ucloud
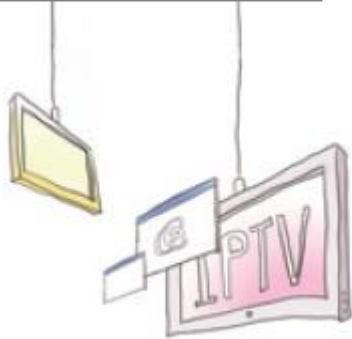
kt cloud computing

2012. 05. 14 / kt_Cloud Engineering Department / Injung Kim

Table of Contents

Cloud Computing is ?

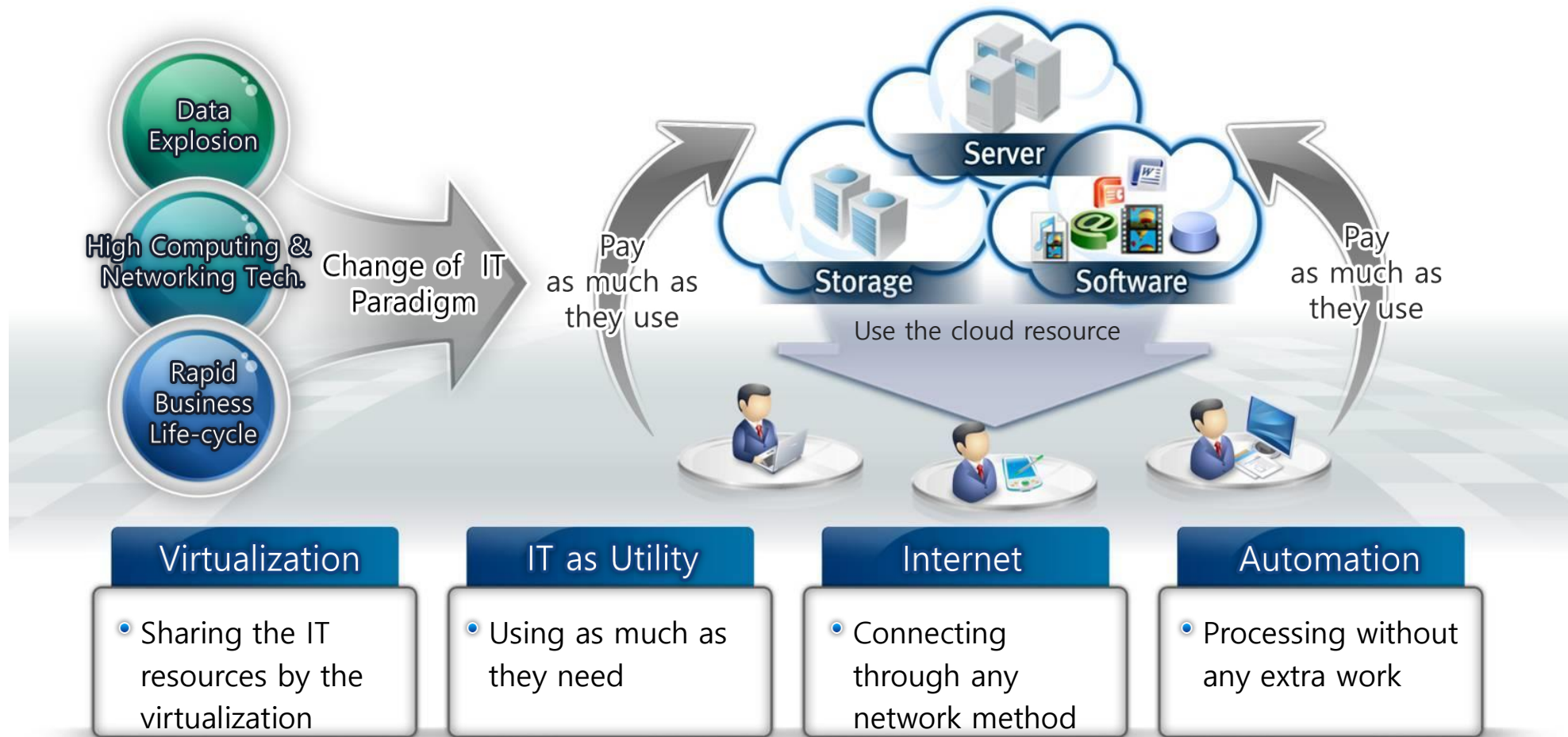### Cloud Computing

☐ Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Cloud Computing is ?

Virtualization	IT as Utility	Internet	Automation
• Sharing the IT resources by the virtualization	• Using as much as they need	• Connecting through any network method	• Processing without any extra work
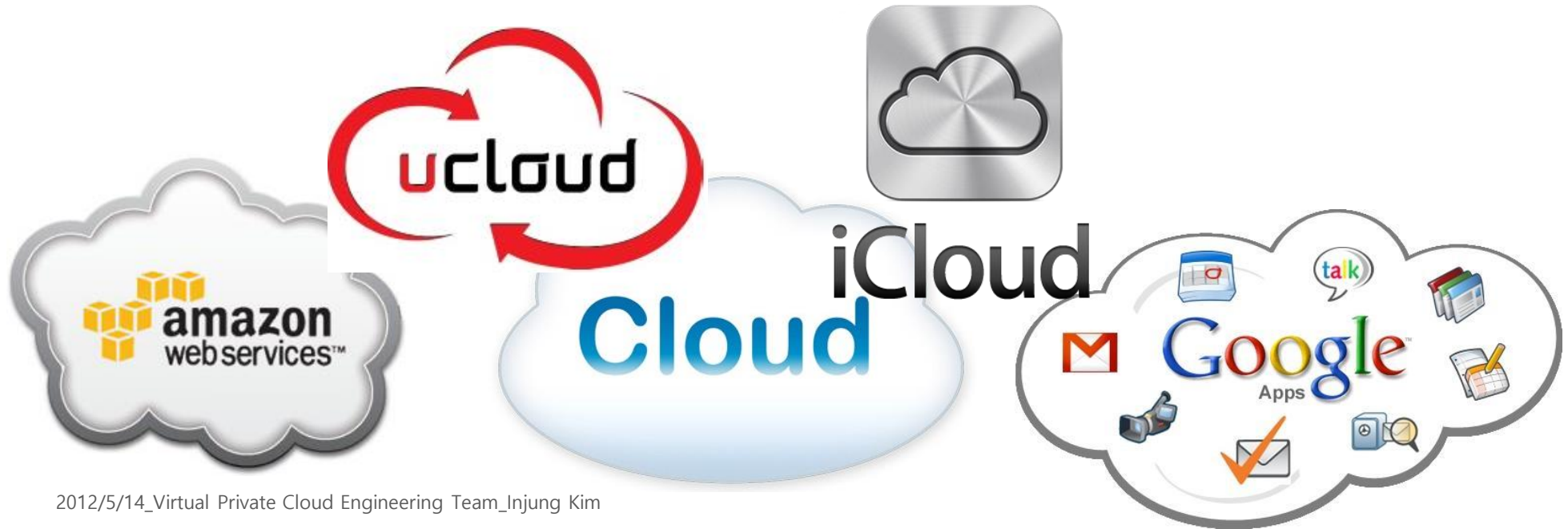
Benefits of Cloud Computing

° Application Execution without physical division of IT resources (Virtualization)

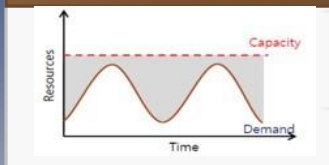Purchase → Delivery → Installation → Composition

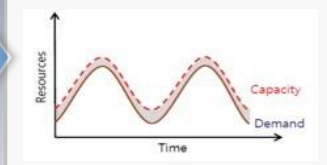Immediate Usage

time

Cloud Self-Service

° Business Immediacy (Automation & Rapidity)

Cloud Computing

Purchase resources by peek prediction → Lease resources based on usage

° Billing based on the IT resource usage & Increasing/Decreasing as much as its needs

	Medium-scale Data Center	Large-scale Data Center
Network Cost (Transmit 1Mbit per sec every month)	$95	$13
Storage Cost (Use 1GB every month)	$2.20	$0.40
Mgmt./Operation Cost (Num. of servers per manager)	140 Servers	Over 1000 servers

° The more having and running big data resources, the less cost needed

View of Cloud Computing

Intention to use

YES (77%)

- 21% within 6mon.
- 16% within 9mon.
- 23% within 12mon.
- 17% After 1yr.

