Beyond Promise

IT Service R&D
in Enterprise Cloud Computing

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Contents

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Definition

> Behind-the-firewalls use of commercial, internet-based cloud technologies focused on company's computing needs (CNET News, 2009)

> Focus primarily on the <u>enterprise adoption of cloud computing services from the public cloud</u> (Gartner, 2009), at present the main consumers of cloud computing are small companies and startups that don't have a legacy of IT investments to manage

> Keyword: Trust(Security, Compliance, Legacy Integration, SLA)

> Most IT Services are targeting ECC for the sake of existing clients

Present

Future Scenario
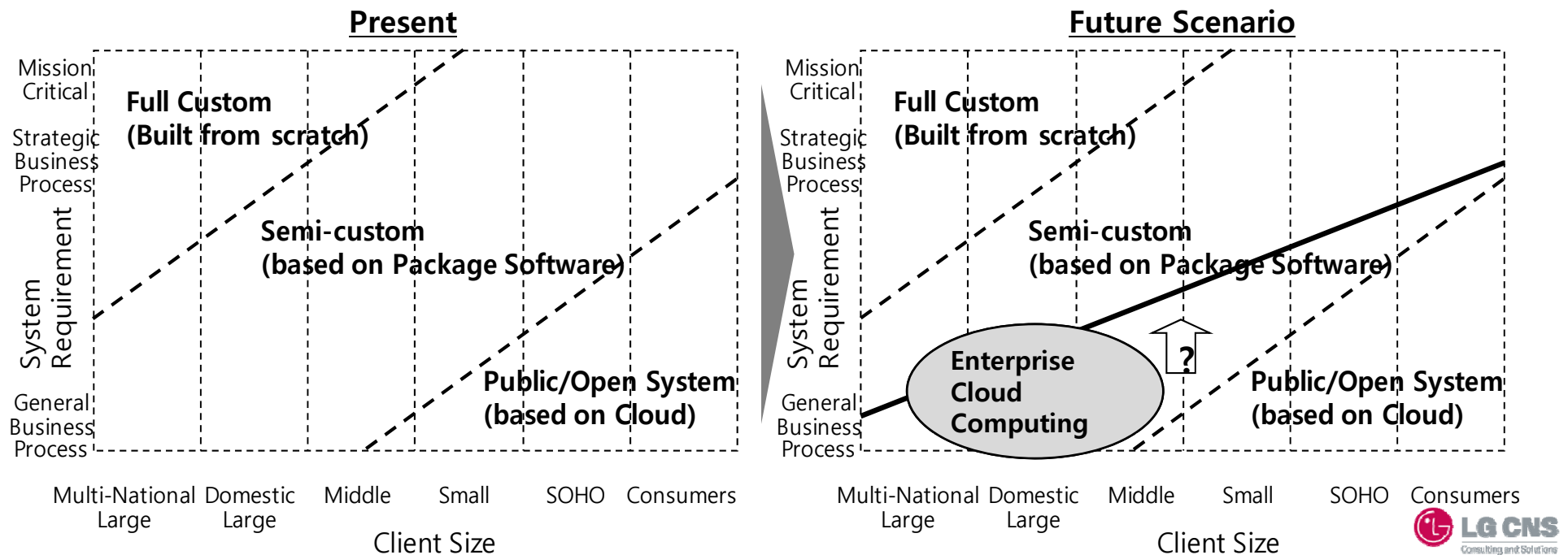
Direction where ECC goes

➤ Current situation: Phase 1 is at dawn, users examine "real impact" of cloud computing

- National Computing & Information Agency is planning to develop IaaS and PaaS for the Government
- SK Telecom's Cloud Computing Platform for mobile content providers to develop and commercialize mobile content services

➤ The first movers to Private Cloud take operational experience, which results in increasing trust to cloud computing

➤ And then, Non-core BP goes to Public Cloud Computing, and core BP goes to Private Cloud Computing

