ETSI TS 129 230 V16.8.0 (2024-09)

Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
5G;
Diameter applications;
3GPP specific codes and identifiers
(3GPP TS 29.230 version 16.8.0 Release 16)

Reference
RTS/TSGC-0429230vg80

Keywords
5G,GSM,LTE,UMTS

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

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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).

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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.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document lists the 3GPP specific Diameter protocol codes, including the AVP codes and Experimental result codes.

This document lists also the application identifiers assigned to 3GPP specific Diameter applications by IANA and the Diameter command code range which is assigned to 3GPP by IANA.

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 TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx interfaces; Signalling flows and message contents".

[2] 3GPP TS 29.229: "Cx and Dx interfaces based on the Diameter protocol; Protocol details".

[3] 3GPP TS 29.328: "IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents".

[4] 3GPP TS 29.329: "Sh Interface based on the Diameter protocol; Protocol details".

[5] 3GPP TS 32.299: "Telecommunication management; Charging management; Diameter charging applications".

[6] 3GPP TS 29.234, Release 11: "3GPP system to Wireless Local Area Network (WLAN) interworking; Stage 3".

[7] 3GPP TS 29.109: "Generic Authentication Architecture (GAA); Zh and Zn Interfaces based on the Diameter protocol; Stage 3".

[8] 3GPP TS 29.209, Release 6: "Policy control over Gq interface".

[9] IETF RFC 3588: "Diameter Base Protocol".

[10] IETF RFC 3589: "Diameter Command Codes for Third Generation Partnership Project (3GPP) Release 5".

[11] IANA's Enterprise-Numbers: http://www.iana.org/assignments/enterprise-numbers

[12] IANA's AAA parameters register: ftp://ftp.iana.org/assignments/aaa-parameters/

[13] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".

[14] 3GPP TS 32.296: "Telecommunication management; Charging management; Online Charging System (OCS): Applications and interfaces".

[15] 3GPP TS 29.210, Release 6: "Charging rule provisioning over Gx interface".

[16] 3GPP TS 29.140, Release 6: "Multimedia Messaging Service (MMS); MM10 interface based on Diameter protocol; Stage 3".

[17] 3GPP TS 29.211, Release 6: "Rx Interface and Rx/Gx signalling flows".

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

[19] 3GPP TS 29.212: "Policy and Charging Control (PCC);Reference points".

[20] 3GPP TS 29.273: "Evolved Packet System (EPS); 3GPP EPS AAA interfaces".

[21] 3GPP TS 29.272: "Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol".

[22] 3GPP TS 29.215: "Policy and Charging Control (PCC) over S9 reference point; Stage 3".

[23] IETF RFC 5516: "Diameter Command Code Registration for Third Generation Partnership Project (3GPP) Evolved Packet System (EPS)".

[24] 3GPP TS 29.172: "Location Services (LCS); Evolved Packet Core (EPC) LCS Protocol (ELP) between the Gateway Mobile Location Centre (GMLC) and the Mobile Management Entity (MME); SLg interface".

[25] 3GPP TS 29.173: "Location Services (LCS); Diameter-based SLh interface for Control Plane LCS".

[26] 3GPP TS 29.219: "Policy and Charging Control: Spending Limit Reporting over Sy reference point".

[27] 3GPP TS 29.368: "Tsp interface protocol between the MTC Interworking Function (MTC-IWF) and Service Capability Server (SCS)".

[28] 3GPP TS 29.336: "Home Subscriber Server (HSS) diameter interfaces for interworking with packet data networks and applications".

[29] 3GPP TS 29.337: "Diameter-based T4 interface for communications with packet data networks and applications".

[30] 3GPP TS 29.338: "Diameter based protocols to support SMS capable MMEs".

[31] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE_LTE)".

[32] 3GPP TS 29.343: "Proximity-services (ProSe) function to ProSe application server aspects (PC2)".

[33] 3GPP TS 29.344: "Proximity-services (ProSe) Function to Home Subscriber Server (HSS) aspects".

[34] 3GPP TS 29.345: "Inter-Proximity-services (Prose) function signalling aspects; Stage 3".

