**3GPP TSG-CT WG4 Meeting #98eC4-203455**

**E-Meeting, 02nd – 12th June 2020 revision of C4-200474**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.503** | **CR** | **0325** | **rev** | **2** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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:*** | SoR Info parameter Provisioning | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NSORAF | | | | |  | ***Date:*** | | | 2020-06-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The SOR-AF may at any time want to update Steering of Roaming Information at a UE. This is described in Annex C.3 of 3GPP°TS°23.122 and in the LS reply from CT1 in C4-203378:  *"The requirement of having the SOR-AF being able to request the HPLMN UDM to provide the UE with SoR information after the registration procedure of type "INITIAL REGISTRATION" (or "EMERGENCY REGISTRATION") still exists."*  *"In the present TS 23.122 specification, the subscribe/notify scheme applies only to the VPLMN use case, i.e., sending/updating SoR information when the UE is in the VPLMN.*  *However, CT1 discussed the introduction of sending/updating the SoR information to the UE in the case when the UE is located in the HPLMN. CT1 has concluded to enable this scenario as well, and to update the TS 23.122 specification as described in the agreed CR in C1-202068 attached. The CR enables providing the UE with the SoR information in the after registration case not only when the UE is registered in the VPLMN, but also when the UE is registered in the HPLMN."*  *"CT1 decided to describe the solution in C1-202793 in a generic way, enabling CT4 to select the most suitable stage-3 solution. In this solution CT1 replaces the subscribe/notify scheme enabling the SOR-AF to update the UDM with the new steering of roaming data for the already registered UE using a general update procedure".*  This CR proposes a solution to cover the above requirements based on reusing the Nudm\_PP\_Update service operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Extend the PpData type with attribute sorInfo, so the SOR-AF can use the Nudm\_PP\_Update service operation to update the Steering of Roaming Information. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | SOR-AF cannot send updated Steering Of Roaming Information for a UE to the UDM. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.6.2.2.2, 6.1.6.2.26, 6.5.6.2.2, A.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 introduces backwards compatible additions to the Nudm\_PP service with impact to TS29503\_Nudm\_PP.yaml | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev2:  A note is added to table 6.5.6.2.2-1 to say that steering of roaming information received within PpData has an operator specific short time to live. Update clause 5.6.2.2.2 to cover the case where the SOR-AF is consumer of Nudm\_PP. | | | | | | | | |

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

5.6.2.1 Introduction

For the Nudm\_ParameterProvision service the following service operations are defined:

- Update

- Create

- Delete

The Nudm\_ParameterProvision service is used by consumer NFs (e.g. NEF) to update a UE's subscription data by means of the Update service operation.

For details see 3GPP TS 23.502 [3] clause 4.15.6.2.

The Nudm\_ParameterProvision service can also be used by a NF Service Consumer (e.g. SOR-AF) to send updated Steering of Roaming Information for a UE to the UDM at any time, as specified in Annex C.3 of 3GPP°TS°23.122°[20].

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

5.6.2.2 Update

5.6.2.2.1 General

The following procedures using the Update service operation are supported:

- Subscription data update

- SoR Information update

- 5G VN Group modification

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

##### 5.6.2.2.x SoR Information update

Figure 5.6.2.2.x-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.x-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.

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

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 \* \* \* \*

6.5.3.1 Overview

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**Figure 6.5.3.1-1: Resource URI structure of the Nudm\_PP API**

Table 6.5.3.1-1 provides an overview of the resources and applicable HTTP methods.

**Table 6.5.3.1-1: Resources and methods overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource name** | **Resource URI** | **HTTP method or custom operation** | **Description** |
| PpData | /{ueId}/pp-data | PATCH | Modify the UE's modifiable subscription data  Send updated SoR Information for a UE to the UDM |
| 5GVnGroupConfiguration | /5g-vn-groups/{external-group-id} | PUT | Create a 5G VN Group |
| DELETE | Delete a 5G VN Group |
| PATCH | Modify a 5G VN Group |

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

##### 6.5.3.2.2 Resource Definition

Resource URI: {apiRoot}/nudm-pp/v1/{ueId}/pp-data

This resource shall support the resource URI variables defined in table 6.5.3.2.2-1.

