

Title*: ISG NFV work programme details as of 2018.09.13

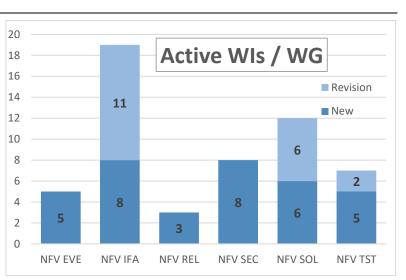
from Source* :	ETSI
Contact:	Laurent Vreck
input for Committee*:	NFV
Submission date*:	2018.09.13

Introduction

This contribution provides a snapshot of ISG NFV ongoing and published work. It includes the changes that occurred <u>at</u> and <u>since</u> the NFV#22 plenary.

There are as of today **55 drafts in development** in ISG NFV Workprogramme.

150 Group Reports or Specifications have been **published** since ISG NFV creation (**77 DISTINCT** documents when not counting revisions).



CHANGES SINCE NFV#22

3 WIs STOPPED

 IFA002 ed251, 003 ed251, 004ed251 --> decision by Remote Consensus following the proposal in <u>NFV(18)000166</u> to not republish the unchanged IFA Rel 2 specifications

1 WI scope changed

• IFA029 Scope changed --> decision by Remote Consensus in NFV(18)000155r1 "IFA029 Change of WI scope"

25 NEW Work Items created

- DGS/NFV-IFA033 "SEC-MANO reference points Interface Specification"-Leslie WILLIS
 --> Approval by Remote Consensus of NFV(18)000134r1 "Security management: Sc-Or, Sc-Vnfm, Sc-Vi reference points" ratified 2018.05.30
- <u>DGR/NFV-IFA034</u> "Licence Management support"-Abinash VISHWAKARMA
 --> Approval by Remote Consensus of NFV(18)000161r2 "VNF License Management Architectural requirements and extensions to NFV-MANO" ratified 2018.07.25.
- <u>DMI/NFV-SOL008 "OpenAPI Work Programme"</u>- Vlademir Brusse
 --> Approval by Remote Consensus of NFV(18)000208r1 ratified 2018.09.12

22 NEW Work Items created following the Remote Consensus approval of the Super WIDs for 2018H2 Release 2 maintenance (<u>NFV(18)000189r1 download</u>) and 2018H2 Release 3 work continuation (<u>NFV(18)000190r1 download</u>):

- <u>RGS/NFV-IFA005ed321 "Or-Vi ref point Spec"-</u>Andy BENNETT
- <u>RGS/NFV-IFA006ed321 "Vi-Vnfm ref point Spec"-</u>Zarrar YOUSAF
- <u>RGS/NFV-IFA007ed321 "Or-Vnfm ref point Spec"-</u>Vlademir BRUSSE
- RGS/NFV-IFA008ed321 "Ve-Vnfm ref point Spec"-Xu YANG
- <u>RGS/NFV-IFA010ed321 "MANO Functional Rqmts Spec"-</u>Ulrich KLEBER
- <u>RGS/NFV-IFA011ed261 "VNF Packaging Spec"-</u>Rajavarma BHYRRAJU
- <u>RGS/NFV-IFA011ed321 "VNF Packaging Spec"-</u>Rajavarma BHYRRAJU
- <u>RGS/NFV-IFA013ed321 "Os-Ma-Nfvo ref point Spec info model"-</u>Ulrich KLEBER
- <u>RGS/NFV-IFA014ed261 "Network Service Templates Spec"-</u>Janusz PIECZERAK
- <u>RGS/NFV-IFA014ed321 "Network Service Templates Spec"-Janusz PIECZERAK</u>
- DGS/NFV-IFA030ed321 "Multi Domain MANO spec"-Haitao XIA
- DGS/NFV-IFA031ed321 "NFV-MANO mgmt spec"-Yusuke OKAZAKI
- <u>RGS/NFV-SOL002ed261 "Ve-Vnfm RESTful protocols spec"-Jong-Hwa YI</u>
- <u>RGS/NFV-SOL002ed311 "Ve-Vnfm RESTful protocols spec"-</u>Yuya KUNO
- <u>RGS/NFV-SOL003ed261 "Or-Vnfm RESTful_protocols spec"-</u>Uwe RAUSCHENBACH



- <u>RGS/NFV-SOL003ed311 "Or-Vnfm RESTful_protocols spec"-</u>Uwe RAUSCHENBACH
- <u>RGS/NFV-SOL004ed261 "VNF Package Stage 3 spec"-</u>Andrei KOJUKHOV
- <u>RGS/NFV-SOL004ed311 "VNF Package Stage 3 spec"-</u>Andrei KOJUKHOV
- <u>DGS/NFV-SOL005ed261 "Os-Ma-nfvo APIs spec"-</u>Vlademir BRUSSE
- <u>DGS/NFV-SOL005ed311 "Os-Ma-nfvo APIs spec"-</u>Vlademir BRUSSE
- <u>RGR/NFV-TST007ed261 "MANO lop Testing Guidelines"-</u>Carsten ROSSENHOEVEL
- <u>RGS/NFV-TST008ed321 "NFVI Compute & Nwk Metrics Spec"-</u>Al MORTON

31 deliverables **PUBLISHED**:

Summer 2018 Batch#1 : 25 GRs and GSs published on the 10th of August. Summer 2018 Batch#2 : 6 GRs and GSs published early September.

- <u>GS NFV 003 v1.4.1 Terminology</u>-Julien MAISONNEUVE
- <u>GS NFV-IFA 005 v2.5.1 Or-Vi ref point Spec-</u>Andy BENNETT
- <u>GS NFV-IFA 005 v3.1.1 Or-Vi ref point Spec-Andy BENNETT</u>
- <u>GS NFV-IFA 006 v3.1.1 Vi-Vnfm ref point Spec-</u>Zarrar YOUSAF
- <u>GS NFV-IFA 006 v2.5.1 Vi-Vnfm ref point Spec-Zarrar YOUSAF</u>
- <u>GS NFV-IFA 007 v2.5.1 Or-Vnfm ref point Spec-</u>Ernest BAYHA
- <u>GS NFV-IFA 007 v3.1.1 Or-Vnfm ref point Spec-Ernest BAYHA</u>
- GS NFV-IFA 008 v2.5.1 Ve-Vnfm ref point Spec-Xu YANG
- GS NFV-IFA 008 v3.1.1 Ve-Vnfm ref point Spec-Xu YANG
- <u>GS NFV-IFA 010 v3.1.1 MANO Functional Rqmts Spec-</u>Ulrich KLEBER
- <u>GS NFV-IFA 010 v2.5.1 MANO Functional Rqmts Spec-</u>Ulrich KLEBER
- <u>GS NFV-IFA 011 v3.1.1 VNF Packaging Spec-</u>Haibin CHU
- <u>GS NFV-IFA 011 v2.5.1 VNF Packaging Spec-</u>Haibin CHU
- GS NFV-IFA 013 v2.5.1 Os-Ma-Nfvo ref point Spec info model-Marc FLAUW
- <u>GS NFV-IFA 013 v3.1.1 Os-Ma-Nfvo ref_point Spec info model-Marc FLAUW</u>
- <u>GS NFV-IFA 014 v3.1.1 Network Service Templates Spec-Janusz PIECZERAK</u>
- <u>GS NFV-IFA 014 v2.5.1 Network Service Templates Spec-Janusz PIECZERAK</u>
- <u>GR NFV-IFA 015 v3.1.1 Info Model Report-</u>Marc FLAUW
- <u>GR NFV-IFA 015 v2.5.1 Info Model Report-Marc FLAUW</u>
- <u>GR NFV-IFA 016 v2.5.1 Papyrus Guidelines-</u>Marc FLAUW
- <u>GR NFV-IFA 016 v3.1.1 Papyrus Guidelines-Marc FLAUW</u>
- <u>GR NFV-IFA 017 v3.1.1 UML Modeling Guidelines-Marc FLAUW</u>
- <u>GR NFV-IFA 017 v2.5.1 UML Modeling Guidelines-</u>Marc FLAUW
- GS NFV-IFA 030 v3.1.1 Multi Domain MANO spec-Haitao XIA
- <u>GS NFV-IFA 031 v3.1.1 NFV-MANO_mgmt_spec-Yusuke OKAZAKI</u>
- GS NFV-SOL 002 v2.5.1 Ve-Vnfm RESTful protocols spec-Jong-Hwa YI
- GS NFV-SOL 003 v2.5.1 Or-Vnfm RESTful protocols spec-Uwe RAUSCHENBACH
- <u>GS NFV-SOL 004 v2.5.1 VNF Package Stage 3 spec-</u>Andrei KOJUKHOV
- <u>GR NFV-TST 007 v2.5.1 MANO lop Testing Guidelines-</u>Carsten ROSSENHOEVEL
- <u>GS NFV-TST 008 v2.5.1 NFVI Compute and Nwk Metrics Spec-</u>Al MORTON
- <u>GS NFV-TST 008 v3.1.1 NFVI Compute and Nwk Metrics Spec-Al MORTON</u>

CHANGES @ NFV#22

1 Final Daft APPROVED for publication:

DGS/NFV-IFA027 "Performance Measurements Specification" ==> PUBLISHED (25 May)

1 NEW Work Items **APPROVED**:

DGR/NFV-TST011 "Test Domain and Description Language Recommendations"

1 NEW Work Items sent to Remove Consensus for Approval:

• NFV(18)000134r1 APPROVED (30 May) as DGS/NFV-IFA033 "SEC-MANO ref points - Interface Spec"

1 Work Item **STOPPED**:

• DGS/NFV-SEC015 "Security Specification for other MANO reference points"

Other changes:

- **3** Work Item Rapporteurs changed
 - IFA026: was Anatoly Andrianov (Nokia) changed-to--> Alex Leadbeater (BT).
 - <u>SOL006</u>: was Bruce THOMPSON (Cisco) changed-to--> to Mahesh Jethanandani (Cisco).



<u>TST007ed251</u>: was Akram AL SAWAF (EANC) – changed-to--> Carsten ROSSENHOEVEL (EANTC)

1 Work Item Scope changed

o IFA026. See scope change in contribution NFV(18)000127

1 Work Item **MOVED** from WG IFA to WG EVE

"Real-time/ultra-low latency aspects report": was IFA025 –moved-to-WG-EVE--> now EVE017





Table of Contents

Introduction	.1 DGR/NFV-SEC018 Remote Attestation Architecture report	23
CHANGES SINCE NFV#22	.1 DGS/NFV-SEC019 Architecture for Sec enhancement Spec	23
CHANGES @ NFV#22	. 2 DGS/NFV-SEC020 Id Mgmt & Security spec	
SUMMARY views of work in development	.5 DGS/NFV-SEC021 VNF Package Security Spec	
DETAILED view of active Work Items	D(CV/MEV/VEC(DD)) = ADLAccocc Tokon Cooc	24
EVE: 5 active Work Items	SOL: 13 active work items	-
DMI/NFV-EVE006 NFV Industry Roadmap	JGS/NFV-SOLUU1 TOSCA-based NFV descriptors spec	
DGS/NFV-EVE011 Cloud Native VNF Classification Spec	RGS/NFV-SOL002ed261 Ve-VIIIII RESTILI protocols - spec	
DMI/NFV-EVE015 Measuring Adoption		
DGR/NFV-EVE016 Report on Connection-based Virtual Services		
DGR/NFV-EVE017 Real-time/ultra-low latency aspects report	n RGS/NFV-SOL00320311 OF-VIIIII RESTIUL Protocols - spec	
IFA: 19 active Work Items	RGS/NFV-SOL004eu201 VNF Package Stage 5 - Spec	
RGS/NFV-IFA002ed321 Acceleration - VNF Intface Spec	RGS/NFV-SOL004ed311 VNF Package Stage 3 - spec	
RGS/NFV-IFA002ed321 Or-Vi ref point - Spec	DGS/NFV-SOL005ed251 OS-Ma-NIVO APIS	
RGS/NFV-IFA006ed321 Vi-Vnfm ref point - Spec	DG3/NFV-30L003E0201 US-IMa-IIIV0 APIS - Spec	
RGS/NFV-IFA000ed321 VI-VIIII Tel point - Spec	11 DG5/NFV-30L005eu311 OS-Ma-IIIVO APIS - Spec	
RGS/NFV-IFA008ed321 Ve-Vnfm ref point - Spec	DGS/NFV-SOLOOD FANG based NFV Descriptors spec	
RGS/NFV-IFA008ed321 Ve-Viiin rel point - Spec	DGS/NFV-SOL007 NSD file structure spec	
RGS/NFV-IFA010ed321 MARO Functional Rqms - Spec		
RGS/NFV-IFA011ed201 VNF Packaging - Spec	131: 7 active work items	
DGR/NFV-IFA012 Os-Ma-Nfvo ref point Spec - svc mgmt & info model		
RGS/NFV-IFA012 Os-Ma-Nfvo ref point Spec - svc fight & fillo filoder		
	RGR/NFV-131007ed201 MANO lop resting duidennes	31
	RGS/NFV-151008ed321 NFV1 compute & Nwk Metrics - Spec	
RGS/NFV-IFA014ed321 Network Service Templates Spec DGS/NFV-IFA026 Architecture enhancement for Sec Mgmt Spec		
		32
	DGR/INEV-LSTUTT ISLUOMAID & Description Lang	33
DGS/NFV-IFA030ed321 Multi Domain MANO - spec	DELATED VIEW OF PUBLINHED WORK	34
DGS/NFV-IFA031ed321 NFV-MANO mgmt - spec		
DGS/NFV-IFA032 Multi-site Intfaces & InfoModel spec		
DGS/NFV-IFA033 SEC-MANO ref points - Intface Spec		
DGR/NFV-IFA034 Licence Management support REL: 3 active Work Items		
DGR/NFV-REL008 Error Handling report		
DGS/NFV-REL009 NFV Reliability Requirements		
DGR/NFV-REL010 Resiliency for Network Slicing report		
SEC: 8 active Work Items		
DGR/NFV-SEC005 Certificate mgmt report		
DGR/NFV-SEC016 Location, locstamp and timestamp		
DGR/NFV-SEC017 Sec Pol Guidelines Report	22	



SUMMARY views of work in development

Note: hyperlinks under WI References link to detailed Work Item information on ETSI portal, the current Ver hyperlinks link to the latest draft file (at snapshot time).

Reference	Rapporteur	Current status	Current	,	Stable	Final	WG App	ТВ Арр	PUB
			Ver		Draft	draft		1	as v
DMI/NFV-EVE006 "NFV Industry Roadmap"	Tony SABOORIAN	Early draft	<u>0.0.9</u>	Feb 2018	Jul 2018	Aug 2018	Aug 2018	Sep 2018	
DGS/NFV-EVE011 "Cloud Native VNF Classification Spec"	Marcus BRUNNER	Stable draft	<u>0.0.19</u>		Sep 2018	Aug 2018	Aug 2018	Sep 2018	3.1.1
DMI/NFV-EVE015 "Measuring Adoption"	Cecilia CORBI	Early draft	<u>0.0.1</u>	Aug 2018	Jun 2018	Nov 2018	Nov 2018		
DGR/NFV-EVE016 "Report on Connection-based Virtual Services"	Mehmet TOY	Early draft	<u>0.0.1</u>	Dec 2017	Dec 2018	Jan 2019	Jan 2019	Feb 2019	1.1.1
DGR/NFV-EVE017 "Real-time/ultra-low latency aspects report"	Zarrar YOUSAF	Early draft	0.0.3	Jun 2018	Dec 2018	Jan 2019	Jan 2019	Feb 2019	1.1.1
RGS/NFV-IFA002ed321 "Acceleration - VNF Intface Spec"	Abdel Hafiz RABI	Start of work		Feb 2018	Mar 2018	May 2018	May 2018	Jun 2018	3.1.1
DGS/NFV-IFA033 "SEC-MANO ref points - Intface Spec"	Leslie WILLIS	Early draft	<u>0.0.1</u>	Sep 2018	Nov 2018	Nov 2018		Dec 2018	3.1.1
DGR/NFV-IFA034 "Licence Management support"	Abinash VISHWAKARMA	Adoption of WI		Sep 2018	Oct 2018	Nov 2018		Dec 2018	3.1.1
RGS/NFV-IFA005ed321 "Or-Vi ref point - Spec"	Andy BENNETT	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
RGS/NFV-IFA006ed321 "Vi-Vnfm ref point - Spec"	Zarrar YOUSAF	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
RGS/NFV-IFA007ed321 "Or-Vnfm ref point - Spec"	Vlademir BRUSSE	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
RGS/NFV-IFA008ed321 "Ve-Vnfm ref point - Spec"	Xu YANG	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
RGS/NFV-IFA010ed321 "MANO Functional Rgmts - Spec"	Ulrich KLEBER	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
DGR/NFV-IFA012 "Os-Ma-Nfvo ref point Spec - svc mgmt & info	Michael KLOTZ	Stable draft	<u>0.12.0</u>		Aug 2018	Dec 2018	Dec 2018	Jan 2019	3.1.1
<u>model"</u> RGS/NFV-IFA011ed261 "VNF Packaging - Spec"	Rajavarma BHYRRAJU	Adaption of 14/1				Dec 2018	Dec 2018	Jan 2019	2.6.1
	Rajavarma BHYRRAJU	Adoption of WI	-						
RGS/NFV-IFA011ed321 "VNF Packaging - Spec"	-	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
RGS/NFV-IFA013ed321 "Os-Ma-Nfvo ref point Spec - info model"	Ulrich KLEBER	Early draft	<u>3.1.2</u>	Aug 2018		Dec 2018		Jan 2019	3.2.1
DGS/NFV-IFA026 "Architecture enhancement for Sec Mgmt Spec"	Alex LEADBEATER	Early draft	<u>0.3.0</u>	Aug 2017		Apr 2019	Apr 2019	May 2019	3.1.1
DGR/NFV-IFA029 "Arch. enhancement for Cloud-native & PaaS"	Marcus BRUNNER	Early draft	<u>0.9.0</u>	Aug 2018	Nov 2018	Dec 2018	Dec 2018	Jan 2019	3.1.1
RGS/NFV-IFA014ed261 "Network Service Templates Spec"	Janusz PIECZERAK	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	2.6.1
RGS/NFV-IFA014ed321 "Network Service Templates Spec"	Janusz PIECZERAK	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
DGS/NFV-IFA032 "Multi-site Intfaces & InfoModel spec"	Zarrar YOUSAF	Early draft	0.4.0	Jul 2018	Dec 2018	Jan 2019	Jan 2019	Feb 2019	3.1.1
DGS/NFV-IFA030ed321 "Multi Domain MANO - spec"	Haitao XIA	Early draft	<u>3.1.1</u>	Sep 2018		Dec 2018	Dec 2018	Jan 2019	3.2.1
DGS/NFV-IFA031ed321 "NFV-MANO mgmt - spec"	Yusuke OKAZAKI	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
DGR/NFV-REL008 "Error Handling report"	Stefan ARNTZEN	Early draft	<u>0.0.6</u>	Sep 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	1.1.1
DGS/NFV-REL009 "NFV Reliability Requirements"	Percy TARAPORE	Early draft	<u>0.0.4</u>	Jun 2018	Sep 2018	Nov 2018	Nov 2018	Dec 2018	1.1.1
DGR/NFV-REL010 "Resiliency for Network Slicing report"	Chidung LAC	Early draft	0.0.4	Sep 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	1.1.1



Reference	Rapporteur	Current status	Current Ver		Stable Draft	Final draft	WG App	ТВ Арр	PUB as v
DGR/NFV-SEC005 "Certificate mgmt report"	Li FENG	Early draft	0.0.12		Mar 2018		Jun 2018	Sep 2018	1.1.1
DGR/NFV-SEC016 "Location, locstamp and timestamp"	Pierre COURBON	Early draft	<u>0.0.2</u>	Feb 2018	Sep 2018	Nov 2018	Jan 2019	Feb 2019	1.1.1
DGR/NFV-SEC017 "Sec Pol Guidelines Report"	Fei Ll	Early draft	<u>0.0.3</u>	May 2018	Sep 2018	Dec 2018	Jan 2019	Feb 2019	1.1.1
DGR/NFV-SEC018 "Remote Attestation Architecture report"	Andre REIN	Early draft	<u>0.0.6</u>	Dec 2017	May 2018	Dec 2018	Jan 2019	Feb 2019	1.1.1
DGS/NFV-SEC019 "Architecture for Sec enhancement Spec"	Alex LEADBEATER	Start of work		May 2018	Jul 2018	Dec 2018	Jan 2019	Feb 2019	3.1.1
DGS/NFV-SEC020 "Id Mgmt & Security spec"	Leslie WILLIS	Start of work		May 2018	Nov 2018	Dec 2018	Dec 2018	Jan 2019	3.1.1
DGS/NFV-SEC021 "VNF Package Security Spec"	Pradheep SINGARAVELU	Stable draft	<u>0.0.2</u>		Jun 2018	Dec 2017	Dec 2017	Jan 2019	2.4.1
DGS/NFV-SEC022 "API Access Token Spec"	Anne-Marie PRADEN	Early draft	<u>0.0.5</u>	Sep 2018	May 2018	Nov 2018	Nov 2018	Dec 2018	2.1.1
DGS/NFV-SOL001 "TOSCA-based NFV descriptors spec"	Shitao LI	Early draft	<u>0.10.0</u>	Aug 2018	Jul 2018	Aug 2018	Aug 2018	Sep 2018	2.4.1
RGS/NFV-SOL002ed261 "Ve-Vnfm RESTful protocols - spec"	Jong-Hwa YI	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	2.6.1
RGS/NFV-SOL002ed311 "Ve-Vnfm RESTful protocols - spec"	Yuya KUNO	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.1.1
RGS/NFV-SOL003ed261 "Or-Vnfm RESTful protocols - spec"	Uwe RAUSCHENBACH	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	2.6.1
RGS/NFV-SOL003ed311 "Or-Vnfm RESTful protocols - spec"	Uwe RAUSCHENBACH	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.1.1
RGS/NFV-SOL004ed261 "VNF Package Stage 3 - spec"	Andrei KOJUKHOV	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	2.6.1
RGS/NFV-SOL004ed311 "VNF Package Stage 3 - spec"	Andrei KOJUKHOV	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.1.1
DGS/NFV-SOL005ed251 "Os-Ma-nfvo APIs"	Ernest BAYHA	Draft receipt by ETSI Secretariat	<u>2.4.8</u>					Sep 2018	2.5.1
DGS/NFV-SOL005ed261 "Os-Ma-nfvo APIs - spec"	Vlademir BRUSSE	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	2.6.1
DGS/NFV-SOL005ed311 "Os-Ma-nfvo APIs - spec"	Vlademir BRUSSE	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.1.1
DGS/NFV-SOL006 "YANG based NFV Descriptors spec"	Mahesh JETHANANDANI	Early draft	<u>0.0.2</u>	Oct 2017	Dec 2018	Feb 2019	Feb 2019	Mar 2019	2.4.1
DGS/NFV-SOL007 "NSD file structure spec"	Manchang JU	Early draft	<u>0.0.3</u>	Aug 2018	Sep 2018	Oct 2018	Oct 2018	Nov 2018	2.6.1
RGR/NFV-TST007ed261 "MANO lop Testing Guidelines"	Carsten ROSSENHOEVEL	Adoption of WI				Dec 2018	Dec 2018	Jan 2018	2.6.1
DMI/NFV-TST003 "Open Source Components for NFV"	Gergely CSATARI	Final draft				Sep 2017	Nov 2017	Dec 2017	
DGR/NFV-TST006 "CICD & Devops report"	Pierre LYNCH	Stable draft	<u>0.0.9</u>		May 2018	Oct 2018	Nov 2018	Dec 2018	1.1.1
RGS/NFV-TST008ed321 "NFVI Compute & Nwk Metrics - Spec"	AI MORTON	Adoption of WI				Dec 2018	Dec 2018	Jan 2019	3.2.1
DMI/NFV-SOL008 "OpenAPI Work Programme"	Vlademir BRUSSE	Adoption of WI							
DGS/NFV-TST009 "NFVI_Benchmarks"	AI MORTON	Final draft	<u>0.0.15</u>			Aug 2018	Aug 2018	Sep 2018	1.1.1
DGS/NFV-TST010 "API Conformance Testing"	Pierre LYNCH	Early draft	<u>0.0.3</u>	Aug 2018	Dec 2018	Apr 2019	Apr 2019	May 2019	2.1.1
DGR/NFV-TST011 "Tst Domain & Description Lang."	Frank MASSOUDIAN	Early draft	<u>0.0.3</u>	Aug 2018		Nov 2018		Dec 2018	1.1.1



DETAILED view of active Work Items

EVE: 5 active Work Items

DMI/NFV-EVE	<u>006</u> NF	V Industry Roadma	ар	Rapporteur:	Tony SABOORIAN Huawei
Title: N	etwork Function	ons Virtualisation	(NFV);		Huwer
nue:	cosystem				
	•	Industry Roadma	n		
	V Industry Roadm		F		
Current status:	arly draft since 20			approval by 2018.0	09.15
Early draft plan:	2018.02.27		2010 00 10		
Stable draft plar	: 2018.07.13	WG Approval plan:	2018.08.10	Pub Plan: as	v
Final draft plan:	2018.08.10	TB Approval plan:	2018.09.15		
to include informa industry bodies (bo are either (i) depei From the ISG missi	tion on the current p oth specification dev odent on NFV activiti on statement: "The	oses the development of a planned activities of the IS elopment bodies as well a ies, or where (ii) NFV ISG NFV ISG's mission is to fa iffection implementation	GG in terms of its deliver as open source commun activities are depender cilitate the industry tra	rables, as well as info nities) on their expec nt on activities in tho nsformation and dev	ormation from other ted deliverables which se other bodies. velopment of an open,
to include informa industry bodies (b are either (i) deper From the ISG missi interoperable, eco ecosystem, the ISC requirements, as v NFV concepts with	tion on the current p oth specification dev odent on NFV activiti on statement: "The system through spec maintains core NFV vell as liaison relation in their specializatio	planned activities of the IS elopment bodies as well of ies, or where (ii) NFV ISG NFV ISG's mission is to fa cification, implementation / documentation, includin nships with other speciali nsAs the focal point for	G in terms of its deliver as open source commun activities are dependen cilitate the industry tra n and deployment expe og an architectural fram ist SDOs and industry an the NFV ecosystem, the	rables, as well as info nities) on their expec nt on activities in tho nsformation and dev rience. As the focal-p nework and associate liances contributing e ISG provides direct	ormation from other ted deliverables which ise other bodies. velopment of an open, point for the NFV ed technical technology or applying ion for NFV related
to include informa industry bodies (bu are either (i) depen From the ISG missi interoperable, eco ecosystem, the ISG requirements, as v NFV concepts with messaging, confer communities." The roadmap shou	tion on the current p oth specification dev odent on NFV activiti on statement: "The system through spece maintains core NFV rell as liaison relation in their specializatio ences and events as Id include identification	Danned activities of the IS elopment bodies as well of ies, or where (ii) NFV ISG NFV ISG's mission is to fa cification, implementation / documentation, includin nships with other speciali nsAs the focal point for well as proactively foster	GG in terms of its deliver as open source commun activities are dependen cilitate the industry tra in and deployment expe og an architectural fram ist SDOs and industry a the NFV ecosystem, the ing continuing innovation	rables, as well as info nities) on their expect nt on activities in tho nsformation and dev rience. As the focal-p nework and associate liances contributing e ISG provides direct on in the NFV concep	ormation from other ted deliverables which ise other bodies. velopment of an open, point for the NFV ed technical technology or applying ion for NFV related pt in academic research
to include informa industry bodies (bu are either (i) depen From the ISG missi interoperable, eco ecosystem, the ISG requirements, as v NFV concepts with messaging, confer communities." The roadmap shou and the dependen	tion on the current p oth specification dev odent on NFV activiti on statement: "The system through spece maintains core NFV rell as liaison relation in their specializatio ences and events as Id include identification cies with the ETSI NF	Nanned activities of the IS elopment bodies as well of ies, or where (ii) NFV ISG NFV ISG's mission is to fa cification, implementation / documentation, includin nships with other speciali nsAs the focal point for well as proactively foster tion of other industry bod V ISG work program.	GG in terms of its deliver as open source commun activities are dependen cilitate the industry tra in and deployment expe- og an architectural fram ist SDOs and industry an the NFV ecosystem, the ing continuing innovation lies with relevant NFV v	rables, as well as info nities) on their expec- nt on activities in tho nsformation and dev rience. As the focal-p nework and associate liances contributing e ISG provides direct fon in the NFV concep work programs, their	ormation from other ted deliverables which ise other bodies. velopment of an open, point for the NFV ed technical technology or applying ion for NFV related pt in academic research deliverable milestones
to include informa industry bodies (b are either (i) depen- From the ISG missi interoperable, eco ecosystem, the ISG requirements, as v NFV concepts with messaging, confer communities." The roadmap shou and the dependen The information in Miscellaneous Iter (among others): st	tion on the current p oth specification dev odent on NFV activiti on statement: "The system through spece maintains core NFV vell as liaison relation in their specializatio ences and events as Id include identificat cies with the ETSI NF this MI is recognized n, the results of this atus reports, presen	Danned activities of the IS elopment bodies as well of ies, or where (ii) NFV ISG NFV ISG's mission is to fa cification, implementation / documentation, includin nships with other speciali nsAs the focal point for well as proactively foster	G in terms of its deliver as open source commun- activities are dependen cilitate the industry tra n and deployment expe- ng an architectural fram ist SDOs and industry an the NFV ecosystem, the ing continuing innovation lies with relevant NFV v ange as the work unfolds of any type of ETSI deliver a continuous manner.	rables, as well as info nities) on their expec- nt on activities in tho nsformation and dev rience. As the focal-p nework and associate liances contributing e ISG provides direct fon in the NFV concep- vork programs, their in various industry is rable. Instead, output	ormation from other ted deliverables which ise other bodies. velopment of an open, point for the NFV ed technical technology or applying ion for NFV related pt in academic research deliverable milestones bodies. As a uts of this MI will include

DGS/NFV-E	EVE011 Clou	ud Native VNF Classification Spec	Rapporteur:	Marcus BRUNNER SWISSCOM				
Title: Network Functions Virtualisation (NFV) Release 3; Virtualised Network Function; Specification of the Classification of Cloud Native VNF implementations								
Working title:	Cloud Native VNF Cla							
	us: Stable draft since 20 ttp://docbox.etsi.org/ISG/NFV/0	018.09.10 version 0.0.19 Next status Final of pen/Drafts/EVE011_Cloud_Native_VNF_Classification_Spec/NFV		val by 2018.08.23 late! as of 2018.09.26				
Early draft pl Stable draft p Final draft pl	plan: 2018.09.10	WG Approval plan: 2018.08.30 TB Approval plan: 2018.09.26	Pub Plan: 20	18.11.07 as v3.1.1				
Scope: In an common platfu This document example, level	NFV environment, netwo form. t will specify a set of non- l of separation of logic and vill contain normative pro 7.02.24 Support Compa	rk operators are expected to configure and deploy functional parameters to classify and characterize of d state, degree of scale-out, memory footprint, use visions in order to classify the VNF implementation nies: SWISSCOM, TELEFONICA, Telecom Italia, VODAFONI E, AT&T, Huawei, Canonical Group Limited	any VNF implem of accelerators, s as cloud native	entation including, for and more.This 2.				



DMI/NFV-E	<u>VE015</u> Me	asuring Adoption	Rapporteur:	Cecilia CORB Telecom Italia
The:	Ecosystem	ons Virtualisation (NFV)		
	Measuring Adop	tion of NFV specifications		
Working title:	Measuring Adoption			
	s: Early draft since 202 p://docbox.etsi.org/ISG/NFV/C	L8.08.27 version 0.0.1 Next stat Open/Drafts/EVE015_Measuring_Adoption/NFV-EVEC	tus Stable draft by 2018.06. D15v001.rar as of 2018.09.26	15 late!
Early draft pla	n: 2018.08.27	MC Assessed slame 2018 11 20		
Stable draft p	lan: 2018.06.15	WG Approval plan: 2018.11.30	Pub Plan: 2018.	12.31 as v
Final draft pla	n: 2018.11.30	TB Approval plan:		
research projec - solutions - specifications identified adopt The outcome of the level of indu	ts and other industry pl (i.e. protocols, APIs and tion issues. ⁵ this work item will inclu Istry adoption of ISG NF	ing information from standardization boa ayers on the level of adoption of ETSI NFV data models). This information will help ude a report, in the form of a PowerPoint V specifications and recommendations or e might be published on the ETSI NFV Wel	' specifications, with emphasi the ISG define corrective mea presentation along with a na actions, if any, needing to b	s on sures to overcome rrative document on

Adoption: 2017.08.18 Support Companies: ORANGE, PT PORTUGAL, TELEFONICA, Telecom Italia, CableLabs, DOCOMO

		Repor Servic	t on Connectio es	n-ba	sed Virtual		Rapporteur:	Mehmet TOY Verizon	
Title:	Evo	lution and	Eco	Virtualisation system; tion-based Virt					
Working title:	Repo	rt on Conned	tion-bo	ased Virtual Service	<u>?</u> S				
Current stat		-		2.21 version 0. /Drafts/EVE016_Connectio				draft by 2018.12 NFV-EVE016v001.docx	
Early draft p Stable draft Final draft p	plan:	2017.12.21 2018.12.06 2019.01.28		/G Approval plan: B Approval plan:		9.01.28 9.02.28		Pub Plan: 2019	9.04.11 as v1.1.1
data center ir This Work Ite. - Describe use - Identify reco Cloud Service - Identify reco Note that the	the clo m will: cases c mmena Provide mmena NFV Ch Multisit	ud (e.g. Virtua and identify g lations for inta rs(cSPs) , inclu lations for cor arging capaba e within IFA-0	al Servic aps with erfaces o iding th nection ilities wi 22 may	are provided over c es defined by MEF). hin the NFV Architect of service user and vin e interface between and connection end ithin EVE-008 and NF be applied to work o : IBM EUROPE, DT, ZTE,	ure Fra rtual r Telco point V Secu f this	amework to sup resources (e.g. ' and cSP, to sup s to support the urity capabilitie: Work Item.	oport c VM, Co oport ti e virtua	onnection-based ntainers), and in he virtual service: Il services.	Virtual Services; terfaces between



DGR/NFV-E	VE0 1		al-time/ultra-low	latency aspects	Rapporteur:	Zarrar YOUSAF
		re	port			
Title:	Net	work Functi	ons Virtualisation	(NFV);		
nue:	Mar	nagement a	nd Orchestration;			
		•		e/ultra-low latency	aspects in N	FV related to
			work handling	,	,	
Working title:			latency aspects report			
	ıs: <mark>Ea</mark> r	ly draft since 20	18.06.01 version 0			
Early draft pl	an:	2018.06.01		2010 01 20		
Stable draft p	olan:	2018.12.06	WG Approval plan:	2019.01.28 2019.02.28	Pub Plan: 2019	0.04.11 as v1.1.1
Final draft pl	an:	2019.01.28	TB Approval plan:	2019.02.28		
Scope: The w	ork ite	m will encompas	s activities related to real	l-time management and o	rchestration of ultro	a low latency services.
This work item	covers	5				
			s (potentially from any o	f the following areas: Auto	omotive industry, he	ealth care,
entertainment						
	-	e NFV MANO arc	hitectural framework incl	luding interfaces regarding	g gaps to support th	ne real-time realisation
of such use cas		acommondation	concerning adaption of	the NFV architecture, if ne	cossan	
				ng interfaces and/or the cr		face(s) if necessary
	-	iverable will be ir		ig interjaces und/or the cr		
Adoption: 2016			,	DT, NetCracker, CENX Inc., ico	onectiv	



IFA: 19 active Work Items

RGS/NFV-II	FA00	<u>2ed321</u> Acc	celeration - VNF In	tface Spec		Rapporteur:	Abdel Hafiz RABI VODAFONE Group Plc
Title:	Acc	eleration Te	ons Virtualisation chnologies; Specification	(NFV) Relea	ase 3;		
Working title:		leration - VNF In					
Current statu No draft availab		art of work since 2018.09.26	2017.12.08	Next statu	is Early (draft by 2018.02	.01 late!
Early draft pl Stable draft p Final draft pl	olan:	2018.02.01 2018.03.01 2018.05.24	WG Approval plan: TB Approval plan:	2018.05.24 2018.06.21		Pub Plan: 201	8.07.26 as v3.1.1
This edition wi the former Rel The scope of ti 1) Requirement regardless of t 2) A deployme The list of abst	ll add ease 2 his wo ts for heir in heir in nt mo	requirements and edition summariz rk item is to specif a set of abstract ir nplementation. Idel of the above in nterfaces to be spe	y: nterfaces, enabling a VNF	es to support the R To leverage accele To the use cases de	elease 3 ; eration s	ervices from the i	nfrastructure,

	Vi ref point - Spec	Rapporteur:	Andy BENNET Samsung R&D Institute U
Management an	point - Interface and Informat		cation
Current status: TB adoption of WI		is Start of work by 2018.	.08.24 late!
Early draft plan: Stable draft plan: Final draft plan: 2018.12.31	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31	Pub Plan: 201	9.02.18 as v3.2.1
			etween the NFVO and



RGS/NFV-IFA006ed321 Vi-	Vnfm ref point - Sp	bec	Rapporteur:	Zarrar YOUSAF
		(NFV) Release 3;	I	
	nd Orchestration;			
	ce point - Interfac	ce and Information	Model Speci	fication
Working title: Vi-Vnfm ref point - S	pec			
Current status: TB adoption of WI	since 2018.08.24	Next status Start of	of work by 2018.0	8.24 late!
No draft available as of 2018.09.26			1	
Early draft plan:	WG Approval plan:	2018.12.31		
Stable draft plan:		2019.01.31	Pub Plan: 2019.	02.18 as v3.2.1
Final draft plan: 2018.12.31	TB Approval plan:	2019.01.31		
Scope: This revision of NFV-IFA 006 d	continues the developme	nt of the specification as pa	art of the NFV Relea	ise 3.
This edition will add requirements and				
features, and it will extend the scope o				
This Work Item will describe the compl	ete functional requireme	nts for interfaces on the Vi	-Vnfm reference po	int in between the
VNFM and the VIM(s), to address the f	unctions specified in GS I	NFV MAN 001. The results o	of the work item wi	ll include:
1) Detailed description of interfaces an	d its operations function	ality, and		
2) Information elements of:				
a) Virtualized resource management				
i) Lifecycle management of virtual	ized resources, including	instantiation, modification,	, configuration and	termination of such
virtualized resources.				
ii) Fault management of virtualize				
iii) Performance management of v				
b) Resource management interfaces				
i) Resources reservation informati				
ii) Virtualized resources informatic	ni retrievai.			
iii) Software image management. The resulting deliverable will contain n	ormativo provisions			
This revision of NFV-IFA 006 will addre		te features listed in Annex F	R of the Release 2 C	Definition $(v0.10.0)$
Where needed, it will continue the pre-				
This revision will reflect the maintenan				
	anies: NEC, PT Portugal, DO			

RGS/NFV-IFA007ed321 Or-V	/nfm ref point - Spec	Rapporteur: Vlademir BRUSSE Ericsson
Management an	ns Virtualisation (NFV) Release 3 d Orchestration; ce point - Interface and Information	
Working title: Or-Vnfm ref point - Sp	Dec	
Current status: TB adoption of WI s No draft available as of 2018.09.26	since 2018.08.24 Next status Status	t of work by 2018.08.24 late!
Early draft plan:Stable draft plan:Final draft plan:2018.12.31	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31	Pub Plan: 2019.02.08 as v3.2.1
This edition will add requirements and s features, and it will extend the scope of The scope of the Work Item will include between the VNFM and the NFVO, to a The results of the work item will include 1) Detailed description of interfaces and 2) Information flows and information el a) VNF lifecycle management interfaces	l its operations functionality. ements of: , for: ling the instantiation, modification, update, scal. s. ting. faces, for: anagement. al and management.	ation model to support the Release 3 fter: aces on the Or-Vnfm reference point 1.



