



Leveraging OpenStack to Realize the SKT Software-Defined Data Center

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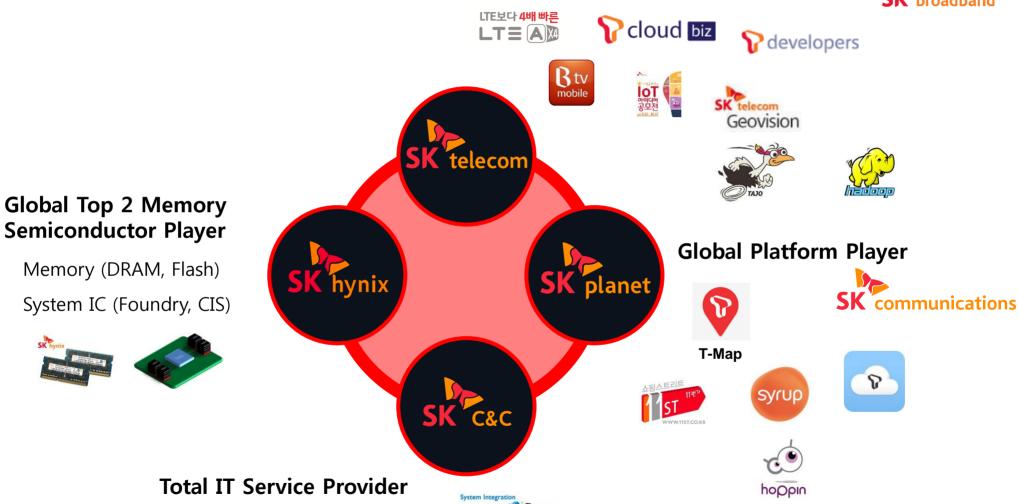
Introduction – About SK Group

IT Outsourcing, IT Consulting

System Integration

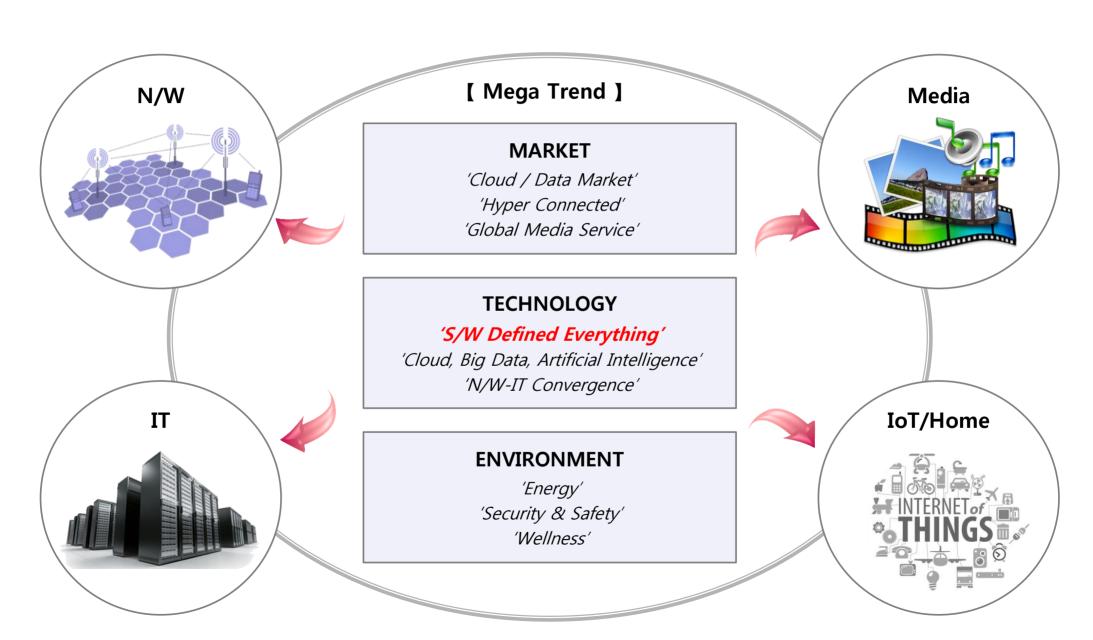
No. 1 Network Operator in Korea





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Introduction – ICT Mega Trend



