ETSI GR NFV-EVE 0018 V0.0.1 (2019-06)

**Group REPORT**

Network Functions Virtualisation (NFV);
Evolution and Ecosystem;
Report on Multi-tenancy in NFV

Release 4

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Reference

DGR/NFV-EVE018

Keywords

functional, management, MANO, NFV, orchestration, requirements, virtualisation, tenancy

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# Foreword

This Group Report (GR) has been produced by ETSI Industry Specification Group <long ISGname> (<short ISGname>).

# Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](https://portal.etsi.org/Services/editHelp%21/Howtostart/ETSIDraftingRules.aspx) (Verbal forms for the expression of provisions).

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# Executive summary

# Introduction

# 1 Scope

Editor’s Note: The following text taken from the WID scope statement needs to be updated.

The present document studies multi-tenancy related use cases for NFV to remove the gap between the existing IFA010 general functional requirements on multi-tenancy management and the missing requirement details regarding NFV elements consumed by different tenants. It will also take into consideration possible relation with Release 3 features like multi-domain NS provisioning, security orchestration. Key issues on multi-tenancy in NFV (e.g. tenant-dependent LCM, tenant-dependent resource management, traffic separation, ..) will be identified and analyzed for concluding the recommendations. …

# 2 References

## 2.1 Normative references

Normative references are not applicable in the present document.

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI GS NFV-IFA 010: "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Functional requirements specification".

[i.2] ETSI GS NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".

[i.3] etc.

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in ETSI GS NFV 003 [i.2] apply.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GS NFV 003 [i.2] and the following apply:

NOTE: An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in ETSI GS NFV 003 [i.2].

# 4 Overview

Editor’s Note: The overview shall cover:

* + Relation to functional blocks and features
	+ Relation between the levels of tenancy defined in IFA010
	+ Reference to studies by other SDO, e.g. SA5 study
	+ Properties to cover, e.g. Traffic isolation, separated control, sharing
	+ Review.

# 5 Use Cases and Scenarios

Editor’s Note: Use cases 1-6 were seen in the WID supporting material. More should be added in separate level 2 clauses, using NFV001 (e.g. NFVIaas, VNFaaS) and other inputs.

## 5.1 Two operators creating NSs on the same NFV

Editor’s Note: This may cover using public cloud infrastructure.

## 5.2 Network slice tenants share one NFV deployment

Editor’s Note: In this case two slice tenants use the same NFO via the Os-Ma-nfvo reference point. The mapping between slice tenants and NS tenants shall be discussed.

## 5.3 Isolation of containerized VNF instances

Editor’s Note: Here two tenants (level to be defined) use instances of the may be the same VNF, while that VNF is implemented using container technology as discussed in IFA029. While isolation is provided on NFVI level, it needs to be discussed how tenancy information is transferred to the NFVI.

## 5.4 Provide Isolation on different levels

Editor’s Note: Illustrate via use cases that different levels of isolation (virtual, physical server, different NFVI/VIM) can be provided

# 6 Analysis

* + Impacts on requirements and reference points

# 7 Recommendations

# 8 Conclusions

Annex A:
Title of annex

Annex B:
Title of annex

# B.1 First clause of the annex

## B.1.1 First subdivided clause of the annex

Annex:
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Annex:
Bibliography

Annex:
Change History

| Date | Version | Information about changes |
| --- | --- | --- |
| June 2019 | 0.0.1 | Provide initial skeleton |
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|  |  |  |
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# History

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| **Document history** |
| <Version> | <Date> | <Milestone> |
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*Latest changes made on 2019-01-08*