This revision of NFV-IFA 007 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0).Where needed, it will continue the previous version to enhance and complete the specified Release 3 features.This revision will reflect the maintenance performed to NFV Release 2 documentation and of already specified Release 3 features.Adoption: 2018.08.24Support Companies: Ericsson, PT Portugal, Orange, DOCOMO, Telefonica, Nokia

RGS/NFV-IFA008	<u>ed321</u> Ve-V	Vnfm ref point - S	pec	Rapporteur:	Xu YANG _{Huawei}
Title: Netw	ork Functio	ns Virtualisation	(NFV) Release 3;		
Mana	agement an	d Orchestration;			
Ve-V	'nfm referen	ce point - Interfa	ice and Information	Model Specificat	tion
	fm ref point - Sp				
Current status: TB a	doption of WI s	ince 2018.08.24	Next status Start of	of work by 2018.08.24 lat	te!
No draft available as of 20	18.09.26				
Early draft plan:		WG Approval plan:	2018.12.31		
Stable draft plan:		TB Approval plan:	2019.01.31	Pub Plan: 2019.02.18	as v3.2.1
Final draft plan:	2018.12.31		2015.01.51		
This edition will add re features, and it will exit The reference point Ve informative GS NFV M, the VNF Manager and management of that V management interface technical specifications The results of the work Detailed description Detailed information Lifecycle managemen Lifecycle change notij Detailed information VNF fault managemen VNF performance ma VNF configuration Detailed information GS NFV MAN 001) nee management operatio Validation of interface protocols needed to im The WI will leverage G in close collaboration v contain normative pro This revision of NFV-IF/ Where needed, it will operation	quirements and s tend the scope of -Vnfm described AN001 in two ref an EM associated (NF. The scope of es over the referen- scan subsequent) item will include of interfaces and model requirement of VNFs, includi fications of VNFs, model requirement to f VNFs, includi fications of VNFs, model requirement the exposed ns. the operations and the operations and the operations and the operations and the other org visions. A 008 will address continue the previous and the previous and the other org visions.	pecification of interface the former Release 2 ed as part of the NFV archi ference points - one betw d with that VNF (Ve-Vnfi the Work Item will inclu- nce points between the ly be defined, for interoper its operations functional ents of related VNF lifecy ing the instantiation, model ents of other related ger ents of other related ger linformation model requirent ind will consider any app ganizations working on t s the Release 3 candidat ious version to enhance	lity. ycle management interface odification, update, scaling, neric VNF management inter f VNF/EM and VNFM, in sup uirements against end-to-e nents are not covered in thi plicable other guidelines, st these aspects, such as 3GPP re features listed in Annex B and complete the specified	on model to support the R r: FV002 is actually further s d a VNF (Ve-Vnfm-vnf) and ints are mainly used for the rmation requirements of o sed on which complete int s, for: healing and termination erfaces, for: ces (new and/or previousl oport of necessary VNF-rea nd flows. Data models/scl is deliverable. udies and requirements a 2 SA5 and TMF. The deliver R of the Release 3 Definitio Release 3 features.	plit in the d one between e lifecycle all VNF erfaces of VNFs. of VNFs. lated hemas and s appropriate, rable will on (v0.10.0).
			ease 2 documentation and		se 3 features.
Adoption: 2018.08.24	Support Compar	nies: Huawei, PT Portugal,	Orange, DOCOMO, Telefonica,	ZTE, Ericsson	



RGS/NEV-II	FA010ed32	2 <u>1</u> MA	NO Functional Rq	mts - Spec	Rapporteur:	Ulrich KLEBER Huawei
Title:	Network	Functio	ns Virtualisation	(NFV) Release	e 3;	
mie:			d Orchestration;	· · ·		
			rements specific			
Working title:	MANO Fund					
Current statu			since 2018.08.24	Next status	Start of work by 2018.	.08.24 late!
No draft availab	· · · · · · · · · · · · · · · · · · ·			1		
Early draft pl	an:			2010 12 21		
Stable draft	olan:		WG Approval plan:	2018.12.31	Pub Plan: 201	9.02.18 as v3.2.1
Final draft pl		12.31	TB Approval plan:	2019.01.31		
This edition wi former Release This WI aims f	ill add function e 2 edition sun or a NFV Phase	aal requirer nmarized h e 2 deliverd	ontinues the developmen nents for NFV-MANO to ereafter: able containing all the no ation, VNF Healing, Heal	support the Release	3 features, and it will ex	xtend the scope of the
This edition wi former Release This WI aims for orchestration The following - Consolidating management unless specific	Il add function e 2 edition sun or a NFV Phase e.g. to support aspects need t g all the function and orchestrations to corrections to	al requirer nmarized h e 2 delivero : VNF migro o be consic onal requir tion. ISG lev certain red	nents for NFV-MANO to ereafter: able containing all the no ation, VNF Healing, Heal dered (in-scope) while de ements scattered in vari yel requirements from N quirements are agreed in	support the Release ormative functional re th-check. eveloping such a deliv ious phase 1 GSs (SW. FV004 should be cons n ISG level.	3 features, and it will ex equirements for NFV mo verable A GS, REL GS, INF GSs, I	xtend the scope of the anagement and MAN GS, NFV004) for
This edition wi former Release This WI aims for orchestration of The following - Consolidating management of unless specific - Refining func The target del The other inter interfaces are This revision of Where needed	Il add functior e 2 edition sun or a NFV Phase e.g. to support aspects need t g all the functii and orchestration corrections to tional requirel iverable is a re rface normativ not in scope o f NFV-IFA 010 l, it will continu	al requirer marized h e 2 delivera vVNF migra o be consid onal requir tion. ISG lev certain rea ments for c quirement we WI can p f this WI. T will addres ue the prev	nents for NFV-MANO to ereafter: able containing all the no ation, VNF Healing, Heal lered (in-scope) while de ements scattered in vari vel requirements from N	support the Release ormative functional re th-check. eveloping such a deliv jous phase 1 GSs (SW) FV004 should be cons n ISG level. e 1 d by NFV managemen functional requiremen contain normative pro te features listed in A and complete the spo	3 features, and it will ex equirements for NFV mo verable A GS, REL GS, INF GSs, I sidered as default requi nt and orchestration int nts on interfaces and m ovisions. nnex B of the Release 3 ecified Release 3 featur	xtend the scope of the anagement and MAN GS, NFV004) for irement for phase 2 rerface normative work. odels related to Definition (v0.10.0). res.

RGS/NFV-IFA	011ed261 VN	F Packaging - Spec	Rapporteur: Rajavarma BHYRRAJU Ericsson				
Title:Network Functions Virtualisation (NFV) Release 2; Management and Orchestration;							
V	NF Descriptor	and Packaging Specification					
Working title: V	NF Packaging - Spec	2					
Current status: No draft available a	TB adoption of WI of 2018.09.26	since 2018.08.24 Next status Sta	art of work by 2018.08.24 late!				
Early draft plan	:						
Stable draft pla	n:	WG Approval plan: 2018.12.31	Pub Plan: 2019.02.18 as v2.6.1				
Final draft plan	2018.12.31	TB Approval plan: 2019.01.31					
applies editorial r modify features, i IFA 011 provides resource requiren	nodifications (i.e. Corr nor does it extend the requirements for the s nents in an interopera		TWPs Annex L). This edition does not add or red hereafter: be the VNF properties and associated				
The focus is on VI considerations.	IF packaging, meta-m	odel descriptors (e.g. VNFD) and package integ	rity and security				
Adoption: 2018.08	.24 Support Compa	nies: Ericsson, PT Portugal, Orange, Huawei, DOCOM	O, Telefonica				



RGS/NFV-IFA011ed321 VNF	Packaging - Spec		Rapporteur:	Rajavarma BHYRRAJU Ericsson
Management an VNF Descriptor		(NFV) Release 3;		
Working title: VNF Packaging - Spec	•			
Current status: TB adoption of WI s No draft available as of 2018.09.26	since 2018.08.24	Next status Start of	of work by 20	18.08.24 late!
Early draft plan:Stable draft plan:Final draft plan:2018.12.31	WG Approval plan: TB Approval plan:	2018.12.31 2019.01.31	Pub Plan: 2	019.02.18 as v3.2.1
Scope: This revision of NFV-IFA 011 co This edition will add functional requirent will extend the scope of the former Rele This Work Item will develop a specificat work item will build from the requirent machine, VNF design patterns, and the The new work item will consider a holis development as well as operational view Analysis for this WI will use and potenti detailing actors and NFV Architectural H developments related to software proce Deliverables for this work item will be a - Requirements for the structure and fou- Extensible language independent meta work on VNFD. This will require using co -Recommendation for Implementation of requirements for extension of) existing This work item will benefit from the SDO	nents and specification of case 2 edition summarize ion for packaging VNFs(ents captured in the SWA VNF Descriptor informat tic end-to-end view of th ws. ally refine End to end VN Framework functional blo urement as input into the n informative GS docume rmat of the VNF archive, n-model for describing th possistent terminology an ready packaging structur cloud services (e.g. TOSC	f the information model to ad hereafter: Virtual Network Functions) and MAN Group Specifica ion elements, among other e package lifecycle from de IF Package lifecycle manag ocks impacted. This new we e analysis. ent addressing: list of mandatory and opti e VNF properties and resou d refinement of the existin re by selecting and reusing (A) and network configurat	support the R to be delivere tion document rs. esign to runtim ement operation ork item will a onal files and a urce requirement g VNF model (e.g., profiling ion specification	telease 3 features, and it d to service providers. This ts related to the VNF state ne, thus capturing ions based on use cases, lso use other industry authorized formats ents buiding on existing g or identifying ons (e.g. DMTF, MEF).
tools, runtime package interpretors and The output of this work should be used SDOs identified in the analysis. This revision of NFV-IFA 011 will addres Where needed, it will continue the prev This revision will reflect the maintenance Adoption: 2018.08.24 Support Compa	as formal requirements f s the Release 3 candidati ious version to enhance o se performed to NFV Rele	for extensions into normati e features listed in Annex E and complete the specified	of the Release Release 3 fea of already spe	e 3 Definition (v0.10.0). tures.

DGR/NFV-	IFA01	1 <u>2</u> Os-	Ma-Nfvo ref poin	t Spec - svc mgmt	Rapporteur:	Michael KLOTZ	
		& i	nfo model			DT	
Title:	Net	twork Function	ons Virtualisation	(NFV) Release 3;			
inde.	Management and Orchestration;						
	Re	port on Os-N	a-Nfvo reference	point - application	and service	management	
			ecommendations			-	
Working title:	Os-N	Ma-Nfvo ref poir	t Spec - svc mgmt & ii	nfo model			
		able draft since 2				•	
		cbox.etsi.org/ISG/NFV/0	Dpen/Drafts/IFA012_Os-Ma-Nfv	o_ref_point_Specsvc_mgmt	info_model/NFV-IFA0	12v0120.zip as of 2018.09.26	
Early draft p			WG Approval plan:	2018.12.06			
Stable draft	•	2018.08.29	TB Approval plan:	2019.01.04	Pub Plan: 2019	9.02.15 as v3.1.1	
Final draft p		2018.12.01					
				and the corresponding reco			
				ions/services on top of Network			
			-	deling requirements and DC S shall be explored in the co			
	-			ndent on one or more NS(s			
addressed:		and higher letter af			,, opeoly.com/) end	jonotning itemie inn ze	
o E2E view							
o Assurance							
	-		Inventory management				
o Policy mana	J						
			oplications/services on to			· · · ·	
			n including creation and	modification (e.g. orchest	ration, launching	of a service and	
adaptation of	runnir	ig services)					



o Real-time capabilities

o Automation (recovery, healing, etc.)

o Monitoring/Tracing

o Testing o Advanced data analytics/Big data including usage of several data sources

o Interoperability

The deliverable will be informative.

Adoption: 2014.11.21 Support Companies: Nokia, Alcatel-Lucent, Hewlett-Packard, NEC, Telecom Italia, KPN N.V., DT, Cisco, Juniper, Amdocs Software Systems Ltd, SPRINT, Comptel Corporation, Huawei (UK)

RGS/NFV-IFA013ed321 Os-	Ma-Nfvo ref point Spec - info model	Rapporteur:	Ulrich KLEBER Huawei
Management an	ns Virtualisation (NFV) Release 3; d Orchestration; erence point - Interface and Informa	ation Model Sp	
Working title: Os-Ma-Nfvo ref point			
Current status: Early draft since 201		draft for approval b nodel/NFV-IFA013ed321v3	
Early draft plan:2018.08.29Stable draft plan:2018.12.31	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31	Pub Plan: 2019.0	2.18 as v3.2.1
This edition will add requirements and s features, and it will extend the scope of As described in the informative GS NFV reference point is used for all managem used for the lifecycle management Netw Work Item will include the detailed fund point Os-Ma-nfvo, based on which com purposes. The results of the work item • Detailed description of interfaces and • Detailed description of interfaces and • Detailed information model requirem • Management of NS Descriptor and VN • Lifecycle management of Network Ser NSs. • Lifecycle change notifications of NSs. • Complete and detailed information m • NS monitoring (e.g. NS fault informati • Policy Management • Detailed information model requirem MAN 001) needed to be exposed betwee • Validation of interface operations and Data models/schemas and protocols ne The WI will leverage GS NFV MAN001, of The deliverable will contain normative p This revision of NFV-IFA 013 will address Where needed, it will continue the prev This revision will reflect the maintenance	its operations functionality. ents of related NS lifecycle management interfaces IF Packages; vices, including the instantiation, modification, up odel requirements of other related NFV managem on retrieval and management, NS performance inf ents of any other NFV management interfaces (new en OSS and NFVO in support of necessary OSS-driv d information model requirements against end-to- ceded to implement the detailed functional require and will consider any applicable other guidelines, s	ion model to support er: ion the OSS and the NF c management frame onship between them) anagement interfaces quently be defined, fo 5, for: date, scaling, and terr ent interfaces, for: formation retrieval an w and/or previously d en E2E operations. end flows. ments are not coverent tudies and requireme B of the Release 3 Dej d Release 3 features.	the Release 3 V Orchestrator. This work, and mainly The scope of the sover the reference r interoperability mination, testing of ad management). lescribed in GS NFV d in this deliverable. ents as appropriate. finition (v0.10.0).



RGS/NFV-IFA014ed261 Ne	twork Service Templates Spec	Rapporteur:	Janusz PIECZERAK Orange		
Title:Network Functions Virtualisation (NFV) Release 2; Management and Orchestration;					
Working title: Network Service Ten	e Templates Specification				
Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!					
Early draft plan:Stable draft plan:Final draft plan:2018.12.31	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31	Pub Plan: 20	19.02.18 as v2.6.1		
Scope: This revision of NFV-IFA 014 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: IFA 014 specifies requirements and templates for describing Network Functions Virtualisation (NFV) Network Services (NSs) in the form of meta-data.					
Adoption: 2018.08.24 Support Comp	anies: Orange, PT Portugal, DOCOMO, Telefonica, ZTE, Hu	awei, Ericsson			

RGS/NFV-IFA014ed321 Net	work Service Tem	plates Spec	Rapporteur:	Janusz PIECZERAK Orange
Management an	ons Virtualisation d Orchestration; Templates Spec	(NFV) Release 3;		
Working title: Network Service Tem				
Current status: TB adoption of WI No draft available as of 2018.09.26		Next status Start	of work by 2018	3.08.24 late!
Early draft plan:	WG Approval plan:	2018.12.31		
Stable draft plan:	TB Approval plan:	2019.01.31	Pub Plan: 201	19.02.18 as v3.2.1
Final draft plan: 2018.12.31		2013.01.31		
Scope: This revision of NFV-IFA 014 cd This edition will add functional requirer will extend the scope of the former Rele This Work Item will develop a specificat to decribe Network Services. Examples of Network Service meta-date Descriptor and PNF Descriptor. This work item will build from the inform elements. Standardized meta-data templates are • describe the relationships between NS other constraints, such as those impose • describe the NFV infrastructure resour • describe the NFV infrastructure resour • describe for this work item will be ar - Requirements for the structure and for - A consistent meta-model, describing th The output of this work should be used SDOs. This revision of NFV-IFA 014 will address Where needed, it will continue the prev	ments and specification of case 2 edition summarize tion for describing Network a templates are Network mation captured in the N required for Network Se and VNFs and/or conne ed by the scope of the M free requirements for a N thin the scope of NFV inc n normative GS document mat of the various NS m the NS properties and result the NS networking propert as formal requirements	of the information model to ed hereafter: bork Service meta-data requ a Service Descriptor, VNF F MAN Group Specification d rvices to: ctivity to PNFs that are pa ANO GS MAN 001, 5 in a service provider envi luding NS lifecycle events t addressing: eta-data templates, bource requirements buildin ties and resource requirent for extensions into normatice features listed in Annex	o support the Rel uirements and me orwarding Graph ocuments related rt of the NS, alon ronment (eg. scaling, upgi nents building,. tive specifications B of the Release 3	ease 3 features, and it eta-data templates used Descriptor, Virtual Link I to information g with dependencies and rading).
This revision will reflect the maintenance				
Adoption: 2018.08.24 Support Compa	nies: Orange, PT Portugal, I	DOCOMO, Telefonica, Huawe	i, Ericsson	



DGS/NFV-I	FA02	<u>6</u> Arc	hitecture enhance	ment for Sec	Rapporteur:	Alex LEADBEATER
		Mg	mt Spec			BT plc
Title:	Net	work Functio	ns Virtualisation	(NFV) Release	3;	
THE.	Mar	hagement an	d Orchestration;			
	Arcl	hitecture enh	ancement for Se	curity Managen	nent Specifica	tion
Working title:			ment for Sec Mgmt S			
Current statu	ıs: <mark>Ea</mark> r	rly draft since 201	7.08.07 version 0.	3.0 Next status St	able draft by 2019.	03.01
Current draft: ht	tp://doc	box.etsi.org/ISG/NFV/C	pen/Drafts/IFA026_Architectu	re_enhancement_for_Sec_M	gmt_Spec/NFV-IFA026v03	30.zip as of 2018.09.26
Early draft pl	an:	2017.08.07	WG Approval plan:	2010 04 01		
Stable draft plan: 20		2019.03.01	TB Approval plan:	2019.04.01 2019.05.06	Pub Plan: 20	19.06.17 as v3.1.1
Final draft plan: 2019.04.01			TB Approvar plan.	2019.03.00		
Scope: This work will propose enhancements to the NFV architecture to support security management and monitoring. The work						
will build on re	quiren	nents defined in SE	CO12 and SECO13 to dev	elop security manager	nent and monitoring	extensions to the MANO
architecture. N	Aultiple	e trust domains wi	ll be considered. The del	iverable will contain no	ormative provisions.	
Adoption: 2016	00.22	Support Compa	nies: Nokia, VODAFONE Gr	oun Plc DT CableLabs Bl	Γnlc Intel SPRINT ΔΤΧ	2.T. Roll Mohility

Marcus BRUNNER Rapporteur: DGR/NFV-IFA029 Arch. enhancement for Cloud-native & SWISSCOM PaaS - Report Network Functions Virtualisation (NFV) Release 3; Title: Architecture: Report on the Enhancements of the NFV architecture towards "Cloud-native" and "PaaS" Working title: Arch. enhancement for Cloud-native & PaaS - Report Current status: Early draft since 2018.08.08 version 0.9.0 Next status Stable draft by 2018.11.01 Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/IFA029_Arch_enhancement_for_Cloud-native_&_PaaS/NFV-IFA029v090.docx as of 2018.09.26 Early draft plan: 2018.08.08 WG Approval plan: 2018.12.06 Stable draft plan: 2018.11.01 Pub Plan: 2019.02.15 as v3.1.1 **TB** Approval plan: 2019.01.04 2018.12.01 Final draft plan: Scope: The report will study the potential enhancements of the NFV architecture for providing "PaaS"-type capabilities and supporting VNFs which follow "cloud-native" design principles, in particular the utilization of container technologies. It will describe the related use cases and provide recommendations on the enhancements of the NFV architecture for flexible choices for the designers of VNFs. Such platform features can include, but are not limited to, common platform services, dependency management, and accessing other VNFs. Management and orchestration of VNFs deployed in containers will be analyzed and resulting recommendations on the enhancements of the NFV architecture will be provided, including impacts on the NFV templates, considering dependencies on the hosting resources. An assumption is that some VNFs may be decomposed into small components (e.g., following a micro-services approach) and/or able to rely on common platfrom services. The study will take into account other initiatives in this space. It is not the intention of this WI to define "cloud-native", nor to recommend how VNFs shall be decomposed and implemented. The report will include recommendations for requirements and if necessary enhancements on architecture and reference points. Support Companies: SWISSCOM, ORANGE, Ericsson, TELEFONICA, DT, ZTE, Red Hat Limited Adoption: 2017.01.30



DGS/NFV-IFA030ed	<u>321</u> Mult	ti Domain MANO - s	bec	Rapporteur:	Haitao XIA _{Huawei}		
THUE:	Network Eurotions Virtualisation (NEV) Release 3:						
Multiple	e Administ	trative Domain Asp	ect Interfaces S	pecification			
Working title: Multi Dor	main MANO -	· spec		***************************************			
Current status: Early dr Current draft: http://docbox.ets		3.09.10 version 3.1.1 pen/Drafts/IFA030ed321/NFV-IFA03	1	draft for approval by 20)18.12.31		
Early draft plan: 201	8.09.10	WC Approval plane 20	10 10 01				
Stable draft plan:			18.12.31 19.01.31	Pub Plan: 2019.02.18	3 as v3.2.1		
Final draft plan: 201	8.12.31	TB Approval plan: 20	19.01.51				
previous work item is sum Specify functional requirer administrative domains. W in different administrative different administrative do addition, the work item wi SLPOC is integrated in VIM This revision will also refle	marized herea, ments, interfac Vork will be ba domains for: 2 omains. 2) NFV ill consider the 1s. The resultin fot the mainten	ess and operations to suppo ised on GR NFV-IFA028. The 1) Management of composit (laaS when the SLPOC (Singl interactions between VIMs ig work item deliverable will nance needed for the previou	rt the provision of NFV work will consider man te Network Service (NS te Logical Point of Cont of the same administr contain normative pro us specified version.	MANO services across m nagement interactions b) and its constituent nest act) is integrated in the I ative domain for NFVIaa	nultiple etween NFVOs ted NSs in NFVO. In		
Adoption: 2018.08.24 S	Support Compan	ies: Huawei, PT Portugal, Telefo	onica, Ericsson				

DGS/NFV-I	FA031ed321 NFV	/-MANO mgmt - sp	Dec	Rapporteur:	Yusuke OKAZAKI DOCOMO
Title:	Management an	d Orchestration;	(NFV) Release 3; cification for mana	agement of I	NFV-MANO
Working title:	NFV-MANO mgmt - s	pec			
	us: TB adoption of WI sole as of 2018.09.26	since 2018.08.24	Next status Start	of work by 2018.	08.24 late!
Early draft p	lan:		2010 12 21		
Stable draft	plan:	WG Approval plan: 2018.12.31		Pub Plan: 2019.02.18 as v3.2.1	
Final draft pl	lan: 2018.12.31	TB Approval plan:	2019.01.31		
previous work Describe the fi requirements, state and log i baseline. The i	item is summarized here ramework to support the the interfaces and necess management of NFV-MAI resulting deliverable will o vill also reflect the mainte	after: management of NFV-MA sary information element NO functional entities. Th contain normative provisi nance needed for the pre		e WI will specify t guration and info utcomes from ET:	the interface rmation, performance,



DGS/NFV-I	FA03	8 <u>2</u> Mu	Ilti-site Intfaces &	InfoModel spec	Rapporteur:	Zarrar YOUSAF
Title:			ons Virtualisation nd Orchestration;	(NFV) Release	3;	
	Inte	erface and In	formation Model	Specification for	r Multi-Site Con	nectivity
	Ser	vices;				
Working title:	Mult	ti-site Intfaces &	InfoModel spec			
		rly draft since 20 cbox.etsi.org/ISG/NFV/0	18.07.17 version 0. Dpen/Drafts/IFA032_Multi-site_		able draft by 2018.12. /NFV-IFA032v040.zip as of 20	
Early draft pl Stable draft p Final draft pl	plan:	2018.07.17 2018.12.01 2019.01.10	WG Approval plan: TB Approval plan:	2019.01.10 2019.02.15	Pub Plan: 2018	.08.31 as v3.1.1
(WIM). The de The interfaces management over WAN infr The following • Resou • Resou • Capac • Inforn • Perfor	ocume are a aspect astruc aspect urces M urces R city Ma nation rmance	nt will also describ subset, with possil is for enabling inte ture. ts will be addressed anagement (e.g. co unagement (e.g. su Management (e.g e Management (e.g	the interfaces for multi-si be the operations and the oble modifications and/or r-connectivity between, of allocate, query, update, t eate, query, update, term ubscribe, notify, query); subscribe, notify, query g. subscribe, notify, get fo e, delete, query, subscrib	e information elements extensions, of Or-Vi rej and management of ne ^E Wide Area Network Vi erminate); ninate);); or performance inform	exchanged over those ference point. They will twork services across, irtualised Resources: ation);	interfaces. I focus on
The work iten provisions.	n will u	ise the outcomes f	rom ETSI GR NFV-IFA 022	as baseline. The result	ting deliverable will cor	itain normative

Adoption: 2017.12.08 Support Companies: PT Portugal, NEC, TELEFONICA, NTT, ZTE, DOCOMO

DGS/NFV-I	FA03	<u>3</u> SEC	-MANO ref points - I	ntface Spec	Rapporteur:	Leslie WILLIS BT plc		
Title:	Network Functions Virtualization (NFV) Release 3;							
	Mar	nagement ar	d Orchestration;					
	Sc-	Or, Sc-Vnfm	, Sc-Vi reference po	oints - Interface	and Information	on Model		
	Spe	cification						
Working title:	SEC-I	MANO ref points	- Intface Spec					
Current status: Early draft since 2018.09.12 version 0.0.1 Next status Stable draft by 2018.11.14 Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/IFA033_SEC-MANO_ref_pointsIntface_Spec/NFV-IFA033v001.docx as of 2018.09.26								
Early draft p	lan:	2018.09.12	WG Approval plan:					
Stable draft	plan:	2018.11.14	WG Approval plan: TB Approval plan: 2018.12.28		Pub Plan: 2019.02.08 as v3.1.1			
Final draft pl	an:	2018.11.30		10.12.20				
Scope: The p	resent	document specifie	s the interfaces supported o	ver the sc-or, sc-vnfm, s	sc-vi reference point	ts as well as the		
information elements exchanged over these interfaces. The purpose of the interfaces is to support security monitoring and								
management as described in NFV-GS-SEC-013. The interface supports delivery of information about the topology of the network								
-	and information about the creation/modification of VNFs. It includes the ability to handle VNF termination requests e.g. to respond							
to a DDoS atto Adoption: 2018	-	Support Compa	nies: TELEFONICA, Cadzow Com	munications OTD Tenca	stle Limited BT nlc			



						Rapporteur:	Abinash	
DGR/NFV-I	FA03	<u>4</u> Lice	ence Management	sup	oort		VISHWAKARMA	
							NEC	
Title:	Network Function Virtualization (NFV) Release 3;							
Management and Orchestration;								
	Rep	port on Archit	ectural enhance	ment	for VNF Lice	nse Managen	nent support	
		l use of VNF				Ŭ		
Working title:	Licer	nce Management	t support					
Current statu	us: <mark>TB</mark>	adoption of WI	since 2018.07.25		Next status Start	of work by 2018.06	5.30 late!	
No draft availab	le as of 2	2018.09.26				-		
Early draft pl	lan:	2018.09.21						
Stable draft	plan:	2018.10.19	WG Approval plan: TB Approval plan:	2019	3.12.27	Pub Plan: 2019.	02.07 as v3.1.1	
Final draft pl	an:	2018.11.30		2010	.12.27			
Scope: This work item will study the enhancements required in the architectural framework of NFV-MANO for the VNF License								
Management support and use of VNF Licenses. The work will analyze the recommendations made in NFV-EVE010 and provide								
recommendations for the necessary enhancements of the existing IFA specifications.								
Adoption: 2018	8.07.25	Support Compa	nies: Orange, DT, CableLab	s, Amdo	ocs Software Systems L	td, AT&T, Gemalto N.	V., Verizon	

REL: 3 active Work Items

Title: Network Functions Virtualisation (NFV); Reliability; Report on Error Handling: Detection, Correlation, Notification Working title: Error Handling report Current status: Early draft since 2018.09.12 version 0.0.6 Next status Stable draft by 2018.07.31 late! Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/REL008_Error_Handling_report/NFV-REL008v006.zip as of 2018.09.26 Pub Plan: 2018.09.12 Stable draft plan: 2018.07.31 TB Approval plan: 2018.09.15 Scope: This WI aims to provide a report on how to detect and notify errors occuring in NFV entities. The scope of the WI is focu on the hardware, software and resource related failures. It discusses mechanisms how to correlate errors that have been detect at different layers in the NFV reference architecture model but are caused by the same fault. It will be investigated how to generate notifications that allow controlling mechanisms to take decisions and actions to maintain the defined reliability,	DGR/NFV-REL008 Erro			or Handling report	:	Rapporteur:	Stefan ARNTZEN Huawei	
Working title: Error Handling report Current status: Early draft since 2018.09.12 version 0.0.6 Next status Stable draft by 2018.07.31 late! Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/REL008_Error_Handling_report/NFV-REL008v006.zip as of 2018.09.26 Early draft plan: 2018.09.12 Stable draft plan: 2018.07.31 WG Approval plan: 2018.09.15 TB Approval plan: 2018.10.15 Pub Plan: 2018.11.26 as v1.1.1 Scope: This WI aims to provide a report on how to detect and notify errors occuring in NFV entities. The scope of the WI is focution the hardware, software and resource related failures. It discusses mechanisms how to correlate errors that have been detect at different layers in the NFV reference architecture model but are caused by the same fault. It will be investigated how to generate notifications that allow controlling mechanisms to take decisions and actions to maintain the defined reliability,	Title:							
Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/REL008_Error_Handling_report/NFV-REL008v006.zip as of 2018.09.26 Early draft plan: 2018.09.12 Stable draft plan: 2018.07.31 Final draft plan: 2018.07.31 Final draft plan: 2018.08.31 Scope: This WI aims to provide a report on how to detect and notify errors occuring in NFV entities. The scope of the WI is focu on the hardware, software and resource related failures. It discusses mechanisms how to correlate errors that have been detect at different layers in the NFV reference architecture model but are caused by the same fault. It will be investigated how to generate notifications that allow controlling mechanisms to take decisions and actions to maintain the defined reliability,	Working title:				tion, Correlation, N	lotification		
Stable draft plan:2018.07.31WG Approval plan:2018.09.15Pub Plan:2018.11.26 as v1.1.1Final draft plan:2018.08.31TB Approval plan:2018.10.15Pub Plan:2018.11.26 as v1.1.1Scope: This WI aims to provide a report on how to detect and notify errors occuring in NFV entities. The scope of the WI is focu on the hardware, software and resource related failures. It discusses mechanisms how to correlate errors that have been detect at different layers in the NFV reference architecture model but are caused by the same fault. It will be investigated how to generate notifications that allow controlling mechanisms to take decisions and actions to maintain the defined reliability,	Current status: Early draft since 2018.09.12 version 0.0.6 Next status Stable draft by 2018.07.31 late!							
on the hardware, software and resource related failures. It discusses mechanisms how to correlate errors that have been detect at different layers in the NFV reference architecture model but are caused by the same fault. It will be investigated how to generate notifications that allow controlling mechanisms to take decisions and actions to maintain the defined reliability,	Early draft plan: 2018.09.12 Stable draft plan: 2018.07.31 WG Approval plan: 2018.09. TB Approval plan: 2018.10. 2018.10.				Pub Plan: 201	8.11.26 as v1.1.1		
availability and other applicable SLA performance requirements. The report also focuses on identifying appropriate metrics for detection and notification. This report will use industry standard fault management terminology, conceptual and operational models, such as ITU-T X.7xx, TM Forum eTOM or ITIL. Extensions to existing NFV specifications will be recommended where necessary								



DGS/NFV-F	RELOO9 NF	V Reliability Requirements	Rapporteur:	Percy TARAPORE					
Title: Network Functions Virtualisation (NFV); Reliability;									
	Specification of	Requirements to Support NFV Relia	ability and A	Availability					
Working title:	NFV Reliability Requ	irements							
Current status: Early draft since 2018.06.13 version 0.0.4 Next status Stable draft by 2018.09.15 Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/REL009_Reliability_Requirements/NFV-REL009v004.zip as of 2018.09.26 Status Stable draft by 2018.09.15									
Early draft plan: 2018.06.13 WG Approval plan: 2018.11.14 Pub Plan: 2019.01.18 as v1.1.1 Stable draft plan: 2018.09.15 TB Approval plan: 2018.12.07 Pub Plan: 2019.01.18 as v1.1.1									
Scope: Netw service reliable enable develo The scope is li and their supp	Final draft plan:2018.11.14TB Approval plan:2018.12.07 Barbar Scope: Network operators are expected to configure and deploy VNFs from multiple vendors onto a common platform such that service reliability and availability expectations are satisfactorily met. This document will specify a set of normative requirements to enable development of necessary architectural mechanisms in support of service reliability and availability. The scope is limited to areas of reliability and availability of NFVI components, and Management and Orchestration components and their support for ensuring the reliability and availability of the VNFs. Examples include affinity and diversity handling of VNFs, support failover mechanisms of MANO and NFVI components, and virtualised resource allocation priority to support mission critical								

support Janover mechanisms of MANO and NEV components, and virtualised resource anocation services (e.g. emergency services in disaster recovery situation). Adoption: 2017.05.19 Support Companies: ORANGE, Ericsson AB, CableLabs, AT&T, Verizon, Huawei Adoption: 2017.05.19

DGR/NFV-RELO	<u>10</u> Res	iliency for Network Slicing report	Rapporteur:	Chidung LAC Orange			
Title: Network Functions Virtualisation (NFV); Reliability;							
Rep	port on NFV I	Resiliency for the Support of Netwo	rk Slicing				
Working title: Resil	liency for Networ	k Slicing report					
Current status: Ea Current draft: http://doo	•	.8.09.12 version 0.0.4 Next status Stable pen/Drafts/REL010_Resiliency_for_Network_Slicing_report/NFV					
Early draft plan: Stable draft plan: Final draft plan:	2018.09.12 2018.09.15 2018.10.14	WG Approval plan: 2018.11.01 TB Approval plan: 2018.12.07	Pub Plan: 2019.0)1.18 as v1.1.1			
Scope: Network slid non-functional requi This report will ident infrastructure. The so	ting leverages NFV, rements. Resiliency ify the guiding prin cope of this WI cov migration, softwa tainment).	SDN and cloud technologies for supporting a diver (e.g., availability, reliability) constitutes a basic att ciples of NFV resiliency assurance for the support o ers all resiliency related operational facets support re modification, resource reallocation in time of sco nies: ORANGE, Ericsson AB, CableLabs, Huawei	tribute of network sl f network slicing bas ing network slicing.	lice characteristics. sed on an NFV This includes			



SEC: 8 active Work Items

DGR/NFV-S	EC005 Cer	Rapporteur: Li FENG HuaWei Technologies Co., Ltd							
i nue:	Network Eulertions Virtualization (NEV):								
	· · · · · · · · · · · · · · · · · · ·	icate Management							
Working title:	Certificate mgmt rep	ort							
Current status: Early draft since 2018.06.12 version 0.0.12 Next status Stable draft by 2018.03.01 late! Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/SEC005 Certificate mgmt report/NFV-SEC005v0012.docx as of 2018.09.26									
Early draft plan: 2018.06.12 WG Approval plan: 2018.06.01 Pub Plan: 2018.11.02 as v1.1.1									
Final draft pla	in: 2018.06.01	TB Approval plan: 2018.09.21							
Scope: The work item will provide guidance to NFV on the use of certificates and Certificate Authorities. It will look at various certificate deployment scenarios and describe certificate specific use cases, threats to the certificate management structure, and resulting requirements for NFV. In addition, this work will provide an overall certificate management guidance and trust validation applied for Virtual Machines and Virtualized Network Functions.									
Adoption: 2014.	11.20 Support Compa	nies: Alcatel-Lucent, Intel, Huawei (UK), Citrix.							

DGR/NFV-SEC016 Location, locstamp and timestamp					Pierre COURBON Ainistère Economie et Finances			
Title:	itle: Network Functions Virtualisation (NFV); Security;							
			on, timestamping of VNFs					
Working title:	Loca	tion, locstamp ar	nd timestamp					
		rly draft since 201 box.etsi.org/ISG/NFV/O	8.02.25 version 0.0.2 Next status Stable pen/Drafts/SEC016_Location_Locstamp_Timestamp/NFV-SEC016					
Early draft pl Stable draft p		2018.02.25 2018.09.21	WG Approval plan: 2019.01.14	Pub Plan: 2	019.04.05 as v1.1.1			
Final draft pla		2018.11.01	TB Approval plan: 2019.02.22					
Scope: A GR to study how the location of sensitive VNFs (e.g. LI functions, VNFs handling data with Data Protection location handling restrictions and network security functions) can be attested. The study will consider using trusted locstamp and timestamp information derived from Global Navigation Satellite Systems (GNSS), such as Galileo. The study will also consider other physical location binding solutions. The work is expected to also have benefits for other less sensitive virtualised services which may need to verify location of VNFs or data. The result of work is expected to be informative.								
Adoption: 2017	.02.24		nies: TELEFONICA, BT, VODAFONE Group Plc, Ministère Ec echnical Assistance, Microsemi, Tencastle Limited, Rogers					

DGR/NFV-S	SEC017 Sec	Pol Guidelines Report	Rapporteur: Fei Ll Huawei						
Title:	Network Function	Network Functions Virtualisation (NFV);							
THE.	Security;								
	Security Policy	Guidelines Report							
Working title:	Sec Pol Guidelines Re	port							
Current statu	us: Early draft since 20	18.05.11 version 0.0.3 Next status Stable	e draft by 2018.09.20						
Current draft: ht	tp://docbox.etsi.org/ISG/NFV/0	Dpen/Drafts/SEC017_Sec_Pol_Guidelines/NFV-SEC017v003.docx a	as of 2018.09.26						
Early draft pl	an: 2018.05.11	MC Approval plant 2010 01 14							
Stable draft	olan: 2018.09.20	WG Approval plan: 2019.01.14 TB Approval plan: 2019.02.22	Pub Plan: 2019.04.05 as v1.1.1						
Final draft pl	an: 2018.12.06								
Scope: This V	VI will identify potential	use cases of NFV security policies design and also id	entify the types of information to be						
included in security policies for identified use cases.									
The WI will consider how security policy applied to one domain may affect policies in other domains.									
Both top-down and bottom-up approaches to information modeling will be used. Determining the detailed information model of									
security policie	es is out of scope of this v	vork item.							
Adoption: 2017	Adoption: 2017.05.19 Support Companies: NEC Corporation, Intel, China Telecommunications, Huawei								



DGR/NFV-S	EC018 Rer	note Attestation Architecture report	Rapporteur:	Andre REIN Huawei			
Title:	Network Functions Virtualisation (NFV); Security;						
	· · · · · · · · · · · · · · · · · · ·	Remote Attestation Architecture					
Working title:	Remote Attestation A						
	us: Early draft since 202 tp://docbox.etsi.org/ISG/NFV/C	L7.12.06 version 0.0.6 Next status Stable	e draft by 2018.05.18 late! FV-SEC018v006.docx as of 2018.09	9.26			
Early draft pl	an: 2017.12.06						
Stable draft	olan: 2018.05.18	WG Approval plan: 2019.01.14 TB Approval plan: 2019.02.22	Pub Plan: 2019.04.05 as v1.1.1	is v1.1.1			
Final draft pl	an: 2018.12.06	TB Approval plan: 2019.02.22					
Scope: This report will identify and study Remote Attestation architectures applicable to NFV systems, including the definition of attestation scope, stakeholders, interfaces and protocols required to support them. Additionally this work item will identify functional capabilities. The work item will produce a set of recommendations. The starting point for this work are SEC007, SEC009 and SEC012.							
Adoption: 2017	.09.16 Support Compa	nies: Ericsson, TELEFONICA, China Telecommunications, F	luawei				

DGS/NFV-SEC019 Arc			hitecture for Sec e	nhancement Spec	Rapporteur:	Alex LEADBEATER		
Title:	Network Functions Virtualisation (NFV) Release 3;							
	Sec	curity;						
	Sys	stem Archited	ture Specification	n for NFV Security	Enhancem	ents		
Working title:	Arch	itecture for Sec e	nhancement Spec					
Current status: Start of work since 2018.01.30 Next status Early draft by 2018.05.01 late! No draft available as of 2018.09.26 No						.01 late!		
Early draft p	lan:	2018.05.01	MC Approval plan	2010 01 14				
Stable draft	plan:	2018.07.02	WG Approval plan:	2019.01.14 2019.02.22	Pub Plan: 201	9.04.05 as v3.1.1		
Final draft pl	an:	2018.12.06	TB Approval plan:	2019.02.22				
Scope: This Work item will address known gaps in existing NFV security capabilities and specify new normative security								
enhancements. The work item will address both sensitive and lower sensitivity VNF, as well as NFVI and MANO aspects. Work item								
will extend wo	will extend work already completed in SEC 012.							
Adoption: 2017	.09.16			Ministère Economie Indu. Nu	mer, Intel, OTD, Ηι	iawei, NCSC, BT plc,		
		InterDigital, Inc.						

