**3GPP TSG-CT WG1 Meeting #127-eC1-207450**

**Electronic meeting, 13-20 November 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **27.007** | **CR** | **0709** | **rev** | **-** | **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)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | AT command for ATSSS parameters |
|  |  |
| ***Source to WG:*** | ZTE, InterDigital |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | ATSSS |  | ***Date:*** | 2020-11-10 |
|  |  |  |  |  |
| ***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 canbe 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:*** | Add new AT Commands + CPATSSSR and +CPNSFI 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:*** | 2, 10.1.xx (new), 10.1.yy (new), Annex B |
|  |  |
|  | **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:*** |  |

\* \* \* 1st 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".

\* \* \* 2nd Change \* \* \* \*

### 10.1.xx Presentation of ATSSS rules +CPATSSSR

Table 10.1.xx-1: +CATSSSR parameter command syntax

| Command | Possible Response(s) |
| --- | --- |
| +CPATSSSR=[<n>] | *+CME ERROR: <err>* |
| +CPATSSSR? | +CPATSSSR: <n>,[,<ATSSS\_rule-l>,<ATSSS\_rule-c>] |
| +CPATSSSR=? | +CPATSSSR: (range of supported <n>s) |

**Description**

The set command controls the presentation of ATSSS rules to the ME supporting MPTCP steering functionality (see 3GPP TS 23.501 [165] subclause 5.32.6) by an unsolicited result code +CPATSSSR: <n>[,<ATSSS\_rule-l>,<ATSSS\_rule-c>]) when ATSSS rules are received from the network. If either <ATSSS\_rule-l> or <ATSSS\_rule\_c> is omitted, the ATSSS rule is deleted.

Read command returns <n> which indicates whether reporting of ATSSS rules is enabled or disabled. When reporting is enabled, the parameters <ATSSS\_rule-l> and <ATSSS\_rule-c> indicate the most recently received ATSSS rules at the ME. When reporting is disabled, no ATSSS rules are provided.

The test command returns values supported as a compound value.

Refer to subclause 9.2 for possible <err> values.

**Defined values**

<n>: integer type.

0 disable unsolicited result code

1 enable unsolicited result code

<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.

### 10.1.yy Presentation of network steering functionalities information +CPNSFI

Table 10.1.yy-1: +CPNSFI parameter command syntax

| Command | Possible Response(s) |
| --- | --- |
| +CPNSFI=[<n>] | *+CME ERROR: <err>* |
| +CPNSFI? | +CPNSFI: <n>,[,<NSFI-l>,<NSFI-c>] |
| +CPNSFI=? | +CPNSFI: (range of supported <n>s) |

**Description**

The set command controls the presentation of network steering functionalities information to the ME supporting MPTCP steering functionality (see 3GPP TS 23.501 [165] subclause 5.32.6) by an unsolicited result code +CPNSFI: <n>[,<NSFI-l>,<NSFI-c>]when network steering functionalities information is received from the network. If either <NSFI-l> or <NSFI-c> is omitted, the network steering functionalities information is deleted.

Read command returns <n> which indicates whether reporting of network steering functionalities information is enabled or disabled. When reporting is enabled, the parameters <NSFI-l> and <NSFI-c> indicate the most recently received network steering functionalities information at the ME. When reporting is disabled, no network steering functionalities information is provided.

The test command returns values supported as a compound value.

Refer to subclause 9.2 for possible <err> values.

**Defined values**

<n>: integer type.

0 disable unsolicited result code

1 enable unsolicited result code

<NSFI-l>: integer type; indicates the length in octets of the <network\_steering\_functionalities\_information\_contents>.

<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.

\* \* \* 3rd of Changes \* \* \* \*

Annex B (normative):
Summary of result codes

ITU‑T Recommendation V.250 [14] result codes which can be used in the present document and result codes defined in the present document:

Table B.1: Result codes

|  |  |  |  |
| --- | --- | --- | --- |
| Verbose result code(V.250 command V1 set) | Numeric(V0 set) | Type | Description |
| +C5GUSMS | as verbose | unsolicited | refer subclause 10.1.59 |
| +CABTSRI | as verbose | unsolicited | refer subclause 10.1.41 |
| +CACSP | as verbose | unsolicited | refer subclause 11.1.7 |
| +CALV | as verbose | unsolicited | refer subclause 8.16 |
| +CANCHEV | as verbose | unsolicited | refer subclause 11.1.8 |
| +CAPPLEVMC | as verbose | unsolicited | refer subclause 8.78 |
| +CAPTT | as verbose | unsolicited | refer subclause 11.1.4 |
| +CPATSSSR | as verbose | unsolicited | refer subclause 10.1.xx |
| +CAULEV | as verbose | unsolicited | refer subclause 11.1.5 |
| +CBCAP | as verbose | unsolicited | refer subclause 8.59 |
| +CBCHG | as verbose | unsolicited | refer subclause 8.61 |
| +CBCON | as verbose | unsolicited | refer subclause 8.60 |
| +CCCM | as verbose | unsolicited | refer subclause 7.16  |
| +CCSFBU | as verbose | unsolicited | refer subclause 8.76 |
| +CCWA | as verbose | unsolicited | refer subclause 7.12 |
| +CCWV | as verbose | unsolicited | refer subclause 8.28 |
| +CDEV | as verbose | unsolicited | refer subclause 8.10 |
| +CDIP | as verbose | unsolicited | refer subclause 7.9 |
| +CDUT | as verbose | intermediate | refer subclause 13.2.1 |
| +CDUU | as verbose | unsolicited | refer subclause 13.2.1 |
| +CECN | as verbose | unsolicited | refer subclause 6.28 |
| +CEDRXSP | as verbose | unsolicited | refer subclause 7.40 |
| +CEMBMSRI | as verbose | unsolicited | refer subclause 14.2.2 |
| +CEMBMSSAII | as verbose | unsolicited | refer subclause 14.2.6 |
| +CEMBMSSRVI | as verbose | unsolicited | refer subclause 14.2.3 |
| +CEN1 | as verbose | intermediateunsolicited | refer subclause 8.67 |
| +CEN2 | as verbose | intermediateunsolicited | refer subclause 8.67 |
| +CEN3 | as verbose | intermediateunsolicited | refer subclause 8.67 |
| +CEN4 | as verbose | intermediateunsolicited | refer subclause 8.67 |
| +CEPTT | as verbose | unsolicited | refer subclause 11.1.10  |
| +CEPSFBS | as verbose | unsolicited | refer subclause 8.81 |
| +CEREG | as verbose | unsolicited | refer subclause 10.1.22 |
| +CPBW | as verbose | intermediate | refer subclause 8.14 |
| +CPNERU | as verbose | unsolicited | refer subclause 8.70 |
| +CGBRRREP | as verbose | unsolicited | refer subclause 10.1.69 |
| +CGDEL | as verbose | intermediate | refer subclause 10.1.29 |
| +CGEV | as verbose | unsolicited | refer subclause 10.1.19 |
| +CGREG | as verbose | unsolicited | refer subclause 10.1.20 |
| +CHSR | as verbose | intermediate | refer subclause 6.16 |
| +CIEV | as verbose | unsolicited | refer subclause 8.10 |
| +CCIOTOPTI | as verbose | unsolicited | refer subclause 7.42 |
| +CIREGU | as verbose | unsolicited | refer subclause 8.71 |
| +CIREPH | as verbose | unsolicited | refer subclause 8.64 |
| +CIREPI | as verbose | unsolicited | refer subclause 8.64 |
| +CKEV | as verbose | unsolicited | refer subclause 8.10 |
| +CLADNU | as verbose | unsolicited | refer subclause 10.1.61 |
| +CLAV | as verbose | unsolicited | refer subclause 8.31 |
| +CLIP | as verbose | unsolicited | refer subclause 7.6 |
| +CMCCSI | as verbose | unsolicited | refer subclause 8.73 |
| +CMCCSS<x> | as verbose | unsolicited | refer subclause 8.73 |
| +CMCCSSEND | as verbose | unsolicited | refer subclause 8.73 |
| +CME ERROR | as verbose | final | refer subclause 9.2.0 |
| +CMICO | as verbose | unsolicited | refer subclause 10.1.55 |
| +CMOLRE | as verbose | unsolicited | refer subclause 9.3.1 |
| +CMOLRG | as verbose | unsolicited | refer subclause 8.50 |
| +CMOLRN | as verbose | unsolicited | refer subclause 8.50 |
| +CMTLR | as verbose | unsolicited | refer subclause 8.57 |
| +CRTDCP | as verbose | unsolicited | refer subclause 10.1.44 |
| +CMWN | as verbose | unsolicited | refer subclause 7.36 |
