**3GPP TSG-CT WG3 Meeting #128 *C3-232328***

**Bratislava, Slovakia, 22nd - 26th May, 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.525** | **CR** | **0262** | **rev** | **-** | **Current version:** | **18.1.0** |  |
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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 VPLMN specific URSP rules | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eUEPO | | | | |  | ***Date:*** | | | 2023-05-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | S2-2305480 agreed in SA2#156E specifies the UE includes its capability for supporting VPLMN specific URSP rules within the UE Policy Container.  TS 23.503, clause 6.1.2.2.2 specifies that the PCF provides to the UE the tuple (PLMN ID, list of PSIs associated with the PLMN ID) and the Policy sections containing URSP rules. | | | | | | | | |
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| ***Summary of change:*** | | Update clause 4.2.2.2.1.1 and 4.2.2.2.3 to indicate that when the UE indicates support of VPLMN-specific URSP rules, the PCF may provide UE Policy Sections with PLMN specific URSP rules, and the tuple (PLMN ID, UPSI of the UE Policy Sections with the PLMN ID specific URSP rules) | | | | | | | | |
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| ***Consequences if not approved:*** | | V-PLMN specific URSP rules are not delivered to the UE.  A non-supporting UE that receives VPLMN-specific URSP rules will only understand the VPLMN-specific URSP rules but will not know that they are “VPLMN-specific”. | | | | | | | | |
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| ***Clauses affected:*** | | 4.2.2.2.1.1, 4.2.2.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 23.503 CR 0961  TS 23.503 CR 1040 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not impact the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

###### 4.2.2.2.1.1 Provisioning of the UE Access Network discovery and selection policies and UE Route Selection Policy

During Initial Registration and 5GS Registration during UE mobility from EPS to 5GS, and when the UE has one or more stored UE policy sections corresponding to the serving PLMN/SNPN or HPLMN, the UE includes the "UE STATE INDICATION" message as defined in clause D.5.4.1 of 3GPP TS 24.501 [15] , whichis transferred transparently by the AMF within the "uePolReq" attribute during the creation of a policy association, as described in clause 4.2.2.1.

The (H-)PCF, or the PCF of the SNPN for the UEs subscribed to the SNPN, may store in the UDR, as specified in 3GPP TS 29.519 [17]:

a) UPSCs and related UE policy sections of the own PLMN or SNPN it provided to a UE;

b) the PEI received from the NF service consumer (e.g. AMF), if available;

c) the OSId(s) received from the UE within the "UE STATE INDICATION" message as described in the Annex D of 3GPP TS 24.501 [15], if available; and

d) the indication of UE's support for ANDSP included in the "UE STATE INDICATION" message as described in the Annex D of 3GPP TS 24.501 [15], if available.

The PCF shall retrieve from UDR the information previously stored in UDR, if not locally available, for URSP/ANDSP rule determination as specified in 3GPP TS 29.519 [17].

The V-PCF may retrieve UPSCs and related UE policy sections applicable for all UEs from a HPLMN from the V-UDR, using the HPLMN ID as key as specified in 3GPP TS 29.519 [17]. The PCF of the serving SNPN has locally configured the UPSCs and related UE policy sections applicable for all UEs other than the UEs subscribed to the SNPN.

When receiving the "UE STATE INDICATION" message, the (V-)(H-)PCF or the PCF of the serving SNPN, shall determine, based on the UPSIs, the ANDSP support indication and the OSId(s) indicated in that message, if available, the UE Policy Sections and UPSCs stored in the UDR, if available, the policy subscription data, if available, application data, if available, inputs received from the NF service consumer,and local policy, as specified in clauses 4.2.2.2.2 and 4.2.2.2.3, whether any new UE policy section(s) need to be installed and whether any existing UE policy section(s) need to be updated or deleted.

When the received "UE STATE INDICATION" message indicated that the UE supports VPLMN-specific URSP rules as specified in Annex D of 3GPP TS 24.501 [15], the (H-)PCF may determine URSP rules specific per VPLMN as specified in clauses 4.2.2.2.3. In this case, the (H-)PCF shall provide to the UE within the "MANAGE UE POLICY COMMAND" the UE policy sections containing the VPLMN-specific URSP rules and the tuple (VPLMN ID, list of UPSI(s) associated with UE policies with VPLMN-specific URSP rules).

Editor's Note: The stage 3 details about the provisioning of VPLMN-Specific URSP rules to the UE within the "MANAGE UE POLICY COMMAND" will be aligned with CT1 agreement, when ready.

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

##### 4.2.2.2.3 UE Route Selection Policy (URSP)

The UE Route Selection Policy is used by the UE to determine how to route outgoing traffic.

