

# Maximizing Flexibility in the Configuration and Provisioning of SD-WAN Solutions

Enea's open uCPE virtualization platform enables TForce to efficiently customize their managed SD-WAN services

## The Problem

TForce, a professional services company headquartered in Saudi Arabia and specializing in IT infrastructure, delivers Software-Defined Wide Area Networking (SD-WAN) to a wide range of customers as a managed service.

Many of TForce's enterprise customers have hundreds or thousands of branch offices, along with one or more central offices. These locations typically have varying requirements both for the hardware platforms that host the SD-WAN services and for the software applications that need to be included in each SD-WAN deployment.

TForce needed to efficiently deploy a flexible software platform at each customer premise, capable of supporting a range of servers as well as unique combinations of software applications.

This Universal Customer Premise Equipment (uCPE) platform would need to meet all applicable open standards for hosting software-based network services and in parallel minimize the costs of acquisition, installation and operation at remote customer locations.

## The Solution

To address TForce's business and technical challenges, Enea delivered Enea Edge, a virtualization and management platform for white-box uCPE deployments.

Enea Edge provides TForce with the flexibility to deploy Virtual Network Functions (VNFs) from multiple vendors, running in a virtualized environment on appropriately-sized servers from industry-standard suppliers.

TForce can now supplement basic SD-WAN connectivity with additional customer-requested third-party functions or even the customer's own applications, running on a variety of server platforms, all provisioned, configured and updated remotely using Enea Edge Management to minimize operational costs while maximizing security.

By adopting this second-generation SD-WAN architecture, TForce gains the flexibility to efficiently provision SD-WAN services for large customers with diverse hardware and software requirements, thereby accelerating their customers' business transformation.

## SD-WAN: transforming business operations for enterprises worldwide

Enterprises are adopting Software-Defined Wide Area Networking (SD-WAN) to reduce the costs of their networking infrastructure by reducing the dependence on MPLS, while improving the performance of their cloud-hosed applications, enhancing users' experience and increasing their business productivity.

An SD-WAN is a virtual WAN architecture that allows enterprises to leverage any combination of transport services, including MPLS, LTE, 5G and broadband internet services, to securely connect users to applications.

Traditional WANs based on conventional routers are not cloud-friendly. They typically require backhauling all traffic, including that destined for the cloud, from branch offices to a hub or headquarters data center where advanced security inspection services can be applied. The delay caused by backhaul impairs application performance resulting in a poor user experience and lost productivity.

Unlike the traditional router-centric WAN architecture, SD-WAN is designed to fully support applications hosted in on-premise data centers, public clouds or private clouds, as well as Software-as-a-Service (SaaS) solutions like Salesforce, Office365 and Dropbox, while delivering the highest levels of application performance.

An SD-WAN uses centralized control to securely and intelligently direct traffic across the WAN. By continuously monitoring applications and WAN transport resources, an SD-WAN can quickly adapt to changing network conditions to maintain the highest application performance and availability, while reducing dependence on MPLS.

## Limitations of first-generation SD-WAN solutions

First-generation SD-WAN products were vertically integrated, comprising proprietary software running on dedicated hardware appliances, with no flexibility for changes or enhancements to the function set after deployment at the customer premise. This represents a significant limitation in the case of a customer who, for example, has standardized on a specific security vendor across their IT network or who wants to add a newly-released next-generation firewall to their SD-WAN after deployment.

Beyond these limitations that impact the end customers, first-generation SD-WANs also impose significant limitations on the Managed Service Provider (MSP) that delivers them. The MSP is unable to customize the SD-WAN to meet the specific needs of individual customers, or to offer SD-WAN solutions that are differentiated and optimized for specific vertical markets like financial services or manufacturing.

## The challenges for TForce

Many of TForce's enterprise customers have hundreds or thousands of branch offices, along with one or more central offices, with varying requirements for the hardware platforms that host the SD-WAN services. Many offices have pre-selected certain brands and already have servers in

place, while others need to install servers with resources dimensioned for the expected software workloads.

Similarly, many offices have specific requirements for the software applications that need to be included in each SD-WAN deployment. Some have standardized on specific security vendors while others need to run their own applications along with the SD-WAN functions, in a dedicated tenant space. Many want the ability to exchange a specific application within the SD-WAN for an alternative provided by another software vendor, for reasons of cost, performance, quality or reliability.

## Finding the right software platform

TForce needed to deploy a flexible software platform at each customer premise, capable of supporting a range of servers as well as unique combinations of software services from multiple vendors.

