ETSI TS 129 525 V15.4.0 (2020-01)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/53907f78-7876-4942-9633-5ab76f2b6035/etsi-ts-129-525-v15.4.0-2020-01

5G;
5G System;
UE Policy Control Service;
Stage 3
(3GPP TS 29.525 version 15.4.0 Release 15)

Reference
RTS/TSGC-0329525vf40

Keywords
5G

ETSI

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

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

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

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

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.
The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2020.
All rights reserved.

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

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

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

Trademarks

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

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/5990f778-7876-4942-b63-5ab76f2b6036/etsi-ts-129-525-v15.4.0-2020-01

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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

Contents

Intellectual Property Rights 2
Legal Notice 2
Modal verbs terminology 2
Foreword 5
1 Scope 6
2 References 6
3 Definitions and abbreviations 7
3.1 Definitions 7
3.2 Abbreviations 7
4 UE Policy Control Service 8
4.1 Service Description 8
4.1.1 Overview 8
4.1.2 Service Architecture 8
4.1.3 Network Functions 9
4.1.3.1 Policy Control Function (PCF) 9
4.1.3.2 NF Service Consumers 10
4.2 Service Operations 11
4.2.1 Introduction 11
4.2.2 Npcf_UEPolicyControl_Create Service Operation 11
4.2.2.1 General 11
4.2.2.2 UE Policy 14
4.2.2.2.1 General 14
4.2.2.2.2 UE Access Network discovery and selection policies 16
4.2.2.2.3 UE Route Selection Policy(URSP) 16
4.2.3 Npcf_UEPolicyControl_Update Service Operation 17
4.2.3.1 General 17
4.2.3.2 Policy Control Request Triggers 19
4.2.3.3 Encoding of updated policy 19
4.2.4 Npcf_UEPolicyControl_UpdateNotify Service Operation 20
4.2.4.1 General 20
4.2.4.2 Policy update notification 20
4.2.4.3 Request for termination of the policy association 21
4.2.5 Npcf_UEPolicyControl_Delete Service Operation 22
5 Npcf_UEPolicyControl API 23
5.1 Introduction 23
5.2 Usage of HTTP 23
5.2.1 General 23
5.2.2 HTTP standard headers 23
5.2.2.1 General 23
5.2.2.2 Content type 23
5.2.3 HTTP custom headers 24
5.3 Resources 24
5.3.1 Resource Structure 24
5.3.2 Resource:UE Policy Associations 24
5.3.2.1 Description 24
5.3.2.2 Resource definition 24
5.3.2.3 Resource Standard Methods 25
5.3.2.3.1 POST 25
5.3.3 Resource: Individual UE Policy Association 25
5.3.3.1 Description 25
5.3.3.2 Resource definition 25
5.3.3.3 Resource Standard Methods 25
5.3.3.3.1 GET 25

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/5390f778-7876-4942-9635-5ab76f2b6036/etsi-ts-129-525-v15.4.0-2020-01

5.3.3.3.2 DELETE 26
5.3.3.4 Resource Custom Operations 27
5.3.3.4.1 Overview 27
5.3.3.4.2 Operation: Update 27
5.3.3.4.2.1 Description 27
5.3.3.4.2.2 Operation Definition 27
5.4 Custom Operations without associated resources 27
5.5 Notifications 27
5.5.1 General 27
5.5.2 Policy Update Notification 28
5.5.2.1 Description 28
5.5.2.2 Operation Definition 28
5.5.3 Request for termination of the UE policy association 28
5.5.3.1 Description 28
5.5.3.2 Operation Definition 28
5.6 Data Model 29
5.6.1 General 29
5.6.2 Structured data types 30
5.6.2.1 Introduction 30
5.6.2.2 Type PolicyAssociation 30
5.6.2.3 Type PolicyAssociationRequest 31
5.6.2.4 Type PolicyAssociationUpdateRequest 32
5.6.2.5 Type PolicyUpdate 33
5.6.2.6 Type TerminationNotification 33
5.6.2.7 UePolicyTransferFailureNotification 33
5.6.3 Simple data types and enumerations 33
5.6.3.1 Introduction 33
5.6.3.2 Simple data types 33
5.6.3.3 Enumeration: RequestTrigger 34
5.6.3.4 Enumeration: PolicyAssociationReleaseCause 34
5.7 Error handling 35
5.7.1 General 35
5.7.2 Protocol Errors 35
5.7.3 Application Errors 35
5.8 Feature negotiation 35
5.9 Security 35