The UE Route Selection Policy shall consist of one or several URSP rules. The PCF determines whether URSP rule(s) have to be provisioned based on input parameters received from the NF service consumer, the received list of UPSIs from the UE, if available, the UE Policy Sections stored in the UDR, if available, other received UE parameters, if available, the policy subscription and application data retrieved from UDR, if available, analytics information received from NWDAF, if available, and local policies.

URSP rules are encoded as defined in 3GPP TS 24.526 [16].

UE Route Selection Policy may only be provided by a H-PCF or the PCF of the SNPN, but shall not be provided by a V-PCF. However, UE Route Selection Policy determined and provided by the H-PCF may be retrieved by a V-PCF from the H-PCF and forwarded to a UE.

The (H-)PCF shall use the UE policy subscription data stored in UDR as specified in 3GPP TS 29.519 [17] to ensure the values included in the Route Selection Descriptor of the generated URSP rules are always supported by subscription.

For the received list of internal group Ids, the (H-)PCF retrieves the corresponding 5G VN group configuration data stored from the UDR as specified in 3GPP TS 29.504[27] and 3GPP TS 29.505 [26], if available. For each available 5G VN group, the (H-)PCF may use the retrieved 5G VN group configuration values to encode the values for the Route Selection Descriptor and the values for the Traffic Descriptor of the generated URSP rules.

If the "EnhancedBackgroundDataTransfer" feature is supported, the (H-)PCF may retrieve the Background Data Transfer Reference ID(s) by retrieving the UE's Application Data from the UDR as defined in clause 6.2.9 of 3GPP TS 29.519 [17]. In this case, the PCF shall retrieve the transfer policy corresponding to the Background Data Transfer Reference ID(s) as defined in clause 5.2.8 of 3GPP TS 29.519 [17] and then may create the URSP rules including the Route Selection Validation Criteria for the UE as defined in clause 6.6.2.1 of 3GPP TS 23.503 [4]. If the (H-)PCF provisions the URSP rules including the Route Selection Validation Criteria for the UE, it shall use the associated S-NSSAI and DNN to store in the UDR the Background Data Transfer Reference ID(s) in the UE's session management policy data as specified in 3GPP TS 29.519 [17].

If the (H-)PCF retrieves the BDT policy and corresponding related information (e.g. network area information, the volume of data to be transferred per UE, etc.) within the BdtData data type, and the "bdtpStatus" attribute within the BdtData data type is set to value "INVALID", the (H-)PCF shall not provision the URSP rules based on the invalid BDT policy. When the BDT policy re-negotiation is completed the PCF may:

- if the new BDT Policy is determined, create or update the applicable URSP rules based on the new BDT policy; or

- if the invalid BDT policy is removed, remove applicable URSP rules.

If the "AfGuideURSP" feature is supported by the Nudr\_DataRepository service, the (H-)PCF may receive Service specific parameter information that contains data for AF guidance information on the URSP determination as defined in clause 6.4.2.15 of 3GPP TS 29.519 [17]. In this case, the (H-)PCF may also use this AF guidance information as input to determine the URSP that will be provisioned to the UE. If the received AF guidance information is not consistent with the UE subscription data, or the local operator policy does not allow the specific S-NSSAI and DNN provided by the AF guidance information, the corresponding AF guidance information shall not be used to determine the URSP rules. The PCF may also determine not to use AF guidance based on the analytics info received from the NWDAF.

When the (H-)PCF decides to provide URSP rules based on the AF guidance information, it shall derive the information as follows:

- Application traffic descriptor within the "trafficDesc" attribute is used to set the Traffic Descriptor of URSP rule (defined in Figure 5.2.2 of 3GPP TS 24.526 [16]).

- Each route selection parameter set within the "routeSelParamSets" attribute of the UrspRuleRequest data type is used to determine a Route selection descriptor (defined in Figure 5.2.2 of 3GPP TS 24.526 [16]) as follows:

- DNN (within the "dnn" attribute of the RouteSelectionParameterSet data type) and S-NSSAI (within the "snssai" attribute of the RouteSelectionParameterSet data type) from the route selection parameter set are used to set the Route selection descriptor contents (defined in Figure 5.2.4 of 3GPP TS 24.526 [16]);

- Route selection precedence (within the "precedence" attribute of the RouteSelectionParameterSet data type) is used to set the Precedence value of route selection descriptor (defined in Figure 5.2.4 of 3GPP TS 24.526 [16]); and

- the spatial validity condition (within the "spatialValidityTais" attribute of the RouteSelectionParameterSet data type) is used to set the Location criteria of the route selection descriptor (defined in Figure 5.2.5 of 3GPP TS 24.526 [16]).