1. Introducing Private Cloud

Public

Core BP ◄► Non-core BP

Private

2. Hybrid Cloud

Public

Non-core BP

Core BP

Private

3. Integration between Public Clouds

Public | Public

Core BP ◄► Non-core BP

Private

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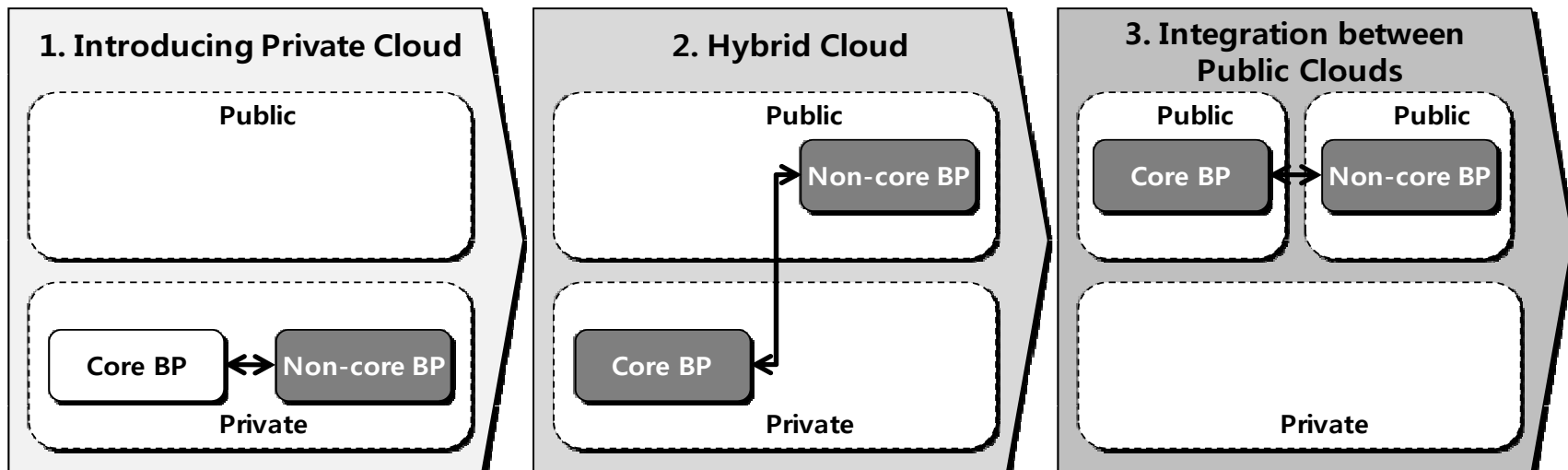
IT Services R&D

- ➢ Transforming knowledge and ideas into assets to be used in the course of the business to support either revenue generation or operations efficiency that reduces costs (Gartner, 2002)

- ➢ Research part is focused on capturing ideas, knowledge and the experience of the organization to sift for new or improved ways to efficiently deliver value to clients

- ➢ Includes investigating ideas to see if they are commercially viable and technically feasible and usually includes some type of business case development

- ➢ Development part is charged with turning ideas into real and intangible assets

- ➢ The assets can be discrete service offerings, complete solutions or new or improved operational processes(ie. outlines, simple process, toolset, template, methodology, supporting material)

