vCPE from NEC

Virtual Home Environment

The virtualization of the customer premises equipment (vCPE) addresses the challenges of the evolving home environment by moving most of the CPE functions into the Telco cloud.

The Evolving Home Environment

- Internet traffic is increasing exponentially, driven mainly by increasing video consumption.

- The number of connected devices is increasing as tablets and smartphones become ubiquitous and home appliances more "intelligent".

- Offloading of mobile data traffic to WiFi is also causing growth in home originated traffic.

Current Deployment Practise

- Current deployments are based on network-located backend systems with dedicated equipment at customer premises.

- CPE represents a significant CAPEX investment for operators to-day. 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.

Home Virtualisation

- The evolving home environment brings new challenges resulting in higher CAPEX and OPEX.

- There is an increase in connectivity problems as well as a perception of network slowness, resulting in more calls to telco’s call centres and more home visits by technicians.

- There is an increasing amount of multimedia traffic resulting in higher bandwidth demand, needing further capacity to be deployed in the edge and core network.

- This also leads to IPv4 address shortages and as a result there is an increasing need for NAT resources.

- 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 minimising dependence on hardware CPE, virtualisation will bring 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 will also reduce any possible incidents and breakdowns. Overall, it will speed up the deployment of new services in the home, reduce time to market for new services and enhance the customer’s connectivity experience.
**vCPE Principle**

- **FUNCTIONS MOVE TO THE NETWORK.**
  
  CPE is the physical equipment installed in a customer's home, possibly including the residential gateway (RGW), cable TV decoder, phone terminal, etc.
  
  The principle of virtualised CPE is that certain IP functions are shifted away from the residential gateways (the equipment installed in the customer's home) towards the carrier's own network.
  
  This means that the higher layer IP functionality would be moved from the residential gateway to the network, i.e 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 premises, i.e 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 premises would not need to change – the migrated functions would simply be disabled.

**Components of NEC’s vCPE Solution**

- **Software Functions on COTS servers**
  
  The NEC vCPE solution includes virtualised BRAS, DHCP and CG-NAT functionality, to run as software on COTS servers in a datacenter architecture.
  
  The comprehensive solution includes diagnostic tools, Element Management (EMS) and Web Portal.

**Benefits of NEC’s vCPE Solution**

- **OPEX SAVING** - Reduce the need for upgrade and problem solving at customer premises.

- **CAPEX SAVING** - Virtualisation provides an opportunity to reduce the cost per unit of CPE hardware.

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

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