

Introduction to **G**lobal **I**nter-**C**loud **T**echnology **F**orum (**GICTF**) and its Roadmaps

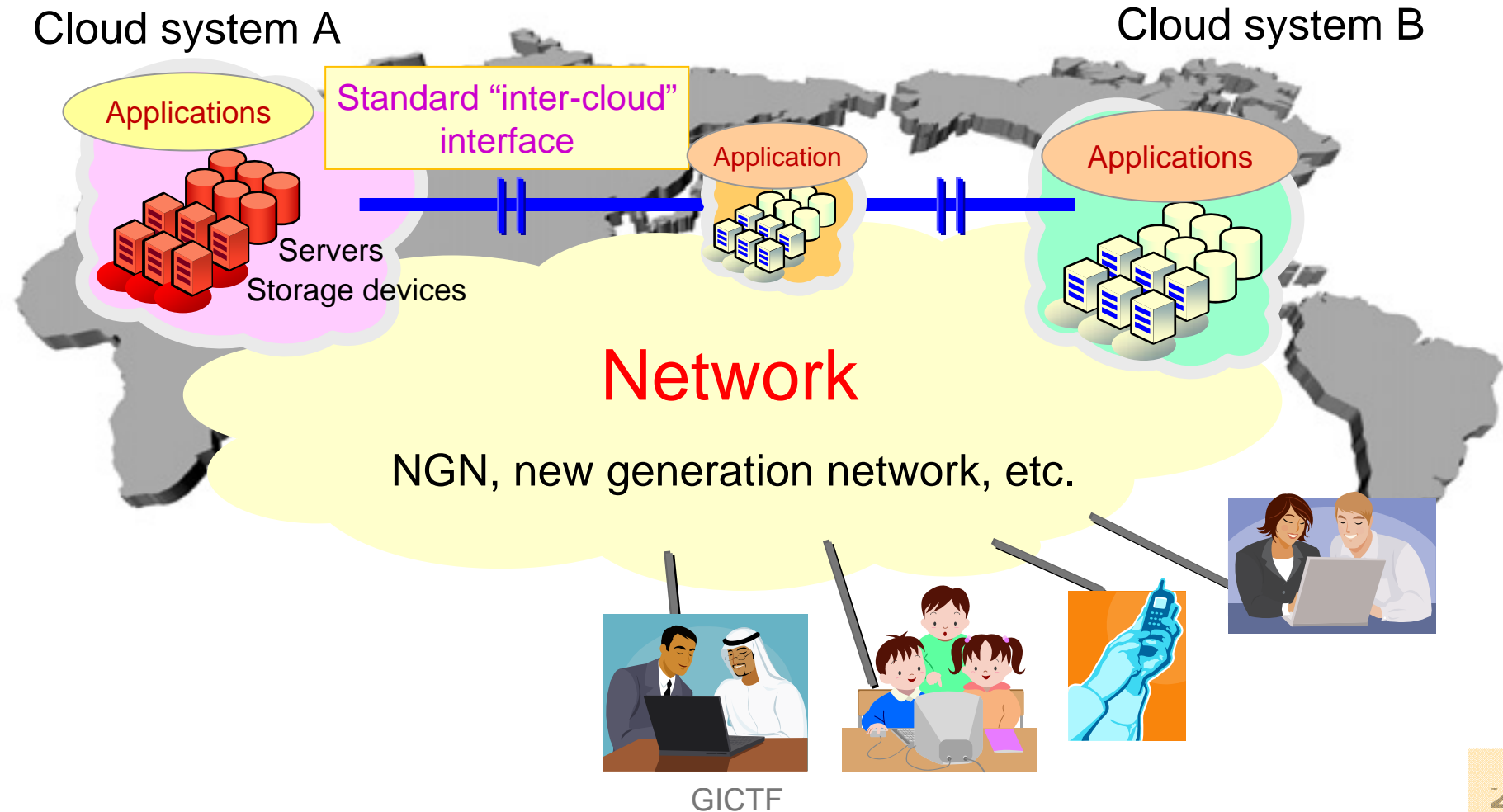
Dec. 10, 2009

Hiroshi Sakai, GICTF secretariat
(NTT Information Sharing Platform Laboratories)

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



Background to establishing the GICTF

An individual cloud has limited scope for scale-out

- Limited space for data centers (land is limited and costly)
- Expensive for a single cloud to have high level of redundancy

High-quality and high-speed broadband network is available

- Commercially available NGN (Next Generation Network)
- It is possible to ensure end-to-end QoS to users even when cloud services are provided across the cloud boundaries.



Develop an inter-cloud world in which multiple cloud systems, running with different policies, interwork with each other to share resources so that end-to-end QoS to users can be maintained even in the event of large fluctuations in computing load that cannot be handled by a single cloud system.

