



Network Functions Virtualisation (NFV) Release 5; Protocols and Data Models; VNF Snapshot Package specification

Disclaimer

The present document has been produced and approved by the Network Functions Virtualisation (NFV) ETSI Industry Specification Group (ISG) and represents the views of those members who participated in this ISG.
It does not necessarily represent the views of the entire ETSI membership.

Reference

RGS/NFV-SOL010ed531

Keywords

data, model, NFV, protocol, stage 3, virtualisation

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from the
[ETSI Search & Browse Standards](#) application.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver](#) repository.

Users should be aware that the present document may be revised or have its status changed,
this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to
the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our
[Coordinated Vulnerability Disclosure \(CVD\)](#) program.

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2025.
All rights reserved.

Contents

Intellectual Property Rights	4
Foreword.....	4
Modal verbs terminology.....	4
1 Scope	5
2 References	5
2.1 Normative references	5
2.2 Informative references.....	5
3 Definition of terms, symbols and abbreviations.....	6
3.1 Terms.....	6
3.2 Symbols.....	6
3.3 Abbreviations	6
4 VNF Snapshot Package	6
4.1 VNF Snapshot Package format	6
4.2 VNF Snapshot Package file contents and structure.....	6
4.2.1 General.....	6
4.2.2 VNF Snapshot Package manifest file.....	7
4.2.3 VNF Snapshot Record in the VNF Snapshot Package.....	8
5 Adding security to VNF Snapshot Package	9
5.1 VNF Snapshot Package authenticity and integrity	9
5.2 Certificate files in the VNF Snapshot Package.....	10
5.3 Conventions in the manifest file.....	10
5.4 Signature of individual artifacts	10
Annex A (informative): VNF Snapshot Package Examples.....	12
A.1 Basic VNF Snapshot Package example.....	12
A.2 VNF Snapshot Package example including VNFD.....	12
Annex B (informative): Change history	13
History	15

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**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](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document specifies the structure and format of a VNF Snapshot Package file and of the artifacts it contains, fulfilling the requirements specified in ETSI GS NFV IFA 011 [1] for a VNF Snapshot Package, in case that all artifacts are stored and available within a single NFVI.

2 References

2.1 Normative 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.

Referenced documents which are not found to be publicly available in the expected location might be found in the [ETSI docbox](#).

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 necessary for the application of the present document.

- [1] [ETSI GS NFV-IFA 011](#): "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; VNF Descriptor and Packaging Specification".
- [2] [IETF RFC 3339 \(July 2002\)](#): "Date and Time on the Internet: Timestamps".
- [3] [ETSI GS NFV-SOL 005](#): "Network Functions Virtualisation (NFV) Release 5; Protocols and Data Models; RESTful protocols specification for the Os-Ma-nfvo Reference Point".
- [4] [ISO/IEC 21320-1 \(2015\)](#): "Information Technology -- Document Container File -- Part 1: Core".
- [5] [ETSI GS NFV-SOL 004](#): "Network Functions Virtualisation (NFV) Release 5; Protocols and Data Models; VNF Package and PNFD Archive specification".
- [6] [Recommendation ITU-T X.509](#): "Information technology - Open Systems Interconnection - The Directory: Public-key and attribute certificate frameworks".
- [7] [IETF RFC 5652 \(September 2009\)](#): "Cryptographic Message Syntax (CMS)".
- [8] [IETF RFC 2315 \(March 1998\)](#): "PKCS #7: Cryptographic Message Syntax Version 1.5".
- [9] [ETSI GS NFV-SOL 003](#): "Network Functions Virtualisation (NFV) Release 5; Protocols and Data Models; RESTful protocols specification for the Or-Vnfm Reference Point".

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 may be useful in implementing an ETSI deliverable or add to the reader's understanding, but are not required for conformance to the present document.

- [i.1] ETSI GR NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".

