**3GPP TSG-CT WG1 Meeting #127-eC1-207621**

**Electronic meeting, 13-20 November 2020 *was* C1-207450**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **27.007** | **CR** | **0709** | **rev** | **1** | **Current version:** | **16.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | AT command for ATSSS parameters | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE, MediaTek Inc. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ATSSS | | | | |  | ***Date:*** | | | 2020-11-17 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As specified in TS 23.501, the functionality in an ATSSS-capable UE that can steer, switch and split the MA PDU session traffic across 3GPP access and non-3GPP access, is called a "steering functionality". An ATSSS-capable UE may support one or more of the following types of steering functionalities: a) high-layer steering functionalities, which operate above the IP layer; b) low-layer steering functionalities, which operate below the IP layer. In this release of the specification, only one high-layer steering functionality is specified, which applies the MPTCP protocol (IETF RFC 8684) and is called "MPTCP functionality".  Based on above, MPTCP steering functinality works on "upper layers" on the TE which requires ATSSS rules and network steering functionalities information provided via AT commands. The AT command interface needs to be updated to allow reporting of the received ATSSS rules and network steering functionalities information to TE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Modify +CGEREP and add new AT Commands + C5GATSSSRRDP and + C5GNSFIRDP for provision of ATSSS rules and network steering functionalities information to TE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | MPTCP steering functinality is not able to work without ATSSS rules and network steering functionalities information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 10.1.19, 10.1.X (new), 10.1.Y (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* Change \* \* \* \*

# 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 22.002: "Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[2] 3GPP TS 22.003: "Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[3] 3GPP TS 22.081: "Line identification supplementary services ‑ Stage 1".

[4] 3GPP TS 22.082: "Call Forwarding (CF) supplementary services ‑ Stage 1".

[5] 3GPP TS 22.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services ‑ Stage 1".

[6] 3GPP TS 22.088: "Call Barring (CB) supplementary services ‑ Stage 1".

[7] 3GPP TS 23.003: "Numbering, addressing and identification".

[8] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3".

[9] GSM MoU SE.13, GSM MoU Permanent Reference Document SE.13: "GSM Mobile Network Codes and Names".

[10] ITU‑T Recommendation E.212: "Identification plan for land mobile stations".

[11] ITU‑T Recommendation T.31: "Asynchronous facsimile DCE control, service class 1".

[12] ITU‑T Recommendation T.32: "Asynchronous facsimile DCE control, service class 2".

[13] ITU‑T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) ‑ Information technology ‑ 7‑bit coded character set for information exchange".

[14] ITU‑T Recommendation V.250: "Serial asynchronous automatic dialling and control".

[15] TIA IS‑99: "Data Services Option Standard for Wideband Spread Spectrum Digital Cellular System".

[16] TIA IS‑135: "800 MHz Cellular Systems, TDMA Services, Async Data and Fax".

[17] PCCA STD‑101 Data Transmission Systems and Equipment: "Serial Asynchronous Automatic Dialling and Control for Character Mode DCE on Wireless Data Services".

[18] 3GPP TS 24.022: "Radio Link Protocol (RLP) for data and telematic services on the Mobile Station ‑ Base Station System (MS ‑ BSS) interface and the Base Station System ‑ Mobile‑services Switching Centre (BSS ‑ MSC) interface".

[19] 3GPP TS 22.030: "Man Machine Interface (MMI) of the Mobile Station (MS)".

[20] 3GPP TS 45.008: "Radio subsystem link control".

[21] 3GPP TS 22.085: "Closed User Group (CUG) supplementary services ‑ Stage 1".

[22] 3GPP TS 22.084: "MultiParty (MPTY) supplementary services ‑ Stage 1".

[23] 3GPP TS 22.090: "Unstructured Supplementary Service Data (USSD) ‑ Stage 1".

[24] 3GPP TS 27.005: "Use of Data Terminal Equipment ‑ Data Circuit terminating Equipment (DTE ‑ DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[25] 3GPP TS 23.038: "Alphabet and language specific information".

[26] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[27] 3GPP TS 22.086: "Advice of Charge (AoC) supplementary services ‑ Stage 1".

[28] 3GPP TS 51.011: "Specification of the Subscriber Identity Module ‑ Mobile Equipment (SIM‑ME) interface".

[29] 3GPP TS 22.034: "High Speed Circuit Switched Data (HSCSD) - Stage 1".

[30] 3GPP TS 22.091: "Explicit Call Transfer (ECT) supplementary service - Stage 1".

[31] 3GPP TS 22.072: "Call Deflection (CD) supplementary service - Stage 1".

[32] ISO/IEC 10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.

