

Ekinops OVP uCPE Consolidates Single Platform for Edge Devices

Eliminating the plethora of edge network and security devices, Ekinops' uCPE platform enables service provider customers with automated and programmable solutions that consolidate enterprise edge IT infrastructure.



Overview

The complex and dynamic nature of today's networks is driving operational technology (OT) and IT to move beyond the cost prohibitive and rigid nature of traditional network and security deployments, by moving intelligence to the edge. Branch office users need seamless access to applications and resources in diverse hosting environments, including multiple public clouds, private clouds, and corporate data centers. Cloud-connected applications are driving the demand for software-defined networking (SDN), which enables an ecosystem of users, network and security devices, data, and analytics that drives business forward.



The virtualization of network services enables communications service providers (CoSPs) to combine several virtual network functions (VNFs) on a single universal customer premises equipment (uCPE), delivering a comprehensive networking solution to enterprise branch users, enabling agility in service deployment, and setting a foundation for new services.

At the enterprise level, the virtualization of IT infrastructure enables organizations to cost-effectively deploy multiple service functions through software on a single uCPE server, rather than individual hardware devices. Diverse hardware devices add complexity and are expensive to purchase, maintain, and support.

Service provider customers are deploying uCPEs within their branch locations to consolidate networking and security functions within a single platform. These functions can then be centrally managed and updated.

The Challenges

Traditional branch networks have a multiplicity of single-function hardware devices, like routers, web security, firewalls, Wi-Fi access points, WAN optimizers, and more. Each separate system requires different skill sets to make changes, update, reconfigure, test, and maintain. These individual appliances add cost and complexity, making it almost impossible to keep policies uniformly up-to-date. This also makes it difficult to have clear visibility and correlate real-time data congestion or security events.

CoSPs as well as enterprises are facing a set of unprecedented challenges either linked to the way they operate and/or to the consequences of digitalization and the internet of things (IoT). uCPEs and SD-WAN are ways to overcome these challenges. SD-WAN software is rapidly enhancing or replacing rigid and slow-to-deploy legacy WAN connectivity, by more securely aggregating cost-effective broadband internet links with existing WAN connections. Through focusing on improving these business-oriented services, rather than managing WAN complexities, SD-WAN is bridging challenges facing both service providers and IT.

From an IT standpoint, the challenges are related to the availability of an edge platform that can be integrated within the IT infrastructure but managed by another organization. In a nutshell it can be summed up in simple requirements: while the CoSP owns the uCPE, enterprise IT must be able to add over-the-top (OTT) services using automated and programmable cloud-native orchestration platforms.

Intel® Network Builders ecosystem partner Ekinops has created its own software and hardware uCPE platforms to serve the growing need for branch office SD-WAN and other services.

OneOS6-LIM: The Heart of Ekinops uCPE Solutions

The Ekinops uCPE solution is based on its OneOS6-LIM (operating system and local infrastructure manager) network functions virtualization infrastructure (NFVI).

OneOS6-LIM is an efficient and lightweight software uCPE platform (see Figure 1) designed to run a wide range of VNFs on Intel® architecture-based servers. This flexibility allows service providers to size the solutions appropriately for each customer use case.

OneOS6-LIM can be used in distributed edge environments where applications are distributed between the cloud data center and the edge. OneOS6-LIM fully supports distributed edge virtual appliances that deliver local data preprocessing that reduces latency in a way that is hard to do at scale in the cloud. This distributed edge is widely used in IoT applications where local compute, messaging, data caching, sync, and machine language inference capabilities are needed.