SKT Cloud Service Portfolio

[Public Cloud]

○ B2B Public Cloud Service





bizpoint

(www.tcloudbiz.com)

- ✓ Cloud Server
- ✓ Cloud Storage
- ✓ Hybrid Cloud
- ✓ Cloud Security

(www.tbizpoint.com)

- ✓ Enterprise Solution
- ✓ Groupware Solution
- ✓ Collaboration Solution
- ✓ System Support
- B2C Public Cloud Service





✓ Picture/Video

√ File/Document

✓ Address

(www.tcloud.com)

Developer's Center

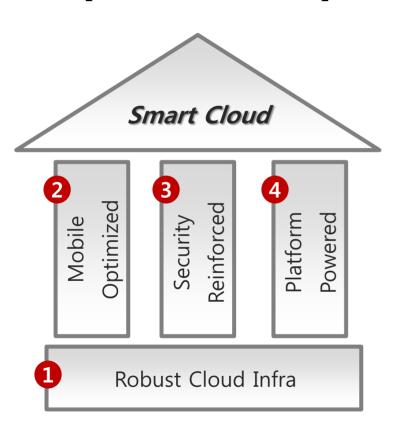


- ✓ T-API
- ✓ Backend as a Service
- (developers.sktelecom.com) ✓ Development Tools

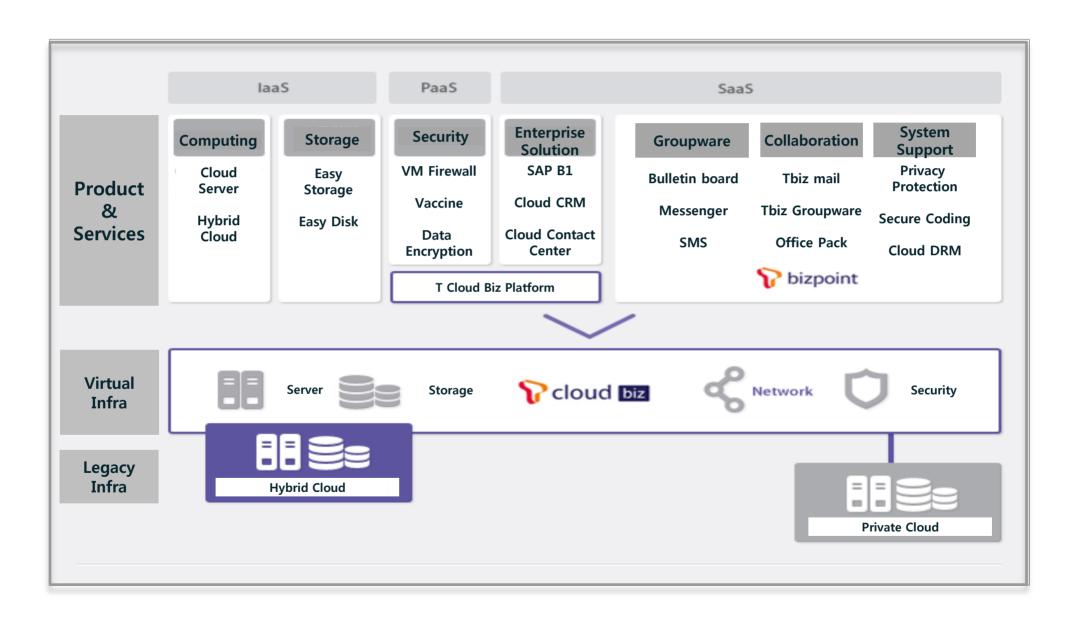
[Private Cloud]

