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# Foreword

This Group Report (GR) has been produced by ETSI Industry Specification Group Network Functions Virtualisation (NFV).

# 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

The present document is a study on the security assurance of NFVI products, i.e., security test cases for evaluating the security NFVI products. Using the security requirements defined in SEC specs (e.g., SEC 012, SEC020, SEC023, SEC025, SEC026, etc.) as inputs, security test cases including testing goals, testing steps, evidence of testing results will be produced for evaluating if the security requirements are fulfilled by NFVI products.

# 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] <Standard Organization acronym> <document number><version number/date of publication>: "<Title>".

[i.2] etc.

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the [following] terms [given in ... and the following] apply:

## 3.2 Symbols

For the purposes of the present document, the [following] symbols [given in ... and the following] apply:

## 3.3 Abbreviations

For the purposes of the present document, the [following] abbreviations [given in ... and the following] apply:

# 4 Overview

## 4.1 Introduction on security assurance methodology

## 4.2 Considerations on security assurance of NFVI products

# 5 Host requirements and related test cases

## 5.1 Introduction

## 5.2 Test cases

### 5.2.1 NFVI Remote Secure logging

|  |  |
| --- | --- |
| **Elements** | **Definition** |
| **Requirement Name** | The NFVI platform logging function shall secure the remote logging. |
| **Requirement Description** | "The NFVI shall log system events to a remote location.""The NFVI shall encrypt log entries during transmission to the remote location." As specified in NFV SEC 012, clause 8.1. |
| **Threat Reference** | TBD. |
| **Test Case** | Test name | TC\_NFVI\_REMOTE\_SECURE\_LOGGING |
| Purpose | To ensure log shall be securely transferred to remote storage. |
| Pre-conditions | 1. The vendor shall list the standard protocols which transfer security event logging data.
2. The session between NFVI and remote location for network product log functions has been set up.
3. The tester has privilege to operate NFVI and related logs can be outputted.
4. There should be a verification that the remote location is what is authorized as an endpoint, and that authorized endpoints cannot be tampered with.
 |
| Execution steps | 1. The tester activates the NFVI platform logging function.
2. The tester operates the NFVI to trigger several event logs.
3. Tester shall be securely authenticated, then, the tester checks whether the used transport protocol is secure protocol which provides confidentiality, integrity and authentication protection.
4. The tester checks whether the remote location has received and stored the related logs.
5. The test turns off the platform logging function and repeats the step 1~3
 |
| Expected results | 1. The used transport protocol for log transfer is a secure standard protocol which provides confidentiality, integrity and authentication protection.
2. In case the platform logging function is on, the tester finds that the remote location has stored the related logs and there is no sensitive parameters in them unless duly documented in the product security documentation, and that content of logs do not cross security domain boundaries
3. In case the platform logging function is off, the tester cannot find the generation of related logs.
 |
| Expected format of evidence | A testing report provided by the testing agency which will consist of the following information:-Settings, protocols and configurations used, -Screenshot-Test result. |

### 5.2.2 NFVI Software package integrity protection

|  |  |
| --- | --- |
| **Elements** | **Definition** |
| **Requirement Name** | The NFVI shall support NFVI software package integrity protection and verification. |
| **Requirement Description** | "The NFVI shall verify the provenance and integrity of all instances and versions of software components (e.g., hypervisor, OS components, etc.) before installing them.""The NFVI should verify the integrity of NFVI software components before execution."As specified in NFV SEC 012, clause 8.14. |
| **Threat Reference** | TBD. |
| **Test Case** | Test name | TC\_SOFTWARE\_INTEGRITY\_PROTECTION |
| Purpose | To ensure NFVI shall validates the NFVI software package integrity before the installation/execution stage. |
| Pre-conditions | 1. A pre-installed workable NFVI with a set of basic NFVI components which are considered to be secure.
2. A network product document containing information regarding NFVI software package integrity checks, including details of how the integrity check is carried out, where public keys or certificates of sources authorised to sign NFVI software packages are stored on the network product and who these sources are, and what evidence is created to prove that the integrity check has been executed and what the result of the check was.
3. Documentation which describes the NFVI software installation procedure including how a user is authorized and authenticated to perform installation process.
4. A valid NFVI software package;
5. Several invalid NFVI packages shall be prepared as follows:
6. Only alter the signature of the package.
7. Only alter the image of the package
8. Alter both the signature and the image of the package
9. Remove the signature of the package
10. A previous version of the package

NOTE: It is prohibited to install a previous version on a running system unless rollback override is enabled. |
| Execution steps | 1. The tester log in the NFVI using the account that is authorized to perform installation process.
2. The tester tries to install the prepared valid NFVI software;
3. The tester tries to install the prepared invalid NFVI software.
 |
| Expected results | 1. The installation operation is successful when using the valid NFVI software package
2. The installation operation fails when using the invalid NFVI software packages.
 |
| Expected format of evidence | Snapshots containing the result of the installation of the packages. |

# 6 Hypervisor requirements and related test case

## 6.1 Introduction

## 6.2 Test cases

# 7 Container infrastructure service requirements and related test case

## 7.1 Introduction

## 7.2 Test cases

# 8 Conclusions and recommendations

Annex A:
Format of test cases

The table below specifies the information required to design a test case.

|  |  |
| --- | --- |
| **Elements** | **Definition** |
| **Requirement Name** | The test Requirement Name indicates clearly and briefly which requirement is intended to be tested in the test. |
| **Requirement Description** | Description of the requirement according to the NFV SEC specifications, e.g., "xxxx" as specified in NFV SEC xxx, clause x.x.x. |
| **Threat Reference** | Description of the corresponding threat according to the NFV SEC specifications. |
| **Test Case** | Test name | The Test name identifies the test. Naming convention: TC\_the name of the clause in the present document (which includes the Test Descriptions) |
| Purpose | The test purpose indicates clearly which requirement is intended to be tested in the test. This part eases the understanding of the Test Description behaviour. |
| Pre-conditions | The pre-conditions field defines the conditions that the state of the product under test shall verify before undergoing the actual execution steps.  |
| Execution steps | A set of steps of the test, carried out by the Tester to verify conformance of the product under test to the Test purpose.  |
| Expected results | Definition of the actions or outputs that the product under test is expected to perform or present. |
| Expected format of evidence | The specific evidence to show the test result, e.g., Screenshot containing the operational results. |

Annex B:
Title of annex

# B.1 First clause of the annex

## B.1.1 First subdivided clause of the annex

Annex:
Bibliography

Annex :
Change History

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