ETSI TS 129 512 V17.11.0 (2023-07)

5G;
5G System;
Session Management Policy Control Service;
Stage 3
(3GPP TS 29.512 version 17.11.0 Release 17)

Reference
RTS/TSGC-0329512vhb0

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

Intellectual Property Rights

Essential patents

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

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

Trademarks

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

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** 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.

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 https://webapp.etsi.org/key/queryform.asp.

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

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.

1 Scope

The present document provides the stage 3 specification of the Session Management Policy Control Service of 5G system. The stage 2 definition and related procedures of the Session Management Policy Control Service are contained in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [6]. 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 [4] and 3GPP TS 29.501 [5].

The Policy Control Function with session related policies provides the Session Management Policy Control Service to the NF server consumers (e.g. Session Management Function).

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

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

[6] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[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 Specification Version 3.0.0", https://spec.openapis.org/oas/v3.0.0.

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

[12] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[13] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane of EPC Nodes".

[14] Void.

[15] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".

[16] 3GPP TS 23.228: "IP multimedia subsystem; Stage 2".

[17] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[18] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point 5".

[19] 3GPP TS 32.291: "5G System; Charging service; Stage 3".

[20] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[21] 3GPP TS 23.380: "IMS Restoration Procedures".

[22] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[23] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".

[24] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[25] 3GPP TS 29.507: "5G System; Access and Mobility Policy Control Service; Stage 3".

[26] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[27] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[29] 3GPP TS 29.510: "Network Function Repository Services; Stage 3".

[30] 3GPP TS 32.290: "5G system; Services, operations and procedures of charging using Service Based Interface (SBI)".

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

[32] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[33] 3GPP TS 23.527: "5G System; Restoration Procedures".

[34] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[35] 3GPP TS 32.255: "Charging management; 5G data connectivity domain charging; stage 2".

[36] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[37] 3GPP TS 29.274: "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".

[38] 3GPP TR 21.900: "Technical Specification Group working methods".

[39] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[40] 3GPP TS 29.524: "Cause codes mapping between 5GC interfaces; Stage 3".

[41] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification".

[42] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[43] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting (ATSSS); Stage 3".

[44] 3GPP TS 24.519: "Time-Sensitive Networking (TSN) Application Function (AF) to Device-Side TSN Translator (DS-TT) and Network-Side TSN Translator (NW-TT) protocol aspects; Stage 3".

[45] IEEE Std 802.1Q-2018: "IEEE Standard for Local and metropolitan area networks--Bridges and Bridged Networks".

[46] 3GPP TS 29.551: "5G System; Packet Flow Description Management Service; Stage 3".

[47] BBF TR-456: "AGF Functional Requirements".

[48] CableLabs WR-TR-5WWC-ARCH: "5G Wireless Wireline Converged Core Architecture".

[49] 3GPP TS 24.539: "5G System (5GS); Network to TSN translator (TT) protocol aspects; Stage 3".

[50] 3GPP TS 29.564: "5G System; User Plane Function Services; Stage 3".

[51] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[52] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[53] 3GPP TS 29.565: "5G System; Time Sensitive Communication and Time Synchronization Function Services; Stage 3".

3 Definitions, symbols 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].

5G QoS Flow: The finest granularity for QoS forwarding treatment in the 5G System. All traffic mapped to the same 5G QoS Flow receive the same forwarding treatment (e.g. scheduling policy, queue management policy, rate shaping policy, RLC configuration, etc.). Providing different QoS forwarding treatment requires separate 5G QoS Flow.

5G QoS Identifier: A scalar that is used as a reference to a specific QoS forwarding behaviour (e.g. packet loss rate, packet delay budget) to be provided to a 5G QoS Flow. This may be implemented in the access network by the 5QI referencing node specific parameters that control the QoS forwarding treatment (e.g. scheduling weights, admission thresholds, queue management thresholds, link layer protocol configuration, etc.).

Access Traffic Steering: The procedure that selects an access network for a new data flow and transfers the traffic of this data flow over the selected access network. Access traffic steering is applicable between one 3GPP access and one non-3GPP access.

