**3GPP TSG-SA2 Meeting # 146E** **(e-meeting) *S2-210xxxx***

**Elbonia, Aug 16 - 27, 2021 (revision of )**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.503** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.9.0** |  |
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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:*** | UE Policy Container with V2X Policy Provisioning Request and alignment with stage 3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eV2XARC | | | | |  | ***Date:*** | | | x |
|  |  | | | |  | |  | | |  |
| ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Per clause 6.1.2.2.2 of TS 23.503, UE Policy Container with V2X Policy Provisioning Request can be included in registration procedure, see below  *6.1.2.2.2 Distribution of the policies to UE*  *…*  *At Initial Registration or the Registration to 5GS when the UE moves from EPS to 5GS:*  *…*  *- UE may indicate the V2X Policy Provisioning Request in the UE Policy Container. If this indication is received, the PCF includes V2XP in the UE policy information as defined in clause 6.2.2 of TS 23.287 [28].*  However, the above is not aligned with stage 3. Per TS 24.501 and TS 24.587,  In Registration Request, UE policy container includes UE STATE INDICATION message but not UE Policy Provisioning Request.  UE policy container with UE Policy Provisioning Request is only included in the UE triggered V2X Policy provisioning procedure.  See below excertp from TS 24.501 and TS 24.587 below:  ==== Excerpt from TS 24.501 v17.0.0====  ***5.5.1.2.2 Initial registration initiation***  *…*  *If the UE has one or more stored UE policy sections identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN, the* ***UE shall set the Payload container type IE to "UE policy container"*** *and include the* ***UE STATE INDICATION*** *message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message. …*  ***D.6.1 UE policy delivery service message type***  *Table D.6.1.1: UE policy delivery service message type*   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *Bits* | | | | | | | | | | | | *8* | *7* | *6* | *5* | *4* | *3* | *2* | *1* | |  |  | | *…* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | |  | *Reserved* | | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *1* |  | | *MANAGE UE POLICY COMMAND message* | | *0* | *0* | *0* | *0* | *0* | *0* | *1* | *0* |  | | *MANAGE UE POLICY COMPLETE message* | | *0* | *0* | *0* | *0* | *0* | *0* | *1* | *1* |  | | *MANAGE UE POLICY COMMAND REJECT message* | | *0* | *0* | *0* | *0* | *0* | *1* | *0* | *0* |  | | ***UE STATE INDICATION message*** | | *0* | *0* | *0* | *0* | *0* | *1* | *0* | *1* |  | | ***UE POLICY PROVISIONING REQUEST*** *message (see NOTE)* | | *0* | *0* | *0* | *0* | *0* | *1* | *1* | *0* |  | | *UE POLICY PROVISIONING REJECT message (see NOTE)* | | *All other values are reserved* | | | | | | | | | | | | *NOTE: Coding and usage of* ***UE POLICY PROVISIONING REQUEST message*** *and UE POLICY PROVISIONING REJECT message are specified in* ***3GPP TS 24.587 [19B].*** | | | | | | | | | | |   === Excerpt from TS 24.587 v17.1.0====  *7.2.1 UE policy provisioning request*  *7.2.1.1 Message d**efinition*  *The UE POLICY PROVISIONING REQUEST message is sent by the UE to the PCF to request the PCF to manage V2XP, see table 7.2.1.1.1*  *Message type: UE POLICY PROVISIONING REQUEST*  *Significance: dual*  *Direction: UE to network*  *Table 7.2.1.1.1: UE POLICY PROVISIONING REQUEST message content*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | *IEI* | *Information Element* | *Type/Reference* | *Presence* | *Format* | *Length* | |  | *PTI* | *Procedure transaction identity*  *TS 24 501 [4] clause 9.6* | *M* | *V* | *1* | |  | *UE POLICY PROVISIONING REQUEST message identity* | *UE policy delivery service message type*  *TS 24 501 [4] clause D.6.1* | *M* | *V* | *1* | |  | *Requested UE policies* | *Requested UE policies*  *8.3.2* | *M* | *LV* | *2-3* | | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | In clause 6.1.2.2.2,  Move the V2X Policy provisioning out from Registration procedure.  Clarify that UE policy container with UE Policy Provisioning Request is included in the UE triggered V2X Policy provisioning procedure as specified in TS 23.287.  Correct the reference to clause 6.2.4 of TS 23.287 | | | | | | | | |
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| ***Consequences if not approved:*** | | Misalignment with stage 3 for V2X policy, and risk of wrong conclusion for ProSe procedure in Rel-17. | | | | | | | | |
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| ***Clauses affected:*** | | 6.1.2.2.2 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* START CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 6.1.2.2.2 Distribution of the policies to UE

