

# Integrating SDN

## Three approaches for one-stop enterprise cloud UPN

ICT technology is a powerful tool for fast innovation. For businesses wanting to enter new markets more quickly, innovate faster, and increase productivity, it's clear what's needed: flexible, reliable, customizable and more efficient ICT services.

By Shen Hongyuan



### It's all about strategy

**D**emand for traditional services like voice, SMS, and video is falling. Following a number of years of growth, a gradual slowdown is also happening with value-added services like broadband services, both fixed and mobile, and IPTV. But, demand for new types of enterprise services such as UPNs

and cloud-based data centers is on the up, and it's growing rapidly.

Enterprise ICT cloud services present lucrative opportunities for carriers. They want to provide easily accessible enterprise IT services akin to the way public utilities are provided to homes or offices, where resources are delivered centrally via pipelines and accessed on demand without

any need for on-site facilities.

Applying the analogy to enterprise IT services, cloud computing service providers can construct large-scale IT cloud infrastructure that offers computing, storage, and value-added services (VAS) via the Internet (VPN). Businesses can then enjoy professional, high-quality, pay-per-use, and elastic IT services without needing to build their own IT infrastructure.

Utilizing their vast network resources, carriers can provide enterprise users with one-stop enterprise cloud VPN services with end-to-end (E2E) VPNs; pay-per-use cloud resources; and elastic, customizable VAS. This cloud + VPN service model will transform the way companies consume ICT resources. Enterprise users will be able to access cloud and network VPN services and enjoy high-quality ICT cloud services with ease.

By applying their strengths in networks and becoming the main point of access to these services for businesses, carriers can stake a claim in a trillion-dollar enterprise ICT market and create new growth drivers and strategic opportunities.

However, carriers face significant obstacles in achieving this goal. One issue is that decades of siloed construction means they use

different vendor hardware and service management systems in different product domains. As a result, carriers typically need 12 to 24 months to launch a new service. This long process involves many steps: selecting technology, waiting for vendors to develop products, integration and verification, and deploying solutions on existing networks. Then, provisioning a new service requires a further 15 to 45 days to coordinate different domains, technologies, and vendor resources, and streamline different systems and departments.

It's crucial for carriers to overcome issues like separating the services and service support systems of clouds and pipelines, a lack of experience in one-stop enterprise cloud VPN service provision, siloed pipelines, and the slow rollout of VPN services.

## Huawei's SDN integration service helps carriers provide one-stop enterprise cloud VPN

SDN is a new solution to address the challenges that carriers face. As part of its SDN integration service, Huawei has developed three approaches that apply its full understanding of WAN networks, data centers, and VAS: SDN WAN

network evolution, VAS service pre-integration and modeling, and ICT resource orchestration.

The solutions are supported by Huawei's SDN Open Lab and Planning and Simulation platform. These approaches will ensure that carriers can resolve typical service system issues and support carrier network transformation and integration. They will help carriers transform traditional siloed networks, enable cloud and network coordination, and provide one-stop cloud VPN services for enterprises such as on-demand flexible pricing, a range of VAS, service deployment in minutes, and online self-service.

### Approach 1: SDN WAN network evolution to speed up service launch and boost service capabilities

Huawei's SDN WAN evolution service helps operators accelerate service launch and boost service capabilities. At Huawei, we believe that carriers need a layered, step-by-step approach for the SDN transformation of traditional WAN networks. Given carriers' large legacy network inventories, SDN transformation necessitates a long-term, gradual evolutionary process. Huawei's SDN WAN network evolution service includes two kinds of solutions: overlay and underlay.

- **Overlay: accurate design and quick E2E integration**

With the overlay solution, a software-defined logical network is overlaid on the legacy network, which remains unchanged—as far as possible. Service logic is put in place by defining the logic network. An overlay solution allows carriers to support new cloud services on their original network architecture, deploy new services with much greater ease, and protect historical investment. Huawei's overlay solution is compatible with hardware from more than 10 mainstream telecoms vendors. It also supports topology recovery and capacity analysis for networks with over 10,000 nodes, allowing for accurate identification of resource bottlenecks and future service growth forecasting – analysis that can be used to develop the optimal overlay solution, so that E2E integration can be quickly completed.