- Dev/Operation Cloud (T Shared Infra)
 - ✓ Internal Cloud Service for Development
 - ✓ External Cloud Service for Operation
 - ✓ Interface Internal Systems
- Fast Delivery Center
 - ✓ Internal Cloud Service, especially for Developing Solution Development
- Cloud for N/W Service (IPC Center)
 - ✓ Internal Cloud Service, especially for Developing Network Solution
 - ✓ Network Function Virtualization

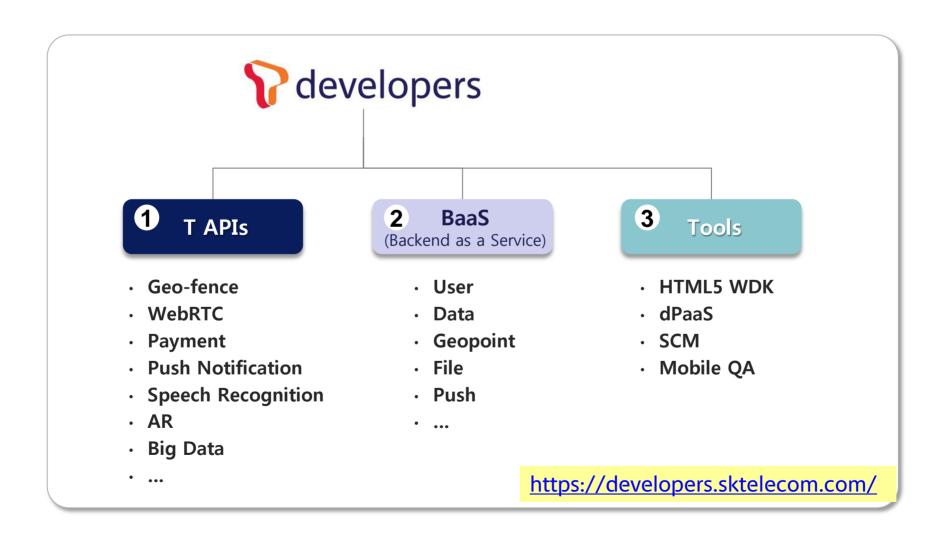
[T cloud biz Values]



- 1 Robust Cloud Infra
 - 99.9% Service Availability
- 2 Mobile Optimized
 - Mobile Device & Network Optimized
- 3 Security Reinforced
 - Telco Level Security Reinforce
- 4 Platform Powered
 - Customer forced Convenience



Targeted for mobile app development utilizing telco assets & APIs

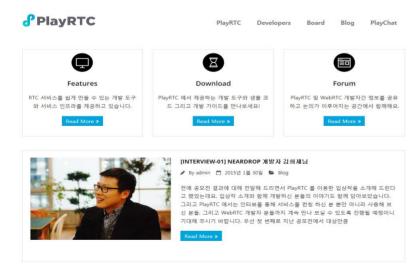


T developers Screenshots

T developers (https://developers.sktelecom.com)

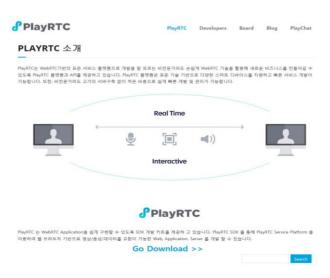


PlayRTC (http://www.playrtc.com)



