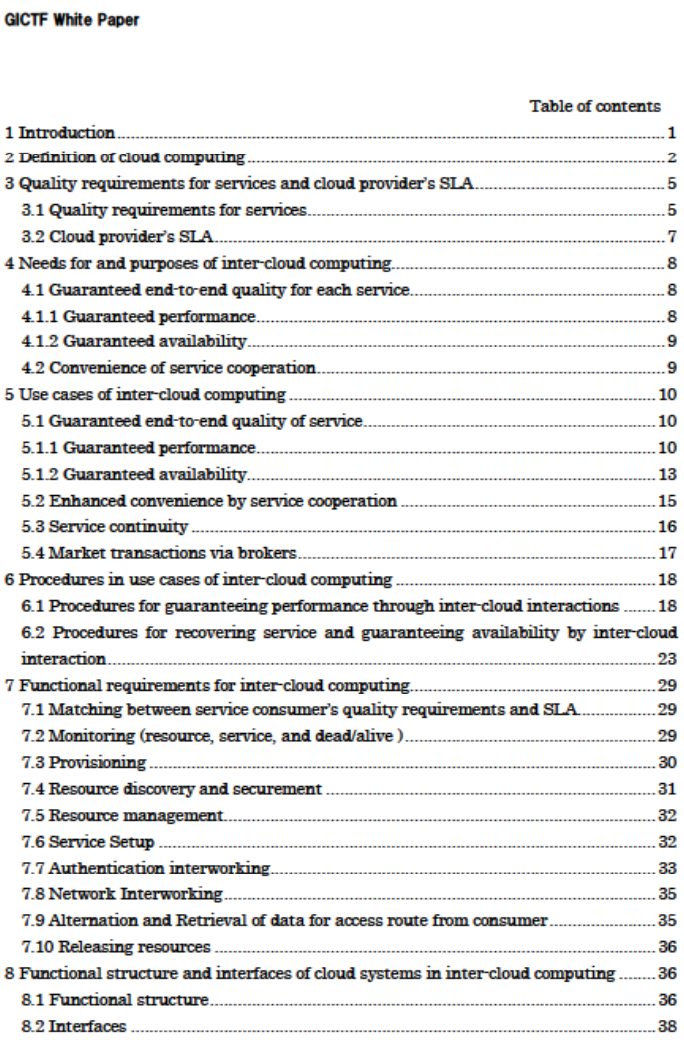
GICTF White Paper



GICTF White Paper

Use Cases and Functional Requirements
for Inter-Cloud Computing

August 9, 2010



GICTF White Paper

Table of contents

[Contents]

- ***Use cases*** of inter-cloud computing
- ***Procedures*** in use cases of inter-cloud computing
- ***Functional requirements*** for inter-cloud computing
- ***Functional structure and interfaces*** of cloud systems in inter-cloud computing