R&D Process

Research		Develop		Business
Search	**Ideation**	**Development**	**Incubation**	
▪ Trend Analysis ▪ New Tech. Research	▪ Business Case ▪ Business Scenario ▪ Service Offering (draft) *Market*	▪ Service Offering ▪ Methodology/Tool ▪ Pilot ▪ SW/Solution PoC ▪ SW/Solution Development	▪ Business Development ▪ Supporting Business *Client Engagement*	▪ Business Engagement
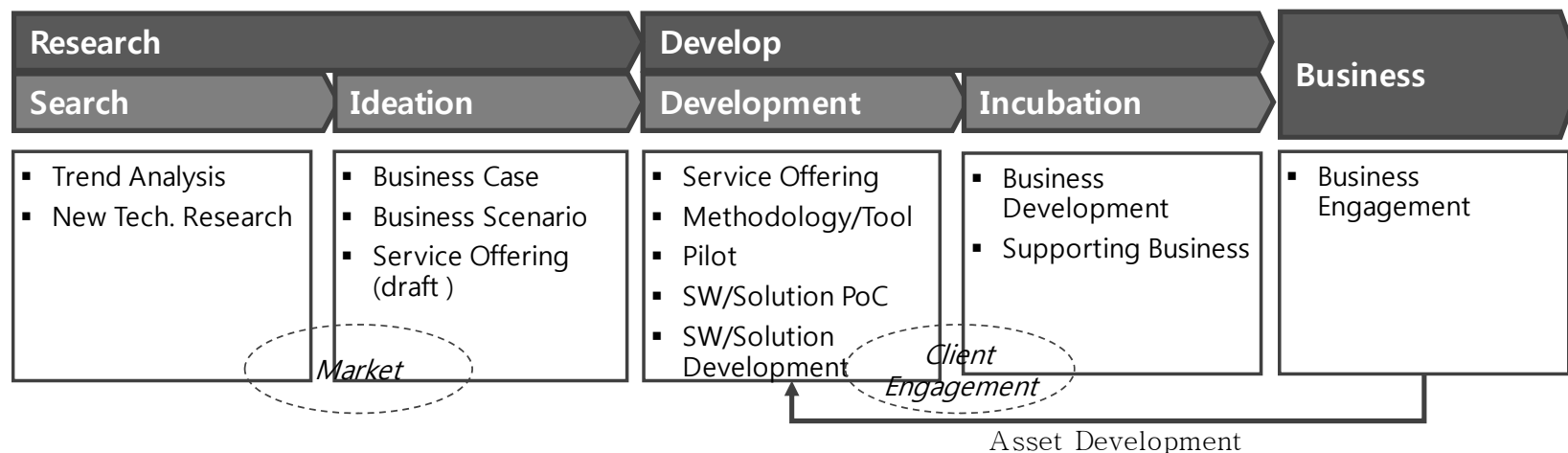
Asset Development

LG CNS, 2007

IT Services R&D

➤ Several attributes unique to IT Services R&D compared to other industries

- More concerned with creating the application of IT than with the technology itself:

  - Biz Model, Service Offering Development

- Brings together disparate pieces of technology that are needed to build a solution:

  - Connect & Develop

- Acts as a filter on what technologies should actually reach the marketplace:

  - Pilot, PoC, BMT

- Much more tactically focused, which can lead to more narrow project scopes and shorter time periods for project

  - Core Tech. Development

- Less capital- and resource-intensive

Case Study

> IBM Research Computing Cloud (RC2)

- Provides self service "on demand" delivery solution for research computing resources

- Zero touch support for the full life cycle of service delivery(Order creation, Automated provisioning and Monitoring)

> Accenture Cloud Computing Accelerator

- help enterprises explore the potential power of cloud computing from assessment through pilot

> Wipro w-SaaS Platform

- a platform for rapid SaaS enablement and deployment on cloud, using some of the commonly accepted trends in software engineering and open standards.

Research Compute Cloud (RC2)