TForce determined their business and technical goals were best addressed by a system architecture based around a software virtualization platform fully compatible with open standards for hosting Virtual Network Functions (VNFs) in a uCPE environment.

For scalability, the virtualization platform should support industry-standard hardware ranging from low-end appliances up to high-end servers. For maximum efficiency across onboarding, installation, configuration and lifecycle management, the platform should support centralized, secure cloud-based management while interfacing seamlessly with standard orchestration solutions.

TForce selected Enea Edge Runtime as the uCPE software virtualization platform and Enea Edge Management as the cloud-based management solution, both supported by the expertise of the Enea Global Services organization.

## Enea Edge delivers the flexibility that TForce needs

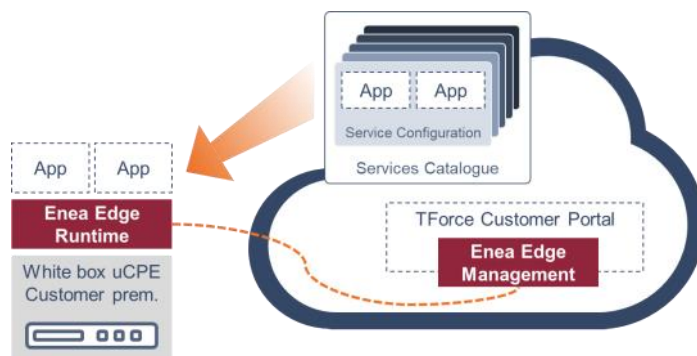
Enea Edge is a software virtualization platform optimized for second-generation, uCPE-based SD-WANs. Fully compatible with all applicable open standards, it has been validated with both VNFs and servers from multiple ecosystem partners, ensuring maximum flexibility for customers in their vendor selection. Its onboarding wizard enables accelerated system deployments through efficient VNF onboarding, while it integrates with third-party orchestrators and service automation tools through standard interfaces.

Full support for any standard server based on Intel architecture- or Arm-based processors enables customers to choose the hardware platform that best matches the resource requirements of their applications or to leverage pre-existing vendor relationships.

Rather than using OpenStack to perform lifecycle management of VNFs, Enea Edge uses NETCONF, resulting in smaller footprint requirements for cores, memory and storage, enabling the SD-WAN to be installed on lower-cost, lower-power hardware.

## Integrated end-to-end management with Enea Edge Management

Complementing Enea Edge Runtime, Enea Edge Management controls the provisioning, configuration and lifecycle management of customer premise functions such as SD-WANs. Deployed in either a private or public cloud data center, Enea Edge Management enables customers to reduce the lifecycle operational costs of their SD-WANs by automating software upgrade management as well as the monitoring of events and alarms.



*Deployment with Enea Edge. The user interface is provided through a third party orchestrator.*

Enea Edge Management delivers the robust security required by enterprise end-users through secure management communications, secure boot and role-based access control policies.

## Summary: Accelerating enterprise business transformation

Thanks to Enea Edge, TForce can deliver managed SD-WAN services to enterprises with widely-varying hardware and software requirements. They can cost-effectively support deployments which need custom configurations for different offices, while ensuring the flexibility to change and expand the range of SD-WAN services after initial deployment. Through this second-generation SD-WAN architecture, TForce can efficiently expand their managed services SD-WAN business while minimizing their costs for deployment, support and maintenance.

## For more information

- ▶ TForce: [www.tforce.com.sa](http://www.tforce.com.sa)
- ▶ Enea: [www.enea.com](http://www.enea.com)



Based in Saudi Arabia, TForce specializes in the field of Information and Communication Technology (ICT), ERP solutions and services, offering integrated solutions and technical consultancy for infrastructure networks, ERP, cloud, retail and software. They deliver business solutions that extend the spectrum of ICT, leveraging IT technology to improve business processes all the way from designing IT infrastructure to connecting people through technology.

Their services include sophisticated consultancy, project design, project management, implementation and after-sales support. TForce plays an integral role in minimizing customers' downtime, maximizing investments and optimizing demand by providing unique and creative solutions which meet and exceed their customers' expectations.

As part of their solution portfolio, TForce delivers managed SD-WAN solutions that provide the software abstraction to create a network overlay and decouple network software services from the underlying hardware.



Enea is a world-leading supplier of innovative software components for telecommunications and cybersecurity. Focus areas are cloud-native, 5G-ready products for mobile core, network virtualization, and traffic intelligence. More than 3 billion people around the globe already rely on Enea technologies in their daily lives. Enea is listed on Nasdaq Stockholm.