Purpose to use

- 21% Lower Cost
- 19% Agility
- 16% Efficiency
- 14% Convenience
- 12% Reliability
- 7% Performance
- 6% Sustainability
- 5% Security

Sourced by Mimecast, Cloud Adoption Survey 2010
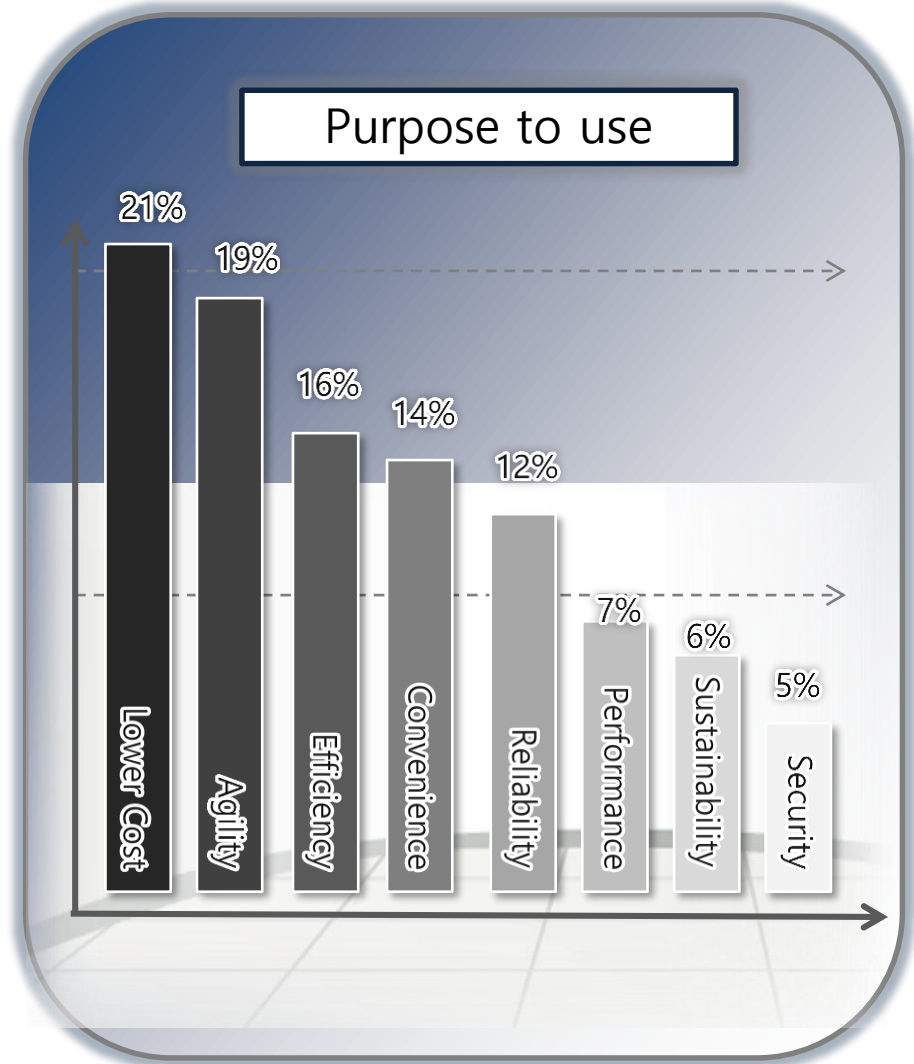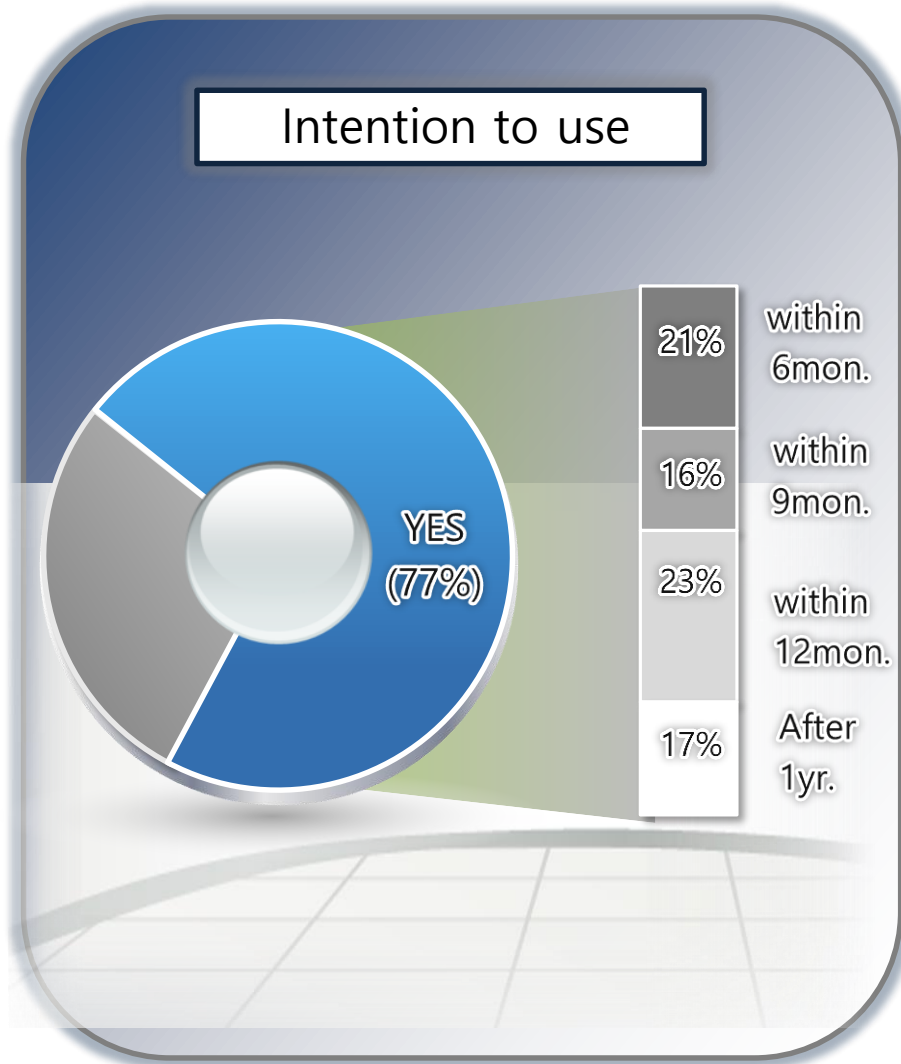
Classification of Cloud Computing

Service Types

Public Cloud
- Through the Internet, several users share the IT environment
- Cloud Service Provider provides and manages

Private Cloud
- Through the Intranet, a company or a department use the IT environment exclusively
- The company or the department controls and manages

Hybrid

Private/Internal

Public/External

The Cloud

On Premises / Internal   Off Premises / Third Party

Service Models

SaaS
- Software as a Service
- It provides several softwares as a service through the Internet and Webbroser

PaaS
- Platform as a Service
- It provides several development environments as a service

IaaS
- Infrastructure as a Service
- It provides virtualized physical servers (cpu, memory, OS), storages, network as a service

Application (ERP, CRM)			SaaS
Development Framework library, run-time environments		PaaS	
S/W such as DB, Web, WAS			
Virtualization	IaaS		
OS			
Sever/Storage/Network			

kt sets a cloud service as a core business & aims for a global top cloud service partner

