



Overview of ETSI G-OAM Standards and Applying to XGVela

CHINA MOBILE

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ETSI NFV's Work on Cloudification for 5G and Beyond

2

Overview of G-OAM standards in ETSI NFV









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Interactions

Release 4: NFV cloudification for 5G and beyond

- **Release 4** develops features and capabilities to leverage and embrace cloudification principles in various areas and further support 5G deployments:
 - Deployment and management of **VNF as containerized workloads** (ETSI GS NFV-IFA 040 + enhancements in other NFV-MANO specifications) and container clusters management (ETSI GS NFV-IFA 036). Security aspects (DGS/NFV-SEC023).
 - **Networking for container-based deployments** (ETSI GR NFV-IFA 038 + enhancements in other NFV-MANO specifications).
 - **VNF generic OAM** (ETSI GR NFV-EVE 019 + DGS/NFV-IFA049).
 - **PaaS services and management for telco** (ETSI GR NFV-IFA 029 and solutions analysis for 5G deployments in ETSI GR NFV-IFA 037 + FEAT21 enhancements in other NFV-MANO specifications)

Published reports and specifications

 <p>ETSI GR NFV-IFA 029 v3.3.1 (2019-11) GROUP REPORT</p>	 <p>ETSI GR NFV-IFA 038 v4.0.1 (2021-05) GROUP REPORT</p>	 <p>ETSI GR NFV-EVE 019 v4.1.1 (2021-10) GROUP REPORT</p>
Network Functions Virtualisation (NFV) Release 3; Architecture; Report on the Enhancements of the NFV architecture toward "Cloud-native" and "PaaS"	Network Functions Virtualisation (NFV) Release 4; Architectural Framework; Report on network connectivity for containers	Network Functions Virtualisation (NFV) Release 4; Architectural Framework; Report on VNF generic OAM functions
 <p>ETSI GS NFV-IFA 040 v4.2.1 (2021-05) GROUP SPECIFICATION</p>	 <p>ETSI GR NFV-IFA 037 v4.0.1 (2021-05) GROUP REPORT</p>	 <p>ETSI GS NFV-IFA 049 v4.4.1 (2023-08) GROUP SPECIFICATION</p>
Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Requirements for service interfaces and object model for OS container management and orchestration specification	Network Functions Virtualisation (NFV) Release 4; Architectural Framework; Report on further NFV support	Network Functions Virtualisation (NFV) Release 4; Architectural Framework; VNF generic OAM functions specification
 <p>ETSI GS NFV-IFA 036 v4.3.1 (2022-09) GROUP SPECIFICATION</p>	 <p>ETSI GS NFV-SOL 018 v4.3.1 (2022-09) GROUP SPECIFICATION</p>	
Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Requirements for service interfaces and object model for container cluster management and orchestration specification	Network Functions Virtualisation (NFV) Release 4; Protocols and Data Models; Profiling specification of protocol and data model solutions for OS Container management and orchestration	

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ETSI NFV's Work on Cloudification for 5G and Beyond

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Overview of G-OAM standards in ETSI NFV