Annex A (normative): OpenAPI specification 36

A.1 General 36

A.2 Npcf_UEPolicyControl API 36

Annex B (informative): Withdrawn API versions 43

Annex C (informative): Change history 44

History 45

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/53960778-7876-4942-9533-5ab762b6036/etsi-ts-129-525-v15.4.0-2020-01

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

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

z the third digit is incremented when editorial only changes have been incorporated in the document.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/53907f78-7876-4942-9633-5ab76f2b6036/etsi-ts-129-525-v15.4.0-2020-01

1 Scope

The present specification provides the stage 3 definition of the UE Policy Control Service (Npcf_UEPolicyControl) of the 5G System.

The stage 2 definition and procedures of UE Policy Control Service are contained in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4]. The 5G System Architecture is defined in 3GPP TS 23.501 [2].

Stage 3 call flows are provided in 3GPP TS 29.513 [7].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition of the 5G System are specified in 3GPP TS 29.500 [5] and 3GPP TS 29.501 [6].

The UE Policy Control Service is provided by the Policy Control Function (PCF). This service provides UE policies.

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 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[5] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[6] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[7] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[8] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[9] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[10] OpenAPI, "OpenAPI 3.0.0 Specification", https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md.

[11] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[12] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[13] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[14] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[15] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[16] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

iTeh STANDARD PREVIEW (standards.iteh.ai) Full standard: https://standards.iteh.ai/catalog/standards/sist/3390f778-7876-4942-9633-5b76f2e6036/etsi-ts-129-525-v15.4.0-2020-01

[17] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Data, Application Data and Structured Data for Exposure; Stage 3".

[18] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[19] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[20] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[21] IETF RFC 7807: "Problem Details for HTTP APIs".

[22] 3GPP TR 21.900: "Technical Specification Group working methods".

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] 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].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] 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].

AMF	Access and Mobility Management Function
ANDSP	Access Network Discovery and Selection Policy
API	Application Programming Interface
DNN	Data Network Name
GPSI	Generic Public Subscription Identifier
GUAMI	Globally Unique AMF Identifier
HTTP	Hypertext Transfer Protocol
H-PCF	Home Policy Control Function
JSON	JavaScript Object Notation
N3AN	Non-3GPP access network
NF	Network Function
NRF	Network Repository Function
OS	Operating System
OSId	Operating System Identity
PCF	Policy Control Function
PEI	Permanent Equipment Identifier
PRA	Presence Reporting Area
PTI	Procedure Transaction Identity.
SUPI	Subscription Permanent Identifier
UDR	Unified Data Repository
UPSC	UE policy section code
UPSI	UE policy section identifier
URSP	UE Route Selection Policy
V-PCF	Visited Policy Control Function

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/53907f78-7876-4a1a-9833-1b6c62b6036/etsi-ts-129-525-v15.4.0-2020-01

4 UE Policy Control Service

4.1 Service Description

4.1.1 Overview

The UE Policy Control Service, as defined in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4], is provided by the Policy Control Function (PCF).

This service is used as part of the provisioning of UE policies determined by the PCF to the UE via the AMF and offers the following functionalities:

- creation of the UE Policy Association requested by the NF service consumer (e.g. AMF);
- provisioning of the policy control request triggers to the NF service consumer (e.g. AMF);
- provisioning of the UE policy to the V-PCF by the H-PCF in the roaming case;
- reporting of the met policy control request trigger; and
- deletion of the the UE Policy Association requested by the NF service consumer (e.g. AMF).

