**3GPP TSG-CT WG1 Meeting #141eC1-23xxxx**

**Online 17– 21 April 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **27.007** | **CR** | **0808** | **rev** | **1s** | **Current version:** | **18.2.0** |  |
|  | | | | | | | | |
| *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 |  |

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|  | | | | | | | | | | |
| ***Title:*** | AT command update for LADN per DNN & S-NSSAI | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | GMEC | | | | |  | ***Date:*** | | | 2023-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As per concluded in CT1#140 meeting, LADN per DNN and S-NSSAI is implemented separately from the legacy LADN feature by defining a new Extended LADN information IE to deliver the LADN service area per DNN and S-NSSAI level from the AMF to the UE. The UE stores and handles the legacy LADN information and the new extended LADN information separately.  With above conclusion, new AT cmmands need to be defined for handling the extended LADN information between the TE and the MT. For the coding of the extended LADN information, it can be referred to the IE definition given in TS 24.501. With this approach, the exiting AT commands for the legacy LADN information handling are not touched. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | It proposes to define new AT cmmands for the handling of the extended LADN information between the TE and the MT. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | AT cmmands for the handling of the extended LADN information between the TE and the MT are missing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 10.1.60, 10.1.60a (new), 10.1.61a (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:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

### 10.1.60 Request LADN information +CRLADN

Table 10.1.60-1: +CRLADN action command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CRLADN[=<ladn\_dnn>[,<ladn\_dnn>[,...]]] | *+CME ERROR: <err>*  +CRLADN: <ladn\_information\_length>,<ladn\_information> |
| +CRLADN=? |  |

**Description**

The execution command enables the TE to request LADN information from the MT for the specified LADN DNN(s). If the parameter <ladn\_dnn> in the execution command is omitted, it indicates a request to the MT for LADN information for all LADN(s) available in the current registration area. If <ladn\_information\_length> has a value of zero and <ladn\_information> consists of an empty string, no LADN information is stored on the MT.

The command should be abortable as the LADN information is provided by the network.

Refer clause 9.2 for possible <err> values.

**Defined values**

<ladn\_dnn>: string type; included when the TE wants to request LADN information for specific LADN DNN(s). The <ladn\_dnn> is encoded as the value part of the DNN information element in 3GPP TS 24.501 [161], clause 9.11.2.1B. This parameter shall not be subject to conventional character conversion as per +CSCS.

<ladn\_information\_length>: integer type; indicates the number of octets of the <ladn\_information> information element.

If the value is zero, no LADN information is stored on the MT.

<ladn\_information>: string type; indicates the LADN information for one or more LADNs, where each LADN consists of a DNN and a tracking area identity list. The <ladn\_information> is encoded as the value part of the LADN information information element in 3GPP TS 24.501 [161], clause 9.11.3.30, where each DNN is encoded as the value part of the DNN information element in 3GPP TS 24.501 [161], clause 9.11.2.1B, and each tracking area identity list is encoded as the length and the value part of the 5GS Tracking area identity list information element as specified in clause 9.11.3.9. This parameter shall not be subject to conventional character conversion as per +CSCS.

If the value is an empty string (""), no LADN information is stored on the MT.

**Implementation**

Optional.

\* \* \* Next Change \* \* \* \*

10.1.60a Request extended LADN information +CRELADN

**Table 10.1.60a-1: +CRELADN action command syntax**

|  |  |
| --- | --- |
| **Command** | **Possible response(s)** |
| +CRELADN[=<ladn\_dnn>,<s-nssai>[,<ladn\_dnn>,<s-nssai>[,...]]] | *+CME ERROR: <err>*  +CRELADN: <extended\_ladn\_information\_length>,<extended\_ladn\_information> |
| +CRELADN=? |  |

**Description**

The execution command enables the TE to request extended LADN information from the MT for the specified LADN DNN(s) and S-NSSAI(s) associated with the LADN. If the parameters <ladn\_dnn> and <s-nssai> in the execution command are omitted, it indicates a request to the MT for extended LADN information for all LADN(s) available in the current registration area. If <extended\_ladn\_information\_length> has a value of zero and <extended\_ladn\_information> consists of an empty string, no extended LADN information is stored on the MT.

The command should be abortable as the extended LADN information is provided by the network.

Refer clause 9.2 for possible <err> values.

**Defined values**

<ladn\_dnn>: string type; included when the TE wants to request extended LADN information for specific LADN DNN(s). The <ladn\_dnn> is encoded as the value part of the DNN information element in 3GPP TS 24.501 [161], clause 9.11.2.1B. This parameter shall not be subject to conventional character conversion as per +CSCS.