http://www.gictf.jp/doc/GICTF_Whitepaper_20100809.pdf

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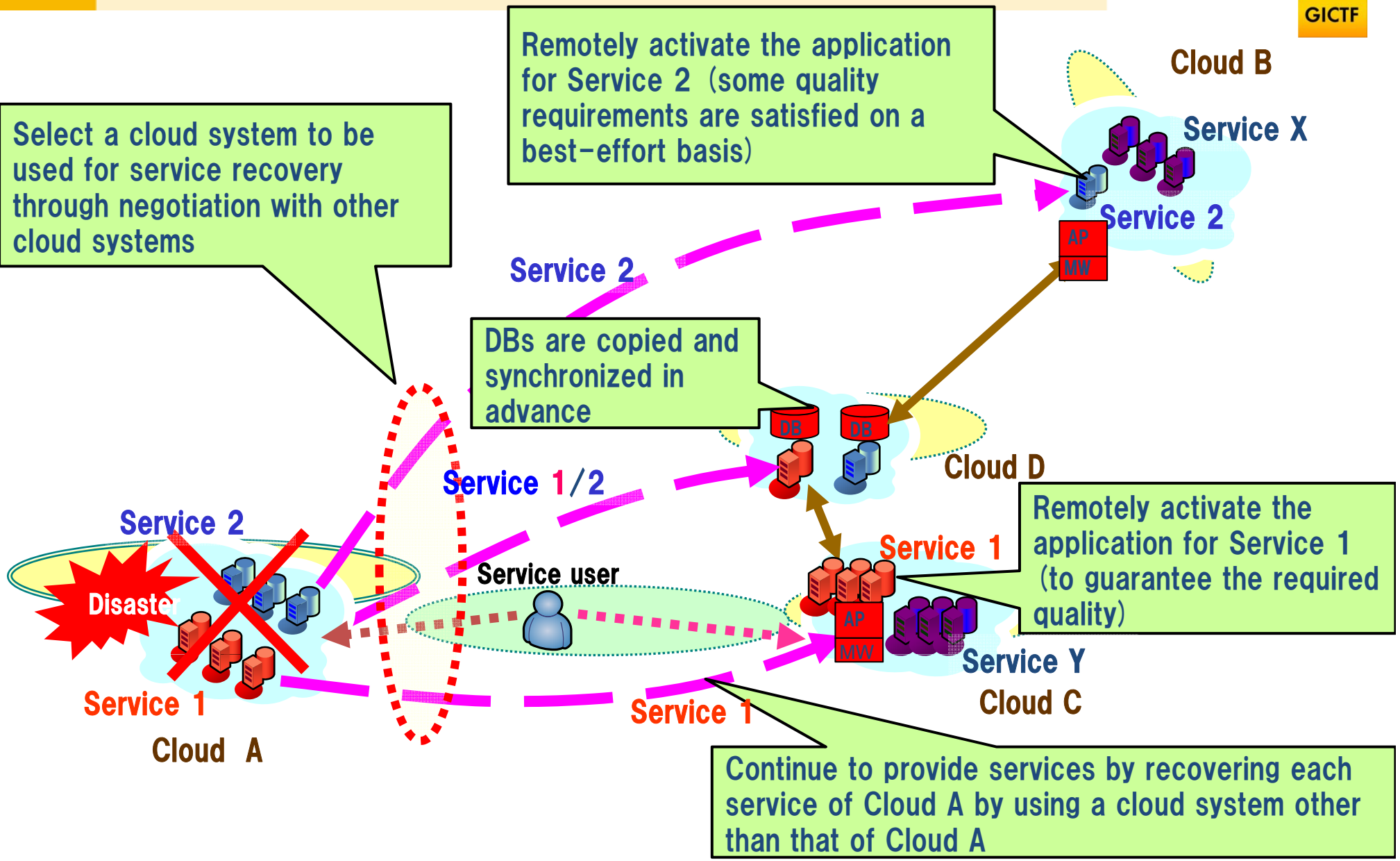
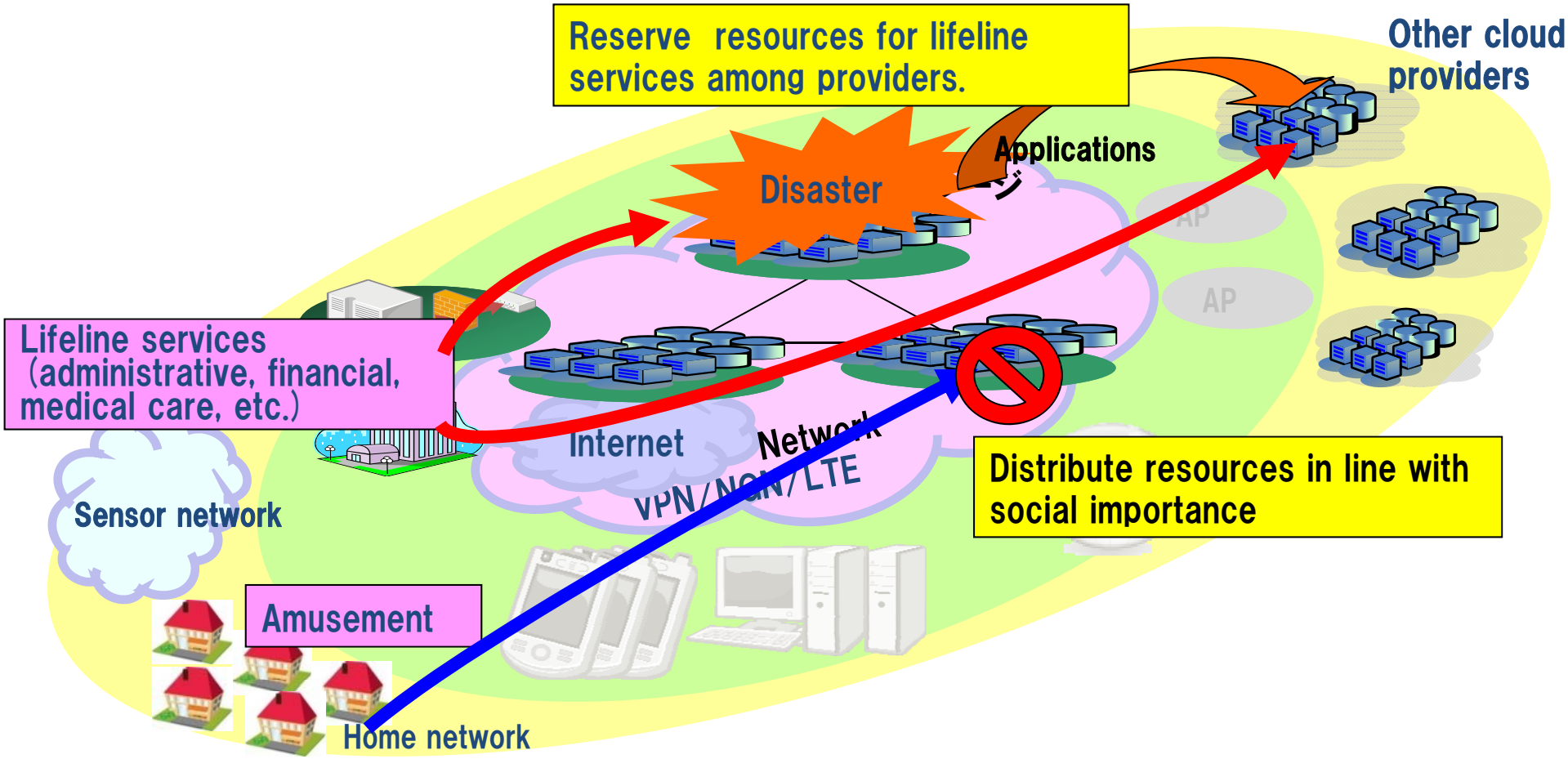
USE CASES FOR THE INTER-CLOUD COMPUTING