India
Zurich
Watson

Yellow area = actual load/demand
Blue line = forecasted load/demand

Load (users)
Time

Application re-implementation

Effort %

40%
40%
50%
Saving
Saving
40%
30%
20%

30%
20%
30%

Native SaaS enablement
Commercial SaaS platform
w-SaaS platform
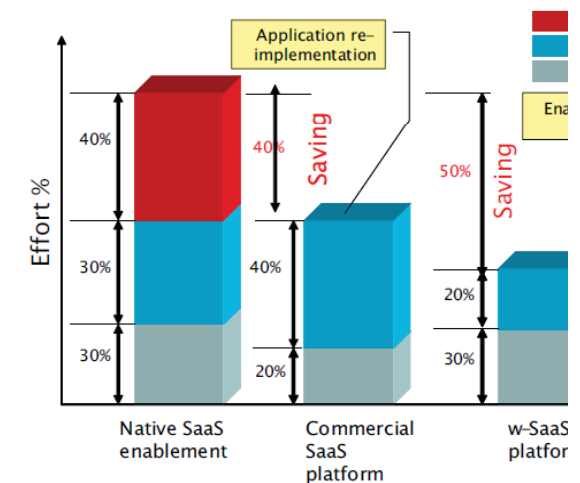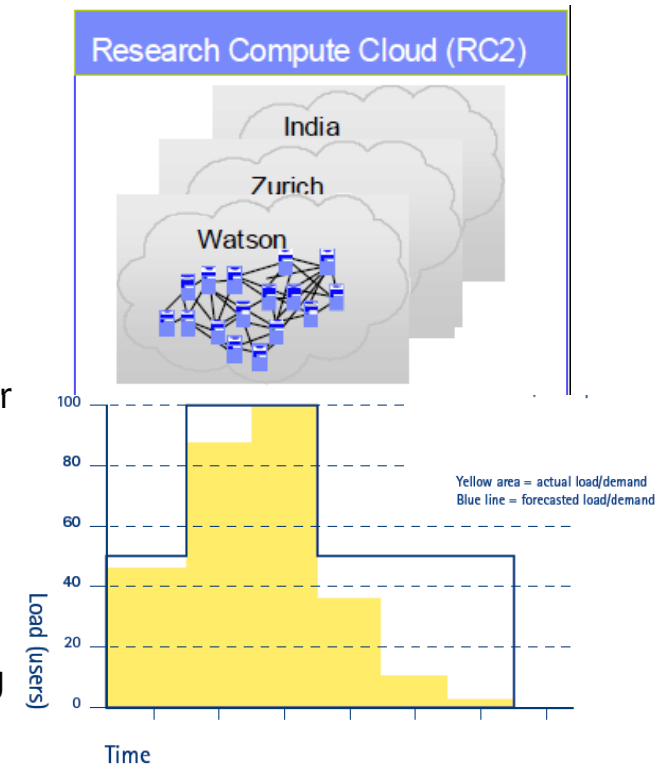
Service Offerings

> Services for optimizing with cloud computing to support clients with cloud building and cloud delivered offerings

- SaaS: ASP Services & System Integration Service

- PaaS: Dev. Platform Service,

- IaaS: Server, Storage, Backup and Server Based Computing Service(Desktop Virtualization)

	1990	2000	2010	
Consulting/ SI			**Private Cloud (2004~)** •SBC(2004~), SaaS SI(2006~) •Dev. Center SI(2007~)	**Total Cloud Service Provider**
BPO	**ASP (1990~)** •Firm Banking, Trade EDI, Payment Gateway, Digital Tax Invoice •160 Clients			
Infra./ ITO			**IDC/Utility Computing (2002~)** •UC(Server, Storage, Backup), 13 Clients •IDC: Yahoo Korea, KEB etc.	
R&D			**Alternative Delivery R&D (2001~)** •UC, Grid, OSS, Web 2.0, Data Service, SOA, SaaS, IaaS	

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SaaS(1)

> SaaS Core Asset

- SI assets for Multi-tenancy and Configurability

- Basic: Object Customizing, UI Customizing, Biz. Logic Customizing and Workflow

- Extended: Reporting, Legacy Integration and Development Environment

SaaS Core Assets

UI
- Global Vars (Meta Data)
- Bridge

Role-Based Access Contol

Tenant Custom Object Service
- Dynamic Object
- Data Import/Export

Dynamic UI Service
- Personalization
- Dynamic UI
  - Pattern LIB
- Dynamic Query
  - Query

Tenant MetaData Caching

Tenant Data Backup/Recovery

Tenant Data Security
- Key Manager
- Enc/Dec

ASync Job Service
- Queue
- e-mail

Workflow Service
- Event Trigger
- Workflow Manager

Biz Logic Service
- Script Process

Tenant-Aware Monitoring
- Disk Usage
- DB Usage
- Service Performance

System Monitoring (BoAPM)
- CPU
- Mem
- Disk

Tenant Provisioning Service
- Disk Allocation
- DB Provisioning
- MetaData Provisioning

SaaS Development Service
- Web-based Service Generator
- Table/MetaData Generator
- Development Language

