**3GPP TSG-CT WG4 Meeting #111-eC4-224abc**

**E-Meeting, 18th – 26th August 2022 *was C4-224249***

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.503** | **CR** | **0918** | **rev** | **1** | **Current version:** | **17.7.0** |  |
|  |
| *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 |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | AreaCode for Forbidden Areas |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2022-08-24 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | As specified by TS 29.503, Forbidden Areas are defined in AM Subscription Data as an array of areas which are forbidden for the subscriber.In some use cases, a UE may be only permitted in limited areas in the network, i.e. most of the areas of the network are forbidden for the UE. To avoid store huge number of TAIs in UDM and transfer to AMF, it is suggest to use operator specific AreaCode to define large area (similar to the Zone Code in legacy), e.g. with a meaning of "All TAIs except xxx".Also similar to the Zone Code, the AreaCode for VPLMNs can also be configured in UE's subscription data with agreement between operators. |
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| ***Summary of change:*** | 1/ Add table NOTE indicating that AreaCode can be used to indicate large area to avoid provisioning and transferring big number of TAIs.2/ Table NOTE also indicates that AreaCode for VPLMN may be provisioned with agreement between operators. |
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| ***Consequences if not approved:*** | For UEs that are only permitted in limited areas, large number of forbidden in AM subscription data waste storage and network traffic bandwidth. |
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| ***Clauses affected:*** | 6.1.6.2.4 |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** | This CR does not require version update on OpenAPI files. |
|  |  |
| ***This CR's revision history:*** | Rev1:- Revert Changes for new IEs- Add table NOTE clarify the usage of AreaCode for forbidden areas- WI change to TEI17, Category change to Cat F. |

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

##### 6.1.6.2.4 Type: AccessAndMobilitySubscriptionData

Table 6.1.6.2.4-1: Definition of type AccessAndMobilitySubscriptionData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| supportedFeatures | SupportedFeatures | O | 0..1 | See clause 6.1.8 |  |
| gpsis | array(Gpsi) | O | 0..N | List of Generic Public Subscription Identifier; see 3GPP TS 29.571 [7] |  |
| internalGroupIds | array(GroupId) | O | 1..N | List of internal group identifier; see 3GPP TS 23.501 [2] clause 5.9.7 |  |
| sharedVnGroupDataIds | map(SharedDataId) | O | 1..N | A map of identifiers of shared 5G VN group data (list of key-value pairs whereGroupId serves as key; see clause 6.1.6.1).This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface. |  |
| hssGroupId | NfGroupId | O | 0..1 | Identity of the HSS group associated with the subscription, which may be used by the UDM in discovering the HSS; see 3GPP TS 29.510 [19].This attribute may be included if the coreNetworkTypeRestrictions does not indicate a value of "EPC".This attribute is only applicable to the Nudr interface and shall not be included over the Nudm interface. |  |
| subscribedUeAmbr | AmbrRm | O | 0..1 |  |  |
| nssai | Nssai | O | 0..1 | Network Slice Selection Assistance Information |  |
| ratRestrictions | array(RatType) | O | 0..N | List of RAT Types that are restricted in 5GC and EPC; see 3GPP TS 29.571 [7] (NOTE 2)Contains unique items |  |
| forbiddenAreas | array(Area) | O | 0..N | List of forbidden areas in 5GS (NOTE x, NOTE y) |  |
| serviceAreaRestriction | ServiceAreaRestriction | O | 0..1 | Subscribed Service Area Restriction (NOTE y) |  |
| coreNetworkTypeRestrictions | array(CoreNetworkType) | O | 0..N | List of Core Network Types that are restricted.The use of the value "5GC" is deprecated on Nudm and shall be discarded by the receiving AMF. |  |
| rfspIndex | RfspIndexRm | O | 0..1 | Index to RAT/Frequency Selection Priority; |  |
| subsRegTimer | DurationSecRm | O | 0..1 | Subscribed periodic registration timer; (see clause 5.20 of 3GPP TS 23.501 [2], clause 4.15.3.2.3b and 4.15.6.3a of 3GPP TS 23.502 [3] and 3GPP TS 29.571 [7]) |  |
