**3GPP TSG-CT WG3 Meeting #135 *C3-243179***

**Hyderabad, IN, 27 - 31 May, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.513** | **CR** | **0550** | **rev** | **1** | **Current version:** | **18.5.0** |  |
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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:***  |  Provisioning of UE policy information |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** | UEP18, Ranging\_SL, UAS\_Ph2 |  | ***Date:*** | 2024-05-28 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
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| ***Reason for change:*** | UE Policies in the PCF have been progressively being extended to cover URSP, ANDSP, V2XP, A2XP, RLSPP and ProSeP kind of UE policies. In addition to this information the PCF also provides UE Policy information related to N2 PC5 policy information associated to the different scenarios.This information is confusing in the different procedures, referring simultaneously to UE policies and e.g. ProSeP as two different pieces of information. In other parts of the specification, the new scenarios are omitted.Clause 5.6.2.2.2 includes two figures, one of them is obsolete. |
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| ***Summary of change:*** | Non-roaming and roaming procedures related to the handling of UE policy information are updated to provide accurate information about the information that the PCF provides.Editorial correction is introduced in clause 5.6.2.2.2 since there is an obsolete figure that needs to be removed. |
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| ***Consequences if not approved:*** | Wrong and unclear procedures may bring to interoperability issues. |
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| ***Clauses affected:*** | 5.6.2.1.2; 5.6.2.1.3; 5.6.2.2.2; 5.6.2.2.3. |
|  |  |
|  | **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's revision history:*** |  |

\* \* \* \* Start of Changes \* \* \* \*

##### 5.6.2.1.2 Non-roaming



Figure 5.6.2.1.2-1: AMF-initiated UE Policy Association Modification procedure – Non-roaming

1. When the AMF detects a Policy Control Request Trigger condition is met or the old AMF transfers to the new AMF the UE Policy Association information, it invokes the Npcf\_UEPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource with information on the conditions that have changed.

NOTE 1: The old AMF transfers to the new AMF the UE Policy Association when the old AMF and the new AMF belong to the same PLMN or equivalent PLMN or belong to the same SNPN or equivalent SNPN.

 During AMF relocation, when the new AMF decides to reuse the UE Policy Association established by the old AMF with the PCF:

a. If the feature "FeatureRenegotiation" is supported, the new AMF invokes the Npcf\_UEPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource, and includes the supported features, the feature(s) related information, if applicable and other information on the conditions that have changed as described in clause 4.2.3.4 of 3GPP TS 29.525 [31].

b. If the feature "FeatureRenegotiation" is not supported, the new AMF invokes the Npcf\_UEPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource with information on the conditions that have changed.

2. The PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s). When the feature "FeatureRenegotiation" is supported, and the PCF received the features supported by the AMF, the PCF re-evaluates the negotiated features and makes the policy decision considering the resulting negotiated features and the information provided by the new AMF.

The policy decision contains the applicable Policy Control Request Trigger(s) and/or updated UE Policy and/or updated V2X N2 PC5 policy, if the "V2X" feature is supported, and/or A2X N2 PC5 policy, if the "A2X" feature is supported, and/or 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported, , and/or Ranging/SL N2 PC5 policy, if the "Ranging\_SL" feature is supported. The PCF checks if the size of determined UE policy exceeds a predefined limit the same as step 6 in clause 5.6.1.2.

 The PCF determines whether and which UE policieshave to be provisioned or updated based on the NF service consumer inputs, policy subscription and application data, if available, the UE Policy Sections previously delivered to the UE, if available, other UE parameters previously received from the UE, if available, the reported information by the AMF and local policies, as defined in 3GPP TS 29.525 [31].

3. The PCF sends an HTTP "200 OK" response to the AMF with:

a. When the feature "FeatureRenegotiation" is not supported, the applicable updated Policy Control Request Trigger(s), and potentially further information as defined in 3GPP TS 29.525 [31].

b. When the feature "FeatureRenegotiation" is supported, the complete "Individual UE Policy Association" resource representation together with the negotiated supported features as described in clause 4.2.3.4 of 3GPP TS 29.525 [31].