Global Inter-Cloud Technology Forum (GICTF)

■ Main activities:

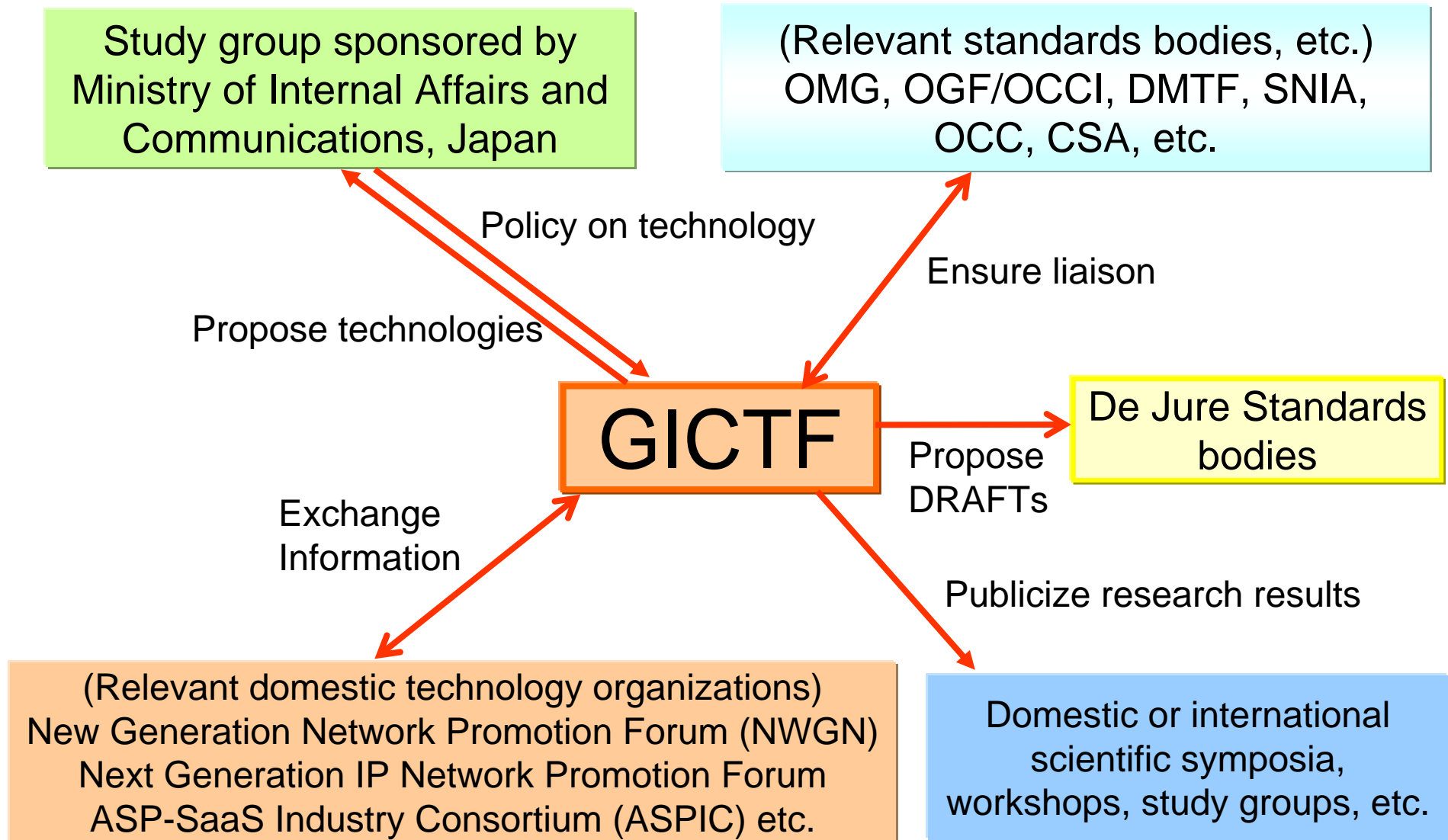
- Identify technical needs for secure cloud federation applicable to e-Government, etc.
- Develop a standard set of specifications for cloud federation, and propose it to relevant overseas standards bodies
- Raise awareness of users

■ Membership (as of November 2009)

- 44 enterprises: NTT, KDDI, NEC, Hitachi, Fujitsu, Toshiba Solutions, IBM, Sun, Oracle, Cisco, RICOH, CTC, and others
- Independent administrative institution, National laboratory
- University professors, etc.
- Ministry of Internal Affairs and Communications of Japan (Observer)

