

## uCPE: The evolution of the intelligent network and the future of SD WAN

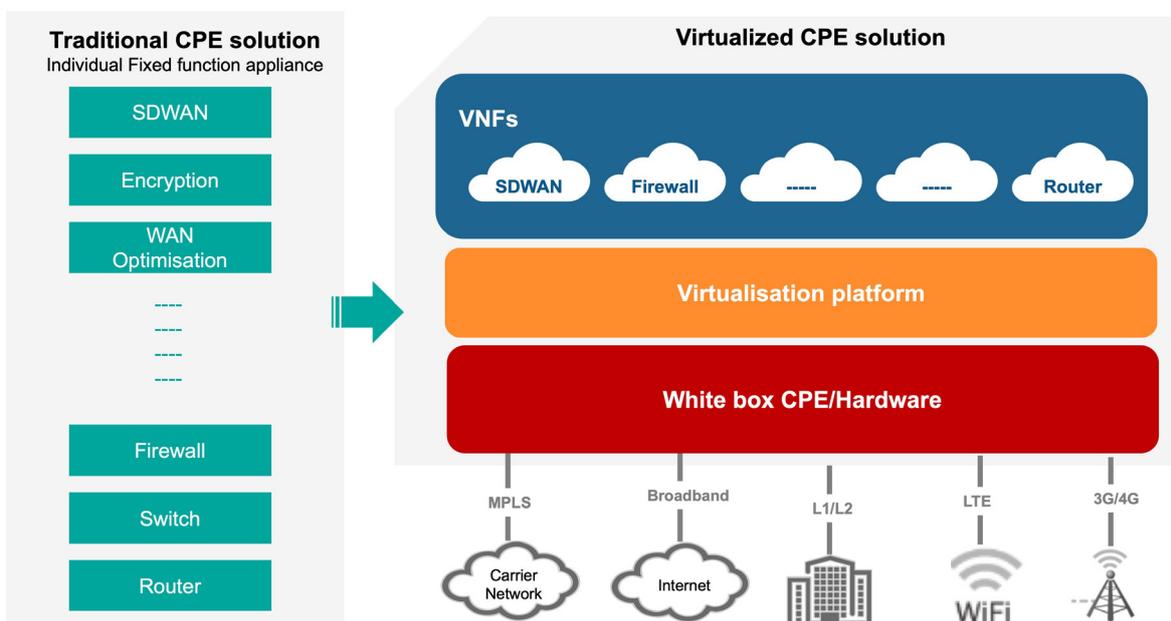
### Introduction

uCPE, or Universal Customer Premise Equipment, is a general-purpose platform that integrates compute, storage and networking on a commodity, off-the-shelf server, providing network services as virtual functions to any site on a network.

uCPE is the equivalent of a “Cloud for network services” but at the customer premise, and network services and functions can be deployed as a combination of powerful Virtual Network Functions (VNFs). The benefit of using Commercial

off the Shelf (COTS) equipment is that it is general purpose, low-cost and easy to commoditise, but it can be challenging to qualify and manage.

uCPE is a rapidly growing market, one that is projected to grow from \$7.7m in 2017 to \$1.02b in 2022, according to IHS Markit. Where once networks would rely on specialised hardware to deliver services – a router, a firewall, a WAN optimiser – that functionality is now provided virtually as software. Everything can be controlled with a universal CPE, placed in a central or branch location.



