**3GPP TSG-CT WG4 Meeting #99eC4-204abc**

**E-Meeting, 18th – 28th June 2020 *was* C4-204313**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.503** | **CR** | **0483** | **rev** | **1** | **Current version:** | **16.4.0** |  |
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| *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:***  | Corrections on 5G SoR |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | NSORAF |  | ***Date:*** | 2020-08-11 |
|  |  |  |  |  |
| ***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)* |
|  |  |
| ***Reason for change:*** | 1. If sorInfoExpectInd in AccessAndMobilitySubscriptionData is set to false, whether sorInfo shall be sent on Nudm or not should be based on operation policy according to description in TS 23.122 clause C.1, the current description is not consistent with the description in TS 23.122.
2. Added a Application Error DETACHED\_USER with 403 Forbidden for SoR Information update service operation of PP service to indicate that there is no any registered AMF (that has subscribed to receive notifications on change of AccessAndMobilitySubscriptionData) for the UE when SOR-AF provisions new SoR information by PP service.
3. Some errors
4. Data type in request body of Figure 5.6.2.2.4-1 is not right
5. Editorial error in cluase 5.2.2.6.6 and 6.1.6.2.4.
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|  |  |
| ***Summary of change:*** | 1. Improve the text with regard to how to handle in UDM after receiving SoR Information update service operation request from SOR-AF in clause 5.6.2.2.4
2. Improve the description of the attributes with regard to 5G SoR.
3. Added an Application Error DETACHED\_USER with 403 Forbidden for SoR Information update service operation of PP service.
4. Correct error in Figure 5.6.2.2.4-1, and Editorial error in clause 5.2.2.6.6 and 6.1.6.2.4.
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| ***Consequences if not approved:*** | Current description may lead to different interpretations and implementations which may raise trouble in interoperability between different vendors. |
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| ***Clauses affected:*** | 5.2.2.6.6, 5.6.2.2.4, 6.1.6.2.4, 6.5.3.2.3.1, 6.5.7.3 |
|  |  |
|  | **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 won't introduce any impact on OpenAPI specification files. |
|  |  |
| ***This CR's revision history:*** | Rev1:1. Reverted the revisions exept for revisions related to error code 403 in clause 5.2.2.6.6.
2. Reverted the revision related to attribute sorInfo, sorUpdateIndicatorList in Table 6.1.6.2.4-1.
3. Removed new text "no change" in description of attribute sorInfoExpectInd in Table 6.1.6.2.4-1
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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*The start of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.2.6.6 Triggering Update of Steering Of Roaming information

Figure 5.2.2.6.6-1 shows a scenario where the NF service consumer (e.g. AMF) sends the request to the UDM to trigger the update of Steering of Roaming information at the UE. The request contains the UE's identity (/{supi}), the type of request (/am-data/update-sor) and the VPLMN ID.



Figure 5.2.2.6.6-1: Triggering update of Steering Of Roaming information

1. The NF service consumer (e.g. AMF) sends a POST request to the resource representing the UE's Access and Mobility Subscription Data, with the request to update the Steering of Roaming information at the UE.

2. The UDM responds with "200 OK" containing the updated Sor Information.

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the POST response body.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.6.2.2.4 SoR Information update

Figure 5.6.2.2.4-1 shows a scenario where the NF service consumer (e.g. SOR-AF) sends updated SoR Information for a UE to the UDM to trigger the sending of this updated SoR Information to the UE via the AMF (as per Annex C.3 of 3GPP TS 23.122 [20]). The request contains the identifier of the UE's parameter provision data ( .../{ueId}/pp-data), the SUPI in this case, and the modification instructions.



Figure 5.6.2.2.4-1: NF service consumer updates SoR Information for a UE

1. The NF service consumer (e.g. SOR-AF) sends a PATCH request to the resource that represents a UE's modifiable subscription data, containing updated Steering of Roaming Information for a UE.

The UDM, after contacting the AUSF to perform integrity protection and getting the related information (sorMacIausf and coutersor), shall immediately convey this updated SoR Information to the concerned UE by triggering a notification to the registered AMF (that has subscribed to receive notifications on change of AccessAndMobilitySubscriptionData) for the UE, if any, as per annex C.3 of 3GPP TS 23.122 [20]. Once the subscribing AMF is notified (or when no AMF has subscribed), the UDM shall delete the updated SorInfo and shall not send it as part of AccessAndMobilitySubscriptionData to an NF (e.g. AMF) retrieving the AccessAndMobilitySubscriptionData.