- [i.2] ETSI GS NFV-SOL 001: "Network Functions Virtualisation (NFV) Release 5; Protocols and Data Models; NFV descriptors based on TOSCA specification".
- [i.3] ETSI GS NFV-SOL 006: "Network Functions Virtualisation (NFV) Release 4; Protocols and Data Models; NFV descriptors based on YANG specification".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI GR NFV 003 [i.1] and the following apply:

NOTE: A term defined in the present document takes precedence over the definition of the same term, if any, in ETSI GR NFV 003 [i.1].

VNF Snapshot Package provider: creator of the VNF Snapshot Package

NOTE: The NFVO is a VNF Snapshot Package provider as producer of the VNF Snapshot Package management interface specified in ETSI GS NFV-SOL 005 [3].

VNF Snapshot Record: file that contains runtime information representing a VNF instance at the time when the snapshot is taken

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GR NFV 003 [i.1] and the following apply:

TOSCA	Topology and Orchestration Specification for Cloud Applications
VNFSR	VNF Snapshot Record
YAML	YAML Ain't Markup Language

4 VNF Snapshot Package

4.1 VNF Snapshot Package format

The VNF Snapshot Package shall be a ZIP archive file whose format shall conform to ISO/IEC 21320-1 [4]. In the rest of the present document, this file is referred to as the "VNF Snapshot Package file".

4.2 VNF Snapshot Package file contents and structure

4.2.1 General

A VNF Snapshot Package shall contain:

- a VNF Snapshot Record (VNFSR) file; and
- additional files.

A VNF Snapshot Package may contain:

- The VNFD corresponding to the snapshotted VNF.

If a VNFD is present in the VNF Snapshot Package, the VNFD file shall be a ZIP archive file as specified in clause 10.4.4 of ETSI GS NFV-SOL 003 [9]. It shall be an exact copy of the VNFD in the VNF Package from which the snapshotted VNF was instantiated and be located at the root of the VNF Snapshot Package file. That copy can be used for troubleshooting by entities external to NFV-MANO. The VNFD in the VNF Snapshot Package is not intended to be used by NFV-MANO entities, e.g. for VNF snapshot reversal.

NOTE 1: ETSI GS NFV-SOL 001 [i.2] specifies the structure and format of the VNFD based on TOSCA specifications.

NOTE 2: ETSI GS NFV-SOL 006 [i.3] specifies the structure and format of the VNFD based on YANG specifications.

Examples of a VNF Snapshot Package file are described in annex A.

4.2.2 VNF Snapshot Package manifest file

A VNF Snapshot Package shall contain a manifest file located at the root of the VNF Snapshot Package file. The name and extension of the manifest file shall be "manifest.mf". The name and extension are case-insensitive.

The manifest file shall start with the VNF Snapshot Package metadata in the form of name-value pairs. Each pair shall appear on a different line. The "name" and the "value" shall be separated by a colon and, optionally, one or more blanks. The order of the name-value pairs is not significant.

The name shall be one of those specified in table 4.2.2-1 and the values shall comply with the provisions specified in table 4.2.2-1. All of these pairs in table 4.2.2-1 shall be in the manifest file.

Table 4.2.2-1: List of valid names and values for VNF Snapshot Package metadata

Name	Value
vnfd_id	A sequence of UTF-8 characters. See note 1.
vnf_snapshot_pkg_name	A sequence of UTF-8 characters. See note 2.
vnf_snapshot_pkg_id	A sequence of UTF-8 characters. See note 3.
vnf_snapshot_id	A sequence of UTF-8 characters. See note 4.
vnf_snapshot_scope	A sequence of UTF-8 characters. See note 5.
vnf_snapshot_pkg_create_date_time	String formatted according to IETF RFC 3339 [2]. See note 6.
NOTE 1: The value shall be identical to the value specified in the VNFD.	
NOTE 2: The value shall be identical to the "name" attribute of the "VnfSnapshotPkgInfo" structure specified in ETSI GS NFV-SOL 005 [3], which is signalled to the NFVO (as VNF Snapshot Package provider) during the VNF Snapshot Package creation request.	
NOTE 3: The value shall be identical to the "vnfSnapshotPkgUniqueId" attribute of the "VnfSnapshotPkgInfo" structure specified in ETSI GS NFV-SOL 005 [3], which is assigned by the NFVO (as VNF Snapshot Package provider) during the VNF Snapshot Package building.	
NOTE 4: The value shall be identical to the value specified in the VNFSR file.	
NOTE 5: Indicates whether it is a partial or full VNF Snapshot Package. The value is set from the value of the isFullSnapshot attribute specified in in ETSI GS NFV-SOL 005 [3]. Permitted values: PARTIAL, FULL.	
NOTE 6: The value shall be identical to the "createdAt" attribute of the "VnfSnapshotPkgInfo" structure specified in ETSI GS NFV-SOL 005 [3], which is assigned by the NFVO during the VNF Snapshot Package building.	

