Virtual Home Environment

Current deployments are based on network-located backend systems with dedicated equipment at customer premises. CPE represents a significant CAPEX investment for operators today. Maintenance of millions of CPE units is costly. Software updates require significant human resources and planning, and do not always go smoothly. New service introduction is complex and slow with the need to update millions of CPEs. Visibility of users' home networks is limited, but in the eyes of users, telcos are responsible for networking problems experienced at home. Visits of technicians are often needed to solve users' problems, and non-faulty CPEs are sometimes replaced due to the difficulty in identifying root causes of problems.

The virtualization of the home environment addresses these challenges by moving most of the CPE functions into the telco's network. NEC's vCPE solution will simplify the home equipment installation process and, by default, the carrier's broadband network access and connectivity. By minimizing dependence on hardware CPE, virtualization brings considerable benefits both to the management of the network and to the end user. This means that network management will become easier and more flexible, thereby guaranteeing greater control and security of the consumer electronics connected to the network. It also reduces any possible incidents and breakdowns. Overall, virtualization speeds up the deployment of new services in the home, reduces time to market for new services and enhances the customer's connectivity experience.

Current Deployment Practice

The evolving home environment brings new challenges resulting in increasing CAPEX and OPEX. Increases in connectivity problems as well as a perception of network slowness result in more calls to telco's call centers and more home visits by technicians. The increasing amount of multimedia traffic results in higher bandwidth demand, requiring further capacity to be deployed in edge and core networks. This also leads to IPv4 address shortages, driving increased demand for NAT resources.
Virtual Home Environment

Principle of vCPE

- Functionality is moved to the network.

CPE is the physical equipment installed in a customer's home, possibly including the residential gateway (RGW), cable TV decoder, and phone terminal.

The principle of virtualized CPE is that higher layer IP functionality is shifted away from the residential gateway (the equipment installed in the customer's home) to the carrier's own network; that is, the carrier's central office or telco cloud.

- RGW becomes a simple L2 bridge.

The residential gateway is therefore simplified and reduced to the essential components needed in the customer's premises, such as access, modem and L2 switching.

The migrated functions run as Virtual Machines (VMs) on Commercial Off The Shelf (COTS) platforms in the telco cloud.

In the short term the hardware in the customer's premises would not need to change – the migrated functions would simply be disabled.

Components of NEC's vCPESolution

- Software functionality on COTS servers

The NEC vCPE solution offers virtualized BRAS, DHCP and CG-NAT functionality, to run as software on COTS servers in a data center architecture.

The comprehensive solution includes diagnostic tools, an element management system (EMS) and web portal.

- Reduced OPEX

- Reduce the need for upgrades and problem solving at the customer's premises.

- Reduced CAPEX

- Reduce the cost per unit of CPE hardware.

- Increased revenue

- Rapidly launch new services from the telco cloud with minimal up-front investment for new hardware, and retain customers with improved QoE.

Benefits of NEC's vCPESolution

- Locating all the equipment on the customer's side of the network interface

- Virtualizing part of the equipment installed on the customer's premises

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