Access Traffic Switching: The procedure that moves all traffic of an ongoing data flow from one access network to another access network in a way that maintains the continuity of the data flow. Access traffic switching is applicable between one 3GPP access and one non-3GPP access.

Access Traffic Splitting: The procedure that splits the traffic of a data flow across multiple access networks. When traffic splitting is applied to a data flow, some traffic of the data flow is transferred via one access and some other traffic of the same data flow is transferred via another access. Access traffic splitting is applicable between one 3GPP access and one non-3GPP access.

Application detection filter: A logic used to detect packets generated by an application based on extended inspection of these packets, e.g., header and/or payload information, as well as dynamics of packet flows. The logic is entirely internal to a UPF, and is out of scope of this specification.

Application identifier: An identifier, referring to a specific application detection filter.

Application service provider: A business entity responsible for the application that is being / will be used by a UE, which may be either an AF operator or has an association with the AF operator.

Binding: The association between a service data flow and the QoS Flow transporting that service data flow.

Binding mechanism: The method for creating, modifying and deleting bindings.

Charging control: The process of associating packets, belonging to a service data flow, to a charging key and applying online charging or offline charging, as appropriate.

Charging key: information used by the CHF for rating purposes.

Detected application traffic: An aggregate set of packet flows that are generated by a given application and detected by an application detection filter.

Dynamic PCC Rule: a PCC rule, for which the definition is provided to the SMF by the PCF.

Gating control: The process of blocking or allowing packets, belonging to a service data flow / detected application's traffic, to pass through to the UPF.

MA PDU Session: A PDU Session that provides a PDU connectivity service, which can use one access network at a time, or simultaneously one 3GPP access network and one non-3GPP access network.

Monitoring key: information used by the SMF and PCF for usage monitoring control purposes as a reference to a given set of service data flows or application (s), that all share a common allowed usage on a per UE and DNN and S-NSSAI basis.

Operating System (OS): Collection of UE software that provides common services for applications.

Operating System Identifier (OSId): An identifier identifying the operating system.

PCC decision: A PCF decision for policy and charging control provided to the SMF (consisting of PCC rules and PDU Session related attributes), a PCF decision for access and mobility related control provided to the AMF, a PCF decision for UE access selection and PDU Session selection related policy provided to the UE or a PCF decision for background data transfer policy provided to the AF.

PCC rule: A set of information enabling the detection of a service data flow and providing parameters for policy control and/or charging control and/or other control or support information. The possible information is described in clause 6.3.1.

PDU Session: Association between the UE and a Data Network that provides a PDU connectivity service.

Policy control: The process whereby the PCF indicates to the SMF how to control the QoS Flow. Policy control includes QoS control and/or gating control.

Policy Control Request trigger report: a notification, possibly containing additional information, of an event which occurs that corresponds with a Policy Control Request trigger.

Policy Control Request trigger: defines a condition when the SMF shall interact again with the PCF.

Predefined PCC Rule: a PCC rule that has been provisioned directly into the SMF by the operator.

Redirection: Redirect the detected service traffic to an application server (e.g. redirect to a top-up / service provisioning page).

Service data flow: An aggregate set of packet flows carried through the UPF that matches a service data flow template.

Service data flow filter: A set of packet flow header parameter values/ranges used to identify one or more of the packet flows in the UPF. The possible service data flow filters are defined in clause 6.2.2.2.

Service data flow filter identifier: A scalar that is unique for a specific service data flow (SDF) filter within a PDU session.

Service data flow template: The set of service data flow filters in a PCC Rule or an application identifier in a PCC rule referring to an application detection filter in the SMF or in the UPF, required for defining a service data flow.

Service identifier: An identifier for a service. The service identifier provides the most detailed identification, specified for flow based charging, of a service data flow. A concrete instance of a service may be identified if additional AF information is available (further details to be found in clause 6.3.1).

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.501 [2], subclause 3.1 apply:

Onboarding Standalone Non-Public Network

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].