T API

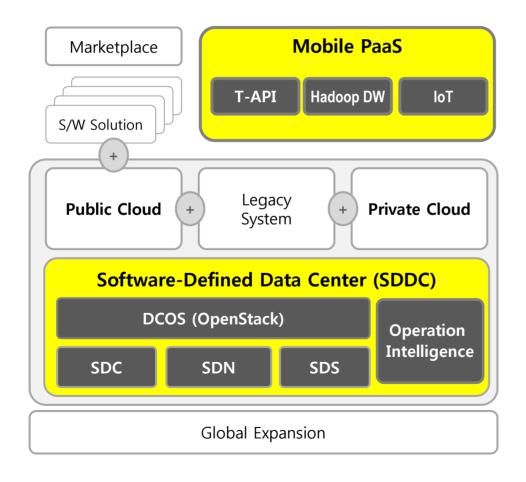




Strategy to Develop Next Generation Cloud

Develop Software-Defined Data Center (SDDC) leveraging OpenStack

[To-be Cloud Architecture]



[Ecosystem]















Data Center OS (DCOS)

Server

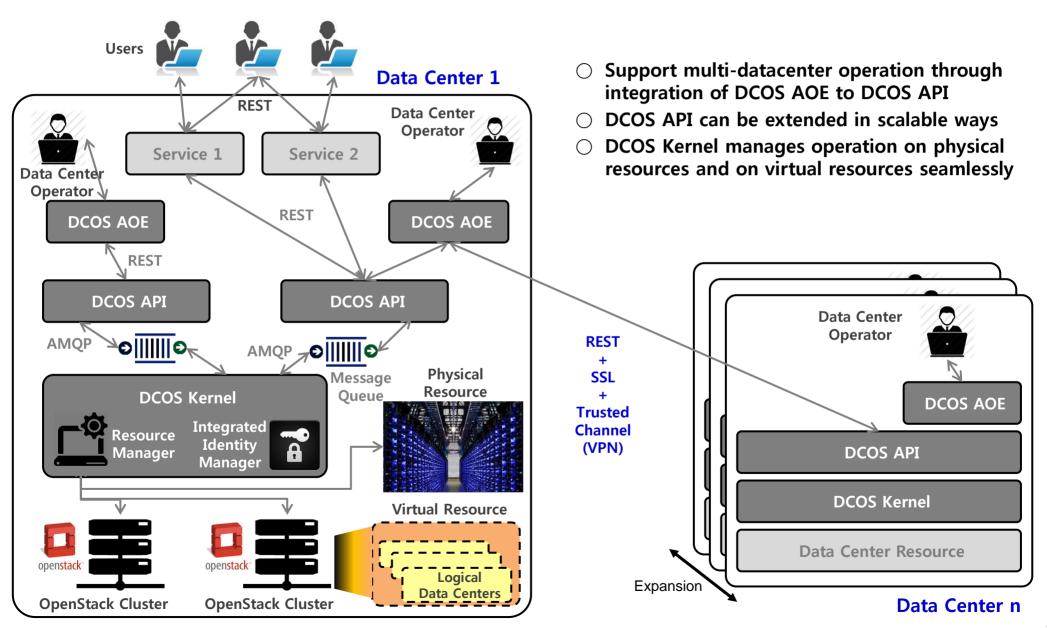
Operating System for Warehouse-Scale Computer

[Architecture] [Tasks] 1 ○ DCOS Administrator Console **DCOS Operating Environment DCOS** - Integrated Monitoring Infra **Operating** - Orchestrator Function Integration 2 DCOS API **Environment DCOS** Deployer - Integrated Event Management **DCOS Kernel Configuration Automation** ○ Installation Process and Configuration 2 Automation of DCOS core S/W & OpenStack **DCOS** - OS, S/W Installation and Provisioning **Deployer** automation **AMOP** High-performance **DBMS** (Message - Physical & virtual resources Provisioning **Event Bus** (Meta Data) Exchange) 3 O Delivery DCOS Open API DCOS API - Development for automation and service **OpenStack (Core Services)** - Integrated Authentication and Access control Glance Heat Ceilometer Horizon Trove ○ DCOS core functions 4 Keystone Cinder Swift Nova Neutron **DCOS** - Integrated Resource Management/Control - Workload Scheduling Kernel - Resource Migration and so on

