CloudCampus Media Roundtable at HUAWEI CONNECT 2017

I. Overview

Various industries are implementing digital transformation, and the digital economy drives the change of ICT from a service support system to a production system. Chief Information Officers (CIOs) of many enterprises are considering their digital transformation. Many enterprises that focus on business intelligence, office digitalization, and production automation have achieved business success through digital transformation.

Digital transformation of industries brings new requirements and challenges to campus networks.

1. Internet of everything and an increasing number of Internet access terminals make wireless network access and management complicated, and pose higher requirements on access density and bandwidth. For example, ultra-HD mobile videos (4K UHDTV) become popular, and augmented reality (AR) and virtual reality (VR) applications have been popularized as a teaching tool, placing higher requirements on wireless bandwidth.

2. Emerging new digital services, frequent service changes, and high resource scheduling requirements raise higher challenges for fast network response. For example, computing resources of a university are dispersed in multiple campuses and colleges, causing uneven resource utilization. Flexible scheduling of computing resources is required among multiple campuses.

3. As the number of network access terminals increases, and branch, campus, and enterprise networks expand in scale, network management and O&M become more complex and the network operating expense (OPEX) increases. According to Gartner, the management and maintenance cost of an enterprise campus network accounts for 73% of the enterprise's total ICT OPEX. Therefore, it is a great challenge for enterprises to implement unified management of interconnection networks between campuses, branches, and enterprises, and reduce network OPEX.

Huawei has launched the next-generation CloudCampus Solution, which provides hybrid wireless access, all Wi-Fi connection among people, things, and the environment, as well as consistent user experience. This solution can be used to virtualize one physical network into multiple virtual networks, and supports multi-tenant network applications and new service rollout in minutes. Converged LAN and WAN management on the cloud simplifies O&M of full service paths and reduces OPEX by 80%.

II. Key Messages

➕ **[Key Capability 1 and ROI]**

- ➢ **Wi-Fi & IoT Hybrid access, all wireless connections of people, things, and the environment**

- ➢ [Problems to Be Solved]

  - ■ Popularization of wireless and IoT services brings service intelligence. However, independent networking and access of Wi-Fi and IoT services (involving Bluetooth and

RFID technologies) complicate access modes, wireless networks, as well as network management and O&M.

■ As more devices (including sensors and IoT terminals) access the Internet through Wi-Fi and 4K services become more popularized, higher Wi-Fi access density and bandwidth are required. Capabilities of current 802.11ac APs cannot meet service requirements. (A single AP supports concurrent access of only 100 terminals, with a bandwidth of 2 Mbit/s per terminal.)

➢ [Solutions and Differentiated Technical Points]

1. Wi-Fi/IoT converged access solution: The Wi-Fi/IoT convergence solution enables all Wi-Fi deployment of office and IoT networks, requiring no wired network.

   IoT APs support Bluetooth, ZigBee, and RFID expansion. Wi-Fi and IoT networks are deployed at the same sites, use the same data backhaul links, and are centrally managed.

2. 10G Wi-Fi networks: provide ubiquitous 4K network experience and all-telepresence wireless office.

   10G Wi-Fi networks support three times greater wireless access bandwidth and four times more efficient unblocking wireless access than 802.11ac networks. The number of concurrent users supported by a single AP with a per-user bandwidth of 2 Mbit/s is increased from 100 to 400.

➢ [Case: Wireless IoT Construction in the New Campus of Wuhan Asia Heart Hospital]

The new campus of Wuhan Asia Heart Hospital wanted to provide access to 7000+ RFID IoT terminals. In traditional mode, IoT and Wi-Fi networks must be deployed simultaneously. Using Huawei's CloudCampus hybrid wireless access solution, the hospital deployed 1400 AP4050DN-Es and matching RFID cards to achieve the following innovative IoT functions:

1. Infant protection: RFID cards of APs pair tags of mothers and babies to prevent mistakes of bringing wrong babies. Alarms are sent if baby tags are cut off. In the future, the hospital will enable geo-fencing of location triggers at entries and exits of clinical departments and automatic door locking to ensure infant protection.

2. Asset management: Active asset tags are deployed to identify locations and working states of valuable assets. On one hand, asset inventory and fast asset locating can be achieved. On the other hand, statistics on the revenues created by assets in a period of time can be collected based on working states of the assets.

Wireless infusion: Infrared sensors are used to avoid extravasation, and infusion is automatically ceased if extravasation occurs. Gravity sensors are used to detect fluid flow speeds and remotely control infusion pumps. When infusion is completed, nurses are called automatically.