2a. The UDM responds with "204 No Content".

2b. If the operation cannot be authorized due to e.g UE isn't registered in the network, HTTP status code "403 Forbidden" should be returned including additional error information in the response body (in "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the PATCH response body.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next 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. |  |
| 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) |  |
| forbiddenAreas | array(Area) | O | 0..N | List of forbidden areas in 5GS |  |
| serviceAreaRestriction | ServiceAreaRestriction | O | 0..1 | Subscribed Service Area Restriction |  |
| 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 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 |  |
| dlPacketCount | DlPacketCount | O | 0..1 | DL Buffering Suggested Packet Count indicates whether extended buffering of downlink packets for High Latency Communication is requested. |  |
| 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. |  |
| 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.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. |  |
| expectedUeBehaviour | 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. |  |
| maximumResponseTimeList | array(MaximumResponseTime) | O | 1..N | Indicates Maximum Response Time associated with AMF (see clause 5.20 of 3GPP TS 23.501 [2] and clause  4.15.6.3a of 3GPP TS 23.502 [3]).This attribute is only applicable to the Nudm interface and shall not be included over the Nudr interface. |  |
| maximumLatencyList | array(MaximumLatency) | O | 1..N | Indicates Maximum Latency associated with AMF (see clause 5.20 of 3GPP TS 23.501 [2] and clause  4.15.6.3a 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) |  |
| 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) |  |
| 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. |  |
| NOTE 1: AccessAndMobilitySubscriptionData can be UE-individual data or shared data. UE-individual data take precedence over shared data. E.g.: When an attribute of type array is present but empty within UE-Individual data and present (with any cardinality) in shared data, 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, 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. |  |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

###### 6.5.3.2.3.1 PATCH

 This method shall support the URI query parameters specified in table 6.5.3.2.3.1-1.

Table 6.5.3.2.3.1-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| supported-features | SupportedFeatures | O | 0..1 | see 3GPP TS 29.500 [4] clause 6.6 |

This method shall support the request data structures specified in table 6.5.3.2.3.1-2 and the response data structures and response codes specified in table 6.5.3.2.3.1-3.

Table 6.5.3.2.3.1-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PpData | M | 1 |  Contains the data to be provisioned or the updated SoR Information to be conveyed to a UE. |

Table 6.5.3.2.3.1-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| n/a |  |  | 204 No Content | Upon success, an empty response body shall be returned. (NOTE 2) |
| PatchResult | M | 1 | 200 OK | Upon success, the execution report is returned. (NOTE 2) |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate one of the following application errors:- USER\_NOT\_FOUND |
| ProblemDetails | O | 0..1 | 403 Forbidden | The "cause" attribute may be used to indicate one of the following application errors:- MODIFICATION\_NOT\_ALLOWED- DETACHED\_USER |
| NOTE 1: In addition common data structures as listed in table 6.2.7-1 are supported.NOTE 2: If all the modification instructions in the PATCH request have been implemented, the UDM shall respond with 204 No Content response; if some of the modification instructions in the PATCH request have been discarded, and the NF service consumer has included in the supported-feature query parameter the "PatchReport" feature number, the UDM shall respond with PatchResult. |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 6.5.7.3 Application Errors

The common application errors defined in the Table 5.2.7.2-1 in 3GPP TS 29.500 [4] may also be used for the Nudm\_ParameterProvision service. The following application errors listed in Table 6.5.7.3-1 are specific for the Nudm\_ParameterProvision service.

The application errors defined for the Nudm\_UECM service are listed in Table 6.5.7.3-1.

Table 6.5.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
| MODIFICATION\_NOT\_ALLOWED | 403 Forbidden | The subscriber does not have the necessary subscription for external parameter provisioning. |
| USER\_NOT\_FOUND | 404 Not Found | The User does not exist. |
| CREATION\_NOT\_ALLOWED | 403 Forbidden | Creation of a 5G VN Group is not allowed. |
| DETACHED\_USER | 403 Forbidden | The user is detached in the Network. |
| GROUP\_IDENTIFIER\_NOT\_FOUND | 404 Not Found | The group does not exist |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*The end of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*