- For URSP provisioning in EPS, if the PCF decided to update the URSP in step 2, the PCF invokes the Npcf\_UEPolicyControl\_Update response service operation to update the URSP and the PCF for the PDU session invokes the Npcf\_UEPolicyControl\_Update request service operation to forward the response of the UE to the PCF as specified in 3GPP TS 29.525 [31]. Step 4 is not applicable for URSP provisioning in EPS.

4. If the PCF decided to update the UE policy, A2X N2 PC5 policy, V2X N2 PC5 policy, 5G ProSe N2 PC5 policy and/or Ranging/SL N2 PC5 policy in step 2, steps 12-15 as specified in Figure 5.6.1.2-1 are executed.

NOTE 2: The messages of step 4 are triggered by the Npcf\_UEPolicyControl\_Update request and some or all of them can be received by the AMF before step 3.

5-6. If the PCF decided to update the UE policy information in step 2, the PCF maintains the latest list of UE policy information delivered to the UE and updates UE policy including the latest list of UPSIs and its content in the UDR by invoking the Nudr\_DataRepository\_Update service operation. The PCF sends an HTTP PUT/PATCH request to the "UEPolicySet" resource, and the UDR sends an HTTP "204 No Content" response.

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

##### 5.6.2.1.3 Roaming



Figure 5.6.2.1.3-1: AMF-initiated UE Policy Association Modification procedure - Roaming

1. When the AMF detects a Policy Control Request Trigger condition is met the old AMF transfers to the new AMF the UE Policy Association information, it invokes the Npcf\_UEPolicyControl\_Update service operation to the V-PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource with information on the conditions that have changed.

NOTE 1: The old AMF transfers to the new AMF the UE Policy Association when the old AMF and the new AMF belong to the same PLMN or equivalent PLMN or belong to the same SNPN or equivalent SNPN.

 During AMF relocation, when the new AMF decides to reuse the UE Policy Association established by the old AMF with the V-PCF:

a. If the feature "FeatureRenegotiation" is supported, the AMF invokes the Npcf\_UEPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource, and includes the supported features, the feature(s) related information elements, if applicable and other information on the conditions that have changed as described in clause 4.2.3.4 of 3GPP TS 29.525 [31].

b. If the feature "FeatureRenegotiation" is not supported, the new AMF invokes the Npcf\_UEPolicyControl\_Update service operation to the PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource with information on the conditions that have changed.

2. The V-PCF forwards the information received from AMF in step 1 to the H-PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource if the H-PCF has subscribed the notification.

 If the V-PCF received a Namf\_Communication\_N1MessageNotify service request with a UE Policy container and/or the V-PCF is made aware of the delivery outcome of previously provided UE Policy, the V-PCF forwards the received informationto the H-PCF by sending an HTTP POST request to the "Individual UE Policy Association" resource.

NOTE 2: The V-PCF is aware of the delivery outcome either based on the response with the result of UE policy delivery from the UE or based on the AMF knowledge that the UE is temporarily unavailable.

3. The H-PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s) and/or updated UE Policy, and/or updated V2X N2 PC5 policy if the "V2X" feature is supported, and/or A2X N2 PC5 policy if the "A2X" feature is supported, and/or 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported, and/or Ranging/SL N2 PC5 policy, if the "Ranging\_SL" feature is supported.

 If the H-PCF received the response of the UE Policy delivery outcome from the V-PCF and the AF subscribed to notifications about the outcome of UE Policies delivery, steps 7-10 of clause 5.5.8 are executed.

 The H-PCF determines whether and which UE Policieshave to be provisioned or updated based on NF service consumer inputs, policy subscription and application data, if available, the UE Policy Sections previously delivered to the UE, if available, other UE parameters previously received from the UE, if available, the reported information by the V-PCF and local policies, as defined in 3GPP TS 29.525 [31].

 In addition, the H-PCF checks if the size of determined UE policy exceeds a predefined limit.

NOTE 3: NAS messages from AMF to UE do not exceed the maximum size limit allowed in NG-RAN (PDCP layer), so the predefined size limit in H-PCF is related to that limitation.