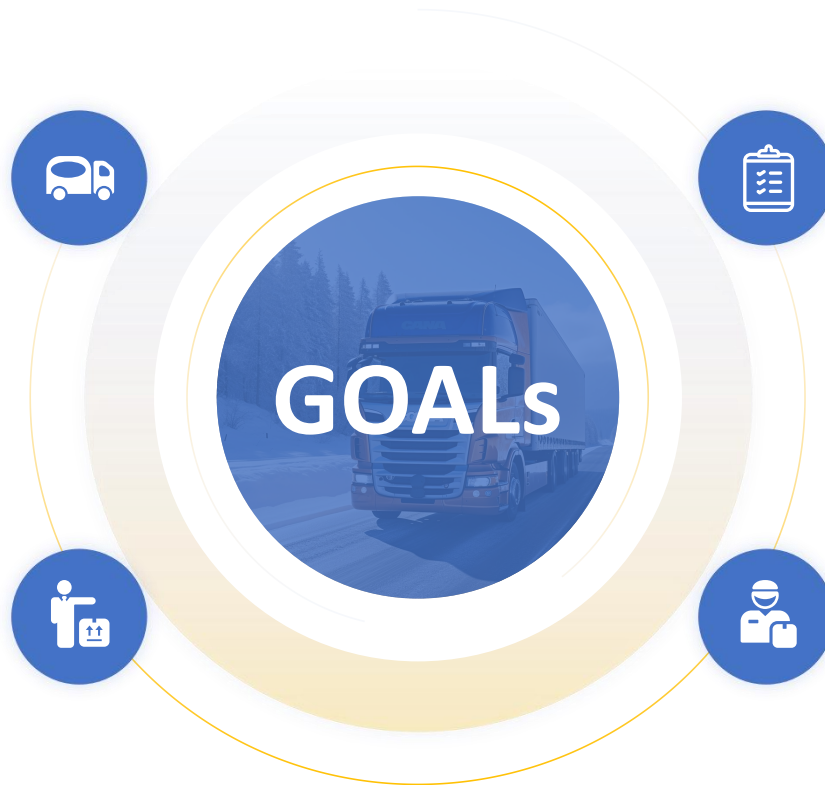
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Interactions

FEAT24 VNF Common Management Function

1 Definition of a set of common management functions for VNFs to ease their provisioning, connectivity, configuration and monitoring on a virtualized platform.

2 Reducing dependencies of the VNF from underlying resources, hosts and network, thus realizing a full network function decoupling from the infrastructure.



3 VNFs reusing generic and common management functionality provided as virtualization platform functionalities.

4 Leveraging PaaS capabilities as a means for providing common management functions.