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

Liaison between GICTF and other related bodies



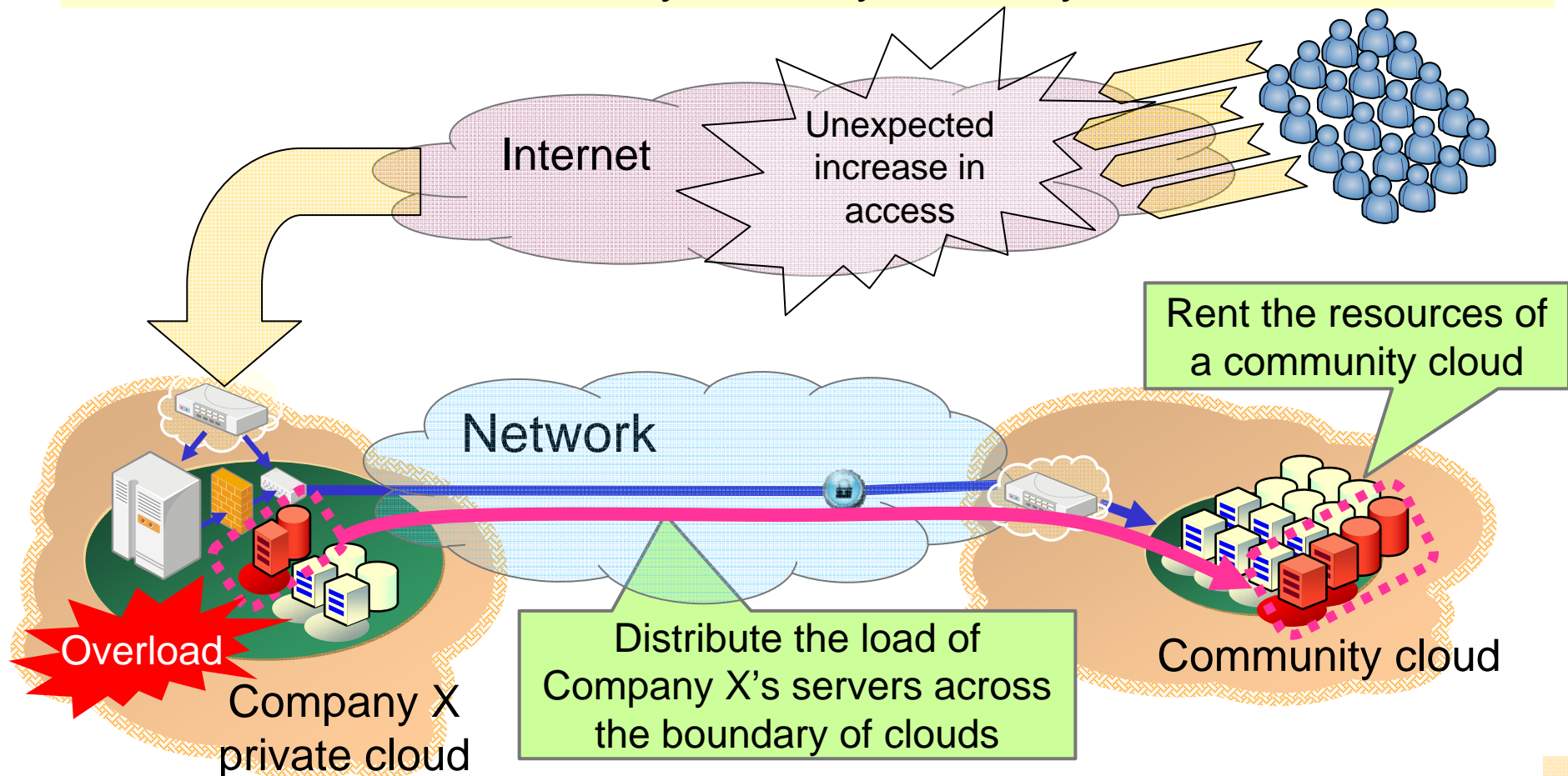
GICTF discussion issues

Discussion issues for cloud federation (1/4)

<p>Theme 1: Inter-cloud federation use cases</p>	<p>Study use cases where cloud federation is effective:</p> <ol style="list-style-type: none">1. Scale-out through cloud federation (cloud bursting)2. Mutual backup and recovery from a disaster through cloud federation3. Porting of services to other cloud providers4. Service interworking through the simultaneous use of multiple clouds etc.
<p>Theme 2: QoS and SLA to be considered in inter-cloud federation</p>	<p>Study QoS / SLA definitions to be considered in cloud federation:</p> <ol style="list-style-type: none">1. QoS and SLA items to be guaranteed end-to-end (totality of server, storage and network)2. Security requirements<ul style="list-style-type: none">- 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.