<s-nssai>: string type in hexadecimal format; included when the TE wants to request extended LADN information for specific S-NSSAI(s). Dependent of the form, the string can be separated by dot(s) and semicolon(s). Refer parameter <S-NSSAI> in clause 10.1.1. This parameter shall not be subject to conventional character conversion as per +CSCS.

<extended\_ladn\_information\_length>: integer type; indicates the number of octets of the <extended\_ladn\_information> information element.

If the value is zero, no extended LADN information is stored on the MT.

<extended\_ladn\_information>: string type; indicates the extended LADN information for one or more LADNs, where each LADN consists of a DNN, an S-NSSAI and a tracking area identity list. The <extended\_ladn\_information> is encoded as the value part of the Extended LADN information information element in 3GPP TS 24.501 [161], clause 9.11.3.96, where each DNN is encoded as the value part of the DNN information element in 3GPP TS 24.501 [161], clause 9.11.2.1B, each S-NSSAI is coded as the length and value part of S-NSSAI information element as specified in 3GPP TS 24.501 [161], clause 9.11.2.8 starting with the second octet, and each tracking area identity list is encoded as the length and the value part of the 5GS Tracking area identity list information element as specified in 3GPP TS 24.501 [161], clause 9.11.3.9. This parameter shall not be subject to conventional character conversion as per +CSCS.

If the value is an empty string (""), no extended LADN information is stored on the MT.

**Implementation**

Optional.

\* \* \* Next Change \* \* \* \*

10.1.61a Extended LADN information +CELADN

**Table 10.1.61a-1: +CELADN parameter command syntax**

|  |  |
| --- | --- |
| **Command** | **Possible response(s)** |
| +CELADN=[<n>] | *+CME ERROR: <err>* |
| +CELADN? | +CELADN: <n>,<extended\_ladn\_information\_length>,<extended\_ladn\_information> |
| +CELADN=? | +CELADN: (list of supported <n>s) |

**Description**

The set command controls the presentation of extended LADN information to the TE by an unsolicited result code +CELADNU: <extended\_ladn\_information\_length>,<extended\_ladn\_information> when there is a change in the extended LADN information stored at the MT. For each LADN, the extended LADN information consists of a DNN, an S-NSSAI and a tracking identity list, as specified in 3GPP TS 24.501 [161], clause 9.11.3.96. If <extended\_ladn\_information\_length> has a value of zero and <extended\_ladn\_information> consists of an empty string, no extended LADN information is stored on the MT.

Read command returns <n> which indicates whether reporting of extended LADN information is enabled or disabled. The read command also returns the current values of <extended\_ladn\_information\_length> and <extended\_ladn\_information> if available.

Test command returns values supported as a compound value.

**Defined values**

<n>: integer type.

0 disable unsolicited result code +CELADNU: <extended\_ladn\_information\_length>,<extended\_ladn\_information>

1 enable unsolicited result code +CELADNU: <extended\_ladn\_information\_length>,<extended\_ladn\_information>

<extended\_ladn\_information\_length>: integer type; indicates the number of octets of the <extended\_ladn\_information> information element.

If the value is zero, no extended LADN information is stored on the MT.

<extended\_ladn\_information>: string type in hexadecimal format; indicates the extended LADN information for one or more LADNs, where each LADN consists of a DNN, an S-NSSAI and a tracking area identity list. The <extended\_ladn\_information> is encoded as the value part of the Extended LADN information information element in 3GPP TS 24.501 [161], clause 9.11.3.96, where each DNN is encoded as the value part of the DNN information element in 3GPP TS 24.501 [161], clause 9.11.2.1B, each S-NSSAI is coded as the length and value part of S-NSSAI information element as specified in 3GPP TS 24.501 [161], clause 9.11.2.8 starting with the second octet, and each tracking area identity list is encoded as the length and the value part of the 5GS Tracking area identity list information element as specified in 3GPP TS 24.501 [161], clause 9.11.3.9. This parameter shall not be subject to conventional character conversion as per +CSCS.

If the value is an empty string (""), no extended LADN information is stored on the MT.

**Implementation**

Optional.