Use case of disaster recovery

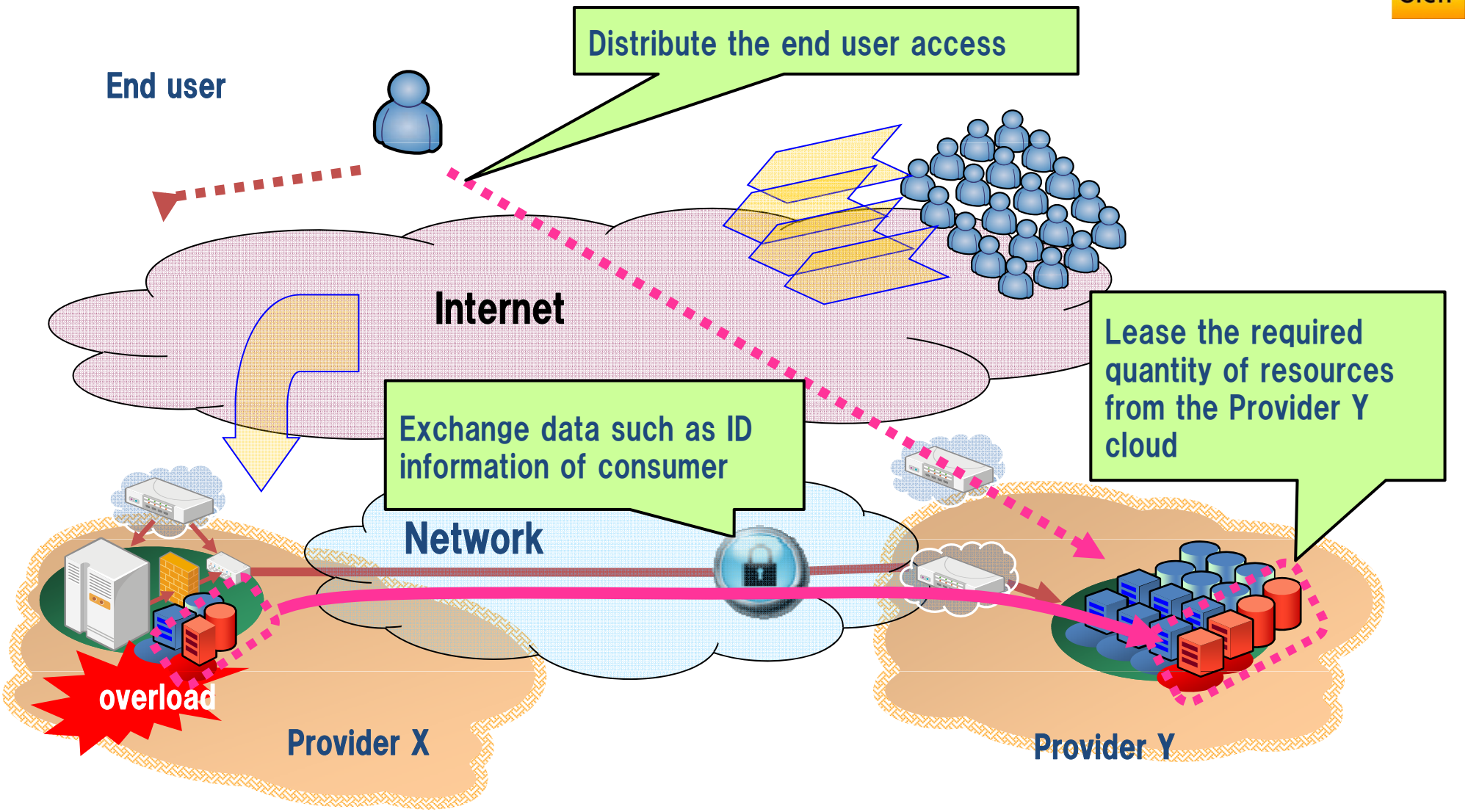


Protect lifeline services in emergency situation

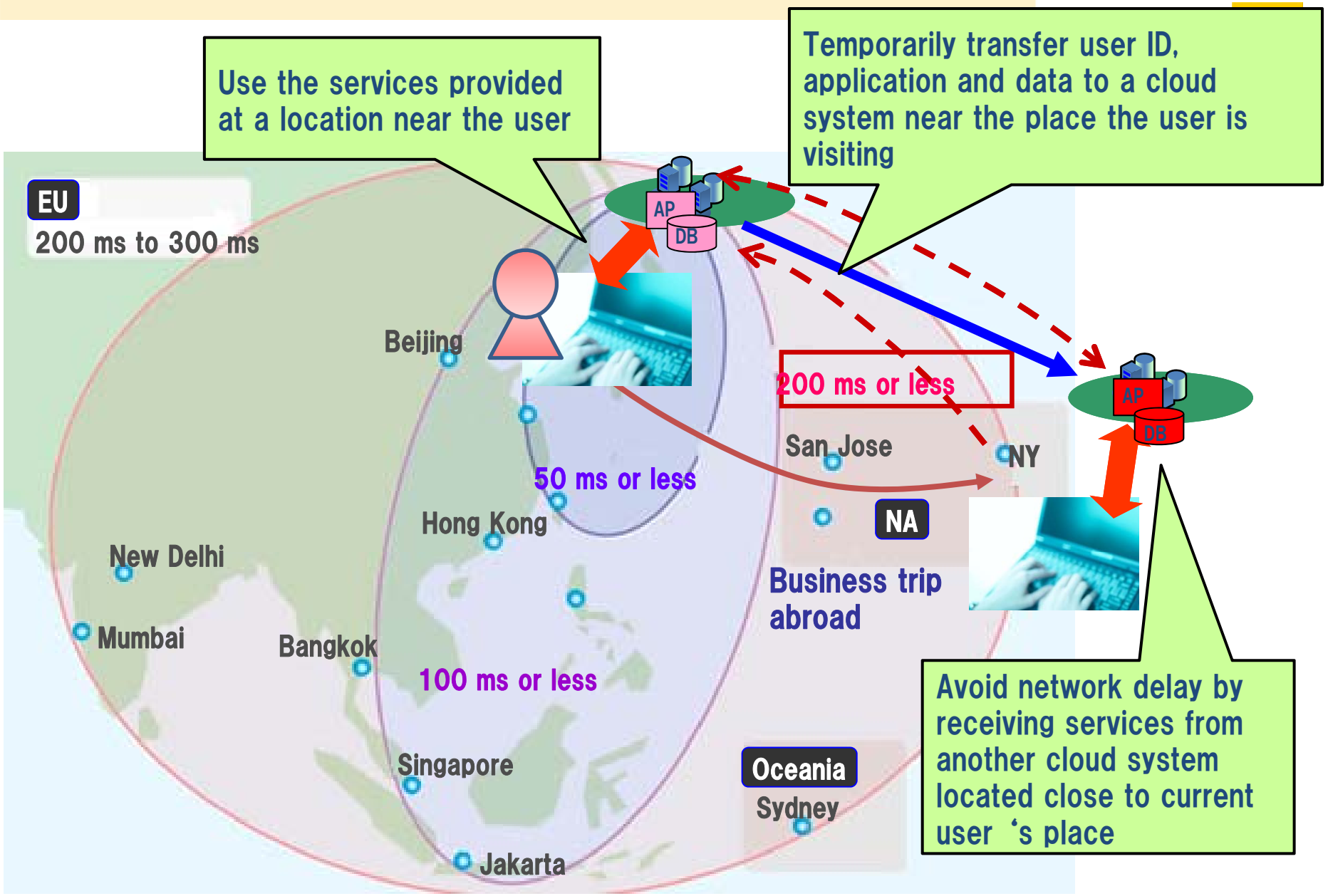
- Protect lifeline services by accommodating resources among cloud/network providers when disaster or massive breakdown occurs
- Distribute cloud/network resources in line with social importance/priority