Goal

The Best Cloud Service Partner

Core Value

Economic Feasibility

Service-ability

Reliability

Mainly Forward

Achievement of the best quality of cloud system Application & competitive price

Achievement of the market reliability through putting the internal systems into the cloud

Business enabler through providing the domestic & global cloud services

Leading the domestic market

Development Cloud Architecture

- Achievement of the own cloud architecture technology which is independent of H/W and S/W vendors.
    - Cost Leadership and High Performance
- Cooperation with Samsung's 30nano D-ram low-power management memory and Intel's efficient energy technology

Application Cloud to Internal System

- 51 of running Service Cloud (700 servers, 470TB storage)
- Cloud IT Process
    - Cost effective of system investment (6.9 billion saving)
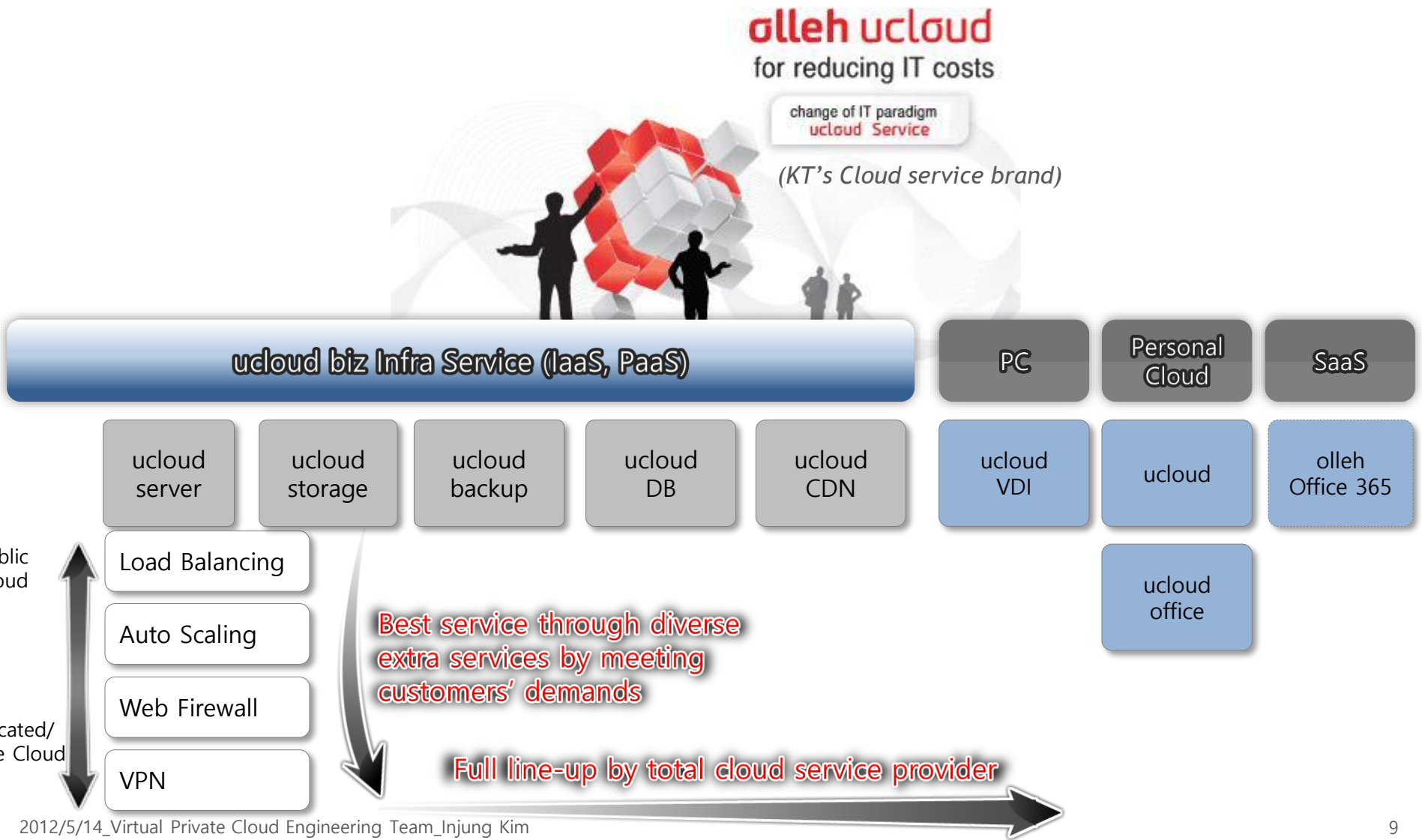
80% decrease of H/W cost
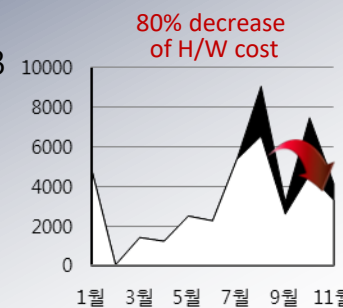
kt ucloud

Build Cloud Data Center

- The first and only build in domestic Cheonahn data center and partial Mokdong one.
    - (Cheonahn 6,000kw, Mokdong 5,000kw)
- Hot Aisle way of the most cooling technology and Green-ized integrated data center

Lead Cloud Business

- Common and several references; N Game Co., H Media co., W Univ., etc.)
- ucloud personal/office; 1 million users ('11)
- Ucloud server; 350 companies ('11)
- Cloud full-lineup such as storage, backup, database, CDN, VDI

Broad IT efficiency through the kt ucloud service

olleh ucloud
for reducing IT costs

change of IT paradigm
ucloud Service

(KT's Cloud service brand)

| ucloud biz Infra Service (IaaS, PaaS) | PC | Personal Cloud | SaaS |

| ucloud server | ucloud storage | ucloud backup | ucloud DB | ucloud CDN | ucloud VDI | ucloud | olleh Office 365 |

ucloud office

Public Cloud

Load Balancing

Auto Scaling

Web Firewall

Dedicated/ Private Cloud

VPN

Best service through diverse extra services by meeting customers' demands

Full line-up by total cloud service provider

The highest level of global competitiveness

**Differentiated
kt ucloud**

Cost 70%	Performance Rank 1~2	Global level of SLA	Security	Rapidity 5 Min.
• Based on the economy of scale • Compared to Amazon, about 70%	• Compared to global providers • Performance rank 1~2 for CPU, Memory, Disk I/O	• Guaranteed high availability compared to IDC (100% compensation for the failure)	• Physical Security & System & Data Security • Multi-level Security	• Build the IT within 5 min. after order • Convenient Web UI

kt ucloud is compromised of efficient and stabilized architecture

Hardware Architecture

Rack structure

Server
- Improve Utilization by Virtualization

Storage
- High availability & minimize H/W dependency
- Improve stability
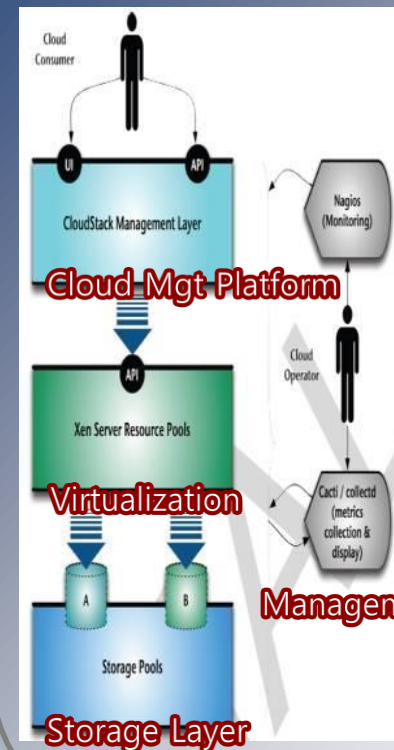
Rack
- High density & high performance
- Innovated cooling