| +CNAP | as verbose | intermediateunsolicited | refer subclause 7.30 |
| +CNEC\_MM | as verbose | unsolicited | refer subclause 9.1b |
| +CNEC\_GMM | as verbose | unsolicited | refer subclause 9.1b |
| +CNEC\_GSM | as verbose | unsolicited | refer subclause 9.1b |
| +CNEC\_EMM | as verbose | unsolicited | refer subclause 9.1b |
| +CNEC\_ESM | as verbose | unsolicited | refer subclause 9.1b |
| +CNEMIU | as verbose | unsolicited | refer subclause 7.33 |
| +CNEMS1 | as verbose | unsolicited | refer subclause 7.33 |
| +CNEM5G | as verbose | unsolicited | refer subclause 7.33 |
| +CNRREG | as verbose | unsolicited | refer subclause 10.1.47 |
| +CPNSFI | as verbose | unsolicited | refer subclause 10.1.yy |
| +COEV | as verbose | unsolicited | refer subclause 8.10 |
| +COLP | as verbose | intermediateunsolicited | refer subclause 7.8 |
| +CPINR | as verbose | intermediate | refer subclause 8.65 |
| +CPINRE | as verbose | intermediate | refer subclause 8.65 |
| +CPOSR | as verbose | unsolicited | refer subclause 8.56 |
| +CPNERU | as verbose | unsolicited | refer subclause 8.70 |
| +CPNSTAT | as verbose | unsolicited | refer subclause 7.28 |
| +CPSB | as verbose | unsolicited | refer subclause 7.29 |
| +CR | as verbose | intermediate | refer subclause 6.9 |
| +CREG | as verbose | unsolicited | refer subclause 7.2 |
| +CRING | as verbose | unsolicited | refer subclause 6.11 |
| +CRLOSPU | as verbose | unsolicited | refer subclause 10.1.65 |
| +CRTDCP | as verbose | unsolicited | refer subclause 10.1.44 |
| +CRUEPOLICYU | as verbose | unsolicited | refer subclause 10.1.51 |
| +CSBTSRI | as verbose | unsolicited | refer subclause 10.1.56 |
| +CSCON | as verbose | unsolicited | refer subclause 10.1.30 |
| +CSDBTSRI | as verbose | unsolicited | refer subclause 10.1.58 |
| +CSSI | as verbose | intermediate | refer subclause 7.17 |
| +CSSU | as verbose | unsolicited | refer subclause 7.17 |
| +CTEV | as verbose | unsolicited | refer subclause 8.10 |
| +CTZE | as verbose | unsolicited | refer subclause 8.41 |
| +CTZEU | as verbose | unsolicited | refer subclause 8.41 |
| +CTZV | as verbose | unsolicited | refer subclause 8.41 |
| +CUSATEND | as verbose | unsolicited | refer subclause 12.2.4 |
| +CUSATP | as verbose | unsolicited | refer subclause 12.2.4 |
| +CUSATS | as verbose | unsolicited | refer subclause 12.2.3 |
| +CUSD | as verbose | unsolicited | refer subclause 7.15 |
| +CUUS1I | as verbose | intermediate | refer subclause 7.26 |
| +CUUS1U | as verbose | unsolicited | refer subclause 7.26 |
| +CWLANOLADI | as verbose | unsolicited | refer subclause 10.1.39 |
| +CWLANOLCMI | as verbose | unsolicited | refer subclause 10.1.40 |
| +DR | as verbose | intermediate | refer subclause 6.26 |
| +ILRR | as verbose | intermediate | refer subclause 4.3 |
| BUSY | 7 | final | busy signal detected |
| CONNECT | 1 | intermediate | connection has been established |
| CONNECT <text> | manufacturer specific | intermediate | as CONNECT but manufacturer specific <text> gives additional information (e.g. connection data rate) |
| ERROR | 4 | final | command not accepted |
| NO ANSWER | 8 | final | connection completion timeout |
| NO CARRIER | 3 | final | connection terminated |
| NO DIALTONE | 6 | final | no dialtone detected |
| OK | 0 | final | acknowledges execution of a command line |
| RING | 2 | unsolicited | incoming call signal from network |
| NOTE: From v6.2.0 onwards, ATV0 numeric result codes 5, 6, 7 for NO DIALTONE, BUSY and NO ANSWER respectively, have been replaced by numeric result codes 6, 7, 8 respectively, to be aligned with the values listed in ITU-T Recommendation V.250 [14] (previously V.25ter). |

NOTE: The table B.1 is as an overview of the result codes, hence the complete syntax of the result codes is not shown.

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