

# Enabling digital transformation through ALL CLOUD



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The global trend for digital transformation is driving enterprises to become fully digitized and digitally operated, and Huawei must pinpoint where it fits in all this. To truly enable digital transformation and digital operations for carriers and enterprises, we must cloudify our products and solutions.

By Eric Xu, Huawei Rotating CEO

## What is digital transformation and ALL CLOUD?

First, I'd like to talk a bit about how I see digital transformation. At the moment, many carriers have set out on the path to become digital telcos, and this is not new. To help them, we have to be clear on what the goal of digital transformation is: to provide carriers' enterprise and consumer customers with a ROADS experience. ROADS, which means real-time, on-demand, all-online, DIY, and social, was a concept I brought up at the Global Analyst Summit in 2014. Over the next two years, it's been extensively communicated, and today the term is widely accepted in the industry.

Enterprises are also talking about digital transformation. Then what does digitization mean for an enterprise? It first means full connectivity for people and things within the enterprise environment, before production activities can become automated and intelligent. Enterprise digitization also concerns the evolving role of enterprise IT systems, which in the past have only been for internal staff. Now they

need to be connected to customers and partners to extract the most value.

To digitize operations and digitally transform, both carriers and enterprises should transform IT systems from purely internal facing to an externally oriented platform, connecting with its customers and partners to deliver a ROADS experience as they buy or use what the enterprise has to offer.

ALL CLOUD, or the full cloudification of networks, operations systems, and services, sets the stage for digital transformation, and it's the most effective technical enabler that's currently available to bring the digital vision into reality. As for cloud, different people have different understandings. As I see it, it has three core features.

First, all hardware resources, including networking and IT, are pooled to maximize resource sharing. The traditional siloed architecture, where one application has a dedicated hardware to go with it, is gone.

Second, the software architecture has to be

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fully distributed, like the technology architecture of Internet companies. Being fully distributed is intrinsic to large systems. Through policy-based management, it allows scalability and flexibility in fault handling and resource scheduling.

The third core feature is the full automation of service provisioning, resource scheduling, and fault handling. No human intervention would be needed.

Cloud is much more than virtualization – it involves comprehensive architectural changes through which structural efficiency gains are made possible in R&D, service provisioning, and operations.

## **Huawei's strategy for ALL CLOUD: Corporate and by customer segment**

Huawei's strategy has always been very clear. We focus on what we call the pipe, or ICT infrastructure, and smart devices. To support carriers and other enterprises as they move towards full-fledged digital transformation and digital operations, our strategy is to fully cloudify all Huawei's products and solutions.



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Huawei aims to become an advocate, a driver, and ultimately a leader of ALL CLOUD. Through the full cloudification of our products and solutions, we hope to enable our carrier and enterprise customers to achieve digital transformation and digital operations.

Just as we did with ALL IP, we're committed to fully cloudifying all our products and solutions over the next few years. We will use the ideas and technologies of cloud computing to fully transform our telecom equipment; build dynamic, agile networks; and ultimately support the digital operations of our carrier and enterprise customers.

In the three customer segments of carriers, enterprises, and consumers, we have outlined different sets of strategies and measures.

**In the carrier business, our overall strategy is to deliver a ROADS experience and accelerate the cloudification of all carrier products and solutions.**

First of all, I'd like to talk about user experience, which can be split into two aspects for a given service. One is the features and functions the service has to offer, and the other is how users feel at every touch point across the customer journey, as captured in ROADS. I've spoken a lot about the ROADS user experience, so I want to talk more about services here. More

specifically, what services should carriers focus on in the future? For years, carriers have been trying to find a killer application to compete with OTT providers. In the end, many have come to realize that, between carriers and OTT providers, it's not just about competition – it's a relationship between both competition and cooperation.

For more than ten years, carriers have invested hugely in building applications, but with little success. Looking back on this part of history, a natural question is: What kind of services and applications are carriers best positioned to offer? In my opinion, carriers' biggest strength is their ability to provide services in real time.

We believe there are four types of real-time services that deserve more attention. One is the Internet of Things (IoT), and building ubiquitous networks to connect more people and more things. This is carriers' most basic offering. It also largely explains why we've seen so much recent momentum in IoT.

