Huawei All-Cloud Strategy:

Initiative for New Possibility

May, 2017
Agenda

• Industry Trend & Market Insight
• Huawei All Cloud Strategy
Cloud Service of Tomorrow Will Be Like Today’s Power Grid  
— From Owned to Shared Services

**Year 1900:** Individuals purchased *generators themselves*  
Dedicated equipment, not flexible, hard to maintain

**Today:** Heavily invested on dedicated HW/SW & employees  
Siloed Service/System, Scale Up…

**Electricity Supply**

**Today:** >90% supply comes from power grid  
On-demand electricity provision @ anytime anywhere

**ICT Service**

**Tomorrow:** 90% Service from Cloud  
Computing, Storage, AI… as a Service  
Cheaper, Agiler, Scale in/out…
Cloud Computing Changes Impossibility to Reality

### 2008
- **Dedicated DC**
  - 900 Engineers
  - 1 year

### 2016
- **Cloud Computing**
  - 3D 4K Movie
    - 4K Resolution, 160 minutes
    - 9,000 images per minute (60s x 30 frame x 5 layer)
    - 1 frame (1 layer) Rendering Time: 2 hours
    - Total Rendering Time: 2,880,000 hours
    - 1 Server / 328 years
  - 3D movie, 1 frame has 2 images
  - Total Rendering Time: ~656 years
  - With Public Cloud Computing
    - 3 Months, Investment saved 91.07%

### 2016
- **Public Cloud Computing**
  - 6,700 Servers
  - 150,000 CPU
  - 400 TB
  - >10M hours, 1,141 Years
Massive Data, Super Computing & Intelligence
— Key factors for the Cloud Service

1202 CPU, 176 GPU
Electricity: 3000 $

Boeing 787 Engine: 0.5TB Data / Flight

CERN Particle Collider: 1PB Data / Second

Cancer Gene Diagnosis: 1TB Data

Lee Sedol, Go Master
2 Bottles of Water ?!

Digital Twins

Science Research

CERN: the European Organization for Nuclear Research

IBM Watson Health
Huawei Practice — IT on Cloud, Building a Digital Huawei

**Real-time**

**On-demand**

**All-online**

**DIY**

**Social**

**Digitization of internal operations**

- R&D
- Marketing
- Supply
- Service
- Delivery
- Finance
- HR

**Shared service platforms and unified data platform**

**IT as service on cloud**

- IT applications and services on cloud (SaaS)
- IT platform as a service (PaaS)
- IT infrastructure as a service (IaaS)

**External**

ROADS user experience, satisfaction

- ROADS experience for 5 groups: customers, consumers, partners, suppliers, employees
- Achieve industry-leading customer satisfaction by making the transaction process easier, more responsive, and more accurate

**Internal**

Industry-leading efficiency

- Key to digital enterprise: digitization of capabilities (e.g., functions, processes, training, and rules), and delivery of capabilities as a service
- Higher E2E efficiency: digital transformation along processes and across domains
Huawei Practice — Cloud Based R&D

- 60% faster iteration cycle
  - 8 → 3 (weeks)
- "0" simulation wait time
  - 230 → 5 (minutes)
- 40% power consumption saved
- 90% support workload saved

80,000+ R&D employee
Cloud Service is Continually Growing

Cloud as of IT Spending on average 43%

- Education: 61% 56%
- Communication: 83% 70%
- Non-Profit: 23% 12%
- Media: 12% 26%
- Energy: 7% 11%
- Agriculture: 52% 12%
- Government: 46% 44%
- Construction: 40% 40%
- Industry: 10% 12%
- Finance: 83% 83%

Source: BitGlass

Rush to Cloud for all Industries in US @ 2015

Global Cloud Service Market will be 300B in Year 2020

Source: Gartner
Entering Into a New Cloud Era

• The 1st decade, 2006~
  • “Born in Cloud”
  • Internet app
  • Agility, Efficient

• The 2nd decade, 2016~
  • “Grow with Cloud”
  • Enterprise app
  • Automation, Intelligence
Cloudifications from Easy (SME) to Difficult (Large Industry)

From Horizontal to Vertical

1. External
   - Customer Interface / New Services / Developing...

2. Internal
   - Manufacturing / Sales & Marketing

3. Core
   - Business / Control / Realtime System

3 Steps To Cloudification

1. From Easy to Difficult
2. "Predix" Industrial App Cloud
3. Aviation Analytics
   - Auto-pilot
   - IoElevator
   - E-Commerce
   - R&D

Proximity
- High touch
- Local services
- ...

QoS
- Network
- Logistics
- ...
- Security
- ...
- Trustful Security
- Brand
- ...

Potential: only 5% traditional enterprise Apps are cloudified, just a beginning

Opportunity: huge potential cloud business in Government, MNC ...

Needs: Data security, reliability, compliance, cloud-migration, multi-cloud...
Reshaping Telco’s B2B Offerings Through Cloud

From Resale to Cloud Services Provider (CSP)

- Agile
- Scale
- Elastic
- Open
- Eco-System
- ...