4.1.2 Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Policy and Charging related 5G architecture is also described in 3GPP TS 29.513 [7].

The UE Policy Control Service (Npcf_UEPolicyControl) is part of the Npcf service-based interface exhibited by the Policy Control Function (PCF).

The known consumers of the Npcf_UEPolicyControl service are the Access and Mobility Management Function (AMF) and the Visited Policy Control Function (V-PCF).

The AMF accesses the UE Policy Control Service at the PCF via the N15 Reference point. In the roaming scenario, the N15 reference point is located between the V-PCF in the visited network and the AMF. The V-PCF accesses the UE Policy Control Service at the Home Policy Control Function (H-PCF) via the N24 Reference point.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/5390f778-7876-4942-9653-5ab7f2b6036/etsi-ts-129-525-v15.4.0-2020-01

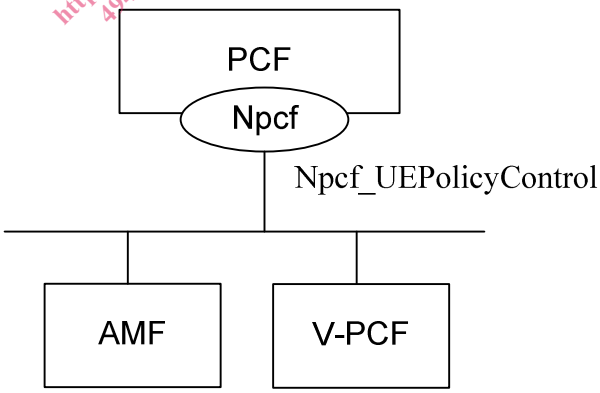


Figure 4.1.2-1: Reference Architecture for the Npcf_UEPolicyControl Service; SBI representation

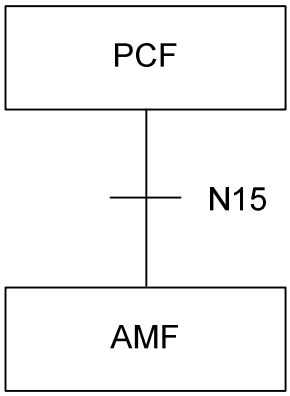
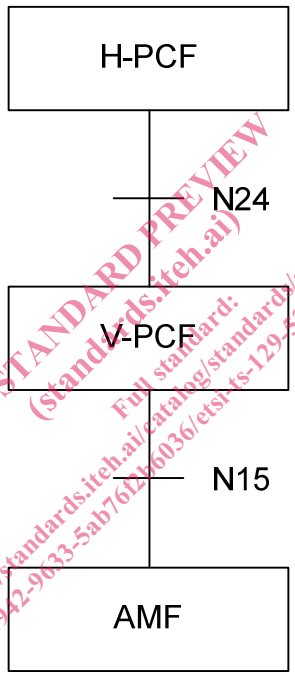


Figure 4.1.2-2: Non-roaming Reference Architecture for the Npcf_UEPolicyControlService; reference point representation



iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/53907f78-7876-4942-9633-5ab76f2b6036/etsi-ts-129-525-v15.4.0-2020-01

Figure 4.1.3-2: Roaming reference Architecture for the Npcf_UEPolicyControlService; reference point representation

4.1.3 Network Functions

4.1.3.1 Policy Control Function (PCF)

For non-roaming scenarios, the Policy Control Function (PCF):

- Supports unified policy framework to govern network behaviour; and
- Provides UE policy, including Access Network Discovery and Selection Policy (ANDSP) and UE Route Selection Policy (URSP) via the AMF transparently to the UE; and
- Provides policy control request triggers to the AMF.