Storage

Network

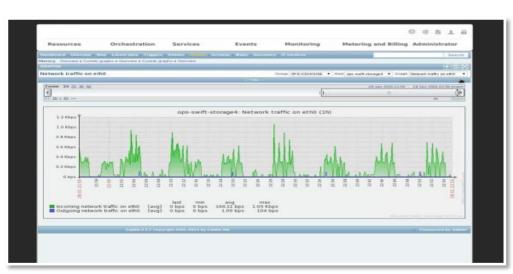
DCOS Operation Model



DCOS Screenshots



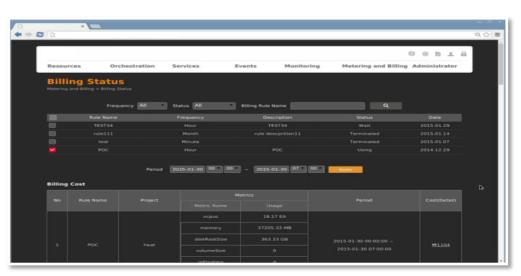
Multi-datacenter operation



Advanced monitoring (Zabbix supported)



Virtual resource management with integrated OpenStack Horizon



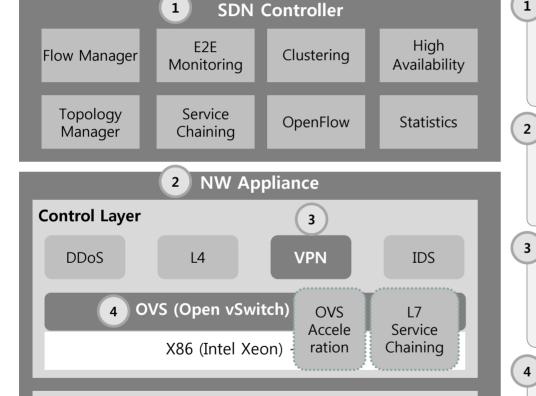
Metering and billing

Software-Defined Networking

[Architecture]

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Data Plane



Switching ASIC (Broadcom, Intel)

[Tasks]

1 **SDN** Controller

○ SDN Controller

- E2E Network Management
- Flexible and Agile Network Service
- Carrier grade network



Open H/W Network Appliance

- Switching ASIC & x86 Server based **Network Appliance**
- Carrier grade Performance, Controllability and Flexiblilty