- The precedence for the generated URSP rule is determined by the (H-)PCF. The (H-)PCF may use the "relatPrecedence" attribute within the "UrspRuleRequest" data type to derive the relative precedence of the URSP rule for a request coming from the same AF.

URSP rules based on AF guidance should not be set as the URSP rules with the "match all" application traffic descriptor.

The (H-)PCF may obtain the information about the UE's OS from the UE as described in the Annex D of 3GPP TS 24.501 [15] or it may derive the information about the UE's OS from the PEI provided by the NF service consumer (e.g. AMF).

If the (H-)PCF is required to provide UE policies to the UE that includes application descriptors then:

a) If the (H-)PCF has been provided with one UE's OS Id by the UE, the (H-)PCF shall use either the traffic descriptor "OS App Id type" or the traffic descriptor "OS Id + OS App Id type" as defined in 3GPP TS 24.526 [16].

NOTE 1: The (H-)PCF uses the traffic descriptor "OS Id + OS App Id type" when the (H-)PCF does not take the received UE's OS Id into account.

b) If the (H-)PCF has been provided with more than one UE's OS Id by the UE,

- the (H-)PCF shall use the traffic descriptor "OS Id + OS App Id type" for the UE's OS Id provided by the UE as defined in 3GPP TS 24.526 [16]; and

- the (H-)PCF shall not use the traffic descriptor "OS App Id type" as defined in 3GPP TS 24.526 [16].

c) If the (H-)PCF has not been provided with the UE's OS Id by the UE,

- the (H-)PCF shall use the traffic descriptor "OS Id + OS App Id type" as defined in 3GPP TS 24.526 [16]; and

- the (H-)PCF shall not use the traffic descriptor "OS App Id type" as defined in 3GPP TS 24.526 [16].

d) If the (H-)PCF has been provided with the UE's OS Id by the UE and the (H-)PCF has derived the UE's OS Id from the PEI and if there is an inconsistency between the OS Id provided by the UE and the OS Id derived from the PEI, the (H-)PCF shall use the OS Id provided by the UE for providing UE policies to the UE that include application descriptors.

URSP rules may be used to support end to end redundant user plane paths by establishing two redundant PDU sessions. PCF configuration based on e.g. deployment, terminal implementation or policies per group of UE(s) may be used by the PCF to determine whether the URSP Rules shall include PDU Session Pair ID and RSN to indicate that they refer to redundant PDU sessions or whether the UE will determine these values instead.

NOTE 2: The PCF can provide two distinct URSP rules to support end to end redundant user plane paths using Dual Connectivity for the duplicated traffic of an application. Duplicated traffic from the UE application is differentiated by two distinct traffic descriptors (different DNNs, and for IP traffic, different IP descriptors or non-IP descriptors), each one defined in a different URSP rule, so that the two redundant PDU sessions are matched to the specific Route Selection Descriptors of distinct URSP rules. These Route Selection Descriptors of distinct URSP rules may include corresponding RSNs and PDU Session Pair IDs as defined in 3GPP TS 24.526 [16]. The Route Selection Descriptors share the same PDU Session Pair ID, if included, to denote the two traffic are redundant with each other.

NOTE 3: For backward compatibility, PCF can provide a Route Selection Descriptor with PDU Session Pair ID and RSN and a Route Selection Descriptor without PDU Session Pair ID and RSN in the URSP rule. In this case, the Route Selection Descriptor with PDU Session Pair ID and RSN has a lower precedence value (i.e. higher prioritised) than the one without PDU Session Pair ID. It allows that if a non-supporting UE receives the Route Selection Descriptor containing PDU Session Pair ID, it ignores this Route Selection Descriptor.

If the (H-)PCF has been provided with the indication of the UE support of VPLMN-specific URSP rules, the (H-)PCF may determine VPLMN-specific URSP rules for the purpose to route traffic to the VPLMN, which contain, based on agreements with the VPLMN, HPLMN values for network slice selection policies and DNN selection policies. When provided, the Time window and Location criteria in each of the RSD(s) contain values that are based on agreements with VPLMN. The (H-)PCF may use application guidance on URSP determination retrieved from the UDR at HPLMN, or in case of roaming, received from the V-PCF, as input for VPLMN-specific URSP rule determination.

Editor's Note: It is FFS The stage 3 details about the provisioning in UDR of application guidance for VPLMN-Specific URSP rules determination and the V-PCF indication to the H-PCF of application guidance for VPLMN-Specific URSP rules determination.

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