Branch Office Network Challenges

Service Provider

- Proprietary form factors create logistical challenges and vendor lock-in
- Multiple hardware upgrade cycles
- Separate hardware appliances consume more space, power, and cooling resources
- Long time-to-deploy and upgrade
- Static deployment and rigid setup, once in place very hard to change
- Adding/removing/changing appliances requires a service interruption
- Harder to troubleshoot and recover when a remote appliance fails

Enterprise

- Operating and managing widely distributed edge devices from a central point
- Integration of the services deployed on those devices as part of a global infrastructure
- Integration of edge appliance with the CoSP-provided networking appliances
- Deployment of centrally managed services

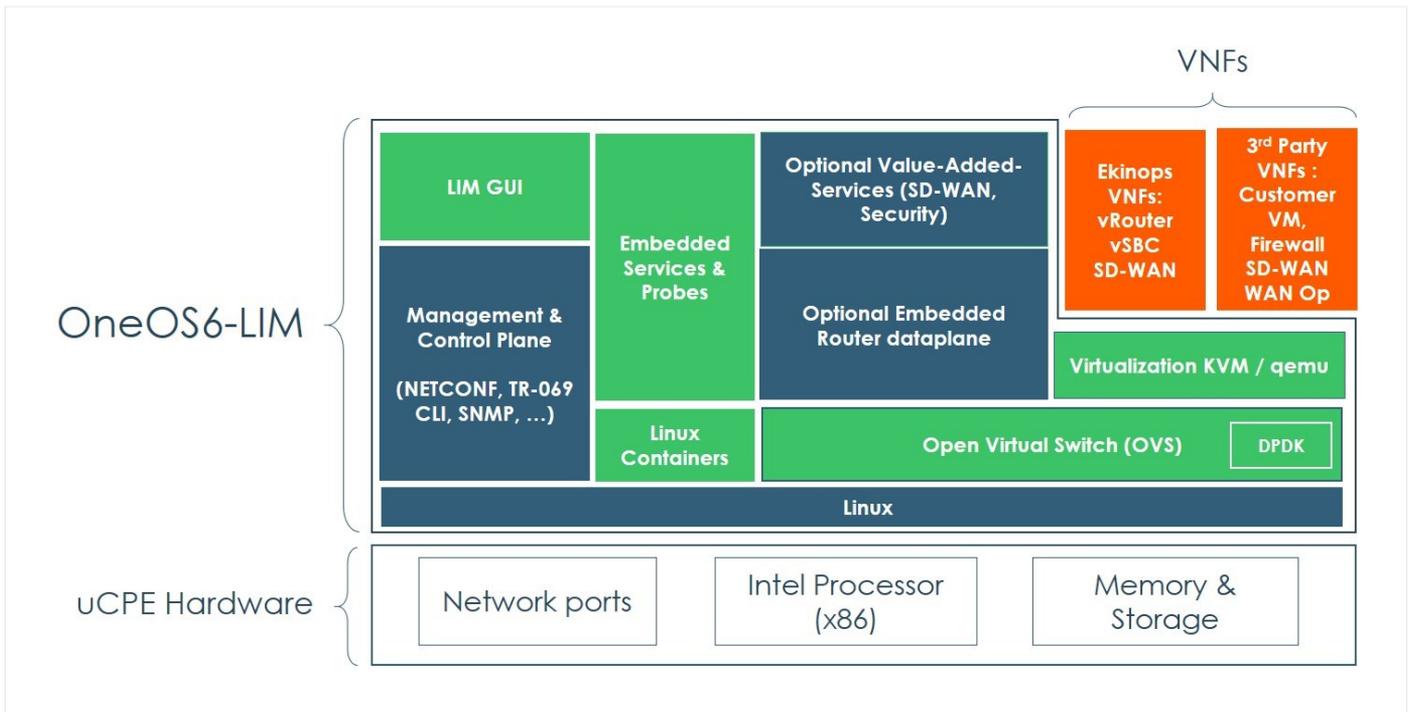


Figure 1. Block diagram of Ekinops OneOS6-LIM virtual infrastructure manager.¹

SD-WAN Ekinops Cisco Viptela Nokia Nuage NSG-V SilverPeak VeloCloud Versa	WAN Optimization Ekinops vWX InfoVista Ipanema Riverbed Steelhead VCX10		
Voice 3CX Ekinops vSBC	Security Barracuda GWAY CheckPoint VSEC Fortinet FortiGate Palo Alto StormShield UTM	Linux CentOS Debian RancherOS Ubuntu	vCPE AT&T Vyatta Cisco CSR1000v Ekinops ONEv600 Juniper vSRX
WiFi Ubiquiti Unifi WLAN	Tools OpenVAS - Sandvine - Thales OpenSand - Zabbix		

Figure 2. Ekinops OneAccess ecosystem of pre-integrated VNFs.