An example of valid manifest file metadata entries follows.

EXAMPLE 1:

```
metadata:
vnfd_id: 2116fd24-83f2-416b-bf3c-ca1964793aca
vnf_snapshot_pkg_id: 3225d37-64f4-518b-af3d-da2064793adb
vnf_snapshot_pkg_name: Sunshine
vnf_snapshot_scope: PARTIAL
vnf_snapshot_id: 43253d7-84f5-619d-bf4e-cf2054783aef
vnf_snapshot_pkg_create_date_time: 2020-04-01T10:00+08:00
```

END OF EXAMPLE 1.

The manifest file shall include a list of all files contained in or referenced from the VNF Snapshot Package with their location, expressed using a Source: location/name key-value pair. The manifest file itself shall not be included in the list.

The manifest file shall also contain a list of entries corresponding to the snapshot images that are part of the VNF Snapshot Package. For each of the comprising snapshot images, a reference to the snapshot image information contained in the VNFSR shall be provided after the corresponding "Source" entry as follow:

- For an image artifact corresponding to a compute snapshot resource, the tag "ComputeImageId" shall be used whose value is the same as the "id" attribute of the specific "VnfcSnapshotInfo" in the VNFSR of the compiled VNFC snapshot.
- For an image artifact corresponding to a storage snapshot resource, the tag "StorageImageId" shall be used whose value is the same as the "storageResourceId" attribute of the specific "VnfcSnapshotInfo" in the VNFSR of the compiled VNFC snapshot.

Below is an example of valid manifest file entries for image artifacts contained in or referenced from the VNF Snapshot Package.

EXAMPLE 2:

```
Source: images/image1
ComputeImageId: 1234d1-5678-910a-bf01-cf1234567abc
Source: images/image2
StorageImageId: 5678e1-1234-109b-bf02-cf7654321def
```

END OF EXAMPLE 2.

In addition, the manifest file shall contain an entry with the tag "Vnfsr" to identify the VNFSR file and, if the VNFD file is contained in the VNF Snapshot Package, another entry with the tag "Vnfd" to identify the VNFD file.

The "Vnfsr" and "Vnfd" tags and the generic "Source" tag are case-insensitive.

The "Vnfsr" entry and, if present, the "Vnfd" entry, shall be listed before the "Source" entries.

Below is an example of valid manifest file entries for files contained in or referenced from the VNF Snapshot Package.

EXAMPLE 3:

```
Vnfsr: MyVnfSnapshot.json
Vnfd: MyVnfd.zip
Source: MyVnfSnapshot.json
Source: MyVnfd.zip
Source: images/image1
```

END OF EXAMPLE 3.

4.2.3 VNF Snapshot Record in the VNF Snapshot Package

The VNF Snapshot Package shall contain a VNFSR of the snapshotted VNF instance. The specification of the contents and format of a VNFSR file is outside the scope of the present document.

The VNFSR file shall be located at the root of the VNF Snapshot Package file. In addition, the VNFSR file shall have an extension .json and the same name as the VNF Snapshot Package file.

5 Adding security to VNF Snapshot Package

5.1 VNF Snapshot Package authenticity and integrity

As specified in ETSI GS NFV-IFA 011 [1], a VNF Snapshot Package shall support a method for authenticity and integrity assurance.