DGS/NFV-SEC020 Id Mgmt & Security spec					Rapporteur:	Leslie WILLIS BT plc		
Title:	itle: Network Functions Virtualisation (NFV) Release 3;							
	Sec	curity;						
	Ide	ntity Manage	ment and Security S	Specification				
Working title:	ld M	gmt & Security s	pec					
Current status: Start of work since 2017.10.02 Next status Early draft by 2018.05.01 late!								
No draft availab	le as of	2018.09.26		·				
Early draft pl	an:	2018.05.01	MC Approval plan: 20	19 12 06				
Stable draft	plan:	2018.11.20	WG Approval plan: 2018.12.06 TB Approval plan: 2019.01.04		Pub Plan: 2019.02.15 as v3.1.1			
Final draft pl	an:	2018.12.04	TB Approval plan: 20	19.01.04				
Scope: This Work item will specify normative requirements for secure VNF identity management and trust relationships in NFV.								
The work item will specify how identities are securely lifecycle managed, verified and trusted. The work item will address both								
horizontal and vertical relationships. The work will leverage existing work in SEC 005, 007, 009, 012 and 013.								
Adoption: 2017	.09.16		nies: Ericsson, TELEFONICA, Min	istère Economie Indu. Nui	mer, Intel, OTD, Gemalto	N.V., iconectiv, BT		
		plc, InterDigital,	, Inc.					



DGS/NFV-S	EC021 VN	Package Security Spec	Rapporteur:	Pradheepkumar SINGARAVELU NEC Corporation	
Title:	Network Functions Virtualisation (NFV) Release 2; Security;				
	VNF Package S	ecurity Specification			
Working title:	VNF Package Security				
	us: Stable draft since 20 tp://docbox.etsi.org/ISG/NFV/O	018.06.13 version 0.0.2 Next status Final (pen/Drafts/SEC021_VNF_Package_Security_Spec/NFV-SEC021v0		ral by 2017.12.04 late! .26	
Early draft pl Stable draft p	olan: 2018.06.13	WG Approval plan: 2017.12.06 TB Approval plan: 2019.01.04	Pub Plan: 201	9.02.15 as v2.4.1	
security issues - Authenticity j - Methods to e -Credential sto	vork item will define VNF related to VNF packages for VNF Packages msure Confidentiality for	package security requirements and procedures. Th , but not limited to: • Integrity of VNF Packages VNF Packages VNF packages during Onboarding. The work alread			
Adoption: 2017		nies: NEC, TELEFONICA, NEC Corporation, Gemalto N.V., I	Huawei		

DGS/NFV-SEC02	2 <u>2</u> API	Access Token Spec		Rapporteur:	Anne-Marie PRADEN Gemalto N.V.	
nue:	Title: Network Functions Virtualisation (NFV) Release 2; Security;					
Acc	ess Token S	pecification for API	Access			
Working title: API A	Access Token Spe	c				
Current status: Ear Current draft: http://doc		.8.09.07 version 0.0.5 pen/Drafts/SEC022_API_Access_Toke	Next status Stable en_Spec/NFV-SEC022v005.zi	•		
Early draft plan: Stable draft plan: Final draft plan:	2018.09.07 2018.05.31 2018.11.01		18.11.08 18.12.07	Pub Plan: 2	019.01.08 as v2.1.1	
and VIM. The work will consist 1. defining sec 2. Analyzing th TS 33.179), 3. Defining an specification will refe	in: urity requirements e tokens specificat NFV token request er to existing specif	pecify the access tokens and r for API access tokens (e.g. AF ions (e.g. Openstack Keyston and generation profile, the a ications of access tokens if th ken verification by the API Pro	PI requester ID binding e, OpenID Connect Id- ccess token format an e NFV requirements an	, provide Auth Token , IETF O, d the associate	entication feature), Auth token Binding, 3GPP ed metadata. The	
This WI will produce						
Adoption: 2017.12.08	Support Compa	nies: Nokia Corporation, TELEFO	NICA, NEC Corporation, G	iemalto N.V., Ub	piwhere Lda (UW)	



SOL: 13 active Work Items

DGS/NFV-S	60L00	<u>01</u> TOS	CA-based NFV descri	ptors spec	Rapporteur:	Shitao LI _{Huawei}	
Title: Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models;							
	NF	I descriptors	based on TOSCA s	pecification			
Working title:	TOSC	CA-based NFV de	scriptors spec				
Current state	us: <mark>Ea</mark> l	rly draft since 201	8.08.29 version 0.10.0	Next status Stable	draft by 2018.07.01 lat	e!	
Current draft: ht	ttp://doc	box.etsi.org/ISG/NFV/O	pen/Drafts/SOL001_TOSCA_desc/NF	V-SOL001v0100.zip as of 201	18.09.26		
Early draft pl	lan:	2018.08.29	WC Approval plane 201	10.00.21			
Stable draft	plan:	2018.07.01		18.08.31 18.09.30	Pub Plan: 2018.11.02 as v2.4.1	2 as v2.4.1	
Final draft pl	an:	2018.08.26	16 Approvarpian. 20.	10.09.30			
Scope: The scope of this work item is to develop a data model specification for NFV descriptors fulfilling the requirements							
specified in GS NFV-IFA 011 and GS NFV-IFA 014. The specification will be based on the OASIS TOSCA Simple profile in YAML							
specification. The deliverable will contain normative provisions and an informative mapping between the data model terminology							
and the terminology used in GS NFV IFA 011 and 014.							
Adoption: 2016	6.02.23	Support Compa	nies: ORANGE, PT PORTUGAL, TE	ELECOM ITALIA , Huawei	Tech.(UK), 6WIND, Nokia		

RGS/NFV-SOL002ed261 Ve-Vnfm RESTful protocols - spec				Rapporteur:	Jong-Hwa YI _{ETRI}	
Title:	Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models;					
	RESTful protoco	ols specification f	or the Ve-Vnfm Re	eference Point		
Working title:	Ve-Vnfm RESTful pro	tocols - spec				
Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!						
Early draft plan: Stable draft plan:		WG Approval plan:	2018.12.31	Pub Plan: 2019.0	2.18 as v2.6.1	
Final draft pl	an: 2018.12.31	TB Approval plan: 2019.01.31				
Scope: This revision of NFV-SOL 002 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: SOL 002 specifies a set of Restful protocols fulfilling the requirements specified in GS NFV-IFA 008 for the interfaces used over the Ve-Vnfm reference point.						
Adoption: 2018	3.08.24 Support Compa	nies: ETRI, PT Portugal, Ord	inge, DOCOMO, Telefonica, Z1	ΓΕ, Huawei, Ericsson		

RGS/NFV-S	OL002ed311 Ve-	Vnfm RESTful prot	cocols - spec	Rapporteur:	Yuya KUNO росомо		
Title: Network Functions Virtualisation (NFV) Release 3; Protocols and Data Models; RESTful protocols specification for the Ve-Vnfm Reference Point							
Working title:	Ve-Vnfm RESTful prot	ocols - spec					
	Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!						
Early draft pl	lan:		2018.12.31				
Stable draft plan:		- FR - FR		Pub Plan: 2019.02.18 as v3.1.1			
Final draft pl	an: 2018.12.31	TB Approval plan:	2019.01.51				
Scope: This revision of NFV-SOL 002 propagates the deliverable into NFV Release 3. This edition will add protocol and data models to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: SOL 002 specifies a set of Restful protocols fulfilling the requirements specified in GS NFV-IFA 008 for the interfaces used over the Ve-Vnfm reference point. This revision of NFV-SOL 002 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0). This revision will reflect the maintenance performed to NFV Release 2 documentation.							
Adoption: 2018	Adoption: 2018.08.24 Support Companies: PT Portugal, Orange, DOCOMO, Telefonica, ZTE, Huawei, Ericsson						



RGS/NFV-SOL003ed261 Or-Vnfm RESTful protocols - spec				Rapporteur:	Uwe RAUSCHENBACH Nokia	
Title:	Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; RESTful protocols specification for the Or-Vnfm Reference Point					
Working title:	Or-Vnfm RESTful pro					
	Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!					
Early draft pl	an:	WG Approval plan: 2	010 10 21			
Stable draft p	olan:	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31		Pub Plan: 2019.02.18 as v2.6.1	019.02.18 as v2.6.1	
Final draft pla	an: 2018.12.31		015.01.51			
Scope: This revision of NFV-SOL 002 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: SOL 002 specifies a set of Restful protocols fulfilling the requirements specified in GS NFV-IFA 008 for the interfaces used over the Ve-Vnfm reference point.						

Adoption: 2018.08.24 Support Companies: kia, PT Portugal, Orange, DOCOMO, Telefonica, Huawei, Ericsson

RGS/NFV-S	OL003ed311 Or-	Rapporteur: Uwe RAUSCHENBACH Nokia					
Title: Network Functions Virtualisation (NFV) Release 3;							
THE.	Protocols and D	ata Models;					
	RESTful protoco	ols specification f	or the Or-Vnfm Re	ference Point			
Working title:	Or-Vnfm RESTful pro	tocols - spec					
Current statu	us: TB adoption of WI	since 2018.08.24	Next status Start of	of work by 2018.08.24 late!			
No draft availabl	le as of 2018.09.26						
Early draft pla	an:	WC Approval plant 2018 12 21					
Stable draft plan:			WG Approval plan: 2018.12.31 Pub Plan: 2019.				
Final draft pla	an: 2018.12.31	TB Approval plan:	2019.01.31				
Scope: This re	evision of NFV-SOL 003 p	propagates the deliverab	le into NFV Release 3.				
This edition wil	II add protocol and data	models to support the Re	elease 3 features, and it wi	ll extend the scope of the former Release			
2 edition summarized hereafter:							
SOL 003 specifies a set of RESTful protocols and data models fulfilling the requirements specified in ETSI GS NFV-IFA 007 for the							
interfaces used over the Or-Vnfm reference point, except for the "Virtualised Resources Management interfaces in indirect mode"							
as defined in clause 6.4 of ETSI GS NFV-IFA 007.							
	This revision of NFV-SOL 003 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0).						
This revision will reflect the maintenance performed to NFV Release 2 documentation.							

Adoption: 2018.08.24 Support Companies: Nokia, PT Portugal, Orange, DOCOMO, Telefonica, Huawei, Ericsson

RGS/NFV-S	RGS/NFV-SOL004ed261 VNF Package Stage 3 - spec			Rapporteur: Andrei KOJUKHOV Amdocs Software Systems Ltd	
Title:	Network Functio	ns Virtualisation (N	IFV) Release 2;		
inde.	Protocols and D	ata Models;			
	VNF Package sp	pecification			
Working title:	VNF Package Stage 3	- spec			
Current status: TB adoption of WI since 2018.08.24Next status Start of work by 2018.08.24 late!No draft available as of 2018.09.26					
Early draft p	lan:	WG Approval plan: 20	018.12.31		
Stable draft plan:			019.01.31	Pub Plan: 2019.02.18 as v2.6.1	
Final draft pl	an: 2018.12.31		515.01.51		
Scope: This revision of NFV-SOL 003 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: SOL 003 specifies a set of RESTful protocols and data models fulfilling the requirements specified in ETSI GS NFV-IFA 007 for the interfaces used over the Or-Vnfm reference point, except for the "Virtualised Resources Management interfaces in indirect mode" as defined in clause 6.4 of ETSI GS NFV-IFA 007.					
Adoption: 2018	.08.24 Support Compa	nies: Amdocs, PT Portugal, Orai	nge, DOCOMO, Telefonica,	Huawei, Ericsson	



RGS/NFV-SOL004ed311 VN	RGS/NFV-SOL004ed311 VNF Package Stage 3 - spec					
Protocols and D	Network Functions Virtualisation (NFV) Release 3; Protocols and Data Models; VNF Package specification					
Working title: VNF Package Stage						
Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!						
Early draft plan: Stable draft plan: Final draft plan: 2018.12.31	WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31	Pub Plan: 2019.02.18 as v3.1.1				
Final draft plan: 2018.12.31 Scope: This revision of NFV-SOL 004 propagates the deliverable into NFV Release 3. This edition will add protocol and data models to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: SOL 004 specifies the structure and format of a VNF package file and its constituents, fulfilling the requirements specified in ETSI GS NFV-IFA 011 for a VNF package. This revision of NFV-SOL 004 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0). This revision will reflect the maintenance performed to NEV Release 2 documentation						

This revision will reflect the maintenance performed to NFV Release 2 documentation.Adoption: 2018.08.24Support Companies: Amdocs, PT Portugal, Orange, DOCOMO, Telefonica, Huawei, Ericsson

Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; RESTful protocols specification for the Os-Ma-nfvo Reference Point				
Current status: Draft receipt by ETSI Secretariat since Next status Publication by 2018.08.29 late! 2018.09.03 version 2.4.8 Current draft: http://docbox.etsi.org/ISG/NFV/Open/Drafts/SOL005ed251_Os-Ma-nfvo_APIs/NFV-SOL005ed251v248.zip as of 2018.09.26				
Pub Plan: 2018.08.29 as v2.5.1				
Final draft plan: Interpreter plant Defendence Scope: This revision of NFV-SOL 005 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter SOL 005 specifies a set of Restful protocol specifications and data models fulfilling the requirements specified in ETSI GS NFV-IFA 013 for the interfaces used over the Os-Ma-nfvo reference point. Adoption: 2018.02.26 Support Companies: Ericsson, PT Portugal, Orange, Huawei, Telefonica, DOCOMO				
	Ation by 2018.08.29 I 48.zip as of 2018.09.26 Pub Plan: 2018.08 <i>rs, ambiguities, misat</i> <i>Ps Annex L). This editi</i> <i>ereafter</i> <i>rements specified in</i>			

DGS/NFV-S	OL005ed261 Os-	Rapporteur:	Vlademir BRUSSE Ericsson				
Title:	Network Functions Virtualisation (NFV) Release 2;						
The:	Protocols and D	ata Models;					
	RESTful protoco	ols specification for	or the Os-Ma-nfvo	Reference	Point		
Working title:	Os-Ma-nfvo APIs - spe	2C					
Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!							
Early draft pl	lan:		2010 12 21				
Stable draft plan:		WG Approval plan: 2018.12.31 TB Approval plan: 2019.01.31		Pub Plan: 2019.02.18 as v2.6.1			
Final draft pl	an: 2018.12.31	IB Approvar plan.	2019.01.31				
Scope: This r	evision of NFV-SOL 003 c	onducts NFV Release 2 m	aintenance. It corrects erro	ors, ambiguities,	misalignments, and		
			l D as described in ETSI TW		s edition does not add or		
modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:							
SOL 003 specifies a set of RESTful protocols and data models fulfilling the requirements specified in ETSI GS NFV-IFA 007 for the							
interfaces used over the Or-Vnfm reference point, except for the "Virtualised Resources Management interfaces in indirect mode"							
as defined in c	lause 6.4 of ETSI GS NFV-	IFA 007.					
Adoption: 2018	Adoption: 2018.08.24 Support Companies: Ericsson, PT Portugal, Orange, DOCOMO, Telefonica, ZTE, Huawei						



DGS/NFV-S	OL005ed311 Os-	Ma-nfvo APIs - spec		Rapporteur:	Vlademir BRUSSE Ericsson	
Title:	Network Functions Virtualisation (NFV) Release 3;					
	Protocols and D	ata Models;				
	RESTful protoco	Is specification for the Os-M	la-nfvo	Reference	Point	
Working title:	Os-Ma-nfvo APIs - spe	2C				
Current state	us: TB adoption of WI	since 2018.08.24 Next stat	tus <mark>Start</mark> (of work by 2018.	.08.24 late!	
No draft availab	le as of 2018.09.26					
Early draft pl	lan:	WG Approval plan: 2018.12.31				
Stable draft plan:				Pub Plan: 201	.9.02.18 as v3.1.1	
Final draft pl	an: 2018.12.31	TB Approval plan: 2019.01.31				
Scope: This r	evision of NFV-SOL 005 p	ropagates the deliverable into NFV Relea	ase 3.			
This edition will add protocol and data models to support the Release 3 features, and it will extend the scope of the former Release						
2 edition summarized hereafter:						
SOL 005 specifies a set of Restful protocol specifications and data models fulfilling the requirements specified in ETSI GS NFV-IFA						
013 for the int	erfaces used over the Os-	Ma-nfvo reference point.				
This revision of NFV-SOL 005 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0).						

This revision will reflect the maintenance performed to NFV Release 2 documentation.Adoption: 2018.08.24Support Companies: Ericsson, PT Portugal, Orange, DOCOMO, Telefonica, ZTE, Huawei

			Rapporteur: Ma	ahesh
DGS/NFV-S	<u>OL006</u> YAI	IG based NFV Descriptors spec	JETHANAN	DANI
				Cisco
Title:		ns Virtualisation (NFV) Release 2;		
	Protocols and D	ata Models;		
	NFV Descriptors	based on YANG Specification		
Working title:	YANG based NFV Des			
	us: Early draft since 201	1	e draft by 2018.12.07	
Current draft: ht	tp://docbox.etsi.org/ISG/NFV/C	pen/Drafts/SOL006_YANG_based_NFV_Descriptors_spec/NFV-Solutions_spec	DL006v002.zip as of 2018.09.26	
Early draft pl	an: 2017.10.10	WG Approval plan: 2019.02.28		
Stable draft	olan: 2018.12.07		Pub Plan: 2019.05.12 as v2.4.1	L
Final draft pl	an: 2019.02.26	TB Approval plan: 2019.03.31		
Scope: The se	cope of this work item is	to develop a data model specification for NFV descr	iptors fulfilling the requirements	
specified in GS	NFV- IFA 011 and NFV G	S NFV-IFA 014.		
The specificati	on will be based on the Y	ANG data modeling language (see RFC 6020, and t	he common data types defined in Ri	FC
6021) . The de	liverable will consist of a	translation in YANG of the constructs in the templa	te specified in GS NFV-SOL 001, and	1 may
contain any ot	her artifact required to e	nsure descriptor equivalence.		
The deliverable	e will contain normative	provisions and, if necessary, an informative mappin	g between the terminology used in	the
YANG model a	nd the terminology used	in GS NFV-IFA 011 and 014. The need for this inforr	mative mapping will be assessed as	the
work progress				
Adoption: 2017	.09.16 Support Compa	nies: TELENOR ASA, TELEFONICA, Cisco, ZTE, BT plc		

DGS/NFV-S	<u>OL00</u>	<u></u>) file structure spe	ec		Rapporteur:	Manchang JU ZTE
Title:	Net	work Functio	ns Virtualisation	(NF	V) Release 2;		
THE.	Pro	tocols and D	ata Models;				
	Net	work Service	Descriptor file s	truc	ture specificati	on	
Working title:	NSD	file structure spe	C				
		rly draft since 201 box.etsi.org/ISG/NFV/O	8.08.29 version 0.		Next status Stable ire_spec/NFV-SOL007v003.:	•	.07 late!
Early draft p	lan:	2018.08.29		201	10 10 21		
Stable draft	plan:	2018.09.07	WG Approval plan: TB Approval plan:		18.10.31 18.11.30	Pub Plan: 2019.01.11 as v2.6.1	.01.11 as v2.6.1
Final draft pl	an:	2018.10.26		201	10.11.50		
Scope: The scope of this work item is to specify the Network Service Descriptor file structure and naming conventions for the							
	different files, fulfilling the requirements specified in ETSI GS NFV-IFA 014.						
The work item	delive	rable will contain r	normative provisions.				
Adoption: 2018	.03.12	Support Compa	nies: Ericsson, NEC, Amdocs	s Soft	ware Systems Ltd, ZTE, H	luawei	



DMI/NFV-	<u>SOL008</u> Ope	enAPI Work Program	ne	Rapporteur:	Vlademir BRUSSE Ericsson
Title: Network Functions Virtualisation (NFV); Protocol and Data Models; Creation and Management of the OpenAPI Work Programme					
Working title:	OpenAPI Work Progra		1		
Current status: TB adoption of WI since 2018.09.11 Next status Start of work by 2018.09.30 No draft available as of 2018.09.26 No draft available as of 2018.09.26					
Early draft p	lan:	WC Approval plant			
Stable draft plan:		WG Approval plan:	Pub Plan: as v		
Final draft p	lan:	TB Approval plan:			
to be tracked 1. The d 2. Enhan 3. Main 4. Recor Within this M SOL 002, GS N	within the ETSI Work Prog efinition and maintenance ncements/modifications to tenance of the ETSI NFV S nmendations to improve I I, the OpenAPI representa	OL WG public and private Wi ETSI CTI tools to better enable tions will be developed and n SOL 005, but not limited to th	wards the completion of the ETSI NFV Relea ki pages e the management of t naintained for each SC	of deliverables. se 2 APIs and bey the OpenAPI wor DL WG API publico	Deliverables include: vond k programme ation (currently GS NFV-



TST: 7 active Work Items

DMI/NFV-1	<u>rst003</u> Op	en Source Compor	nents for NFV	Rapporteur:	Gergely CSATARI Nokia
Title:		ons Virtualisation omponents for N	· · · · · · · · · · · · · · · · · · ·		
Working title:	Open Source Compor	nents for NFV			
	us: Final draft for appr le as of 2018.09.26	roval since 2017.09.15	Next status V	VG approval by 2017.	11.01 late!
Early draft p Stable draft Final draft pl	plan:	WG Approval plan: TB Approval plan:	2017.11.01 2017.12.08	Pub Plan: 201	7.12.08 as v
Specifically, th - Open approp - Provide guid communities. - Coordinate t format to influ - Support and requirements - Provide feed these projects - Provide feed - Create award it to ISG E2E a	tween both worlds. his work item aims to: briate communication cho ance/best practices recor he collection of NFV requ lence new releases. contribute to the identifi- and feature requests. back on implementation (e.g. as reports on guide back on implementation eness of the work (e.g. av rchitecture, use cases, an	nmendations to NFV WG irements and feature rec cation and tracking of go experience gained during lines, best practices, etc. experience from these pr vailable components, fea id/or requirements.	is with respect to effe quests and feeding the aps between the imple g running PoCs, intero). rojects to the ISG.	ctive communication to em to these projects in ementation of these pro p tests, and other expe	o Open Source a digestible, prioritized ojects and NFV erimental activities to
raiseawarene. Informative ol	n-going industry initiative ss in ETSI NFV to those pr utputs from this WI is sto atewiki.etsi.org/index.ph	iorities. red on NFV Private Wiki i	here:	ents and OPNFV plann	ed features, and

DGR/NFV-1	rsto(<u>)6</u> CIC	D & Devops report		Rapporteur:	Pierre LYNCH Keysight Technologies UK Ltd
Title:			ns Virtualisation (NI	FV);		
		sting;				
	Rep	port on NFV	CICD and Devops			
Working title:	CICD	& Devops repor	t			
		able draft since 20 box.etsi.org/ISG/NFV/C	018.05.08 version 0.0.9 Open/DRAFTS/TST006_CICD_and_Dev	Next status Final of vops_report/NFV-TST006v00		•
Early draft pl	an:			10 11 02		
Stable draft plan: 2018.05.08		WG Approval plan: 2018.11.03 TB Approval plan: 2018.12.07		Pub Plan: 2019.01.18 as v1.1.1		
Final draft pl	an:	2018.10.15	TB Approval plan: 20	18.12.07		
SW provider to - Will ex	o sercio xplore	ce provider, or any the implications of	commendations on how to le combination of developer, in the processes with regard to ionality in the NFV system, tl	stallation and operation the impact of the SW	onal entities package hand	off between SW provider
testing/valida Orchestration;	tion ca : VNF F	pability. It may im Packaging Specifico	: for a modification or additic oact DGS/NFV-IFA011 (Netwo tion ons for future enhancements	ork Functions Virtualis	ation (NFV); M	lanagement and

May have some recommendations for future enhancements to the lifecycle management for upgrading the SW code, and test and performance metrics. Based on the existing and enhanced lifecycle management, the general procedures for software upgrade testing will be developed. Reference NFV(15)000275 NFV REL "Software Update/Upgrade Functionality Specification"
 The resulting deliverable will be informative

Adoption: 2016.02.23 Support Companies: *SWISSCOM, Telecom Italia, Huawei, AT&T, Ixia Technologies*



RGR/NFV-1	<u> IST007ed261</u> MA	NO lop Testing Gu	uidelines	Rapporteur:	Carsten ROSSENHOEVEL EANTC AG	
Title: Network Functions Virtualisation (NFV) Release 2; Testing; Guidelines on Interoperability Testing for MANO						
Working title:	MANO lop Testing Gu					
	us: TB adoption of WI sole as of 2018.09.26	since 2018.08.24	Next status Start	of work by 2018.08	3.24 late!	
Early draft p	lan:		2018.12.31			
Stable draft plan:			Pub Plan: 2018.02.18 as v2.6.1			
Final draft pl	an: 2018.12.31					
Final draft plan: 2018.12.31 TB Approval plan: 2018.01.31 Scope: This revision of NFV-TST 007 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter TST 007 provides informative interoperability test guidelines for NFV capabilities requiring interaction among VNF, MANO and VIM-NFVI, such as (but not limited to): NS Lifecycle Management, VNF Lifecycle management, VNF Package Management, Software Image Management, The document follows the Interoperability Testing Methodology developed by the NFV TST WG (TST002) and is intended to be applicable for all implementations aligned with ETSI NFV architecture; references to open source implementations may be included as examples. Adoption: 2018.08.24 Support Companies: EANTC, PT Portugal, Telefonica, Keysight Technologies UK Ltd, Ericsson, AT&T						

RGS/NFV-	TST008ed321 NFV	/I Compute & Nwk N	letrics - Spec	Rapporteur:	AI MORTON		
Title:		ns Virtualisation (N	FV) Release 3;	·			
	Testing;	and Notwork Motrie	e Specification				
Working title:	NFVI Compute and Network Metrics Specification Working title: NFVI Compute & Nwk Metrics - Spec						
Current status: TB adoption of WI since 2018.08.24 Next status Start of work by 2018.08.24 late! No draft available as of 2018.09.26 Next status Start of work by 2018.08.24 late!							
Early draft p Stable draft)18.12.31)19.01.31	Pub Plan: 2019.02	2.18 as v3.2.1		
Final draft p	lan: 2018.12.31		19.01.51				
Scope: This revision of NFV-TST 008 continues the development of the specification as part of the NFV Release 3. This edition will add requirements and specification of metrics to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: Specify detailed and vendor-agnostic key operational performance metrics at different layers of the Network Function Virtualization Infrastructure (NFVI), especially processor usage and network interface usage metrics. These metrics are expected to serve as references for processed and time-aggregated measurement values for performance management information that traverses the Or-Vi and/or Vi-Vnfm reference points.							
This revision of Where needer This revision v	The work item deliverable will contain normative provisions. This revision of NFV-TST 008 will address the Release 3 candidate features listed in Annex B of the Release 3 Definition (v0.10.0). Where needed, it will continue the previous version to enhance and complete the specified Release 3 features. This revision will reflect the maintenance performed to NFV Release 2 documentation and of already specified Release 3 features. Adoption: 2018.08.24 Support Companies: AT&T, PT Portugal, Telefonica, Swisscom						

ETSI	

DGS/NFV-TST009 NFV	/I_Benchmarks		Rapporteur:	AI MORTON AT&T	
nue:	ons Virtualisation (N	FV)			
Testing					
Specification of	Networking Benchr	narks and Meas	urement Metho	ods for NFVI	
Working title: NFVI_Benchmarks					
Current status: Final draft for appr	roval since 2018.08.22	Next status WG a	pproval by 2018.08.1	7 late!	
	version 0.0.15				
Current draft: http://docbox.etsi.org/ISG/NFV/0	Dpen/DRAFTS/TST009_NFVI_Benchr	narks/NFV-TST009v0015.zip a	s of 2018.09.26		
Early draft plan:	WG Approval plan: 2	018.08.17			
Stable draft plan:			Pub Plan: 2018.10	.29 as v1.1.1	
Final draft plan: 2018.08.22					
Final draft plan: 2018.08.22 TB Approval plan: 2018.09.17 Scope: This work item will specify vendor-agnostic definitions of performance metrics and the associated methods of measurement for Benchmarking networks supported in the NFVI. The Benchmarks and Methods will take into account the communication-affecting aspects of the compute/networking/virtualization environment (such as the transient interrupts that block other processes, or the ability to dedicate variable amounts of resources to communication processes). These Benchmarks are intended to serve as a basis for fair comparison of different implementations of NFVI, (composed of various hardware and software components) according to each individual Benchmark and networking configuration evaluated. Note that a Virtual Infrastructure Manager (VIM) may play a supporting role in configuring the network under test. Example of existing Benchmarks include RFC 2544 Throughput and Latency (developed for physical network functions). Adoption: 2017.05.19 Support Companies: SWISSCOM, Spirent Communications, AT&T, EANTCAG, Ixia Technologies					

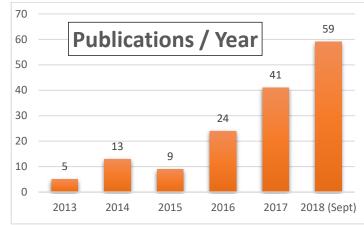
DGS/NFV-1	<u>rst010</u> API	Conformance Testing	Rapporteur: Pierre LYNCH Keysight Technologies UK Ltd		
Title:	Title: Network Function Virtualisation (NFV) Release 2; Testing;				
	API Conformance	ce Testing Specification			
Working title:	API Conformance Tes				
Current state	us: Early draft since 201	18.08.28 version 0.0.3 Next status Stabl	e draft by 2018.12.06		
Current draft: ht	ttp://docbox.etsi.org/ISG/NFV/C	pen/DRAFTS/TST010_API_Conformance_Testing/NFV-TST010v0	03.docx as of 2018.09.26		
Early draft p	lan: 2018.08.28				
Stable draft	plan: 2018.12.06	WG Approval plan: 2019.04.18 TB Approval plan: 2019.05.24	Pub Plan: 2019.07.05 as v2.1.1		
Final draft pl	an: 2019.04.11	TB Approval plan: 2019.05.24			
Scope: Test descriptions, procedures, methods and test configurations, along with precise expected outcomes that will comprise a conformance test plan for the APIs exposed on the following reference points: Os-Ma-Nfvo, Or-Vnfm, and Ve-Vnfm, defined in ETSI GS NFV-SOL 002, ETS GS NFV-SOL 003, and ETSI GS-NFV SOL005. Where possible, the tests will be specified using means to facilitate automation of the testing.					
Adoption: 2017	.12.08 Support Compa	nies: Orange, Ericsson, DOCOMO, Ixia Technologies			

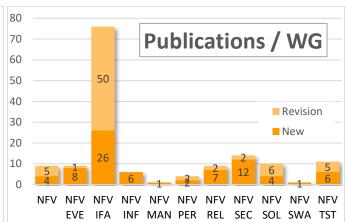


DGR/NFV	- <u>TST011</u> Tst	Domain & Description La	Rapporteu	r: Frank MASSOUDIAN Huawei		
Title:	Network Functions Virtualization (NEV/):					
Working title:						
	tus: Early draft since 201		tt status Stable draft by ption_Lang/NFV-TST011v003.docx	as of 2018.09.26		
Early draft Stable draft Final draft	: plan:	WG Approval plan: TB Approval plan: 2018.12	.14 Pub Plan	: 2019.01.25 as v1.1.1		



DETAILED view of PUBLISHED Work





150 ISG NFV deliverables PUBLISHED.

			40
GS NFV 001 v1.1.1	NFV Use Cases	GS NFV-IFA 008 v2.1.1 Ve-Vnfm ref point Spec	
GR NFV 001 v1.2.1	NFV Use Cases revision	GS NFV-IFA 008 v2.3.1 Ve-Vnfm ref point Spec	
GS NFV 002 v1.1.1	NFV Architectural Framework	GS NFV-IFA 008 v2.4.1 Ve-Vnfm ref point Spec	
GS NFV 002 v1.2.1	NFV Architectural Framework	GS NFV-IFA 008 v3.1.1 Ve-Vnfm ref point Spec	
GS NFV 003 v1.1.1	Terminology for Main Concepts	GS NFV-IFA 008 v2.5.1 Ve-Vnfm ref point Spec	
GS NFV 003 v1.2.1	Terminology for Main Concepts	GS NFV-IFA 009 v1.1.1 MANO architectural options report .	
GS NFV 003 v1.3.1	Terminology	GS NFV-IFA 010 v2.1.1 MANO Functional Rqmts Spec	
GS NFV 003 v1.4.1	Terminology	GS NFV-IFA 010 v2.2.1 MANO Functional Rqmts Spec	
GS NFV 004 v1.1.1	NFV Virtualisation Requirements37	GS NFV-IFA 010 v2.3.1 MANO Functional Rqmts Spec	
GS NFV-EVE 001 v3.1.		GS NFV-IFA 010 v2.4.1 MANO Functional Rqmts Spec	
GS NFV-EVE 003 v1.1.		GS NFV-IFA 010 v3.1.1 MANO Functional Rqmts Spec	
GS NFV-EVE 004 v1.1.	0 1	GS NFV-IFA 010 v2.5.1 MANO Functional Rqmts Spec	
GS NFV-EVE 005 v1.1.	S	GS NFV-IFA 011 v2.1.1 VNF Packaging Spec	
GS NFV-EVE 007 v3.1.	· ·	GS NFV-IFA 011 v2.3.1 VNF Packaging Spec	
GS NFV-EVE 007 v3.1.		GS NFV-IFA 011 v2.4.1 VNF Packaging Spec	
GR NFV-EVE 008 v3.1		GS NFV-IFA 011 v3.1.1 VNF Packaging Spec	
GR NFV-EVE 010 v3.1	5	GS NFV-IFA 011 v2.5.1 VNF Packaging Spec	
GR NFV-EVE 012 v3.1	5 1	GS NFV-IFA 013 v2.1.1 Os-Ma-Nfvo ref point - info model	
	1 Acceleration - UCs report	GS NFV-IFA 013 v2.3.1 Os-Ma-Nfvo ref point - info model	
	1 Acceleration - VNF Intface Spec	GS NFV-IFA 013 v2.4.1 Os-Ma-Nfvo ref point - info model	. 56
GS NFV-IFA 002 v2.3.	1 Acceleration - VNF Intface Spec 41	GS NFV-IFA 013 v3.1.1 Os-Ma-Nfvo ref point - info model	. 56
GS NFV-IFA 002 v2.4.3	1 Acceleration - VNF Intface Spec	GS NFV-IFA 013 v2.5.1 Os-Ma-Nfvo ref point - info model	. 57
GS NFV-IFA 003 v2.1.	1 Acceleration - Switching Aspects 42	GS NFV-IFA 014 v2.1.1 Network Service Templates Spec	. 57
GS NFV-IFA 003 v2.3.2	1 Acceleration - Switching Aspects 42	GS NFV-IFA 014 v2.3.1 Network Service Templates Spec	. 57
GS NFV-IFA 003 v2.4.2	1 Acceleration - Switching Aspects 43	GS NFV-IFA 014 v2.4.1 Network Service Templates Spec	. 58
GS NFV-IFA 004 v2.1.	1 Acceleration - Mgmt aspects Spec 43	GS NFV-IFA 014 v3.1.1 Network Service Templates Spec	. 58
GS NFV-IFA 004 v2.3.2	1 Acceleration - Mgmt aspects Spec 43	GS NFV-IFA 014 v2.5.1 Network Service Templates Spec	. 58
GS NFV-IFA 004 v2.4.3	1 Acceleration - Mgmt aspects Spec 43	GR NFV-IFA 015 v2.1.1 Info Model Report	. 59
GS NFV-IFA 005 v2.1.3	1 Or-Vi ref point Spec	GR NFV-IFA 015 v2.3.1 Info Model Report	. 59
GS NFV-IFA 005 v2.3.	1 Or-Vi ref point Spec	GR NFV-IFA 015 v2.1.2 Info Model Report	. 59
GS NFV-IFA 005 v2.4.	1 Or-Vi ref point Spec	GR NFV-IFA 015 v2.4.1 Info Model Report	. 59
GS NFV-IFA 005 v3.1.	1 Or-Vi ref point Spec	GR NFV-IFA 015 v3.1.1 Info Model Report	. 60
GS NFV-IFA 005 v2.5.	1 Or-Vi ref point Spec	GR NFV-IFA 015 v2.5.1 Info Model Report	. 60
GS NFV-IFA 006 v2.1.	1 Vi-Vnfm ref point Spec	GR NFV-IFA 016 v2.1.1 Papyrus Guidelines	. 60
GS NFV-IFA 006 v2.3.3	1 Vi-Vnfm ref point Spec	GR NFV-IFA 016 v2.4.1 Papyrus Guidelines	
GS NFV-IFA 006 v2.4.3	1 Vi-Vnfm ref point Spec	GR NFV-IFA 016 v3.1.1 Papyrus Guidelines	. 61
	1 Vi-Vnfm ref point Spec	GR NFV-IFA 016 v2.5.1 Papyrus Guidelines	. 61
GS NFV-IFA 006 v2.5.3	1 Vi-Vnfm ref point Spec	GR NFV-IFA 017 v2.1.1 UML Modeling Guidelines	. 62
GS NFV-IFA 007 v2.1.3	1 Or-Vnfm ref point Spec	GR NFV-IFA 017 v2.4.1 UML Modeling Guidelines	. 62
	1 Or-Vnfm ref point Spec	GR NFV-IFA 017 v3.1.1 UML Modeling Guidelines	
	1 Or-Vnfm ref point Spec	GR NFV-IFA 017 v2.5.1 UML Modeling Guidelines	
	1 Or-Vnfm ref point Spec	GS NFV-IFA 018 v3.1.1 Acceleration Intface Spec	
	1 Or-Vnfm ref point Spec		
		•	



	esource Mgmt Acceleration @ Nf-Vi - ec63
GR NFV-IFA 021 v3.1.1 M	ANO automated deployment report
	licy Mgmt in MANO report
	V IM External touchpoints
	rf. Measurements Spec
	ulti admin domain support -report. 65
	ulti Domain MANO spec
	V-MANO_mgmt_spec
	frastructure Overview
	frastructure Compute Domain 66
	frastructure Hypervisor Domain 66
	frastructure Network Domain 66
	eth. to desc. Interfaces and
	ostractions67
	V Service Quality Metrics67
	Management and Orchestration. 67
GS NFV-PER 001 v1.1.1	NFV Performance & Portability Best
Pr	actises 67
GS NFV-PER 001 v1.1.2	NFV Performance & Portability Best
Pr	actises 68
GS NFV-PER 002 v1.1.1	NFV PoC Framework68
GS NFV-PER 002 v1.1.2	NFV PoC Framework revision 68
GS NFV-REL 001 v1.1.1Re	siliency Requirements
GS NFV-REL 002 v1.1.1Sc	alable Arch for Reliability Report 69
	E reliability models report
	E reliability models report
	tive monitoring & failure detection
	port
	Jality Accountability Framework 70
	V Upgrade spec70
GR NFV-REL 007 v1.1.1	
GR NFV-REL 007 v1.1.2	MANO resilience report71
GS NFV-SEC 001 v1.1.1	Security Problem Statement
GS NFV-SEC 002 v1.1.1	Security features in mgmt sofware
	port
GS NFV-SEC 003 v1.1.1	Security and Trust Guidance
GR NFV-SEC 003 v1.2.1	Security and Trust Guidance
GS NFV-SEC 004 v1.1.1	LI report
GS NFV-SEC 006 v1.1.1	Sec & Regulation report
GR NFV-SEC 007 v1.1.1	NFV Attestation report
GS NFV-SEC 009 v1.1.1	UCs for multi-layer host admin73
GR NFV-SEC 009 v1.2.1	UCs for multi-layer host admin 73
GS NFV-SEC 009 v1.2.1	
GR NFV-SEC 010 V1.1.1 GR NFV-SEC 011 v1.1.1	Retained Data Report
	LI Architecture Report
GS NFV-SEC 012 v3.1.1	Arch for sensitive components - Spec 74
GS NFV-SEC 013 v3.1.1	Sec mgmt & Monitoring Spec 74
GS NFV-SEC 014 v3.1.1	MANO Security Spec75
GS NFV-SOL 002 v2.3.1	Ve-Vnfm RESTful protocols spec 75
GS NFV-SOL 002 v2.4.1	Ve-Vnfm RESTful protocols spec 75
GS NFV-SOL 002 v2.5.1	Ve-Vnfm RESTful protocols spec 75
GS NFV-SOL 003 v2.3.1	Or-Vnfm RESTful protocols spec76
GS NFV-SOL 003 v2.4.1	Or-Vnfm RESTful protocols spec76
GS NFV-SOL 003 v2.5.1	Or-Vnfm RESTful protocols spec76
GS NFV-SOL 004 v2.3.1	VNF Package Stage 3 spec
GS NFV-SOL 004 v2.4.1	VNF Package Stage 3 spec
GS NFV-SOL 004 v2.5.1	VNF Package Stage 3 spec
GS NFV-SOL 004 V2.3.1 GS NFV-SOL 005 v2.4.1	Os-Ma-nfvo APIs
03 IVI V-30L 003 VZ.4.1	03-1918-11190 AF15