Guarantee performance against abrupt increase of the load

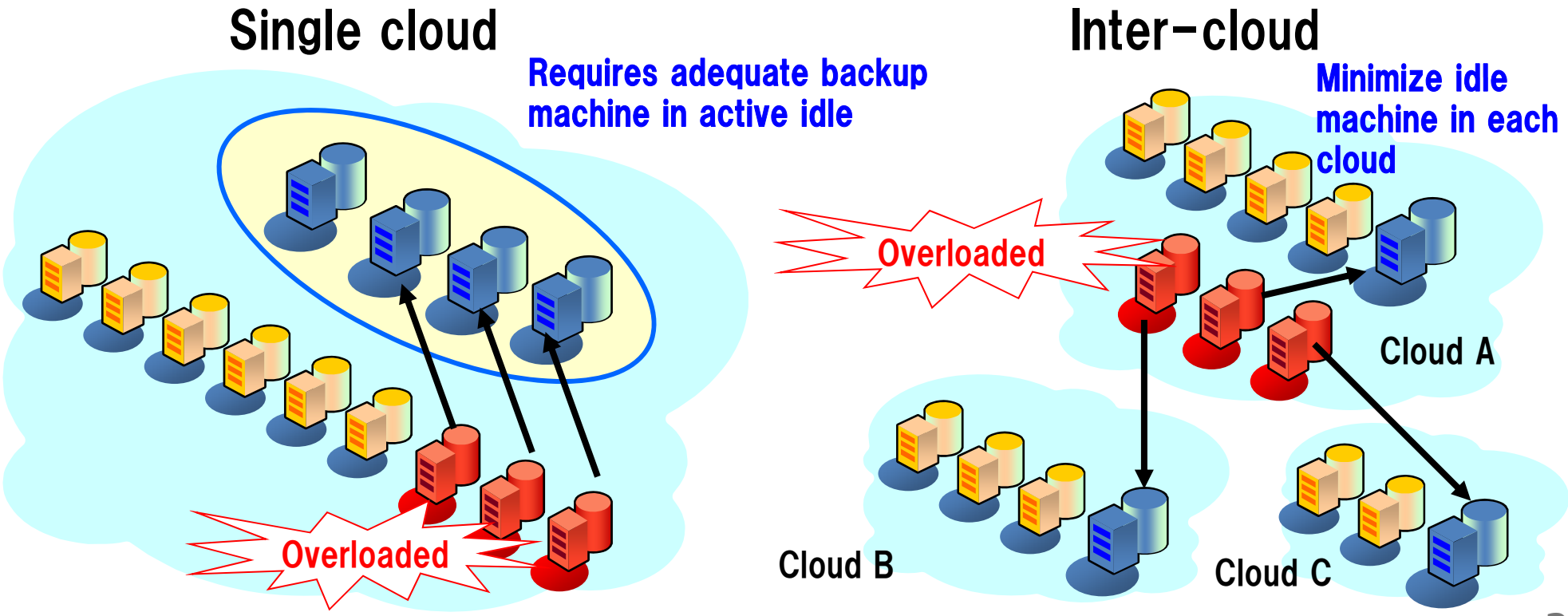


Guarantee performance regarding delay



Inter-cloud reduces power consumption

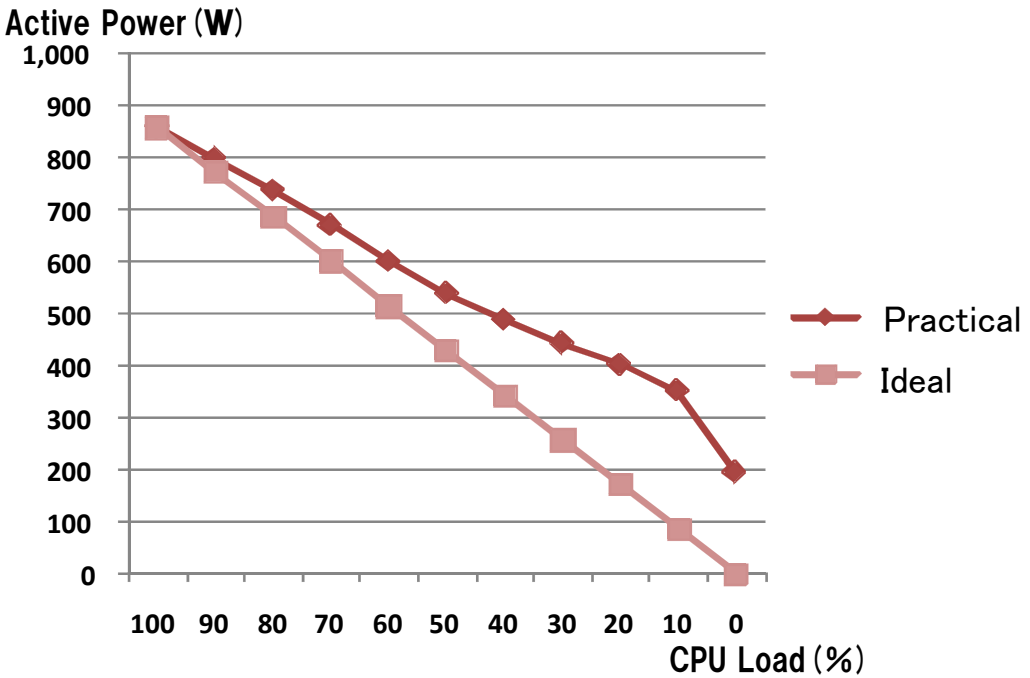
- Guaranteeing high-availability and high-performance by single cloud increases power consumption due to backup machines in active idle.
- Inter-cloud enables multiple cloud systems to share resources, which reduces the power consumption since each cloud can minimize the number of idle machines.