In order to provide the public key based authenticity and integrity for the whole VNF Snapshot Package, the complete VNF Snapshot Package file shall be digitally signed with the private key of the VNF Snapshot Package provider. The NFVO, as VNF snapshot package provider, shall sign the file when the VNF Snapshot Package is created with the "Build VNF snapshot package" operation specified in ETSI GS NFV-SOL 005 [3]. The VNF Snapshot Package provider shall deliver one ZIP archive file consisting of the VNF Snapshot Package file, a signature file and a certificate file that includes the public key of the VNF Snapshot Package provider. The signature file shall have an extension '.cms' and the same name as the VNF Snapshot Package file. The certificate may also be included in the signature container, if the signature format allows that.

The manifest in the VNF Snapshot Package shall be signed.

The format of the ZIP archive file embedding the VNF Snapshot Package file shall conform to ISO/IEC 21320-1 [4].

The ZIP archive file embedding the VNF Snapshot Package file delivered by the VNF Snapshot Package provider is therefore structured according to one of the options described in figure 5.1-1.

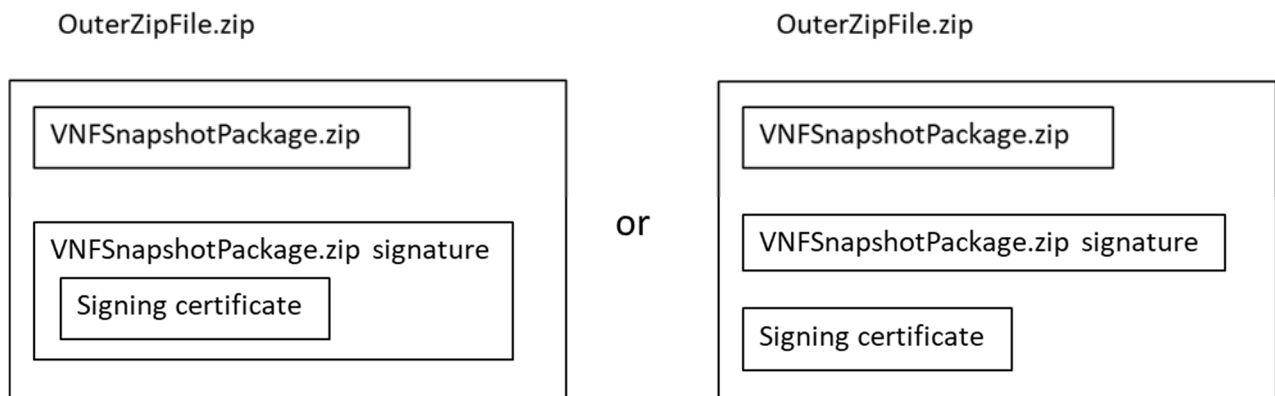


Figure 5.1-1: Composition of the VNF Snapshot Package zip file

This solution, relies on the existence at the VNF Snapshot Package consumer side of a root certificate of a trusted CA that shall have been delivered via a trusted channel that preserves its integrity (separate from the VNF Snapshot Package) to the VNF Snapshot Package consumer side and be preinstalled in the consumer side before processing of the VNF Snapshot Package.

NOTE: The present document makes no assumption on who this trusted CA is. Furthermore, it does not exclude that the root certificate be issued by the VNF Snapshot Package provider.

5.2 Certificate files in the VNF Snapshot Package

As described in clause 5.1, authenticity and integrity of the VNF Snapshot Package is ensured by signing the VNF Snapshot Package file with the private key of VNF Snapshot Package provider. If one or more artifacts are stored externally to the VNF Snapshot Package within the NFVI, then the VNF Snapshot Provider shall sign each external artifact, and include the signatures within the VNF Snapshot Package instead of the artifacts before signing the whole VNF Snapshot Package as per clause 5.1. The digital signature is stored in a separate file and within the ZIP archive file as per clause 5.1. The VNF Snapshot Package provider shall also include an X.509 certificate [6]). The certificate may be included in the signature itself if the signature format allows it or in a signature file. The certificate file shall have an extension .cert and the same name as the VNF Snapshot Package file. A consumer of the VNF Snapshot Package can verify the signature of the complete VNF Snapshot Package file with the public key of VNF Snapshot Package provider. In addition, a consumer of the VNF Snapshot Package shall verify the signatures of the external artifacts, that are listed in the manifest file, if any.

