

ETSI TS 129 213 V15.6.0 (2019-10)



**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);**

LTE;

**Policy and charging control signalling flows
and Quality of Service (QoS) parameter mapping
(3GPP TS 29.213 version 15.6.0 Release 15)**



ReferenceRTS/TSGC-0329213vf60

Keywords

GSM,LTE,UMTS

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Foreword

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1 Scope

The present specification adds detailed flows of Policy and Charging Control (PCC) over the Diameter-based Rx, Gx, Gxx, Sd, Sy, S9, Nt, Diameter-based St and Np reference points and their relationship with the bearer level signalling flows over the Gn/Gp, S4, S5/S8, S2a and S2c interfaces.

The calls flows depicted in this Technical Specification represent usual cases, i.e. not all situations are covered. Detailed information provided in 3GPP TS 29.212 [9], 3GPP TS 29.214 [10], 3GPP TS 29.215 [22], 3GPP TS 29.217 [36], 3GPP TS 29.154 [56] and 3GPP TS 29.219 [28] shall be taken into consideration.

The present specification also describes the PCC reference architectures for non-roaming and roaming scenarios.

The present specification also describes the binding and the mapping of QoS parameters among SDP, UMTS QoS parameters, and QoS authorization parameters.

The present specification also describes the PCRF addressing using DRA.

The present specification also describes Diameter race condition handling for Gx based applications, i.e Gx, Gxx, Sd and S9.

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 and/or edition number or version number) or non-specific.
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- 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 23.203: "Policy Control and charging architecture".
- [3] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".
- [4] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".
- [5] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP; Stage 3".
- [6] 3GPP TS 26.234: "End-to-end transparent streaming service; Protocols and codecs".
- [7] Void.
- [8] Void
- [9] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".
- [10] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point".
- [11] IETF RFC 2327: "SDP: Session Description Protocol".
- [12] IETF RFC 3264: "An Offer/Answer model with the Session Description Protocol (SDP)".
- [13] IETF RFC 3556: "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".
- [14] Void.

- [15] IETF RFC 5245: "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal for Offer/Answer Protocols".
- [16] IETF RFC 4145: "TCP-Based Media Transport in the Session Description Protocol (SDP)".
- [17] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".
- [18] 3GPP2 C.S0046-0 v1.0: "3G Multimedia Streaming Services".
- [19] 3GPP2 C.S0055-A v1.0: "Packet Switched Video Telephony Services (PSVT/MCS)".
- [20] Void
- [21] 3GPP TS 23.402: "Architecture Enhancements for non-3GPP accesses".
- [22] 3GPP TS 29.215: "Policy and Charging Control over S9 reference point".
- [23] IETF RFC 3890: "A Transport Independent Bandwidth Modifier for the Session Description Protocol (SDP)".
- [24] 3GPP TS 24.292: "IP Multimedia (IM) Core Network (CN) subsystem Centralized Services (ICS); Stage 3".
- [27] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".
- [28] 3GPP TS 29.219: "Policy and Charging Control over Sy reference point".
- [29] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction"
- [30] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS) Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".
- [31] Void.
- [32] Broadband Forum WT-134: "Policy Control Framework" (work in progress).
- [33] IETF RFC 7683: "Diameter Overload Indication Conveyance".
- [34] 3GPP TS 23.468: "Group Services and System Aspects; Group Communication System Enablers for LTE (GCSE LTE)".
- [35] 3GPP TS 23.380: "IMS Restoration Procedures".
- [36] 3GPP TS 29.217: "Policy and Charging Control: Congestion Reporting over Np reference point".
- [37] 3GPP TS 23.003: "Numbering, addressing and identification".
- [38] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".
- [39] IETF RFC 5761: "Multiplexing RTP Data and Control Packets on a Single Port".
- [40] IETF RFC 7944: "Diameter Routing Message Priority".
- [51] 3GPP TS 23.335: "User Data Convergence (UDC); Technical realization and information flows; Stage 2".
- [52] 3GPP TS 29.335: "User Data Convergence (UDC); User Data Repository Access Protocol over the Ud interface; Stage 3".
- [53] 3GPP TS 29.201: "Representational State Transfer (REST) reference point between Application Function (AF) and Protocol Converter (PC)".
- [54] 3GPP TS 29.155: "Traffic Steering Control; Representational State Transfer (REST) over St reference point".

- [55] 3GPP TS 32.240: "Telecommunication management; Charging management; Charging architecture and principles".
- [56] 3GPP TS 29.154: "Service Capability Exposure Function over Nt reference point".
- [57] Void.
- [58] 3GPP TS 22.153: "Multimedia Priority Service".
- [59] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [60] IETF RFC 8583: "Diameter Load Information Conveyance".
- [61] IETF RFC 6733: "Diameter Base Protocol".
- [62] 3GPP TS 29.250: "Nn reference point between SCEF and PCRF for sponsored data connectivity".
- [63] 3GPP TS 29.251: "Gw and Gwn reference points for sponsored data connectivity".
- [64] 3GPP TS 23.280: "Common functional architecture to support mission critical services; Stage 2".
- [65] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane of EPC Nodes; Stage 3".

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:

DRA binding: The PCRF routing information stored per UE or per PDN in the DRA, which include the user identity (UE NAI), the UE Ipv4 address and/or Ipv6 prefix, the APN (if available) and the selected PCRF identity for a certain IP-CAN Session.

Gateway Control Session: An association between a BBERF and a PCRF (when GTP is not used in the EPC), used for transferring access specific parameters, BBERF events and QoS rules between the PCRF and BBERF. In the context of this specification this is implemented by use of the Gxx procedures.

IP-CAN session: association between a UE and an IP network.

The association is identified by one or more UE Ipv4 addresses/ and/or Ipv6 prefix together with a UE identity information, if available, and a PDN represented by a PDN ID (e.g. an APN). An IP-CAN session incorporates one or more IP-CAN bearers. Support for multiple IP-CAN bearers per IP-CAN session is IP-CAN specific. An IP-CAN session exists as long as the related UE Ipv4 address and/or Ipv6 prefix are assigned and announced to the IP network.

Policy counter: A mechanism within the OCS to track spending applicable for a subscriber.

Policy counter status: A label whose values are not standardized and that is associated with a policy counter's value relative to the spending limit(s) (the number of possible policy counter status values for a policy counter is one greater than the number of thresholds associated with that policy counter, i.e. policy counter status values describe the status around the thresholds). This is used to convey information relating to subscriber spending from OCS to PCRF. Specific labels are configured jointly in OCS and PCRF.

RAN user plane congestion: RAN user plane congestion occurs when the demand for RAN resources exceeds the available RAN capacity to deliver the user data for a prolonged period of time.

NOTE: Short-duration traffic bursts is a normal condition at any traffic load level, and is not considered to be RAN user plane congestion. Likewise, a high-level of utilization of RAN resources (based on operator configuration) is considered a normal mode of operation and might not be RAN user plane congestion.

Spending limit: A spending limit is the usage limit of a policy counter (e.g. monetary, volume, duration) that a subscriber is allowed to consume.