CPU load – Active power

Performance			Power	
Target Load	Actual Load	ssj_ops	Average Active Power (W)	Performance to Power Ratio
100%	99.6%	3,417,531	858	3,983
90%	90.0%	3,089,214	798	3,869
80%	80.0%	2,745,590	736	3,729
70%	70.0%	2,403,210	669	3,594
60%	60.2%	2,065,033	599	3,445
50%	50.0%	1,716,434	538	3,190
40%	40.0%	1,371,435	487	2,818
30%	29.9%	1,027,604	442	2,325
20%	19.9%	683,596	401	1,706
10%	10.0%	342,961	351	978
Active Idle		0	194	0
			∑ssj_ops / ∑power =	**3,106**

Power consumption in active idle is around 20% of that in full CPU use.

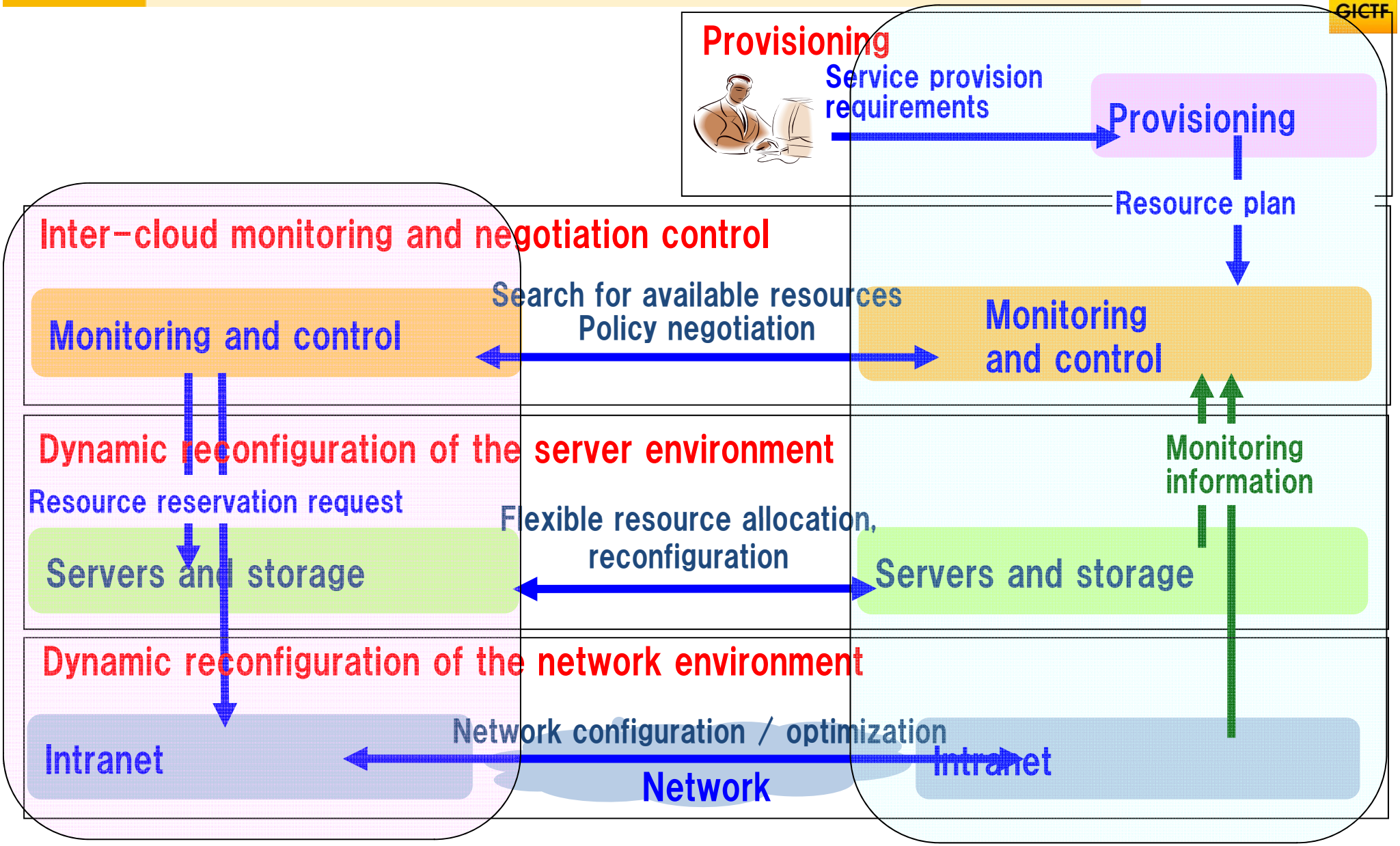


Hewlett-Packard Company ProLiant SL2X170z G6

http://www.spec.org/power_ssj2008/results/res2010q2/power_ssj2008-20100406-00247.html

FUNCTIONAL REQUIREMENTS

Functional Structure of Inter-cloud Computing



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GLOBAL COLLABORATION

Opportunities for collaboration with other groups

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2009/3Q | 2009/4Q | 2010/1Q | 2010/2Q | 2010/3Q | 2010/4Q | 2011/1Q | 2011/2Q | 2011/3Q | 2011/4Q

- GICTF was established
- OGF27
- OGF28
- OGF-Europe
- OMG — Cloud Interoperability Roadmaps Session
- NIST CC forum