Report Service
- Dynamic Report

Integration Service
- Webservices
- API
- Mash-up

Support
- Subscription
- Billing
- Metering
- SSO
- SLA

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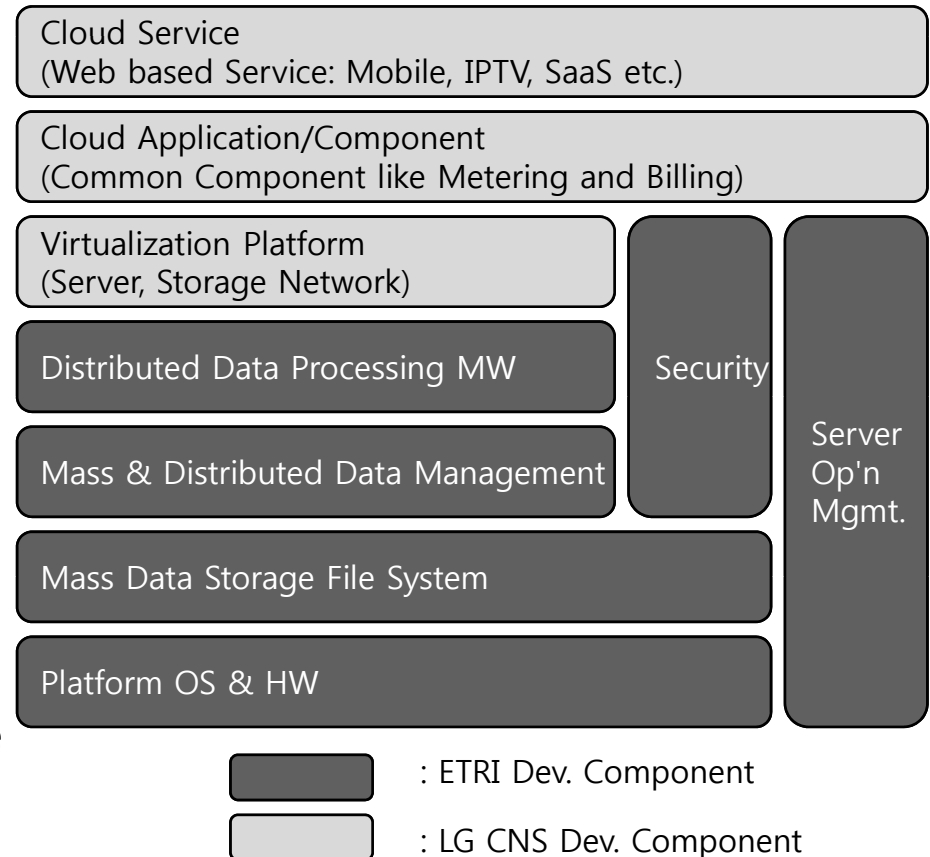## SaaS(2)