GS NFV-SWA 001 v1.1.1 VNF Architecture	77
GS NFV-TST 001 v1.1.1Pre-deployment Validation report	rt 78
GS NFV-TST 002 v1.1.1 lop Testing Methodology report.	78
GR NFV-TST 004 v1.1.1 NFVI_PATH_TEST report	78
GR NFV-TST 004 v1.1.2 NFVI_PATH_TEST report	79
GR NFV-TST 005 v3.1.1 VNF_snapshot_report	79
GR NFV-TST 007 v1.1.1 MANO lop Testing Guidelines	79
GR NFV-TST 007 v2.5.1 MANO lop Testing Guidelines	80
GS NFV-TST 008 v2.1.1NFVI Compute & Nwk Metrics - S	pec 80
GS NFV-TST 008 v2.4.1NFVI Compute & Nwk Metrics - S	pec 80
GS NFV-TST 008 v3.1.1NFVI Compute & Nwk Metrics - S	pec 80
GS NFV-TST 008 v2.5.1NFVI Compute & Nwk Metrics - S	pec 81
GS ZSM 006 v1.1.1 PoC Framework	81



GS <u>NFV 001</u> v <u>1.1.1</u> NFV Use Cases	Rapporteur: Elena Demaria			
Full Title: Network Functions Virtualisation (NFV);				
Use Cases				
Current status: PUBLICATION since 10/10/2013				
Scope: The scope of this work is to collect and define the use cases of interest for NFV.				
Support Companies: TELEFONICA, Telecom Italia, BT, DT, Verizon				

GR <u>NFV 001</u> v1	.2.1 NFV Use Cases revision	Rapporteur: Elena Demaria		
Full Title: Ne	Full Title: Network Functions Virtualisation (NFV);			
Us	Use Cases			
Current status: PUB	LICATION since 5/12/2017			
Scope: This Work	Item will revise ETSI GS NFV 001 with the following objectives:			
 Provide a detailed user story description for all use cases already present in the published deliverable. Align the description of existing NFV use cases with the terminology defined in ETSI GS NFV 003 and other ISG NFV deliverables. 				
- Identify any additional NFV use cases that have material impact on the specification work of NFV ISG.				
The deliverable will be informative.				
Support Companies:	ORANGE, PT PORTUGAL, HPE, Telecom Italia, KPN N.V., TeliaSonera AB, CableLabs, Telef 6WIND, Ericsson	onica I+D, Juniper, DOCOMO,		

GS <u>NFV 002</u> v <u>1.1.1</u> NFV Architectural Framework	Rapporteur:	Joan Triay	
Full Title: Network Functions Virtualisation (NFV);			
Architectural Framework			
Current status: PUBLICATION since 10/10/2013			
Scope: This document is an input to the NFV end-to-end architecture. The purpose of this document is to build a common understanding of "architecture" in the NFV ISG context and provides a central focus to enhance cross-WG coordination to ensure a consistent set of underpinning documents (WG work items). It may eventually be released as a public document and is written with this goal in mind.			
Support Companies: Telefon AB LM Ericsson, TELEFONICA, BT, DT, Verizon, Huawei (UK)			

GS <u>NFV 002</u> v <u>1.2.1</u> NFV Architectural Framework	Rapporteur:	Joan Triay	
Full Title: Network Functions Virtualisation (NFV);			
Architectural Framework			
Current status: PUBLICATION since 12/23/2014			
Scope: The document describes the high-level architectural framework and design philosophy of VNFs, and of the supporting platform and infrastructure. The work to realize in the revision of the Architectural Framework aims at			
developing the basic principles of the existing framework and implementing any current missing description that will			
help improve the understanding of the NFV architecture within and outside the NFV ISG co	ntext.		
Support Companies: ORANGE, NSN, Ericsson, TELEFONICA, Telecom Italia, BT, VODAFONE Group Plc, DT, DO	COMO, AT&T, Veria	zon, Huawei (UK)	

GS <u>NFV 00</u>	<u>3 v1.1.1</u>	Terminology	for Main Co	ncepts in N	FV	Rapporteur:	Andy Bennett
Full Title:	Network Fu	inctions Virtual	isation (NF	FV);			
	Terminolog	y for Main Cor	cepts in NI	FV			
Current statu	s: PUBLICATION si	nce 10/10/2013					
•		ls to provide terms on language" across					
need to be r	evised throughou	inology and archite It the process of arc res regular update (hitecture worl	k. In that sense	e this docume	nt shall be un	derstood as a
Workgroups	are requested to	contribute to this	paper to captu	ure the latest a	liscussions on	conceptual e	ntities being
defined in th	e different Work	ing Groups.					
Support Compa	nies: TELEFONIC	A, BT, DT, Verizon					



GS <u>NFV 003</u> v <u>1.2.1</u> Terminology for Main Co	oncepts in NFV Rapporteur: Andy R	Bennett
Full Title: Network Functions Virtualisation (N	FV);	
Terminology for Main Concepts in N	1FV	
Current status: PUBLICATION since 12/23/2014		
Scope: This document intends to provide terms and definitions for conceptual entities with the scope of the NFV work, in order to achieve a "common language" across all the NFV working groups and for wider industry discussions on this topic. It should be noted, that terminology, architecture and requirements very much depend on each other, and that this document may need to be revised to align with the content of various group specifications and iterations of the ISG architecture document.		
Workgroups are requested to contribute to this paper to capt defined in the different Working Groups	·	eing
Support Companies: Hewlett-Packard, NEC, TELEFONICA, Cisco, DOCOM	O, AT&T, Verizon	

GS <u>NFV 00</u>	<u>3 v1.3.1</u> Terminology	Rapporteur:	Julien Maisonneuve
			Ivialsonneuve
Full Title:	Network Functions Virtualisation (NFV);		
	Terminology for Main Concepts in NFV		
Current statu	: PUBLICATION since 1/8/2018		
Scope: This Work Item intends to provide terms and definitions for conceptual entities within the scope of ISG NFV work, in order to achieve a "common language" across all the NFV working groups and for wider industry discussions on this topic.			
Support Compa	nies: ORANGE, Cisco, Oracle Corporation, 6WIND		

GS NFV 003 v1.4.1 Terminology	Rapporteur: Julien
	Maisonneuve
Full Title: Network Functions Virtualisation (NFV);	
Terminology for Main Concepts in NFV	
Current status: PUBLICATION since 8/10/2018	
Scope: This document intends to provide terms and definitions for conceptual entities wit	th the scope of the NFV work,
in order to achieve a "common language" across all the NFV working groups and for wide	r industry discussions on this
topic. It should be noted, that terminology, architecture and requirements very much depe	end on each other, and that
this document may need to be revised to align with the content of various group specifican	tions and iterations of the
ISG architecture document.	
Support Companies: Orange Nokia Corporation TELEFONICA Cablelahs DOCOMO Verizon Ivia Technology	uios Hugwai

GS <u>NFV 004</u> v <u>1.1.1</u> NFV Virtualisation Requirements	Rapporteur: Susana Sabater	
Full Title: Network Functions Virtualisation (NFV);		
Virtualisation Requirements		
Current status: PUBLICATION since 10/10/2013		
Current status: PUBLICATION since 10/10/2013 Scope: This WI specifies the requirements on Network Functions Virtualisation in order to consolidate network equipment, belonging to fixed and mobile networks, onto industry standard high volume servers, switches and storage, which could be located in Datacentres, Network Nodes and in end user premises. This work will address the requirements on the following areas: • Portability/Interoperability. • Performance. • Elasticity • Security • Resiliency. • Network Stability. • Service continuity • Operations • Energy Efficiency • Migration and co-existence with existing platforms. And will address high level requirements for the virtualisation domains, i.e. Infrastructure domain, applications domain and management and orchestration domain as well as the requirements inherent to the interactions amongst them		
Support Companies: AT&T BT; Cisco; DOCOMO; DT; Telefon AB LM Ericsson; Hewlett-Packard; Huawei (UK) ; France Tele	: NEC; Nokia Siemens Networks ; NTT	



GS <u>NFV-EVE 001</u> v <u>3.1.1</u> Hypervisor Rqmts spec	Rapporteur:	Bruno Chatras
Full Title: Network Functions Virtualisation (NFV);		
Virtualisation Technologies;		
Hypervisor Domain Requirements specification; Release 3	3	
Current status: PUBLICATION since 7/25/2017		
Scope: The scope of this work item is to:		
1) Address - Requirements on the hypervisor to enable use of a stand-alone (*) vswitch		
- Support of VNF(C) live migration.		
2) Restructure/rewrite the existing text to clearly distinguish between normative requirements to be fulfilled by the		
hypervisor domain and other informative material (e.g. best practices)		
<i>3)</i> Update the state-of-the-art (e;g. options for vswitch implementations) and identification industry progress and lessons learnt from the PoCs.	n of challeng	ges, based on
4) Update the document to align with the "vSwitch Benchmarking and Acceleration" delive	rable	
(*) In the above context, "stand-alone" refers to a vswitch whose lifecycle events (restart, u	ıpgrade) d	o not directly
impact virtual machines and that can be provided by software vendor independent from the hypervisor provider		
The deliverable will contain normative provisions.		
Support Companies: ORANGE, PT PORTUGAL, Cisco, Intel, AT&T		

GS <u>NFV-EVE 003</u> v <u>1.1.1</u> NFVI Node Arch report	Rapporteur: Percy Tarapore
Full Title: Network Functions Virtualisation (NFV);	
Ecosystem;	
Report on NFVI Node Physical Architecture Guidelines for	r Multi-Vendor
Environment	
Current status: PUBLICATION since 1/8/2016	
Scope: This WI will develop a report to study the internal architectural structure/physical	components of an NFVI
Nodeand provide a set of guidelines to support an NFV environment. The goai is to facilitat	te the availability of these
components in a multi-vendor environment. The scope is limited to the "Hardware Resourc	
the Infrastructure Overview GS INF001 V1.1.1. These Resources include the Compute, Store	age, and Network hardware.
Accordingly, this document will study:	
- Applicable Architectural Principles (e.g., Open Compute Project)	
- Physical Hardware Components	
- Node Construction (e.g., COTS Products, Rack Designs, Processors, Heating/Cooling Issues	s)
- Interconnection Methods	and Customer Brom
 "Building" NFVI Node Configurations with generic set of components (e.g., Transport, Acc Provider Edge, etc.) 	ess, customer Prem,
- Support Various Use Cases specified in GS INF001 (e.g., Cloud Computing Services, Cloud	Deployment Models, etc.)
- Scaling Issues (Minimum configuration to support specified function, Stacking component	
"size" requirements)	
The proposed GS intends to cover these topics at an acceptable level of detail. It is expecte	d that this study may
highlight the need for additional requirements for individual components such as processo	rs. Such requirements can
then be pursued either in the ISG or in other SDO's as applicable.	
Support Companies: ORANGE, Ericsson, NEC, BT, Intel, AT&T	

GS <u>NFV-E</u>	/E 004 v1.1.1 Virtualisation technologies Report	Rapporteur:	Bruno Chatras
Full Title:	Network Functions Virtualisation (NFV); Virtualisation Technologies; Report on the application of Different Virtualisation Techno Framework	ologies in t	the NFV
Current statu	s: PUBLICATION since 3/11/2016		
MANO) are scalability m managed.	ough the NFV architecture is not tied to hypervisor-based solutions, the detaile biased towards these solutions. The hypervisor approach has some cost in terr hay not be sufficient for cases where a huge number of virtualisation container. f this work item is twofold:	ms of efficien	cy and the



- Identtify the impact of using alternative virtualisation technologies on the NFV framework and specifications, and propose appropriate changes.

- Provide an analysis of the pros and cons of these alternative technologies Alternative virtualisation technologies to be considered include – but are not limited to – the following ones:

- Container-based operating system virtualization such as LXC

- Higher layer container technology such as Java virtual machines

The deliverable will contain informative material only, including recommendations on how to modify other ETSI NFV specifications to cover Non hypervisor-based virtualisation. These modifications are expected to be performed under separate work items.

Support Companies: SWISSCOM, ORANGE, PT PORTUGAL, Telecom Italia, Ericsson AB, Oracle Corporation, AT&T

GS <u>NFV-EVE</u>	005 v <u>1.1.1</u> SDN usage in NFV Report	Rapporteur: Marie-Paule Odini
Full Title:	letwork Functions Virtualisation (NFV);	
E	cosystem;	
F	Report on SDN Usage in NFV Architectural Framework	
Current status: P	JBLICATION since 12/18/2015	
Scope: Softwar	e-Defined Networking (SDN) is mentioned in different ETSI NFV GSs (e.g. SV	NA001 Annex A). A number
of POCs also co	nbine NFV with SDN. The deliverable for this Work Item (WI) will identify us	se cases, clarify the different
usages of SDN v	vithin the context of the NFV architecture framework, including SDN Contro	oller as a VNF, SDN
Controller as a	ealization of the Infrastructure network controller, etc. , and proposes req	uirements to be fulfilled,
	controller playing the role of network controller in the NFV architecture (cf.	
	ns to be covered include datacenter SDN, datacenter-WAN interworking, a	ccess network and WAN. The
	vide a comparison with other forms of network controllers.	
	vill leverage existing work from ETSI ISG NFV. It will support discussions wit	
	jects such as IETF, OPNFV, ONF, OpenStack, OpenDaylight and others as ap	
will contain info	rmative material only but will also make recommendations as to whether	normative work should be
initiated as a fo	llow-up activity.	
Support Companies	: ORANGE, Nokia, Hewlett-Packard, NEC, Coriant, DT, CableLabs, NTT, Intel, Telefonica Eu. Citrix.	rope plc, AT&T, ConteXtream Inc.,

GS <u>NFV-EVE 007</u> v <u>3.1.1</u> NFVI Hw rqmts spec	Rapporteur: Percy Tarapore
Full Title: Network Functions Virtualisation (NFV) Release 3;	
NFV Evolution and Ecosystem;	
Hardware Interoperability Requirements Specification	
Current status: PUBLICATION since 3/23/2017	
Scope: This Work Item proposes to develop a set of Normative interoperability requirement ecosystem and telecommunications physical environment to support NFV deployment. It be in EVE003.	
The Work Item scope encompasses the following:	
-Specification of requirements to enable interoperability of equipment in the telecommunic	cations environment to
support NFV deployment. The focus includes the following areas:	
-Operations	
-Environmental	
-Mechanical	
-Cabling -Maintenance.	
 Specification of requirements for the support of lawful intercept and/or critical national in Investigate baseline reliability requirements for NFVI Node 	ıfrastructures.
•Collaborate with other existing industry fora or SDOs (e.g., Open Compute Project – Telco hardware interoperability requirements are fulfilled.	Project) to ensure NFV
Support Companies: SWISSCOM, Nokia, NEC, BT, CableLabs, Intel, AT&T, Huawei	



GS <u>NFV-EVE 007</u> v <u>3.1.2</u> NFVI Hw rqmts spec	Rapporteur: Percy Tarapore
Full Title: Network Functions Virtualisation (NFV) Release 3;	
NFV Evolution and Ecosystem;	
Hardware Interoperability Requirements Specification	
Current status: PUBLICATION since 3/31/2017	
Scope: This Work Item proposes to develop a set of Normative interoperability requiren ecosystem and telecommunications physical environment to support NFV deployment. I in EVE003.	-
The Work Item scope encompasses the following: -Specification of requirements to enable interoperability of equipment in the telecommu support NFV deployment. The focus includes the following areas: -Operations -Environmental -Mechanical -Cabling -Maintenance.	inications environment to
 Specification of requirements for the support of lawful intercept and/or critical national Investigate baseline reliability requirements for NFVI Node Collaborate with other existing industry fora or SDOs (e.g., Open Compute Project – Techardware interoperability requirements are fulfilled. 	·
Support Companies: SWISSCOM, Nokia, NEC, BT, CableLabs, Intel, AT&T, Huawei	

GR NFV-E	VE 008 v <u>3.1.1</u> Charging and Billing report	Rapporteur:	Rajshree Char
Full Title:	Network Functions Virtualisation (NFV) Release 3;		
	Charging;		
	Report on Usage Metering and Charging Use Cases and	Architectu	ral Study
Current statu	us: PUBLICATION since 12/14/2017		
•	present document studies use cases and charging triggers for usage metering ew functional blocks for 1) the collection and provision of accounting informatic quests.	-	
-	ces (and information flows) between the proposed functional blocks and the cu are part of the study.	rrent NFV Ard	chitectural
The present While mane	ng models have been taken into account: Infrastructure as a Service (IaaS), and t document includes recommendations to either modify existing or new specific agement and orchestration event charging for VNFaasS is part of the present w is for further study.	ations, or bo	th.

 for VNFaaS is for further study.

 Support Companies:
 Nokia, Alcatel-Lucent, Telecom Italia, DT, Openet Telecom, Hitachi Europe Ltd., Huawei, NetCracker

GR <u>NFV-EV</u>	/E 010 v3.1.1 License Management report	Rapporteur:	Abinash Vishwakarma
Full Title:	Network Functions Virtualisation (NFV) Release 3;		
	Licensing Management;		
	Report on License Management for NFV		
Current status	: PUBLICATION since 12/20/2017		
Scope: This	Work Item studies the features needed within the NFV-MANO framework to s	upport licens	e management
for NFV. In th	is version, focus is made on the software licenses for VNFs. A set of use cases	related to VI	NF licenses in
the NFV envi	ronment are described, analyzed and used to understand the issues and produ	ice recomme	ndations
regarding su	pport for license management within the NFV architectural and NFV-MANO fr	ameworks.	
Support Compar	nies: ORANGE, Ericsson, BT, DT, CableLabs, Openet Telecom, Amdocs Software Systems Ltd, V	erizon, RIFT.io, I	NetCracker



GR NFV-E	EVE 012 v3.1.1 Network Slicing report	Rapporteur:	Tetsuya			
			Nakamura			
Full Title: Network Functions Virtualisation (NFV) Release 3;						
Evolution and Ecosystem;						
Report on Network Slicing Support with ETSI NFV Architecture Framework						
Current state	us: PUBLICATION since 12/21/2017					
Scope: Thi	s Work Item will analyze Use Cases related to Network Slicing as defined in SDC	s and industry	fora.			
Furthermor	Furthermore, the WID will document how these use cases could be mapped to current NFV concepts and supported by					
the ETSI NF	V architecture framework					
Support Comp	Danies: ORANGE, HPE, TELEFONICA, Telecom Italia, DT, CableLabs, Intel, ZTE, Gemalto N.V., Hua	wei, NetCracker, N	lokia			

GS <u>NFV-II</u>	FA 001 v1.1.1 Acceleration - UCs report	Rapporteur:	Jinwei Xia
Full Title:	Network Functions Virtualisation (NFV);		
	Acceleration Technologies;		
	Report on Acceleration Technologies & Use Cases		
Current statu	us: PUBLICATION since 12/4/2015		
Scope: This	s WI suggests a common architecture and abstraction layer for the NFV ac	celeration (hardwa	re &
	which allows deployment of various accelerators within NFVI and facilitate Fs and accelerators. As well as presenting the general overview of the NFV		
describes a	set of use cases illustrating the usage of NFV acceleration in NFV environm	ment.	
The deliver	able will contain informative material only. This Work Item is the 1st of a s	series of Work Items	s on NFV
Acceleratio	n. Its deliverable will be the 1st part of a multi-part Group Specification.		
Support Comp	Danies: ORANGE, Nokia, Hewlett-Packard, Intel, China Telecommunications, Huawei (UK)		

GS <u>NFV-IF</u>	<u>A 002</u> v <u>2.1.1</u>	Acceleration - VNF Intface Spec	Rapporteur:	Abdel Hafiz Rabi
Full Title:	Network Fu	Inctions Virtualisation (NFV);		
		n Technologies;		
	VNF Interfa	aces Specification		
Current statu	is: PUBLICATION sin	nce 3/30/2016		
Scope: The	scope of this wor	k item is to specify:		
1) Requirem	nents for a set of a	abstract interfaces, enabling a VNF to leverage acce	leration services from t	he
infrastructu	re, regardless of t	heir implementation.		
2) A deployi	ment model of th	e above interfaces.		
The list of a	bstract interfaces	to be specified will be derived from the use cases de	escribed in IFA 001 (Ove	erview and Use
Cases) of th	e multi-part GS o	n NFV Acceleration. Results will be a normative spe	cification .	
This Work It	tem is the 2nd of	a series of Work Items on NFV Acceleration.		
Support Comp	anies: ORANGE, P	T PORTUGAL, Huawei, China Telecommunications		

GS <u>NFV-IF</u>	A 002 v2.3.1 Acceleration - VNF Intface Spec	Rapporteur:	Abdel Hafiz Rabi
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Acceleration Technologies;		
	VNF Interfaces Specification		
Current statu	s: PUBLICATION since 8/21/2017		
Scope: This	work item is a revision of IFA002. It develops a set of interface specifications in	n the form of i	message flows
and inform	ation elements fulfilling the requirements specified in clause 5 of IFA002 v2.1.1	and may perf	orm
maintenand	e activities. The deliverable will be a normative specification.		
Support Comp	anies: ORANGE, TeliaSonera AB, Huawei, 6WIND		



GS <u>NFV-I</u>	FA 002 v2.4.1	Acceleration - VNF Intface Spec	apporteur:	Abdel Hafiz Rabi
Full Title:	Network Fu	inctions Virtualisation (NFV) Release 2;		
	Acceleratio	n Technologies;		
	VNF Interfa	ices Specification		
Current stat	us: PUBLICATION sir	nce 2/22/2018		
Scope: Thi	s revision of NFV-I	FA 002 conducts NFV Release 2 maintenance: it corrects errors,	ambiguities	5,
misalignme	ents, and applies e	ditorial modifications (i.e. Corrections of category F and D as de	scribed in E	TSI TWPs
Annex L). T	his edition does no	ot add or modify features, nor does it extend the scope of the for	rmer Releas	e 2 edition
summarize	d hereafter:			
IFA 002 spe	cifies requirement	ts for a set of abstract interfaces enabling a VNF to leverage acc	eleration	
services fro	m the infrastructu	re, regardless of their implementation. IFA 002 also provides an	n acceleratio	on
architectur	al model to suppo	rt its deployment model.		
Support Comp	oanies: Vodafone, F	PT Portugal, Orange, Huawei, Telefonica		

GS <u>NFV-IFA 003</u> v2.1.1	Acceleration - Switching Aspects Spec	Rapporteur:	Brian Skerry
Full Title: Network Fu	nctions Virtualisation (NFV);	•	
Acceleratio	n Technologies;		
vSwitch Be	nchmarking and Acceleration Specification		
Current status: PUBLICATION sin	ice 4/19/2016		
parameters for virtual switch Define requirements for virtu - Define deployment scenario path or in any intelligent NIC, for common virtual switching	k item includes the following deliverables: - Define performa ing in the usage models provided in the companion work iter al switch acceleration, and quantify possible gains in perform s for compute node based virtual switching that is supportal in a consistent manner across multiple vendor implementat functions across usage models such as packet delivery into IAT, service chaining, load balancing and, in general, match-	m "Overview & nance, latency ble in any virtu ions Define I VNFs, networl	& Use Cases" & SLA metrics. al switch data requirements & overlay and

GS NFV-I	FA 003 v2.3.1 Acceleration - Switching Aspects Spec	Rapporteur:	Abdel Hafiz
			Rabi
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Acceleration Technologies;		
	vSwitch Benchmarking and Acceleration Specification		
Current stat	us: PUBLICATION since 8/21/2017		
Scope: Thi	s revision of IFA003 is created to conduct NFV Release 2 maintenance, i.e. apply	corrections o	of Category F
and D as de	efined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision	does not exte	nd the scope of
IFA003 v2.1	1.1.		
Support Comp	panies: PT PORTUGAL, Intel, Orange, Telefonica		



GS <u>NFV-IFA 003</u> v2.4.1 Acceleration - Switching Aspects Spec	Rapporteur	Abdel Hafiz
		Rabi
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Acceleration Technologies;		
vSwitch Benchmarking and Acceleration Specification	on	
Current status: PUBLICATION since 2/23/2018		
Scope: This revision of NFV-IFA 003 conducts NFV Release 2 maintenance: it corre	ects errors, ambiguit	ties,
misalignments, and applies editorial modifications (i.e. Corrections of category F a	ind D as described ii	n ETSI TWPs
Annex L). This edition does not add or modify features, nor does it extend the scop	e of the former Rele	ease 2 edition
summarized hereafter:		
IFA 003 specifies performance benchmarking metrics for virtual switching, with the		
adaguately guantify performance gains achieved through virtual switch accelerati	ion conforming to th	an accordented
adequately quantify performance gains achieved through virtual switch accelerati		
requirements specified herein. The acceleration-related requirements will be applied	cable to common vi	irtual switching
requirements specified herein. The acceleration-related requirements will be applic functions across usage models such as packet delivery into VNFs, network overlay	cable to common vi and tunnel termina	irtual switching ition, stateful
requirements specified herein. The acceleration-related requirements will be applic functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener	cable to common vi and tunnel termina ral, match-action bc	irtual switching Ition, stateful Ised
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deplo	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w	irtual switching Ition, stateful Ised
requirements specified herein. The acceleration-related requirements will be applic functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of c	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w	irtual switching Ition, stateful Ised
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deplo	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w	irtual switching Ition, stateful Ised
requirements specified herein. The acceleration-related requirements will be applic functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of c	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities.	irtual switching Ition, stateful Ised
requirements specified herein. The acceleration-related requirements will be applied functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deplo to multiple vendor implementations and recommendations for follow-on proof of Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004</u> v <u>2.1.1</u> Acceleration - Mgmt aspects Spec	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities.	irtual switching ition, stateful ised vith applicability
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of o Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004</u> v2.1.1 Acceleration - Mgmt aspects Spec Full Title: Network Functions Virtualisation (NFV);	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities.	irtual switching ition, stateful ised vith applicability
requirements specified herein. The acceleration-related requirements will be applied functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in generation policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deplet to multiple vendor implementations and recommendations for follow-on proof of Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004 v2.1.1</u> Acceleration - Mgmt aspects Spec Full Title: Network Functions Virtualisation (NFV); Acceleration Technologies;	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities.	irtual switching ition, stateful ised vith applicability
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of o Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004</u> v2.1.1 Acceleration - Mgmt aspects Spec Full Title: Network Functions Virtualisation (NFV);	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities.	irtual switching ition, stateful ised vith applicability
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deplo to multiple vendor implementations and recommendations for follow-on proof of Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004 v2.1.1</u> Acceleration - Mgmt aspects Spec Full Title: Network Functions Virtualisation (NFV); Acceleration Technologies; Management Aspects Specification	cable to common vi and tunnel termina ral, match-action ba oyment scenarios w concept activities. Rapporteur	irtual switching ition, stateful ised vith applicability : Zhipeng Huang
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of or Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004 v2.1.1</u> Acceleration - Mgmt aspects Spec Full Title: Network Functions Virtualisation (NFV); Acceleration Technologies; Management Aspects Specification Current status: PUBLICATION since 4/21/2016	cable to common vi and tunnel termina ral, match-action bo oyment scenarios w concept activities. Rapporteur:	irtual switching ition, stateful ised vith applicability : Zhipeng Huang cr (VIM) and the
requirements specified herein. The acceleration-related requirements will be applie functions across usage models such as packet delivery into VNFs, network overlay Network Address Translators (NAT), service chaining, load balancing and, in gener policies/flows applied to traffic going to/from the VMs. IFA 003 also provides deple to multiple vendor implementations and recommendations for follow-on proof of o Support Companies: Vodafone, PT Portugal, Orange, Huawei, Telefonica GS <u>NFV-IFA 004</u> v2.1.1 <u>Acceleration - Mgmt aspects Spec</u> Full Title: Network Functions Virtualisation (NFV); Acceleration Technologies; Management Aspects Specification Current status: PUBLICATION since 4/21/2016 Scope: This work item will specify functional requirements for both Virtualised Infi	cable to common vi and tunnel termina cal, match-action bo oyment scenarios w concept activities. Rapporteur rastructure Manage perspective. This inc	irtual switching ition, stateful ised vith applicability : Zhipeng Huang cr (VIM) and the ludes the control

and reference points ([GS NFV IFA005], [GS NFV IFA006]) will be identified. Support Companies: ORANGE, Nokia, BT, Juniper, China Telecommunications, Huawei (UK)

GS <u>NFV-IF</u>	A 004 v2.3.1 Acceleration - Mgmt aspects Spec	Rapporteur: Zhipeng Huang
Full Title:	Network Functions Virtualisation (NFV) Release 2;	
	Acceleration Technologies;	
	Management Aspects Specification	
Current statu	s: PUBLICATION since 8/4/2017	
•	revision of IFA004 is created to conduct NFV Release 2 maintenance, i.e. appl	
and D as de	fined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision	does not extend the scope of
IFA004 v2.1	1.	

PT PORTUGAL, Huawei, Orange, Telefonica Support Companies:

GS NFV-IF	<u> 4 004 v2.4.1</u>	Acceleration - Mgmt a	spects Spec	Rapporteur: Zhipeng Huang
Full Title:	Network Fu	nctions Virtualisation (NFV) Release 2;	·
	Acceleratio	n Technologies;		
	Manageme	nt Aspects Specification	n	
Current status	: PUBLICATION sin	ce 2/22/2018		
misalignmen Annex L). Thi summarized	ts, and applies ea is edition does no hereafter:	ditorial modifications (i.e. Cor t add or modify features, nor	2 maintenance: it corrects err rections of category F and D c does it extend the scope of th	is described in ETSI TWPs e former Release 2 edition
			alised Infrastructure Manage	
controlling a IFA 004 also	nd management identifies the cor	of acceleration resources, e.g	elated specifications regarding	ive. This includes the overy of acceleration resources. g functional requirements ETSI
Support Compa		Portuaal. Oranae. Telefonica		



GS <u>NFV-IFA 005</u> v2.1.1 Or-Vi ref point Spec	Rapporteur:	Andy Bennett
Full Title: Network Functions Virtualisation (NFV);		
Management and Orchestration;		
Or-Vi reference point - Interface and Information Model S	oecificatio	n
Current status: PUBLICATION since 4/21/2016		
Scope: This Work Item describe the complete functional requirements for interfaces on th	e Or-Vi refer	ence point
between the NFVO and the VIM(s), to address the functions specified in GS NFV MAN 001.	-	
The work will include:		
1) Detailed description of interfaces and its operations functionality, and		
2) Information elements of:		
a) Virtualized resource management interfaces, for:		
i) Lifecycle management of virtualized resources, including instantiation, modification	, configuratio	on and
termination of such virtualized resources.		
ii) Fault management of virtualized resources.		
iii) Performance management of virtualized resources.		
b) Resource orchestration interfaces, for:		
i) Virtualized resources/NFVI capacity management.		
ii) Resources reservation management.		
iii) Virtualized resources information management.		
iv) Software image management,		
v) NFP management.		
The resulting deliverable will contain normative provisions.		
Support Companies: ORANGE, PT PORTUGAL, Nokia, Hewlett-Packard, Ericsson, NEC EUROPE, TELEFONICA, VODAFONE, DT, Cisco, CableLabs, Sonus Networks Ltd, NTT corp., Openet Telecom, Juni		PN N.V.,

GS NFV-I	FA 005 v2.3.1 Or-Vi ref point Spec	Rapporteur:	Andy Bennett		
Full Title:	Network Functions Virtualisation (NFV) Release 2; Management and Orchestration;				
	Or-Vi reference point - Interface and Information Model Sp	pecificatio	n		
Current stat	us: PUBLICATION since 8/23/2017				
and D as de	Scope: This revision of IFA005 is created to conduct NFV Release 2 maintenance, i.e. apply corrections of Category F and D as defined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision does not extend the scope of				
IFA005 v2.1					
Support Comp	panies: PT PORTUGAL, HPE, Orange, Cisco, Docomo, Telefonica, ZTE, Telecom Italia, Nokia, NTT,	Vodafone, Erics	son		

GS <u>NFV-IF</u>	<u>A 005</u> v <u>2.4.1</u> Or-Vi ref point Spec	Rapporteur:	Andy Bennett	
Full Title:	Network Functions Virtualisation (NFV) Release 2;			
	Management and Orchestration;			
	Or-Vi reference point - Interface and Information Model Sp	oecificatio	n	
Current status	: PUBLICATION since 2/14/2018			
Scope: This revision of NFV-IFA 005 conducts NFV Release 2 maintenance: it corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:				
	ifies the interfaces supported over the Or-Vi reference point of the NFV-MANG framework GS NFV 002 as well as the information elements exchanged over a		Ces	
Support Compa				



GS NFV-IFA 005 v3.1.1 Or-Vi ref point Spec	Rapporteur:	Andy Bennett
Full Title: Network Functions Virtualisation (NFV) Release 3;		
Management and Orchestration;		
Or-Vi reference point - Interface and Information Model S	pecificatio	n
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 005 propagates the deliverable into NFV Release 3.		
This edition will add requirements and specification of interfaces and associated informati	on model to s	support the
Release 3 features, and it will extend the scope of the former Release 2 edition summarize	d hereafter:	
This Work Item describe the complete functional requirements for interfaces on the Or-Vi	reference poi	nt between the
NFVO and the VIM(s), to address the functions specified in GS NFV MAN 001.		
The work will include:		
1) Detailed description of interfaces and its operations functionality, and		
2) Information elements of:		
a) Virtualized resource management interfaces, for:		
i) Lifecycle management of virtualized resources, including instantiation, modification	, configuratio	on and
termination of such virtualized resources.		
ii) Fault management of virtualized resources.		
iii) Performance management of virtualized resources.		
b) Resource orchestration interfaces, for:		
i) Virtualized resources/NFVI capacity management.		
ii) Resources reservation management.		
iii) Virtualized resources information management.		
iv) Software image management,		
v) NFP management.		
The resulting deliverable will contain normative provisions.		
This revision of NFV-IFA 005 will address the Release 3 candidate features listed in Annex I	B of the Relea	ise 3 Definition
(v0.8.0).		
This revision will also reflect the maintenance performed to NFV Release 2 documentation		
Support Companies: Samsung R&D Institute UK, PT Portugal, DOCOMO Communications Lab, HPE, NTT Corp		

	<u>005</u> v <u>2.5.1</u> Or-Vi ref point Spec	Rapporteur:	Andy Bennett
Full Title:	Network Functions Virtualisation (NFV) Release 2;	•	
	Management and Orchestration;		
	Or-Vi reference point - Interface and Information Model Sp	oecificatio	n
Current status	PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 005 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: IFA 005 specifies the interfaces supported over the Or-Vi reference point of the NFV-MANO			
architectural	framework ETSI GS NFV 002 as well as the information elements exchanged o	over those in	terfaces.
Support Compar	ies: PT Portugal, Orange, Huawei, Telefonica, DOCOMO, Samsung		

GS <u>NFV-IFA 006</u> v <u>2.1.1</u> Vi-Vnfm ref point Spec	Rapporteur:	Zarrar Yousaf
Full Title: Network Functions Virtualisation (NFV);		
Management and Orchestration;		
Vi-Vnfm reference point - Interface and Information Mo	lel Specifica	ation
Current status: PUBLICATION since 4/20/2016		
Scope: This Work Item will describe the complete functional requirements for interface point in between the VNFM and the VIM(s), to address the functions specified in GS NF work item will include:		-
1) Detailed description of interfaces and its operations functionality, and		
2) Information elements of:		
a) Virtualized resource management interfaces, for: i) Lifecycle management of virtualized resources, including instantiation, modificat	on configuratio	n and
termination of such virtualized resources.	on, conjiguratio	in unu
ii) Fault management of virtualized resources.		



iii) Performance management of virtualized resources.	
b) Resource management interfaces, for:	
i) Resources reservation information retrieval.	
ii) Virtualized resources information retrieval.	
iii) Software image management.	
The resulting deliverable will contain normative provisions.	
Support Companies: ORANGE, PT PORTUGAL, Nokia, Hewlett-Packard, Ericsson, NEC EUROPE, TELEFON	
VODAFONE, DT, Cisco, CableLabs, Sonus Networks Ltd, NTT corp., Openet Telecom,	Juniper, DOCOMO
GS <u>NFV-IFA 006</u> v <u>2.3.1</u> Vi-Vnfm ref point Spec	Rapporteur: Zarrar Yousaf
Full Title: Network Functions Virtualisation (NFV) Release 2;	
Management and Orchestration;	
Vi-Vnfm reference point - Interface and Information Mc	del Specification
Current status: PUBLICATION since 8/7/2017	
Scope: This revision of IFA006 is created to conduct NFV Release 2 maintenance, i.e. o	pply corrections of Category F
and D as defined in Annex L, clause L3 of ETSI Technical Working Procedures. This revis	ion does not extend the scope of
IFA006 v2.1.1.	
Support Companies: PT PORTUGAL, HPE, Orange, NEC, Docomo, Telefonica, ZTE, Telecom Italia, Nokia, I	NTT, Vodafone, Ericsson
GS <u>NFV-IFA 006</u> v2.4.1 Vi-Vnfm ref point Spec	Rapporteur: Zarrar Yousaf
Full Title: Network Functions Virtualisation (NFV) Release 2;	
Management and Orchestration;	
	del Specification
Vi-Vnfm reference point - Interface and Information Mc	del Specification
Current status: PUBLICATION since 2/13/2018	arrara ambiguitios
Scope: This revision of NFV-IFA 006 conducts NFV Release 2 maintenance: it corrects of minipal and applies editorial medifications (i.e. Corrections of estagen) 5 and 1	_
misalignments, and applies editorial modifications (i.e. Corrections of category F and L	
Annex L). This edition does not add or modify features, nor does it extend the scope of	the former Release 2 edition
summarized hereafter:	
IFA 006 specifies the interfaces supported over the Vi-Vnfm reference point of the NFV architectural framework ETSI GS NFV-MAN 001 as well as the information elements experience of the second	
Support Companies: NEC, PT Portugal, Orange, Docomo, Huawei, Telefonica, Ericsson	chunged over those interfaces.
GS <u>NFV-IFA 006</u> v <u>3.1.1</u> Vi-Vnfm ref point Spec	Rapporteur: Zarrar Yousaf
Management and Orchestration;	
Vi-Vnfm reference point - Interface and Information Mo	del Specification
Current status: PUBLICATION since 8/10/2018	
Scope: This revision of NFV-IFA 006 propagates the deliverable into NFV Release 3.	
This edition will add requirements and specification of interfaces and associated inform	
Release 3 features, and it will extend the scope of the former Release 2 edition summa	-
This Work Item will describe the complete functional requirements for interfaces on th	
between the VNFM and the VIM(s), to address the functions specified in GS NFV MAN	001. The results of the work item
will include:	
1) Detailed description of interfaces and its operations functionality, and	
2) Information elements of:	
a) Virtualized resource management interfaces, for:	tion of firm the stand
i) Lifecycle management of virtualized resources, including instantiation, modificant	tion, configuration and
termination of such virtualized resources.	
ii) Fault management of virtualized resources.	
iii) Performance management of virtualized resources.	
 b) Resource management interfaces, for: i) Resources reservation information retrieval. 	
i) Virtualized resources information retrieval.	
iii) Software image management.	
The resulting deliverable will contain normative provisions.	
This revision of NFV-IFA 006 will address the Release 3 candidate features listed in Anr	
	av B of the Release 2 Definition
	nex B of the Release 3 Definition
(v0.8.0). This revision will also reflect the maintenance performed to NEV Release 2 documenta	
(v0.8.0). This revision will also reflect the maintenance performed to NFV Release 2 documenta Support Companies: NEC Europe, PT Portugal, DOCOMO Communications Lab, HPE	



GS NFV-IFA	006 v2.5.1	Vi-Vnfm ref po	int Spec		Rapporteur:	Zarrar Yousa
Full Title:		nctions Virtualis		Release 2 [·]		
		nt and Orchestr				
		erence point - I		Information M	lodel Specifica	ation
Current status:	PUBLICATION sin					
		A 006 conducts NF	/ Release 2 mair	tenance. It corrects	s errors, ambiquiti	es,
•		ditorial modification				
		t add or modify feat				
summarized l	hereafter:					
IFA 006 specij	fies the interface	s supported over the	e Vi-Vnfm refere	ence point of the NF	V-MANO	
		GS NFV-MAN 001 a		ormation elements	exchanged over th	ose interfaces.
Support Company	nies: PT Portugal,	Orange, Huawei, Telefor	nica, NEC, DOCOMO			
GS <u>NFV-IFA</u>	<u>007 v2.1.1</u>	Or-Vnfm ref po	oint Spec		Rapporteur:	Uwe
						Rauschenbach
Full Title:		nctions Virtualis		;		
		nt and Orchestr				
		erence point - l	Interface and	d Information N	Nodel Specific	ation
	: PUBLICATION sin					
•		k Item will include th				-
		/NFM and the NFVC), to address the	functions specified	in GS NFV MAN 0	01.
-	f the work item w					
		rfaces and its opera		ity.		
		mation elements of	7			
	cle management					
		NFs, including the ins	stantiation, mod	lification, update, s	caling and termino	ition of VNFs.
	nange notification stration interface					
	eration interface					
		ment interfaces, for:				
		val and managemei				
II VINE TOUT IN						

- *ii)* VNF performance information retrieval and management.
- iii) VNF package management.
- iv) Policy management.