Second, the voice service has been there for decades, without much change, and the experience has left much to be desired. At the moment, we're quite far from high-fidelity, music-grade voice services.

Third, video should be positioned as a basic service.

Carriers have built extensive broadband and 4G networks, but if they don't carry traffic, they can hardly be of value. It's been widely agreed in the industry that the most effective way to fill networks is through video services. Video has been positioned as a value-added service, a proposition which we believe should be changed. Video should become a basic service for carriers. Networks, organizational structures, operating models, and employees' skill sets need to be revisited to see if they're sufficient to support the new positioning of video services.

The fourth one is enterprise cloud services. Carriers have extensive networks and facilities. They also have strong brand equity in local communities and customer relationships with enterprises. With these assets combined, carriers have a good chance to succeed in providing cloud services for enterprises. Over the past two years, Huawei has partnered with carriers on research and trials; for example, we're working with Deutsche Telekom on enterprise cloud services. As for our global strategy, we choose to work with a number of carriers from around the world that have the willingness, enterprise customer base, and a dedicated internal team for business customers to explore the cloud service market and drive new revenue streams and business growth for carriers.

Next, I'd like to talk about how carriers can create new services and provide new experiences. I believe full cloudification in four layers is the fundamental answer.

The first is equipment cloudification. Network Functions Virtualization (NFV) has been a buzzword for the past few years, but I believe NFV is not enough. With NFV, hardware becomes standardized and virtualized, but the traditional box-type of approach is still followed when it comes to software architecture and the operating model. I think we should use NFC,

Network Functions Cloudification, instead of NFV, going beyond virtualization and turning network functions into fully distributed, fully automated applications.

The second layer is network cloudification. Network equipment is distributed in different locations. While they are interconnected, resource scheduling at the network level isn't done particularly well. This is particularly true for IP networks, where traffic loads can vary significantly from node to node, and the overall utilization is quite low. That's where software-defined networking (SDN) comes in. The idea is to allow global scheduling across the network through an SDN controller to ensure user experience and enhance network utilization. Essentially this is the same as cloud computing, except that cloud computing schedules computing and storage while SDN orchestrates networking resources.

The third layer is service cloudification. Generally the telecom industry isn't doing well on services, with traditional voice and messaging services on the decline. These legacy services can be cloudified. More importantly, new services such as VoLTE, video, public cloud services, and IoT, should be made cloud-native from day one, with the ability to support a massive number of users.

The fourth layer is the cloudification of operations. Online is becoming part of the new paradigm for consumers and businesses. Take a look at Amazon. Everything carriers are selling or want to sell has already been offered by Amazon online. Amazon is able to sell all its products and services, including cloud services, all-online. Why can't carriers do the same? To do that, carriers need to transform their IT systems, which are currently set up as internal operations support systems, into customer-oriented production systems. In addition, the IT systems must adopt cloud architecture as they will have to support hundreds of millions of users and millions of partners.

With ALL CLOUD, we'll come to find that network architecture will be data center-centric, as all the network functions and service applications will sit in data centers. Network architecture will go through major transformation.

As carriers move to ALL CLOUD and ROADS, they need to choose and focus on the services and applications where they have an advantage, position video as a basic service, and embark on a journey to transform their operations systems and networks. These are key initiatives that may help them regain a strong position in the value chain. The earlier they start to make the changes, the greater the benefits will be.

**In the enterprise segment, our strategy is to leverage cloud computing, SDN, and big data to help enterprise customers navigate the digital transition towards agility and intelligence.**

The IT department is probably the most painful division in any company. Internal customer satisfaction with IT service capabilities and response times are low due to outdated IT architecture. The key to transforming traditional enterprise IT into the IT systems that everyone wants is migration into cloud architecture. An IT system with cloud architecture is able to engage with internal staff, as well as customers and partners. It also helps to deliver a consistent customer experience, online or offline, across all the products and solutions.

A full-cloud architecture may free CIOs from the distress of being constantly blamed.