Network
- Minimize complex networking

Switch
- Remove L4 & software processing

Software Architecture

Cloud Mgt Platform

Virtualization

Management

Storage Layer

Vendor independency
- Cost reduction

Commoditization of H/W
- High performance by Orchestration

Possibility of evolution
- Customizing by open source

Rapid Rack Configuration
- Time reduction (4hours vs 7days)

Flexible scalability
- Interlock test with 3rd party S/W

kt ucloud CDC (cloud data center)

8 kt IDC Server Centers in Korea
Size:111,922m^2

Cheonahn Data Center
Size:789m^2

Capital IDC

Suburban IDC

Mokdong 2008.05

Yeongdong 2007.11

Bundang 2001.09

Suwon 2006.02

Cheonahn 2010.12

Chungjoo 2000.12

Gwangjoo 2001.10

Daegu 2000.12

Pusan 2000.12

- Mokdong **Data Center**
  Bldg. size: 64,076m^2
  Server center size: 24,918m^2
  12 Floors

- **Cheonahn Data Center**
  Land size: 108,663m^2
  Server center size: 789m^2
  1 Floor

Cooling for the high density

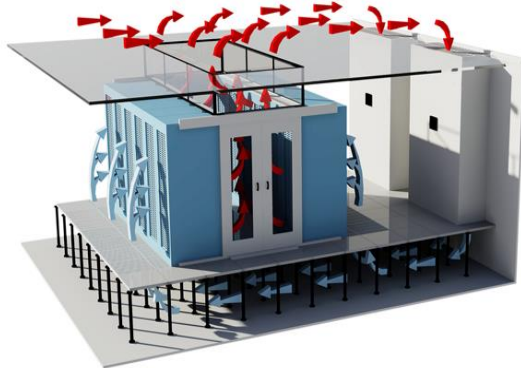Cloud Computing

Virtualization

brings

High Density

requires

New Cooling Technology

kt ucloud Cooling System: Hot Aisle Containment for the Energy Efficiency

Cooling System

Hot Aisle Containment[1]

Hot Aisle Containment reduces 40% Fan energy

- By using the Containment, Optimized cooling efficiency by divide hot aisle and cold aisle
- Through the Passive Cooling[2] way, no need to spend management cost, and reduce energy because of no use of energy power
- Improved cooling performance: 30kw per rack (Original cooling way: 10kw per rack)

Fan power use in the conventional hot/cold aisle section and the new high-density containment section

Fan Power Comparison	Conventional Hot/Cold Aisle Section	HDHC Rack Section
Total IT Equipment Load, kW	4375.1	2336.9
Number of CRAC Fans	63	27
CRAC Fan Power, kW	55@ 7.45 kW and 8 @11.19 kW/each	4.69 kW/each
Rack Exhaust Fan Power, kW	0	500 @ 0.07 kW/each
Total Fan Power, kW	499.3	158.1
Fan Power per Unit IT Equipment Load (kW/kW)	0.114	0.068

1) Containment: After collecting hot air, it induces the hot air to the constant-temperature oven
2) Passive Cooling: Without extra power, hot air goes to the constant-temperature oven

Service Quality Assurance by the cloud-oriented customer center & professional engineering groups

Global level SLA (99.16% Availability, 100% Compensation)

On-line Customer Support

Manual
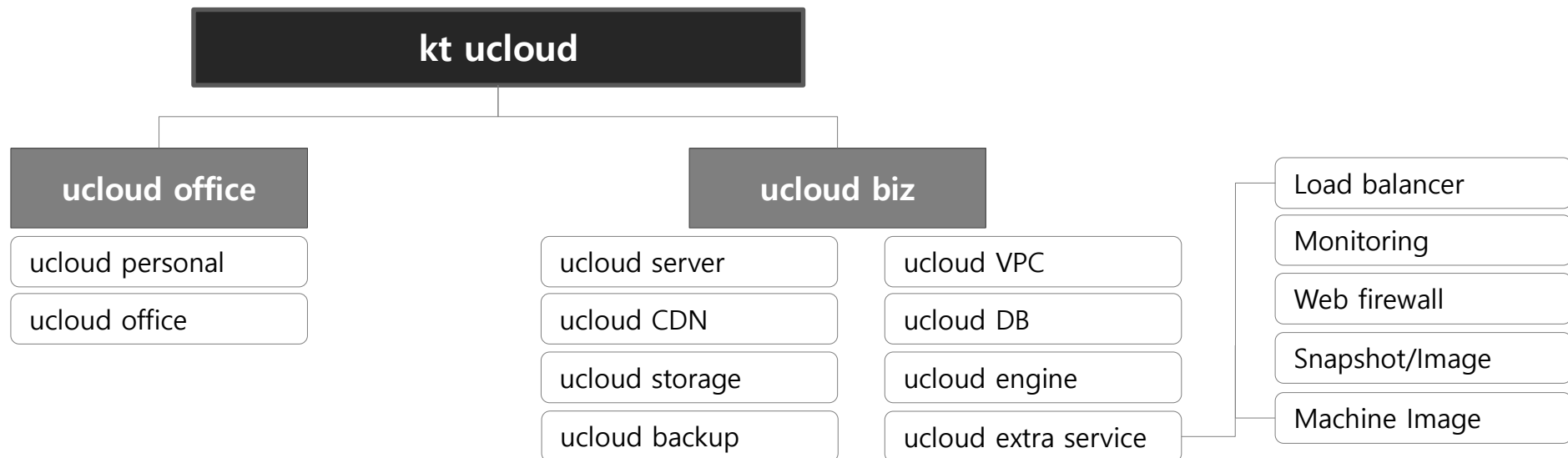
Phone / Email Support

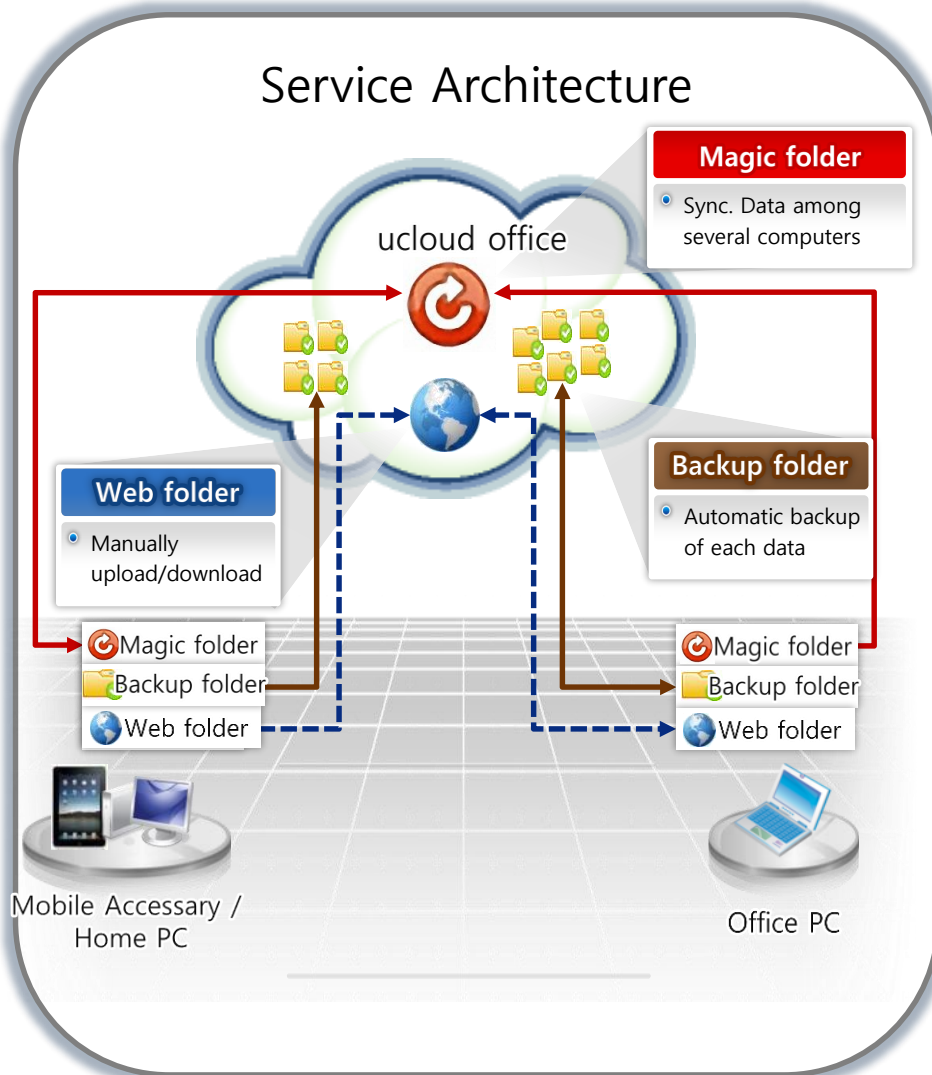Direct Support Through the Sales Representatives