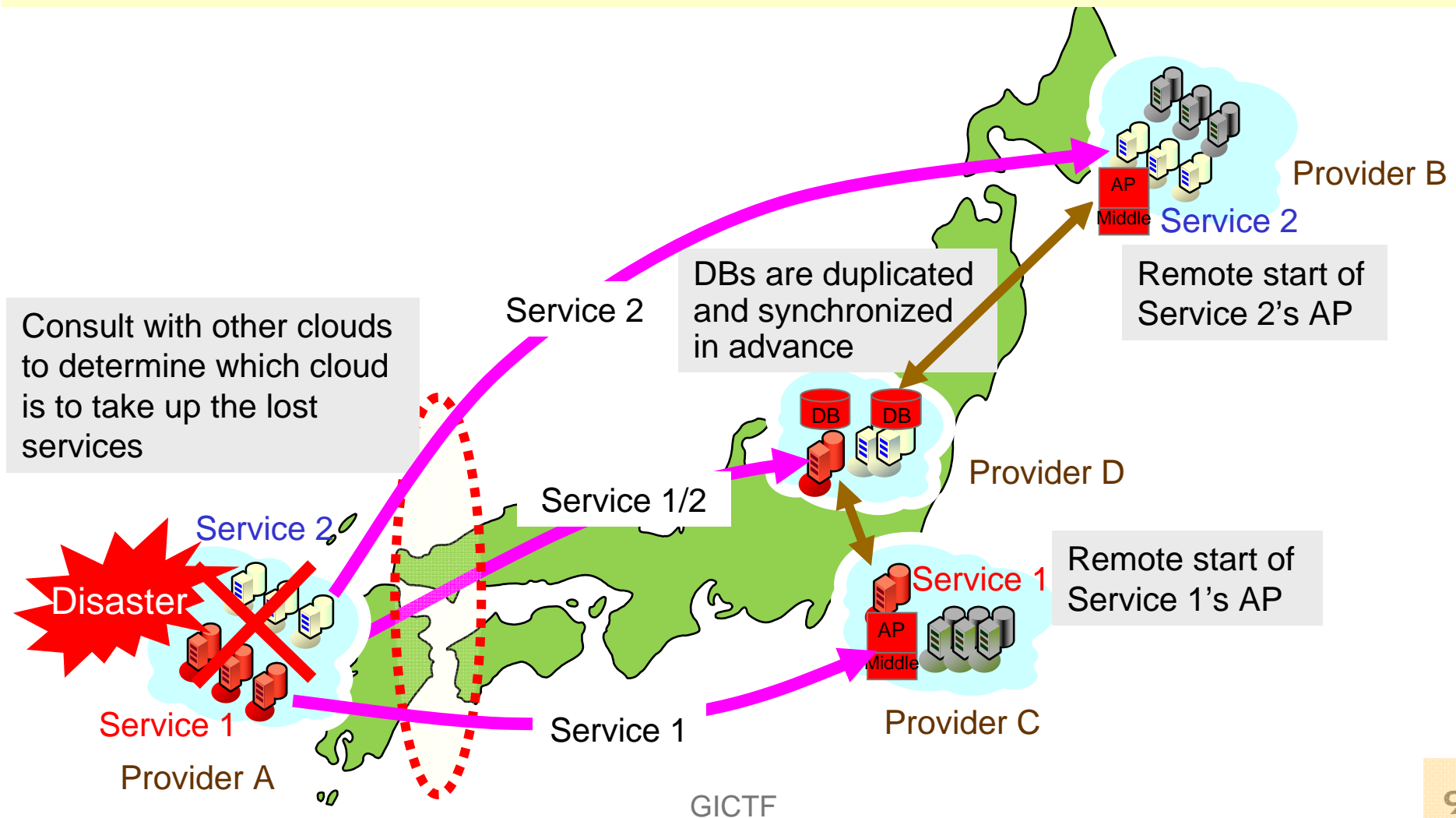
Scale-out through cloud federation

In the event that a newsflash is released or an event relating to Company X occurs unexpectedly, Company X can still operate its cloud stably by distributing its load between the resources of its own cloud and a community cloud dynamically.



Mutual backup through cloud federation and recovery from a disaster

In the event that an earthquake damages provider A's cloud or causes power outage, cloud resources in providers B, C and D are used to restore the services of provider A.



Discussion issues for cloud federation (2/4)

<p>Theme 3: Inter-cloud service monitoring and audit</p>	<p>Study the procedure for centrally monitoring services provided across multiple clouds, and the procedure for auditing them:</p> <ul style="list-style-type: none">- Details of monitoring and audit information exchanged between clouds- Disaster detection mechanism, etc.
<p>Theme 4: Inter-cloud resource discovery and reservation procedure</p>	<p>Study inter-cloud resource discovery and reservation procedure:</p> <ol style="list-style-type: none">1. Procedures for dynamic discovering, reserving or leasing network resources and computing resources from the other clouds2. Inter-cloud policy negotiation<ul style="list-style-type: none">- policies on resource leasing, security, and monitoring of dead/alive, etc.