First, we will facilitate the migration of enterprise IT to cloud architecture. Why do enterprises need to adopt cloud architecture? To answer the question, we need to go back to business needs and the inherent advantages of cloud architecture. What will future business needs

be? The agility and intelligence to quickly identify and satisfy customer needs, particularly their personalized needs. This will be the core to the competitiveness of any enterprise in the future.

Agility and intelligence are built on big data and massive storage and processing capacity. Only cloud architecture can provide a combination of massive processing power, cost advantages, and full resource utilization. Take Huawei's R&D as an example. There are 200,000 virtual machines to support large-scale collaboration in research and development. Productivity has increased in great leaps, with software compilation taking just 10 minutes and testing and verification only one to two days. At Huawei, the value of IT goes far beyond automating business processes – it has penetrated all aspects of business. Since Huawei entered the IT market in 2008, our aim has been to build large-scale distributed systems. Today, our cloud operating system FusionSphere and OceanStor distributed storage systems lead the market.

Second, we'll work to accelerate the transition of enterprise networking to SDN Agile IT systems that depend on agile networks. SDN needs to be introduced faster into data centers, campus networks, and the enterprise backbone to allow network agility and cloudified IT systems.

Moreover, as the digital transformation of enterprises goes deeper, data volumes will keep growing, yet remain unevenly distributed. Therefore, it may not be cost effective to build a private cloud to carry all workloads, so using carriers' public clouds for certain applications would be the logical option. This means that enterprises will trend towards a hybrid cloud model that will require the coordination and harmonization of enterprise networks and carrier networks.

Huawei is one of the few vendors with both carrier and enterprise networking in its portfolio. Back in the beginning when we were designing SDN controllers, we were committed to a single architecture that supports multiple scenarios, so that carrier networks, enterprise networks, and data center networks can be orchestrated end-to-end to allow full agility.

Third, we will leverage the power of big data to enable smart enterprises. Big data is among the top buzzwords of the year, but data only has value when its put in context, coming together with applications and business scenarios. Therefore, big data presents itself to users not in the form of massive amounts of data, but as smart applications and services like search, precise marketing, and smart manufacturing.

It is the enterprises and application developers in different industries that are able to fully extract the value of big data. In light of this, Huawei focuses on its FusionInsight big data platform. We don't develop applications ourselves, but embrace open collaboration with the ecosystem. Our role is to provide a developer-friendly, high-performance, and leading platform at scale. This builds on Huawei's technological strengths to support enterprises or industry partners as they develop industry-specific applications and services to enable smart enterprises.

In a nutshell, our core strategy in the enterprise segment is to facilitate the migration of enterprise IT towards cloud architecture and enterprise networks towards SDN, and to provide a big data platform to monetize the growing data assets.

**In the consumer business, brand, quality, user experience, and the ecosystem matter most. These sit at the core of Huawei's strategy.**

Building a mid-to-high-end brand: We hope to

leverage decades of technical expertise to build a truly global high-end brand and realize large-scale sales globally at reasonable margins. Our experience in the Chinese market has shown that creating a mid-range to high-end brand can boost overall sales and help us become a premium brand. In the future, Huawei wants to become one of the brands consumers around the world consider when they want to purchase a premium-brand device.

Winning with quality and services: In times of scarcity, one can make a lot of money just by building enough production capacity to meet demand. But today is a time of surplus and the old way of winning on cost or value for money, is doomed to fail. Competition in the end will be a competition of quality. Winning companies are those that can build an image of high quality in the minds of customers.

In the era of smart devices, services are another key differentiator – not only after-sales services, but services across the entire customer journey from the time of purchase. In China, we've become a leader in customer satisfaction, and we're now focusing on building our global service network and core service capabilities to turn services into Huawei's unique advantage in the device market.

Building a consumer experience-centered ecosystem: For the device business, ecosystem is key. But an ecosystem isn't a random assembly of resources. Rather, it starts from consumer experience, and pools the best of what the industry has to offer through partnerships. The best resources include global and local applications and content, as well as joint innovations in technology and key components. The aim is to increase consumer loyalty, and ultimately turn Huawei into a brand that consumers value and trust. 

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