kt ucloud product line

☐ kt ucloud product line consists of business use and enterprise use. ucloud office is for the business use, and ucloud biz is for the enterprise one. ucloud office is object to store personal or business data. ucloud biz, however, is object to manage and control virtualized IT resources.

```
                          kt ucloud
           ┌──────────────────┴──────────────────┐
      ucloud office                          ucloud biz
      ┌──────────────┐        ┌──────────────┐ ┌──────────────┐    ┌──────────────────┐
      │ucloud personal│       │ ucloud server│ │  ucloud VPC  │    │  Load balancer   │
      └──────────────┘        └──────────────┘ └──────────────┘    └──────────────────┘
      ┌──────────────┐        ┌──────────────┐ ┌──────────────┐    ┌──────────────────┐
      │ ucloud office│        │  ucloud CDN  │ │   ucloud DB  │    │    Monitoring    │
      └──────────────┘        └──────────────┘ └──────────────┘    └──────────────────┘
                              ┌──────────────┐ ┌──────────────┐    ┌──────────────────┐
                              │ucloud storage│ │ ucloud engine│    │   Web firewall   │
                              └──────────────┘ └──────────────┘    └──────────────────┘
                              ┌──────────────┐ ┌──────────────────┐ ┌─────────────────┐
                              │ ucloud backup│ │ucloud extra service│ │ Snapshot/Image │
                              └──────────────┘ └──────────────────┘  └────────────────┘
                                                                     ┌──────────────────┐
                                                                     │  Machine Image   │
                                                                     └──────────────────┘
```

Personal/Office cloud storage

Service Architecture

Magic folder
- Sync. Data among several computers

ucloud office

Web folder
- Manually upload/download

Backup folder
- Automatic backup of each data

Magic folder
Backup folder
Web folder

Magic folder
Backup folder
Web folder

Mobile Accessary / Home PC

Office PC

Features

- Storing big data and being safe from data lose, external access, capacity shortage

|	
Sync	Back up easily and keep up-to-date data among several PCs (easy to backup & mobility of work place)
Store	Manual backup (Stronger security by distributed stored into the cloud folders)
Cooperate	Sharing data within a group (Big data transition through email)
Use other device	Several mobile accessories' access such as smart phone, Pad (Broad mobility of work place and method)
Guess access	Guest folder and Guest ID (Stronger sales competitively)
Safety Guarantee	SSL encryption of transition path & distributed data storing (AES 128bit)

ucloud server

☐ ucloud server provides secure and high performance "cloud server" quickly & easily

ucloud portal

- Easily accessible public portal

- Build a server within 5 min. with a few clicks

- Easy & Simple requests & manages
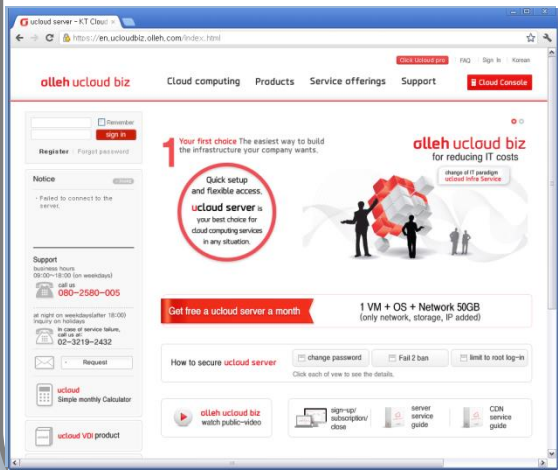
Best quality of cloud server

- Global level of high performance cloud server (CPU, IOPS, etc.)

- Multi-level network/power and big capacity of infrastructure with 10Gbps network

- Immediate server allocation and control for the rapid actions

- Guaranteed end-to-end systematic security outside of CDC and inside of system

- Re-running without any data lose even during VM failure because of division of between c-node and s-node
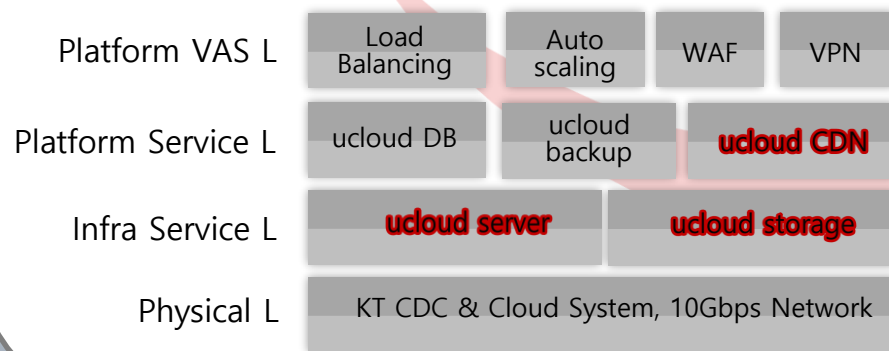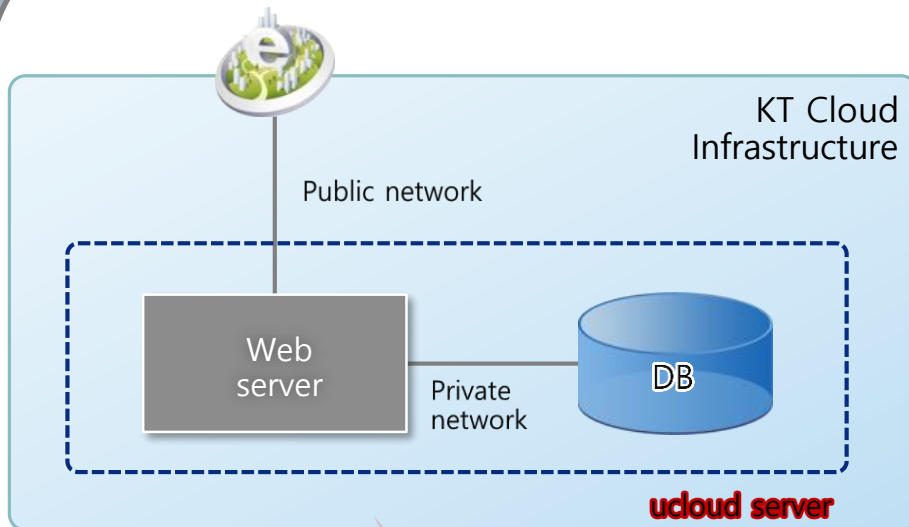
- Auto-scaling for the flexible server usage

Reduce costs & Focus on a core business

- Cost effective from the investment and operate costs (50% ↓)

- Quick build of server without purchasing the server, preparing IDC (abt. 1mon.), and predicting of future amount of usage

