

Enea NFV Access: Virtualization Platform for White Box uCPE

Enea NFV Access is a virtualization and management platform for white box uCPEs. It scales from ultra-low to high end CPEs, providing minimal footprint and maximum networking performance for SD-WAN and UTM applications.

Benefits

- ▶ **Future Proven** - Replace or extend with new VNFs post deployment
- ▶ **Automated** - Automate the deployment and management of the platform with Secure Zero Touch Provisioning, Ansible playbooks and orchestration integration
- ▶ **Optimized** - Maximize hardware utilization by avoiding the overhead of OpenStack services, utilizing hardware acceleration and fine tuning the software platform for virtualized networking performance
- ▶ **Scales from ultra-low end** - Use 2 Core / 2GB RAM hardware configurations for ultra-low end SD-WAN solutions on Intel Celeron/Atom or ARMv8
- ▶ **Scales to high-end** - Scale from ultra-low end to high-end Intel Xeon with Service Function Chaining and advanced networking configurations using 1/10/40 Gb NICs
- ▶ **Secure** - Secured using NETCONF for all management communications, secure boot and role based access control
- ▶ **Platform and VNF Management in Cloud** - Deploy the Enea uCPE Manager in the cloud for centralized VNF Onboarding and Lifecycle Management as well as complete platform level FCAPS including software upgrade management, monitoring and events & alarms

Ideal uCPE Networking Characteristics

The award-winning Enea NFV Access is purpose-built for deployments on white box universal customer premise equipment (uCPE) with multivendor virtual network functions (VNFs). It is optimized to combine high networking performance with a small footprint. Unlike solutions originating from traditional data centers, the edge native Enea NFV Access provides virtualization and management without OpenStack, greatly reducing overheads and complexity.

Any VNF, Any Orchestrator, Any White Box CPE

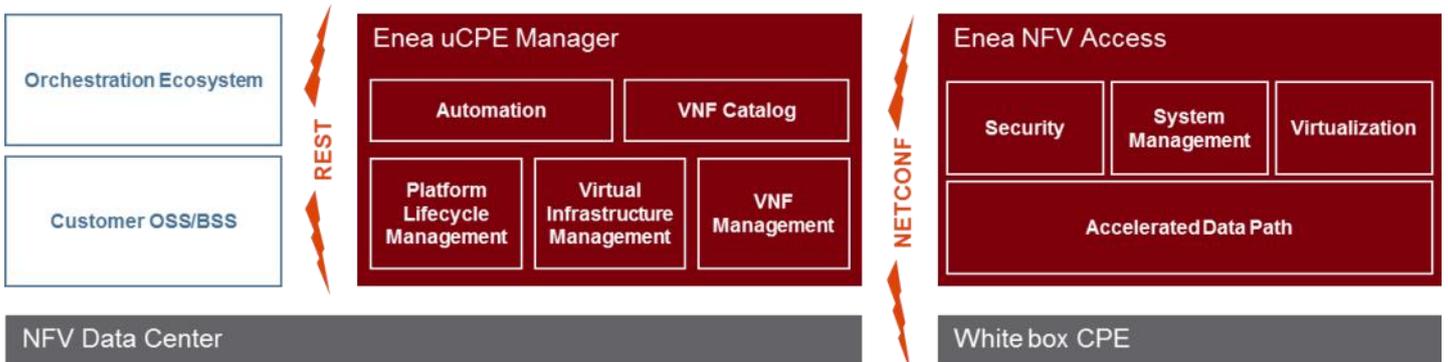
Enea NFV Access supports any white box based on Intel or ARM, on-boards any VNF using its built-in onboarding wizard, and integrates with any orchestrator and service automation tool through standardized open interfaces. A large partner ecosystem provides pre-qualified solutions from hardware and software vendors, as well as system integrator services.