The UE policy control enables the PCF to provide UE access selection related policy information, PDU Session related policy information and V2X Policy information to the UE, i.e. UE policies, that includes Access network discovery & selection policy (ANDSP) or UE Route Selection Policy (URSP) or V2X Policy (V2XP) or their combinations using Npcf and Namf service operations.

The PCF may be triggered to provide the UE policy information during UE Policy Association Establishment and UE Policy Association Modification procedures as defined in clause 4.16.11 and clause 4.16.12 of TS 23.502 [3].

NOTE 1: The PCF can install a PCC Rule and activate start and stop of application detection in the SMF. When the same PCF is selected for SM policy association control and UE policy association control, the reporting of start and stop of an application can trigger the installation or update of a URSP rule in the UE to send the application traffic to the PDU Session as defined in the URSP rule.

NOTE 2: The PCF can subscribe to the UDR on service specific information change, which will be taken into consideration by the PCF to determine the updated V2XP as defined in clause 4.15.6.7 of TS 23.502 [3].

Operator defined policies in the PCF may depend on input data such as UE location, time of day, information provided by other NFs, etc. as defined in clause 6.2.1.2.

The PCF includes the UE policy information delivered to the UE into a Policy Section identified by a Policy Section Identifier (PSI). The PCF may divide the UE policy information into different Policy Sections, each one identified by a PSI. Each Policy Section provides a list of self-contained UE policy information to the UE, via AMF. The PCF ensures that a Policy Section is under a predefined size limit, known by the PCF.

NOTE 3: The size limit to allow the policy information to be delivered using NAS transport is specified in TS 29.507 [13]. The size limit is configured in the PCF.

A list of self-contained UE policy information implies that:

- when the PCF delivers URSP rules to the UE, the PCF provides the list of URSP rules in the order of precedence and without splitting a URSP rule across Policy Sections;

- when the PCF delivers V2XP to the UE, the PCF provides the list of V2XP in the order of precedence and without splitting a V2XP across Policy Sections;

- when the PCF delivers WLANSP rules, the list of WLANSP rules are provided in the order of priority and without splitting a WLANSP rule across Policy Sections;

- when the PCF delivers the non-3GPP access network selection information, the whole list of non-3GPP access network selection information (as defined in clause 6.6.1.1) is provided in one Policy Section.

It is up to PCF decision how to divide the UE policy information into Policy Sections as long as the requirements for the predefined size limit and the self-contained content (described above) are fulfilled.

NOTE 4: The Policy Section list can be different per user. One PSI and its corresponding content can be the same for one or more users.

NOTE 5: The PCF may, for example, assign the URSP as one whole Policy Section, or it may subdivide the information in the URSP into multiple Policy Sections by assigning one or several URSP rules to each Policy Section.

The PLMN ID is provided to the UE together with UE policy information and it is used to indicate which PLMN a Policy Section list belongs to.

The AMF forwards the UE policy information transparently to the UE. If the (H-)PCF decides to split the UE policies to be sent to the UE, the PCF provides multiple Policy Sections separately to the AMF and then AMF uses UE configuration Update procedure for transparent UE policies delivery procedure to deliver the policies to the UE, this is defined in clauses 4.2.4.3 and clause 4.16 of TS 23.502 [3].

NOTE 6: The AMF does not need to understand the content of the UE policy, rather send them to the UE for storage.

The UE shall update the stored UE policy information with the one provided by the PCF as follows (details are specified in TS 24.501 [22]):

- If the UE has no Policy Sections with the same PSI, the UE stores the Policy Section;

- If the UE has an existing Policy Section with the same PSI, the UE replaces the stored Policy Section with the received information;

- The UE removes the stored Policy Section if the received information contains only the PSI.

The UE keeps the received UE policies stored even when registering in another PLMN. The number of UE policies to be kept stored in the UE for PLMNs other than the HPLMN is up to UE implementation. If necessary, e.g. the number of UE policies stored in UE for PLMNs exceeds the maximum value, the UE may remove earlier stored UE policy in UE.

