**3GPP TSG-WG SA2 Meeting #165S2-240xxxx**

**Hyderabad, IN, 14th Oct – 18th Oct, 2024 (revision of S2-240xxxx)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.xxx** | **CR** | **XXXX** | **rev** | **X** | **Current version:** | **18.x.x** |  |
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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 | **X** | ME | **X** | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:*** | Title | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | WIC | | | | |  | ***Date:*** | | | 2024-08-09 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **X** |  | | | | | ***Release:*** | | | Rel-1X |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Why are the changes needed? | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Summarise the changes in one or two paragraphs | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | What would go wrong if the changes are not accepted? | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.1.2.3, 4.1.2.4, 5.y (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

Make generic for adding in 23.501

## 4.10b Differentiated services for Non-3GPP devices behind UE/5G-RG

In case of Non-3GPP devices which are not autheticable by 5GC but may e.g. be locally authenticated by the UE/5G-RG using e.g. pre-shared secret or other mechanism outside 3GPP scope. Differentiated services (QoS, network slicing) may be provided for NAUN3 devices and ??to N3GPP device identified by Non.3GPP device identifier?? as defined in this clause.

"Connectivity Group IDs" may be defined on the UE/5G-RG where each Connectivity Group ID corresponds to a separate physical or virtual port on the UE.5G-RG or to a specific N3GPP device connected behind the UE/5G-RG identified by the Connectivity Group ID. These ports could, for example, refer to separate physical ethernet ports and/or to separate WLAN SSIDs and/or to a separate VLAN. The UE/5G-RG may also associate the Connectity Group ID to a specific device connecting via a WLAN SSID. How the UE/5G-RG associated the N3GPP device that connect to a certain logical port as part of the same Connectivity Group ID or to a different Connectivity Group is based on implementation on the UE/5G-RG out of scope of this specification. As shown in the exemple in the figure 4.10b the UE/5G-RG can bind the Non-3GPP device A which is connected via the WLAN with SSID 1 to the connectivity Group 2, the Non-3GPP device B which is connected via the WLAN with SSID 1 to the connectivity Group 3 and all the other deivces connected to SSID 2 to the COnnecitivty Group 3.

Each Connectivity Group ID is then mapped to a separate PDU Session that is established by the UE/5G-RG based on the procedures defined in clause 7. The overall architecture is illustrated in Figure-4.10b-1.



Figure 4.10b-1: Example scenario for NAUN3 devices behind UE/5G-RG based on connectivity groups

The 5G-RG is configured with the (virtual) port information (e.g. VLANs and SSIDs) based on TR-69 [18], TR-360 and TR-181 [46].

URSP rules can be provided to the UE/5G-RG to indicate how to map Connectivity Group ID to the parameters of the PDU Session used to carry the traffic of corresponding associated devices e.g. DNN, S-NSSAI, etc.

Whether and how the NAUN3 devices and UIA device ? are configured to use a specific SSID and BT on UE or connect to specific SSID or a certain Ethernet port on the 5G-RG is out of scope of this specification.

Differentiation of charging and QoS may be provided via PCC rules (for different service flows) related with dedicated PDU Sessions for NAUN3 devices and UIA device ? . Isolation of devices using a specific Connectivity Group ID into a specific network slice, i.e. with separate S-NSSAI may also be provided.

\* \* \* \* Second change \* \* \* \*

Just a draft



\* \* \* \* Third change \* \* \* \*

\* \* \* \* Fourth change \* \* \* \*\change in 23.501 re adding those in 23.316

### 6.6.2 UE Route Selection Policy information

#### 6.6.2.1 Structure Description

The UE Route Selection Policy (URSP) includes a prioritized list of URSP rules.

Table 6.6.2.1-1: UE Route Selection Policy

| Information name | Description | Category | PCF permitted to modify in a URSP | Scope |
| --- | --- | --- | --- | --- |
| URSP rules | 1 or more URSP rules as specified in table 6.6.2.1-2 | Mandatory | Yes | UE context |

The structure of the URSP rules is described in Table 6.6.2.1-2 and Table 6.6.2.1-3.