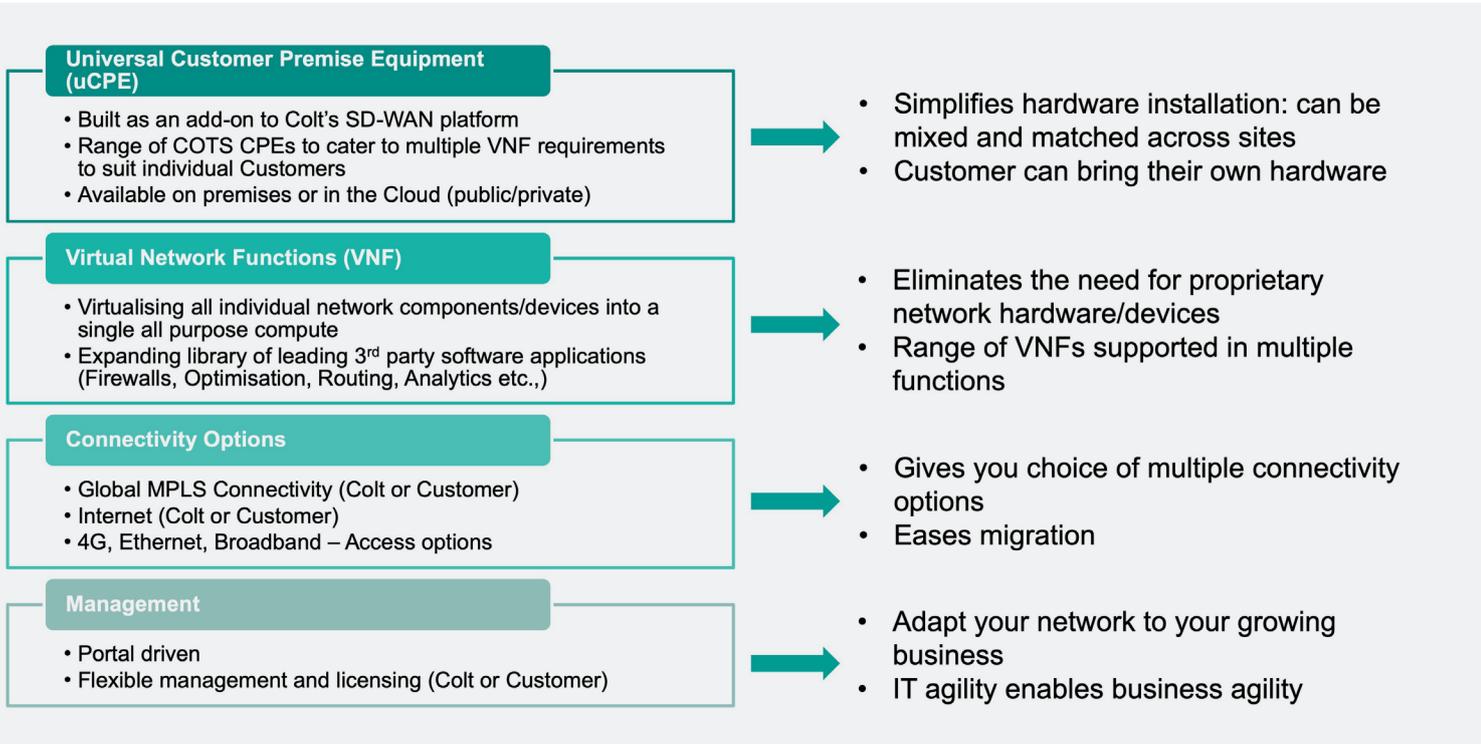


## Why do we need uCPE?

Customers expect a lot from their network, both in performance and bandwidth but also when it comes to flexibility and responsiveness. The problem is that Customer Premise Equipment (CPE) traditionally consists of provider-installed and owned, specialised hardware devices that perform dedicated network functions. Having to comply with this model can be a challenge for businesses when opening new branch offices or adopting new network functions in their existing IT infrastructure. Enterprise IT needs to source the appropriate

solution, negotiate with a selection of suppliers, who will eventually send network technicians to provision and configure once contracts are signed. The process is not only time and resource-consuming, but expensive.

uCPE is the next step in an ongoing evolution of the intelligent network as it moves from physical to virtual, one that puts more control into the hands of the end customer. Moving to virtualisation is a key part of digital transformation and can result in lower costs, easier and quicker deployment and the ability to move much faster.



While cloud computing ushered in the era of virtualisation for enterprise IT and LAN infrastructure, bringing about a significant shift in how IT services are deployed and consumed, the impact was barely felt in the WAN side of things until SD WAN, and even this was largely within the service provider domain.

## The benefits of uCPE

If virtualisation is being introduced for enterprises in the enterprise IT and LAN infrastructure, why not for the WAN? For the end customer, uCPE removes the need to buy dedicated hardware just to add new functions and makes adding new locations to the network much quicker, easier and cheaper.

With the uCPE model, network functions can be consolidated using software-based virtual network functions (VNFs) running on top of a

single universal vCPE (uCPE) appliance. The VNFs may reside inside an on-site hardware device, in an enterprise data centre, or in the cloud. VNFs can also be distributed between the uCPE and the cloud in a hybrid model. When combined with Zero Touch Provisioning (ZTP), where the uCPE auto-installs and configures itself at power-on, businesses and service providers can simplify operation, reduce Capex and Opex and speed up service delivery, whether installing new offices or implementing a new network function.