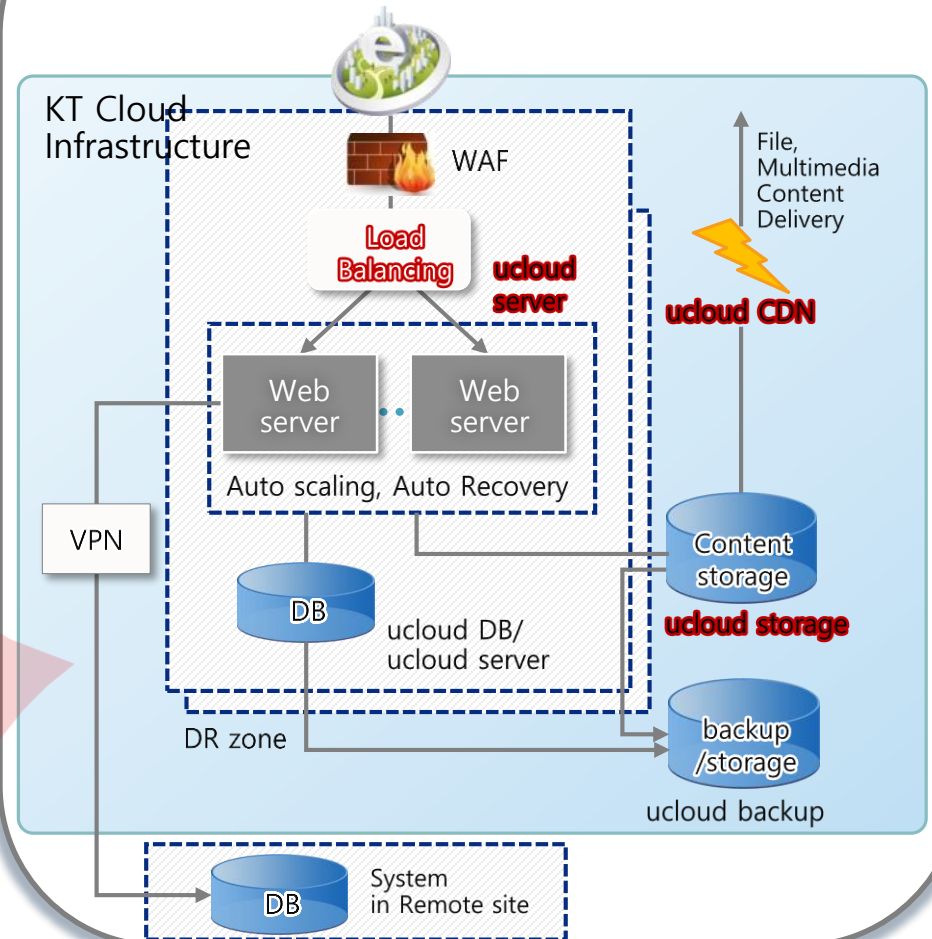- Support diverse services to compose complete infrastructure
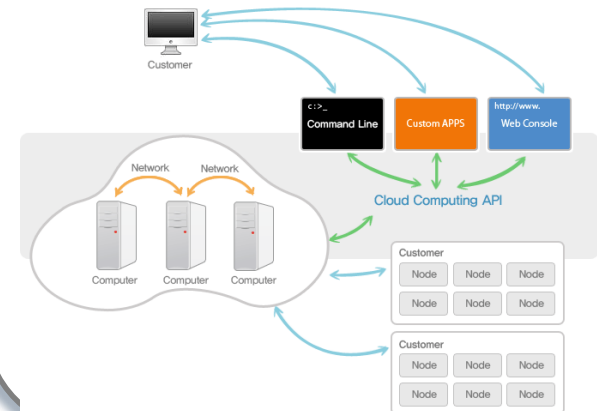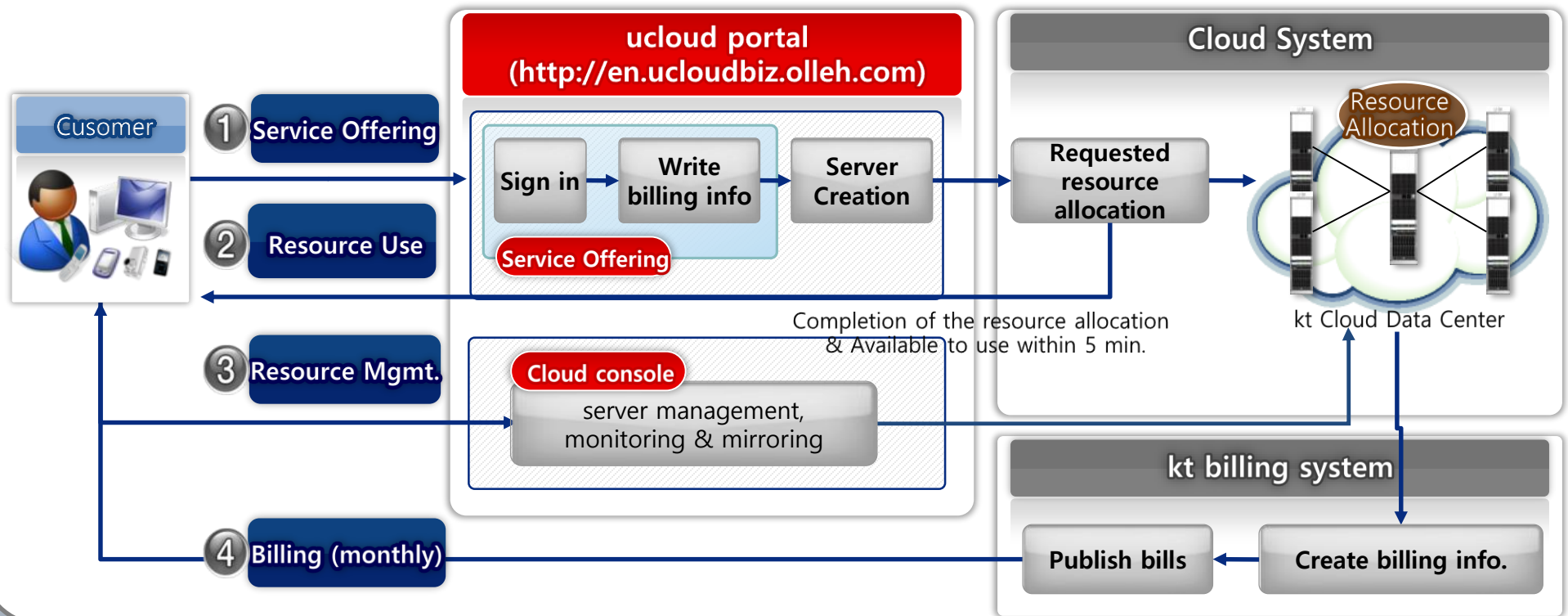
ucloud server: Construct More Powerful & Flexible Web-service
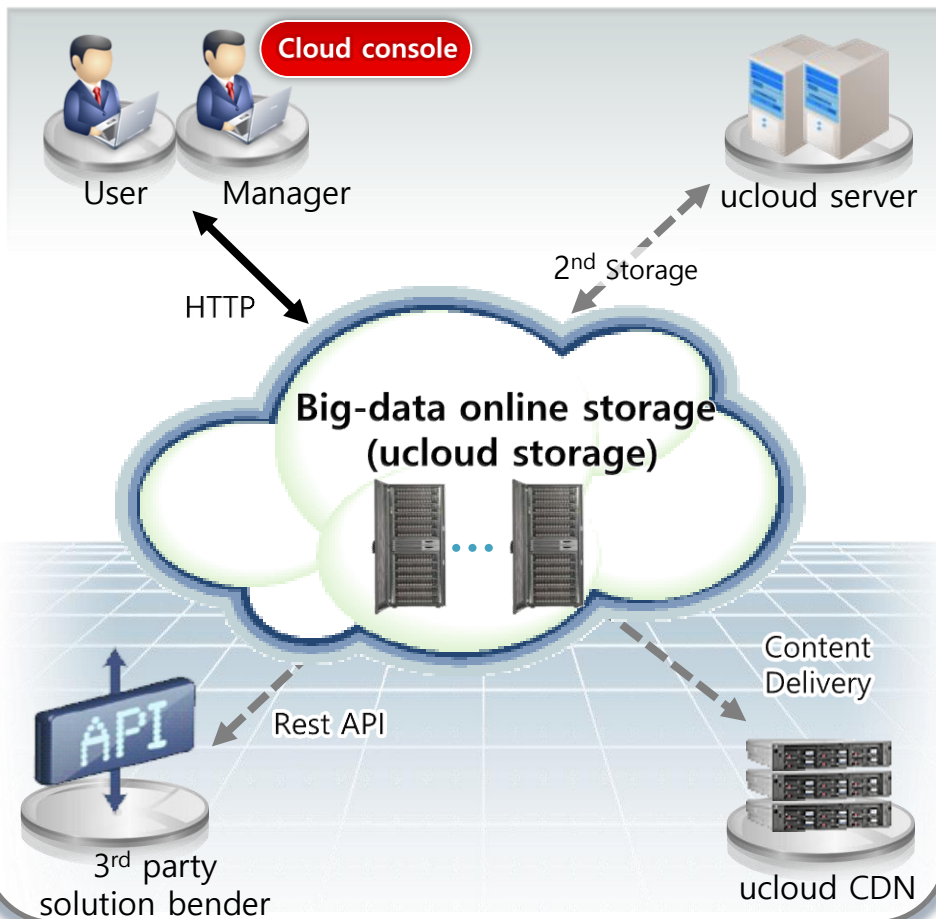
ucloud server: How to use