EVE019 Report on VNF generic OAM functions (1/4)

Use cases related to LCM of generic OAM functions

Instantiation of VNFs using generic OAM functions managed by NFV-MANO

1

Termination of VNF instances using generic OAM functions managed by NFV-MANO

2

Lifecycle of generic OAM function managed by NFV-MANO

3

Use cases related to type of generic OAM functions

Log aggregator
function

Log analyser
function

Traffic enforcer
function

VNF metrics
aggregator function

VNF metrics analyser
function

Time function

Notification manager
function

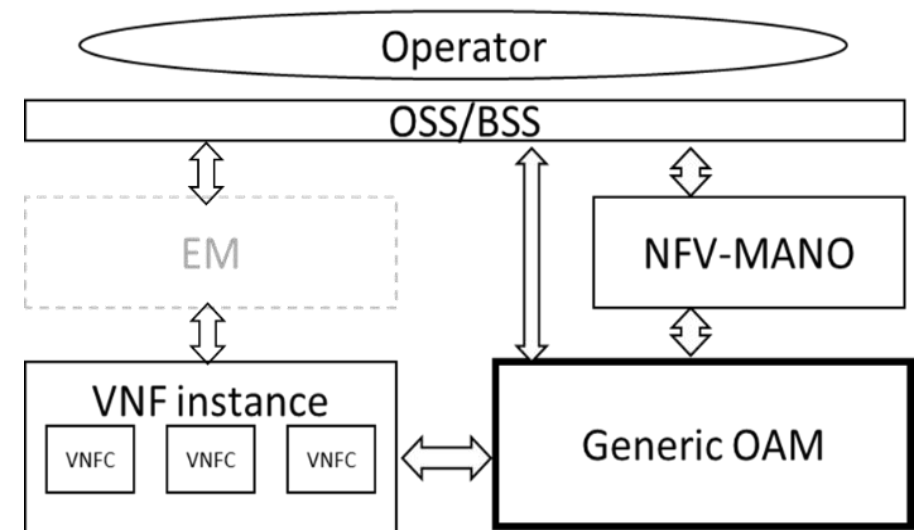
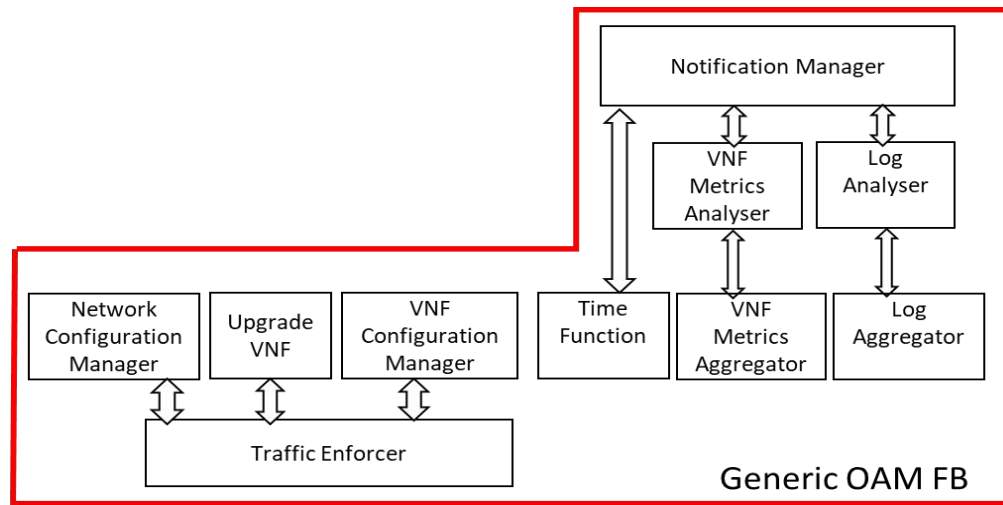
Network configuration
manager function

