ucloud

kt cloud computing

2012. 05. 14 / kt_Cloud Engineering Department / Injung Kim
# Table of Contents

1. Cloud Computing
2. kt ucloud Business
3. kt ucloud Products
4. Case study
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.
What is Cloud Computing?

Cloud Computing is?

- Sharing the IT resources by the virtualization
- Using as much as they need
- Connecting through any network method
- Processing without any extra work

Virtualization

IT as Utility

Internet

Automation
Benefits of Cloud Computing

- Application Execution without physical division of IT resources (Virtualization)
- Business Immediacy (Automation & Rapidity)
- Purchase resources by peek prediction
- Lease resources based on usage
- Billing based on the IT resource usage & Increasing/Decreasing as much as its needs

Cloud Computing

<table>
<thead>
<tr>
<th></th>
<th>Medium-scale Data Center</th>
<th>Large-scale Data Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Cost</td>
<td>$95</td>
<td>$13</td>
</tr>
<tr>
<td>(Transmit 1Mbit per sec every month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Cost</td>
<td>$2.20</td>
<td>$0.40</td>
</tr>
<tr>
<td>(Use 1GB every month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mgmt./Operation Cost</td>
<td>140 Servers</td>
<td>Over 1000 servers</td>
</tr>
<tr>
<td>(Num. of servers per manager)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Features of Cloud Computing

View of Cloud Computing

Intention to use

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

Purpose to use

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

Sourced by Mimecast, Cloud Adoption Survey 2010
### Types & Models of Cloud Computing

#### Classification of Cloud Computing

**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

#### Service Types

**Public Cloud**

**Private Cloud**

**Hybrid**

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

Goal of kt ucloud

The Best Cloud Service Partner

Goal

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
Achievement of kt ucloud

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

kt ucloud

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)

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
Portfolio of kt ucloud

Broad IT efficiency through the kt ucloud service

kt ucloud Business

kt ucloud

for reducing IT costs

change of IT paradigm

ucloud Service

(KT’s Cloud service brand)

ucloud biz Infra Service (IaaS, PaaS)

ucloud server
ucloud storage
ucloud backup
ucloud DB
ucloud CDN

PC

Personal Cloud

SaaS

ucloud VDI
ucloud
olleh Office 365
ucloud

office

Best service through diverse extra services by meeting customers’ demands

Full line-up by total cloud service provider

Public Cloud

Load Balancing
Auto Scaling
Web Firewall
VPN

Dedicated/Private Cloud

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### Features of kt ucloud

#### The highest level of global competitiveness

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

**kt ucloud Business**

**Differentiated kt ucloud**

- Performance rank 1~2 for CPU, Memory, Disk I/O
- Guaranteed high availability compared to IDC (100% compensation for the failure)
- 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

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

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

kt ucloud CDC (cloud data center)

8 kt IDC Server Centers in Korea
Size: 111,922m²

- **Mokdong Data Center**
  - Bldg. size: 64,076m²
  - Server center size: 24,918m²
  - 12 Floors
  - 2008.05

- **Yeongdong Data Center**
  - 2007.11

- **Bundang Data Center**
  - 2001.09

- **Suwon Data Center**
  - 2006.02

- **Cheonahn Data Center**
  - 2010.12

Cheonahn Data Center
Size: 789m²

Suburban IDC

- **Chungjoo Data Center**
  - 2000.12

- **Gwangjoo Data Center**
  - 2001.10

- **Daegu Data Center**
  - 2000.12

- **Pusan Data Center**
  - 2000.12

Cooling for the high density

Cloud Computing
Virtualization

brings

High Density

requires

New Cooling Technology

kt ucloud Business

kt ucloud Business

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

Cooling System

- By using the Containment, Optimized cooling efficiency by divide hot aisle and cold aisle
- Through the Passive Cooling 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

