ETSI NFV Announcement after NFV#17: work progress and Release 2 and Release 3 updates

In 2017, the ETSI ISG on Network Functions Virtualisation (NFV) started its third 2-year period (the extension of the ISG for a third two-year period was agreed unanimously at NFV#14 Plenary in May 2016). Since its foundation, more than 60 deliverables have been published, and at present, the ISG NFV has more than 50 active work items.

In the previous ETSI NFV announcement [1], we reported about the completion of the set of NFV Release 2 specifications corresponding to information models and interfaces, and the start of the NFV Release 2 maintenance work. We also reported about the status of Stage 3 work items (developing protocols and data models) corresponding to NFV Release 2 capabilities. Since the NFV#15 Plenary, which took place in September 2016 in Sophia-Antipolis, France, additional work items have been added to the NFV Release 2. More information is provided latter in this document.

The NFV Release 3 work is on track. Since reporting about the NFV Release 3 Definition in the previous announcement, the ISG NFV has progressed many of the work items part of the Release 3, including the completion of a number of specifications and reports. More information about the NFV Release 3 is also provided latter in this document.

Besides the specific Release 2 and Release 3 work program and work items, it is worth mentioning that the ISG NFV has continued contributing actively to the multi-SDO (MSDO) information modeling (IM) activities. Among those, several ISG NFV participants took part in the IM MSDO Workshop in early December 2016 at Deutsche Telekom's HQ in Bonn, Germany.

In addition, at plenaries NFV#15 (Sep. 2016, Sophia-Antipolis, France), NFV#16 (Dec. 2016, Shenzhen, China) and NFV#17 (Feb. 2017, Bilbao, Spain) a number of 5G-related plenary and working group discussion sessions set the basis for defining the role of the ISG NFV with regards to 5G. Related to this, a concrete new work item (NWI) on how 5G network slicing can be supported by virtualization technologies was approved at NFV#17. Section 2 provides some more information.

The remaining of this announcement document is as follows: section 1 provides updates about the status of the NFV Release 2. Section 2 gives an update about the recent achievements and ongoing work as part of NFV Release 3. Finally, section 3 presents some of the work items that are close to completion or that have been completed since our last announcement after NFV#15.

1. NFV Release 2 Updates

As part of the NFV Release 2, the ISG NFV has specified functional requirements for the VIM, VNFM and NFVO functional blocks composing of the NFV Management and Orchestration (MANO) of the ETSI NFV Architectural Framework. The NFV Release 2 also specifies requirements applicable to the reference points identified in the same Framework, as well as requirements, interfaces and information models related to the diverse NFV Release 2 capabilities such as VNF lifecycle management (LCM), Network Service (NS) LCM and virtualized resource management.

Since the previous announcement, the set of NFV Release 2 specifications has been extended. The work items on NFV information modeling were completed in between NFV#15 and NFV#17 plenaries, namely: IFA015, IFA016, IFA017 and IFA024. As a result of this, the NFV Release 2 is now deemed to be more complete in terms of the NFV information model. It is worth mentioning that as part of the development of the NFV information model within the ISG NFV, several ISG NFV participants have substantially contributed to the different IM MSDO activities.

The Stage 3 work of Release 2 capabilities has also progressed, and since the previous announcement, two new work items have been added: SOL004, dealing with the specification of the structure and format of the VNF Package and of the applicable file naming conventions; and SOL005, which addresses the specification of RESTful protocols for the Os-Ma-nfvo reference point.

While evaluating the capabilities set of NFV Release 2, it was also deemed necessary to include two additional work items into NFV Release 2: TST008 and IFA027. Both work items deal with the specification of performance metrics. On the one hand, TST008 focuses on specifying the NFVI compute and network metrics. On the other hand, IFA027 concentrates on specifying the performance metrics that will be carried over NFV-MANO interfaces. These two work items, at present, are still under development, but both are foreseen to be completed in 2017, and aligned to the completion of Release 2 Stage 3 work.