OneOS6-LIM provides built-in carrier-grade routing and network security functions for cloud, other managed services, and SD-WAN services for branch office connectivity. Ekinops has also developed an ecosystem of VNFs that are pre-validated for deployment (see Figure 2). In addition, the company will work with CoSP customers to custom validate VNFs and match their compute needs to the right Intel architecture-based server platform.

CoSPs can flexibly select and combine OneOS6-LIM functions to create and deploy new and custom virtualized services on-demand.

The local infrastructure management features of the OneOS6-LIM provide full VNF lifecycle management, VNF service chaining, and hardware monitoring. The LIM also includes a NETCONF/YANG management interface. OneOS6-LIM is an open API, based on KVM virtualization technologies and Linux Containers (LXC) to deliver VNFs services such as DHCP.

The programmable framework (see Figure 3) lays the foundation for lifecycle management of hosting, chaining, and managing Ekinops OneAccess and third-party VNFs.

Ekinops Open Virtual Platform (OVP) uCPE Hardware

Ekinops Open Virtual Platform (OVP) uCPE is a carrier-grade server platform that utilizes OneOS6-LIM to enable flexible creation and deployment of multiple virtualized services. Ekinops OVP uCPE provides connectivity, virtualization, acceleration, and management functions based on standard protocols and open data models.

Ekinops OVP eliminates the plethora of individual proprietary network and security devices. The Ekinops software-driven uCPE platform allows service providers and their enterprise customers to delineate between the cloud and the network, while leveraging an automated and programmable solution to consolidate IT infrastructure within edge locations.

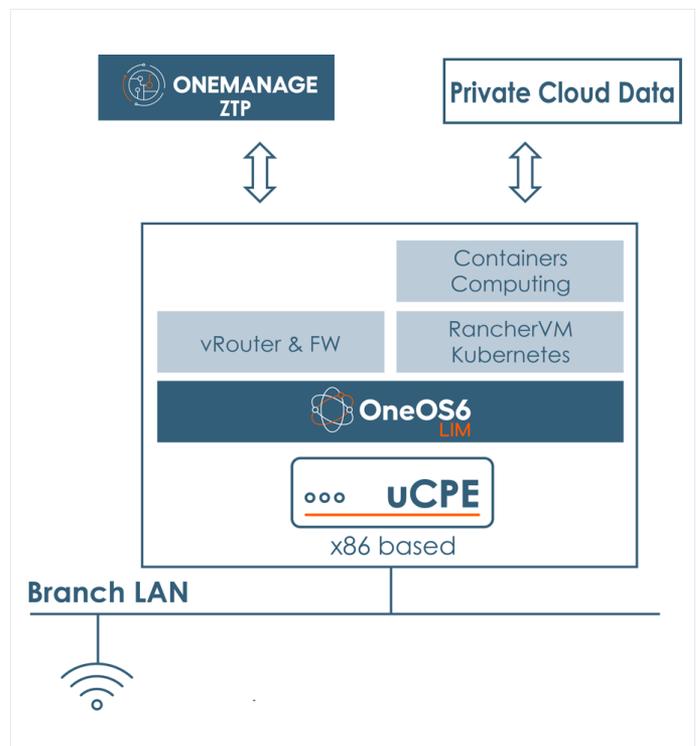


Figure 3. Ekinops OVP uCPE VNF lifecycle management.

Centrally managed, with zero touch provisioning, Ekinops OVPs can be distributed across customer premises edge locations. Ekinops OVP is a small-footprint, easily managed multi-functional platform that can be rapidly deployed using third-party orchestrators, and easily scaled from the smallest to largest enterprise environments.