Table 6.5.3.2.2-1: Resource URI variables for this resource

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 6.5.1 |
| ueId | Represents the Generic Public Subscription Identifier (see 3GPP TS 23.501 [2] clause 5.9.8) or SUPI.  pattern: See pattern of data type VarUeId in 3GPP TS 29.571 [7] |

\* \* \* 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 | Response  codes | | 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 | |
| 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 \* \* \* \*

##### 6.1.6.2.26 Type: SorInfo

Table 6.1.6.2.26: Definition of type SorInfo

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| ackInd | AckInd | M | 1 | Contains the indication on whether an acknowledgement from UE is to be requested to the UE. |
| sorMacIausf | SorMac | C | 0..1 | Contains the SoR-MAC-IAUSF. Shall be present when SorInfo is sent within AccessAndMobilitySubscriptionData on Nudm, and shall be absent when sent on Nudr or within PpData. |
| countersor | CounterSor | C | 0..1 | Contains the CounterSoR. Shall be present when SorInfo is sent within AccessAndMobilitySubscription on Nudm, and shall be absent when sent on Nudr or within PpData. |
| steeringContainer | SteeringContainer | C | 0..1 | When present, this information contains the information needed to update the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM either as an array of preferred PLMN/AccessTechnologies combinations in priority order (with the first entry in the array indicating the highest priority and the last entry indicating the lowest) or a secured packet.  If no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the USIM is needed, then this attribute shall be absent.  This attribute shall be present when SorInfo is sent within PpData. |
| provisioningTime | DateTime | M | 1 | Point in time of SorInfo provisioning at the UDR or SOR-AF. |

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

##### 6.5.6.2.2 Type: PpData

Table 6.5.6.2.2-1: Definition of type PpData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| supportedFeatures | SupportedFeatures | O | 0..1 |  |
| communicationCharacteristics | CommunicationCharacteristics | O | 0..1 | communication characteristics |
| expectedUeBehaviour | ExpectedUeBehaviour | O | 0..1 | Expected UE Behaviour Parameters |
| ecRestriction | EcRestriction | O | 0..1 | Enhanced Coverage Restriction Parameters |
| acsInfo | AcsInfoRm | O | 0..1 | Identifies the ACS Information (see TS 23.316 [37] clause 9.6.3); nullable. |
| stnSr | StnSrRm | O | 0..1 | Session Transfer Number for SRVCC |
| lcsPrivacy | LcsPrivacy | O | 0..1 | LCS Privacy Parameters (see clause 5.4.3 of 3GPP TS 23.273 [38]) |
| sorInfo | SorInfo | O | 0..1 | Steering of Roaming information to be conveyed to a UE  See NOTE°1 and NOTE°2. |
| NOTE°1: If the UDM is not able to immediately (after conducting integrity protection with the AUSF) convey the received Steering of Roaming information to the concerned UE for any reason (e.g. no AMF registered for the UE), it shall discard it.  NOTE°2: The behaviour of the UDM at reception of Steering of Roaming information within PpData is specified in Annex C.3 of 3GPP°TS°23.122°[20]. | | | | |

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

## A.6 Nudm\_PP API

openapi: 3.0.0

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*text not shown for clarity\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PpData:

type: object

properties:

communicationCharacteristics:

$ref: '#/components/schemas/CommunicationCharacteristics'

supportedFeatures:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

expectedUeBehaviourParameters:

$ref: '#/components/schemas/ExpectedUeBehaviour'

ecRestriction:

$ref: '#/components/schemas/EcRestriction'

acsInfo:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/AcsInfoRm'

stnSr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/StnSrRm'

lcsPrivacy:

$ref: '#/components/schemas/LcsPrivacy'

sorInfo:

$ref: 'TS29503\_Nudm\_SDM.yaml#/components/schemas/SorInfo'

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*text not shown for clarity\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* \* \* End Of Change \* \* \* \*