Simple test web service

① Use ucloud portal to sign in and write billing information

② Immediate allocation from the request ③ Resource management ④ Publish bills (monthly)

ucloud portal
(http://en.ucloudbiz.olleh.com)

Cloud System

Cusomer

① **Service Offering**

Sign in → Write billing info → Server Creation

Service Offering

② **Resource Use**

Requested resource allocation

Resource Allocation

kt Cloud Data Center

Completion of the resource allocation & Available to use within 5 min.

③ **Resource Mgmt.**

Cloud console

server management, monitoring & mirroring

kt billing system

④ **Billing (monthly)**

Publish bills ← **Create billing info.**

ucloud storage

Service Architecture & Features

Cloud console

User   Manager

ucloud server

2nd Storage

HTTP

**Big-data online storage
(ucloud storage)**

Content
Delivery

API

Rest API

3rd party
solution bender

ucloud CDN

Product Feature

- Archiving (doc/picture/music/movie) service on the server or PC
- Unlimited expandable size (PB level) & pricing as much as they use
- Easy and Rapid deployment through kt ucloud CDN
- Support Open API based on Restful in order to support diverse development environments

Target Customer

- Customers who want to archive data files, back up, or cooperate with CDN service
- Contents storage company who can manage multi-users such as social commerce, Big-data email, web hard services
- A company who has flexible big data, and hard to predict storage size

Bundle Products

- server + storage (Web Server + Storage)
- storage + CDN (Storage + CDN service)
- server + storage + CDN
  (Web Server+ Storage + CDN service)

ucloud server, storage: Open API

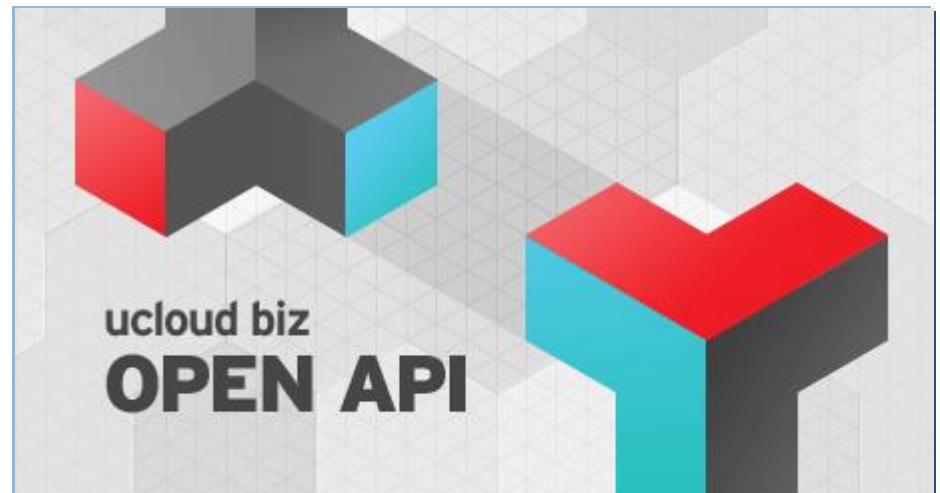## Support Open API for developers

Open API

- Open API is for the developer to use ucloud server, ucloud storage service that can be done on the ucloud biz portal.

Features

- Compatibility with CloudStack 2.2.13
- RESTful language to manage cloud resource such as VM, Network, Volume
- For the authentication, API key and Signature (created from Secret key)
- HTTP GET/POST, Query String knowledge
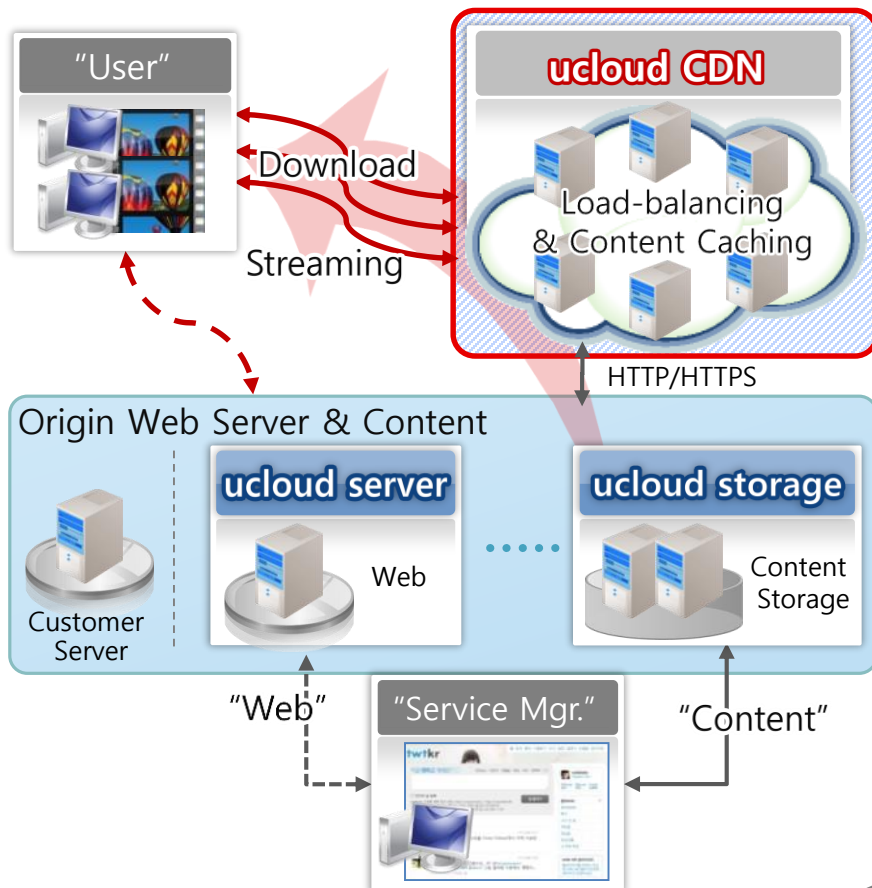- XML, JSON response format

Benefits

- It can allow the developer or 3rd party bender to make automatic system for any kind

ucloud biz
OPEN API

ucloud CDN (contents delivery network)

Service Architecture

"User"

Download

Streaming

ucloud CDN

Load-balancing & Content Caching

HTTP/HTTPS

Origin Web Server & Content

Customer Server

ucloud server

Web

ucloud storage

Content Storage

"Web"

"Service Mgr."