➢ SaaS SW Development using Drag & Drop | ➢ Service Development based on SaaS Core Asset
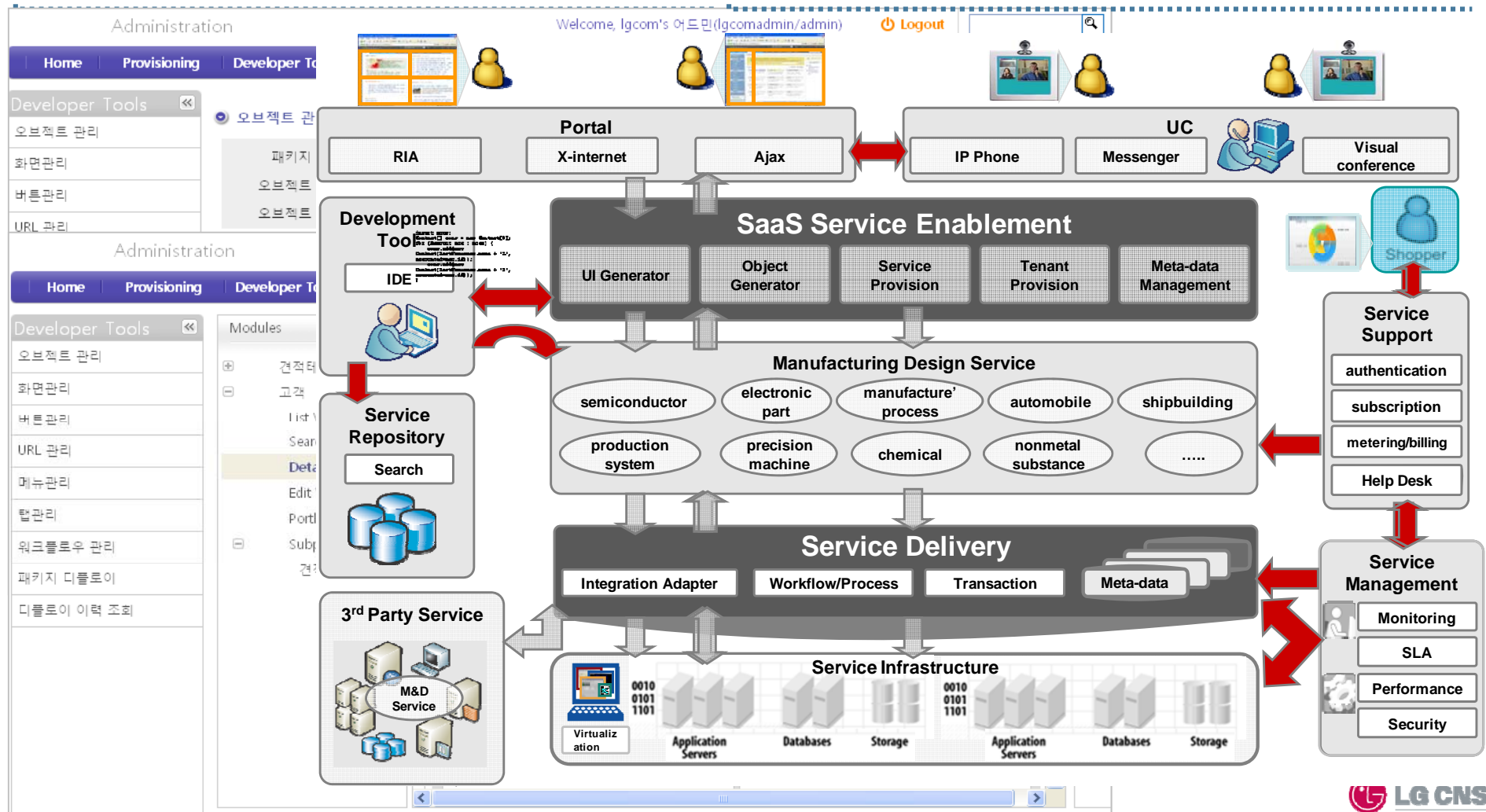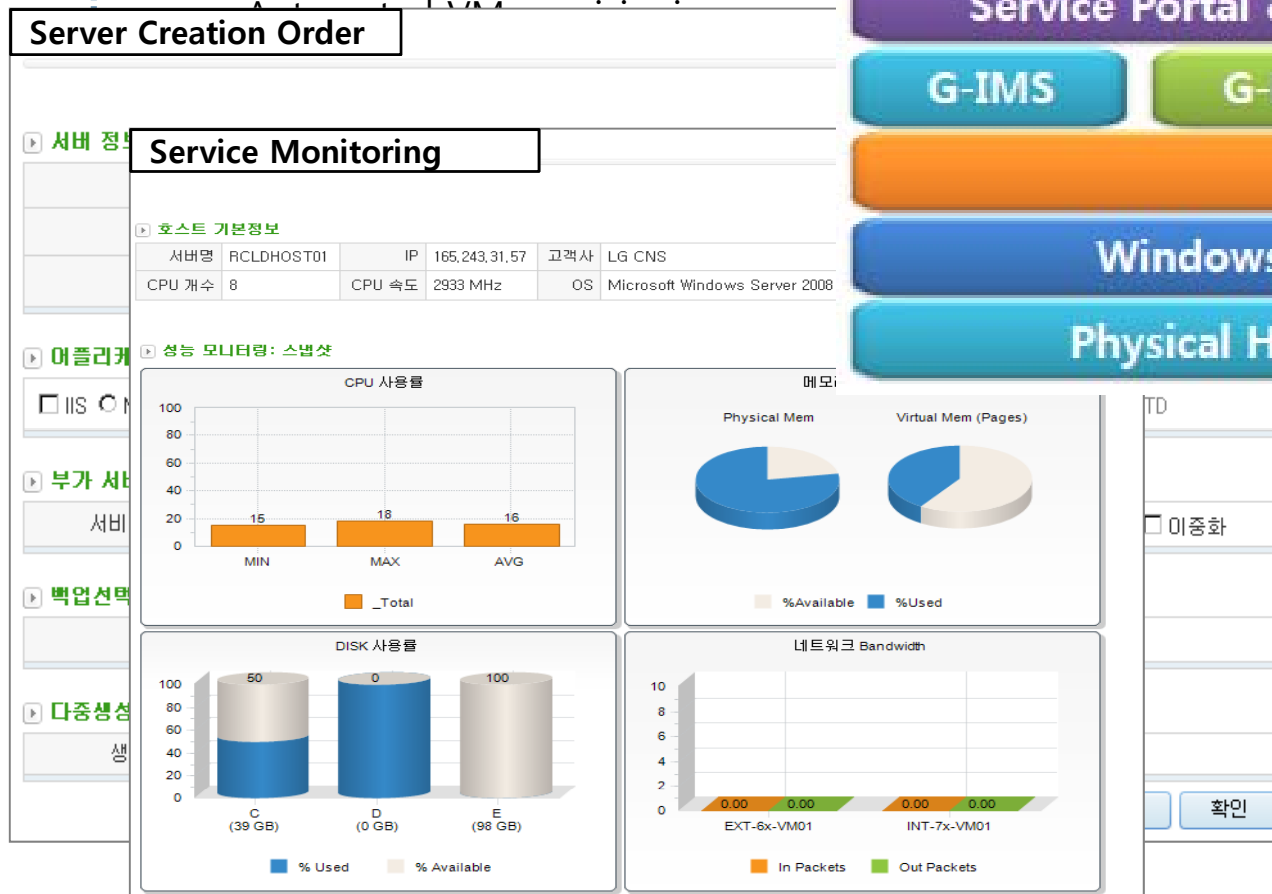
IaaS(1)