- If the size is under the limit then the UE policy information is included in Npcf\_UEPolicyControl\_Update response service operation.

- If the size exceeds the predefined limit, the H-PCF splits the UE policy information in smaller logical independent UE policy information fragments and ensures the size of each is under the predefined limit. One fragment will be sent in Npcf\_UEPolicyControl\_Update response service operation, and others will be then sent by initiating the PCF-initiated UE Policy Association Modification procedure specified in clause 5.6.2.2.3.

4. The H-PCF sends an HTTP "200 OK" response to the V-PCF with the updated policy information decided in step 3.

5. The V-PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s) and/or updated UE Policy information, if applicable. When the feature "FeatureRenegotiation" is supported, and the V-PCF received the features supported by the AMF, the V-PCF re-evaluates the negotiated features and makes the policy decision considering the resulting negotiated features and the information provided by the new AMF. The V-PCF checks if the size of determined UE policy exceeds a predefined limit the same as step 13 in clause 5.6.1.3.

 The V-PCF determines whether VPLMN ANDSP has to be provisioned or updated based on NF service consumer inputs, policy subscription for the UE PLMN, other UE parameters previously received from the UE, if available, and local policies, as defined in clauses 4.2.2.2.1.1, 4.2.2.2.2 (for ANDSP) of 3GPP TS 29.525 [31].

6. The V-PCF sends an HTTP "200 OK" response to the AMF:

a. When the feature "FeatureRenegotiation" is not supported, the applicable updated Policy Control Request Trigger(s), and potentially further information as defined in 3GPP TS 29.525 [31].

b. When the feature "FeatureRenegotiation" is supported, and the V-PCF received the features supported by the AMF, the complete "Individual UE Policy Association" resource representation together with the negotiated supported features as described in clause 4.2.3.4 of 3GPP TS 29.525 [31].

- For URSP provisioning in EPS, and LBO roaming scenarios, if the V-PCF received the URSP in step 4, the V-PCF invokes the Npcf\_UEPolicyControl\_UpdateNotify request service operation to update the URSP and the V-PCF for the PDU session invokes the Npcf\_UEPolicyControl\_Update request service operation to forward the response of the UE to the V-PCF as specified in 3GPP TS 29.525 [31].

7. If the V-PCF decided to update the UE policy information in step 5 or the V-PCF received the UE Policy, V2X N2 PC5 policy and/or A2X N2 PC5 policy and/or 5G ProSe N2 PC5 policy and/or Ranging/SL N2 PC5 policy in step 4, steps 19-24 as specified in Figure 5.6.1.3-1 are executed.

- For URSP provisioning in EPS, steps 19-22 as specified in Figure 5.6.1.3-1 are not applicable.

NOTE 4: The messages of step 7 are triggered by the Npcf\_UEPolicyControl\_Update request and some or all of them can be received by the AMF before step 6.

8-9. If the H-PCF decided to update the UE policy information in step 3, the H-PCF maintains the latest list of UE policy information delivered to the UE and updates UE policy including the latest list of UPSIs and its content in the H-UDR by invoking the Nudr\_DataRepository\_Update service operation. The PCF sends an HTTP PUT/PATCH request to the "UEPolicySet" resource, and the UDR sends an HTTP "204 No Content" response.

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

##### 5.6.2.2.2 Non-roaming



Figure 5.6.2.2.2-1: PCF-initiated UE Policy Association Modification procedure – Non-roaming

1. The PCF receives an external trigger (e.g. the subscriber policy data of a UE is changed, the applied BDT Policy Data is changed, or subscription data for the 5G VN group data is changed, or application detection), or the PCF receives an internal trigger (e.g. operator policy is changed, or a pending policy counter becomes active) to re-evaluate UE policy decision for a UE.

NOTE 1: When the external trigger affects more than one UE (e.g. when Network Performance is degraded in a network area info) the PCF will apply the next steps to all the affected active UE Policy Associations.

2-3. If the applied BDT policy Data is changed in step 1, and if the corresponding transfer policy is not locally stored in the PCF, the PCF sends the HTTP GET request to the "IndividualBdtData" resource to retrieve the related Background Data Transfer policy information (i.e. Time window and Location criteria) stored in the UDR. The UDR sends an HTTP "200 OK" response to the PCF.