[33] 3GPP TS 22.022: "Personalization of GSM Mobile Equipment (ME) Mobile functionality specification".

[34] 3GPP TS 27.060: "General requirements on Mobile Stations (MS) supporting General Packet Radio Bearer Service (GPRS)".

[35] Void.

[36] CCITT Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[37] Void.

[38] 3GPP TS 45.005: "Radio transmission and reception".

[39] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting GPRS and Packet Data Networks (PDN)".

[40] 3GPP TS 23.081: "Line identification supplementary services ‑ Stage 2".

[41] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[42] 3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[43] Infrared Data Association; Specification of Ir Mobile Communications (IrMC).

[44] IrDA Object Exchange Protocol.

[45] 3GPP TS 27.010: "Terminal Equipment to User Equipment (TE-UE) multiplexer protocol User Equipment (UE)".

[46] 3GPP TS 23.107: "Quality of Service, Concept and Architecture".

[47] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[48] Void.

[49] 3GPP TS 43.068: "Voice Group Call service (VGCS) - Stage 2".

[50] 3GPP TS 43.069: "Voice Broadcast Service (VBS) - Stage 2".

[51] Void.

[52] 3GPP TS 44.068: "Voice Group Call service (VGCS) - Stage 3".

[53] 3GPP TS 44.069: "Voice Broadcast Service (VBS) - Stage 3".

[54] 3GPP TS 22.067: "enhanced Multi‑Level Precedence and Pre‑emption service (eMLPP) ‑ Stage 1".

[55] 3GPP TS 42.068: "Voice Group Call service (VGCS) - Stage 1".

[56] 3GPP TS 42.069: "Voice Broadcast Service (VBS) - Stage 1".

[57] Void.

[58] 3GPP TS 22.087: "User-to-User Signalling (UUS) - Stage 1".

[59] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) Application".

[60] ETSI TS 102 221 "Smart Cards; UICC-Terminal interface; Physical and logical characteristics (Release 1999)".

[61] 3GPP TS 44.065: "Mobile Station (MS) – Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[62] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP)".

[63] 3GPP TS 23.227 "Applications and User interaction in the UE-Principles and specific requirements", Release 5.

[64] Void.

[65] 3GPP TS 31.101: "UICC-Terminal Interface; Physical and Logical Characteristics."

[66] ETSI TS 102 310: "Smart Cards; Extensible Authentication Protocol support in the UICC".

[67] Void.

[68] RFC 3748: "Extensible Authentication Protocol (EAP)".

[69] RFC 3629: "UTF-8, a transformation format of ISO 10646".

[70] 3GPP TS 44.318: "Generic Access (GA) to the A/Gb interface; Mobile GA interface layer 3 specification".

[71] 3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[72] 3GPP TS 25.308: "High Speed Downlink Packet Access (HSDPA): Overall Description; Stage 2".

[73] 3GPP TS 25.319: "Enhanced Uplink; Overall Description; Stage 2".

[74] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".

[75] 3GPP TS 24.216: "Communication Continuity Management Object (MO)".

[76] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[77] 3GPP TS 25.305 "User Equipment (UE) positioning in Universal Terrestrial Radio Access Network (UTRAN); Stage 2".

[78] IEC 61162: "Maritime navigation and radio communication equipment and systems – Digital interfaces".

[79] 3GPP TS 44.031: "Location Services (LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC), Radio Resource LCS Protocol (RRLP)".

[80] 3GPP TS 49.031: "Base Station System Application Part, LCS Extension (BSSAP-LE)".

[81] Void.

[82] 3GPP TS 23.401: "GPRS enhancements for E-UTRAN access".

[83] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS)".

[84] Void.

[85] 3GPP TS 23.203: "Policy and charging control architecture".

[86] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[87] 3GPP TS 24.173: "IMS multimedia telephony communication service and supplementary services; Stage 3".

[88] RFC 4291: "IP Version 6 Addressing Architecture".

[89] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)".

[90] 3GPP TS 23.221: "Architectural requirements".

[91] 3GPP TS 24.237: "IP Multimedia Subsystem (IMS) Service Continuity".

[92] 3GPP TS 31.111: "Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)".

[93] 3GPP TS 22.096: "Name identification supplementary services ‑ Stage 1".

[94] 3GPP TS 23.096: "Name identification supplementary services ‑ Stage 2".

[95] 3GPP TS 25.133: "Requirements for support of radio resource management (FDD)".

[96] 3GPP TS 25.123: "Requirements for support of radio resource management (TDD)".

[97] 3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".

[98] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[99] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[100] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[101] 3GPP TS 24.341: "Support of SMS over IP networks".