The ANDSP for VPLMN, if provided within the UE policy in the UE Configuration Update procedure described in clause 4.2.4.3 of TS 23.502 [3], applies to the equivalent PLMN(s) indicated in the last received list of equivalent PLMNs in Registration Accept.

At Initial Registration or the Registration to 5GS when the UE moves from EPS to 5GS:

- The UE provides the list of stored PSIs which identify the Policy Sections associated to the home PLMN and the visited PLMN (if the UE is roaming) that are currently stored in the UE. If USIM is changed, the UE does not provide any PSI. If no policies are stored in the UE for the home PLMN, the UE does not provide any PSI associated to the home PLMN. If the UE is roaming and has policies for the home PLMN but no associated policies for the visited PLMN the UE includes only the list of PSIs associated to the home PLMN.

- UE may indicate its ANDSP support to the PCF. If it is received, the PCF shall take it into account for the determination on whether to provide the ANDSP to the UE. The PCF does not provide ANDSP rules to the UE if the UE does not indicate support for ANDSP.

- The UE may also provide the OSId.

The UE may trigger an Initial registration with the list of stored PSIs to request a synchronization for example if the UE powers up without USIM being changed.

During Initial Registration, the (H-)PCF retrieves the list of PSIs and its content stored in the (H-)UDR for this SUPI while the V-PCF (in the roaming scenario) retrieves the list of PSIs and its content stored in the V-UDR for the PLMN ID of this UE (alternatively, the V-PCF can have this information configured locally).

NOTE 7: The PSI list and content stored/configured for a PLMN ID can be structured according to e.g. location areas (e.g. TAs, PRAs). The V-PCF can then provide PSIs and its content only if they correspond to the current UE location.

In the roaming scenario, the V-PCF shall also forward any UE provided PSIs that are associated to the home PLMN to the H-PCF.

When the PCF (i.e. the (H-)PCF as well as the V-PCF) receives a list of PSIs associated to the PLMN of the PCF from the UE, the PCF compares the list of PSIs provided by the UE and the list of PSIs retrieved from the UDR. In addition, the PCF checks whether the list of PSIs provided by the UE or its content needs to be updated according to operator policies, e.g. change of Location and/or time. If the two lists of PSIs are different or an update is necessary according to operator policies (which includes the case that the UE did not provide a list of PSIs associated to the PLMN of the PCF), the PCF provides the changes in the list of PSIs or the corresponding content to the AMF which forwards them to the UE.

The (H-)PCF maintains the latest list of PSIs delivered to each UE as part of the information related to the Policy Association until the UE policy association termination request is received from the AMF. Then the (H-)PCF stores the latest list of PSIs and its contents in the (H-)UDR using the Nudr\_DM\_Update including DataSet "Policy Data" and Data Subset "Policy Set Entry".

The (H-)PCF may use the PEI provided by the AMF and/or the OSId provided by the UE, to determine the operating system of the UE.

If the PEI, the OSId or the indication of UE support for ANDSP is available to the PCF, the PCF stores them in the UDR using Nudr\_DM\_Create including DataSet "Policy Data" and Data Subset "UE context policy control data" when such information is received from the UE in the UE Policy Container.

If the (H-)PCF is not able to determine the operating system of the UE, and if the (H-)PCF requires to deliver URSP rules that contain Application descriptors as Traffic Descriptors, then the Traffic Descriptors of such URSP rules include multiple instances of Application descriptors each associated to supported UE operating systems by the network operator implementation.

If the (H-)PCF determines the operating system of the UE and if the (H-)PCF requires to deliver URSP rules that contain Application descriptors as Traffic Descriptors, then the Traffic Descriptors of such URSP rules include the Application descriptors associated with the operating system determined by the PCF.

NOTE 8: If the PCF does not take into account the received PEI and/or OSId then the PCF can send URSP rules containing application traffic descriptors associated to multiple operating systems.

The UE may initiate UE Triggered Policy provisioning procedure as defined in clause 6.2.4 of TS 23.287 [28]. In this procedure, the includes. Upon reception of this request,determines the applicableand initiates the UE Policy Delivery procedure defined in 4.2.4.3 of TS 23.502 [3] to deliver to the UE the required

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* END CHANGES \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*