4. The PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s) and/or updated UE Policy and/or updated V2X N2 PC5 policy, if the "V2X" feature is supported, and/or updated A2X N2 PC5 policy, if the "A2X" feature is supported and/or updated 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported, and/or updated Ranging/SL N2 PC5 policy if the "Ranging\_SL" feature is supported. The PCF checks if the size of determined UE policy exceeds a predefined limit the same as step 6 in clause 5.6.1.2.

4a. In non-roaming case, if the PCF determines that the policy decision depends on the status of the policy counters available at the CHF and such reporting is not established for the subscriber, the PCF initiates an Initial Spending Limit Report as defined in clause 5.3.2. If policy counter status reporting is already established for the subscriber, and the PCF decides to modify the list of subscribed policy counters, the PCF sends an Intermediate Spending Limit Report as defined in clause 5.3.3. If the PCF decides to unsubscribe any future status notification of policy counters, it sends a Final Spending Limit Report Request to cancel the request for reporting the change of the status of the policy counters available at the CHF as defined in clause 5.3.4.

5. If the PCF decided to update the Policy Control Request Trigger(s) in step4 or it needs to report the successful delivery of ANDSP/WLANSP to the AMF, the V-PCF shall invoke the Npcf\_UEPolicyControl\_UpdateNotify service operation by sending an HTTP POST request to the callback URI "{notificationUri}/update".

- For URSP provisioning in EPS, if the PCF decided to update the URSP in step 4, the PCF invokes the Npcf\_UEPolicyControl\_UpdateNotify request service operation to update the URSP and the PCF for the PDU session invokes the Npcf\_UEPolicyControl\_Update request service operation to forward the response of the UE to the PCF as specified in 3GPP TS 29.525 [31]. Step 7 is not applicable for URSP provisioning in EPS.

6. The AMF sends an HTTP “204 No Content” response to the PCF.

7. If the PCF decided to update the UE policy, V2X N2 PC5 policy and/or A2X N2 PC5 policy and/or 5G ProSe N2 PC5 policy and/or Ranging/SL N2 PC5 policy in step 4, steps 12-15 as specified in Figure 5.6.1.2-1 are executed.

8-9. If the PCF decided to update the UE policy in step 4, steps 5-6 in clause 5.6.2.1.2 are executed.

NOTE 2: When the trigger to update the UE policy is AF-based service parameter provisioning as described in clause 5.5.8, the AF requested to be notified of the outcome of the UE Policy delivery and the PCF initiated step 7 based on the AF request, then steps 7 - 10 specified in clause 5.5.8 are executed.

##### 5.6.2.2.3 Roaming



Figure 5.6.2.2.3-1: PCF-initiated UE Policy Association Modification procedure – Roaming

If the H-PCF receives a trigger, steps 1 to 4 and 10 to 11 are executed and steps 5 to 8 are omitted.

If the V-PCF receives a trigger, steps 1 to 4 and 10 to 11 are omitted and steps 5 to 8 are executed.

1. The H-PCF receives an external trigger, e.g. the subscriber policy data of a UE is changed, or the PCF receives an internal trigger, e.g. operator policy is changed, to re-evaluate UE policy decision for a UE.

2. The H-PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s) and/or updated UE Policy and/or updated V2X N2 PC5 policy, if the "V2X" feature is supported, and/or updated A2X N2 PC5 policy, if the "A2X" feature is supported and/or updated 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported, and/or updated Ranging/SL N2 PC5 policy if the "Ranging\_SL" feature is supported.

 The H-PCF determines whether and which UE Policieshave to be provisioned or updated based on policy subscription and application data, if available, the UE Policy Sections previously delivered to the UE, if available, other UE parameters previously received from the UE, if available, and local policies, as defined in 3GPP TS 29.525 [31].

 In addition, the H-PCF checks if the size of determined UE policy exceeds a predefined limit.

NOTE 1: NAS messages from AMF to UE do not exceed the maximum size limit allowed in NG-RAN (PDCP layer), so the predefined size limit in H-PCF is related to that limitation.