Table 5.2-1 summarizes the characteristics for integrity assurance.

Table 5.2-1: Integrity assurance: summary of characteristics

Digest per artifact	Signature per artifact	Support external artifacts	Signature as part of the manifest file	External Signature file for the whole ZIP	Certificate may be part of the signature	Certificate may be in a separate file
No	Yes	Yes	Yes (if manifest is signed)	Yes	Yes	Yes

The X.509 certificate may contain one single signing certificate or a complete certificate chain. A trusted root certificate corresponding to the producer signing certificate needs to be pre-installed in the consumer side. The pre-installed root certificate shall be used for validation of the signatures within the VNF Snapshot Package by the VNF Snapshot Package consumer (see clause 5.1).

5.3 Conventions in the manifest file

The signature in the manifest file shall conform to conventions specified in clause 5.3 of ETSI GS NFV-SOL 004 [5].

5.4 Signature of individual artifacts

The VNF Snapshot Package provider shall digitally sign all artifacts individually. If the artifact is included in the VNF Snapshot Package file, a signature file in CMS (see IETF RFC 5652 [7]) or PKCS#7 (see IETF RFC 2315 [8]) format shall accompany the signed artifact. Except for the manifest file, the signature file shall be a sibling of the signed artifact, i.e. placed in the same folder in the VNF Snapshot Package file, which can also be the root of the file. The naming scheme for the signature file shall maintain the original file name and extension and append a '.sig' extension followed by a file type specific extension (e.g. '.cms', '.p7b', '.p7c').

If the artifact and signature are included in the VNF Snapshot Package an X.509 certificate shall also be included in the VNF Snapshot Package file as per one of the two following alternatives:

- 1) One certificate per signed artifact, according to one of the following options:
 - 1a) A certificate file is included as a sibling of the signed artifact file, i.e. placed in the same folder as the signed artifact. The naming scheme for the certificate file shall maintain the original file name and extension and append the '.cert' extension.
 - 1b) The certificate is included in the signature file, provided that the signature format allows for it.
- 2) One single certificate for all signed artifacts in which case the certificate file shall follow the rules specified in clause 5.2. If some, but not all, artifacts have an individual signing certificate, the certificate described in this alternative shall only be used for those artifacts that do not have an individual signing certificate.

Signature and certificate files of the artifacts included in the package shall be listed in their own blocks in the manifest, like any other file.

For external artifacts, delivered using as defined in clause 5.1, referred to but not included in the package, the signature file in CMS or PKCS#7 format shall be included in the package. The VNF Snapshot Package provider shall provide, in addition to those specified in clause 5.3, a name-value pair in the block in the manifest that contains the artifact URI, where name is 'Signature' and value shall be set to the file name with path in the VNF Snapshot Package file where the signature is contained. The file should have a double extension: '.sig' followed by a file type specific one (e.g. '.cms', '.p7b', '.p7c'). In addition, the signing X.509 certificate shall be provided as per one of the following alternatives:

- 1) One certificate per signed artifact: included in the signature file, provided the signature format allows for it, or in a certificate file included in the package. The VNF Snapshot Package provider shall provide, in addition to those specified in clause 5.3, a name-value pair in the block in the manifest that contains the artifact URI, where name is 'Certificate' and value shall be set to the file name with path in the VNF Snapshot Package file where the certificate is contained. The extension of the file containing the signing certificate should be '.cert'.
- 2) One single certificate for all signed artifacts: in one certificate file in the VNF Snapshot Package file with extension .cert and the same name as the VNF Snapshot Package file and located at the root of the VNF Snapshot Package file. If some, but not all, artifacts have an individual signing certificate, the certificate described in this alternative is used only for those artifacts that do not have an individual signing certificate.

Signature and certificate files of external artifacts shall, in addition, be listed in their own blocks in the manifest, like any other file.