At present, the NFV Release 2 comprises of the following published Group Specifications and Group Reports:

- ETSI GS NFV-IFA 002 (v2.1.1): Network Functions Virtualisation (NFV); Acceleration Technologies; VNF Interfaces Specification
- ETSI GS NFV-IFA 003 (v2.1.1): Network Functions Virtualisation (NFV); Acceleration Technologies; vSwitch Benchmarking and Acceleration Specification
- ETSI GS NFV-IFA 004 (v2.1.1): Network Functions Virtualisation (NFV); Acceleration Technologies; Management aspects Specification
- ETSI GS NFV-IFA 005 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Or-Vi reference point – Interface and Information Model Specification
- ETSI GS NFV-IFA 006 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Vi-Vnfm reference point – Interface and Information Model Specification
- ETSI GS NFV-IFA 007 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Or-Vnfm reference point – Interface and Information Model Specification
- ETSI GS NFV-IFA 008 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Ve-Vnfm reference point – Interface and Information Model Specification
- ETSI GS NFV-IFA 010 (v2.2.1): Network Functions Virtualisation (NFV); Management and Orchestration; Functional requirements specification
- ETSI GS NFV-IFA 011 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; VNF Packaging Specification
- ETSI GS NFV-IFA 013 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Os-Ma-nfvo reference point – Interface and Information Model Specification
- ETSI GS NFV-IFA 014 (v2.1.1): Network Functions Virtualisation (NFV); Management and Orchestration; Network Service Templates Specification
- ETSI GS NFV-IFA 015 (v2.1.2): Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Report on NFV Information Model
- ETSI GR NFV-IFA 016 (v2.1.1): Network Functions Virtualisation (NFV) Release 2; Information Modeling; Papyrus Guidelines
- ETSI GR NFV-IFA 017 (v2.1.1): Network Functions Virtualisation (NFV) Release 2; Information Modeling; UML Modeling Guidelines
- ETSI GR NFV-IFA 024 (v2.1.1): Network Functions Virtualisation (NFV) Release 2; Information Modeling; Report on External Touchpoints related to NFV Information Model

More information and details about the set of capabilities provided by NFV Release 2 is available in the NFV Release 2 Description document, which has been updated to version v1.1 [2]. As usual (and announced in the past) all ongoing working drafts being developed by the ISG NFV are publicly available on the NFV Open Area [3].

2. NFV Release 3 Updates

NFV Release 3 is progressing on track for delivering a big set of its Release 3 specifications already throughout 2017. At the same time, some new features have been added into the Release 3 Definition based on the approval of new work items at NFV#16 and NFV#17 plenaries.

The three new features that have been added to NFV Release 3 Definition deal with the:

- Support of NFV-MANO services across multiple administrative domains.
- Support in the NFV Architectural Framework for providing "Platform as a Service (PaaS)-type" capabilities assisting VNFs which follow "cloud-native" design principles.
- Definition of "cloud-native" VNFs.

The corresponding work items addressing the above three features are IFA028, IFA029 and EVE011, respectively.

A number of NFV Release 3 work items have been completed, and resulting deliverables have already been published, or will be made publicly available soon. These are:

- ETSI GS NFV-EVE 007: Network Functions Virtualisation (NFV) Release 3; Evolution and Ecosystem; Hardware Interoperability Requirements Specification
- ETSI GS NFV-SEC 012: Network Functions Virtualisation (NFV) Release 3; Security; System architecture specification for execution of sensitive NFV components
- ETSI GS NFV-SEC 013: Network Functions Virtualisation (NFV) Release 3; Security; Security Management and Monitoring Specification
- ETSI GR NFV-TST 005: Network Functions Virtualisation (NFV); Continuous Development and Integration; Report on use cases and recommendations for VNF Snapshot

More information and details about the set of features under development as part of NFV Release 3 is available in the NFV Release 3 Definition document, which has been updated to version 0.5.0 [4], and which is now also publicly available on the NFV Open Area.

Last but not least, it is worth reporting that as part of the recent approval of a NWI, within the EVE012 work item umbrella, the ISG NFV will analyze use cases related to Network Slicing as defined in SDOs and industry fora. Furthermore, the ISG NFV will document how these use cases could be mapped to current NFV concepts and supported by the ETSI NFV Architectural Framework.