NOTE 1: The PCF invokes the Namf_Communication service specified in 3GPP TS 29.518 [14] to provide the UE Policy.

For roaming scenarios, the Visited Policy Control Function (V-PCF):

- Provides policy control request triggers to the AMF;
- Provides the ANDSP of the VPLMN via the AMF transparently to the UE; and
- Forwards the ANDSP and URSP received form the H-PCF via the AMF to the UE.

NOTE 2: The V-PCF invokes the Namf_Communication service specified in 3GPP TS 29.518 [14] to provide the UE Policy.

For roaming scenarios, the Home Policy Control Function (H-PCF):

- Provides policy control request triggers to the V-PCF; and
- Provides the ANDSP and URSP of the HPLMN to the V-PCF for forwarding to the UE via the the AMF.

4.1.3.2 NF Service Consumers

The Access and Mobility Management function (AMF) performs:

- Registration management;
- Connection management;
- Reachability management;
- Mobility Management;
- Forwardingof UE Policy towards the served UE;
- Reporting of the UE state to the (V-)PCF; and
- Forwarding of the UE policy enforcement result received from the UE to the (V-)PCF.

NOTE: The AMF invokes the Namf_Communication service specified in 3GPP TS 29.518 [14] to report the UE policy enforcement result.

The Visited Policy Control Function (V-PCF) provides the functions described in subclause 4.1.3.1 towards the visited network as NF service prodcer and acts as NF Service consumer toward the H-PCF, performing the following functions:

- Receiving policy control request triggers, ANDSP and URSP form the H-PCF
- Reporting of the UE state and UE policy enforcement result to the H-PCF.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/5390f778-7876-4042-9633-5ab76f2b6036/etsi-ts-129-525-v15.4.0-2020-01

4.2 Service Operations

4.2.1 Introduction

Table 4.2.1-1: Operations of the Npcf_UEPolicyControl Service

Service operation name	Description	Initiated by
Npcf_UEPolicyControl_Create	Creates a UE Policy Association.	NF consumer (AMF, V-PCF in roaming case)
Npcf_UEPolicyControl_Update	Updates of an UE Policy Association and provides corresponding policies to the NF consumer when the policy control request trigger is met or the AMF is relocated due to the UE mobility and the old PCF is selected.	NF consumer (AMF, V-PCF in roaming case)
Npcf_UEPolicyControl_UpdateNotify	Provides the updated policy control request triggers to the AMF by the (V-)PCF in the non-roaming or roaming case; Provides updated UE policy and policy control request trigger to the V-PCF by the H-PCF; or initiates the UE Policy association termination towards to the NF consumer by the NF producer.	PCF (H-PCF and V-PCF in roaming case)
Npcf_UEPolicyControl_Delete	Provides means for the NF consumer to delete the UE Policy Association.	NF consumer (AMF, V-PCF in roaming case)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/5390f778-7876-4962-9635-5ab7f2b6036/etsi-ts-129-525-v15.4.0-2020-01

4.2.2 Npcf_UEPolicyControl_Create Service Operation

4.2.2.1 General

The procedure in the present subclause is applicable when the NF service consumer creates a UE policy association in the following cases:

- UE initial registers to the network as defined in subclause 5.5.1.2.2 of 3GPP TS 24.501 [15];
- UE performs the mobility registration if the UE operating in the single-registration mode performs inter-system change from S1 mode to N1 mode as defined in subclause 5.5.1.3.2 of 3GPP TS 24.501 [15] and there is no existing UE Policy Association between AMF and PCF for this UE;
- the AMF is relocated (between the different AMF sets) and the new AMF selects a new PCF. The procedure for the case where the AMF is relocated and the new AMF selects the old PCF is defined in subclause 4.2.3.1.

The creation of an UE policy association only applies for normally registered UEs, i.e., it does not apply for emergency-registered UEs.

Figure 4.2.2.1-1 illustrates the creation of a policy association.