Upgrade VNF
function

VNF configuration
manager function

EVE019 Report on VNF generic OAM functions (2/4)

- **Solution A:** Introducing generic OAM as a new functional block (FB)



- Generic OAM works as functional block to operate and maintain VNFs in NFV environment.
- In order to do so, the functions interact with each other.

- This solution assumes that operators send requests to Generic OAM FB via OSS/BSS and NFV-MANO.
- Generic OAM FB interacts with VNF/VNFC instance and CISM to complete operation and maintenance.

EVE019 Report on VNF generic OAM functions (3/4)

- **Solution B:** splitting of functionalities into existing functional blocks (two variations B1 and B2)

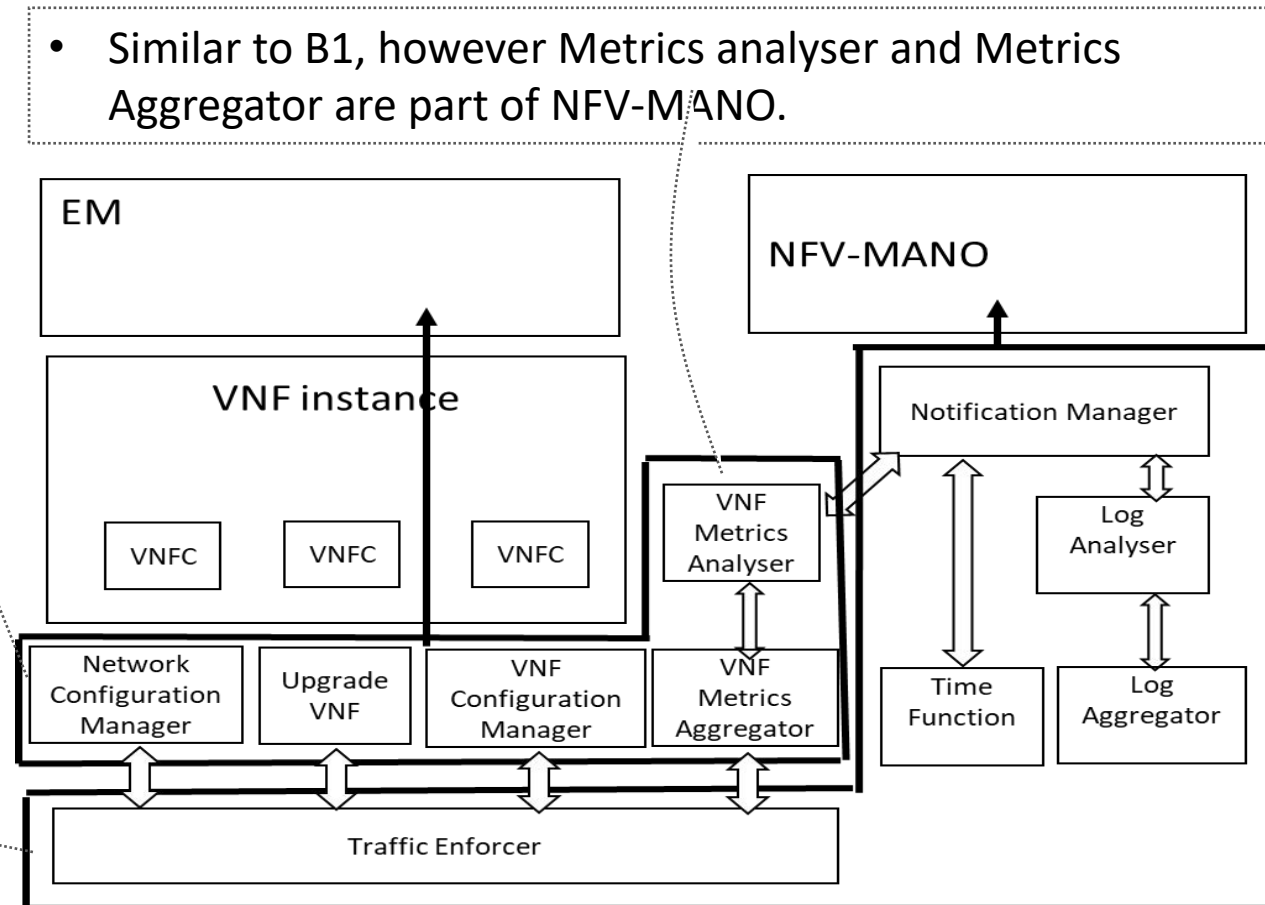
Solution B1

- Network configuration manager function, Upgrade VNF function, VNF configuration manager function and VNF metrics aggregator/analyser functions can be defined as extended functionality of EM.
- LCM coordination interface as defined in IFA008, will require extensions to cover this case.

- Rest functions are part of MANO in order to be aware of the state of the NFVI resources which is not known to EM.

Solution B2

- Similar to B1, however Metrics analyser and Metrics Aggregator are part of NFV-MANO.



EVE019 Report on VNF generic OAM functions (4/4)

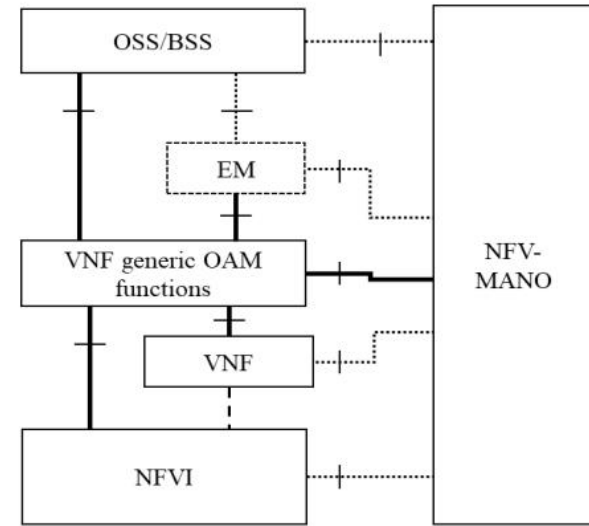
- Solution C:** generic OAM functions as VNF

- “PaaS services as VNFs” is described in ETSI GR NFV-IFA 029 clause 7.1.1.2
- Generic OAM functions as VNFs reassemble the concept of common service VNF, where PaaS services are visible at the VNF design level.
- Concepts are close (generic OAM vs common VNF) but functionality and objectives are different.

