ENEA

DATASHEET

Enea Edge: Virtualization Platform for White-Box uCPE

Enea Edge is an open virtualization and management platform for white-box uCPEs. It provides minimal footprint and maximum networking performance for SD-WAN and edge applications.

Key Benefits

- **Future-Ready** - Replace or extend with new applications on-demand on already deployed uCPEs
- **Automated** - Automate deployment and management with Zero Touch Provisioning, Ansible automation, and orchestration integration
- **Optimized for uCPE**- Low footprint and high networking performance with no OpenStack
- **Scales from ultra-low to high-end** - Scales from high-end Xeon servers down to 2 Core / 2GB RAM hardware configurations for cost-efficient deployments
- **Secure** - Secured using NETCONF for all management communications, secure boot and role based access control
- **Centralized uCPE management** - Centralized application onboarding, networking management and application lifecycle management
- **Ecosystem** - Large ecosystem of verified white boxes, applications, and orchestrators

Ideal Characteristics for uCPE

The award-winning Enea Edge is purpose-built to host virtual networking and edge applications on white-box universal customer premise equipment (uCPE). It is optimized to combine high networking performance with small platform footprint. Unlike solutions originating from the data center, Enea Edge provides virtualization and management without OpenStack, significantly reducing overheads and complexity.

Enea Edge consists of three elements:

- *Enea Edge Runtime*: white-box operating system providing virtual machines and containers
- *Enea Edge Management*: platform and application/VNF lifecycle management
- *Enea Edge Automation*: framework for automating deployment and operation of large-scale networks

Any Application, Any Orchestrator, Any White-Box uCPE

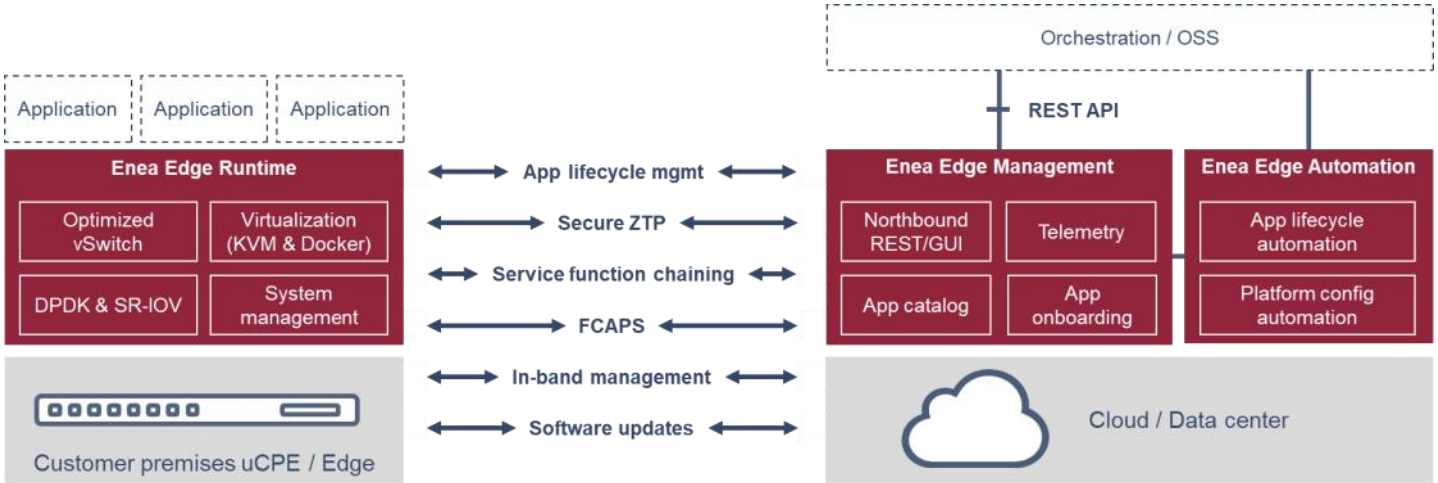
Enea Edge Runtime deploys on any white-box based on Intel or ARM, on-boards any application using its built-in onboarding wizard, and connects to any orchestrator and service automation tool through open REST interfaces.

A large partner ecosystem provides pre-qualified solutions from hardware and software vendors, as well as system integrator services.

Integrated End-to-End Management over NETCONF

Enea Edge Management streamlines the operation of large-scale uCPE and application deployments. It provides end-to-end management using NETCONF to connect with Enea Edge Runtime for configuration, deployment and management of infrastructure and application lifecycles.