Discussion issues for cloud federation (3/4)

<p>Theme 5: Inter-cloud service setup procedure</p>	<p>Study the procedure for the provision of service using reserved resources across multiple clouds</p> <ol style="list-style-type: none">1. Dynamic network configuration<ul style="list-style-type: none">- setup of a VPN between the original cloud and the cloud in which resources are reserved.- setup of a VPN between end user and the cloud in which resources are reserved.- reroute end user access to the reserved resources, etc.2. Procedures for reallocating applications and data
<p>Theme 6: Inter-cloud authentication procedure</p>	<p>Study the inter-cloud authentication procedure for cases where the cloud providers concerned use different domains:</p> <ul style="list-style-type: none">- tenant / end user authentication procedure across multiple clouds- exchange end user attribute information, etc.

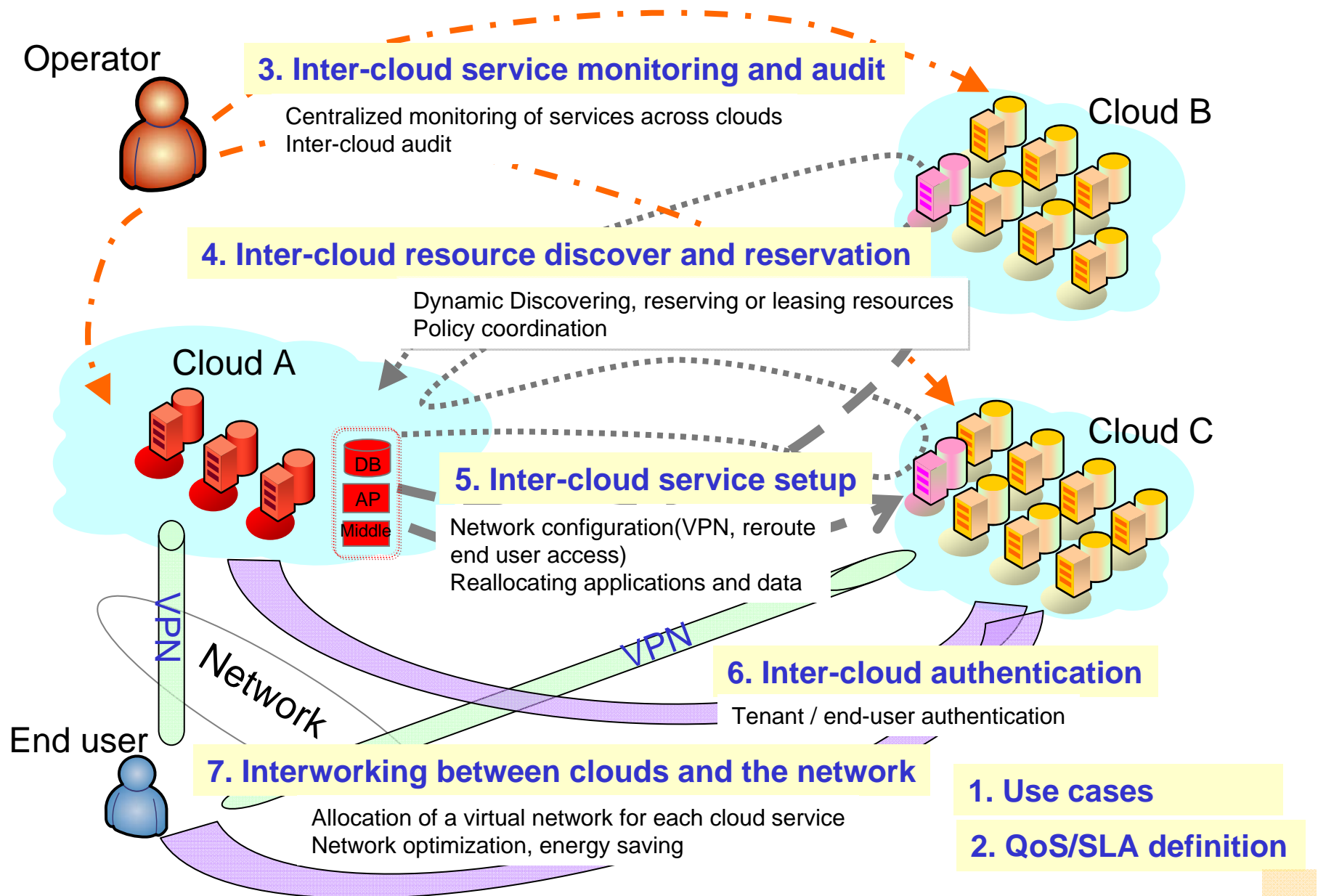
Discussion issues for cloud federation (4/4)