| ueUsageType | UeUsageType | O | 0..1 |  |  |
| mpsPriority | MpsPriorityIndicator | O | 0..1 |  |  |
| mcsPriority | McsPriorityIndicator | O | 0..1 |  |  |
| activeTime | DurationSecRm | O | 0..1 | subscribed active time for PSM UEs (see clause 5.20 of 3GPP TS 23.501 [2] and clause 4.15.3.2.3b and 4.15.6.3a of 3GPP TS 23.502 [3]). |  |
| sorInfo | SorInfo | O | 0..1 | On Nudm, this IE shall be present if the UDM shall send the information for Steering of Roaming during registration or the subscription data update to the UE. The UDM may detect the need to send sorInfo by retrieving context information from the UDR.(NOTE 4) |  |
| sorInfoExpectInd | Boolean | C | 0..1 | Contains the indication on whether or not the UE is expecting to receive SoR information at initial registration.- When set to true; it indicates that the UE is expecting to receive SoR information at initial registration in a VPLMN, i.e. the UDM shall send SoR information to the AMF on Nudm even when nothing was received from UDR or SOR-AF. In case the UDM was not able to obtain SoR information, SoR information sent on Nudm shall contain the indication that "no change" is needed.- When set to false: it indicates that the UE is not expecting to receive SoR information at initial registration, i.e. the UDM shall send SoR information to the AMF based on operator policy.This attribute may be present on Nudr interface and shall be absent on UDM interface.The UDM shall ignore this attribute if the UE is not roaming out of its HPLMN. |  |
| sorafRetrieval | boolean | C | 0..1 | Contains the indication on whether or not SoR information shall be retrieved from the SOR-AF.- When set to true: it indicates that the UDM shall retrieve SoR information from the SOR-AF.- When set to false or absent: it indicates that the retrieval of SorInfo from the SOR-AF is not required.This attribute may be present on Nudr interface and shall be absent on Nudm interface.The UDM shall ignore this attribute if it is received in Nudr but the UE is not roaming out of its HPLMN. |  |
| sorUpdateIndicatorList | array(SorUpdateIndicator) | C | 1..N | When present, it contains the list of SoR Update Indicators;- It shall indicate that the AMF shall retrieve SoR information when the UE performs Registration with NAS Registration Type "Initial Registration" if the value "INITIAL\_REGISTRATION" is included;- And/or it shall indicate that the AMF shall retrieve SoR information when the UE performs Registration with NAS Registration Type "Emergency Registration" if the value "EMERGENCY\_REGISTRATION" is included.When absent on Nudm interface, it indicates that the AMF is not requested to retrieve SoR information when the UE performs Registration with either NAS Registration Type "Initial Registration" or NAS Registration Type "Emergency Registration".The UDM shall ignore this attribute if the UE is not roaming out of its HPLMN. |  |
| upuInfo | UpuInfo | O | 0..1 | This IE shall be present if the UDM shall send the information for UE Parameters Update after the UE has been successfully authenticated and registered to the 5G system. |  |
| routingIndicator | string | O | 0..1 | This IE may be sent in Nudm\_SDM notification as defined in 3GPP TS 23.502 Clause 4.20.2, if UE Parameter Update was sent for Routing Indicator Update, but without requesting the UE to re-register. |  |
| micoAllowed | MicoAllowed | O | 0..1 | Indicates whether the UE subscription allows MICO mode. |  |
| sharedAmDataIds | array(SharedDataId) | O | 0..N | Identifier of shared Access And Mobility Subscription data | SharedData |
| odbPacketServices | OdbPacketServices | O | 0..1 | Operator Determined Barring for Packet Oriented Services (NOTE 3). |  |
| subscribedDnnList | array(Dnn) | O | 0..N | List of the subscribed DNNs for the UE (including optionally the Wildcard DNN). Used to determine the list of LADN available to the UE as defined in clause 5.6.5 of TS 23.501 [2].When present, this IE shall contain the Network Identifier only. |  |
| serviceGapTime | DurationSec | O | 0..1 | Used to set the Service Gap timer for Service Gap Control (see TS 23.501 [2] clause 5.26.16 and TS 23.502 [3] clause 4.2.2.2.2). |  |