\* \* \* Next Change \* \* \* \*

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** | |
| +C5GPDUAUTHU | | as verbose | | unsolicited | | refer clause 10.1.73 | |
| +C5GREG | | as verbose | | unsolicited | | refer clause 10.1.47 | |
| +C5GREGN3GPP | | as verbose | | unsolicited | | refer clause 10.1.85 | |
| +C5GUSMS | | as verbose | | unsolicited | | refer clause 10.1.59 | |
| +CABTSRI | | as verbose | | unsolicited | | refer clause 10.1.41 | |
| +CACSP | | as verbose | | unsolicited | | refer clause 11.1.7 | |
| +CALV | | as verbose | | unsolicited | | refer clause 8.16 | |
| +CANCHEV | | as verbose | | unsolicited | | refer clause 11.1.8 | |
| +CAPPLEVMC | | as verbose | | unsolicited | | refer clause 8.78 | |
| +CAPTT | | as verbose | | unsolicited | | refer clause 11.1.4 | |
| +CAULEV | | as verbose | | unsolicited | | refer clause 11.1.5 | |
| +CBCAP | | as verbose | | unsolicited | | refer clause 8.59 | |
| +CBCHG | | as verbose | | unsolicited | | refer clause 8.61 | |
| +CBCON | | as verbose | | unsolicited | | refer clause 8.60 | |
| +CC2APT | | as verbose | | unsolicited | | refer clause 18.2.2 | |
| +CCCM | | as verbose | | unsolicited | | refer clause 7.16 | |
| +CCSFBU | | as verbose | | unsolicited | | refer clause 8.76 | |
| +CCSTATEREQU | | as verbose | | unsolicited | | refer clause 10.1.72 | |
| +CCWA | | as verbose | | unsolicited | | refer clause 7.12 | |
| +CCWV | | as verbose | | unsolicited | | refer clause 8.28 | |
| +CDEV | | as verbose | | unsolicited | | refer clause 8.10 | |
| +CDIP | | as verbose | | unsolicited | | refer clause 7.9 | |
| +CDNSADD | | as verbose | | unsolicited | | refer clause 10.1.80 | |
| +CDUT | | as verbose | | intermediate | | refer clause 13.2.1 | |
| +CDUU | | as verbose | | unsolicited | | refer clause 13.2.1 | |
| +CECN | | as verbose | | unsolicited | | refer clause 6.28 | |
| +CECSCONFU | | as verbose | | unsolicited | | refer clause 10.1.84 | |
| +CEDRXSP | | as verbose | | unsolicited | | refer clause 7.40 | |
| +CEMBMSRI | | as verbose | | unsolicited | | refer clause 14.2.2 | |
| +CEMBMSSAII | | as verbose | | unsolicited | | refer clause 14.2.6 | |
| +CEMBMSSRVI | | as verbose | | unsolicited | | refer clause 14.2.3 | |
| +CEN1 | | as verbose | | intermediate  unsolicited | | refer clause 8.67 | |
| +CEN2 | | as verbose | | intermediate  unsolicited | | refer clause 8.67 | |
| +CEN3 | | as verbose | | intermediate  unsolicited | | refer clause 8.67 | |
| +CEN4 | | as verbose | | intermediate  unsolicited | | refer clause 8.67 | |
| +CEPTT | | as verbose | | unsolicited | | refer clause 11.1.10 | |
| +CEPSFBS | | as verbose | | unsolicited | | refer clause 8.81 | |
| +CEREG | | as verbose | | unsolicited | | refer clause 10.1.22 | |
| +CPBW | | as verbose | | intermediate | | refer clause 8.14 | |
| +CPNERU | | as verbose | | unsolicited | | refer clause 8.70 | |
| +CGBRRREP | | as verbose | | unsolicited | | refer clause 10.1.69 | |
| +CGDEL | | as verbose | | intermediate | | refer clause 10.1.29 | |
| +CGEV | | as verbose | | unsolicited | | refer clause 10.1.19 | |
| +CGREG | | as verbose | | unsolicited | | refer clause 10.1.20 | |
| +CHSR | | as verbose | | intermediate | | refer clause 6.16 | |
| +CIEV | | as verbose | | unsolicited | | refer clause 8.10 | |
| +CCIOTOPTI | | as verbose | | unsolicited | | refer clause 7.42 | |
| +CIREGU | | as verbose | | unsolicited | | refer clause 8.71 | |
| +CIREPH | | as verbose | | unsolicited | | refer clause 8.64 | |
| +CIREPI | | as verbose | | unsolicited | | refer clause 8.64 | |
| +CKEV | | as verbose | | unsolicited | | refer clause 8.10 | |
| +CLADNU | | as verbose | | unsolicited | | refer clause 10.1.61 | |
| +CELADNU | | as verbose | | unsolicited | | refer clause 10.1.61a | |
| +CLAV | | as verbose | | unsolicited | | refer clause 8.31 | |
| +CLIP | | as verbose | | unsolicited | | refer clause 7.6 | |
| +CMCCSI | | as verbose | | unsolicited | | refer clause 8.73 | |
| +CMCCSS<x> | | as verbose | | unsolicited | | refer clause 8.73 | |