[35] 3GPP TS 29.217: "Policy and Charging Control over Np reference point".

[36] 3GPP TS 29.128: "Diameter based T6a/T6b interface between the MME/SGSN and the SCEF".

[37] 3GPP TS 29.153: "Service exposure functionality between SCEF and RCAF reference point".

[38] 3GPP TS 29.154: "Service capability exposure functionality over Nt Reference point".

[39] 3GPP TS 29.283: "Diameter Data Management applications".

[40] 3GPP TS 29.388: "V2X Control Function to V2X Control Function to Home Subscriber Server (HSS) aspects (V4)".

[41] 3GPP TS 29.389: "Inter-V2X Control Function Signalling aspects (V6)".

[42] 3GPP TS 29.561: "Interworking between 5G Network and external Data Networks; Stage 3".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

3GPP specific: A definition which is used in conjunction with the 3GPP's vendor identifier.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AVP	Attribute-Value-Pair
CR	Change Request
IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force
LS	Liaison Statement

4 Application identifiers

The Diameter applications are identified with the application identifiers as specified in the RFC 3588 [9]. There are two kind of applications: IETF standards track applications and vendor specific applications. All application identifiers are assigned by IANA [12]. This chapter lists the application identifiers assigned by IANA to all 3GPP Diameter applications.

The application identifiers are transferred in Diameter command's header in the Application-ID field.

4.1 3GPP specific application identifiers

The 3GPP specific application identifiers allocated by IANA are listed in the following table.

Table 4.1: 3GPP specific application identifiers

Application identifier	Application	3GPP TS
16777216	3GPP Cx/Px	29.228 [1] and 29.229 [2]
16777217	3GPP Sh/Ph	29.328 [3] and 29.329 [4]
16777218	3GPP Re	32.296 [14]
16777219	3GPP Wx	29.234 [6]
16777220	3GPP Zn	29.109 [7]
16777221	3GPP Zh	29.109 [7]
16777222	3GPP Gq	29.209 [8]
16777223	3GPP Gmb	29.061 [13]
16777224	3GPP Gx	29.210 [15]
16777225	3GPP Gx over Gy	29.210 [15]
16777226	3GPP MM10	29.140 [16]
16777229	3GPP Rx	29.211 [17]
16777230	3GPP Pr	29.234 [6]
16777236	3GPP Rx	29.214 [18]
16777238	3GPP Gx	29.212 [19]
16777250	3GPP STa	29.273 [20]
16777251	3GPP S6a	29.272 [21]
16777252	3GPP S13/S13'	29.272 [21]
16777255	3GPP SLg	29.172 [24]
16777264	3GPP SWm	29.273 [20]
16777265	3GPP SWx	29.273 [20]
16777266	3GPP Gxx	29.212 [19]
16777267	3GPP S9	29.215 [22]
16777268	3GPP Zpn	29.109 [7]
16777272	3GPP S6b	29.273 [20]
16777291	3GPP SLh	29.173 [25]
16777292	3GPP SGmb	29.061 [13]
16777302	3GPP Sy	29.219 [26]
16777303	3GPP Sd	29.212 [19]
16777308	3GPP S7a	29.272 [21]
16777309	3GPP Tsp	29.368 [27]
16777310	3GPP S6m	29.336 [28]
16777311	3GPP T4	29.337 [29]
16777312	3GPP S6c	29.338 [30]
16777313	3GPP SGd	29.338 [30]
16777318	3GPP S15	29.212 [19]
16777319	3GPP S9a	29.215 [22]
16777320	3GPP S9a*	29.215 [22]
16777335	3GPP MB2-C	29.468 [31]
16777336	3GPP PC4a	29.344 [33]
16777337	3GPP PC2	29.343 [32]
16777340	3GPP PC6/PC7	29.345 [34]
16777342	3GPP Np	29.217 [35]
16777345	3GPP S6t	29.336 [28]
16777346	3GPP T6a/T6b	29.128 [36]
16777347	3GPP Ns	29.153[37]
16777348	3GPP Nt	29.154[38]
16777349	3GPP St	29.212 [19]
16777350	3GPP PC2	29.343 [32]
16777351	3GPP Diameter Data Management	29.283 [39]
16777355	3GPP V4	29.388 [40]
16777356	3GPP V6	29.389 [41]
16777358	3GPP Nta	29.154 [38]

5 Command codes

The command codes are used for communicating the command associated with the Diameter message. The command code is carried in the Diameter header's Command-Code field. The command codes can be divided into standard command codes allocated by IANA and experimental command codes for testing purposes only.