Ekinops OVP uCPE Capabilities/Benefits

- Based on open and standard techniques
- Embedded VNF services are chaining across any third-party VNF
- Small footprint
- Simple zero touch provisioning (ZTP) process
- Cost-effective uCPE solution
- Optimized analytics and monitoring
- Data security enabled uCPE host OS (OneOS6-LIM)
- Eliminate direct and indirect costs coalescing multiple functions
- Ease of testing and qualification

Ekinops OVP is a cost-effective solution implemented on low-cost Intel architecture-based hardware. For small offices, the Ekinops OVP uCPE with OneOS6-LIM middleware runs on the family of Intel Atom® C3000 processors. These processors optimize cost and infrastructure for network and cloud edge environments. Providing efficient performance and intelligence within a dense, lower-power system-on-a-chip, the Intel Atom C3000 processor can run the same software and instruction sets as Intel® Xeon® processors, for software consistency from the data center to the network edge.²

For larger deployments, the Ekinops OVP uCPE with OneOS6-LIM middleware runs on the family of Intel Xeon D-2100 processors. These processors deliver flexible, high-density, and workflow-optimized performance in space- and power-constrained data centers and cloud edge locations. The system-on-a-chip processors provide single-socket network, storage, and cloud computing capabilities, with integrated security, network, and acceleration functions.³

Ekinops Compose

Ekinops simplifies uCPE deployment and lifecycle management with its suite of Compose software products, which include Compose Design Studio, Compose OneManage, and Compose SD-WAN Manager. Compose OneManage is a lightweight orchestrator that uses standard APIs to allow service providers to automate the deployment of service chains utilizing Ekinops' pre-integrated VNFs and third-party VNF service functions. It enables a simple auto-provisioning process for fast time-to-market with a much smaller investment into third-party orchestration solutions. Compose Design Studio enables CoSPs to build a consistent service chain with an easy drag-and-drop interface.

The Service Provider Edge Consolidation

Using Compose as a first step enables CoSPs to consolidate their services on a single platform, bringing agility in their deployment model and enabling dynamically changing services based on customer requirements.

In this context, the OneOS6-LIM is delivering a full-fledged solution with rich embedded functionalities, enabling the CoSP to build its own portfolio to address its various market segments with an appropriate solution.

A good illustration of this is how a tier 1 European CoSP will be using Ekinops' solution to offer an agile branch connectivity solution to enterprise customers, based on virtualization technology, without disrupting existing services. The solution comprises the Ekinops fully open NFVI OneOS6-LIM middleware, allowing access to an extensive catalog of

certified VNFs. This gives the CoSP the flexibility to select any white-box CPE hardware and choose from a range of third-party and Ekinops VNFs, as well as freeing them from vendor lock-in and simplifying supplier management.

An Enterprise Distributed Edge Example

With digitalization, software is a key part of all connected devices that request regular software updates (security, fixes, etc.). These updating requirements are becoming universal, applying to a wide range of applications, including airline, car manufacturers, robotics, or even simpler systems such as IoT or automation solutions.

These constant updates create a new challenge for an enterprise that wants to keep up to date but in a controlled and more secure way while simultaneously ensuring availability across the whole organization using a continuous improvement/continuous delivery (CI/CD) environment. Some large enterprises and specialized vertical service providers have already looked at the challenge and are encountering the same issues as CoSPs when it comes to consolidating diverse appliances.