The resulting deliverable will contain normative provisions.

 Support Companies:
 ORANGE, PT PORTUGAL, Nokia, Hewlett-Packard, Ericsson, NEC EUROPE, TELEFONICA, TELECOM ITALIA, KPN N.V.,

 VODAFONE, DT, Cisco, CableLabs, Sonus Networks
 NTT, Openet Telecom, Amdocs Software, Juniper, DOCOMO

GS <u>NFV-IF</u>	A 007 v2.3.1 Or-Vnfm ref point Spec	Rapporteur:	Uwe
			Rauschenbach
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Management and Orchestration;		
	Or-Vnfm reference point - Interface and Information Mode	I Specifica	ation
Current statu	s: PUBLICATION since 8/21/2017		
Scope: This	revision of IFA007 is created to conduct NFV Release 2 maintenance, i.e. apply	corrections of	of Category F
and D as de	fined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision (does not exte	end the scope of
IFA007 v2.1	.1.		
Support Compa	anies: PT PORTUGAL, HPE, Orange, Nokia, Docomo, Ericsson, Telefonica, ZTE, Telecom Italia, N	TT, Vodafone, Er	ricsson



Uwe **Or-Vnfm ref point Spec** Rapporteur: GS NFV-IFA 007 v2.4.1 Rauschenbach Full Title: Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Or-Vnfm reference point - Interface and Information Model Specification Current status: **PUBLICATION** since 2/14/2018 Scope: This revision of NFV-IFA 007 conducts NFV Release 2 maintenance: it corrects errors, ambiauities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: IFA 007 specifies the interfaces supported over the Or-Vnfm reference point of the Network Functions Virtualisation Management and Orchestration (NFV-MANO) architectural framework ETSI GS NFV-MAN 001 as well as the information elements exchanged over those interfaces. Support Companies: Nokia, PT Portugal, Orange, Docomo, Huawei, Telefonica, Ericsson

GS <u>NFV-IFA 007 v3.1.1</u> Or-Vnfm ref point Spec	Rapporteur:	Ernest Bayha
Full Title: Network Functions Virtualisation (NFV) Release 3;		
Management and Orchestration;		
Or-Vnfm reference point - Interface and Information Mode	I Specifica	ation
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 007 propagates the deliverable into NFV Release 3.		
This edition will add requirements and specification of interfaces and associated information	on model to s	support the
Release 3 features, and it will extend the scope of the former Release 2 edition summarized		
The scope of the Work Item will include the complete functional requirements for interface	es on the Or-V	/nfm reference
point between the VNFM and the NFVO, to address the functions specified in GS NFV MAN	001.	
The results of the work item will include:		
1) Detailed description of interfaces and its operations functionality.		
2) Information flows and information elements of:		
a) VNF lifecycle management interfaces, for:		
i) Lifecycle management of VNFs, including the instantiation, modification, update, scaling	and termina	tion of VNFs.
ii) Lifecycle change notifications of VNFs.		
b) VNF orchestration interfaces, for:		
i) Lifecycle operation and resource granting.		
c) Other related VNF management interfaces, for:		
i) VNF fault information retrieval and management.		
ii) VNF performance information retrieval and management.		
iii) VNF package management.		
iv) Policy management.		
The resulting deliverable will contain normative provisions.	of the Deleg	an 2 Definition
This revision of NFV-IFA 007 will address the Release 3 candidate features listed in Annex B (v0.8.0).	of the Relea	se 3 Definition
(v0.8.0). This revision will also reflect the maintenance performed to NFV Release 2 documentation.		
Support Companies: Nokia, PT Portugal, DOCOMO Communications Lab, Orange		
Support companies. Anotal, i i i ortagal, bocomo commanications tab, orange		
GS NFV-IFA 007 v2.5.1 Or-Vnfm ref point Spec	Rapporteur:	Ernest Bayha
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		

Or-Vnfm reference point - Interface and Information Model Specification

Current status: PUBLICATION since 8/10/2018

Scope: This revision of NFV-IFA 007 conducts NFV Release 2 maintenance. It corrects errors, ambiguities,

misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:

IFA 007 specifies the interfaces supported over the Or-Vnfm reference point of the Network Functions Virtualisation Management and Orchestration (NFV-MANO) architectural framework ETSI GS NFV-MAN 001 as well as the information elements exchanged over those interfaces.

Support Companies: Nokia, PT Portugal, Orange, Huawei, Telefonica, Ericsson, DOCOMO,



GS <u>NFV-IFA 008</u> v <u>2.1.1</u> Ve-Vnfm ref point Spec	Rapporteur:	Shitao Li
Full Title: Network Functions Virtualisation (NFV);		
Management and Orchestration;		
Ve-Vnfm reference point - Interface and Information Mo	del Specificati	on
Current status: PUBLICATION since 10/18/2016	•	
Scope: The reference point Ve-Vnfm described as part of the NFV architecture framework further split in the informative GS NFV MAN001 in two reference points – one between (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF points are mainly used for the lifecycle management of that VNF. The scope of the Work functional and information requirements of all VNF management interfaces over the report VNFM and theVNF/EM, based on which complete interfaces technical specifications carrienteroperability purposes. The results of the work item will include: • Detailed description operations functionality. • Detailed information model requirements of related VNF lifet for: – Lifecycle management of VNFs, including the instantiation, modification, update, termination of VNFs. – Lifecycle change notifications of VNFs. • Detailed information model requirements of any other generic VNF management interfaces, for: – VNF fault management. – VNF perfor configuration • Detailed information model requirements of any other generic VNF mara and/or previously described in GS NFV MAN 001) needed to be exposed between in sup support of necessary VNF-related management operations. • Validation of interface oper equirements are not covered in this deliverable. The WI will leverage GS NF any applicable other guidelines, studies and requirements as appropriate, in close collade organizations working on these aspects, such as 3GPP SA5 and TMF. The deliverable with the second secon	the VNF Manager (Ve-Vnfm-em); th (Item will include erence points betw subsequently be of on of interfaces an ycle managemen ycaling, healing ar del requirements rmance managen agement interface ort of VNF/EM a rations and inform implement the de (MAN001 and win oration with the of	and a VNF ese reference the ween the defined, for nd its t interfaces, nd of other nent. – VNF es (new nd VNFM, in mation model tailed Il consider other

Support Companies: ORANGE, Alcatel-Lucent, Hewlett-Packard, Ericsson, TELEFONICA, Sonus Networks Limited, Juniper, Amdocs Software Systems Ltd, SPRINT, AT&T, Huawei (UK)

GS <u>NFV-IF</u>	A 008 v2.3.1 Ve-Vnfm ref point Spec	Rapporteur:	Shitao Li
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Management and Orchestration;		
	Ve-Vnfm reference point - Interface and Information Mode	el Specification	n
Current statu	s: PUBLICATION since 8/21/2017		
Scope: This	revision of IFA008 is created to conduct NFV Release 2 maintenance, i.e. apply	corrections of Ca	itegory F
and D as de	fined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision	does not extend t	he scope of
IFA008 v2.1	1.		
Support Comp	nies: PT PORTUGAL, HPE, Orange, Huawei, Docomo, Ericsson, Telefonica, ZTE, Telecom Italia,	Nokia, NTT, Ericsson	

GS <u>NFV-IFA 008</u> v <u>2.4.1</u> Ve-Vnfm ref point Spec	Rapporteur:	Xu Yang		
Full Title: Network Functions Virtualisation (NFV) Release 2;				
Management and Orchestration;				
Ve-Vnfm reference point - Interface and Information Mod	el Specification			
Current status: PUBLICATION since 2/13/2018				
Scope: This revision of NFV-IFA 008 conducts NFV Release 2 maintenance: it corrects error	rs, ambiguities,			
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	described in ETSI T	WPs		
Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:				
IFA 008 specifies the interfaces supported over the Ve-Vnfm-em and Ve-Vnfm-vnf reference points of the NFV-MANO				
architectural framework ETSI GS NFV-MAN 001 as well as the information elements exch	inged over those in	terfaces.		
Support Companies: Huawei, PT Portugal, Orange, Docomo, Telefonica, Ericsson				





 Section 1115 1115 1115 Det Mark E Constructions Point operation (NFV) Release 3; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: Detailed description of interfaces and its operations functionality. Detailed discription of interfaces and its operations functionality. Detailed information model requirements of arelated VNF lifecycle management interfaces, for: Lifecycle change notifications of VNFs. Detailed information model requirements of any other generic VNF management interfaces, for: VNF fault management. VNF configuration Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of n			
Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV020 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: • Detailed description of interfaces and its operations functionality. • Detailed description of Interfaces and its operations functionality. • Detailed description of MVFs, including the instantiation, modification, update, scaling, healing and termination of VNFs. • Lifecycle change notifications of VNFs. • Detailed information model requirements of other related generic VNF management interfaces, for: • VNF fordinguration • UWF performance management. • VWF configuration • Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. • Validation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocol	GS <u>NFV-IFA 008</u> v <u>3.1.1</u> Ve-Vnfm ref point Spec	Rapporteur:	Xu Yang
Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: • Detailed description of interfaces and its operations functionality. • Detailed description of interfaces and its operations functionality. • Detailed information model requirements of other related generic VNF management interfaces, for: • Lifecycle change notifications of VNFs. • Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. • Udidation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocols needed to implement the detailed functional requirements are appropriate, in close collaboration with the other organizations working on these aspects, such as 3GPP SA5 and TNF. the deliverable.	Full Title: Network Functions Virtualisation (NFV) Release 3;		
Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: • Detailed description of interfaces and its operations functionality. • Detailed description of interfaces and its operations functionality. • Detailed information model requirements of other related generic VNF management interfaces, for: • Lifecycle change notifications of VNFs. • Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. • Udidation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocols needed to implement the detailed functional requirements are appropriate, in close collaboration with the other organizations working on these aspects, such as 3GPP SA5 and TNF. the deliverable.	Management and Orchestration:		
Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVMF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work Item will include: • Detailed description of interfaces and its operations functionality. • Detailed description of interfaces and its operations functionality. • Detailed information model requirements of related VNF lifecycle management interfaces, for: • Lifecycle change notifications of VNFs. • Detailed information model requirements of other related generic VNF management interfaces, for: • UNF configuration • VNF configuration • Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. • Validation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocols needed to implement the detailed functional requirements are not covered in this deliverable. The WI will leverage GS NFV MAN001 and wil		el Specificatio	'n
 Scope: This revision of NFV-IFA 008 propagates the deliverable into NFV Release 3. This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: Detailed information model requirements of related VNF lifecycle management interfaces, for: Lifecycle change notifications of VNFs. Detailed information model requirements of other related generic VNF management interfaces, for: VNF fault management. VNF performance management. VNF configuration Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. Validation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocls needed to implement the detailed functional requirements are not covered i			
This edition will add requirements and specification of interfaces and associated information model to support the Release 3 features, and it will extend the scope of the former Release 2 edition summarized hereafter: The reference point Ve-Vnfm described as part of the NFV architecture framework in GS NFV002 is actually further split in the informative GS NFV MAN001 in two reference points - one between the VNF Manager and a VNF (Ve-Vnfm-vnf) and one between the VNF Manager and an EM associated with that VNF (Ve-Vnfm-em); these reference points are mainly used for the lifecycle management of that VNF. The scope of the Work Item will include the functional and information requirements of all VNF management interfaces over the reference points between the VNFM and theVNF/EM, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include: Detailed description of interfaces and its operations functionality. Detailed information model requirements of related VNF lifecycle management interfaces, for: Lifecycle change notifications of VNFs. Detailed information model requirements of other related generic VNF management interfaces, for: VNF foult management. VNF foult management. VNF configuration VNFs. VNF configuration Detailed information model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. VINF configuration VNF-related management operations. VNF configuration model requirements of any other generic VNF management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between in support of VNF/EM and VNFM, in support of necessary VNF-related management operations. Validation of interface operations and information model requirements against end-to-end flows. Data models/schemas and protocols needed to implem			
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	The deliverable will contain normative provisions.		
(v0.8.0)	This revision of NFV-IFA 008 will address the Release 3 candidate features listed in Annex	B of the Release 3	Definition
	(v0.8.0).		
This revision will also reflect the maintenance performed to NFV Release 2 documentation.		า.	
Support Companies: Huawei UK Ltd., PT Portugal, DOCOMO Communications Lab, Orange, ZTE	Support Companies: Huawei UK Ltd., PT Portugal, DOCOMO Communications Lab, Orange, ZTE		

Full Title: Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: IFA 008 specifies the interfaces supported over the Ve-Vnfm-em and Ve-Vnfm-vnf reference points of the NFV-MANG architectural framework ETSI GS NFV-MAN 001 as well as the information elements exchanged over those interface Support Companies: PT Portugal, Orange, Huawei, Telefonica, Ericsson, Telefonica	GS <u>NFV-IF</u>	A 008 v2.5.1	Ve-Vnfm ref point	Spec		Rapporteur:	Xu Yang
Ve-Vnfm reference point - Interface and Information Model Specification Current status: PUBLICATION since 8/10/2018 Scope: This revision of NFV-IFA 008 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: IFA 008 specifies the interfaces supported over the Ve-Vnfm-em and Ve-Vnfm-vnf reference points of the NFV-MANG architectural framework ETSI GS NFV-MAN 001 as well as the information elements exchanged over those interface	Full Title: Network Functions Virtualisation (NFV) Release 2;						
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GS <u>NFV-IFA 009</u> v <u>1.1.1</u> MANO architectural options report	Rapporteur: Peter Worndle
Full Title: Network Functions Virtualisation (NFV);	
Management and Orchestration;	
Report on Architectural Options	
Current status: PUBLICATION since 7/5/2016	
Scope: The WI is an architecture study that shall:	
outline clearly a set of possible functional/architectural options	
analyse the impact of different interactions between some functional blocks in the	e NFV architectural
framework (EM, VNF, OSS) and NFV-MANO functional blocks (NFVO, VNFM, VIM) on the fu	
partitioning/distribution/consolidation of functionality amongst NFV-MANO functional blo	
 analyse the scope of the VNFM and NFVO and clarify the difference and impact, if 	fany, of separating VNFM
from the NFVO versus having those functionalities combined	
analyse the impact of centralized versus distributed VNFM functionality	
analyze and outline functional/architectural impact of separating versus combinin	ng the two broad functions
of the NFVO (Network Service Orchestration and Resource Orchestration);	
analyze and outline functional/architectural options of VNFM, NFVO, VIM to supp	ort operations across
administrative domains boundaries and identify the necessary interfaces.	
• identify for each architectural option views of usage of the interfaces and function	hal blocks, and which
management interfaces are significant	
 provide valuable insights for consideration by other normative work on NFV archite 	tecture and interfaces
The WI deliverable shall be informative.	
Support Companies: ORANGE, Alcatel-Lucent, Hewlett-Packard, NEC, TELEFONICA, KPN N.V., DT, Cisco, Sonus Software Systems Ltd, Oracle Corporation, SPRINT, AT&T, Huawei (UK)	Networks Limited, Juniper, Amdocs

GS <u>NFV-IFA 010</u> v2.1.1 MANO Functional Rqmts Spec	Rapporteur: Amanda Xiang
Full Title: Network Functions Virtualisation (NFV);	·
Management and Orchestration;	
Functional requirements specification	
Current status: PUBLICATION since 4/6/2016	
Scope: This WI aims for a NFV Phase 2 deliverable containing all the no	ormative functional requirements for NFV
management and orchestration e.g. to support VNF migration, VNF Hea	aling, Health-check.
The following aspects need to be considered (in-scope) while developing	g such a deliverable
- Consolidating all the functional requirements scattered in various phase	se 1 GSs (SWA GS, REL GS, INF GSs, MAN GS,
NFV004) for management and orchestration. ISG level requirements fro	om NFV004 should be considered as default
requirement for phase 2 unless specific corrections to certain requirement	ents are agreed in ISG level.
- Refining functional requirements for concepts defined in Phase 1	
The target deliverable is a requirement GS which will be fulfilled by NFV	management and orchestration interface
normative work. The other interface normative WI can progress in para	llel. The functional requirements on interfaces
and models related to interfaces are not in scope of this WI. The final de	eliverable will contain normative provisions.
Support Companies: Alcatel-Lucent, Hewlett-Packard, DT, Oracle Corporation, ZTE, SP	PRINT, Huawei (UK)

GS <u>NFV-IFA 010</u> v2.2.1 MANO Functional Rqmts Spec	Rapporteur:	Amanda Xiang
Full Title: Network Functions Virtualisation (NFV);		
Management and Orchestration;		
Functional requirements specification		
Current status: PUBLICATION since 9/27/2016		
Scope: The scope of this work is the revision of IFA10 specification in order to conduct ma	lintenance a	nd add new
functional requirements that may be identified during the continued development of the re	elease 2 inter	rface
specifications.		
The resulting specification will contain a complete set of normative functional requirement	ts for NFV m	anagement and
orchestration. The requirements on interfaces related to reference points are not in scope	of this WI.	
Support Companies: ORANGE, HPE, China Telecommunications, SPRINT, Huawei		



GS <u>NFV-IFA 010</u> v2.3.1 MANO Fun	ctional Rqmts Spec	Rapporteur: Amanda Xiang
Full Title: Network Functions Virtu	alisation (NFV) Release 2;	
Management and Orch	estration;	
Functional requirement	s specification	
Current status: PUBLICATION since 8/4/2017		
Scope: This revision of IFA010 is created to c	onduct NFV Release 2 maintenance, i.e. app	ly corrections of Category F
and D as defined in Annex L, clause L3 of ETS	Technical Working Procedures. This revision	n does not extend the scope of
IFA010 v2.2.1.		
Support Companies: PT PORTUGAL, HPE, Orange, Hu	awei, Telefonica, ZTE, Telecom Italia	

GS <u>NFV-IFA 010</u> v <u>2.4.1</u> MANO Functional Rqmts Spec	Rapporteur:	Ulrich Kleber				
Full Title: Network Functions Virtualisation (NFV) Release 2;						
Management and Orchestration;						
Functional requirements specification						
Current status: PUBLICATION since 2/13/2018						
Scope: This revision of NFV-IFA 010 conducts NFV Release 2 maintenance: it corrects error	rs, ambiguitie	<i>s,</i>				
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs					
Annex L). This edition does not add or modify features, nor does it extend the scope of the	Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition					
summarized hereafter:						
IFA 010 specifies functional requirements for NFV management and orchestration, and general guidelines and						
requirements for NFV management and orchestration interface design.						
FA 010 does not cover the functional requirements on interfaces.						
Support Companies: Huawei, PT Portugal, Orange, Telefonica						

GS <u>NFV-IF</u>	A 010 v <u>3.1.1</u>	MANO Fun	ctional Rqmts Sp	ec	Rapporteur:	Ulrich Kleber
Full Title:	Network Fu	Inctions Virtu	alisation (NFV)	Release 3;		
	Manageme	nt and Orche	estration;			
	Functional	requirements	specification			
Current status	s: PUBLICATION sir	nce 8/10/2018	•			
Scope: This	revision of NFV-I	IFA 010 propaga	tes the deliverable i	nto NFV Release 3.		
	will add functiond former Release 2			pport the Release 3	features, and it w	ill extend the
This WI aims	for a NFV Phase	2 deliverable co		native functional req alth-check.	uirements for NF	V management
The followin	g aspects need to	be considered (in-scope) while deve	loping such a delive	rable	
- Consolidati	ng all the functio	nal requirement.	s scattered in variou	s phase 1 GSs (SWA	GS, REL GS, INF G	Ss, MAN GS,
	-			nts from NFV004 sho		d as default
				irements are agreed	d in ISG level.	
			s defined in Phase			
-				y NFV management		
				n parallel. The function		
				inal deliverable will o		
	of NFV-IFA 010 v	vill address the R	elease 3 candidate	features listed in Anı	nex B of the Relea	se 3 Definition
(v0.8.0).						
This revision	will also reflect t	he maintenance	performed to NFV F	Release 2 documenta	ition.	
Support Compa	nies: Huawei UK	Ltd., PT Portugal, Ord	ange, DOCOMO Commur	ications Lab, NEC Europe,	. ZTE. NTT Corp	



ETSI	

GS <u>NFV-IFA 010</u> v <u>2.5.1</u> MA	NO Functional Rqmts Spec	Rapporteur: Ulrich K	leber
Full Title: Network Functio	ns Virtualisation (NFV) Release	2;	
Management an	d Orchestration;		
Functional requi	rements specification		
Current status: PUBLICATION since 8/1	0/2018		
misalignments, and applies editoria Annex L). This edition does not add summarized hereafter:	conducts NFV Release 2 maintenance. It co I modifications (i.e. Corrections of category or modify features, nor does it extend the so	F and D as described in ETSI TWPs cope of the former Release 2 edition	n
IFA 010 specifies functional requirer requirements for NFV management IFA 010 does not cover the function		ion, and general guidelines and	
Support Companies: PT Portugal, Orange	, Huawei, Telefonica, DOCOMO		

GS <u>NFV-IFA 011</u> v2.1.1 VNF Packaging Spec	Rapporteur: Jon Fanna
	Karlsson-Taylo
Full Title: Network Functions Virtualisation (NFV);	
Management and Orchestration;	
VNF Packaging Specification	
Current status: PUBLICATION since 10/17/2016	
Scope: This Work Item will develop a specification for packaging VNFs(Virtual Network	Functions) to be delivered to
service providers.	
This work item will build from the requirements captured in the SWA and MAN Group S	
to the VNF state machine, VNF design patterns, and the VNF Descriptor information ele	_
The new work item will consider a holistic end-to-end view of the package lifecycle from capturing development as well as operational views.	n design to runtime, thus
Analysis for this WI will use and potentially refine End to end VNF Package lifecycle mai	nagement operations based on
use cases, detailing actors and NFV Architectural Framework functional blocks impacte	-
use other industry developments related to software procurement as input into the and	lysis.
Deliverables for this work item will be an informative GS document addressing:	
- Requirements for the structure and format of the VNF archive, list of mandatory and c	ptional files and authorized
formats	
-Extensible language independent meta-model for describing the VNF properties and re	
existing work on VNFD. This will require using consistent terminology and refinement o	5
-Recommendation for Implementation ready packaging structure by selecting and reus	
requirements for extension of) existing cloud services (e.g. TOSCA) and network configu DMTF, MEF).	ration specifications (e.g.
This work item will benefit from the SDO gap analysis and it will be used as input to ope	on source activities related to
packaging tools, runtime package interpretors and execution environments.	in source activities related to
The output of this work should be used as formal requirements for extensions into norn	native specifications developed
by other SDOs identified in the analysis.	
Support Companies: Alcatel-Lucent, Hewlett-Packard, TELEFONICA, Intel, Amdocs Software Systems Ltd, A	AT&T

GS NFV-IFA 011 v2.3.1 VNF Packaging Spec	Rapporteur: Jon Fannar
	Karlsson-Taylor
Full Title: Network Functions Virtualisation (NFV) Re	elease 2;
Management and Orchestration;	
VNF Packaging Specification	
Current status: PUBLICATION since 8/21/2017	
Scope: This revision of IFA011 is created to conduct NFV Release 2 ma and D as defined in Annex L, clause L3 of ETSI Technical Working Proce	
IFA011 v2.1.1.	
Support Companies: PT PORTUGAL, HPE, Orange, Amdocs, Verizon, Telefonica, ZTE,	Telecom Italia, Ericsson

53/92



GS <u>NFV-IFA 011</u> v2.4.1 VNF Packaging Spec	Rapporteur:	Haibin Chu
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
VNF Descriptor and Packaging Specification		
Current status: PUBLICATION since 2/13/2018		
Scope: This revision of NFV-IFA 011 conducts NFV Release 2 maintenance: it corr	rects errors, ambiguities	,
misalignments, and applies editorial modifications (i.e. Corrections of category F	and D as described in E	TSI TWPs
Annex L). This edition does not add or modify features, nor does it extend the sco summarized hereafter:	pe of the former Releas	e 2 edition
IFA 011 provides requirements for the structure and format of a VNF Package to associated resource requirements in an interoperable template.	describe the VNF proper	rties and
The focus is on VNF packaging, meta-model descriptors (e.g. VNFD) and package considerations.	e integrity and security	
Support Companies: PT Portugal, Orange, Huawei, Telefonica, Ericsson		

GS <u>NFV-IFA 011</u> v3	. <u>1.1</u>	VNF Packagiı	ng Spec		Rapporteur:	Haibin Chu
Full Title: Netwo	ork Fun	ctions Virtua	lisation (NFV)	Release 3;		
Mana	gement	t and Orches	stration;			
VNF D	Descrip	tor and Pack	aging Specific	cation		
Current status: PUBLICA						
Scope: This revision o	f NFV-IFA	011 propagate	s the deliverable ii	nto NFV Release 3.		
This edition will add fu	nctional i	requirements an	d specification of	the information mod	del to support the R	elease 3
features, and it will ex	tend the s	scope of the forr	ner Release 2 editi	on summarized here	eafter:	
This Work Item will de	velop a sp	pecification for p	ackaging VNFs(Vi	rtual Network Funct	tions) to be delivere	d to service
providers. This work it						
documents related to a among others.	the VNF s	tate machine, V	NF design pattern.	s, and the VNF Desci	riptor information e	elements,
The new work item wi				package lifecycle fro	om design to runtin	ne, thus
capturing developmen						
Analysis for this WI will use cases, detailing ac	tors and I	NFV Architecture	al Framework fund	tional blocks impac	ted. This new work	
use other industry dev Deliverables for this w					naiysis.	
- Requirements for the				-	d ontional files and	authorized
formats	Structure	, and joinnat of	the vivi archive, n	it of manuatory and	a optional jies and	uutiionzeu
-Extensible language in existing work on VNFE -Recommendation for requirements for exter DMTF, MEF).). This will Impleme	l require using controls in the second se I require using second	onsistent terminol ackaging structure	bgy and refinement by selecting and rea	of the existing VNF using (e.g., profiling	model g or identifying
This work item will ber packaging tools, runti					pen source activitie	s related to
The output of this wor by other SDOs identifie	k should l	be used as form			rmative specificatio	ns developed
<i>This revision of NFV-IF.</i> (v0.8.0).			lease 3 candidate	features listed in An	nnex B of the Releas	e 3 Definition
This revision will also r	eflect the	e maintenance p	erformed to NFV F	elease 2 documento	ation.	

Support Companies: HPE, PT Portugal, Docomo, CableLabs, NEC Europe



ETSI	

Full Title: Network Functions Virtualisation (NEV) Release 2:		Haibin Chu
Full Title: Network Functions Virtualisation (NFV) Release 2;	•	
Management and Orchestration;		
VNF Descriptor and Packaging Specification		
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 011 conducts NFV Release 2 maintenance. It corrects erro	ors, ambiguities	6
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	described in E	TSI TWPs
Annex L). This edition does not add or modify features, nor does it extend the scope of the summarized hereafter:	former Releas	e 2 edition
FA 011 provides requirements for the structure and format of a VNF Package to describe associated resource requirements in an interoperable template.	the VNF prope	rties and
The focus is on VNF packaging, meta-model descriptors (e.g. VNFD) and package integrity considerations.	and security	
Support Companies: Ericsson, PT Portugal, Orange, Huawei, Telefonica, DOCOMO		
GS <u>NFV-IFA 013</u> v <u>2.1.1</u> Os-Ma-Nfvo ref point Spec - info model	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV);		

Management and Orchestration;

Os-Ma-Nfvo reference point - Interface and Information Model Specification Current status: PUBLICATION since 10/17/2016

Scope: As described in the informative GS NFV MAN 001, Os-Ma-nfvo is a reference point between the OSS and the NFV Orchestrator. This reference point is used for all management interactions between OSS and the NFV-specific management framework, and mainly used for the lifecycle management Network Services (a group of VNFs with defined relationship between them). The scope of the Work Item will include the detailed functional and information requirements of all NFV management interfaces over the reference point Os-Ma-nfvo, based on which complete interfaces technical specifications can subsequently be defined, for interoperability purposes. The results of the work item will include:

• Detailed description of interfaces and its operations functionality.

• Detailed information model requirements of related NS lifecycle management interfaces, for:

- Management of NS Descriptor and VNF Packages;

- Lifecycle management of Network Services, including the instantiation, modification, update, scaling, and termination, testing of NSs.

- Lifecycle change notifications of NSs.

• Complete and detailed information model requirements of other related NFV management interfaces, for:

- NS monitoring (e.g. NS fault information retrieval and management, NS performance information retrieval and management).

- Policy Management

• Detailed information model requirements of any other NFV management interfaces (new and/or previously described in GS NFV MAN 001) needed to be exposed between OSS and NFVO in support of necessary OSS-driven E2E operations.