[102] 3GPP TS 24.167: "3GPP IMS Management Object (MO); Stage 3".

[103] IETF STD 5: "Internet Protocol".

[104] IETF STD 51: "The Point-to-Point Protocol (PPP)".

[105] RFC 1144: "Compressing TCP/IP Headers for Low-Speed Serial Links".

[106] RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[107] RFC 2507: "IP Header Compression".

[108] RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed".

[109] 3GPP TS 24.080: "Mobile radio interface Layer 3 supplementary service specification; Formats and coding".

[110] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[111] RFC 3261: "SIP: Session Initiation Protocol".

[112] RFC 3966: "The tel URI for Telephone Numbers".

[113] RFC 3969: "The Internet Assigned Number Authority (IANA) Uniform Resource Identifier (URI) Parameter Registryfor the Session Initiation Protocol (SIP)".

[114] RFC 5341: "The Internet Assigned Number Authority (IANA) tel Uniform Resource Identifier (URI) Parameter Registry".

[115] 3GPP TS 36.355: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP)".

[116] RFC 2141: "URN Syntax".

[117] RFC 3406: "Uniform Resource Names (URN) Namespace Definition Mechanisms".

[118] RFC 5031: "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services".

[119] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[120] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[121] 3GPP TS 24.654: "Closed User Group (CUG) using IP Multimedia (IM) Core Network (CN) subsystem, Protocol Specification".

[122] RFC 4715: "The Integrated Services Digital Network (ISDN) Subaddress Encoding Type for tel URI".

[123] 3GPP TS 22.093: "Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1".

[124] 3GPP TS 22.094: "Follow Me service description; Stage 1".

[125] 3GPP TS 22.097: "Multiple Subscriber Profile (MSP) Phase 2; Service description; Stage 1".

[126] 3GPP TS 22.135: "Multicall; Service description; Stage 1".

[127] 3GPP TS 24.182: "IP Multimedia Subsystem (IMS) Customized Alerting Tones (CAT); Protocol specification".

[128] 3GPP TS 24.183: "IP Multimedia Subsystem (IMS) Customized Ringing Signal (CRS); Protocol specification".

[129] 3GPP TS 24.239: "Flexible Alerting (FA) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[130] 3GPP TS 24.259: "Personal Network Management (PNM)".

[131] 3GPP TS 24.390: "Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem IMS".

[132] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[133] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[134] 3GPP TS 24.606: "Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[135] 3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[136] 3GPP TS 24.611: "Anonymous Communication Rejection (ACR) and Communication Barring (CB) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[137] 3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".

[138] 3GPP TS 24.616: "Malicious Communication Identification (MCID) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[139] 3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[140] 3GPP TS 24.642: "Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[141] 3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM) Core Network (CN) subsystem".

[142] 3GPP TS 36.509: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Special conformance testing functions for User Equipment (UE)".

[143] 3GPP TS 25.102: "Multiplexing and channel coding (TDD)".

[144] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[145] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description".

[146] 3GPP TS 45.001: "Physical layer on the radio path; General description".

[147] 3GPP TS 22.101: "Service aspects; Service principles".

[148] 3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD); Stage 3".

[149] 3GPP TS 23.682: "Architecture Enhancements to facilitate communications with Packet Data Networks and Applications".

[150] 3GPP TS 36.443: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); M2 Application Protocol (M2AP)".

[151] Wi-Fi Alliance: "Hotspot 2.0 (Release 2) Technical Specification, version 1.0.0", 2014-08-08.

[152] IEEE Std 802.11™-2012: "Information Technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[153] 3GPP TS 24.312: "Access Network Discovery and Selection Function (ANDSF) Management Object (MO)".

[154] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".

[155] RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[156] 3GPP TS 44.018: "GSM/EDGE Radio Resource Control (RRC) protocol".

[157] CEN EN 15722:2015 (April 2015): "Intelligent transport systems - ESafety - ECall minimum set of data".

[158] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[159] 3GPP TS 38.300: "NR; NR and NG-RAN Overall Description".

[160] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[161] 3GPP TS 24.501: "Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[162] 3GPP TS 37.340: "Evolved Universal Terresterial Radio Access (E-UTRA) and NR; Multi-Connectivity; Stage 2".

[163] 3GPP TS 24.196: "Enhanced Calling Name (eCNAM)".

[164] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services".

[165] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[166] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".

[167] 3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements".

[168] 3GPP TS 24.250: "Protocol for Reliable Data Service between UE and SCEF; Stage 3".

[169] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".

[170] 3GPP TS 22.011: "Service accessibility".

