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**LTE;  
Telecommunication management;  
Life Cycle Management (LCM) for mobile networks that include  
virtualized network functions;  
Stage 3  
(3GPP TS 28.528 version 15.1.0 Release 15)**



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# Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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# Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> Generation Partnership Project Technical Specification Group Services and System Aspects, Telecommunication Management; as identified below:

TS 28.525: Telecommunication management; Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Requirements

TS 28.526: Telecommunication management; Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Procedures

TS 28.527: Telecommunication management; Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Stage 2

**TS 28.528: Telecommunication management; Life Cycle Management (LCM) for mobile networks that include virtualized network functions; Stage 3**

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# 1 Scope

The present document is the Life Cycle Management (LCM) stage 3 specification for mobile networks that include virtualized network functions.

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## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
  - [2] 3GPP TS 28.500: "Telecommunication management; Concept, architecture and requirements for mobile networks that include virtualized network functions".
  - [3] ETSI GS NFV-SOL 002 (V2.3.1): "Network Function Virtualisation (NFV) Release 2; Protocols and Data Models; RESTful protocols specification for the Ve-Vnfm Reference Point".
  - [4] ETSI GS NFV-SOL 005 (V2.5.1): "Network Functions Virtualisation (NFV); Protocols and Data Models; RESTful protocols specification for the Os-Ma-Nfvo Reference Point".
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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1], 3GPP TS 28.500 [2] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1] or in 3GPP TS 28.500 [2].

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1], 3GPP TS 28.500 [2] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1] or in 3GPP TS 28.500 [2].

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## 4 Data model and interface definitions

### 4.1 Os-Ma-nfvo

For Os-Ma-nfvo NSD management, the following shall be used:

- the RESTful API URI structure and supported content formats specified in clause 4.2 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common procedures specified in clause 4.3 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common data types specified in clause 4.4 of ETSI GS NFV-SOL 005 [4], and

- the NSD management RESTful API resource structure, methods, resources and data model specified in clause 5 of ETSI GS NFV-SOL 005 [4].

For Os-Ma-nfvo NS lifecycle management, the following shall be used:

- the RESTful API URI structure and supported content formats specified in clause 4.2 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common procedures specified in clause 4.3 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common data types specified in clause 4.4 of ETSI GS NFV-SOL 005 [4], and
- the NS LCM RESTful API resource structure, methods, resources and data model specified in clause 6 of ETSI GS NFV-SOL 005 [4].

For Os-Ma-nfvo NS lifecycle change notification, the following shall be used:

- the RESTful API URI structure and supported content formats specified in clause 4.2 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common procedures specified in clause 4.3 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common data types specified in clause 4.4 of ETSI GS NFV-SOL 005 [4], and
- the NS lifecycle change notification RESTful API resource structure, methods, resources and data model specified in clause 7 of ETSI GS NFV-SOL 005 [4].

For Os-Ma-nfvo VNF package management, the following shall be used:

- the RESTful API URI structure and supported content formats specified in clause 4.2 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common procedures specified in clause 4.3 of ETSI GS NFV-SOL 005 [4], and
- the RESTful API common data types specified in clause 4.4 of ETSI GS NFV-SOL 005 [4], and
- the VNF package management RESTful API resource structure, methods, resources and data model specified in clause 10 of ETSI GS NFV-SOL 005 [4].

## 4.2 Ve-Vnfm-em

For Ve-Vnfm-em VNF lifecycle management, the following shall be used:

- the RESTful API URI structure and supported content formats specified in clause 4.2 of ETSI GS NFV-SOL 002 [3], and
- the RESTful API common procedures specified in clause 4.3 of ETSI GS NFV-SOL 002 [3], and
- the RESTful API common data types specified in clause 4.4 of ETSI GS NFV-SOL 002 [3], and
- the VNF LCM RESTful API resource structure, methods, resources, data model and handling of errors specified in clause 5 of ETSI GS NFV-SOL 002 [3].

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## Annex A (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2018-01	SA#78	SP-170964	0001	1	F	Update the references to ETSI NFV SOL specifications	14.1.0
2018-06	SA#80	SP-180417	0002	1	B	Scope extension to cover RAN	15.0.0
2018-12	SA#82	SP-181041	0003	-	F	Fix outdated reference	15.1.0



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# History

<b>Document history</b>		
V15.0.0	June 2018	Publication
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