- **The underlay solution: multi-layer collaborative design and a 30 percent increase in service capabilities.**

The underlay solution introduces SDN architecture and integrates IP/MPLS backbone networks and optical networks by reconstructing legacy network hardware. This simplifies network O&M, enhances network intelligence and automation, and improves the coordination of IP and optical networks.

In one case, Huawei's underlay solution helped a carrier customer boost planning efficiency by 50 percent and resource utilization by 30

percent. In this project, Huawei's IP + optical joint planning solution included IP and optical network coordination design for topology, capacity, and service protection.

- **Approach 2: VAS pre-integration and modeling for the most competitive VAS**

Carriers must perform pre-integration and verification for every new VAS. With traditional networks, which are tightly coupled with service systems, this requires integrating the service system with many surrounding nodes, each of which may have dozens of interfaces. It also requires developing new code. The highly time- and labor-consuming work of connecting large numbers of nodes and interfaces means new service launches takes a long time, making it difficult for carriers to keep up with market demand.

- **Quick integration with VAS pre-integration**

Supported by the Huawei SDN Open Lab in Beijing, Huawei's VAS pre-integration service provides advanced integration and verification on VAS and delivers the best industry practice for new VAS integration in just seven days. To date, Huawei has partnered with over 20 major VAS providers and offers more than 50 typical VAS. Huawei has completed more than 30 E2E VAS pre-integration projects in markets around the world, helping carriers quickly launch outstanding VAS for enterprise customers at low cost. Huawei has earned widespread recognition for its service from carriers and partners alike.

### • **Finding NEMO (network modeling) to quickly customize service templates for enterprises**

Service customization and innovation are core concerns for carriers. On traditional networks, northbound interface abstraction is performed using a bottom-up approach, which causes problems like interface complexity and difficulty with conflict detection and standardization. Huawei's next-generation NEMO programming language targets these problems and meets carriers' needs for convenient service customization.

NEMO offers carrier service designers a service template customization tool that's easy to use. NEMO abstracts network hardware from the top down, employing universal network operation modes and application-centered network models. The solution is designed to suit the needs of enterprise users in different industries. Huawei has developed six typical service scenarios, through the practical application of NEMO and analysis of carrier business services, and developed over 20 typical network models using the NEMO language. The models are provided as part of Huawei's SDN cloud data center solutions and they're updated dynamically. Carriers' service

design is significantly simplified and service innovation and deployment is accelerated.

### **Approach 3: ICT resource orchestration for convenient enterprise self-service**

Huawei's ICT cross-domain service orchestration offers SDN network services and resource orchestration, including underlay and overlay solutions; cloud data center services; allocation for cloud services including data center cloud computing, storage, and virtual data centers; and the centralized orchestration of ICT resources on both cloud and network. A self-defined portal provides convenient self-service for enterprise users, delivering on-demand application for cloud, UPN, and UAS services, with immediate resource provision-on-subscription, and dynamic loading and deletion, and capacity scaling.

## **Shoulder to shoulder with carriers in the SDN revolution**

SDN will bring opportunities for network transformation and innovation, and it will be crucial for carriers to seize them. No one is better placed than Huawei, with its continual investment in SDN R&D and with global SDN experts, including more than 20 senior system architects, 100 system

architects, and 2,000 professional service engineers. They act in concert to provide customized SDN integration services and technical support to help carriers do so.

Huawei's Beijing-based Open Lab is Huawei's SDN-based Global Network Evolution & Experience Center. It focuses on SDN network evolution and service transformation. Through the center Huawei has formed partnerships with over 20 service partners for UAS pre-integration and verification and completed over 30 E2E service integration projects in markets around the world, earning widespread recognition for its service from carriers and partners alike.

By promoting open cooperation in SDN integration services, Huawei has built a win-win SDN ecosystem in cooperation with industry partners and developers, including carriers, standards organizations (ONOS and ODL), and OTTs.

Huawei is committed to promoting its open SDN ecosystem and innovative solutions to quickly meet customer requirements and develop the SDN sector. 