[Key Capability 2 and ROI]

➢ **Multi-tenant network: one physical network can be virtualized into multiple virtual**

networks on demand that support multi-tenant network applications and new service rollout in minutes.

- ➢ [Problems to Be Solved]

  - ■ During the digital transformation of enterprises, new digital services keep emerging. To achieve fast deployment of new services, campus networks need to carry different services, and implement service isolation and network resource sharing.

  - ■ Fast rollout of new services brings high business value. However, rolling out new services generally requires network adjustment and generates high labor costs. This prevents the fast rollout of new services.

- ➢ **[Differentiated Technical Points]**

  1. Multi-tenant network: VxLAN virtualization technology is used to virtualize one physical network into multiple tenant networks, improving network resource utilization.
  2. Deployment automation: Network deployment using natural languages and real-time allocation of dedicated network resource based on user services shorten the service rollout period from weeks to minutes.

- ➢ [Main Typical Application Scenarios and Expected Effects (Numbers)]

  Multi-tenant scenarios: Virtualize one physical network into R&D, teaching, and office networks.

  Cloud computing services: Integrate server resources dispersed on campuses through network virtualization, improving resource efficiency.

  Video surveillance services: Rapidly construct dedicated video surveillance networks through network virtualization, achieving security isolation.

  Construction of a temporary R&D network in minutes: Virtualize a university's physical network to construct a temporary virtual R&D network in minutes.

- ➢ [Case: KMITL University]

  KMITL University is the top 2 engineering university in Thailand. It focuses on R&D of new technologies and subjects in the communication and information fields, and boasts many R&D projects. However, KMITL University has no centralized data center. Its computing resources are dispersed in multiple campuses, causing uneven computing resource utilization. Huawei assisted KMITL University in building the world's first SDN network with campuses and data centers converged. Using VXLAN technology, the solution integrates IT resources in a dozen of campuses, reducing TCO without the need of constructing new data centers. On the unified SDN-based virtual network, Huawei Agile Controller is used to implement flexible service orchestration and network isolation, meeting requirements for fast deployment of teaching and R&D service networks. Digital transformation of KMITL University offers 22,000 teachers and students optimal network experience.

➕ **[Key Capability 3 and ROI]**

➢ **Cloud-based converged LAN and WAN management simplifies full service path O&M and reduces the OPEX by 80%.**

➢ [Problems to Be Solved]

Increased network scale brought by digitalization increases OPEX. According to Gartner, the management and maintenance cost of an enterprise campus network accounts for 73% of the enterprise's total ICT OPEX. Cloud management network solutions are a trend in the industry due to their remote deployment and high O&M capabilities. However, cloud management network solutions in the industry only support small- and medium-sized businesses (SMBs) and branches, and do not support medium- or large-sized campuses. They also do not support unified management of LANs, WANs, or WLANs. Enterprises must maintain multiple network management platforms and cannot converge services and network policies, generating high network management and O&M costs.

➢ [Solutions and Differentiated Technical Points]

1. Cloud-based converged LAN & WAN management: Achieves unified cloud-based management of campus-wide network devices and WAN links. Only one network needs to be constructed, ensuring consistent O&M experience and simplifying management.
2. Network-wide lifecycle management on the cloud:
   - Planning: cloud-based network planning, completing wired and wireless network planning in 10 minutes
   - Deployment: plug and play
   - Optimization and management: cloud-based online optimization and network PMI
3. Automatic policy deployment: User-based policies are deployed to ensure consistent network-wide experience. Policies are orchestrated using natural languages, improving deployment efficiency by 50%.

➢ [Main Typical Application Scenarios and Expected Effects (Numbers)]

Cloud-based converged LAN & WAN management is applicable to SMBs, enterprise branches, medium- or large-sized campus networks, and enterprise interconnection networks. This solution reduces enterprises' OPEX by 80% and shortens the deployment period from a month to several days.

➢ [Case: Wanyang]

Wanyang Group invested in constructing a high-quality industrial park in Wenzhou, Zhejiang province. Enterprises in the park share releasable or sellable production, living, information, and financial services. This collectivized development mode is appreciated by many enterprises and has been replicated. Wanyang Group's businesses will be expanded to Zhejiang (Ningbo, Jinhua,

and Quzhou), Gangdong (Foshan), and Shandong provinces.

However, information construction in small regions costs high, and Wanyang International Industrial Park requires strong information technology capabilities. Located in a remote area, the park is unable to attract high-end technical personnel, which causes high information construction costs for Wanyang.

Huawei CloudCampus Solution uses a cloud architecture, requiring no onsite high-end technical personnel and significantly reducing OPEX. The park constructed a cloud managed network at the lowest network access cost to provide information services and network operation.