| mdtUserConsent | MdtUserConsent | O | 0..1 | When present, this IE shall indicate whether the user has given his consent for MDT activation or not (see clause 4.9 of 3GPP TS 32.422 [48]).When absent, "CONSENT\_NOT\_GIVEN" is the default value. |  |
| mdtConfiguration | MdtConfiguration | C | 0..1 | This IE shall be present if the MDT task is activated.When present, this IE shall contain MDT configuration data for UE (see clause 4.1.2.17 of 3GPP TS 32.422 [48]). |  |
| traceData | TraceData | O | 0..1 | Trace requirements about the UE, only sent to AMF in the HPLMN or one of its equivalent PLMN(s) |  |
| cagData | CagData | O | 0..1 | Closed Access Group Data.Shall be absent if both- no CAG is subscribed for the serving PLMN and- an acknowledgement from the UE is not pending. | CAGFeature |
| stnSr | StnSr | O | 0..1 | This IE shall be present if the UE is subscribed to 5G SRVCC.When present, it indicates the STN-SR (Session Transfer Number for SRVCC) of the UE. |  |
| cMsisdn | CMsisdn | O | 0..1 | This IE shall be present if the UE is subscribed to 5G SRVCC.When present, it indicates the C-MSISDN (Correlation MSISDN) of the UE. |  |
| nbIoTUePriority | NbIoTUePriority | O | 0..1 | Indicates NB IoT UE priority which is used by the NG-RAN to prioritise resource allocation between UEs accessing via NB-IoT(see clause 5.31.17 of 3GPP TS 23.501 [2]). |  |
| nssaiInclusionAllowed | boolean | O | 0..1 | Indicates that the UE is allowed to include NSSAI in the RRC connection establishment in clear text for 3GPP access, as specified in clause 5.15.9 of 3GPP TS 23.501 [2] and clause 4.2.2.2.2 of 3GPP TS 23.502 [3].true: indicates that NSSAI can be included in RRC connection establishment by the UE.false or absent: indicates that NSSAI cannot be included. |  |
| rgWirelineCharacteristics | RgWirelineCharacteristics | O | 0..1 | Indicates the RG Level Wireline Access Characteristics as specified in 3GPP TS 23.316 [37]. |  |
| ecRestrictionDataWb | EcRestrictionDataWb | O | 0..1 | Indicates Enhanced Coverage Restriction Data for WB-N1 mode.If absent, indicates Enhanced Coverage is not restricted for WB-N1 mode. |  |
| ecRestrictionDataNb | boolean | O | 0..1 | If present, this IE shall indicate whether Enhanced Coverage for NB-N1 mode is restricted or not.true: Enhanced Coverage for NB-N1 mode is restricted.false or absent: Enhanced Coverage for NB-N1 mode is allowed. |  |
| expectedUeBehaviourList | ExpectedUeBehaviourData | O | 0..1 | Indicates Expected UE Behaviour parameters associated with AMF(see clause 5.20 of 3GPP TS 23.501 [2] and clause  4.15.6.3 of 3GPP TS 23.502 [3]).This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface. |  |
| primaryRatRestrictions | array(RatType) | O | 0..N | List of RAT Types that are restricted for use as primary RAT in 5GC and EPC; see 3GPP TS 29.571 [7] (NOTE 2)Contains unique items |  |
| secondaryRatRestrictions | array(RatType) | O | 0..N | List of RAT Types that are restricted for use as secondary RAT in 5GC and EPC; see 3GPP TS 29.571 [7] (NOTE 2)Contains unique items |  |
| edrxParametersList | array(EdrxParameters) | O | 1..N | List of subscribed the extended idle mode DRX parameters (see clause 5.31.7.2.1 of 3GPP TS 23.501 [2]). |  |
| ptwParametersList | array(PtwParameters) | O | 1..N | List of subscribed the Paging Time Window parameters (see clause 5.31.7.2.1 of 3GPP TS 23.501 [2]). |  |
| iabOperationAllowed | boolean | O | 0..1 | Indicates that the UE is allowed for IAB operation as specified in 3GPP TS 23.501 [2].true: indicates that the UE is allowed for IAB operation.false or absent: indicates that the UE is not allowed for IAB operation. |  |
| adjacentPlmnRestrictions | map(PlmnRestriction) | O | 1..N | A map (list of key-value pairs where PlmnId converted to string serves as key; see 3GPP TS 29.571 [7]) of PlmnRestrictions for adjacent PLMNs |  |
| wirelineForbiddenAreas | array(WirelineArea) | O | 0..N | List of forbidden areas for 5G-BRG/5G-CRG/FN-CRG (NOTE x, NOTE y) |  |
| wirelineServiceAreaRestriction | WirelineServiceAreaRestriction | O | 0..1 | Subscribed Service Area Restriction for 5G-BRG/5G-CRG/FN-CRG (NOTE y) |  |