Low Loyalty w/o Stickiness
- One-off Selling

Stagnate Business Progress
- Low Margin Services
- Limited Subs. Scale
- Long TTM @ New Service

V.S

Resale
- 8% Resale
- 100% Resale
- 60% Capex

CSP
- 30% CSP
- 10% Capex + Opex
- 30%+ EBIDTA Margin
- One selling → Continuous
- 90%+ TTM
- Elastic, weeks → days or less
- 60%+ Accessible space @ Enterprise IT investment

60%+

60%+

8%

30%

Resale

CSP
Rapid Adoption of Cloud Principles

Cloud Principles: Cloud-based Technology, Architecture & Service; Cloud-based Business Model

AT&T Integrated Cloud – AIC (Shared, Common, Homogeneous)
ECOMP - Enhanced Control, Orchestration, Management, Policy

UNICA Infrastructure
Open Cloud Public Cloud Service
A COMMON AND COMPLETE SOLUTION FOR IT, ENTERPRISE AND TELCO SERVICES

Evolving Telco DC with Software-Defined Technologies, All-IT Network
Composable, Open, Scalable, and Mobile-Oriented System

Global Operators Committed to Cloud-Centric Infrastructure & Operation Transformation
Broadband & Cloudification are the Foundations for ICT Industry

Cloud as % of IT Spend

10% 35%

STARTERS ADOPTERS FRONTRUNNERS

Big Data & IoT Spending

FBB%

ADOPTERS 3%
FRONTRUNNERS

Source: Huawei Global Connectivity Index (GCI) 2017

Cloud as % of IT Spend

Broadband supports cloud, which in turn drives IoT and big data

Trigger point to jump ahead

IoT
Big Data
Cloud
Data Centers
Broadband

GCI 2017
Agenda

• Industry Trend & Market Insight

• Huawei All Cloud Strategy
All-Cloud – A Major Trend for the Next 10 Years

Past 10 years

PSTN
TDM
ATM
...

All-IP

Next 10 years

Cloudifying:
Operations
Services
Networks

All-Cloud
2017: Steady Roll-out of All Cloud Strategy to Enable Digital Transformation

Proactive and comprehensive transformation.

Committed to becoming an All Cloud advocate & enabler.
Three Key Philosophies of Cloud that Support Digitization of ROADS Experience

**Hardware resource pooling**
- Sharing of all resources
- Resource utilization improves by 100%

**Fully automated operations**
- Automation of all operations
- Operational efficiency improves by 100 times

**Distributed software architecture**
- Distributed architecture for all computing
- Service TTM Months -> Days
CloudRAN, Paving the Network Architecture to 5G

Flexible Multi-connectivity, Ready for 5G
High Efficient Coordination, Maximize User Experience
On-demand Deployment, Adaptable to Diversified Service
CloudFAN, Maximize the Value of Access Infrastructure

Easy installation, easy to O&M and high-performance Cloud-Managed Wi-Fi service for customers

- Home WiFi Speed: 35Mbps (83Mbps)
- Broadband Churn Rate: 1.1% (0.9%)
CloudMetro, Unified metro, differentiated services

Resource Pooling
100% Improves network Utilization

Service Agility
Shortens TTM from Months to Days

Automated Operation
10 Times Improves Efficiency

Network Cloud Engine

- Resource Pooling
- Service Agility
- Automated Operation

Network Capabilities Openness Platform

- Metro Network Plan & Simulation
- Metro Network Mgmt.
- Metro Network Control
- Metro Network Analytics
- BRAS-CP Sub. Mgmt. Access Address Authentication Policy
- Security FW Anti-DDOS

PaaS

- IaaS

MWC 2017, Barcelona, DT Booth
5G network slicing demonstrations


2017.01.12, Guangdong Unicom Launch the First Commercial SD-UTN Smart Leased Line Service

MWC 2017, Barcelona

OLT Subscriber Access Metro Backbone

CPE E2E Slicing Network

PaaS

IaaS

MSE Metro Service Edge
MCF Metro Core Fabric

BRAS: Broadband Remote Access Server
CP: Customer Premises
CR: Carrier Router

MSE: Metro Service Edge
MCF: Metro Core Fabric
CloudBackbone, Reconstruct DC-Centric Network

Cloud-oriented Automation
Tenant differentiated SLA guaranteed

Intelligent optimization
Multi-dimension path computing & globe load balancing

IP + Optical synergy
Multi-layer planning, simulation, recovery

Service provisioning 30% 40%
OAM and planning Efficiency
IP port utilization
Summary: Building A Better Connected World

Better Connected
- Connect the Unconnected
  - FTTx, WTTx
  - 3G/4G/4.5G/5G
  - ...

Better Experience
- Upgrade Customer Experience
  - Video
  - IoT
  - ...

More Intelligent
- Digital Transformation
  - Cloud Services
  - Agile Operation
  - ...

All Cloud Enabled
Thank You
Thank You