**Theme 7:
Interworking
between
clouds and
the network**

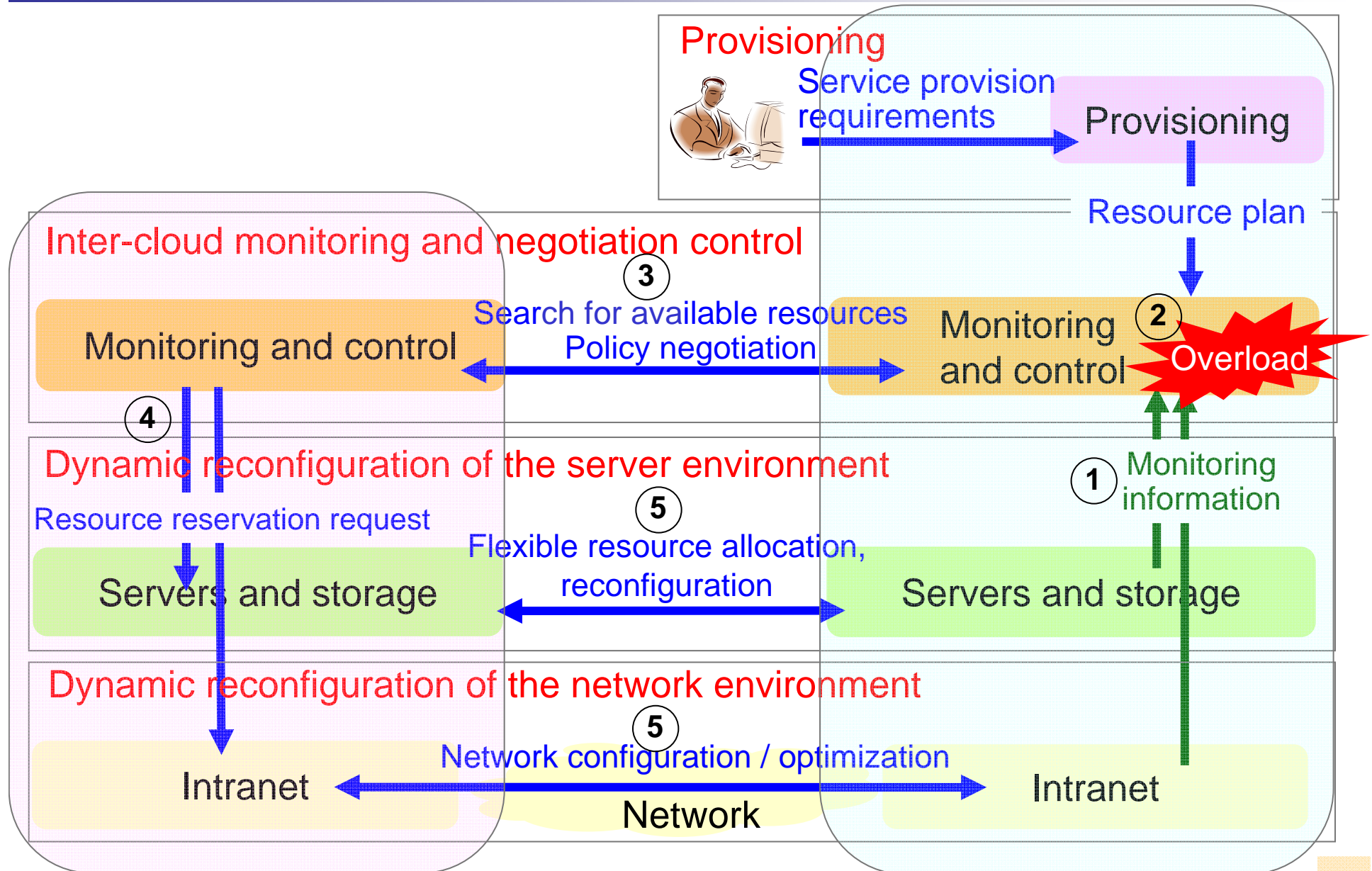
Identify new value that can be created by the integration of cloud and network technologies, and the requirements for the network:

- routing optimization based on monitoring of the traffic of each cloud service
- saving of power consumed by the network by turning off the power of network devices not currently used, etc.