- NIST CC forum II
- SecureCloud 2010 — ISACA, enisa, CSA, IEEE
- SaaS/GOV 2010
- OGF30
- OMG — Telecom Cloud
- IEEE — 2nd Cloud Com
- siena — 1st Roadmap
- siena — CloudscapeIII
- ISO/IEC JTC1 SC38
- CIE — 3rd China Cloud Computing Convention
- FTTH Council — Asia Pacific Conference 2011
- IEEE — Cloud Computing Symposium 2011
- IEEE/ACM — 9th Joint Conference on Digital Libraries

The collaboration for sharing the activities in the technical meeting of GICTF.

2010/7/23
David Bernstein (IEEE CCSSG)
2010/9/22 DMTF, SNIA, GICTF
Winston Bumpus (DMTF)
Wayne Adams (SNIA)
Mark Carlson (SNIA)
2010/11/22
Jim Curry (OpenStack)
2011/5/16
Chang-Won Ahn (ETRI)

- ITU-T 1st FG Cloud
- 2nd
- 3rd
- 4th
- 5th
- 6th
- 7th
- 8th

GICTF is proposing the Use Cases from our White Paper.
Our proposal is accepted as a Inter-Cloud User Case. In French meeting of ITU-T, we are proposing the features for Inter-Cloud.

Use cases and functional requirements for inter-cloud computing

Draft interfaces for Inter-Cloud computing

Requirements for network virtualizatoin in Inter-Cloud computing

＊ Red characters mean to provide GICTF's presentation.

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