[171] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[172] 3GPP TS 24.486: "Vehicle-to-Everything (V2X) Application Enabler (VAE) layer; Protocol aspects; Stage 3".

[173] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[174] RFC 3339: "Date and Time on the Internet: Timestamps".

[175] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Stage 3".

[176] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[1xx] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting; Stage 3".

\* \* \* Change \* \* \* \*

### 10.1.19 Packet domain event reporting +CGEREP

Table 127: +CGEREP parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CGEREP=[<mode>[,<bfr>]] | *+CME ERROR: <err>* |
| +CGEREP? | +CGEREP: <mode>,<bfr> |
| +CGEREP=? | +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) |

**Description**

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned. Refer subclause 9.2 for possible <err> values.

Read command returns the current mode and buffer settings.

Test command returns the modes and buffer settings supported by the MT as compound values.

**Defined values**

<mode>: integer type

0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

1 discard unsolicited result codes when MT‑TE link is reserved (e.g. in on‑line data mode); otherwise forward them directly to the TE

2 buffer unsolicited result codes in the MT when MT‑TE link is reserved (e.g. in on‑line data mode) and flush them to the TE when MT‑TE link becomes available; otherwise forward them directly to the TE

<bfr>: integer type

0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered

1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)

**Defined events**

The events are valid for all accesses unless explicitly mentioned.

For network attachment, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

For MT class, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW CLASS <class>

The network has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS.

+CGEV: ME CLASS <class>

The mobile termination has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS.

For PDP context activation, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW PDN ACT <cid>[,<WLAN\_Offload>]

The network has activated a context. The context represents a Primary PDP context. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

<WLAN\_Offload>: integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value) and bit 2 (UTRAN offload acceptability value) in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.

0 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable.

1 offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode.

2 offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode.

3 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable.

NOTE 1: This event is not applicable for EPS and 5GS.

+CGEV: ME PDN ACT <cid>[,<reason>[,<cid\_other>[,<WLAN\_Offload>[,<SSC>,<old-cid>,[<MA\_3GPP>,<MA\_N3GPP>]]]]]

The mobile termination has activated a context. The context represents a PDN connection or a Primary PDP context. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameter <cid> is found in command +CGDCONT. The format of the parameter <WLAN\_Offload> is defined above.

<reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6.

0 IPv4 only allowed

1 IPv6 only allowed

2 single address bearers only allowed.

3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.

<cid\_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid\_other>.

<SSC>: integer type; indicates whether the established PDU session is requested by the network for SSC mode 2 or SSC mode 3 PDU session anchor relocation as specified in 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].

1 the established PDU session is requested by the network for SSC mode 2 PDU session anchor relocation.

2 the established PDU session is requested by the network for SSC mode 3 PDU session anchor relocation.

<old-cid>: integer type; indicates the context identifier of the QoS flow of the default QoS rule of the SSC mode 2 or SSC mode 3 PDU session where the network requests relocation of the PDU session anchor.

<MA\_3GPP>: integer type;

0 the established PDU session is an MA PDU session and the user plane resources are not established over 3GPP access.

1 the established PDU session is an MA PDU session and the user plane resources are established over 3GPP access.

<MA\_N3GPP>: integer type;

0 the established PDU session is an MA PDU session and the user plane resources are not established over non-3GPP access.

1 the established PDU session is an MA PDU session and the user plane resources are established over non-3GPP access.

NOTE 1A: For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid\_other> returned to TE.

+CGEV: NW ACT <p\_cid>, <cid>, <event\_type>[,<WLAN\_Offload>]

The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <WLAN\_Offload> is defined above.

<event\_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.

0 Informational event

1 Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.

+CGEV: ME ACT <p\_cid>, <cid>, <event\_type>[,<WLAN\_Offload>]

The network has responded to an ME initiated context activation. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event\_type> and <WLAN\_Offload> are defined above.

For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

+CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

+CGEV: NW PDN DEACT <cid>[,<WLAN\_Offload>[,<SSC>]]

The network has deactivated a context. The context represents a PDN connection or a Primary PDP context. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. The format of the parameters <WLAN\_Offload> and <SSC> are defined above.

NOTE 2: Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

+CGEV: ME PDN DEACT <cid>

The mobile termination has deactivated a context. The context represents a PDN connection or a Primary PDP context. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 3: Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

+CGEV: NW DEACT <p\_cid>, <cid>, <event\_type>[,<WLAN\_Offload>]

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event\_type> and <WLAN\_Offload> are defined above.

NOTE 4: Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

+CGEV: ME DEACT <p\_cid>, <cid>, <event\_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event\_type> is defined above.