O Virtual Private Cloud

- Overlay Network, Virtual Private Network
- Inter-Cloud Management

Open vSwitch

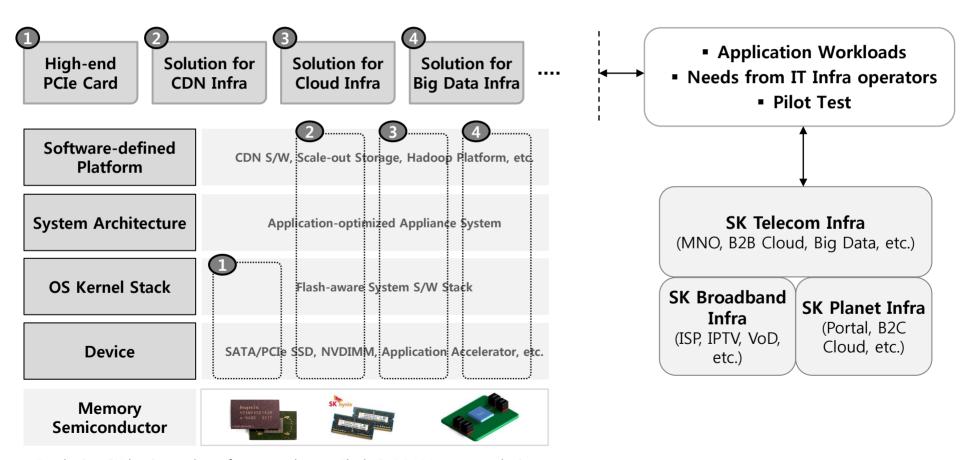
○ Carrier Grade Virtual Switch

- vSwitch Acceleration Tech in SDDC
- L7 Awareness based Service Chaining Tech

Software-Defined Storage

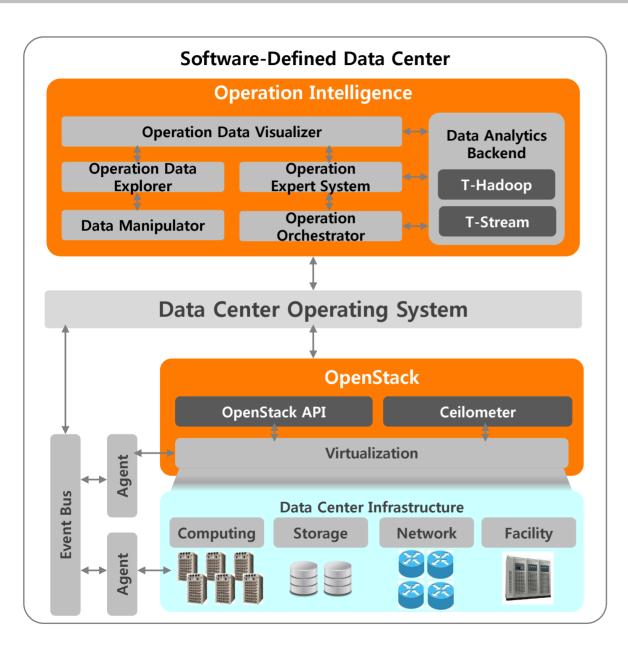
Leveraging SSD technologies from SK hynix

Vertically Optimized Storage Solutions For Major Emerging Applications



Employing SK hynix products for general spec. Flash & DRAM memory devices

Operation Intelligence



OpenStack as an operation data management system

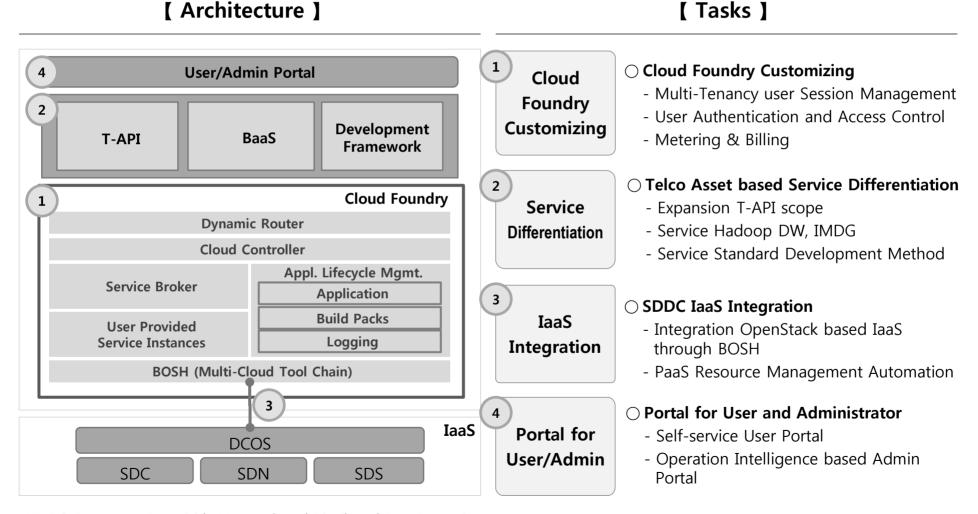
- ✓ Ceilometer collects and archieves operation data
- ✓ Ceilometer API provides route to operation intelligence

OpenStack as an operation controller core

✓ OpenStack API accepts operation control commands from the OI system and deliver the commands to virtualized IT Infra

Mobile PaaS

Mobile optimized PaaS platform and services based on Cloud Foundry



X IMDG (In-memory Data Grid): Memory based Distributed Data Processing

B2B Service

B2C Service

Internal Service (Billing, Customer Care, etc.)