These two name-value pairs applicable for blocks in the manifest related to external artifacts, with names 'Signature' and 'Certificate', need not be included for artifacts included in the VNF Snapshot Package file because signatures and certificates files for internal artifacts are identified by the naming and placing conventions, i.e. as siblings of the artifact.

Example of a block in the manifest containing entries for an external artifact.

EXAMPLE:

Source: https://www.provider_org.com/SunShine/images/image1
Signature: /somedirectory/somefilename1.sig.cms
Certificate: /somedirectory/somefilename1.cert

END OF EXAMPLE.

Annex A (informative): VNF Snapshot Package Examples

A.1 Basic VNF Snapshot Package example

The example illustrates a VNF Snapshot Package file which contains a VNFSR (CompanySnapshotPackage.json), a manifest file and images. In this example, the VNFSR, images, and the manifest file are located at the root level.

EXAMPLE:

```
!---- CompanySnapshotPackage.json
!---- CompanySnapshotPackage.json.sig.cms
!---- manifest.mf
!---- image(s)
!---- image(s) signature(s)
```

END OF EXAMPLE.

A.2 VNF Snapshot Package example including VNFD

The example illustrates another VNF Snapshot Package file which contains a VNFSR (CompanySnapshotPackage.json), a manifest file, VNFD (CompanyVNFD.zip) and images. In this example, the VNFSR, VNFD, images, and the manifest file are located at the root level.

EXAMPLE:

```
!---- CompanySnapshotPackage.json
!---- CompanySnapshotPackage.json.sig.cms
!---- manifest.mf
!---- CompanyVNFD.zip
!---- CompanyVNFD.zip.sig.cms
!---- image(s)
!---- image(s) signature(s)
```

END OF EXAMPLE.

Annex B (informative): Change history

Date	Version	Information about changes
October 2018	0.0.1	Initial version based on contributions that were agreed at the NFVSOL#81 meeting. - NFVSOL(18)000599_SOL010_ToC_Skeleton - NFVSOL(18)000600_SOL010_Scope - NFVSOL(18)000601_SOL010_Normative_Reference
November 2018	0.0.2	Version 0.0.2 based on contributions that were agreed during Email Approval (EA) following the NFVSOL#83 meeting. - NFVSOL(18)000646_SOL010_Adding_4_1_TOSCA_YAML_CSAR - NFVSOL(18)000648_SOL010_Adding_References_and_Abbreviations
January 2019	0.0.3	Version 0.0.3 based on contributions that were agreed at the NFVSOL#85 meeting. NFVSOL(18)000647r3_SOL010_Normative_text_for_CSAR_Structure_options
March 2019	0.0.4	Version 0.0.4 based on a contribution that was agreed at the NFVSOL#92 meeting. NFVSOL(19)000122r1_SOL010_-_Definitions_of_VNF_Snapshot_Record_and_Abbreviation
April 2019	0.0.5	Version 0.0.5 based on contributions that were agreed at the NFVSOL#97 and NFVSOL#98 meetings. - NFVSOL(19)000238r1_SOL010_the_skeleton_of_Clause_4_3 - NFVSOL(19)000244r2_SOL010_VNF_Snapshot_Record_in_the_VNF_Snapshots_Package
February 2020	0.0.6	Version 0.0.6 based on a contribution that was agreed during Email Approval (EA) following the NFVSOL#125 meeting. NFVSOL(19)000056r4_SOL010__VNF_Snapshot_Package_file_contents_General Rapporteur action: deleted the authors annex.
April 2020	0.0.7	Version 0.0.7 based on contributions that were agreed at the NFVSOL#131 and NFVSOL#133 meetings and during Email Approval (EA) following the NFVSOL#132 meeting. - NFVSOL(20)000196r1_SOL010_ZIP_structure_for_the_VNF_Snapshot_package - NFVSOL(20)000250_SOL010_editorial_changes - NFVSOL(20)000248r3_SOL010_VNF_Snapshot_Package_manifest_file - NFVSOL(20)000272r2_SOL010_vnf_snapshot_package_content
July 2020	0.0.8	Version 0.0.8 based on contributions that were agreed at the NFVSOL#142 and NFVSOL#143 meetings and during Email Approval(EA) following the NFVSOL#143 meeting. - NFVSOL(20)000575r5_SOL010_VNF_Snapshot_Package_authenticity_and_integrity - NFVSOL(20)000611r1_SOL010_zip_file_compression_method - NFVSOL(20)000610r1_SOL010_Conventions_in_the_manifest_file - NFVSOL(20)000625r1_SOL010_Certificate_file - NFVSOL(20)000109r5_SOL010_Annex_A_ZIP_example
August 2020	0.1.0	Version 0.1.0 based on contributions that were agreed at the NFVSOL#145 and NFVSOL#148 meetings. - NFVSOL(20)000645r1_SOL010_Clause_5_2_Manifest_and_certificate_files_in_the_VNF - NFVSOL(20)000646r3_SOL010_Clause_5_4_Signature_of_individual_artifacts - NFVSOL(20)000647r1_SOL010_Annex_A_2_VNF_Snapshot_example_including_VNFD