Validation of interface operations and information model requirements against end-to-end flows.
 Data models/schemas and protocols needed to implement the detailed functional requirements are not covered in this
 deliverable. The WI will leverage GS NFV MANOO1, and will consider any applicable other guidelines, studies and
 requirements as appropriate. The deliverable will contain normative provisions.
 Support Companies: ORANGE, Alcatel-Lucent, Hewlett-Packard, Ericsson, NEC, TELEFONICA, KPN N.V., DT, Cisco, Juniper, Amdocs Software

t Companies: ORANGE, Alcatel-Lucent, Hewlett-Packard, Ericsson, NEC, TELEFONICA, KPN N.V., DT, Cisco, Juniper, Amdocs Software Systems Ltd, Oracle Corporation, SPRINT, Huawei (UK)

GS <u>NFV-IFA</u>	013 v2.3.1 Os-Ma-Nfvo ref point Spec - info model	Rapporteur:	Marc Flauw
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Management and Orchestration;		
	Os-Ma-Nfvo reference point - Interface and Information Me	odel Specif	ication
Current status:	PUBLICATION since 8/21/2017		
	vision of IFA013 is created to conduct NFV Release 2 maintenance, i.e. apply ed in Annex L, clause L3 of ETSI Technical Working Procedures. This revision o	-	
Support Companie	DT DOPTLICAL HDE Orange Deceme Telefenica 7TE		

Support Companies: PT PORTUGAL, HPE, Orange, Docomo, Telefonica, ZTE



	A 013 v2.4.1	Os-Ma-Nfvo	ref point S	pec - info m	nodel	Rapporteur:	Marc Flauw
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		ent and Orche					
				and In	formation M		fication
		o reference p	om - men	ace and m	IOITTALIOIT IV	iouel Speci	IICation
	s: PUBLICATION sin				-		
		IFA 013 conducts					
-		ditorial modificat					
		ot add or modify f	eatures, nor de	oes it extend t	he scope of the	former Releas	e 2 edition
summarized							
	-	s supported over t					
		I GS NFV-MAN 00				-	
		services on top of					
Application		agement Interface			cification ETSI	Draft DGS/NFV	/-IFA012.
Support Compa	anies: HPE, PT Por	rtugal, Orange, Docom	10, Huawei, Telefoi	nica			
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S <u>NFV-IF</u>	A 013 v3.1.1	Os-Ma-Nfvo	ref point S	pec - info m	nodel	Rapporteur:	Marc Flauv
ull Title:	Network Fu	unctions Virtu	alisation (N	IFV) Releas	se 3;		
		ent and Orche		,			
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		l extend the scope					
		ve GS NFV MAN 0					
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		agement interfac	es over the refe	erence point C)c_N/a_ntvo had	ed on which co	
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				ed, for interop			
	escription of inte	rfaces and its ope	erations functio	ed, for interop	erability purpos	ses. The results	
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• Detailed in - Manageme - Lifecycle m	lescription of intenformation mode ent of NS Descrip	rfaces and its ope I requirements of tor and VNF Pack	erations functio related NS life ages;	ed, for interop onality. cycle manage	erability purpos ment interfaces	es. The result: , for:	s of the work
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GS <u>NFV-II</u>	FA 013 v <u>2.5.1</u>	Os-Ma-Nfvo r	ef point Spec -	info model	Rapporteur:	Marc Flauw
Full Title:	Network Fu	inctions Virtual	isation (NFV)	Release 2;		
	Manageme	nt and Orchest	ration;			
	Os-Ma-Nfv	o reference poi	nt - Interface	and Information M	odel Speci	fication
Current statu	us: PUBLICATION sir	nce 8/10/2018				
Scope: This	s revision of NFV-I	FA 013 conducts NF	V Release 2 maint	enance. It corrects error	rs, ambiguities	s,
misalignme	nts, and applies e	ditorial modification	ns (i.e. Corrections	of category F and D as	described in E	TSI TWPs
Annex L). Ti summarized		ot add or modify fea	tures, nor does it	extend the scope of the	former Releas	e 2 edition
IFA 013 def	ines the interfaces	s supported over the	e Os-Ma-nfvo refe	rence point of the NFV-N	MANO	
architecture	al framework ETSI	GS NFV-MAN 001 d	as well as the info	mation elements excha	nged over tho	se interfaces.
Application	s and end-to-end	services on top of n	etwork services ar	e out of scope of IFA 013	3 and are add	ressed in
Application	and Service Man	agement Interface a	nd Information M	odel Specification ETSI	Draft DGS/NF	V-IFA012.
Support Comp	anies: HPE, PT Por	tugal, Orange, Huawei, T	Telefonica, DOCOMO			

GS NFV-IFA	014 v2.1.1	Network S	ervice Temp	lates Specific	ation	Rapporteur:	Bruno Chatra
Full Title:	Network Fu	Inctions Virt	ualisation (I	NFV);		1	
	Manageme	ent and Orch	estration;				
	Network Se	ervice Temp	lates Speci	fication			
Current status:	PUBLICATION sin	·					
Scope: This V	Vork Item will d	evelop a specifi	cation for desc	ribing Network S	ervice meta-d	ata requirem	ents and meta-
data templat	es used to decri	be Network Serv	vices.				
	letwork Service escriptor and Pl		plates are Net	work Service Des	criptor, VNF Fo	orwarding Gr	aph Descriptor,
			n captured in t	he MAN Group S	Specification de	ocuments rel	ated to
information e			· ·				
Standardized	meta-data tem	plates are requi	red for Networ	rk Services to:			
• desc	ribe the relatior	nships between	NS and VNFs a	nd/or connectivi	ty to PNFs that	t are part of t	he NS, along
with depende	ncies and other	constraints, suc	ch as those imp	oosed by the sco	pe of the MAN	O GS MAN O	<i>)1,</i>
• desc	ribe the NFV inf	rastructure reso	ource requirem	ents for a NS in a	a service provid	ler environm	ent
	ribe NS operatio	onal behaviour v	vithin the scop	e of NFV includii	ng NS lifecycle	events (eg. s	caling,
upgrading).							
				ment addressing			
				various NS meta			
				rties and resourd			
				orking properties			
The output of by other SDO		id be used as foi	rmal requireme	ents for extension	ns into normat	ive specificat	ions developed
Support Company	ies: ORANGE, A Oracle Corp		ett-Packard, ITALT	EL SpA, NEC, Ericssor	n AB, Cisco, Huawe	ei, Amdocs Softw	vare Systems Ltd,

GS <u>NFV-IF</u>	A 014 v2.3.1 Network Service Templates Specification	Rapporteur:	Janusz Pieczerak
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Management and Orchestration;		
	Network Service Templates Specification		
Current status	: PUBLICATION since 8/21/2017		
	revision of IFA014 is created to conduct NFV Release 2 maintenance, i.e. apply ined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision		
IFA014 v2.1.	1.		
Support Compa	nies: PT PORTUGAL, HPE, Orange, Verizon, Telefonica, ZTE, Telecom Italia, Ericsson		



GS <u>NFV-IFA 014</u> v <u>2.4.1</u> Network Service Templates Spec	Rapporteur:	Janusz Pieczerak
Full Title: Network Functions Virtualisation (NFV) Release 2;		PIECZEI ak
Management and Orchestration;		
Network Service Templates Specification		
Current status: PUBLICATION since 2/13/2018		
Scope: This revision of NFV-IFA 014 conducts NFV Release 2 maintenance: it corre		
misalignments, and applies editorial modifications (i.e. Corrections of category F a		
Annex L). This edition does not add or modify features, nor does it extend the scop summarized hereafter:	e of the former Release	2 eartion
	rtualization (NEV)	
FA 014 specifies requirements and templates for describing Network Functions Vir Network Services (NSs) in the form of meta-data.		
Support Companies: Orange, PT Portugal, Huawei, Telefonica, Ericsson		
upport companies. Orange, i i i oraga, natwel, relejoned, Encoor		
	Rapporteur:	Janusz
3S <u>NFV-IFA 014</u> v <u>3.1.1</u> Network Service Templates Spec	Rapporteur.	Pieczerak
ull Title: Network Functions Virtualisation (NEV) Release 3:		Pieczerak
Management and Orchestration;		
Network Service Templates Specification		
urrent status: PUBLICATION since 8/10/2018		
cope: This revision of NFV-IFA 014 propagates the deliverable into NFV Release .	3.	
his edition will add functional requirements and specification of the information r	model to support the Re	lease 3
eatures, and it will extend the scope of the former Release 2 edition summarized l	hereafter:	
his Work Item will develop a specification for describing Network Service meta-do	ata requirements and m	eta-data
emplates used to decribe Network Services.		
xamples of Network Service meta-data templates are Network Service Descriptor	, VNF Forwarding Grap	h Descriptor,
/irtual Link Descriptor and PNF Descriptor.		
This work item will build from the information captured in the MAN Group Specific	ation documents relate	d to
	cation documents relate	d to
nformation elements. Standardized meta-data templates are required for Network Services to:		
nformation elements. Standardized meta-data templates are required for Network Services to: Indescribe the relationships between NS and VNFs and/or connectivity to PNFs that	t are part of the NS, alo	
nformation elements. Standardized meta-data templates are required for Network Services to: Pdescribe the relationships between NS and VNFs and/or connectivity to PNFs that Rependencies and other constraints, such as those imposed by the scope of the MA	t are part of the NS, alor ANO GS MAN 001,	
nformation elements. Standardized meta-data templates are required for Network Services to: Dedescribe the relationships between NS and VNFs and/or connectivity to PNFs that Dependencies and other constraints, such as those imposed by the scope of the MA Dedescribe the NFV infrastructure resource requirements for a NS in a service provide	t are part of the NS, alo ANO GS MAN 001, der environment	ng with
nformation elements. Standardized meta-data templates are required for Network Services to: Standardized meta-data templates are required for Network Services to: Standardized meta-data templates and VNFs and/or connectivity to PNFs that Rependencies and other constraints, such as those imposed by the scope of the MA Standardized by the scope of the MA Standardized by the scope of the NFV infrastructure resource requirements for a NS in a service provide Standardized by the scope of NFV including NS lifecycle	t are part of the NS, alo ANO GS MAN 001, der environment	ng with
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GS <u>NFV-IFA 014</u> v <u>2.5.1</u> Network Service Templates Spec	t are part of the NS, alor ANO GS MAN 001, der environment events (eg. scaling, upg s, s building, equirements building,. normative specification Annex B of the Release entation.	ng with grading). as developed 3 Definition Janusz
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nformation elements. It and ardized meta-data templates are required for Network Services to: It describe the relationships between NS and VNFs and/or connectivity to PNFs that lependencies and other constraints, such as those imposed by the scope of the MA describe the NFV infrastructure resource requirements for a NS in a service provide describe NS operational behaviour within the scope of NFV including NS lifecycle Deliverable for this work item will be an normative GS document addressing: Requirements for the structure and format of the various NS meta-data templates A consistent meta-model, describing the NS properties and resource requirements A consistent meta-model, describing the NS networking properties and resource re- The output of this work should be used as formal requirements for extensions into any other SDOs. This revision of NFV-IFA 014 will address the Release 3 candidate features listed in w0.8.0). This revision will also reflect the maintenance performed to NFV Release 2 document upport Companies: Orange, PT Portugal, DOCOMO Communications Lab, ZTE, HPE, NEC Europe, NE Orange, PT Portugal, DOCOMO Communications Lab, ZTE, HPE, NEC Europe, NE S <u>NFV-IFA 014 v2.5.1</u> Network Service Templates Spec will Title: Network Functions Virtualisation (NFV) Release 2; Management and Orchestration;	t are part of the NS, alor ANO GS MAN 001, der environment events (eg. scaling, upg s, s building, equirements building,. normative specification Annex B of the Release entation.	ng with grading). as developed 3 Definition Janusz
Information elements. Standardized meta-data templates are required for Network Services to: Adescribe the relationships between NS and VNFs and/or connectivity to PNFs that the pendencies and other constraints, such as those imposed by the scope of the MA adescribe the NFV infrastructure resource requirements for a NS in a service provide the describe NS operational behaviour within the scope of NFV including NS lifecycle Deliverable for this work item will be an normative GS document addressing: Requirements for the structure and format of the various NS meta-data templates A consistent meta-model, describing the NS properties and resource requirements A consistent meta-model, describing the NS networking properties and resource reflee output of this work should be used as formal requirements for extensions into any other SDOs. This revision of NFV-IFA 014 will address the Release 3 candidate features listed in v0.8.0). This revision will also reflect the maintenance performed to NFV Release 2 docume upport Companies: Orange, PT Portugal, DOCOMO Communications Lab, ZTE, HPE, NEC Europe, N SS <u>NFV-IFA 014 v2.5.1</u> Network Service Templates Spec full Title: Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Network Service Templates Specification	t are part of the NS, alor ANO GS MAN 001, der environment events (eg. scaling, upg s, s building, equirements building,. normative specification Annex B of the Release entation.	ng with grading). as developed 3 Definition
nformation elements. It and ardized meta-data templates are required for Network Services to: It describe the relationships between NS and VNFs and/or connectivity to PNFs that lependencies and other constraints, such as those imposed by the scope of the MA describe the NFV infrastructure resource requirements for a NS in a service provide describe NS operational behaviour within the scope of NFV including NS lifecycle Deliverable for this work item will be an normative GS document addressing: Requirements for the structure and format of the various NS meta-data templates A consistent meta-model, describing the NS properties and resource requirements A consistent meta-model, describing the NS networking properties and resource re- The output of this work should be used as formal requirements for extensions into any other SDOs. This revision of NFV-IFA 014 will address the Release 3 candidate features listed in w0.8.0). This revision will also reflect the maintenance performed to NFV Release 2 document upport Companies: Orange, PT Portugal, DOCOMO Communications Lab, ZTE, HPE, NEC Europe, NE Orange, PT Portugal, DOCOMO Communications Lab, ZTE, HPE, NEC Europe, NE S <u>NFV-IFA 014 v2.5.1</u> Network Service Templates Spec will Title: Network Functions Virtualisation (NFV) Release 2; Management and Orchestration;	t are part of the NS, alor ANO GS MAN 001, der environment events (eg. scaling, upg S, s building, equirements building,. normative specification Annex B of the Release entation. ITT Corp Rapporteur:	ng with grading). as developed 3 Definition Janusz

Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:

IFA 014 specifies requirements and templates for describing Network Functions Virtualisation (NFV) Network Services (NSs) in the form of meta-data.

Support Companies: Orange, PT Portugal, Orange, Huawei, DOCOMO, Ericsson, Telefonica,



GR <u>NFV-IFA 015</u> v <u>2.1.1</u> Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 1/11/2017		
Scope: This Work Item will build upon the Information Elements developed in IFA	Work Items IFA004, IF	A005, IFA006,
IFA007, IFA008, IFA011, IFA012, IFA013 and IFA014 and translate them into a UM	L NFV Information Mo	del. The NFV
Information Model will present a consolidated view of NFV Management and Orcl	hestration model. It w	ill use
information from: • Network Service Templates information elements, produced l	•	•
information elements produced by IFA011 • Informatiom elements related to acce		-
produced by IFA004 • Information elements produced by IFA005, IFA006, IFA007,		
deliverable shall be informative even it consolidates the normative information ele		
above. The output deliverable will include the UML NFV Information Model as an	electronic attachmen	t. The format
of the model will be the Papyrus Open Source format.		
Support Companies: Nokia, Hewlett-Packard, Ericsson AB, Huawei, Wipro Limited, Oracle Corporat	ion, Verizon, EANTC AG	

GR <u>NFV-IFA 015</u> v <u>2.3.1</u> Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 8/4/2017		
Scope: This revision of IFA015 is created to conduct NFV Release 2 maintenance, i.e. apply	corrections of	f Category F
and D as defined in Annex L, clause L3 of ETSI Technical Working Procedures. This revision	does not exten	d the scope of
IFA015 v2.1.1.		
Support Companies: PT PORTUGAL, HPE, Verizon, Orange, Telefonica, ZTE, Telecom Italia, Nokia, Ericsson		

GR <u>NFV-IFA 015</u> v2.1.2 Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 1/13/2017		
Scope: This Work Item will build upon the Information Elements developed in IFA Work Ite	ems IFA004, IF	A005, IFA006,
IFA007, IFA008, IFA011, IFA012, IFA013 and IFA014 and translate them into a UML NFV In	formation Mo	del. The NFV
Information Model will present a consolidated view of NFV Management and Orchestratic	on model. It w	ill use
information from: • Network Service Templates information elements, produced by IFA01	4 • VNF Descr	iptor
information elements produced by IFA011 • Informatiom elements related to acceleration	resource man	agement
produced by IFA004 • Information elements produced by IFA005, IFA006, IFA007, IFA008,	IFA012 and IF	4013. The WI
deliverable shall be informative even it consolidates the normative information elements f	rom the Work	Items listed
above. The output deliverable will include the UML NFV Information Model as an electron	nic attachmen	t. The format
of the model will be the Papyrus Open Source format.		
Support Companies: Nokia, Hewlett-Packard, Ericsson AB, Huawei, Wipro Limited, Oracle Corporation, Verizo	n, EANTC AG	

Support Companies:	Nokia, Hewiett-Packara, Ericsson AB, Huawei, Wipro Limitea, Oracie Corporation, Verizon, EANTC AG

GR <u>NFV-IFA 015</u> v2.4.1 Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 2/23/2018		
Scope: This revision of NFV-IFA 015 conducts NFV Release 2 maintenance: it corrects error	rs, ambiguities	,
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	described in El	TSI TWPs
Annex L). This edition does not add or modify features, nor does it extend the scope of the	former Release	e 2 edition
summarized hereafter:		
IFA 015 provides an NFV Information Model consolidating information elements from the I	ETSI NFV IFA sp	pecifications
listed in the reference section.		
Support Companies: HPE, PT Portugal, Orange, Huawei, Telefonica, Ericsson		



GR <u>NFV-IFA 015</u> v <u>3.1.1</u> Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 3;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 9/4/2018		
Scope: This revision of NFV-IFA 015 propagates the deliverable into NFV Release 3.		
This edition will add the information model to support the Release 3 features, and it will ex	tend the scop	e of the former
Release 2 edition summarized hereafter:		
This Work Item will build upon the Information Elements developed in IFA Work Items IFAC		
IFA008, IFA011, IFA012, IFA013 and IFA014 and translate them into a UML NFV Informatic		
Information Model will present a consolidated view of NFV Management and Orchestratio	n model. It w	ill use
information from:		
Network Service Templates information elements, produced by IFA014 NAL Descriptor information elements produced by IFA011		
 VNF Descriptor information elements produced by IFA011 Informatiom elements related to acceleration resource management produced by IFA004 	1	
 Information elements produced by IFA005, IFA006, IFA007, IFA008, IFA012 and IFA013. 	*	
The WI deliverable shall be informative even it consolidates the normative information elements	ments from th	e Work Items
listed above. The output deliverable will include the UML NFV Information Model as an el		
format of the model will be the Papyrus Open Source format.		
This revision of NFV-IFA 015 will address the Release 3 candidate features listed in Annex E	of the Releas	e 3 Definition
(v0.8.0).		
This revision will also reflect the maintenance performed to NFV Release 2 documentation.		
Support Companies: HPE, PT Portugal, DOCOMO Communications Lab, CableLabs, NEC Europe		

GR <u>NFV-IFA 015</u> v2.5.1 Info Model Report	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Report on NFV Information Model		
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 015 conducts NFV Release 2 maintenance. It corrects error misalignments, and applies editorial modifications (i.e. Corrections of category F and D as Annex L). This edition does not add or modify features, nor does it extend the scope of the summarized hereafter:	described in E former Releas	TSI TWPs e 2 edition
IFA 015 provides an NFV Information Model consolidating information elements from the I	ETSI NFV IFA s	pecifications
listed in the reference section.		
Support Companies: HPE, PT Portugal, Orange, Huawei, Telefonica, DOCOMO		

GR <u>NFV-I</u>	FA 016 v2.1.1 Papyrus Guidelines	Rapporteur:	Marc Flauw
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Information Modeling;		
	Papyrus Guidelines		
Current stat	is: PUBLICATION since 3/1/2017		
Scope: Thi	Work Item will produce guidelines for the development of a protocol-neutral	UML (Unified I	Modeling
Language)	information model for ETSI NFV.		
This Work I	tem will build upon the internal document NFV Papyrus Guidelines developed o	as part of IFAO	15. This Work
Item will ac	ldress closer alignment with corresponding UML modelling guidelines from ON	IF and may be	influenced by
other partn	ers cooperating with NFV.		
The deliver	able will be informative.		
Support Comp	anies: Nokia, Alcatel-Lucent, HPE, TELEFONICA, Ericsson AB, Oracle Corporation, Verizon, Clea	rPath Networks, N	letCracker



GR NFV-I	FA 016 v2.4.1 Papyrus Guidelines	Rapporteu	r: Marc Flauw
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Information Modeling;		
	Papyrus Guidelines		
Current stat	is: PUBLICATION since 2/13/2018		
Scope: Thi	revision of NFV-IFA 016 conducts NFV Release 2 maintenance: it correc	ts errors, ambigu	iities,
-	nts, and applies editorial modifications (i.e. Corrections of category F an nis edition does not add or modify features, nor does it extend the scope I hereafter:		
IFA 016 def	ines the guidelines that are recommended to be taken into account duri	ng the creation o	f a protocol-
	fied Modeling Language (UML) information model using the Open Sourc		
-	tive for the general reader, but need to be followed when designing mo	dels for the ETSI I	NFV Information
Model.			
Support Comp	anies: HPE, PT Portugal, Orange, Huawei, Telefonica		

GR NFV-IF	A 016 v3.1.1	Papyrus Guideline	s		Rapporteur:	Marc Flauw
Full Title:	Network Fu	nctions Virtualisati	on (NFV) Release	e 3;		
	Information	Modeling;				
	Papyrus Gu	idelines				
Current statu	s: PUBLICATION sin	ce 8/10/2018				
Scope: This	revision of NFV-I	FA 016 propagates the a	leliverable into NFV Re	lease 3.		
This edition	will add guideline	s for information modeli	ng to support the Relea	ase 3 features	, and it will ex	tend the scope
of the forme	er Release 2 editio	n summarized hereafter	:			
	em will produce g model for ETSI NF	uidelines for the develop V.	ment of a protocol-ne	utral UML (Un	ified Modelin	g Language)
Item will add	· · · · ·	the internal document nent with corresponding th NFV.				
The delivera	ble will be inform	ative.				
This revision	of NFV-IFA 016 w	ill address the Release 3	candidate features lis	ted in Annex E	3 of the Releas	e 3 Definition
(v0.8.0).						
This revision	n will also reflect th	ne maintenance perform	ed to NFV Release 2 do	ocumentation.		
Support Compa	anies: HPE, PT Port	ugal, DOCOMO Communicatio	ns Lab, CableLabs			

GR NFV-IFA 016 v2.5.1 Papyrus Guidelines	Rapporteur:	Marc Flauw
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Information Modeling;		
Papyrus Guidelines		
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-IFA 016 conducts NFV Release 2 maintenance. It corrects error	s, ambiguities	;
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as		
Annex L). This edition does not add or modify features, nor does it extend the scope of the j summarized hereafter:	former Releas	e 2 edition
IFA 016 defines the guidelines that are recommended to be taken into account during the o	creation of a p	rotocol-
neutral Unified Modeling Language (UML) information model using the Open Source tool F		-
are informative for the general reader, but need to be followed when designing models for	the ETSI NFV	Information
Model.		
Support Companies: HPE, PT Portugal, Orange, Huawei, Telefonica,		



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Support Companies: HPE, PT Portugal, Orange, Huawei, Telefonica,



GS <u>NFV-IFA</u>	<u>018</u> v <u>3.1.1</u>	Acceleration Intface	Spec		Rapporteur:	Jinwei Xia
Full Title:	Network Fu	nctions Virtualisation	(NFV);			
	Acceleration	n Technologies;				
	Network Acc	celeration Interface S	Specification; Re	elease 3		
Current status:	PUBLICATION sind	ce 7/25/2017				
Scope: This W	VI will specify the	e message flows and inform	ation elements on t	he interface b	etween the VN	√F and an
allocated swit	ch controlled by	the VNF.				
		Dynamic Optimization of P NFVI, and identify the VNF		use case in IF	A001, it will ar	nalyze the
The work will	consider the cas	es where the switch is a phy	sical switch, a virtu	al switch and,	/or a switching	accelerator.
For DOPFR, th	is WI aims to usi	ing a common language to	define the semantics	s of the VNF v	vhile IFA002 co	ntinuation
will cover the	EPD (Extensible	Para-virtualized Device) spe	ecification.			
The deliverabl	e will be a norm	ative specification.				
Support Compani	ies: ORANGE, Chi	na Telecommunications, Huawei,	6WIND, Wind River			

GS <u>NFV-IFA 019</u> v <u>3.1.1</u> Resource Mgmt Acceleration @ Nf-Vi - Spec	Rapporteur: Zhipeng Huang
Full Title: Network Functions Virtualisation (NFV);	
Acceleration Technologies;	
Acceleration Resource Management Interface Specification	on; Release 3
Current status: PUBLICATION since 7/25/2017	
Scope: This Work Item will specify the interfaces in a form of message flows and informat	ion elements used for
acceleration resource management on the Nf-Vi reference point.	
The related information model will be defined in IFA015.	
The work will include	
1) discovery of acceleration resources.	
2) lifecycle management of acceleration resources.	
The work will be based on the requirements contained in IFA004.	
The deliverable will be a normative specification.	
Support Companies: Nokia, Intel, China Telecommunications, Huawei, 6WIND	

GR <u>NFV-IFA 021</u> v <u>3.1.1</u> MANO and automated deployment report	Rapporteur:	Joan Triay
Full Title: Network Functions Virtualisation (NFV) Release 3;	•	
Management and Orchestration;		
Report on management of NFV-MANO and automated de	ployment o	f EM and
other OSS functions		
Current status: PUBLICATION since 1/19/2018		
Scope: This Work Item will report on management of NFV-MANO functions and automate	d deployment	of Element
Management (EM) and other Operations Support System (OSS) functions, with the following	ng objectives:	
a) Report on deployment options of EM and other service-dependent OSS functions, and preferred options.	rovide recomm	endations on
b) Define use cases, possible information flows and recommendations to support the man	agement of NF	V-MANO
functions, including: update, configuration, automation of deployment and decomission, a	nd reliability a	spects.
The resulting deliverable will be informative.		
Support Companies: ORANGE, PT PORTUGAL, HPE, Ericsson, TeliaSonera AB, NTT, ZTE, DOCOMO, Fujitsu Lim	ited	



Full Title:						
	Network Ful	nctions Virtualis	ation (NFV)	Release 3;		
	Managemer	nt and Orchestra	ation;			
	Report on M	lanagement and	d Connectivi	ty for Multi-Site	Services	
Current status:	PUBLICATION sin	ce 4/19/2018				
multi-site NFV used to produc VLinks, CPs, etc connectivity to MANO support other MANO fu documents wil application spe	services (i.e. ov ce a set of recon c., 2) multi-netw support the mu t for multi-site s unctional entitie I serve as a basi ecific functional	port on the function er WANs, access net mendations regardi vork connectivity at t ulti-site services and ervices, and identify es and reference poin is. EVE005 recommen ity will not be consid- gement. The deliver	works). A set of I ing: 1) multi-site the infrastructure their associated the role of the V its. Concepts ar ndations for WA ered. The conne	multi-site use cases services in terms of e layer, and 3) map functional entities. VIM (ref. MAN001) nd terminology defi N connectivity, #8-1 ctivity study and red	will be described, f their supporting pings from the inj The report will a and possible ram ned in current IFA 11, 20, 21, will be	analyzed and VNFFGs, VNFs, frastructure lso examine ifications for 012 and IFA009 evaluated. VNF

GR <u>NFV-IFA 023</u> v <u>3.1.1</u> Policy Mgmt in MANO report	Rapporteur:	Haitao Xia
Full Title: Network Functions Virtualisation (NFV);		
Management and Orchestration;		
Report on Policy Management in Mano; Release 3		
Current status: PUBLICATION since 7/26/2017		
Scope: This informative work aims at developing the use cases of applying policy framework	ork in the NFV N	ΛΑΝΟ
functionality and identifying & analysis of potential MANO architecture, interface and wor	k flow impacts	introduced by
policy management.		
Support Companies: HPE, China Telecommunications, Hitachi Europe Ltd., SPRINT, Comptel Corporation, Hua	wei	

GR <u>NFV-IFA 024</u> v <u>2.1.1</u> NFV IM External touchpoints	Rapporteur:	Marc Flauw	
Full Title: Network Function Virtualisation (NFV) Release 2;			
Information Modeling;			
Report on External Touchpoints related to NFV Informatio	n Model		
Current status: PUBLICATION since 3/1/2017			
Scope: This Work Item defines the touchpoints/ relations between the NFV Information M	Scope: This Work Item defines the touchpoints/ relations between the NFV Information Model (IFA015) and the		
models from other organisations including but not limited to: ONF, 3GPP, MEF, TM Forum.			
This Work Item does not change the NFV Information Model (IFA015).	This Work Item does not change the NFV Information Model (IFA015).		
The WI deliverable will be informative.			
The output deliverable will include the UML Information Model describing the touchpoints as an electronic			
attachment. The format of the model will be the Papyrus Open Source format.			
Support Companies: ORANGE, HPE, TELEFONICA, DT, Verizon			

GS <u>NFV-IFA 027</u> v <u>2.4.1</u> Perf. Measurements Spec	Rapporteur:	Joey Chou
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Management and Orchestration;		
Performance Measurements Specification		
Current status: PUBLICATION since 5/25/2018		
Scope: Specify the performance measurements (i.e. performance metrics, performance va	lues) and use c	cases for
descriptors and interfaces, including Or-Vnfm reference point, Ve-Vnfm reference point, Vi	-Vnfm referenc	e point, Or-Vi
reference point, and Os-Ma-nfvo reference point, based on the performance metrics collec	ted from NFVI.	
Support Companies: ORANGE, Nokia, Intel, ZTE		



GR NFV-I	A 028 v3.1.1 Multi admin domain support -report	Rapporteur:	Haitao Xia
Full Title:	Network Functions Virtualisation (NFV) Release 3;	·	
	Management and Orchestration;		
	Report on architecture options to support multiple admin	istrative dom	nains
Current statu	s: PUBLICATION since 1/24/2018		
Scope: This	work item will report on architecture options to support the offering of NFV	MANO services	across
multiple ad	ninistrative domains.		
Initial use c	ases to be considered are: NFVIaaS and NS over multiple administrative domo	ains.	
The report v	vill examine:		
	eractions between functional blocks belonging to different administrative do		
	e need for potential extensions to the MANO architecture. Different architect		
(3) Ide enhanceme	ntification of the functional blocks involved in the use cases and analysis of p nts.	otential function	nal
	e need for new reference points and interfaces between the functional blocks tential changes to existing interfaces will be studied.	involved in the	use cases. The
Recommen	lations for preferred options are provided and potential impact to existing IF/	A specifications	is identified.
Multi-site c	onnectivity and its management will not be covered by this WI but is covered	by IFA022. Secu	rity and trust
domains wi	I not be considered in this WI but is covered by IFA026.		
The resultin	g work item deliverable will be informative.		
Support Comp	anies: ORANGE, HPE, Telecom Italia, Huawei		

GS <u>NFV-IFA 030 v3.1.1</u> Multi Domain MANO spec	Rapporteur:	Haitao Xia
Full Title: Network Functions Virtualisation (NFV	Release 3;	
Management and Orchestration;		
Multiple Administrative Domain Aspect	Interfaces Specification	
Current status: PUBLICATION since 9/6/2018		
Scope: This work item will specify functional requirements, inter-	aces and operations to support the provi	sion of NFV
MANO services across multiple administrative domains.		
Work will be based on GR NFV-IFA028.		
The work will consider management interactions between NFVOs	<i>in different administrative domains for:</i>	
1) Management of composite Network Service (NS) and its consti	tuent nested NSs in different administrati	ive domains.
2) NFVIaaS when the SLPOC (Single Logical Point of Contact) is in	egrated in the NFVO.	
In addition, the work item will consider the interactions between	VIMs of the same administrative domain	for NFVIaaS
when the SLPOC is integrated in VIMs.		
The resulting work item deliverable will contain normative provis	ons.	
Support Companies: HPE, TELEFONICA, ZTE, Huawei, Ericsson Limited		

GS <u>NFV-II</u>	A 031 v3.1.1 NFV-MANO_mgmt_spec	Rapporteur: Yusuke Okazaki		
Full Title:	Full Title: Network Functions Virtualisation (NFV) Release 3;			
	Management and Orchestration;			
	Requirements and interfaces specification for management	nt of NFV-MANO		
Current statu	s: PUBLICATION since 9/6/2018			
WI will spec configuratio The work ite	Scope: This Work Item will describe the framework to support the management of NFV-MANO functional entities. The WI will specify the interface requirements, the interfaces and necessary information elements enabling the fault, configuration and information, performance, state and log management of NFV-MANO functional entities. The work item will use the outcomes from ETSI GR NFV-IFA 021 as baseline. The resulting deliverable will contain normative provisions.			
Support Comp	anies: PT PORTUGAL, Ericsson, NEC, China Telecommunications, ZTE, DOCOMO, Huawei			



GS NFV-IN	F 001 v1.1.1 Infrastructure Overview	Rapporteur:	Andy Reid
Full Title:	Network Functions Virtualisation (NFV);		
	Infrastructure Overview		
Current statu	: PUBLICATION since 1/13/2015		
context all t This Work It	Work Item presents an overview of the architecture of the virtualization infrast ne infrastructure architecture documents. Item will also give guidance an on the scope of each the infrastructure architect developing the performance, reliability, security, and interoperability needed	ure domains a	and some of
network fun			
Support Comp	nies: Telefon AB LM Ericsson, BT, Cisco, AT&T, Huawei (UK)		

GS <u>NFV-IN</u>	VF 003 v1.1.1 Infrastructure Compute Domain	Rapporteur: Nabil Damouny
Full Title:	Network Functions Virtualisation (NFV);	
	Infrastructure;	
	Compute Domain	
Current statu	is: PUBLICATION since 12/23/2014	
which suppo	WI specifies the requirements and interfaces of the "Compute Domain" of the orts virtualized network functions. It also addresses the interfaces within the furmain, and the interfaces between this domain and the Hypervisor and infrastru	nctional blocks of the
Support Comp	anies: Telefon AB LM Ericsson, BT, Cisco, AT&T, Huawei (UK)	

GS NFV-IN	NF 004 v1.1.1 Infrastructure Hypervisor Domain	Rapporteur:	Valerie Young
Full Title:	Network Functions Virtualisation (NFV);		
	Infrastructure;		
	Hypervisor Domain		
Current statu	Current status: PUBLICATION since 1/7/2015		
Scope: This	WI specifies the requirements and interfaces of the "Hypervisor Domain" of th	e architectu	re infrastructure
which suppo	orts virtualized network functions. It also addresses the interfaces within the fu	nctional bloc	ks of the
hypervisor a	lomain, and the interfaces between this domain and the compute and infrastru	cture netwo	rk domains.
Support Comp	anies: Telefon AB LM Ericsson, BT, Cisco, AT&T, Huawei (UK)		

GS NFV-IN	F 005 v <u>1.1.1</u> Infrastructure Network Domain	Rapporteur:	Evelyne Roch
Full Title:	Network Functions Virtualisation (NFV); Infrastructure; Network Domain		
Current statu	s: PUBLICATION since 12/23/2014		
infrastructur acknowledg networkdom	WI specifies an architectural description of the Infrastructure Network domain re which supports virtualised network functions. It sets out the scope of the inf- ing the potential for overlap between virtualisation infrastructure domains, an pain and the virtualised network functions. Its also sets out the nature of interf re domains and within the infrastructure network domain.	rastructure n d between th	etwork domain ne infrastructure
Support Compa			



GS <u>NFV-INF 007</u> v <u>1.1.1</u> Meth. to desc. Interfaces and Abstractions	Rapporteur: Johann Tonsing
Full Title: Network Functions Virtualisation (NFV);	
Infrastructure;	
Methodology to describe Interfaces and Abstractions	
Current status: PUBLICATION since 10/10/2014	
Scope: This WI presents a crosscutting framework (covering compute, hypervisor and in domains, also data, control, and management planes) which describes how NFV interfaces derived and specified.	-
The WI describes the concepts associated with interfaces and abstractions. It covers the sp methodology in general. Provision is made for exposing a subset of an interface and for tro to facilitate interworking.	
Note that this WI does not specify all the interfaces and abstractions as these are covered documents. Examples of interfaces and abstractions are nevertheless supplied to illustrate framework may also be of interest to the SA and MANO WGs, they need to be consulted and document does not provide or standardize detailed specifications. Where appropriate it re	the methodology. As the nd kept abreast. This
future specifications developed by other bodies.	
Support Companies: Telefon AB LM Ericsson, BT, Cisco, AT&T, Huawei (UK)	

GS <u>NFV-INF 010</u> v <u>1.1.1</u> NFV Service Quality Metrics	Rapporteur:	Julien Maisonneuve
Full Title: Network Functions Virtualisation (NFV); Service Quality Metrics		
Current status: PUBLICATION since 12/23/2014		
Scope: This work item defines objective and quantitative metrics for the service qualities of providers to the VNFs hosted on NFV infrastructure which can impact end user service qua metrics are useful when setting service level objectives between organizations operating V service delivered to end users) and organizations operating NFV infrastructure (e.g., virtua networking) and functional blocks offered as-a-service (e.g., database-as-a-service). These included in industry standard service level agreement frameworks (e.g., TMForum, NIST) a offerings	lities. These of NFs (e.g., voi I compute, vi metrics are of	bbjective ice-over-LTE rtual designed to be
Support Companies: Alcatel-Lucent, TELEFONICA, BT, AT&T, Verizon, Huawei (UK)		

GS <u>NFV-MAN 001</u> v <u>1.1.1</u> Management and Orchestration	Rapporteur: Jürgen Quittek		
Full Title: Network Functions Virtualisation (NFV);			
Management and Orchestration			
Current status: PUBLICATION since 12/23/2014			
Scope: Define the issues and analyze the existing standards for the management and orchestration of network			
services based on NFV infrastructures. Identify the gaps between those issues and the current standards, and propose			
actions to fill these gaps			
Support Companies: Alcatel-Lucent, NEC, TELEFONICA, Verizon			

GS <u>NFV-PER 001</u> v <u>1.1.1</u> NFV Performance & Portability Best Practises	Rapporteur: Gerardo Garcia de Blas			
Full Title: Network Functions Virtualisation (NFV);				
NFV Performance & Portability Best Practises				
Current status: PUBLICATION since 6/30/2014				
Scope: White paper on performance evaluation methodology for selected virtual network functions representative of				
different kinds of workloads, and best practices to optimise performance of different workloads while achieving				
predictable performance and isolation in non-vertically integrated servers.				
Support Companies: Alcatel-Lucent, TELEFONICA, BT, DT, Intel, ORANGE SA, Verizon, Huawei (UK)				



GS <u>NFV-PE</u>	ER 001 v1.1.2 NFV Performance & Portability Best Practises	Rapporteur: Gerardo Garcia de Blas		
Full Title:	Network Functions Virtualisation (NFV);			
	NFV Performance & Portability Best Practises			
Current status	s: PUBLICATION since 12/8/2014			
Scope: Quick re-publication of NFV PER 001 following an editorial error found during NFV#8.				
Support Compa	nies: Alcatel-Lucent, TELEFONICA, BT, DT, Intel, ORANGE SA, Verizon, Huawei (UK)			

GS N	FV-PER 002 v1.1.1 NFV PoC Framework	Rapporteur:	Steven Wright
Full Tit	tle: Network Functions Virtualisation (NFV);		
	Proofs of Concepts; Framework		
Curren	t status: PUBLICATION since 10/10/2013		
Scope	e: This WI is to develop a framework to coordinate and promote public demonstration	ns of Proofs	of Concept
PoCs r progre incorp progre	lence and encourage development of an open ecosystem by integrating components joneed to be scoped around the agreed ISG use cases and address the technical challengessed by the WGs. PoCs are envisaged to be initially focused on feasibilty and interoprotorating additional aspects (performance, reliability, security, integrability) as the digess in defining a common understanding of these aspects.	ges and app erability issu fferent WGs	roaches being les, and EGs
(i) (ii) (iii) impac	define a process for calling for PoCs and adjudicating proposals (e.g., where/what outline the acceptance criteria for a PoC proposal, (e.g., participation, reporting, e document the objectives for the approved PoCs, (e.g., identification of the NFV use ted by the PoC)	exhibition da	tes, etc.)
(iv) (v)	define the reporting requirements from the approved PoCs aggregate the approved PoC proposals & reports into a deliverable document.		
It sho	uld also issue guidance on timescales and under what conditions the PoC can be dem try. It can be useful to have timescales driven by a particular conference demonstration		

Support Companies: Telefon AB LM Ericsson, TELEFONICA, Telecom Italia, BT, DT, ORANGE SA, SPRINT, AT&T, Verizon, Huawei (UK)

GS <u>NFV-P</u>	ER 002 v1.1.2 NFV PoC Framework revision	Rapporteur: Javier Ra	Francisco- món Salguero
Full Title:	Network Functions Virtualisation (NFV);		
	Proofs of Concept; Framework		
Current statu	s: PUBLICATION since 12/8/2014		
Scope: As N become out	IFV transitions to phase 2, the current PoC Framework, which includes refere dated.	nces to NFV pho	ase 1 WGs, will
	this WI is to make an editorial revision of the NFV PoC Framework (NFV-PERC ise 2 WG structure, as well as to ensure the continuity of the PoC activity dur IFV#9)		-

Support Companies: TELEFONICA, DT, CableLabs, DOCOMO, AT&T

GS <u>NFV-R</u>	EL 001 v1.1.1 Resiliency Requirements	Rapporteur:	Marcus Schoeller
Full Title:	Network Functions Virtualisation (NFV);		
	Resiliency Requirements		
Current statu	s: PUBLICATION since 1/7/2015		
network arc mechanisms	work will be focused on the unique aspects related to providing robustness an hitecture. Items like application portability, fault monitoring, isolation and rec s necessary to maintain service sustainability will be considered as part of this requirements for resiliency of the network comprised of virtualized network fu	overy, and othe effort. This work	r
Support Compa	anies: Alcatel-Lucent, NEC, DT, Verizon		





GS <u>NFV-REL 002</u> v <u>1.1.1</u> Scalable Arch for Reliability Report	Rapporteur: Percy Tarapore
Full Title: Network Functions Virtualisation (NFV);	
Reliability;	
Report on Scalable Architectures for Reliability Manageme	ent
Current status: PUBLICATION since 9/3/2015	
Scope: This WI proposes a study of how one designs processing components to achieve sc	alabiity, efficiency, and
reliability in NFV environments. To meet the low-latency and high-availability requirement	s, this will require new
techniques and abstractions for managing shared processing state. The hope is to identify	
techniques that can be applied generally, rather than have each VNF use its own idiosyncro	atic method for meeting
these goals.	
Although an individual VNF could manage its own scale and replication, it is envisioned the	
composed of many disparate VNFs would require a a single coherent manager, such as an manage the scale and capacity of the VNFs.	orchestrator that would
To illustrate our intentions, consider how one might achieve scalable reliability when there	is no state shared between
flows and the failure of a small number of flows is acceptable. Today's IT/Cloud Data Center	
availability levels by limiting the amount of unique state in a single element and creating a	
from a number of small replicated components whose functional capacity can be scaled in	-
running number of components. Reliability and availability for these type of VNFs is provid	ed by a number of small
replicated components. When an individual component fails, little state is lost and the over	
change in functional capacity. Capacity failures can be recovered by instantiating addition to load balancing across the active instances may be required.	al components. Adjustments
We offer this as an initial example of how scalable reliability might be achieved. We anticip	pate the resulting document
will consider a wide variety of use cases, involving differing levels of shared state and diffe	
and these will each require their own application-independent way of how to manage stat	e, react to failures, and
respond to increased load.	
Accordingly, the deliverable from this proposed WID is an Informative Report. The intent is	to provide guidance on Best
Practices for scale out system architectures for the management of reliability.	isted Computing BEI
External dependencies of this work item are: - MANO VNFD - SWA Design Patterns and Tru Documents.	sted computing - KEL
Support Companies: Alcatel-Lucent, NTT, Intel, AT&T	

GS <u>NFV-R</u>	REL 003 v1.1.1 E2E reliability models report	Rapporteur:	Hidefumi Nakamura
Full Title:	Network Functions Virtualisation (NFV);		
	Reliability;		
	Report on Models and Features for End-to-End Reliability		
Current state	us: PUBLICATION since 4/27/2016		
•	s document will study software reliability estimation models, reliability/availab echanisms for E2E resiliency. It will then propose guidelines and procedures tha		
services of	different resiliency levels.		
Support Comp	panies: ORANGE, CableLabs, NTT, AT&T, Huawei (UK)		