| +CMCCSSEND | | as verbose | | unsolicited | | refer clause 8.73 | |
| +CME ERROR | | as verbose | | final | | refer clause 9.2.0 | |
| +CMICO | | as verbose | | unsolicited | | refer clause 10.1.55 | |
| +CMOLRE | | as verbose | | unsolicited | | refer clause 9.3.1 | |
| +CMOLRG | | as verbose | | unsolicited | | refer clause 8.50 | |
| +CMOLRN | | as verbose | | unsolicited | | refer clause 8.50 | |
| +CMSSRI | | as verbose | | unsolicited | | refer clause 10.1.z | |
| +CMTLR | | as verbose | | unsolicited | | refer clause 8.57 | |
| +CRTDCP | | as verbose | | unsolicited | | refer clause 10.1.44 | |
| +CMWN | | as verbose | | unsolicited | | refer clause 7.36 | |
| +CNAP | | as verbose | | intermediate  unsolicited | | refer clause 7.30 | |
| +CNEC\_MM | | as verbose | | unsolicited | | refer clause 9.1b | |
| +CNEC\_GMM | | as verbose | | unsolicited | | refer clause 9.1b | |
| +CNEC\_GSM | | as verbose | | unsolicited | | refer clause 9.1b | |
| +CNEC\_EMM | | as verbose | | unsolicited | | refer clause 9.1b | |
| +CNEC\_ESM | | as verbose | | unsolicited | | refer clause 9.1b | |
| +CNEMIU | | as verbose | | unsolicited | | refer clause 7.33 | |
| +CNEMS1 | | as verbose | | unsolicited | | refer clause 7.33 | |
| +CNEM5G | | as verbose | | unsolicited | | refer clause 7.33 | |
| +CNRREG | | as verbose | | unsolicited | | refer clause 10.1.47 | |
| +COEV | | as verbose | | unsolicited | | refer clause 8.10 | |
| +COLP | | as verbose | | intermediate  unsolicited | | refer clause 7.8 | |
| +CPAGTCC | | as verbose | | unsolicited | | refer clause 10.1.79 | |
| +CPAGERES | | as verbose | | unsolicited | | refer clause 10.1.78 | |
| +CPINR | | as verbose | | intermediate | | refer clause 8.65 | |
| +CPINRE | | as verbose | | intermediate | | refer clause 8.65 | |
| +CPOSR | | as verbose | | unsolicited | | refer clause 8.56 | |
| +CPNERU | | as verbose | | unsolicited | | refer clause 8.70 | |
| +CPNSTAT | | as verbose | | unsolicited | | refer clause 7.28 | |
| +CPSB | | as verbose | | unsolicited | | refer clause 7.29 | |
| +CR | | as verbose | | intermediate | | refer clause 6.9 | |
| +CREG | | as verbose | | unsolicited | | refer clause 7.2 | |
| +CREJPAG | | as verbose | | unsolicited | | refer clause 10.1.77 | |
| +CRING | | as verbose | | unsolicited | | refer clause 6.11 | |
| +CRLOSPU | | as verbose | | unsolicited | | refer clause 10.1.65 | |
| +CRTDCP | | as verbose | | unsolicited | | refer clause 10.1.44 | |
| +CRUEPOLICYU | | as verbose | | unsolicited | | refer clause 10.1.51 | |
| +CSBTSRI | | as verbose | | unsolicited | | refer clause 10.1.56 | |
| +CSCON | | as verbose | | unsolicited | | refer clause 10.1.30 | |
| +CSDBTSRI | | as verbose | | unsolicited | | refer clause 10.1.58 | |
| +CSSI | | as verbose | | intermediate | | refer clause 7.17 | |
| +CSSU | | as verbose | | unsolicited | | refer clause 7.17 | |
| +CTEV | | as verbose | | unsolicited | | refer clause 8.10 | |
| +CTZE | | as verbose | | unsolicited | | refer clause 8.41 | |
| +CTZEU | | as verbose | | unsolicited | | refer clause 8.41 | |
| +CTZV | | as verbose | | unsolicited | | refer clause 8.41 | |
| +CUNPER | | as verbose | | unsolicited | | refer clause 8.86 | |
| +CUSATEND | | as verbose | | unsolicited | | refer clause 12.2.4 | |
| +CUSATP | | as verbose | | unsolicited | | refer clause 12.2.4 | |
| +CUSATS | | as verbose | | unsolicited | | refer clause 12.2.3 | |
| +CUSD | | as verbose | | unsolicited | | refer clause 7.15 | |
| +CUUAAPT | | as verbose | | unsolicited | | refer clause 18.2.1 | |
| +CUUS1I | | as verbose | | intermediate | | refer clause 7.26 | |
| +CUUS1U | | as verbose | | unsolicited | | refer clause 7.26 | |
| +CWLANOLADI | | as verbose | | unsolicited | | refer clause 10.1.39 | |
| +CWLANOLCMI | | as verbose | | unsolicited | | refer clause 10.1.40 | |
| +DR | | as verbose | | intermediate | | refer clause 6.26 | |
| +ILRR | | as verbose | | intermediate | | refer clause 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 Change \* \* \* \*