- Joint R&D for Distributed Mass Storage Processing with Electronics and Telecommunications Research Institute(ETRI)

- ETRI focuses on research related to their existing GLORY (Global Resource Management System For Future Internet Service) project

- LG CNS mainly develops the application area and services for enterprises

- LG CNS proposed distributed file system architecture to Supreme Court for the cost saving in processing the legal multimedia records

Cloud Service
(Web based Service: Mobile, IPTV, SaaS etc.)

Cloud Application/Component
(Common Component like Metering and Billing)

Virtualization Platform
(Server, Storage Network)

Distributed Data Processing MW

Security

Mass & Distributed Data Management

Server Op'n Mgmt.

Mass Data Storage File System

Platform OS & HW

: ETRI Dev. Component

: LG CNS Dev. Component

IaaS(2)

➤ IaaS Management Asset

- User self-service portal

- Automated VM provisioning

Server Creation Order

➤ IaaS Platform

Service Portal & User Request Management

| G-IMS | G-EMS | V-Center | Bladelogic |

Hypervisor

Windows 2008 Datacenter Core

Physical Hardware (서버, 스토리지)

▶ 서버 정보

Service Monitoring

▶ 호스트 기본정보

| 서버명 | RCLDHOST01 | IP | 165.243.31.57 | 고객사 | LG CNS |
| CPU 개수 | 8 | CPU 속도 | 2933 MHz | OS | Microsoft Windows Server 2008 |

▶ 애플리케ㅣ

▶ 성능 모니터링: 스냅샷

☐ IIS ○ M

CPU 사용률

100 / 80 / 60 / 40 / 20 / 0

15 (MIN)   18 (MAX)   16 (AVG)

☐ _Total

메모ㅣ

Physical Mem   Virtual Mem (Pages)

☐ %Available   ☐ %Used

TD

▶ 부가 서ㅣ

서비

☐ 이중화

▶ 백업선택

DISK 사용률

100 / 80 / 60 / 40 / 20 / 0

50 (C) (39 GB)   0 (D) (0 GB)   100 (E) (98 GB)

☐ % Used   ☐ % Available

네트워크 Bandwidth

10 / 8 / 6 / 4 / 2 / 0

0.00 0.00 (EXT-6x-VM01)   0.00 0.00 (INT-7x-VM01)

☐ In Packets   ☐ Out Packets

▶ 다중생성

생

확인

Further Research Theme

➢ Pricing

- PUPM(per user per month) is used but 'pay as you go' pricing structure is required

➢ SLA

- mostly nonexistent

- ensuring satisfactory quality of service, which is critical to the success of cloud computing.

➢ Business Model

- community model: national cyber manufacturing design hub, national green service portal for SMB, SaaS for small & medium sized hospitals, carbon payment model etc.

Thank You

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