The network provides data such as the water and power usage, logistics, people traces, number of employees, and employee consumption, and opens up the data to financial institutions. Depending on the data, the financing and crediting processes are closed among financial institutions, enterprise owners, and the park operator, eliminating financing pain points of enterprises.

➢ [Case: Dongfeng Hongda]

Dongfeng Honda has more than 400 dealerships in China. It wanted to implement in-depth mobile and digital transformation, and provide mobile office services for sales and after-sales service personnel. It also wanted to offer intelligent services to improve working efficiency and customer experience. However, Dongfeng Honda has no professional ICT deployment and maintenance personnel in dealerships. The network solution that it used previously cannot create value-added benefits from marketing activities and services.

Huawei CloudCampus Solution supports all-cloud network planning, deployment, optimization, and O&M, and helps Dongfeng Honda deploy networks rapidly in all its dealerships in China. Non-professional IT personnel in dealerships can complete network deployment in only half a day. The O&M team with five persons at the headquarters can perform remote network O&M around China. In addition, Huawei CloudCampus Solution provides strong data analysis and value-added capabilities, supporting precision marketing and services of Dongfeng Honda. According to related data analysis, the network deployment efficiency is improved by six times, O&M efficiency is improved by 75%, and network construction cost is reduced by 30%.

🞧 **[Key Capability 4 and ROI]**

➢ **Open cloud platforms, 20+ industry applications, and 30+ business partners**

➢ [Problems to Be Solved]

■ Digital transformation in various industries poses new requirements on campus networks. Campus networks are required not only to achieve intelligence and automation, but also to support digital transformation. For example, digital transformation in office scenarios requires networks to adjust terminal rights and policies in real time based on demands of

applications. Digital transformation in shopping malls and supermarkets requires networks to provide data support and customer profiling for achieving precision marketing and analysis.

➢ [Main Typical Application Scenarios and Expected Effects (Numbers)]

Huawei cooperates with more than 30 business partners to provide over 20 industry applications for supermarkets, retail stores, service providers, logistics enterprises, education institutions, healthcare scenarios, and warehouses, and property management companies.

➢ [Differentiated Technical Points]

1. Diverse open interfaces and sound open ecosystems: Huawei CloudCampus Solution provides extensive open APIs and cooperates with more than 30 business partners to offer over 20 business applications covering six industries.

2. Application examples in various industries:

   ● Retail: customer profiling, customer flow analysis, electronic shelf label, and smart shopping guide
   ● Logistics: asset management, personnel management, and AGV navigation
   ● Enterprise office: energy efficiency management and asset management
   ● Education: student health management and e-schoolbag
   ● Property management: access control through facial recognition and smart property management
   ● SP: authentication and accounting, network management and monitoring

➢ [Case: Shanghai Aihui Health Technology Co., Ltd]

Supporting the Plan of Health China 2030 and following developing trends of the healthcare industry, Shanghai Aihui Health Technology Co., Ltd. built a new healthcare service platform "Aihui Nuanping Service Platform" by integrating the Internet with the healthcare industry. Aihui's Nuanping Service Platform using customized tablets and Wi-Fi networks as carriers assists hospitals in providing point-to-point information and services to inpatients according to their material and spiritual demands. It also assists intelligence upgrade of hospitals, improves paperless office work of hospitals' inpatient departments. The hospital planned to implement wireless and IT transformation for more than 200 hospitals with 500,000 ward beds in the next three years, and achieve mobile nursing using apps.

The hospital deployed Huawei CloudCampus Solution to complete Wi-Fi network construction, management, and maintenance in hospitals around China. Huawei CloudCampus Solution opens up APIs for wireless location and authentication, and achieves mobile inpatient nursing and one-click authentication using apps, helping hospitals improve healthcare management capabilities.

➢ [Case: Splunk]

Splunk is an industry-leading software corporation that integrates logs and machine data. Splunk

captures, indexes, and leverages computing data of all application programs, servers, and network devices to display network monitoring and security event analysis results in minutes. It helps customers implement cost-effective network Big Data O&M.

Based on its experience in projects, Splunk finds that data resources are dispersed, data collection efficiency is low, latency is high, and user experience is poor on traditional networks, especially on cross-region branch networks. It is always a great challenge for Splunk solution experts to improve data collection efficiency, fast display data analysis results, and improve Big Data analytics experience on customer terminals.

Using cloud management platforms, Huawei CloudCampus Solution allows for centralized management of a large number of branch networks, enables network Big Data collection, and provides open APIs. In this way, network Big Data collection is accelerated, and end-to-end latency during Big Data analytics is reduced, and experience of network management engineers is improved.