3. Summary of Specifications and Reports Completed or Close to Completion

NFV001 – Report on NFV Use Cases

The scope of the NFV001 v1.2.1 is to describe use cases of interest and relevance for NFV. It updates and extends the previously published NFV001 v1.1.1 by enhancing the description of existing use cases and adding new ones.

EVE001 – Hypervisor Domain Requirements Specification

The EVE001 provides requirements for the hypervisor domain as it pertains to an operator's network. It focuses on gaps between NFV use cases and the industry state of art at the time of publication. Therefore requirements that are deemed to be supported by most hypervisor solutions at the time of publication are not repeated in this document.

EVE007 – NFV Hardware Interoperability Requirements Specification [COMPLETED]

The ETSI GS NFV-EVE 007 develops a set of normative interoperability requirements for the NFV hardware ecosystem and telecommunications physical environment to support NFV deployment.

The EVE007 focuses on the development of requirements to enable interoperability of equipment in the telecommunications environment to support NFV deployment. The following areas are examined: operations, environmental, mechanical, cabling, maintenance, and security.

IFA021 – Report on management of NFV-MANO and automated deployment of EM and other OSS functions

In NFV, the Management and Orchestration layer provides a mechanism to manage the deployment of VNFs. This brings up the question, what manages entities in the NFV-MANO layer? The IFA021 report investigates use cases and analyses potential solutions to enable the monitoring and management of VNFMs, NFVOs, and VIMs, and the automated deployment, of Element Managers and other related OSS functions. The report concludes with recommendations for the enhancement of ETSI NFV specifications.

IFA023 – Report on Policy Management in MANO

Policy Management frameworks are a common component of a significant proportion of networking systems today. The IFA023 report investigates use cases and analyses potential solutions for incorporating a Policy Management framework in the MANO layer of NFV. The report concludes with recommendations for the enhancement of ETSI NFV specifications.

REL007 – Report on the Resilience of NFV-MANO critical capabilities

During the runtime of a Network Service, the NFV-MANO might be involved in decisions influencing the running Network Service (e.g., scaling). Therefore, the availability of NFV-MANO parts involved in such operations has an influence on the availability of the Network Service.

The REL007 report identifies how the resiliency requirements of REL001 are addressed in MANO and which capabilities of MANO are involved in providing reliable services. Finally, proposals are made on how MANO functional blocks can be implemented in a reliable way.

SEC013 – Security Management and Monitoring Specification [COMPLETED]

The ETSI GS NFV-SEC 013 specifies functional and security requirements for automated, dynamic security policy management and security function lifecycle management, and security monitoring of NFV systems. The main objectives of the document are to: a) identify use cases for NFV Security Lifecycle Management across Security Planning, Security Enforcement, and Security Monitoring, and b) establish NFV Security Lifecycle Management and Security Monitoring requirements and architecture.

The document investigates passive and active monitoring of subscriber and management information flows, where subscriber information includes signaling and content.

TST008 – NFVI compute and network metrics Specification

The TST008 will outline the standard performance metrics for NFVI, focusing mainly on the compute and network interface metrics. The metrics are defined, as well as how to obtain such metrics in a vendor-agnostic way. The metrics in TST008 can then be used by other specifications for processed and time aggregated metrics as needed.

References

[1] ETSI ISG NFV, “Announcement on work progress – Release 2 and the Definition of Release 3,” [Online] available at: https://docbox.etsi.org/ISG/NFV/Open/Other/NFV(16)000338_ETSI_NFV_Announcement_on_work_progress-Release_2_and_the_Definition_of_Release_3.pdf

[2] ETSI ISG NFV, “NFV Release 2 Description,” NFV(16)000274r5. Version 1.1. [Online] available at: https://docbox.etsi.org/ISG/NFV/Open/Other/NFV(16)000274r5_NFV_Release_2_Description_v11.pdf

[3] ETSI ISG NFV, Open Area. [Online] available at: https://docbox.etsi.org/ISG/NFV/Open/Drafts/

[4] ETSI ISG NFV, “NFV Release 3 Definition,” NFV(16)000229r6. Version 0.5.0. [Online] available at: https://docbox.etsi.org/ISG/NFV/Open/Other/NFV(16)000229r6_NFV_Release_3_Definition_v050.pdf