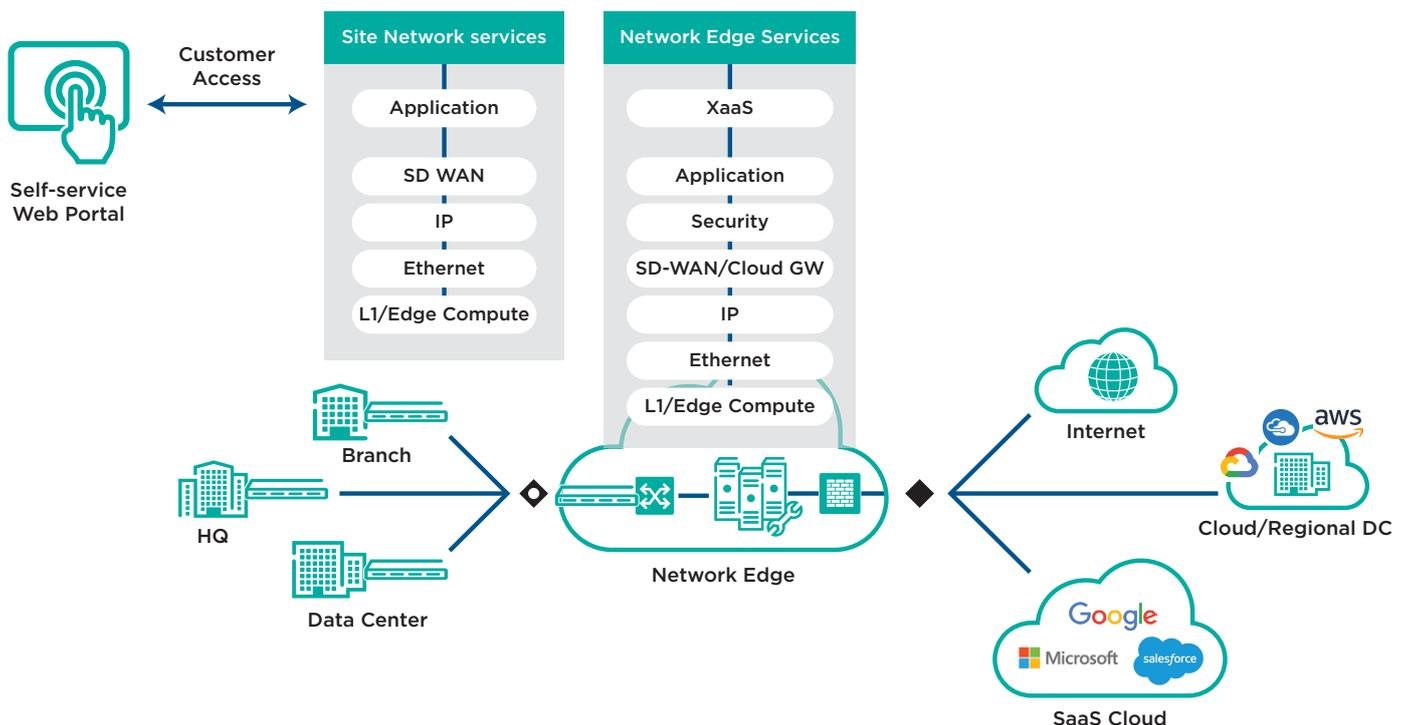
- **Shared Resources:** By using uCPE, the same server can be used for multiple network functions. Instead of having specialised hardware devices, these functions are virtualised to reside on a single piece of hardware – cutting down on upfront and running costs
- **Service on demand:** As network functions are software-based (rather than hardware based), it's easier to initiate new features
- **uCPE and the Network Edge (NFVi):** Virtualisation, uCPE and NFVi are creating new opportunities for both providers and customers to adopt new services, new platforms and transform their IT infrastructures on demand
- **Avoids the need for dedicated appliances for WAN services:** Taking advantage of virtualisation, the uCPE platform avoids the need for dedicated appliances for WAN services such as SD WAN, firewall, and WAN optimisers etc., replacing them with equivalent software-based VNFs. Combined with orchestration capabilities, the uCPE platform provides software-based dynamic control, allowing CSPs (Cloud Service Providers) to deliver on demand WAN services

## Software defined Edge with SD WAN and uCPE

SD WAN (Software Defined WAN) enables businesses to cope with the explosion in bandwidth demand by combining dedicated data connections with less expensive broadband links in their wide area network. The result is a hybrid network, where non-critical data is offloaded to a secured internet tunnel, freeing up MPLS bandwidth for business-critical data, efficiently increasing the total

bandwidth to branch sites. This approach gives customers much more control over their network, which is where uCPE comes in.

As SD WAN integrates more network functions, it may not be possible to have dedicated hardware for them all. With uCPE, all these services can be virtualised and can be offered through a single device. So the future of SD WAN is on uCPE, as providers can deploy virtualised services on a low-cost platform that enables the deployment of a wide variety of VNFs.



## What next for the intelligent network?

uCPE and SD WAN add intelligence and flexibility into the network, driven by the growing number of virtualised services and cloud-based applications. This need for intelligence will drive further innovation, potentially combined with AI to automate tasks or spot problems before they occur.

Another area of development is fog computing, which spreads processing across multiple edge devices to reduce the time required or the compute power in a single location, ideal for IOT applications. For this to work the networks need to be intelligent, flexible and easy to manage and deploy – so it's no surprise that the SD WAN and uCPE markets are forecast for significant growth in the coming years.

### Find out more

Colt launched its uCPE proposition in Q3 2019 and it further puts the network in the hands of the customer, giving them the flexibility to license, manage, monitor functions in service provider or customer managed modes with a choice of network options.

Colt's uCPE utilises ADVA's Ensemble Connector as the virtualisation platform and offers a host of VNFs, supporting multiple network functions, such as SD WAN and firewalls.

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