- If the size is under the limit then the UE policy information is included in a single Npcf\_UEPolicyControl\_UpdateNotify service operation and messages 3 to 4 are thus executed one time.

- If the size exceeds the predefined limit, the PCF splits the UE policy information in smaller logical independent UE policy information fragments and ensures the size of each is under the predefined limit. Each UE policy information fragment will be then sent in separated Npcf\_UEPolicyControl\_UpdateNotify service operations and messages 3 to 4, and 9 are thus executed several times, one time for each UE policy information fragment.

3. The H-PCF invokes the Npcf\_UEPolicyControl\_UpdateNotify service operation by sending an HTTP POST request to the callback URI "{notificationUri}/update" with the updated UE policy and/or the updated V2X N2 PC5 policy and/or the updated A2X N2 PC5 policy, and/or the updated 5G ProSe N2 PC5 policy and/or Ranging/SL N2 PC5 policy and/or Policy Control Request Trigger(s) if applicable.

4. The V-PCF sends an HTTP "204 No Content" response to the H-PCF.

5. The V-PCF receives an external trigger, e.g. operator policy in the V-UDR for the PLMN ID of this UE is changed, or the V-PCF receives an internal trigger, e.g. local policy is changed, to re-evaluate UE policy decision for a UE.

NOTE 2: When the V-PCF receives an internal or external trigger to re-evaluate the UE policy decision for the roaming UEs of a PLMN ID, the PCF applies control mechanisms to avoid signalling storms and potential network overload, as e.g. limiting the number of simultaneous updates distributing the base of visiting UEs in a time dispersion interval.

6. The V-PCF makes the policy decision including the applicable updated Policy Control Request Trigger(s) and/or updated UE Policy.

 In addition, the V-PCF checks if the size of determined UE policy and received UE policy from H-PCF in step 3 exceeds a predefined limit.

NOTE 3: NAS messages from AMF to UE do not exceed the maximum size limit allowed in NG-RAN (PDCP layer), so the predefined size limit in V-PCF is related to that limitation.

- If the size is under the limit then the UE policy information is included in a single Namf\_Communication\_N1N2MessageTransfer service operation and message 9 is thus executed one time.

- If the size exceeds the predefined limit, the V-PCF splits the UE policy information in smaller logical independent UE policy information fragments and ensures the size of each is under the predefined limit. Each UE policy information fragment will be then sent in separated Namf\_Communication\_N1N2MessageTransfer service operations and message 9 is thus executed several times, one time for each UE policy information fragment.

7. If the V-PCF needs to update the Policy Control Request Trigger(s), forward the Policy Control Request Trigger(s) received from the H-PCF in step 3, or report the successful delivery of ANDSP/WLANSP to the AMF, the V-PCF shall invoke the Npcf\_UEPolicyControl\_UpdateNotify service operation by sending an HTTP POST request to the callback URI "{notificationUri}/update".

- For URSP provisioning in EPS, and LBO roaming scenarios, if the V-PCF received the URSP in step 3, the V-PCF invokes the Npcf\_UEPolicyControl\_UpdateNotify request service operation to update the URSP and the PCF for the PDU session invokes the Npcf\_UEPolicyControl\_Update request service operation to forward the response of the UE to the V-PCF as specified in 3GPP TS 29.525 [31].

8. The AMF sends an HTTP "204 No Content" response to the PCF.

9. If the V-PCF decided to update the UE policy in step 6 or the V-PCF received the UE Policy and/or V2X N2 PC5 policy, if the "V2X" feature is supported, and/or A2X N2 PC5 policy, if the "A2X" feature is supported, and/or 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported, and/or Ranging/SL N2 PC5 policy if the "Ranging\_SL" feature is supported, in step 3, steps 19-24 as specified in Figure 5.6.1.3-1 are executed.

- For URSP provisioning in EPS, steps 19-22 as specified in Figure 5.6.1.3-1 are not applicable.

10-11. If the H-PCF decided to update the UE policy information in step 2, the steps 8-9 in clause 5.6.2.1.3 are executed.

\* \* \* \* End of change \* \* \* \*