NEXCOM
The Intelligent Systems

White Paper

Telecom Companies' Preference for NFV Drives Enterprise vCPE Market Forward

Leveraging universal hardware platform, virtualization and software technology, telecom services can be flexibly added to or removed from vCPE, reducing the cost, effort, and time of service maintenance for operators.

As telecom services become more diversified, operators who rely on traditional proprietary network appliances require strenuous effort in developing new services. The use of software-defined networking (SDN), network function virtualization (NFV) along with virtual customer premises equipment (vCPE) will grow in significance and set to open new territory for the industry.

Telecom operators are bound to vendor lock-in imposed by telecommunications equipment manufacturers (TEM). Despite the fact that the core telecom network and devices built on a closed architecture defined by TEM ensure service performance and quality, the push towards service diversity is still in motion. For example, network communication and services are gradually becoming integral parts within the telecom industry, with many operators shifting their focus to network services. However, using existing traditional equipment either incurs high costs or lacks the capability to deliver the right functions that meet the expectations of operators.

Within this dilemma of stalled progress, NFV is seen as the ray of hope for paving a new way for telecom operators. Hadwin Liu, Chief Architect of NEXCOM Network and Communication Solutions Business Group, explains that NFV is generally favored as it is built upon industry open standards, and uses universal hardware platform, virtualization technology and software to enable network functions that are only available on expensive, proprietary equipment. This helps operators to be less reliant on TEMs or system integrators, greatly reducing the deployment cost of equipment.

The NFV value chain consists of hardware (one of which serves as the main platform for vCPE), cloud operating system, application software and other components. Operators can list these components as open bids without having to worry about interoperability issues between heterogeneous components. For businesses who have invested in the development of x86-based enterprise vCPE, this will present a vast pool of opportunities.

Rising Significance of vCPE for Offloading Cloud Workloads

Liu points out that the concept of NFV operation focuses on translating network functions such as network security, WAN optimization and load balancing, into service processes that can be executed on a virtual machine. These processes are not closely bounded to the underlying hardware. In other words, businesses can simply use control commands of back-end cloud data centers to flexibly insert NFV virtual machines or remove devices.

As the number of end devices increases, more processing burdens are placed on the cloud center. As a result, the concept of "fog computing" has emerged to relieve the heavy processing load. The idea of fog computing is to share the workload of the cloud by using end devices with stronger computing power to enable vCPE functions to take place. Compared to traditional CPE, vCPE differs greatly as traditional CPE typically only handles simple network processing tasks that require only a dual-core processor and small amount of system memory. vCPE, on the other hand, requires high processor core count, large system memory and network bandwidth capacity.

In terms of processor core count, vCPE basically requires four processor cores.

Diversified telecom services and dedicated network appliances are two driving forces for enterprise vCPE.

The first core is used to run cloud operating systems such as Wind River, while the second core is dedicated for network switching (OVS). The remaining two cores are then used to run VNF virtual machines. For applications that require additional VNFs or network switching performance (OVS-DPDK), a higher processor core count is required.

Besides telecom businesses, another possible driving force for enterprise vCPE could come from traditional dedicated devices used for delivering network functions and performance. The main focus of these devices centers on allowing users to enjoy services offered by providers, while at the same time allowing room to access NFV services provided by other vendors. However, industry experts have evaluated that the development of dedicated devices may not be as significant as telecom services.

x86 to Non-x86 Cross-Platform Migration with NFV Virtual Machines

NEXCOM looks forward to the potential development of enterprise vCPE, and has vigorously revitalized its product lines; vCPE-related products from now on utilize Intel-based solutions as the core architecture. Not only Intel® Virtualization Technology is full-featured and complete, it is also widely used throughout the industry as the main platform for various applications, thus ensuring high degree of integration. Furthermore, to strengthen the competitiveness of enterprise vCPE products, NEXCOM has been actively investing resources in building two specialized teams with distinct roles. The first specializes in non-x86 technology while the second specializes in software technology. These investment and research efforts have come together as the foundation for NEXCOM's unique niche.

For non-x86 technology, NEXCOM plans to reserve a wider resource space for platform migration. For example, a virtual service running on an x86 platform can be migrated to non-x86 platforms based on vendors like NXP's SoC. As a result, octa-core processor coupled with OVS hardware acceleration can be made available with competitive pricing to target the budget-constrained customer base. As for software technology, interoperability between devices and virtual machines will be assured, and if any issues are encounter by users, consultations are provided.

NEXCOM's enterprise vCPE is currently divided into three product series, which are NSA 7135, NSA 5160 and NSA 1150, from high-end to low-end respectively in that order. NSA 7135 features Intel® Xeon® processor E5 family with support for up to 44-core processors. NSA 5160 features Intel® Xeon® processor D-1500 family with support for up to 16-core processors. Lastly, NSA 1150 features Intel® Atom™ processor family with support for 2- to 8-core processors.

Founded in 1992, NEXCOM integrates its capabilities and operates six global businesses, which are IoT Automation Solutions, Intelligent Digital Security, Internet of Things, Interactive Signage Platform, Mobile Computing Solutions, and Network and Communication Solutions. NEXCOM serves its customers worldwide through its subsidiaries in five major industrial countries. Under the IoT megatrend, NEXCOM expands its offerings with solutions in emerging applications including IoT, robot, connected cars, Industry 4.0, and industrial security.

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