Public API / Partial API / Private API

Data Analytics Platform Context Awareness Platform

Cognitive Platform

IoT Platform Location Platform

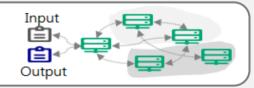
Social Platform

IT Infrastructure

Expandable Distributed Storage



Distributed/ Parallel Processing



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Data Base

Telco Data

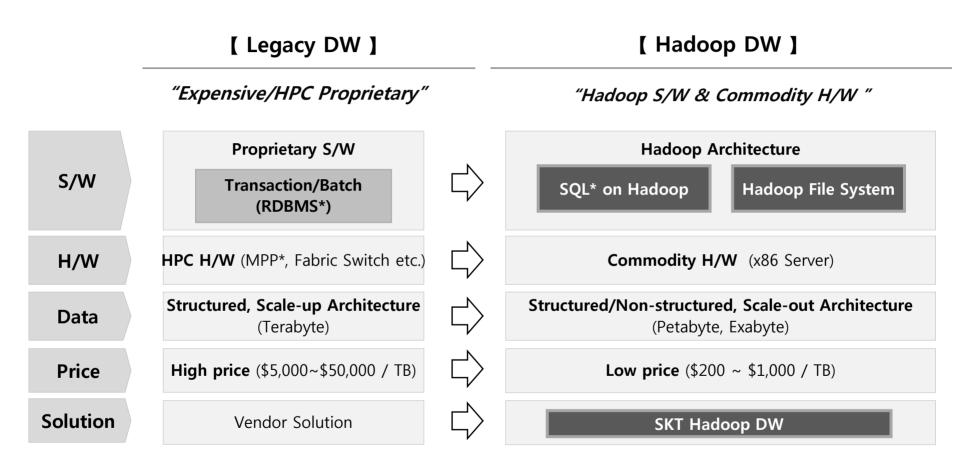
- Call
- Packet
- Location



- External
 - Data
- Public
- Internet
- Other Industries

Hadoop DW

Telco big data processing using Hadoop-based solution



MPP Massively Parallel Processing, **RDBMS** Relational DB Management System, **SQL** Structured Query Language

T Dev Forum

Monthly forum for developers to share knowledge & information

About T Dev Forum

Representative event that SKT makes the ICT ecosystem with biz partners and developers by showing our future plan in advance and giving the opportunity to join our community

2012.07 / 1st Forum Started

2014.10 / 24th Forum : T API

- T developers & T API
- WebRTC, T-AR API Usecase
- SKT API Strategy & Roadmap











2014.12 / 26th Forum : SDDC

- SKT SDDC R&D strategy
- DC Virtualization & SDDC
- For Programmable DC N/W infra





Pivotal

ymware splunk >

27th T Dev Forum : OpenStack

When

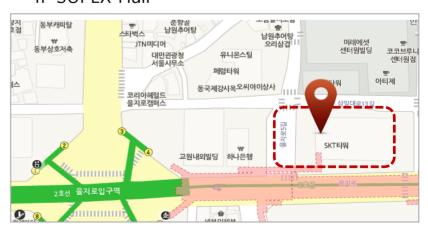
2015. 2. 25 (Wed) pm. 1:00 ~ 6:00

Content

- SKT Strategy & Roadmap with SDDC
- SKT DCOS and OpenStack
- Nova and Neutron with perspectives of NFV
- Hybrid Cloud Sol'n and OpenStack Neutron

Where

 SK T-Tower, 65, Eulji-ro, Jung-gu, Seoul 4F SUPEX Hall



Conclusion

- OpenStack is a foundation technology for our Software-Defined Data Center
- Our effort is focused on developing SDN, SDS, DCOS, and Mobile PaaS technologies
- We are committed to support OpenStack and Open Source community



Thank You!