5.1 Command codes allocated for 3GPP

Based on the IETF RFC 3589 [10] the IANA has allocated a standard command code range 300 - 313 for 3GPP. The command codes are presented in the following table.

Table 5.1/1: Command code values allocated for 3GPP

Command code value	Command name	Abbreviation	Specified in 3GPP TS
300	User-Authorization-Request/-Answer	UAR/UAA	29.229 [2]
301	Server-Assignment-Request/-Answer	SAR/SAA	
302	Location-Info-Request/-Answer	LIR/LIA	
303	Multimedia-Auth-Request/-Answer	MAR/MAA	
304	Registration-Termination-Request/-Answer	RTR/RTA	
305	Push-Profile-Request/-Answer	PPR/PPA	
306	User-Data-Request/-Answer	UDR/UDA	29.329 [4]
307	Profile-Update-Request/-Answer	PUR/PUA	
308	Subscribe-Notifications-Request/-Answer	SNR/SNA	
309	Push-Notification-Request/-Answer	PNR/PNA	
310	Boostrapping-Info-Request/Answer	BIR/BIA	29.109 [7]
311	Message-Process-Request/Answer	MPR/MPA	29.140 [16
312	GBAPush-Info-Request/Answer	GPR/GPI	29.109 [7]

Editor's Note: The following command codes have been allocated to 3GPP, but they have not been used yet.

Table 5.1/2: Command codes allocated for 3GPP

Command code value	Command name	Abbreviation	Specified in 3GPP TS
313			

As defined in the IETF RFC 5516 [23]. IANA has allocated the following command code values for the S6a/S6d interface application and S13/S13' interface application.

Table 5.1/3: SAE related Standard Command code valuess allocated for 3GPP

Command code value	Command name	Abbreviation	Specified in 3GPP TS
316	Update-Location-Request/Answer	ULR/ULA	29.272 [21]
317	Cancel-Location-Request/Answer	CLR/CLA	
318	Authentication- Information - Request/Answer	AIR/AIA	
319	Insert Subscriber Data-Request/Answer	IDR/IDA	
320	Delete-Subscriber-Data-Request/Answer	DSR/DSA	
321	Purge-UE-Request/Answer	PUR/PUA	
322	Reset-Request/Answer	RSR/RSA	
323	Notify-Request/Answer	NOR/NOA	
324	ME-Identity-Check-Request/Answer	ECR/ECA	

Besides the standard command code values allocated for 3GPP, IANA has allocated the following vendor-specific command code values for 3GPP vendor-specific Diameter applications:

Table 5.1/4: Vendor-specific command codes allocated for 3GPP

Command code value	Command name	Abbreviation	Specified in 3GPP TS
8388620	Provide-Location-Request/Answer	PLR/PLA	29.172 [24]
8388621	Location-Report-Request/Answer	LRR/LRA	
8388622	LCS-Routing-Info-Request/Answer	RIR/RIA	29.173 [25]
8388635	Spending-Limit-Request/Answer	SLR/SLA	29.219 [26]
8388636	Spending-Status-Notification-Request/Answer	SNR/SNA	
8388637	TDF-Session-Request/Answer	TSR/TSA	29.212 [19]
8388731	TSSF-Notification-Request/Answer	TNR/TNA	
8388638	Update-VCSG-Location-Request/Answer	UVR/UVA	29.272 [21]
8388642	Cancel-VCSG-Location-Request/Answer	CVR/CVA	
8388639	Device-Action-Request/Answer	DAR/DAA	29.368 [27]
8388640	Device-Notification-Request/Answer	DNR/DNA	
8388641	Subscriber-Information-Request/Answer	SIR/SIA	29.336 [28]
8388718	Configuration-Information-Request/Answer	CIR/CIA	29.336 [28]
8388719	Reporting-Information-Request/Answer	RIR/RIA	
8388726	NIDD-Information-Request/Answer	NIR/NIA	
8388643	Device-Trigger-Request/Answer	DTR/DTA	29.337 [29]
8388644	Delivery-Report-Request/Answer	DRR/DRA	
8388645	MO-Forward-Short-Message Request/Answer	OFR/OFA	29.338 [30]
8388646	MT-Forward-Short-Message Request/Answer	TFR/TFA	
8388647	Send-Routing-Info-for-SM-Request/Answer	SRR/SRA	
8388648	Alert-Service-Centre-Request/Answer	ALR/ALA	
8388649	Report-SM-Delivery-Status-Request/Answer	RDR/RDA	
8388656	Trigger-Establishment-Request/Answer	TER/TEA	29.215 [30]
8388662	GCS-Action-Request/Answer	GAR/GAA	29.468 [31]
8388663	GCS-Notification-Request/Answer	GNR/GNA	
8388664	ProSe-Subscriber-Information-Request/Answer	PIR/PIA	29.344 [33]
8388665	Update-ProSe-Subscriber-Data-Request/Answer	UPR/UPA	
8388666	ProSe-Notify-Request/Answer	PNR/PNA	
8388713	ProSe-Initial-Location-Information-Request/Answer	PSR/PSA	
8388668	ProSe-Authorization-Request/Answer	PAR/PAA	29.345 [34]
8388669	ProSe-Discovery-Request/Answer	PDR/PDA	
8388670	ProSe-Match-Request/Answer	PMR/PMA	

8388671	ProSe-Match-Report-Info-Request/Answer	PIR/PIA	
8388672	ProSe-Proximity-Request/Answer	PRR/PRA	
8388673	ProSe-Location-Update-Request/Answer	PLR/PLA	
8388674	ProSe-Alert-Request/Answer	ALR/ALA	
8388675	ProSe-Cancellation-Request/Answer	RPR/RPA	
8388676	ProXimity-Action-Request/Answer	PXR/PXA	29.343 [32]
8388727	ProXimity-Application-Request/Answer	XAR/XAA	
8388720	Non-Aggregated-RUCI-Report-Request/Answer	NRR/NRA	29.217 [35]
8388721	Aggregated-RUCI-Report-Request/Answer	ARR/ARA	
8388722	Modify-Uecontext-Request/Answer	MUR/MUA	
8388724	Network-Status-Request/Answer	NSR/NSA	29.153 [37]
8388725	Network-Status-Continuous-Report-Request/Answer	NCR/NCA	
8388723	Background-Data-Transfer-Request/Answer	BTR/BTA	29.154 [38]
8388728	Data-Pull-Request/Answer	DPR/DPA	29.283 [39]
8388729	Data-Update-Request/Answer	DUR/DUA	
8388730	Notification-Data-Request/Answer	NDR/NDA	
8388732	Connection-Management-Request/Answer	CMR/CMA	29.128 [36]
8388733	MO-Data-Request/Answer	ODR/ODA	
8388734	MT-Data-Request/Answer	TDR/TDA	
8388735	Event-Configuration-Request/Answer	ECR/ECA	29.154 [38]
8388736	Event-Reporting-Request/Answer	ERR/ERA	

6 Vendor identifier

The vendor identifier (also known as Enterprise number) indicates the vendor specific attributes, result codes and application identifiers in Diameter commands. The vendor identifier is used in the Vendor-ID field of the AVP header and in the Vendor-Id AVP. The Vendor-Id AVP is used to identify the vendor in the Vendor-Specific-Application-Id and Experimental-Result-Code grouped AVPs.

6.1 3GPP's vendor identifier

The IANA has allocated a vendor identifier value 10415 for 3GPP [11].

7 Attribute-Value-Pair codes

The AVP codes are used together with the vendor identifier to identify each attribute uniquely. There are multiple AVP namespaces. The IETF IANA namespace, that is, the AVPs with vendor identifier zero or without vendor identifier, is controlled by IANA. Each vendor controls the AVP codes within their AVP namespaces.