NOTE 5: Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW MODIFY <cid>, <change\_reason>, <event\_type>[,<WLAN\_Offload>[,<PDU-lifetime>]]

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change\_reason> and <event\_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change\_reason>, <event\_type>, and <WLAN\_Offload> are defined above.

<change\_reason>: integer type; a bitmap that indicates what kind of change occurred. The <change\_reason> value is determined by summing all the applicable bits. For example if both the values of QoS changed (Bit 2) and WLAN\_Offload changed (Bit 3) have changed, then the <change\_reason> value is 6.

NOTE 5A: The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN\_Offload> defined above.

Bit 1 TFT changed

Bit 2 Qos changed

Bit 3 WLAN Offload changed

Bit 4 Relocation of PDU session anchor requested

Bit 5 PDP address or PDP type changed

Bit 6 ATSSS parameters changed

<PDU-lifetime>: integer type; indicates the PDU session address lifetime value in seconds for relocation of SSC mode 3 PDU session anchor, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].

+CGEV: ME MODIFY <cid>, <change\_reason>, <event\_type>[,<WLAN\_Offload>]

The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change\_reason> and <event\_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change\_reason>, <event\_type> and <WLAN\_Offload> are defined above.

For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:

+CGEV: REJECT <PDP\_type>, <PDP\_addr>

A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP\_type> and <PDP\_addr> are found in command +CGDCONT.

NOTE 6: This event is not applicable for EPS and 5GS.

+CGEV: NW REACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

NOTE 7: This event is not applicable for EPS and 5GS.

**Implementation**

Optional.

\* \* \* Change \* \* \* \*

### 10.1.X 5GS ATSSS Rules read dynamic parameters +C5GATSSSRRDP

Table 10.1.x-1: + C5GATSSSRRDP action command syntax

| Command | Possible Response(s) |
| --- | --- |
| +C5GATSSSRRDP[=<cid>] | [+C5GATSSSRRDP: <cid>[,<ATSSS\_rule-l>,<ATSSS\_rule-c>]]  [<CR><LF>+C5GATSSSRRDP: <cid>[,<ATSSS\_rule-l>,<ATSSS\_rule-c>]  [...]] |
| +C5GATSSSRRDP=? | +C5GATSSSRRDP: (list of <cid>s associated with QoS flows) |

**Description**

The execution command returns the ATSSS rules <ATSSS\_rule-l> and <ATSSS\_rule-c> of the QoS flow of the default QoS rule associated to the provided context identifier <cid>.

If the parameter <cid> is omitted, the ATSSS parameters for all QoS flows are returned.

The test command returns a list of <cid>s associated with all QoS flows.

**Defined values**

<cid>: integer type; specifies a particular QoS flow definition, Traffic Flows definition and a PDP Context definition (see the +CGDCONT and +CGDSCONT commands).

<ATSSS\_rule-l>: integer type; indicates the length in octets of the <ATSSS\_rule-c>.

<ATSSS\_rule-c>: string type; coded as defined in 3GPP TS 24.193 [1xx] subclause 6.1.3.2. This parameter shall not be subject to conventional character conversion as per +CSCS.

**Implementation**

Optional. This AT-cmd is appliccable to UEs that support ATSSS.

\* \* \* Change \* \* \* \*

### 10.1.Y 5GS network steering functionalities information read dynamic parameters +C5GNSFIRDP

Table 10.1.y-1: + C5GNSFIRDP action command syntax

| Command | Possible Response(s) |
| --- | --- |
| +C5GNSFIRDP[=<cid>] | [+C5GNSFIRDP: <cid>[,<NSFI-l>,<NSFI-c>]]  [<CR><LF>+ C5GNSFIRDP: <cid>[,<NSFI-l>,<NSFI-c>]  [...]] |
| +C5GNSFIRDP=? | +C5GNSFIRDP: (list of <cid>s associated with QoS flows) |

**Description**

The execution command returns the network steering functionalities information <NSFI-l> and <NSFI-c> of the QoS flow of the default QoS rule associated with the provided context identifier <cid>.

If the parameter <cid> is omitted, the network steering functionalities information for all QoS flows are returned.

The test command returns a list of <cid>s associated with all QoS flows.

**Defined values**

<cid>: integer type; specifies a particular QoS flow definition, Traffic Flows definition and a PDP Context definition (see the +CGDCONT and +CGDSCONT commands).

<NSFI-l>: integer type; indicates the length in octets of the <NSFI-c>.

<NSFI-c>: string type; coded as defined in 3GPP TS 24.193 [1xx] subclause 6.1.4.2. This parameter shall not be subject to conventional character conversion as per +CSCS.

**Implementation**

Optional.

\* \* \* End of Changes \* \* \* \*