| pcfSelectionAssistanceInfos | array(PcfSelectionAssistanceInfo) | C | 1..N | List of combination of DNN and S-NSSAI that indicates that the same PCF needs to be selected by the AMF. (NOTE 5) |  |
| aerialUeSubInfo | AerialUeSubscriptionInfo | O | 0..1 | This IE shall contain the subscribed Aerial UE Subscription Information when present. |  |
| roamingRestrictions | RoamingRestrictions | O | 0..1 | This IE is used by Nudr\_DataRepository API starting with 3GPP Rel-17 and onwards (see Table 5.2.3.3.1-3 in 3GPP TS 29.505 [10]). If present, this IE contains information on the roaming restrictions. If this IE is absent e.g. if the UDR is not provisioned with the serving PLMN ID, then the UDM may use the UE's home subscribed profile as the default profile to handle the roaming and SNPN scenarios. |  |
| remoteProvInd | boolean | O | 0..1 | Indicates whether the UE is allowed only for Remote Provisioning as specified in clause 5.30.2.10.3.2 of 3GPP TS 23.501 [2]. UE subscription either allows, or does not allow the UE to access the PLMN as the Onboarding Network using PLMN credentials.- false (default), or the attribute is absent: indicates that the UE is not restricted to the Onboarding only;- true: indicates that the UE is allowed only for the Onboarding. |  |
| NOTE 1: AccessAndMobilitySubscriptionData can be UE-individual data or shared data. UE-individual data take precedence over shared data unless treatment instructions associated to the shared data indicate otherwise. E.g.: When an attribute of type array is present but empty within UE-Individual data and present (with any cardinality) in shared data and no treatment instructions are applicable, the empty array takes precedence. Similarly, when a nullable attribute is present with value null within the individual data and present (with any value) in shared data and no treatment instructions are applicable, the null value takes precedence (i.e. for the concerned UE the attribute is considered absent).NOTE 2: If the primaryRatRestrictions and secondaryRatRestrictions attributes are supported by the sender, the sender shall include the list of RAT Types that are restricted, if any, in the ratRestrictions attribute, shall include the list of RAT Types that are restricted for use as primary RAT, if any, in the primaryRatRestrictions attribute and shall include the list of RAT Types that are restricted for use as secondary RAT, if any, in the secondaryRatRestrictions attribute. If the primaryRatRestrictions and secondaryRatRestrictions attributes are supported by the receiver, the receiver shall use the data in the primaryRatRestrictions attribute, if received, as the list of RAT Types that are restricted for use as primary RAT, and shall use the data in the secondaryRatRestrictions attribute, if received, as the list of RAT Types that are restricted for use as secondary RAT, otherwise the receiver shall use the data in the ratRestrictions attribute, if received, as the list of RAT Types that are restricted.If the secondaryRatRestictions attribute is included in the subscription profile, the content may be sent to MME during inter RAT handover from NR SA to EN-DC, for the purpose of adequate SGW selection at MME based on subscription profile, and to avoid allocating unnecessary resources for secondary RAT at EPC if it is restricted.NOTE 3: The AMF shall take responsibility to perform PDU session related actions subject to change of OdbPacketService, e.g. release existing PDU session.NOTE 4: The UDM shall ignore the content of sorInfo received on Nudr if "sorafRetrieval" is set to true.NOTE 5: If multiple PDU sessions to one DNN and S-NSSAI are established in EPS, the AMF shall select the same PCF by configuration or by using existing method, e.g. same PCF selection in usage monitoring.NOTE x: When UE is only permitted in a small area, i.e. the UE is forbidden in most of TAIs in the PLMN, AreaCode (e.g. "All TAIs except xxx") may be used to avoid provisoning and transferring large number of TAIs. AeraCode may be used otherwise.NOTE y: AreaCode for VPLMN(s) may be provisioned under agreement between operators. |  |

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