Date	Version	Information about changes
October 2020	0.2.0	Version 0.2.0 based on contributions that were agreed at the NFVSOL#151, NFSOL#152 and NFVSOL#153 meetings and during Email Approval(EA) following the NFVSOL#151 meeting. - NFVSOL(20)000675_SOL010_two_editor_s_notes_cleanup - NFVSOL(20)000678r1_SOL010_clause_4_2_2_Clarify_the_presence_of_pairs - NFVSOL(20)000680r1_SOL010_Clause_4_2_2_Resolving_EN_about_vnf_snapshot_name - NFVSOL(20)000691r1_SOL010_-_Miscellaneous_Improvements - NFVSOL(20)000693r2_SOL010_File_identification_in_the_manifest_file - NFVSOL(20)000692r2_SOL010_Removal_of_leftovers_from_integrity_assurance_option - NFVSOL(20)000685r2_SOL010_Clause_4_2_2_Adding_information_about_VNFC_snapshots - NFVSOL(20)000690_SOL010_Clause_5_2_Resolving_EN_about_signature_per_artifact - NFVSOL(20)000720_SOL010_Annex_A_examples_correction - NFVSOL(20)000712r3_SOL010_Resolving_the_comments_from_NFVSEC - NFVSOL(20)000722r1_SOL010_Clause_5_1_Resolving_EN_about_VNF_Snapshot_Package_pr - NFVSOL(20)000717_SOL010_Clause_4_2_2_Clarification_vnf_snapshot_package_create_data
April 2021	3.3.3	Version 3.3.3 based on contributions that were agreed at the NFVSOL#169 meeting. - NFVSOL(21)000231r1_SOL010ed351_Clause_5_1_Security_enhancement - NFVSOL(21)000245_SOL010ed351_Clause_5_2_Security_enhancement - NFVSOL(21)000244r2_SOL010ed351_Clause_5_4_Security_enhancement
May 2021	3.3.4	Version 3.3.4 based on contributions that were agreed at the NFVSOL#170 meeting and during Email Approval(EA) following the NFVSOL#170 meeting. - NFVSOL(21)000295_SOL010ed351_Annex_A_VNF_Snapshot_Package_examples_update - NFVSOL(21)000296r1_SOL010ed351_Clause_1_Scope_update
June 2021	3.3.5	Version 3.3.5 based on a contribution that was agreed during Email Approval(EA) following the NFVSOL#172 meeting. NFVSOL(21)000348r1_SOL010ed351_Resolving_the_comments_from_NFVSEC
September 2022	3.6.2	Base line for Release 3 maintenance, created from v3.5.1
June 2023	4.4.2	Version 4.4.2 based on a contribution that was agreed at the NFVSOL#249 meeting. NFVSOL(23)000204_SOL010ed451_Clause_2_references_update
June 2025	5.0.1	Version 5.0.1 based on a contribution that was agreed at the NFVSOL#329 meeting. NFVSOL(25)000220_SOL010ed531_Clause_2_references_update

History

Document history		
V5.3.1	August 2025	Publication