Overview of discussion issues for cloud federation



Inter-cloud federation architecture: overview

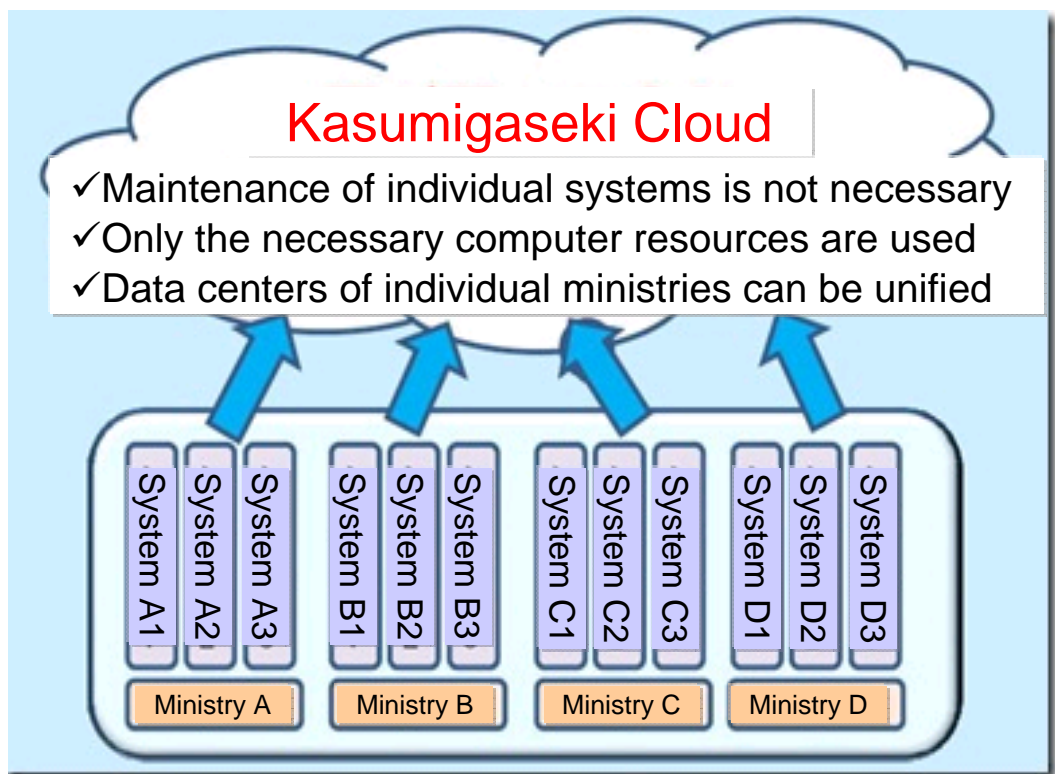


Japanese government clouds

Kasumigaseki Cloud (provisional name)

Concept of e-government using cloud computing technology

(Start with the migration of smaller systems, and aim at completion in 2015)



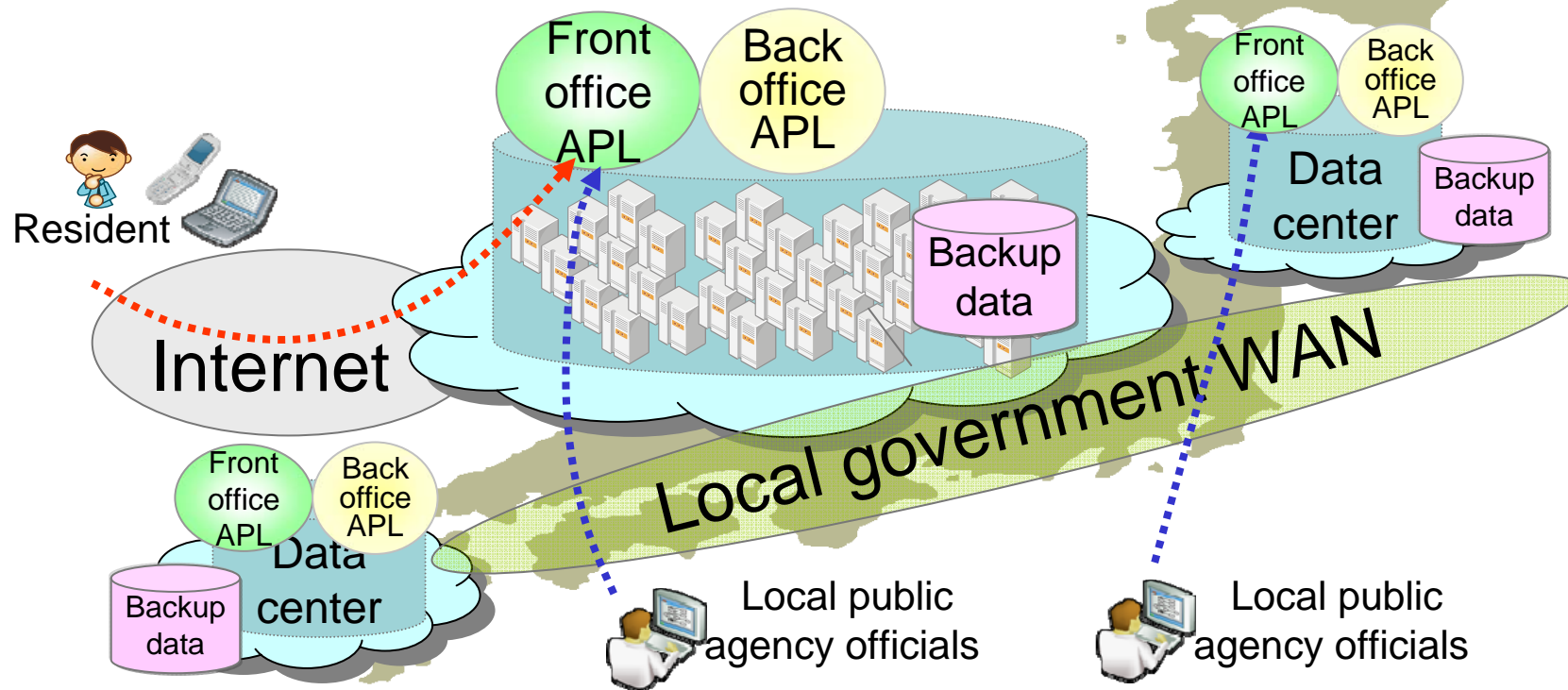
Dramatically reduce the cost of building and operating the information systems of the central government