It connects to 3rd party orchestration solutions using standard REST APIs. It is extensible and adaptable to brownfield deployments, feature extensions and complex integrations and deployments.



Virtualization

Virtual machines and containers and can be set up in any combination. The applications communicate over an internal OVS bridge independently of virtualization implementation.

- Machine virtualization: KVM
- Container virtualization: Docker

Networking

A highly optimized data plane provides high throughput and low latency.

- Built-in Linux routing
- Network acceleration with SR-IOV, PCI pass-through, and DPDK-accelerated OVS
- LTE access over PCI and USB
- Wi-Fi support via PCI pass-through
- Supports uCPE deployment behind NAT

Integrated Wi-Fi support

- Support for embedded Wi-Fi modules

Open interfaces

Open standards and APIs enable integration with any white box, any application, and any orchestrator, and escapes vendor lock-in.

- NETCONF connection between Enea Edge Runtime deployed on a device and Enea Management deployed in data center
- REST API for northbound connection with orchestration

Security Hardened

- Secure boot
- Secured Call Home (RFC 8071)
- Signed updates
- Multi-factor authentication

Zero Touch Provisioning

- ZTP over secure NETCONF
- Compliant with RFC 8071

Characteristics	Enea Edge Runtime	Alternatives
Platform RAM footprint	< 1 GB	4-12 GB
Platform Disk footprint	< 1 GB	4-12 GB
Platform CPU footprint	1 core	2-4 cores
Platform boot speed	< 3 s	10-30 s
Throughput over vSwitch	10 Gb IMIX line rate	1 Gb IMIX line rate
Latency over vSwitch	Average 10-15 µs	Average 25-75 µs

Comparison of performance characteristics between Enea Edge and alternatives based on OpenStack.

Infrastructure Provisioning

Infrastructure provisioning is based on simple and flexible procedures.

- Centralized installation: network Installation over PXE
- Local installation: installation from USB
- Geomapping

Automation

Built-in automation simplifies management and roll-outs for large scale deployments.

- Automation of deployment and management functions
- Ansible framework for platform and app lifecycle automation
- Python/REST based automation

In-Band Management

In-band management simplifies deployment

- App and platform management on separate management plane over network connection shared with data plane, i.e. using single NIC

White-labeling

- Enea Edge can be rebranded for service providers and solution vendors

Platform Management

- Software upgrade and patch management
- Network management
- Snapshots for VNF backup and restore
- FCAPS

Telemetry

- Device monitoring with automatic alarms
- Visualization through Grafana

Virtualization Management

- Service function chaining using OVS flow rules
- App lifecycle management
- App image update
- App monitoring with alarms

VNF Onboarding Wizard

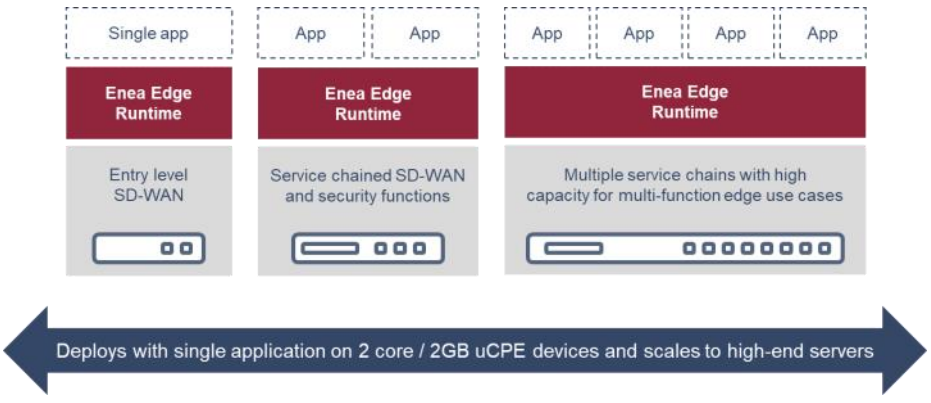
The onboarding wizard simplifies onboarding of apps onto the platform.

- Quick and easy onboarding for 3rd party Apps
- Completes Day 0 configuration

White-box Support

Enea Edge is designed for deployment on any white-box uCPE based on Intel or ARM

- Intel Xeon
- Intel Atom
- Intel Celeron
- ARMv8



Best fit for each deployment scenario is a major cost saver. Enea Edge scales from entry-level to high-end deployments.

Find out more!

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. For more information: www.enea.com

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