GS <u>NFV-RE</u>	EL 003 v1.1.2 E2E reliability models report	Rapporteur:	Hidefumi Nakamura
Full Title:	Network Functions Virtualisation (NFV); Reliability;		
	Report on Models and Features for End-to-End Reliability		
Current status	s: PUBLICATION since 7/4/2016		
upgrade me	document will study software reliability estimation models, reliability/availabi chanisms for E2E resiliency. It will then propose guidelines and procedures tha ifferent resiliency levels.		
	E ReE-PUBLICATION - This version (v1.1.2) was created to fix an error on page	70 of v1.1.1, see	e remark.
Support Compa	nies: ORANGE, CableLabs, NTT, AT&T, Huawei (UK)		



GS <u>NFV-REL 004</u> v <u>1.1.1</u> Active monitoring & failure detection report	Rapporteur: Gurpreet Singh
Full Title: Network Functions Virtualisation (NFV);	
Assurance;	
Report on Active Monitoring and Failure Detection	
Current status: PUBLICATION since 4/15/2016	
Scope: This deliverable will describe methods for active monitoring and failure detection.	
It will address the following aspects:	
1) Periodic testing of VNFs and service chains to ensure adherence to SLAs.	
2) Proactive failure detection and recovery.	
The deliverable will propose potential enhancements to the ETSI NFV architecture to bette	r support active monitoring.
Support Companies: CableLabs, Spirent Communications, Intel, Verizon	

Full Title: Network Functions Virtualisation (NFV); Accountability; Report on Quality Accountability Framework Current status: PUBLICATION since 1/4/2016 Scope: This work item will apply QuEST Forum quality management best practices (especially TL 9000 Measurements Handbook) and TM Forum SLA management standards (especially GB917 and TR178) to the ETSI NFV architecture. The intent of this framework is to promote the development of capabilities by which VNFs, NFV infrastructure and MANO can eventually enable rapid and reliable root cause analysis of service quality impairments, corrective action, and SLA management. This document will: 1. Define high level roles, service boundaries and identify associated NFV reference points; and their quality- related responsibilities to enable rapid root cause analysis and corrective actions 2. align high level roles with TMForum's SLA management service delivery relationships 3. frame how traditional PNF quality measurements (e.g., TL 9000 Service Outage measurements) will be applied to VNFs to permit side-by-side quality comparions, and enable traditional quality measurement (e.g., service outage downtime) for new NFV architectural elements The resulting deliverable will reuse work performed in other relevant NFV Work Items, and collaborate with the corresponding WGs.	GS NFV-R	EL 005 v1.1.1	Quality Accountability Fra	mework	Rapporteur:	Julien
Accountability; Report on Quality Accountability Framework Current status: PUBLICATION since 1/4/2016 Scope: This work item will apply QuEST Forum quality management best practices (especially TL 9000 Measurements Handbook) and TM Forum SLA management standards (especially GB917 and TR178) to the ETSI NFV architecture. The intent of this framework is to promote the development of capabilities by which VNFs, NFV infrastructure and MANO can eventually enable rapid and reliable root cause analysis of service quality impairments, corrective action, and SLA management. This document will: 1. Define high level roles, service boundaries and identify associated NFV reference points; and their quality- related responsibilities to enable rapid root cause analysis and corrective actions 2. align high level roles with TMForum's SLA management service delivery relationships 3. frame how traditional PNF quality measurements (e.g., TL 9000 Service Outage measurements) will be applied to VNFs to permit side-by-side quality comparions, and enable traditional quality measurement (e.g., service outage downtime) for new NFV architectural elements The resulting deliverable will reuse work performed in other relevant NFV Work Items, and collaborate with the					٦	Maisonneuve
Report on Quality Accountability Framework Current status: PUBLICATION since 1/4/2016 Scope: This work item will apply QuEST Forum quality management best practices (especially TL 9000 Measurements Handbook) and TM Forum SLA management standards (especially GB917 and TR178) to the ETSI NFV architecture. The intent of this framework is to promote the development of capabilities by which VNFs, NFV infrastructure and MANO can eventually enable rapid and reliable root cause analysis of service quality impairments, corrective action, and SLA management. This document will: 1. Define high level roles, service boundaries and identify associated NFV reference points; and their quality-related responsibilities to enable rapid root cause analysis and corrective actions 2. align high level roles with TMForum's SLA management service delivery relationships 3. frame how traditional PNF quality measurements (e.g., TL 9000 Service Outage measurements) will be applied to VNFs to permit side-by-side quality comparions, and enable traditional quality measurement (e.g., service outage downtime) for new NFV architectural elements The resulting deliverable will reuse work performed in other relevant NFV Work Items, and collaborate with the	Full Title:	Network Fu	nctions Virtualisation (NF\	/);		
Current status: PUBLICATION since 1/4/2016 Scope: This work item will apply QuEST Forum quality management best practices (especially TL 9000 Measurements Handbook) and TM Forum SLA management standards (especially GB917 and TR178) to the ETSI NFV architecture. The intent of this framework is to promote the development of capabilities by which VNFs, NFV infrastructure and MANO can eventually enable rapid and reliable root cause analysis of service quality impairments, corrective action, and SLA management. This document will: 1. Define high level roles, service boundaries and identify associated NFV reference points; and their quality-related responsibilities to enable rapid root cause analysis and corrective actions 2. align high level roles with TMForum's SLA management service delivery relationships 3. frame how traditional PNF quality measurements (e.g., TL 9000 Service Outage measurements) will be applied to VNFs to permit side-by-side quality comparions, and enable traditional quality measurement (e.g., service outage downtime) for new NFV architectural elements The resulting deliverable will reuse work performed in other relevant NFV Work Items, and collaborate with the		Accountabi	ity;			
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 Handbook) and TM Forum SLA management standards (especially GB917 and TR178) to the ETSI NFV architecture. The intent of this framework is to promote the development of capabilities by which VNFs, NFV infrastructure and MANO can eventually enable rapid and reliable root cause analysis of service quality impairments, corrective action, and SLA management. This document will: 1. Define high level roles, service boundaries and identify associated NFV reference points; and their quality- related responsibilities to enable rapid root cause analysis and corrective actions 2. align high level roles with TMForum's SLA management service delivery relationships 3. frame how traditional PNF quality measurements (e.g., TL 9000 Service Outage measurements) will be applied to VNFs to permit side-by-side quality comparions, and enable traditional quality measurement (e.g., service outage downtime) for new NFV architectural elements The resulting deliverable will reuse work performed in other relevant NFV Work Items, and collaborate with the 	Current state	us: PUBLICATION sir	ce 1/4/2016			
	Handbook) The intent of MANO can and SLA mo 1. De related resp 2. ali 3. fro applied to N outage dow The resulting	and TM Forum SL of this framework eventually enable inagement. This a fine high level role oonsibilities to ena gn high level roles ime how tradition /NFs to permit side vntime) for new Ni g deliverable will	A management standards (especial s to promote the development of or rapid and reliable root cause analy ocument will: s, service boundaries and identify ble rapid root cause analysis and of with TMForum's SLA managemen al PNF quality measurements (e.g., p-by-side quality comparions, and of V architectural elements	lly GB917 and TR178) to the capabilities by which VNFs, vsis of service quality impa- associated NFV reference p forrective actions t service delivery relations TL 9000 Service Outage m enable traditional quality r	ne ETSI NFV arc NFV infrastruc irments, correc points; and the hips neasurements) measurement (e	hitecture. ture and tive action, ir quality- will be e.g., service

Support Companies: ORANGE, Alcatel-Lucent, Hewlett-Packard, TELEFONICA
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GS <u>NFV-</u>	EL 006 v <u>3.1.1</u> SW Upgrade spec	Rapporteur: Percy Tarapore			
Full Title:	ull Title: Network Functions Virtualisation (NFV) Release 3;				
Reliability; Maintaining Service Availability and Continuity Upon Software Modification					
					Current stat
Scope: This Work Item specifies requirements for the purpose of Software Updates/ Upgrades, such that service availability and continuity is maintained.					
All types of software related to Network Function Virtualisation (NFV) - e.g., Virtual Network Functions (VNF),					
Management and Orchestration (MANO) and Network Function Virtualisation Infrastructure (NFVI) - as well as					
required controlling and supporting functionality will be addressed.					
The final de	liverable will contain normative provisions.				

Support Companies: NEC, Intel, AT&T, Huawei



GR NFV-F	REL 007 v1.1.1	MANO resiliend	e report		Rapporteur:	Chidung Lac
Full Title:	Network Fu	nctions Virtualis	ation (NFV);		•	
	Reliability;					
	Report on th	ne resilience of I	NFV-MANO	critical capabilities	3	
Current state	us: PUBLICATION sin	ce 9/28/2017		•		
Scope: This perspective It will:		how to build a resilie	nt NFV-MANO fu	inctional block from the	e reliability/av	vailability
	resilience requiren		•	le services to the VNFs h existing NFV-MANO (listed in up to
The work w	vill report on possil	nstraints for the iden ble mechanisms that ilities dependable an	enable high-ava	s. ilability within the diffe	rent entities c	f NFV-MANO

to render the identified capabilities dependable and trustworthy. Support Companies: ORANGE, NEC, NTT, Intel, AT&T

GR <u>NFV-REL 007</u> v <u>1.1.2</u> MANO resilience report	Rapporteur:	Chidung Lac
Full Title: Network Functions Virtualisation (NFV);		
Reliability;		
Report on the resilience of NFV-MANO critical capabilities	3	
Current status: PUBLICATION since 10/2/2017		
Scope: This WI will report on how to build a resilient NFV-MANO functional block from th	e reliability/av	ailability
perspective.		
It will:		
1) Identify critical NFV-MANO capabilities required to provide reliable services to the VNFs	and the NSs.	
2) Map the resilience requirements, e.g., established in REL001, with existing NFV-MANO	capabilities as	listed in up to
release 2 GSs.		
3) Study specific needs and constraints for the identified capabilities.		
The work will report on possible mechanisms that enable high-availability within the diffe	rent entities o	f NFV-MANO
to render the identified capabilities dependable and trustworthy.		
Support Companies: ORANGE, NEC, NTT, Intel, AT&T		

GS <u>NFV-SEC 001</u> v <u>1.1.1</u> Security Problem Statement	Rapporteur:	Bob Briscoe		
Full Title: Network Functions Virtualisation (NFV);				
NFV Security; Problem Statement				
Current status: PUBLICATION since 10/6/2014				
Scope: * Define NFV sufficiently to understand its security impact				
* Provide a reference list of deployment scenarios				
* Identify new security vulnerabilities resulting from NFV				
* Identify candidate NFV working groups responsible for addressing each vulnerability				
Support Companies: Alcatel-Lucent, TELEFONICA, BT, Intel				

GS <u>NFV-S</u>	EC 002 v <u>1.1.1</u>	Security features in mgm	nt sofware report	Rapporteur:	Huilan Lu
Full Title:	Network Fu	nctions Virtualisation (NF	=V);	·	
	NFV Securi	ty;			
	Cataloguing	security features in mar	nagement software		
Current statu	is: PUBLICATION sin	ce 8/17/2015			
OpenStack of services (sur graphs of th Once the de deployment	as the first case st ch as authentication peir respective dep pendency graph is t.	o catalogue security features in r udy. The initial deliverable is a co on, authorization, confidentiality endencies down to the modules s established, recommendations	ntalogue of OpenStack mo , integrity protection, log that implement cryptogra	odules that provide ging, and auditing aphic protocols an	e security ı) with the full d algorithms.
Support Comp	anies: Alcatel-Luce	nt, BT, AT&T, Verizon, Huawei (UK)			



GS <u>NFV-SEC 003</u> v <u>1.1.1</u> Security and Trust Guidance	Rapporteur:	Kurt Roemer		
Full Title: Network Functions Virtualisation (NFV);				
NFV Security;				
Security and Trust Guidance				
Current status: PUBLICATION since 12/23/2014				
Scope: Define areas of consideration where security and trust technologies, practices and processes have different requirements than non-NFV systems and operations.				
Supply guidance for the environment that supports and interfaces with NFV systems and operations, but avoid redefining any security considerations that are not specific to NFV.				
Support Companies: Alcatel-Lucent, BT, Intel, Citrix.				

GR <u>NFV-S</u>	EC 003 v1.2.1 Security and Trust Guidance	Rapporteur:	Mihai Serb
Full Title:	Network Functions Virtualisation (NFV);	•	
	NFV Security;		
	Security and Trust Guidance		
Current statu	s: PUBLICATION since 8/26/2016		
Scope: Cha	nges to clause 4.4.5.1 of GS NFV-SEC003 v1.1.1: replace Secured Boot with Tru	stworthy Boot	and add a
new descrip	tion to clarify its coverage.		
Support Compa	anies: TELEFONICA, BT, Intel, Huawei		

GS <u>NFV-S</u>	EC 004 v <u>1.1.1</u> LI report	Rapporteur:	Scott Cadzow
Full Title:	Network Functions Virtualisation (NFV);		
	NFV Security;		
	Privacy and Regulation;		
	Report on Lawful Interception Implications		
Current statu	is: PUBLICATION since 9/3/2015		
Scope: The	aim of this work item is to expand the problem statement for application of La	wful Intercep	otion (LI) in NFV.
The report s	shall identify the security and architecture pre-conditions for the provision of LI	in an NVF ba	sed network.
The report s	shall identify the requirements for provision of the points of interception for eac	ch of Intercep	t Related
Information	(IRI) and Content of Communication (CC) with respect to the handover require	ments define	d by ETSI TC LI.
Support Comp	anies: ORANGE, Alcatel-Lucent, Ericsson, TELEFONICA, BT, Cadzow Communications		

GS NFV-SE	C 006 v <u>1.1.1</u> Sec & Regulation report	Rapporteur:	Scott Cadzow	
Full Title:	Network Functions Virtualisation (NFV);			
	Security Guide;			
	Report on Security Aspects and Regulatory Concerns			
Current status	: PUBLICATION since 4/18/2016			
•	deliverable will develop a guide to assist with addressing the security aspects of locuments and applications.	and regulato	ry concerns of	
This will include a template to assist the development of ETSI NFV deliverables and broader guidance for developers,				
architects and	d designers of hardware and software.			
Support Compar	nies: TELEFONICA, Cadzow Communications, British Telecommunications plc, OTD, AT&T, Citra	ix.		



GR NFV-SEC	007 v <u>1.1.1</u> NFV Attestation report	Rapporteur:	Diego Lopez
Full Title:	letwork Functions Virtualisation (NFV);		
ר	rust;		
F	eport on Attestation Technologies and Practices for Secu	ure Deploy	ments
Current status: P	IBLICATION since 10/19/2017		
Scope: This rep	ort will identify gaps in existing attestation technologies and practices, as c	applicable to N	IFV sytsem.
These will inclue	le, but not limited to:		
- Levels of assur	ance		
- Assumed capa	bilities from the NFVI		
- Operational pi	ocedures		
- Requirements	for interoperability		
	of current (established or newly proposed) attestation technology		
-Recommendat	ons for follow-on PoCs to demonstrate feasibility of such attestation procee	dures	
Support Companies	Alcatel-Lucent, Hewlett-Packard, TELEFONICA, Intel, AT&T		

GS <u>NFV-SE</u>	C 009 v <u>1.1.1</u> UCs for multi-layer host admin	Rapporteur:	Mike Bursell		
Full Title:	Network Functions Virtualisation (NFV);				
	NFV Security;				
	Report on use cases and technical approaches for multi-layer host				
	administration				
Current status	: PUBLICATION since 12/18/2015				
Scope: One	of the enduring issues within complex administration domains is the provision	of multi-laye	r		
administrati	on within a single virtualisation host. Multi-layer administration seeks to provi	ide assurances	s that Virtual		
Machines or	Machines or Containers running on a virtualisation host ("hosted applications") – are not vulnerable to interference (of				
various type:	various types) by the host system or platform ("hosting service"). This Work Item will list use cases for multi-layer				
administrati	on and discuss possible technical approaches.				
Support Compa	nies: NEC, TELEFONICA, BT, VODAFONE Group Plc, Intel, OTD, National Technical Assistance				

GR <u>NFV-SI</u>	EC 009 v1.2.1 UCs for multi-layer host admin	Rapporteur:	Anne-Marie Praden	
Full Title:	Network Functions Virtualisation (NFV);			
	NFV Security; Report on use cases and technical approaches for multi-la administration	ayer host		
Current statu:	Current status: PUBLICATION since 1/20/2017			
administrati Machines or various type	Scope: One of the enduring issues within complex administration domains is the provision of multi-layer administration within a single virtualisation host. Multi-layer administration seeks to provide assurances that Virtual Machines or Containers running on a virtualisation host ("hosted applications") - are not vulnerable to interference (of various types) by the host system or platform ("hosting service"). This Work Item will list use cases for multi-layer administration and discuss possible technical approaches.			
Support Compa				

GS NFV-S	EC 010 v1.1.1 Retained Data Report	Rapporteur: Mark Shepherd		
Full Title:	Network Functions Virtualisation (NFV);			
	NFV Security;			
	Report on Retained Data problem statement and requirem	nents		
Current state	us: PUBLICATION since 4/18/2016			
Scope: The	e aim of this work item is to provide a problem statement and articulate the exis	sting requirements for		
Retained Data in the context of NFV.				
The present document examines the core underlying requirements for Retained Data such as those presented by ETSI				
TC LI (TS 102 656 and TS 102 657).				
The present	t document aims to identify solutions or mitigations to the problems identified.			
Support Comp	panies: VODAFONE Group Plc; National Technical Assistance;Yaana Limited: Tencastle Limited; C	Cadzow Communications		



GR NFV-S	EC 011 v1.1.1 LI Architecture Report	Rapporteur:	Alex
	·		Leadbeater
Full Title:	Network Functions Virtualisation (NFV);		
	Security;		
	Report on NFV LI Architecture		
Current statu	s: PUBLICATION since 4/6/2018		
Scope: NFV	virtualised networks are required to be able to support Lawful Interception (Li	l). In order for v	virtual
functions to	support LI, the NFV virtualisation layer must provide a set of capabilities, inter	faces, function	is and
components	which can be utilised by the virtualised applications (VNFs) to provide Lawful	Interception. T	his report will
identify pot	ential top to bottom (Virtualised Application through NFV layer through hardw	are platform) l	LI
	s and identify within the scope of ETSI NFV, capabilities, interfaces, functions c	and component	ts required to
	se architectures.		
	njectives of this work item are to		
	ntify and define 1 or more NFV reference LI architectures, including administre	ation functions	, virtual points
	ion, mediation functions and other LI functions.		
	ntify potential NFV solutions which provide the capabilities, interfaces, functio	ns and compoi	nents to meet
	d LI architectures.		
	cument deployment scenarios examples for each of the identified reference LI	architectures	
This work w	ill build on applicable work already undertaken in NFV SEC 004 & 009.		
This work m	ay include collaboration with other work groups, e.g. IFA WG.		
This Report	is expected to form the basis from which a future normative NFV LI architectur	e can be devel	oped.
Support Comp	anies: ORANGE, Ericsson, BT, Ministère Economie Indu. Numer, OTD, Yaana Limited, Tencastle	Limited	

GS <u>NFV-SEC 012</u> v <u>3.1.1</u> Arch for sensitive components - Spec	Rapporteur:	Mike Bursell
Full Title: Network Functions Virtualisation (NFV) Release 3;		
Security;		
System architecture specification for execution of sensitive	NFV con	nponents
Current status: PUBLICATION since 1/6/2017		
Scope: Many different VNFs include components – VNFCIs, whether VMs or Containers – w or algorithms. These may need integrity and/or confidentiality protection from a number of including NFVI administrators. Some elements of the Mangement and Orchestration doma protection. Equally, NFVI hosts must be assured that they are protected from malicious or This normative Work Item will describe a system architecture for the execution of sensitive all of these use cases. This system architecture will describe technical measures, software if and software techniques. The expectation is that for some use cases, sensitive and non-ser to co-exist on the same platform, and protection one from the other is considered in scope Support Companies: BT, Ministère Economie Indu. Numer, Intel, OTD, National Technical Assistance, Yaana Lin	of different er iin also requi compromised NFV compon interfaces an insitive worklo of this WI.	ntities, re such 1 work loads. ents, covering d hardware

GS NFV-SEC 0	<u>13 v3.1.1</u>	Sec mgmt & Monitoring Spec		Rapporteur: Ashutosh Dutta
Full Title: N	etwork Fu	nctions Virtualisation (NFV) Release	93;	
S	ecurity;			
S	ecurity Ma	nagement and Monitoring specificat	ion	
Current status: PU	BLICATION sin	ce 2/28/2017		
Scope: This WI v	vill study Secu	urity Management and Monitoring, as well as u	se cases and	deployment scenarios in an
NFV environmen	t.			
It will specify sec analytics for secu		ment and Monitoring requirements, architectu yment.	re, protocols,	provisioning, and security
This WI will reco	nmend meth	odologies for secure placement and provisionin	g of security j	functions and policies,
including visibilit	y and control	elements.		
The output of thi	s work will be	a normative specification.		
Support Companies:	Nokia, Alcate Huawei, Citri	el-Lucent, BT, Cisco, NEC Corporation, AQSACOM S.A.S., Spin x.	rent Communica	tions, Intel, AT&T, Yaana Limited,



GS <u>NFV-S</u>	EC 014 v3.1.1 MANO Security Spec	Rapporteur: Pradheepkumar		
		Singaravelu		
Full Title:	Full Title: Network Functions Virtualisation (NFV) Release 3; NFV Security; Security Specification for MANO Components and Reference points			
Current statu	us: PUBLICATION since 4/20/2018			
internal inte	Scope: This work item will perform and document a threat analysis for MANO components (NFVO, VNFM, VIM) and internal interfaces (Or-Vnfm, Vi-Vnfm, Or-Vi). The requirements to counter the identified threats will be specified. Support Companies: NEC, TELEFONICA, Cadzow Communications, Cisco, Intel, SPRINT, AT&T			

GS NFV-S	<u>OL 002</u> v <u>2.3.1</u>	/e-Vnfm RESTful protocols spe	c	Rapporteur:	Jong-Hwa Yi
Full Title:	Network Fund	tions Virtualisation (NFV) Re	elease 2;	•	
	Protocols and	Data Models;			
	RESTful proto	cols specification for the Ve	-Vnfm Referenc	e Point	
Current statu	s: PUBLICATION since	3/29/2017			
specified in depend on deliverable NOTE: REST	Current status: PUBLICATION since 8/29/2017 Scope: The scope of this work item is to develop a set of Restful protocols specifications fulfilling the requirements specified in GS NFV IFA 008 for the interfaces used over the Ve-Vnfm reference point. The type of RESTful protocol may depend on the interface considered (e.g. the VNF configuration interface can be specified based on RESTCONF). The deliverable will contain normative provisions. NOTE: RESTful protocols may not be suitable for all interfaces used on the Ve-Vnfm Reference Point. Specification of protocols for such interfaces is outside the scope of this work item.				
Support Comp	anies: ORANGE, PT PO	RTUGAL, NEC, Ericsson AB, DOCOMO, Huawei			

GS NFV-S	DL 002 v2.4.1 Ve-Vnfm RESTful protocols spec	Rapporteur:	Jong-Hwa Yi	
Full Title:	Network Functions Virtualisation (NFV) Release 2;			
	Protocols and Data Models;			
	RESTful protocols specification for the Ve-Vnfm Reference	e Point		
Current statu	s: PUBLICATION since 2/23/2018			
Scope: This	revision of NFV-SOL 002 conducts NFV Release 2 maintenance: it corrects erro	ors, ambiguitie	?S,	
misalignme	ts, and applies editorial modifications (i.e. Corrections of category F and D as	described in E	TSI TWPs	
Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:				
SOL 002 specifies a set of Restful protocols fulfilling the requirements specified in GS NFV-IFA 008 for the interfaces				
used over th	e Ve-Vnfm reference point.			
Support Comp	nies: ETRI, PT Portugal, Orange, Docomo, Huawei, Telefonica, Ericsson			

GS <u>NFV-SOL 002</u> v2.5.1 Ve-Vnfm RESTful protocols spec	Rapporteur:	Jong-Hwa Yi		
Full Title: Network Functions Virtualisation (NFV) Release 2;				
Protocols and Data Models;				
RESTful protocols specification for the Ve-Vnfm Referenc	e Point			
Current status: PUBLICATION since 9/7/2018				
Scope: This revision of NFV-SOL 002 conducts NFV Release 2 maintenance. It corrects erro	rs, ambiguitie	?S,		
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	described in E	TSI TWPs		
Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter:				
SOL 002 specifies a set of Restful protocols fulfilling the requirements specified in GS NFV-IFA 008 for the interfaces				
used over the Ve-Vnfm reference point.				
Support Companies: ETRI, PT Portugal, Orange, Ericsson, Huawei, Telefonica, DOCOMO				



GS <u>NFV-S</u>	OL 003 v2.3.1 Or-Vnfm RESTful protocols spec	Rapporteur:	Uwe Rauschenbach
Full Title:	Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; RESTful protocols specification for the Or-Vnfm Reference	e Point	
Current statu	s: PUBLICATION since 7/26/2017		
Scope: The scope of this work item is to produce a Group Specification documenting a set of RESTful Interface Specifications fulfilling the requirements specified in GS NFV IFA 007 for the interfaces used over the Or-Vnfm reference point. The work item deliverable will contain normative provisions. When the same interface is produced or consumed on the Or-Vnfm and Ve-Vnfm reference points, one of the deliverables will reference and profile the other one			
Support Comp	anies: ORANGE, Nokia, Ericsson, NEC, Telecom Italia, KPN N.V., VODAFONE Group Plc, Cisco, Do	ОСОМО	

GS NFV-S	OL 003 v2.4.1 Or-Vnfm RESTful protocols spec	Rapporteur:	Uwe
			Rauschenbach
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Protocols and Data Models;		
	RESTful protocols specification for the Or-Vnfm Reference	e Point	
Current stat	us: PUBLICATION since 2/22/2018		
misalignme Annex L). T summarize SOL 003 sp 007 for the	s revision of NFV-SOL 003 conducts NFV Release 2 maintenance: it corrects erro ents, and applies editorial modifications (i.e. Corrections of category F and D as his edition does not add or modify features, nor does it extend the scope of the d hereafter: ecifies a set of RESTful protocols and data models fulfilling the requirements spe interfaces used over the Or-Vnfm reference point, except for the "Virtualised Re	described in f former Relea ecified in ETS	ETSI TWPs ise 2 edition I GS NFV-IFA
	n indirect mode" as defined in clause 6.4 of ETSI GS NFV-IFA 007.		
Support Comp	banies: Nokia, PT Portugal, Orange, Docomo, Huawei, Telefonica, Ericsson		

GS NFV-SOL 003 v2.5.1 Or-Vnfm RESTful protocols spec	Rapporteur:	Uwe
		Rauschenbach
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Protocols and Data Models;		
RESTful protocols specification for the Or-Vnfm Reference	ce Point	
Current status: PUBLICATION since 9/6/2018		
Scope: This revision of NFV-SOL 003 conducts NFV Release 2 maintenance. It corrects err misalignments, and applies editorial modifications (i.e. Corrections of category F and D as Annex L). This edition does not add or modify features, nor does it extend the scope of the summarized hereafter: SOL 003 specifies a set of RESTful protocols and data models fulfilling the requirements sp	s described in e former Relea	ETSI TWPs ase 2 edition
007 for the interfaces used over the Or-Vnfm reference point, except for the "Virtualised I interfaces in indirect mode" as defined in clause 6.4 of ETSI GS NFV-IFA 007.	Resources Ma	nagement
Support Companies: Nokia, PT Portugal, Orange, Huawei, Ericsson, Telefonica,		

GS <u>NFV-S</u>	OL 004 v2.3.1 VNF Package Stage 3 spec	Rapporteur:	Andrei Kojukhov
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Protocols and Data Models;		
	VNF Package specification		
Current state	us: PUBLICATION since 7/3/2017		
Scope: The	e scope of this work item is to specify the structure and format of a VNF Package	e and its constit	tuents,
fulfilling the	e requirements specified in GS NFV IFA 011 for a VNF Package. The work item d	eliverable will d	contain
normative	provisions.		
Support Comp	panies: ORANGE, Amdocs Software Systems Ltd, China Telecommunications, AT&T, Huawei, Net	tCracker	



GS <u>NFV-S</u>	OL 004 v2.4.1 VNF Package Stage 3 spec	Rapporteur:	Andrei Kojukhov
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Protocols and Data Models;		
	VNF Package specification		
Current state	us: PUBLICATION since 2/13/2018		
misalignme Annex L). T	s revision of NFV-SOL 004 conducts NFV Release 2 maintenance: it corrects erro ents, and applies editorial modifications (i.e. Corrections of category F and D as a his edition does not add or modify features, nor does it extend the scope of the j d hereafter:	described in ETS	
SOL 004 sp	ecifies the structure and format of a VNF package file and its constituents, fulfili	ing the	
requiremen	ts specified in ETSI GS NFV-IFA 011 for a VNF package.		
Support Comp	oanies: Amdocs, PT Portugal, Orange, Huawei, Telefonica, Ericsson		

Andrei GS NFV-SOL 004 v2.5.1 VNF Package Stage 3 spec Rapporteur: Kojukhov Full Title: Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; **VNF** Package specification Current status: **PUBLICATION** since 9/6/2018 Scope: This revision of NFV-SOL 004 conducts NFV Release 2 maintenance. It corrects errors, ambiguities, misalignments, and applies editorial modifications (i.e. Corrections of category F and D as described in ETSI TWPs Annex L). This edition does not add or modify features, nor does it extend the scope of the former Release 2 edition summarized hereafter: SOL 004 specifies the structure and format of a VNF package file and its constituents, fulfilling the requirements specified in ETSI GS NFV-IFA 011 for a VNF package. Amdocs, PT Portugal, Orange, Huawei, Telefonica, Support Companies:

GS NFV-SOL	005 v <u>2.4.1</u> Os-Ma-nfvo APIs	Rapporteur:	Ernest Bayha
Full Title:	letwork Functions Virtualisation (NFV) Release 2;		
F	Protocols and Data Models;		
F	RESTful protocols specification for the Os-Ma-nfvo Refere	ence Point	
Current status: P	JBLICATION since 2/13/2018		
Scope: The scope of this work item is to develop a set of Restful protocol specifications fulfilling the requirements specified in GS NFV-IFA 013 for the interfaces used over the Os-Ma-nfvo reference point. The deliverable will contain			
normative prov	sions.		
Support Companies	: ORANGE, PT PORTUGAL, HPE, Ericsson, Telecom Italia, BT, Cisco, NetCracker		

GS NFV-S	NFV-SWA 001 v1.1.1 Virtual Network Function Architecture		Thinh
			Nguyenphu
Full Title:	Network Functions Virtualisation (NFV);	-	
	Virtual Network Functions Architecture		
Current stat	us: PUBLICATION since 12/23/2014		
Scope: 1)	Define requirement categories and their attributes		
2) Decomp	osition of Network Elements into Functional Blocks + assignment of FBs to requ	irement categ	ories
3) Specify v awareness	whether FB can be agnostic or need to be aware of the virtualization infrastruct	ture and what	is the level of
4) Assignm	ent of FB to architecture layer (Network Function in Software/application layer	^r vs. infrastruct	ure layer)
Support Com	anies: Nokia Siemens Networks Oy, NEC, DT, SPRINT		



GS NFV	-TST 001 v1.1.1 Pre-deployment Validation report	Rapporteur:	Rajesh
	<u> </u>		Rajamani
Full Title:	Network Functions Virtualisation (NFV);		
	Pre-deployment Testing;		
	Report on Validation of NFV Environments and Services		
Current st	atus: PUBLICATION since 4/4/2016		
Scope: 7	his deliverable will develop recommendations for pre-deployment validation of I	VFV functional b	locks in a lab
environn	nent.		
The follo	wing aspects of lab testing will be addressed:		
1)	Functional validation of VNFs interaction with NFV functional blocks.		
2)	User and control plane performance validation. Including the assessment of cap	acity manageme	nt e.g. during
VNF scal	e-out to ensure that performance levels adhere to SLAs.		
3)	Validation of reliability and availability of VNFs, NFVI and services during workle	oad migrations.	
The deliv	and the second		

 The deliverable may propose potential enhancements to the ETSI NFV architecture to better support testing.

 Support Companies:
 CableLabs, Spirent Communications, Intel, Verizon

GS <u>NFV-TST 002</u> v <u>1.1.1</u> lop Testing Methodology report	Rapporteur:	Carsten
		Rossenhoevel
Full Title: Network Functions Virtualisation (NFV);		
Testing Methodology;		
Report on NFV Interoperability Testing Methodology		
Current status: PUBLICATION since 10/21/2016		
Scope: This work item covers the analysis of the NFV interoperability methodology landsd	ape and suga	iests a
framework to be addressed.		
Specifically, the work item will:		
- Analyze pre-existent work on NFV interoperability testing methodology from NFV	ISG work. Po	Cs. other SDOs.
open source projects, general ETSI experience in this area, etc.		,,
- Review current NFV ISG work for testable interoperability requirements		
- Evaluate the requirements for NFV use case-agnostic interoperability and applica	tion-level inte	eroperability for
NFV-related use cases		
This work item will not deal with performance metrics.		
Normative or Informative? Informative.		
Deliverables from this WI:		
- Report on NFV interoperability test methodology		
External dependencies of this work item are:		
- Testing methodology developed already externally by other industry forums and	standards bo	dies such as, for
example, IETF		
Interface work items by other NEVISC working groups		
- Interface work items by other NFV ISG working groups		

GR <u>NFV-TST 004</u> v <u>1.1.1</u> NFVI_PATH_TEST report	Rapporteur:	Al Morton
Full Title: Network Functions Virtualisation (NFV);		
Testing;		
Guidelines for Test Plan on Path Implementation through	NFVI	
Current status: PUBLICATION since 5/24/2017		
Scope: This work item provides guidelines for test plans that assess different approaches Applications, different ways of arranging and federating SDN Controllers, and arrangement switching/forwarding functions (both physical and virtual) to create the various path-impli- among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities details of technologies of interest.	nts of network ementations be NFV framework	etween and < (when
Although the primary emphasis of testing is the performance and benchmarking of system components above, the attempts to combine different protocols and functions will undoub which are non-interoperable, and these should be noted. (See NFV(15)FTR011r2 for more SDOs/areas of collaboration outside this scope.)	tedly uncover o	combinations
Support Companies: TELEFONICA, Spirent Communications, AT&T, EANTC AG		



GR NFV-TST 004 v1.1.2 NFVI_PATH_TEST report Ra Full Title: Network Functions Virtualisation (NFV); Testing; Guidelines for Test Plan on Path Implementation through NF Current status: PUBLICATION since 7/28/2017 Scope: This work item provides guidelines for test plans that assess different approaches to a Applications, different ways of arranging and federating SDN Controllers, and arrangements of switching/forwarding functions (both physical and virtual) to create the various path-implement among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the NFV testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities, and details of technologies of interest. Although the primary emphasis of testing is the performance and benchmarking of systems co components above, the attempts to combine different protocols and functions will undoubted		
Testing; Guidelines for Test Plan on Path Implementation through NF Current status: PUBLICATION since 7/28/2017 Scope: This work item provides guidelines for test plans that assess different approaches to a Applications, different ways of arranging and federating SDN Controllers, and arrangements a switching/forwarding functions (both physical and virtual) to create the various path-implement among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the NFV testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities, and details of technologies of interest. Although the primary emphasis of testing is the performance and benchmarking of systems co		
Guidelines for Test Plan on Path Implementation through NF Current status: PUBLICATION since 7/28/2017 Scope: This work item provides guidelines for test plans that assess different approaches to a Applications, different ways of arranging and federating SDN Controllers, and arrangements a switching/forwarding functions (both physical and virtual) to create the various path-implement among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the NFV testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities, and details of technologies of interest. Although the primary emphasis of testing is the performance and benchmarking of systems co		
Current status: PUBLICATION since 7/28/2017 Scope: This work item provides guidelines for test plans that assess different approaches to a Applications, different ways of arranging and federating SDN Controllers, and arrangements a switching/forwarding functions (both physical and virtual) to create the various path-implement among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the NFV testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities, and details of technologies of interest. Although the primary emphasis of testing is the performance and benchmarking of systems co	4	
Applications, different ways of arranging and federating SDN Controllers, and arrangements of switching/forwarding functions (both physical and virtual) to create the various path-implement among NS Endpoints and VNFs. These guidelines support development of detailed test plans, and ultimately influence the NFV testers share their results from testing arrangements encouraged by these guidelines). The test plan guidelines should be sufficiently abstract to include all envisioned possibilities, and details of technologies of interest. Although the primary emphasis of testing is the performance and benchmarking of systems co		
which are non-interoperable, and these should be noted. (See NFV(15)FTR011r2 for more info SDOs/areas of collaboration outside this scope.)	network tations b ramewol will also nposed o uncover	between and rk (when o pursue the f the combinations

GR <u>NFV-TST 005</u> v <u>3.1.1</u> VNF_snapshot_report	Rapporteur: Joerg A	elken
Full Title: Network Functions Virtualisation (NFV);		
Continuous Development and Integration;		
Report on use cases and recommendations for VNF Snap	shot	
Current status: PUBLICATION since 3/3/2017		
Scope: This Work Item will report on use cases, recommendations and potential solutions	for VNF snapshotting, v	vith
the following objectives:		
a) Describing use cases that would benefit from VNF snapshot functionality.		
b) Studying the conditions for capturing VNF/VNFC snapshots and VNF data.		
c) Analysing recommendations for the support of VNF/VNFC snapshots.		
d) Defining end-to-end orchestration procedures and overall framework supporting the cap	ture of VNF data and	
VNF/VNFC snapshots.		
The WI will consider analysing and leveraging available related techniques from Open Sour	ce and others.	
The resulting deliverable will be informative.		
Support Companies: ORANGE, PT PORTUGAL, Ericsson, TELEFONICA, TeliaSonera AB, NTT, DOCOMO, Fujitsu L	imited	

Support Companies: ORANGE, PT PORTUGAL, Ericsson, TELEFONICA, TeliaSonera AB, NTT, DOCOMO, Fujitsu Limited

GR NFV-	GR NFV-TST 007 v1.1.1 MANO lop Testing Guidelines		Carsten
			Rossenhoevel
Full Title:	Network Functions Virtualisation (NFV);		
	Testing;		
	Guidelines on Interoperability Testing for MANO		
Current stat	us: PUBLICATION since 11/28/2017		
Scope: Th	is WI intends to create informative interoperability test guidelines for NFV capal	oilities requir	ing interaction
among VN	F, MANO and VIM-NFVI, such as (but not limited to): NS Lifecycle Management,	VNF Lifecycl	e management,
VNF Packa	ge Management, Software Image Management,		
This WI wil	ll follow the Interoperability Testing Methodology developed by the NFV TST W(G (TST002) a	nd is intended
to be appli	cable for all implementations aligned with ETSI NFV architecture; references to o	open source	
implement	ations may be included as examples.		
Support Com	panies: HPE, BT, Spirent Communications, Openet Telecom, AT&T, EANTC AG, Ixia Technologies		



GR <u>NFV-T</u>	ST 007 v2.5.1 MANO lop Testing Guidelines	Rapporteur:	Carsten
			Rossenhoevel
Full Title:	Network Functions Virtualisation (NFV) Release 2;		
	Testing;		
	Guidelines on Interoperability Testing for MANO		
Current state	us: PUBLICATION since 8/10/2018		
Scope: Thi	s WI intends to create informative interoperability test guidelines for NFV capa	bilities requiring	g interaction
among VNI	, MANO and VIM-NFVI, such as (but not limited to): NS Lifecycle Management,	, VNF Lifecycle i	management,
VNF Packag	ge Management, Software Image Management,		
This WI will	follow the Interoperability Testing Methodology developed by the NFV TST W	G (TST002) and	is intended
to be applic	able for all implementations aligned with ETSI NFV architecture; references to	open source	
implemente	ntions may be included as examples.		
Support Comp	anies: Keysight Technologies UK Ltd, Spirent Communications, AT&T, EANTC AG		
GS NFV-T	ST 008 v2.1.1 NFVI Compute & Nwk Metrics - Spec	Rapporteur:	Al Morton
Full Title:	Network Functions Virtualisation (NFV) Release 2;	•	
	Testing;		
	NFVI Compute and Network Metrics Specification		
Current stat	us: PUBLICATION since 5/29/2017		
	cify detailed and vendor-agnostic key operational performance metrics at diffe	erent lavers of t	he Network
	rtualization Infrastructure (NFVI), especially processor usage and network inter		
	evaluation in the serve as references for processed and time approached measurem		

metrics are expected to serve as references for processed and time-aggregated measurement values for performance management information that traverses the Or-Vi and/or Vi-Vnfm reference points. The work item deliverable will contain normative provisions.