Source: "ICT and Economic Recovery" (Ministry of Internal Affairs and Communications), etc., ASPIC Spring Meeting, May 15, 2009

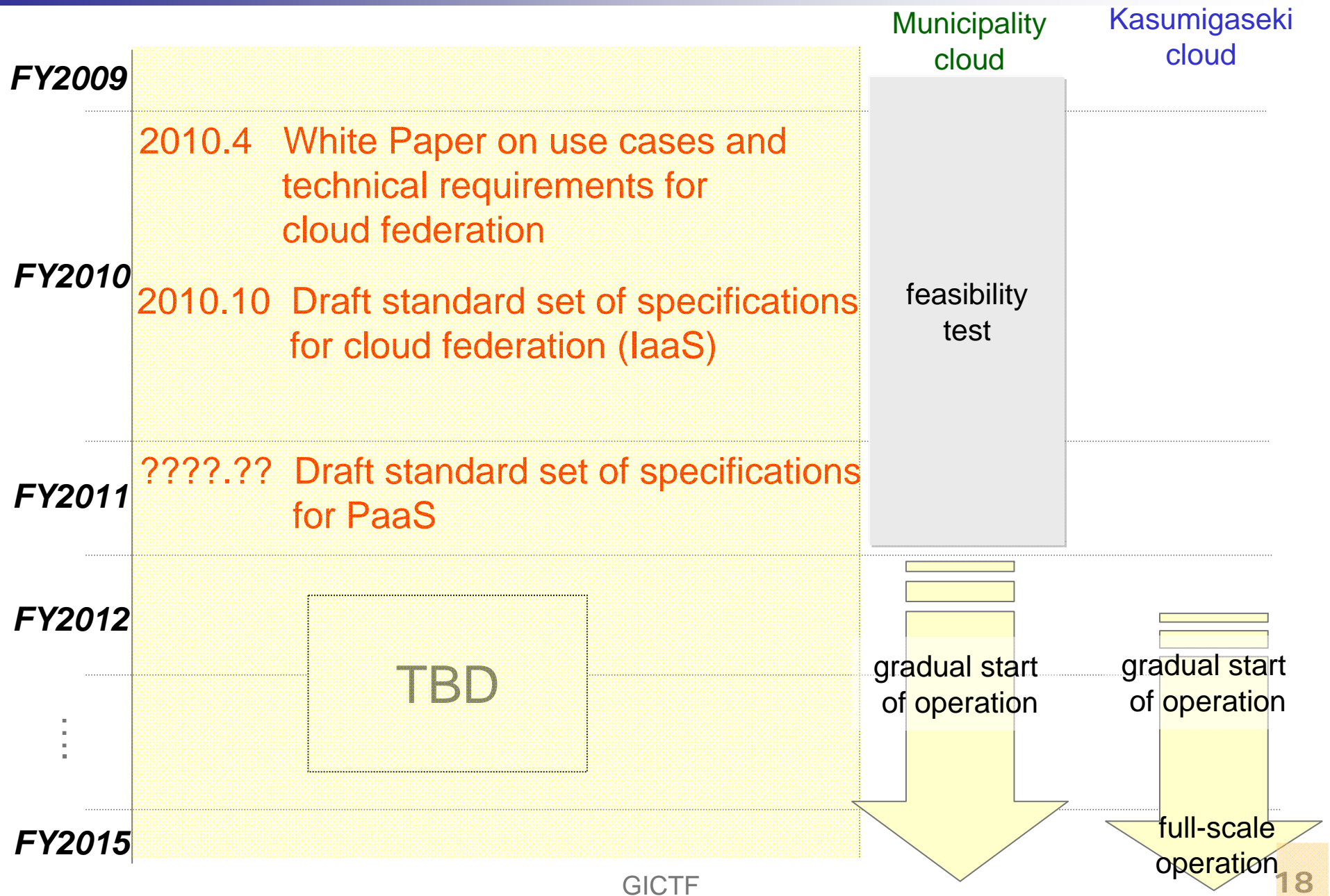
Municipality cloud (provisional name)

Consolidate municipalities' systems into 3 data centers distributed in a well-balanced manner across Japan, under the leadership of prefectural governments, and aim to operate them efficiently by incorporating the interworking of data, data backup and load balancing, by cloud computing

A feasibility test is planned in Japan
6 prefectures, 66 municipalities to participate



Roadmap



Thanks!