"Content"

Service Features

High quality of performance

Quality Mgmt.

- High performance caching platform
- Expandability to process traffic
- Contents storage

- High-tech monitoring
- Professional CDN operators
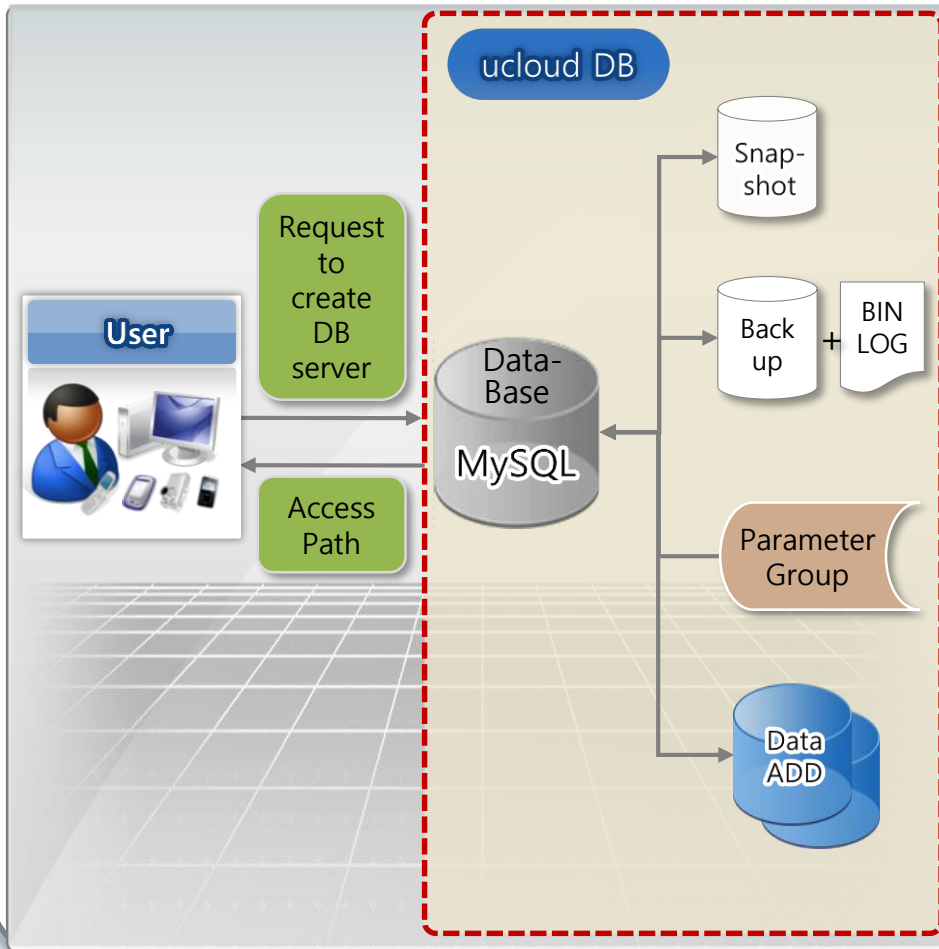- High quality of SLA (99.9%)

ucloud CDN

- Pricing as much as usage

- Simple Self offering, immediate running
- Automatic processing (w/o involving manager)

Cost Effective

Rapidity

ucloud DB (database)

ucloud DB Service

ucloud DB

User

Request to create DB server

Access Path

Data-Base

MySQL

Snap-shot

Back up + BIN LOG

Parameter Group

Data ADD

Service Features

Rapidity
- Provide service within 5 min. by automatic resource allocation
- No need to manage complicated DB

Cost effective
- Pay as much as they use
- Reduce operation cost
- No extra cost to close the service

Expendability
- Simple and easy expend through adding a new virtual server

Safety
- Rapid failure recovery by switching extra resources
- No need of System Redundancy
- Simple backup & recovery w/ UI option

Accessibility
- Convenient access through public IP whenever & wherever

ucloud backup

Based kt cloud h/w infrastructure and HP's data protector solution, professional kt technicians operate customers' server back up in 24/7/365

A CDC

CDC / IDC

Backup

Restore

Server

Backup platform

Area Backup

B CDC

Backup platform
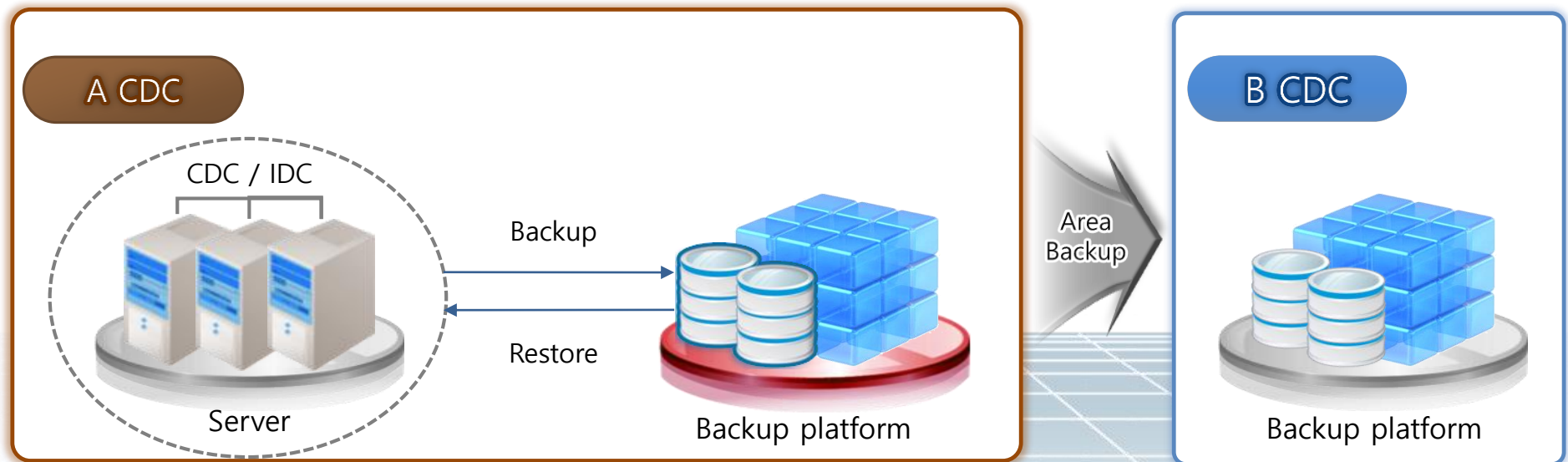
Support diverse OS & DBMS

- Oracle , MSSQL , DB2 , etc.
- Windows , Linux, Unix, etc.

Guaranteed data correction

- High technical backup solution: HP Data Protector
- Reliable kt cloud infrastructure

Optimized backup on LAN/WAN

- Professional backup solution HP Data Protector

N Game company: Biggest game contents

- Several games deployed on kt ucloud server
- One of the games; SD Samgookji reduced its cost about 30%
- With development and sales departments' satisfactory, they also
  expand for web-game and mobile-game to use kt cloud servers

Customer Value	Cost Effective	Rapid Business	Automatic Resource Scale-out/Reliability	Easy H/W Mgmt.

S Media company: Sports Media Application

S Media mobile service got into the kt cloud for the rapid service delivery

Customer Value

Rapid resource scale-out / reliability

- After service open, they had a big problem to expand on their IDC, and it took about 2 weeks.
- Through the kt ucloud, they could move their service only in 2 weeks and it has worked reliably

Cost effective

- Sales dept. satisfied with reduced cost
- Examine to move other service into the kt ucloud and decide for the future product to deploy on the kt ucloud

Thank you

KT Cloud Service
http://en.ucloud.olleh.com