<table>
<thead>
<tr>
<th>Fan Power Comparison</th>
<th>Conventional Hot/Cold Aisle Section</th>
<th>HDHC Rack Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total IT Equipment Load, kW</td>
<td>4375.1</td>
<td>2336.9</td>
</tr>
<tr>
<td>Number of CRAC Fans</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>CRAC Fan Power, kW</td>
<td>55 @ 7.45 kW and 8 @ 11.19 kW/each</td>
<td>4.69 kW/each</td>
</tr>
<tr>
<td>Rack Exhaust Fan Power, kW</td>
<td>0</td>
<td>500 @ 0.07 kW/each</td>
</tr>
<tr>
<td>Total Fan Power, kW</td>
<td>4993.3</td>
<td>158.1</td>
</tr>
<tr>
<td>Fan Power per Unit IT Equipment Load (kW/ kW)</td>
<td>0.114</td>
<td>0.068</td>
</tr>
</tbody>
</table>

Hot Aisle Containment reduces 40% Fan energy

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
kt ucloud Service Quality Assurance

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

Downloads

User manual
- ucloud server User’s Manual
- ucloud DB User’s Manual
- ucloud CDN User’s Manual
- ucloud CDN Streaming HLS User’s Manual
- ucloud CDN Streaming RTMP User’s Manual
- ucloud storage User’s Manual
- ucloud Monitoring Application and Setup Manual

Additional Download
- The CLOUD FRONTIER 2011 Presentations
- Firefox
- ucloud storage & CDN Manual work
- Cyberduck User’s Manual

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

- Ucloud product line
  - ucloud personal
  - ucloud office
  - ucloud server
  - ucloud CDN
  - ucloud storage
  - ucloud backup
  - ucloud VPC
  - ucloud DB
  - ucloud engine
  - ucloud extra service

- Ucloud products
  - Load balancer
  - Monitoring
  - Web firewall
  - Snapshot/Image
  - Machine Image
Personal/Office cloud storage

Service Architecture

- Magic folder
  - Sync. Data among several computers
- Web folder
  - Manually upload/download
- Backup folder
  - Automatic backup of each data

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 biz

KT ucloud Products

ucloud server: Construct More Powerful & Flexible Web-service

Simple test web service

More powerful & flexible web service

KT Cloud Infrastructure

Public network

Private network

Web server

DB

Platform VAS L
Load Balancing
Auto scaling
WAF
VPN

Platform Service L
ucloud DB
ucloud backup

Infra Service L

ucloud server

ucloud CDN

Physical L

KT CDC & Cloud System, 10Gbps Network

KT CDC & Cloud System, 10Gbps Network

Web server

Web server

Web server

WAF

VPN

Load Balancing

ucloud CDN

ucloud storage

ucloud server

DB

ucloud DB/ucloud server

Backup/Storage

ucloud backup

System in Remote site

Content delivery

File, Multimedia Content Delivery
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)
Service Architecture & Features

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)
Support Open API for developers

- 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 CDN (contents delivery network)**

### Service Architecture

- **Origin Web Server & Content**
  - Source: Customer Server
  - Flow: Origin Web Server & Content -> ucloud CDN
- **ucloud CDN**
  - Functions: Load-balancing & Content Caching
  - Protocol: HTTP/HTTPS
- **ucloud server**
  - Role: Web
- **ucloud storage**
  - Role: Content Storage

**User**
- Flow: Download, Streaming

### Service Features

- **High quality of performance**
  - High performance caching platform
  - Expandability to process traffic
  - Contents storage

- **Quality Mgmt.**
  - High-tech monitoring
  - Professional CDN operators
  - High quality of SLA (99.9%)

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

- **Cost Effective**
- **Rapidity**

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**ucloud DB (database)**

**ucloud DB Service**

- **User**: Request to create DB server
- **Data-Base**: MySQL
- **Parameter Group**: Back up + BIN LOG
- **Data ADD**: Snapshot

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

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 with kt ucloud

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
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