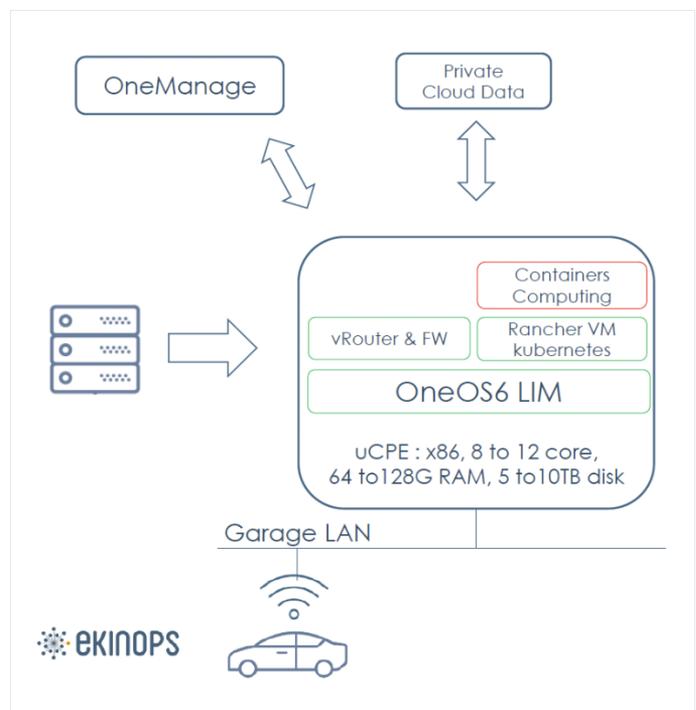


Figure 4. Ekinops vertical-centric distributed edge solution.

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A new distributed edge collaboration between the enterprise and the CoSP is a new way of addressing the challenges, where local preprocessing on the uCPE enables the CoSP to deliver an agile networking solution and simultaneously offering a cloud-based hosting platform to the enterprise to focus on the management of its applications rather than the management of an edge platform.

As an example, many automobile repair shops have multiple sites and a growing need for improved communications for the increased digital technology used in automobiles. The U.S. automotive repair and maintenance services industry has about 160,000 businesses nationwide. Automotive service technicians inspect, maintain, and repair vehicles, as well as diagnose and service more complex problems.

The biggest challenges these shops face are training technicians, staying up to date on diagnostic advances, and keeping up with advances in vehicle technology. Automotive repair companies and independent repair shops struggle with finding the right IT solutions to support these needs with minimal support staff.

To address this challenge, and others, Ekinops developed a vertical-market centric distributed edge solution (see Figure 4) that provides a network infrastructure for fast and more secure access to cloud databases for parts and stocking information, price quoting, repair planning guides, and software repository; access to printers; and WAN management.

In this solution, the Ekinops OVP uCPE integrates all of the networking and security functions that previously required individual hardware devices, using VNFs that can be deployed with redundancy for high reliability. Multi-location auto service businesses can leverage Ekinops OneManage software to centrally distribute VNF-based services and their updates and have everything managed with consistent business policies.

Most cars are now connected with dozens of software functions that require regular updates. Vehicle service and repair shops need continuous and current car manufacturer software updates and patches. Car manufacturers can use Ekinops' vertical-centric solution to distribute and manage VNFs over the cloud to thousands of vehicle service and repair shops around the world.

The flexibility of Ekinops OVP uCPE enables service providers to manage the connectivity and uCPEs or offer a co-managed solution.

Conclusion

Increasingly complex and disparate technologies are requiring IT and security teams to find agile, cost-effective, and dynamically scalable network and security solutions. Enterprises can no longer afford the capital and operational expenditures associated with the jumble of edge network and security devices. The Ekinops OVP uCPE platform allows service providers to enable their enterprise customers with automated and programmable solutions, while streamlining IT infrastructure through consolidation.

Ekinops OVP uCPE accomplishes this with a small footprint and pre-integrated VNF services. This enables fast time-to-market and a quick return on investment. Implemented on cost-effective Intel architecture-based hardware, Ekinops OVP uCPE helps lower costs, while enabling enterprises with the flexibility to quickly and easily deploy services across their remote business units.

As enterprises look to service providers for WAN infrastructure simplification and new services that help them compete in today's software-driven environment, uCPEs are an integral solution. Ekinops OVP uCPE runs on Intel Atom C3000 processors and Intel Xeon D-2100 processors. Organizations are able to meet their performance and service requirements with the appropriate software, services, and cost-effective hardware they need.

More Information

[Ekinops OVP uCPE](#)

[Ekinops Local Infrastructure Manager \(LIM\)](#)

[Intel Atom® C3000 processors](#)

[Intel® Xeon® D-2100 processors](#)

[Intel® Network Builders program](#)



Notices & Disclaimers

¹ Figures provided courtesy of Ekinops.

² <https://www.intel.com/content/www/us/en/products/docs/processors/atom/c-series/c3000-family-brief.html>

³ <https://www.intel.com/content/www/us/en/products/docs/processors/xeon/d-2100-brief.html>

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