



## VNF Management Agent Powered by Enea's **On-Device Management**

Software Defined Networking (SDN) and Network Function Virtualization (NFV) bring a host of benefits to the telecommunications service provider/carrier community. The Open Platform Network Function Virtualization (OPNFV) project, with Enea as member and active contributor, makes possible the exponential adoption of this technology. However, the scope of the OPNFV project is limited to the infrastructure platform (NFVI and VIM), which shortens the reach of the management plane functionality coverage.

While the OPNFV platform provides a common mechanism for life-cycle management of Virtualized Network Functions (deployment and instantiation), it lacks VNF management functionality (configuration, monitoring and control). Thus constituting a challenge for developers building commercial grade solutions/applications.

### **ENEAA'S ON-DEVICE MANAGEMENT IN A VNF**

Enea's On-Device Management middleware is a data-model driven management framework which provides a variety of standard-based northbound management interfaces for configuring, monitoring and controlling carrier grade VNFs.

**Accelerate time-to-market.** Using Enea's on-device management eliminates the time and resources needed to develop a feature-rich framework that includes extensive support for major management protocols (e.g. NETCONF, SNMP) and modeling languages (e.g. YANG), so that you can focus on what you do best – building your NFV product/service.

**Reduce operating expenses (OPEX).** Providing VNFs with a consistent and powerful set of management capabilities simplifies the complexity of the overall management solution. Features like reliable transactions with validation maintain consistent and correct configuration state, and full-featured alarm and notification capabilities streamline monitoring of VNF health.

**Hardware agnostic.** Enea's On-Device Management framework is designed to be compatible across all hardware architectures. Whether you are building Intel, ARM or heterogeneous NFV platforms, you can seamlessly incorporate this framework in your portable VNF deployments.

Further **expand your management scope** and VNF **reliability and availability**. Complement Enea's On-Device Management framework with *ElementCenter Network Management System (NMS)*, a generic network orchestration solution that provides a simple interface to all managed network devices, applications and services. And for those critical applications and devices that need a higher degree of reliability or availability, this framework is pre-integrated with Enea's *Carrier Grade High Availability middleware framework* - allowing simple addition of features such as Live Software Upgrade and Advanced Application Lifecycle Management.

## TRUST ENEA IN YOUR NFV JOURNEY

Enea is an **industry-leading company in the NFV domain**. Enea was the first company to demonstrate a complete OPNFV reference platform running on ARM-based hardware. Furthermore, Enea is a member of relevant communities and holds key roles in OPNFV, Linaro Networking Group, OpenDataPlane (ODP) and OpenFastPath (OFP).

Enea has **extensive experience and reputation in networking**.

Enea's solutions are already deployed in a variety of networking nodes (i.e. over half of the world's cellular base stations and a majority of the world's satellite base stations). Serving companies in the networking domain has been the dominating part of Enea's business for more than two decades. Moreover, Enea holds long lasting partnerships with all the major network hardware manufacturers.

Enea customers enjoy **world-class support** coverage to address immediate and long term support needs. Enea ensures the lifetime of your application with over 400 engineers and offices in 8 countries within Europe, North America and Asia.

## TECHNICAL FEATURES

- **Northbound Interfaces:** NETCONF, SNMP, XML-RPC and CLI interfaces provide access to Alarm, Performance, Inventory, Provisioning, Configuration and Security related information; including features such as session/transaction/rollback support.
- **Data Modeling:** The YANG data modeling language is used by the framework to model configuration and state data manipulated by Northbound Agents.
- **Southbound Interface and Messaging Layer:** XML object message passing layer that provides data-model mapping to northbound agents and southbound clients. Operational data, configuration updates, commit validation, etc.

- **Security:** Access Control Levels (ACL) provide security at the User/Managed device level. Security at the transport level is provided through Secure Shell (SSH).

- **Logging/Audit Trail:** Feature rich set of logging capabilities for developing distributed applications which includes features such as dynamic filtering.

- **Separate plug-ins** can be added:

- Life Software Upgrade
- Advanced Application Lifecycle Management
- High Availability

- **Network Orchestration extension:** ElementCenter NMS.