Support Companies: SWISSCOM, AT&T, EANTC AG, Ixia Technologies

GS NFV-TST 008 v2.4.1 NFVI Compute & Nwk Metrics - Spec	Rapporteur:	Al Morton
Full Title: Network Functions Virtualisation (NFV) Release 2;		
Testing;		
NFVI Compute and Network Metrics Specification		
Current status: PUBLICATION since 2/13/2018		
Scope: This revision of NFV-TST 008 conducts NFV Release 2 maintenance: it corrects erro	rs, ambiguities	
misalignments, and applies editorial modifications (i.e. Corrections of category F and D as	described in ET	SI TWPs
Annex L). This edition does not add or modify features, nor does it extend the scope of the	former Release	2 edition
summarized hereafter:		
TST 008 specifies detailed and vendor-agnostic key operational performance metrics at dif		
especially processor usage and network interface usage metrics. These metrics are expected		
processed and time-aggregated measurement values for performance management information of the second secon	mation that tra	verses the Or-
Vi and/or Vi-Vnfm reference points of the NFV architectural framework.		
Support Companies: SWISSCOM, AT&T, EANTC AG, Ixia Technologies, PT Portugal, Orange, Huawei, Telefonic	ca	
GS <u>NFV-TST 008</u> v <u>3.1.1</u> NFVI Compute & Nwk Metrics - Spec	Rapporteur:	Al Morton
Full Title: Network Functions Virtualisation (NFV) Release 3;		
Testing;		
NFVI Compute and Network Metrics Specification		
Current status: PUBLICATION since 8/10/2018		
Scope: This revision of NFV-TST 008 propagates the deliverable into NFV Release 3.		
This edition will add requirements and specification of metrics to support the Release 3 fee	atures, and it w	ill extend the
scope of the former Release 2 edition summarized hereafter:		
Specify detailed and vendor-agnostic key operational performance metrics at different lay		
Virtualization Infrastructure (NFVI), especially processor usage and network interface usage		
expected to serve as references for processed and time-aggregated measurement values f	or performance	?
management information that traverses the Or-Vi and/or Vi-Vnfm reference points.		
The work item deliverable will contain normative provisions. This revision of NFV-TST 008 will address the Release 3 candidate features listed in Annex I	D of the Dologe	2 Definition
(v0.8.0).		
This revision will also reflect the maintenance performed to NFV Release 2 documentation.		
Support Companies: AT&T GNS Belgium, PT Portugal, Ixia Technologies, Swisscom	•	
Support companies. After ons beigian, if i fortaga, ind reenhologies, swisseon		



GS <u>NFV-T</u>	<u>ST 008 v2.5.1</u>	NFVI Comput	e & Nwk Metr	ics - Spec	Rapporteur:	Al Morton
Full Title:	Network Fu	Inctions Virtua	lisation (NFV)	Release 2;		
	Testing;					
	NFVI Comp	oute and Netwo	ork Metrics S	oecification		
Current statu	us: PUBLICATION sir	nce 8/10/2018				
Scope: This	s revision of NFV-T	ST 008 conducts N	FV Release 2 mai	ntenance. It correc	ts errors, ambiguiti	es,
misalignme	nts, and applies e	ditorial modificatio	ons (i.e. Correction	is of category F an	d D as described in	ETSI TWPs
Annex L). Ti summarized		ot add or modify feo	atures, nor does it	t extend the scope	of the former Relea	se 2 edition
TST 008 spe	cifies detailed and	d vendor-agnostic k	key operational pe	erformance metric	s at different layers	of the NFVI,
			-		expected to serve as t information that t	
Vi and/or V	i-Vnfm reference µ	points of the NFV a	rchitectural frame	ework.		
Support Comp	anies: AT&T, PT Pc	ortugal, Orange, Huawe	i Telefonica			

U 3 Z	SM 006 v1.1.1	PoC Framework Rapporteu	r: Klaus Martiny
Full Ti	itle: Zero touc	ch network and Service Management (ZSM);	
		Concept Framework	
Curre	nt status: PUBLICATION	•	
stake to de	holder Proofs of Conc monstrate the viabilit	ment defines a framework to be used by ETSI ISG ZSM to coordinate and pr cept (PoC) projects illustrating key aspects of ZSM. Proofs of Concept are a ity of a new technology during its early days and or pre-standardisation ph e ZSM PoC framework are:	n important tool
•	to ensure that the	C projects are scoped around relevant topics for ISG ZSM that require from- e PoC results, lessons learnt and identified gaps are feedback to ISG ZSM; ce on the viability of ZSM;	-the-field input;
• from	to encourage the different players;	e development of a diverse and open ecosystem by fostering the integration	n of components
		ardization and industry promotion activities of ISG ZSM.	
• This f	framework describes:		
• This f			
• This f		es and responsibilities in the PoC activity process.	





Previous versions of the present document:

- <u>NFV(18)000041r2</u> ISG NFV work programme details as of 2018.05.09"- pre-NFV#23 update
- <u>NFV(18)000041r1</u> ISG NFV work programme details as of 2018.05.09"- pre-NFV#22 update
- NFV(18)000041 ISG NFV work programme details as of 2018.02.23 pre-NFV#21 update
- NFV(17)000040r4 ISG NFV work programme details as of 2017.11.30 pre-NFV#20 update
- NFV(17)000040r3 ISG NFV work programme details as of 2017.09.05 pre-NFV#19 update
- <u>NFV(17)000040r2</u> ISG NFV work programme details as of 2017.06.12
- <u>NFV(17)000040r1</u> ISG NFV work programme details as of 2017.05.14- *pre-NFV#18 update*
- <u>NFV(17)000040</u> ISG NFV work programme details as of 2017.02.20- *pre-NFV#17 update*
- <u>NFV(16)000076r5</u> ISG NFV work programme details as of 2016.11.25- *pre-NFV#16 update*
- <u>NFV(16)000076r4</u> ISG NFV work programme details as of 2016.09.14- pre-NFV#15 update
- <u>NFV(16)000076r3</u> ISG NFV work programme details as of 2016.07.05
- <u>NFV(16)000076r2</u> ISG NFV work programme details as of 2016.04.27 pre-NFV#14 update
- <u>NFV(16)000076r1</u> ISG NFV work programme details as of 2016.03.07 post NFV#13 update
- <u>NFV(16)000076</u> NFV workprogramme details as of 2016.02.04 *before NFV#13*
- NFV(15)000095r4 NFV workprogramme details as of 2015.10.15
- <u>NFV(15)000095r3</u> NFV workprogramme details as of 2015.08.14
- <u>NFV(15)000095r2</u> NFV workprogramme details as of 2015.07.21
- <u>NFV(15)000095r1</u> NFV workprogramme details as of 2015.06.23
- <u>NFV(15)000095</u> NFV workprogramme details as of 2015.05.11

Changes between NFV#21 and NFV#22

1 New Work Item proposal was **approved** by Remove Consensus

<u>DGS/NFV-SOL007 "NSD file structure spec"</u>
 SOL NWI proposal in <u>NFV(18)000066r1</u> approved by Remote Consensus

3 Approved drafts were PUBLISHED (2 were approved by Remote Consensus):

- <u>GR NFV-IFA 022 v3.1.1 "Multi-Site Services report"</u>: RC ended 1st April, PUBLISHED (19 April)
- GS NFV-SEC 014 v3.1.1 "MANO Security Spec": RC ended 1st April, PUBLISHED (20 April)
- GR NFV-SEC 011 v1.1.1 "LI Architecture Report": PUBLISHED (20 April)

Rapporteur change

• IFA007: Uwe Rauschenbach (Nokia) --> Ernest Bayha (Ericsson)

Changes at NFV#21

- **1 New Work Item** was **created**
 - DGS/NFV-SOL005ed251 "Os-Ma-nfvo APIs"

1 Final Draft was **approved** for **publication**

GR SEC011 "LI Architecture Report"

2 final drafts were sent to approval by **Remote Consensus**.



Approved for

Publication

<u>SEC014</u> "MANO Security Spec" <u>IFA022</u> "Multi-Site Services report"

Other changes :

- GS IFA012 was **turned into a GR** (informative), title, scope, and schedule were amended, as well as supporting companies, as described in contribution NFV(18)00067.
- SOL001 scope was changed, as described in NFV(18)00068r1



- SEC0016 approval is expected to be delayed by approximately a year
 → NFV Approval now scheduled at NFV24, December 2018 (was Oct 2017).
- SEC015 Candidate for stopping: the lack of progress and contribution on this WI was discussed in December at NFV#20, and at NFV#21. The NFV#21 plenary agreed to defer the decision until NFV#22, and requested SEC WG to prepare a contribution for decision.

Changes between NFV#20 and NFV#21:

26 deliverables were **published** of which 22 had been approved by Remote Consensus

- GS NFV 003 v1.3.1 Terminology
- GR NFV-EVE 008 v3.1.1 Charging and Billing report
- GR NFV-EVE 010 v3.1.1 License Management report
- GR NFV-EVE 012 v3.1.1 Network Slicing report
- <u>GS NFV-IFA 002 v2.4.1 Acceleration VNF Intface Spec</u>
- <u>GS NFV-IFA 003 v2.4.1 Acceleration Switching Aspects Spec</u>
- <u>GS NFV-IFA 004 v2.4.1 Acceleration Mgmt aspects Spec</u>
- <u>GS NFV-IFA 005 v2.4.1 Or-Vi</u> ref point Spec
- <u>GS NFV-IFA 006 v2.4.1 Vi-Vnfm ref point Spec</u>
- <u>GS NFV-IFA 007 v2.4.1 Or-Vnfm ref point Spec</u>
- <u>GS NFV-IFA 008 v2.4.1 Ve-Vnfm ref point Spec</u>
- <u>GS NFV-IFA 010 v2.4.1 MANO Functional Rqmts Spec</u>
- <u>GS NFV-IFA 011 v2.4.1 VNF Packaging Spec</u>
- <u>GS NFV-IFA 013 v2.4.1 Os-Ma-Nfvo ref point Spec info model</u>
- <u>GS NFV-IFA 014 v2.4.1 Network Service Templates Spec</u>
- GR NFV-IFA 015 v2.4.1 Info Model Report
- GR NFV-IFA 016 v2.4.1 Papyrus Guidelines
- <u>GR NFV-IFA 017 v2.4.1 UML Modeling Guidelines</u>
- GR NFV-IFA 021 v3.1.1 MANO and automated deployment report
- GR NFV-IFA 028 v3.1.1 Multi admin domain support -report
- <u>GS NFV-REL 006 v3.1.1 SW Upgrade spec</u>
- <u>GS NFV-SOL 002 v2.4.1 Ve-Vnfm RESTful protocols spec</u>
- <u>GS NFV-SOL 003 v2.4.1 Or-Vnfm RESTful protocols spec</u>
- <u>GS NFV-SOL 004 v2.4.1 VNF Package Stage 3 spec</u>
- <u>GS NFV-SOL 005 v2.4.1 Os-Ma-nfvo APIs</u>
- GS NFV-TST 008 v2.4.1 NFVI Compute and Nwk Metrics Spec

Change of rapporteur:

EVE015: Bruno CHATRAS \rightarrow Cecilia CORBI SEC005: Marcus WONG \rightarrow Li FENG

CHANGES @ NFV#20

4 FINAL DRAFTS APPROVED for publication:

Approved for Publication

RC 🐐

Remote

Consensus

- <u>GR NFV-EVE 008 v3.1.1</u> "Charging and Billing report"
- GR NFV-EVE 010 v3.1.1 "License Management report"
 - <u>GR NFV-EVE 012 v3.1.1</u> "Network Slicing report"
 - <u>GS NFV 003 v1.3.1</u> "Terminology"

3 final drafts were sent to approval by Remote Consensus.

- NFV(17)000327-"Draft DGS/NFV-REL006 v0.1.0 "SW Upgrade spec"
- NFV(17)000382-"Draft DGR/NFV-IFA021 v0.11.0 "MANO and automated deployment report"
 - NFV(17)000381-"Draft DGR/NFV-IFA028 v0.13.0 "Multi admin domain support -report""

17 NEW Work Items created:



- GS NFV-003ed141 "Terminology"
- <u>GS NFV-IFA030</u> "Multi Domain MANO spec"
- <u>GS NFV-IFA031</u> "NFV-MANO_mgmt_spec"



- GS NFV-IFA032 "Multi-site Intfaces & InfoModel spec"
- <u>GS NFV-SEC 022</u> "API Access Token Spec"
- <u>GS NFV-TST 010</u> "API Conformance Testing"

Release 3 Super WID: 11 New WIs

11 Release 2 WIs were propagated (or evolved) from Release 2 to Release 3

- RGS/NFV-TST008ed311 "NFVI Compute & Nwk Metrics Spec"
- RGS/NFV-IFA002ed311 "Acceleration VNF Intface Spec"
- RGS/NFV-IFA005ed311 "Or-Vi ref point Spec"
- RGS/NFV-IFA006ed311 "Vi-Vnfm ref point Spec"
- RGS/NFV-IFA007ed311 "Or-Vnfm ref point Spec"
- RGS/NFV-IFA010ed311 "MANO Functional Rqmts Spec"
- RGS/NFV-IFA013ed311 "Os-Ma-Nfvo ref point Spec info model"
- RGS/NFV-IFA014ed311 "Network Service Templates Spec"
- RGR/NFV-IFA015ed311 "Info Model Report"
- <u>RGR/NFV-IFA016ed311</u> "Papyrus Guidelines"
- RGR/NFV-IFA017ed311 "UML Modeling Guidelines"

Titles tuned for 4 Work Item (following TSC proposal):

- <u>EVE008</u> Network Functions Virtualisation (NFV) Release 3; <u>Management and Orchestration Charging</u>; Report on Usage Metering and Charging Use Cases and Architectural Study
- GS <u>EVE011</u> Network Functions Virtualisation (NFV) Release 3; <u>Software Architecture Virtualised Network Function</u>; Specification of the Classification of Cloud Native VNF implementations
- GS <u>IFA011</u> Network Functions Virtualisation (NFV) Release 2;

Management and Orchestration;

VNF Descriptor and Packaging Specification

 GR <u>IFA029</u> Network Functions Virtualisation (NFV) Release 3; <u>Software Architecture</u> <u>Architecture</u>; Report on the Enhancements of the NFV architecture towards "Cloud-native" and "PaaS"

Rapporteurs Changed for 3 Work Items:

- <u>GS IFA008ed241 "Ve-Vnfm ref point Spec"</u> was Shitao LI (Huawei) -changed to --> Xu YANG (Huawei)
- <u>GS IFA010ed241 "MANO Functional Rqmts Spec"</u>
 Was Amanda Xiang (Huawei) changed to → Ulrich Kleber (Huawei)
- <u>GS IFA011ed241 "VNF Packaging Spec"</u> was Jon TAYLOR (Amdocs) -changed to --> Haibin CHU (Ericsson).

Changes between NFV#19 and NFV#20:

3 deliverables were **published**

- <u>GR NFV-REL 007 v1.1.2 "MANO resilience report"</u> Published 2017.10.02
- GR NFV-SEC 007 v1.1.1 "NFV Attestation report" Published 2017.10.19
- <u>GR NFV-TST 007 v1.1.1 "MANO lop Testing Guidelines"</u> Published 2017.11.28



1 New Work Item was **approved** by Remote Consensus

• New NWI proposal approved **DGR/NFV-REL010** "Resiliency for Network Slicing report" Rapporteur = Chidung Lac

Remote consensus status/result:



Changes @ NFV#19

6 New WIs proposals were approved:

- GR EVE016 "Report on Connection-based Virtual Services"
 - GR SEC018 "Remote Attestation Architecture report"
 - <u>GS SEC019</u> "System Architecture Spec for NFV Security enhancement"
 - GS SEC020 "Id Mgmt & Sec spec"
 - <u>GS SEC021</u> "VNF Package Security Spec"
 - <u>GS SOL006</u> "YANG based NFV Descriptors spec"

1 Final Draft was approved at the closing plenary

Approved for <u>GR NFV-REL 007 "MANO resilience report"</u>

2 final drafts were sent to approval by **Remote Consensus**.

- <u>NFV(17)000268-</u>"Draft DGR/NFV-SEC007 v0.0.13 "NFV Attestation report"
- NFV(17)000287-"Draft DGR/NFV-EVE008 v0.0.13 "Charging and Billing report"

2 Wort Items were Stopped

- IFA020 work item was Stopped
- EVE009 work item was **Stopped**

Change of rapporteur:

Remote

Consensus

- NFV003 "Terminology": Was Andy BENNETT (Samsung), changed to Julien Maisonneuve (Nokia France).
- IFA025 "RT/ultra-low latency aspects report": Was Michael KLOTZ (DT) changed to Zarrar YOUSAF (Neclab)

IFA028 "Multi admin domain support: Was Astrid MANN (Huawei) changed to Haitao XIA (Huawei).

Changes between NFV#18 and NFV#19

21 NFV deliverables were **published** of which 19 were approved by remote Consensus.

• <u>GS NFV-EVE001 v3.1.1 "Hypervisor Rqmts spec"</u> This GS had been approved in April but had dependencies on IFA018 & IFA019 and was published with them.

12 IFA Release 2 2017H1Maintenance

- GS NFV-IFA002 v2.3.1 "Acceleration VNF Intface Spec"
- <u>GS NFV-IFA003 v2.3.1 "Acceleration Switching Aspects Spec"</u>
- <u>GS NFV-IFA004 v2.3.1 "Acceleration Mgmt aspects Spec"</u>



- <u>GS NFV-IFA005 v2.3.1 "Or-Vi ref point Spec"</u>
- <u>GS NFV-IFA006 v2.3.1 "Vi-Vnfm ref point Spec"</u>
- <u>GS NFV-IFA007 v2.3.1 "Or-Vnfm ref point Spec"</u>
- GS NFV-IFA008 v2.3.1 "Ve-Vnfm ref point Spec"
- <u>GS NFV-IFA010 v2.3.1 "MANO Functional Rgmts Spec"</u>
- <u>GS NFV-IFA011 v2.3.1 "VNF Packaging Spec"</u>
- GS NFV-IFA013 v2.3.1 "Os-Ma-Nfvo ref point Spec info model"
- GS NFV-IFA014 v2.3.1 "Network Service Templates Specification"
- <u>GR NFV-IFA015 v2.3.1 "Info Model Report"</u>

IFA Release 3

- <u>GS NFV-IFA018 v3.1.1 "Acceleration Intface Spec"</u>
- GS NFV-IFA019 v3.1.1 "Resource Mgmt Acceleration @ Nf-Vi Spec"
- GR NFV-IFA023 v3.1.1 "Policy Mgmt in MANO report"

SOL deliverables published together with R2 2017H1 Maintenance

- <u>GS NFV-SOL002 v2.3.1 "Ve-Vnfm RESTful protocols spec"</u>
- GS NFV-SOL003 v2.3.1 "Or-Vnfm RESTful protocols spec"
- GS NFV-SOL004 v2.3.1 "VNF Package Stage 3 spec"
- GR NFV-TST004 v1.1.2 "NFVI_PATH_TEST report"
- GS NFV-TST008 v2.1.1 "NFVI Compute & Nwk Metrics Spec"

19 New WIs were approved

by Remote Consensus:



18 Maintenance WIs for Release 2 2017H2 maintenance (approved be RC in July). See WI list and details in contribution <u>NFV(17)000193r2-</u>"18 WIs for 2017H2 Release 2 Maintenance"

 1 Miscellaneous WI in support of an STF proposal <u>DMI/NFV-EVE015 – Measuring Adoption</u> (approved be RC in August)

Changes @ NFV#18

- 3 New WI proposals were immediately approved during NFV#18:
 DGS/NFV-REL009 "NFV Reliability Requirements"- rapporteur = Percy TARAPORE
 DGR/NFV-SEC017 "Sec Pol Guidelines Report"- rapporteur = Fei LI
 DGS/NFV-TST009 "NFVI_Benchmarks"- rapporteur = AI MORTON
- 2 Final Drafts were approved at the closing plenary
 Approved for
 Publication
 NFV-TST 004 v1.1.1 "NFVI PATH TEST report"
 NFV-TST 008 v2.1.1 "NFVI Compute & Nwk Metrics Spec"

Other changes:

• IFA022: Change of Rapporteur. Was Andy Veitch (NetCracker), changed to Zarrar Yousaf (NEC).

Changes between NFV#17 and NFV#18

2 Final draft were approved by **Remote Consensus**

RC Solution DGS/NFV-EVE001 "Hypervisor Rqmts spec"

Consensus - NFV 001 v1.2.1 "NFV Use Cases revision"

- → WAITING FOR IFA018&019 (Normative Refs)
- → PUBLISHED

6 Final drafts approved at the NFV#17 closing plenary have been **published**:



- EVE 007 v3.1.2 "NFVI Hw rqmts spec"
- IFA 016 v2.1.1 "Papyrus Guidelines"
- IFA 024 v2.1.1 "NFV IM External touchpoints"
- IFA 017 v2.1.1 "UML Modeling Guidelines"
- SEC 013 v3.1.1 "Sec mgmt & Monitoring Spec"
- <u>TST 005 v3.1.1</u> "VNF_snapshot_report"

Changes @ NFV#17

- 3 New WIs approved
 - DGR/NFV-EVE012 "Network Slicing report"
 - DGS/NFV-EVE011 "Cloud Native VNF Classification Spec"
 - DGR/NFV-SEC016 "Location, locstamp and timestamp"

• 6 Final Drafts approved

- NFV-EVE 007 v3.1.2 "NFVI Hw rqmts spec"
- NFV-IFA 016 v2.1.1 "Papyrus Guidelines"
- NFV-IFA 024 v2.1.1 "NFV IM External touchpoints"
- <u>NFV-IFA 017 v2.1.1</u> "UML Modeling Guidelines"
- <u>NFV-SEC 013 v3.1.1</u> "Sec mgmt & Monitoring Spec"
- <u>NFV-TST 005 v3.1.1</u> "VNF_snapshot_report"

Changes between NFV#16 and NFV#17

- **3** Final Drafts approved at and after NFV#16 are now **published**:
 - SEC 012 v3.1.1 "Arch for sensitive components Spec"
 - SEC 009 v1.2.1 "UCs for multi-layer host admin"
 - IFA 015 v2.1.2 "Info Model Report"

• 1 New WI approved

An ISG-wide conference call took place on the 30th of Jan:

<u>NFV(16)000361r9</u> "Report on the Enhancements of the NFV architecture towards "Cloud-native" and PaaS" – Marcus Brunner (Swisscom) was approved as:



DGR/NFV-IFA029 "Arch. enhancement for Cloud-native & PaaS – Report"

Changes @ NFV#16

- 12 New WIs approved
 - 11 Release 2 maintenance NWIs created
 - <u>RGS/NFV-IFA003ed221</u> "Acceleration Switching Aspects Spec"
 - <u>RGS/NFV-IFA004ed221</u> "Acceleration Mgmt aspects Spec"
 - <u>RGS/NFV-IFA005ed221</u> "Or-Vi ref point Spec"
 - RGS/NFV-IFA006ed221 "Vi-Vnfm ref point Spec"
 - RGS/NFV-IFA007ed221 "Or-Vnfm ref point Spec"
 - RGS/NFV-IFA008ed221 "Ve-Vnfm ref point Spec"
 - RGS/NFV-IFA010ed231 "MANO Functional Rgmts Spec"
 - RGS/NFV-IFA011ed221 "VNF Packaging Spec"
 - RGS/NFV-IFA013ed221 "Os-Ma-Nfvo ref_point Spec info model"
 - RGS/NFV-IFA014ed221 "Network Service Templates Specification"
 - <u>RGS/NFV-IFA015ed221 "Info Model Report"</u>

• 1 NWI proposal approved on "Management and Orchestration Report on architecture options to

port multiple administrative domains"

DGR/NFV-IFA028 "Multi admin domain support -report"





2 Final Drafts were approved for immediate publication:
 Approved for
 <u>PrV-IFA 015 v0.8.0 "Info Model Report"</u>
 <u>Publication</u>
 <u>NFV-SEC 012 v0.0.13 "Arch for sensitive components - Spec"</u>

1 Final Draft will go for Remote Consensus approval:
 Remote
 V-SEC 009ed1.2.1 v1.2.1 "UCs for multi-layer host admin"
 Consensus

- IFA016 and IFA017 moved from Release 3 to Release 2
- Title tuning: decision to include the release number in the title of all drafts and Work Items.
 - GSs (not GRs) included in Release 3 got "Release 3" added to the first line of their title. This includes: EVE001, EVE007, IFA012, IFA018, IFA019, IFA026, SEC012, SEC013, SEC014
 - GSs remaining non-published Release 2 WI got "Release 2"added to the first line of their title. This includes: SOL001, SOL003, SOL005, SOL002, SOL004, NFV-003ed211

Changes between NFV#15 and NFV#16 (as of 2016.11.25)

- **7** Drafts approved in September/October have been **published**:
 - 2016.10.18: **NFV-IFA 007 v2.1.1** "Or-Vnfm ref point Spec"
 - 2016.10.18: **NFV-IFA 008 v2.1.1** "Ve-Vnfm ref point Spec"
 - 2016.09.27: MFV-IFA 010 v2.2.1 "MANO Functional Rqmts Spec"
 - 2016.10.17: NFV-IFA 011 v2.1.1 "VNF Packaging Spec"
 - 2016.10.17: NFV-IFA 013 v2.1.1 "Os-Ma-Nfvo ref point Spec info model"
 - 2016.10.17: NFV-IFA 014 v2.1.1 "Network Service Templates Specification"
 - 2016.10.21: NFV-TST 002 v1.1.1 "lop Testing Methodology report"

4 New WIs approved in November:

- 4 New WIs were APPROVED during the 2016.11.23 conference call
- <u>NFV(16)000271r4</u> (Performance measurements)
 APPROVED as <u>GS IFA027</u>
- <u>NFV(16)000279r2</u> (VNF Package Stage 3)
- APPROVED as GS SOL004
- <u>NFV(16)000339r7</u> (Os-Ma-nfvo Stage 3)
- APPROVED as <u>GS SOL005</u>
- <u>NFV(16)000336r2</u> (NFVI compute/network metrics) APPROVED as <u>GS TST008</u>

Remote Consensuses in October:

SEC014 final draft was sent to Remote Consensus for approval (see RC report <u>here</u>) → consensus was not reached, and SEC014 was not approved.

2 late NWI proposals @ NFV#15 were sent for approval by Remote Consensus:
 NFV(16)000307r1-"Security Specification for other MANO reference points"
 → APPROVED as <u>GS SEC015</u>

NFV(16)000308r2-"External industry activities focused on NFV info/data modelling and APIs"

- consensus was not reached, several comments by WG Officials requesting clarification
 → Proposal was Noted (not approved), revision requested.
- \rightarrow The author of the proposal (Michael Brenner, Gigaspaces) has withdrawn the proposal.
- Title tuning

Titles were aligned with the conventions commonly applied to NFV publications. Updates WIs are : REL006, REL007, SEC012, SEC013, SOL002, SOL003, TST004) \rightarrow See TSC contribution <u>NFVTSC(16)000052</u> ...



Changes @ NFV#15

- 9 New WI proposals were presented:
- **4 New WI** proposals were immediately **approved**:

RGR/NFV-SEC009ed121 "SEC009 Maintenance"



DGR/NFV-EVE10 "Report on License Management for NFV" DGR/NFV-IFA025 "Real-time/ultra-low latency aspects report"

DGS/NFV-IFA026 "Architecture enhancement for Sec Mgmt Spec"



2 proposals were **late** submission → sent to approval by Remote Consensus (1 week). <u>NFV(16)000308r2-</u>"External industry activities focused on NFV info/data modelling and APIs"-GigaSpaces <u>NFV(16)000307r1-</u>"Security Specification for other MANO reference points"-NEC



- 3 proposals required more discussion and were **deferred**: <u>NFV(16)000271r3-</u>"NWI on Performance Measurements Definitions"-Intel <u>NFV(16)000279-</u>"Stage 3 VNF Package"-Huawei <u>NFV(16)000267-</u>"NFV Descriptors based on YANG"-Cisco
- 2 Final Drafts were approved for publication: <u>IFA 010 "MANO Functional Rqmts Spec"</u> <u>TST 002 "lop Testing Methodology report"</u>
- Other changes:

SEC014 title has been changed upon IFA request: "Security Specification for MANO Components and InterfacesReference points" TST007 Scope changed NFV001 \rightarrow GS changed to GR IFA015 \rightarrow GS changed to GR (title, scope, and deliverable type updated)

Changes between NFV#14 and NFV#15 (as of 2016.09.14)

- 7 Final Drafts went to approval by Remote Consensus (RC).
 4 were approved for publication:
 - IFA009 "MANO architectural options report" published 2016.07.05
 - IFA007 "Or-Vnfm ref point Spec" to be published soon
- Approved for Publication
- IFA008 "Ve-Vnfm ref point Spec" to be published soon
- SEC003 "Security and Trust Guidance" published 2016.08.26

3 did not reach approval at the first RC and went for a second RC after modification: many valid editorial and technical comments were raised during the first RC. WG IFA decided to implement them all, and it was hence decided to implement the changes in new versions of the draft and to submit them for approval in a second Remote Consensus. The Second RC closed on 22nd of Sept:

- IFA011 "VNF Packaging Spec"
- IFA013 "Os-Ma-Nfvo ref point Spec info model"
- IFA014 "Network Service Templates Specification"



o **<u>REL003</u>** published 2016.06.28

An editorial error was found: in <u>v1.1.1</u> figure 70 had been duplicated erroneously at publication time (page 76 and 77). This was corrected in REL003 <u>v1.1.2</u>.

• **17** Informative GSs created by ISG NFV at or after NFV#12 were turned into Group Reports (GR). <u>Note</u>: GR us the new deliverable type created by ETSI Board earlier this year to distinguish between informative and normative work.





Changes @ NFV#14

Introduction (by ETSI Board) of the new GR (Group <u>Report</u>) deliverable type: in the future Work Items that only contain informative content will be published as GRs, not as GSs.

 \rightarrow As per TSC decision, current reports that were created **at** or **after** NFV#12 will be turned into GRs.

- **3** New WI proposals were approved:
 - DGR/NFV-EVE009 "E2E Process Descriptions report"
 - DGR/NFV-IFA023 "Policy Mgmt in MANO report"
 - <u>RGR/NFV-SEC003ed112 "Security and Trust Guidance" (maintenance revision for immediate Re-Pub)</u>
- Other changes
 - EVE02 "MEF Use Cases report" was STOPPED, as per NFV(16)000158 proposal
 - RGS/NFV-001ed211 WI reference changed to RGS/NFV-001ed121
 And target publication version changed from v2.1.1 to v1.2.1
 - On <u>DGS/NFV-TST004</u>: title changed:

from "Report on Test Plan for Path implementation through NFVI" to "Guidelines for Test plan for path implementation through NFVI"

- Rapporteur change
 - On DMI/NFV-TST003: was Frank ZDARSKY (RedHat) changed to Gergely CSATARI (Nokia)

Changes between NFV#13 and NFV#14

- **3** Final Drafts approved at NFV#13 are now **published**:
 - 2016.03.11: <u>EVE 004v1.1.1</u> "Virtualisation technologies Report"
 - 2016.04.15: **REL 004**v1.1.1 "Active monitoring & failure detection report"
 - 2016.04.4: **TST 001**v1.1.1 "Pre-deployment Validation report"
- **9** Final Drafts were approved by Remote Consensus, they are now **published**:
 - NFV-IFA 002v2.1.1 "Acceleration VNF Intface Spec" 2016.03.30: NFV-IFA 003v2.1.1 "Acceleration - Switching Aspects Spec" 2016.04.19: NFV-IFA 004v2.1.1 "Acceleration - Mgmt aspects Spec" 2016.04.21: NFV-IFA 005v2.1.1 "Or-Vi ref point Spec" 2016.04.21: 2016.04.20: NFV-IFA 006v2.1.1 "Vi-Vnfm ref point Spec" NFV-IFA 010v2.1.1 "MANO Functional Rqmts Spec" 2016.04.6: NFV-REL 003v1.1.1 "E2E reliability models report" 2016.04.27: NFV-SEC 006v1.1.1 "Sec & Regulation report" 2016.04.18: NFV-SEC 010v1.1.1 "Retained Data Report" 2016.04.18:
- **6** New WI proposals were **Approved** during an ISG-Wide conference call on the ^{7th} of April.
 - **EVE008** "Charging and Billing report"-Rajshree CHAR
 - IFA020 "Report on NFVO split options"-Astrid MANN
 - IFA021 "MGMT_FUNCTIONS_REPORT"-Joan TRIAY
 - IFA022 "Multi-Site Services"-Andrew VEITCH
 - <u>SOL002</u> "Ve-Vnfm protocols"-Bruno CHATRAS
 - <u>SOL003</u> "Or-Vnfm protocols"-Uwe RAUSCHENBACH
- Rapporteur changed for IFA002ed221
 Was Francois OZOG (6Wind), changed to Abdel Hafiz RABI (Intel).

Changes @ NFV#13

Update of target dates is not indicated in this log.

• 4 Scope Adjustments: IFA004, IFA010, IFA005 and IFA006 See details in contribution <u>NFV(16)000083</u>



Rapporteur changed for EVE001
 Was Valerie YOUNG (intel), changed to Bruno CHATRAS (Orange).

- Scope updated for IFA004, IFA010, IFA005 and IFA006 See details in contribution <u>NFV(16)000083</u>
 - 3 Final Drafts approved for publication
 - EVE004 v0.6.0 "Virtualisation technologies Report" in <u>NFV(16)000032</u>
 - REL004 v0.2.0 "Active Monitoring and Failure Detection" in <u>NFV(16)000036</u>
 - **TST001** "Pre-deployment validation report" in <u>NFV(16)000037</u>
 - 9 Final Drafts sent for approval by Remote Consensus

SEC

- SEC006 v0.0.14 "Sec & Regulation report" in NFV(16)000105-
- SEC010 v0.0.7 "Retained Data Report" in NFV(16)000119

REL

• RELOO3 v0.6.0 "E2E reliability models report" in NFV(16)000117

IFA

- IFA002 v0.4.1 (GS NFV-IFA 002) "Acceleration VNF Intface Spec" in NFV(16)000123
- IFA003 v0.3.0 "Acceleration Switching Aspects Spec" in <u>NFV(16)000104</u>
- IFA004 v0.5.0 "Acceleration Mgmt aspects Spec" in <u>NFV(16)000121</u>
- IFA005 v0.11.1 "Or-Vi ref point Spec" in <u>NFV(16)000131</u>
- IFA006 v0.9.0 "Vi-Vnfm ref point Spec" in <u>NFV(16)000130</u>
- IFA010 v0.8.1 "MANO Functional Rqmts Spec" in <u>NFV(16)000132</u>
- 17 New WIs approved
 - 001ed311 "NFV Use Cases" (revision)
 - <u>00TOSCA desc</u> <u>"TOSCA-based NFV descriptors spec"</u>
 - EVE007 "NFVI Hw rqmts spec"
 - IFA002ed311 "Acceleration VNF Intface Spec" (revision)
 - IFA010ed221 "MANO Functional Rqmts Spec" (revision)
 - IFA016 "Papyrus Guidelines"
 - IFA017 <u>"UML Modeling Guidelines"</u>
 - IFA018 "Acceleration Intface Spec"
 - IFA019
 "Resource Mgmt Acceleration @ Nf-Vi Spec"
 - <u>**REL006**</u> <u>"SW Upgrade spec"</u>
 - <u>REL007</u> <u>"MANO resilience report"</u>
 - <u>**REL008**</u> <u>"Error Handling report"</u>
 - SEC014 "MANO Security Spec"
 - TST004 "NFVI_PATH_TEST report"
 - TST005 "VNF snapshot report"
 - TST006 "CICD & Devops report"
 - TST007 "VIM/VNFM lop Testing Guidelines"

Changes between NFV#12 and NFV#13

1 draft approved during NFV#12 + 4 Drafts approved after NFV#12 by Remote Consensus were PUBLISHED:

2016.01.08:EVE 003 "NFVI Node Arch report" -published.2016.01.04:REL 005 "Quality Accountability Framework" - published2015.12.18:EVE 005 "SDN usage in NFV Report "
SEC 009 "UCs for multi-layer host admin" - published2015.12.04:IFA001 "Acceleration 1 - UCs report" published

Changes @ NFV#12

• 2 New Work Items created



- SEC12 "Architecture for sensitive components Spec"
- <u>SEC13 "Security Management & Monitoring Spec"</u>
- **1 Final Drafts approved** for publication
 - EVE005 "SDN usage in NFV Report" V0.2.0 in NFV(15)000225 was approved
- 4 Final Drafts ready for remote approval
 - SEC009 "UCs for multi-layer host admin" v0.0.18 in NFV(15)000224r3.
 - IFA001 "Acceleration 1 UCs report"
 - V0.7.1 in <u>NFV(15)000222r2</u>.
 - <u>REL005</u> "Quality Accountability Framework" V0.1.6 in <u>NFV(15)000231</u>.
 - EVE3 "NFVI Node Arch report" V0.1.3 in NFV(15)000284.
- Other changes
 - SEC008 was STOPPED
 - IFA 003 rapporteur changed: was Dan DALY, changed to Brian SKERRY, Intel IFA002 scope changed, see <u>NFV(15)000289</u>
 - IFA015 Scope changed, see <u>NFV(15)000234</u>

Many target dates were updated during NFV#12

Changes between NFV#11 and NFV#12:

• 4 new WIs were created at NFV#11:

NFV-0003ed211 Terminology (revision) IFA015 NFV Information Model Report SEC010 Retained Data Report SEC011 LI Architecture Report

- SEC002, was approved at NFV#11 and published on August the 17th.
- REL002 and SEC004 were approved by Remote Consensus in August and published early Sept.
- IFA001, IFA002, IFA003, IFA004 (acceleration): titles modified
 "Part x" removed from all 4 titles. These 4 WIs are no longer presented as a group.
- IFA008: Rapporteur changed Was Deepanshu GAUTAM (Huawei) changed to Shitao LI (Huawei)