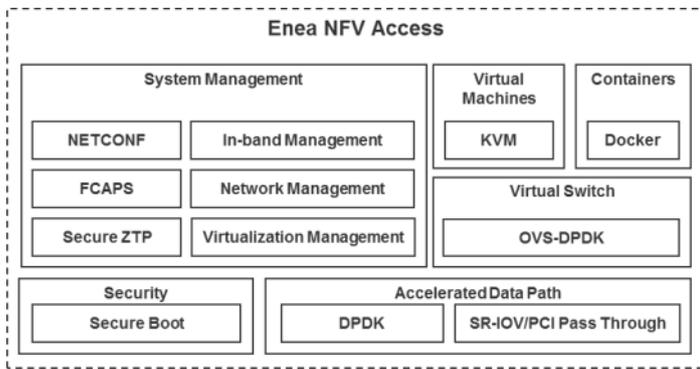
Integrated End-to-End Management over NETCONF

Enea uCPE Manager is a management solution for large-scale deployments of VNFs and uCPEs. It is integrated with Enea NFV Access where it acts as an end-to-end management solution using NETCONF to connect customer premise equipment with the data center. NETCONF provides a standardized, unified way to configure, deploy and manage the NFV infrastructure and VNFs, with a focus on security and versatility.

Enea uCPE Manager handles all aspects of VNF management, virtual infrastructure management (VIM), and platform lifecycle management.

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





Characteristics	Enea NFV Access	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 (excl. BIOS)	< 3 s	10-30 s
Network Throughput over vSwitch	10 Gb IMIX Line Rate	1 Gb IMIX Line Rate
Network Latency over vSwitch	Average 10-15 µs	Average 25-75 µs

Virtualization

Virtual machines and containers can be set up in any combination. The VNFs 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.

- Network acceleration with SR-IOV, PCI pass-through, and DPDK-accelerated OVS
- LTE access over PCI and USB

Open

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

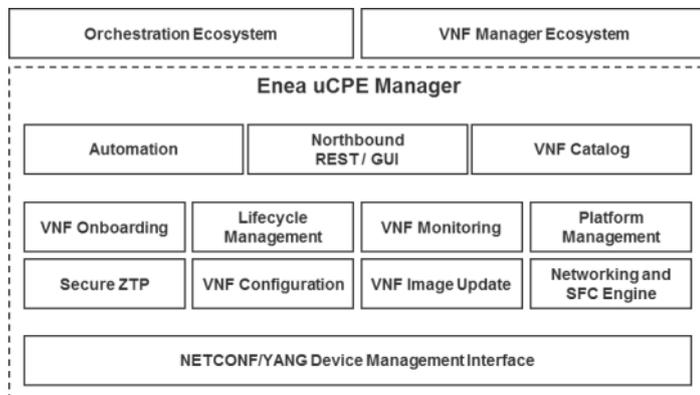
- NFVI platform supports NETCONF
- REST API for northbound interface with orchestration

Security Hardened

- Secure boot
- Secure ZTP (RFC 8071)
- Validated against NVD (National Vulnerability Database) with zero vulnerabilities as criteria
- Signed updates
- Access control security policies are based on SELinux/sVirt

Zero Touch Provisioning

- Secure ZTP over NETCONF
- Compliant with RFC 8071



Automation

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

- Deployment and management functions are automated
- Ansible framework for platform and VNF automation
- Python/REST based automation

VNF Onboarding Wizard

The onboarding wizard simplifies the onboarding of VNFs onto the NFVI platform.

- "1h onboarding" for 3rd party VNFs on NFVI platform
- Completes Day 0 configuration

In-Band uCPE Management

- NETCONF based management over non-dedicated WAN link simplifies deployment

Virtualization Management

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

Platform Management

- Software upgrade and patch management
- Network management
- FCAPS

Integration and Deployment

- Northbound integration through REST API
- Southbound integration (to device) through NETCONF
- Deploys in the cloud on a VM or as a stand-alone application

White Box Support

Enea NFV Access is designed for deployment on any white box uCPE device based on Intel or ARM

- Intel C3000
- Intel Xeon D
- Intel Xeon Skylake-D/Skylake-SP,
- Intel Celeron
- ARMv8

Find out more on the Enea website!



Enea develops the software foundation for the connected society. We provide solutions for mobile traffic optimization, subscriber data management, network virtualization, traffic classification, embedded operating systems, and professional services. Solution vendors, systems integrators, and service providers use Enea to create new world-leading networking products and services. More than 3 billion people around the globe already rely on Enea technologies in their daily lives. For more information: www.enea.com