Aspect	generic OAM function	VNF common service
Motivation	<ul style="list-style-type: none"> - Reduce complexity of VNF design (e.g. decouple VNF from underlying resources, host, network) - Simplify OSS/BSS operation (e.g. generic way for configuration and monitoring) so that OSS/BSS can focus on services management. 	<ul style="list-style-type: none"> - Reduce complexity of NS and VNF design (e.g. services provide common functionalities like messaging, database, logging), so that developers can focus on the application design and user experience. - Simplify for NFVI providers the process of providing their platform to their customers
Functional scope	OAM functionalities of the VNFs (and partially the EM) (see use cases in EVE19 clause 4.3)	Protocol messaging, databases, logging, etc. associated to VNF instances (see clause 5.1.2.1 of IFA029).
...
Consumers	OSS/BSS, VNFs, NFV-MANO, and other VNF generic OAM functions	VNFs, and other VNF common/dedicated services
Design options	<ul style="list-style-type: none"> - Modelled as VNF - Modelled as new type of object - Modelled as new type of object specific to PaaS layer 	<ul style="list-style-type: none"> - Modelled as VNF - Modelled as new type of NFVI resource - Modelled as new type of object specific to PaaS layer
Requires a descriptor, such as VNFD.	Yes	Yes
Recommended additional functions to support the function/service	Service registry, service discovery, service binding	Service registry, service discovery, service binding

IFA 049 VNF G-OAM Framework Design (1/3)

- Traffic enforcer
- Network configuration manager
- Upgrade VNF
- Log aggregate
- Log analyser
- Metrics aggregator
- Metrics analyser
- Time function
- VNF configuration manager



•FRAMEWORK

The set of VNF generic OAM functions can interact with other functional blocks and functions (like NFV-MANO, NFVI, etc.)

VNF generic OAM functions can be realized as PaaS services (i.e. PaaS service hosted by VNFs, PaaS services as NFVI resources or PaaS services as a new object class) by means of deployment and lifecycle management.

VNF generic OAM functions can interact with other entities on two major sets of interfaces categorized as "southbound" and "northbound".

VNF G-OAM Function (2/3)

Name	Introduction
Traffic enforcer	Perform traffic isolation and traffic rerouting of one or more VNFC instances.
Network configuration manager	Set network configuration information related to one or more VNF/VNFC instances.
Upgrade VNF	Modify the software of a VNF to another version. Add an additional virtual resource to a VNFC instance during the process of VNF upgrading. Coordinate among VNFs when modifying their software to run on another version. Coordinate with other VNF generic OAM functions and/or NFV-MANO during the process of VNF software modification to address specific steps in the process.
Log aggregator	Collect different types of logs from different entities. Pre-process the logs. Aggregate the logs in a configurable manner. Store historical log records. Expose (filtered) logs to authorized consumers.
Log analyser	Analyse and process different types of logs based on a set of analysis functions. Support configuration of the analytics/processing to be applied. Send notifications based on findings from the analysis of the logs. Expose analytics results to authorized consumers.

VNF G-OAM Function (3/3)

Name	Introduction
Metrics aggregator	Collect different types of metrics from a set of VNF instances determined by a filter. Support the capability to pre-process the metrics. Aggregate the metrics in a configurable manner. Store time series metrics for records. Expose (filtered) metrics to authorized consumers.
Metrics analyser	Analyse and process different types of metrics based on a set of analysis functions. Provide configuration of the analytics/processing of metrics to be applied. Provide configuration of the analytics/processing of metrics to be applied. Expose the metrics analytics results to authorized consumers.
Time function	Manage the synchronization between the system time of VNFs and their components. Configure the time protocol(s) used in the system. Provide notifications and alerts to authorized consumers. Record and provide logs to authorized consumers.
VNF configuration manager	Convey configuration information to one or more VNF/VNFC instances. Query configuration information of VNF/VNFC instances.

- **XGVela** integrates CNCF projects based on telco requirements to form general-PaaS.
Could cover the functionality exposure required by individual generic VNFs, also exposed as VNFs.
Could cover the generic OAM functionality exposure by means of XGVela General PaaS.
- ETSI **GR NFV-IFA 049** is completed recently.
- It is recommended that **XGVela** design and implement the open source version of PAAS service by taking considerations of the newly released specification.

Interactions



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