Table 6.6.2.1-2: UE Route Selection Policy Rule

| Information name | Description | Category | PCF permitted to modify in a UE context | Scope |
| --- | --- | --- | --- | --- |
| Rule Precedence | Determines the order the URSP rule is enforced in the UE. | Mandatory (NOTE 1) | Yes | UE context |
| Indication for reporting URSP rule enforcement | Determines the need for reporting the URSP rule enforcement in the UE.  (NOTE 10) | Optional | Yes | UE context |
| **Traffic descriptor** | *This part defines the Traffic descriptor components for the URSP rule.* | Mandatory (NOTE 3) |  |  |
| Application descriptors | It consists of OSId and OSAppId(s) (NOTE 2, NOTE 8). | Optional | Yes | UE context |
| IP descriptors  (NOTE 6) | Destination IP 3 tuple(s) (IP address or IPv6 network prefix, port number, protocol ID of the protocol above IP) (NOTE 8, NOTE 12). | Optional | Yes | UE context |
| Domain descriptors | FQDN(s) or a regular expression which are used as a domain name matching criteria (NOTE 7, NOTE 8). | Optional | Yes | UE context |
| Non-IP descriptors  (NOTE 6) | Descriptor(s) for destination information of non-IP traffic (NOTE 8, NOTE 12). | Optional | Yes | UE context |
| DNN | This is matched against the DNN information provided by the application (NOTE 8). | Optional | Yes | UE context |
| Connection Capabilities | This is matched against the information provided by a UE application when it requests a network connection with certain capabilities (NOTE 4, NOTE 8) or traffic categories (NOTE 5). | Optional | Yes | UE context |
| PIN ID | Matched against a PIN ID for a specific PIN configured in the PEGC (NOTE 9). | Optional | Yes | UE context |
| Connectivity Group ID | Matched against a Connectivity Group ID for a specific Connectivity Group configured in the UE/ 5G-RG (NOTE 11). | Optional | Yes | UE context |
| **List of Route Selection Descriptors** | A list of Route Selection Descriptors. The components of a Route Selection Descriptor are described in table 6.6.2.1-3. | Mandatory |  |  |
| NOTE 1: Rules in a URSP shall have different precedence values.  NOTE 2: The information is used to identify the Application(s) that is(are) running on the UE's OS. The OSId does not include an OS version number. The OSAppId does not include a version number for the application.  NOTE 3: At least one of the Traffic descriptor components shall be present.  NOTE 4: The format and some values of Connection Capabilities, e.g. "ims", "mms", "internet", etc. are defined in TS 24.526 [19]. More than one Connection Capabilities value can be provided.  NOTE 5: The format and values of Connection Capabilities Traffic Descriptor to match against standardized traffic categories are defined in TS 24.526 [19] according to the requirements in GSMA PRD NG.135 [39]. The reserved values of Connection Capabilities to match operator-specific traffic categories are specified in TS 24.526 [19]. Traffic categories requested by the UE application are independent from the UE's Operating System. Operator-specific traffic categories values are out of scope of 3GPP specifications. Details on how UE applications indicate traffic categories to the UE's Operating System are out of scope of 3GPP specifications.  NOTE 6: A URSP rule cannot contain the combination of the Traffic descriptor components IP descriptors and Non-IP descriptors.  NOTE 7: The match of this Traffic descriptor does not require successful DNS resolution of the FQDN provided by the UE Application.  NOTE 8: Not applicable for PINE traffic.  NOTE 9: The PCF delivers Traffic descriptor with PIN ID based on S-NSSAI/DNN as specified in clause 6.2.1.3. PIN ID only applies to traffic to/from PINEs. PIN ID and other Traffic descriptor components are mutually exclusive, i.e. if PIN ID is included in a URSP rule, then no other Traffic descriptor components are supported in the same URSP rule.  NOTE 10: A URSP rule can contain this indication only if the URSP rule includes a Connection Capabilities Traffic descriptor.  NOTE 11: Only applies to traffic to/from NAUN3 devices behind the 5G-RG (as defined in TS 23.316 [27])and to traffic to/from N3GPP device connected behind UE/5G-RG per UIA??? and may only be combined with IP descriptors and/or non-IP descriptors in the same URSP rule.  NOTE 12: May also be applied for traffic from NAUN3 devices behind the 5G-RG (as defined in TS 23.316 [27]) and and to traffic to/from N3GPP device connected behind UE/5G-RG per UIA??? | | | | |

Table 6.6.2.1-3: Route Selection Descriptor

| Information name | Description | Category | PCF permitted to modify in URSP | Scope |
| --- | --- | --- | --- | --- |
| Route Selection Descriptor Precedence | Determines the order in which the Route Selection Descriptors are to be applied. | Mandatory (NOTE 1) | Yes | UE context |
| **Route selection components** | *This part defines the route selection components* | Mandatory (NOTE 2) |  |  |
| SSC Mode Selection | One single value of SSC mode.  (NOTE 5) | Optional | Yes | UE context |
| Network Slice Selection | Either a single value or a list of values of S-NSSAI(s). | Optional  (NOTE 3) | Yes | UE context |
| DNN Selection | Either a single value or a list of values of DNN(s). | Optional | Yes | UE context |
| PDU Session Type Selection | One single value of PDU Session Type | Conditional  (NOTE 8) | Yes | UE context |
| Non-Seamless Offload indication | Indicates if the traffic of the matching application is to be offloaded to non-3GPP access outside of a PDU Session. | Optional  (NOTE 4)  (NOTE 10) | Yes | UE context |
| ProSe Layer-3 UE-to-Network Relay Offload indication | Indicates if the traffic of the matching application is to be sent via a ProSe Layer-3 UE-to-Network Relay outside of a PDU Session. | Optional  (NOTE 4)  (NOTE 10) | Yes | UE context |
| ProSe Multi-path Preference | Indicates if the traffic of the matching application is preferred to be sent via a PDU Session over the Uu reference point and a ProSe Layer-3 UE-to-Network Relay outside of a PDU Session. | Optional  (NOTE 9)  (NOTE 10) | Yes | UE context |
| Access Type preference | Indicates the preferred Access Type (3GPP or non-3GPP or Multi-Access) when the UE establishes a PDU Session for the matching application. | Optional | Yes | UE context |
| PDU Session Pair ID | An indication shared by redundant PDU Sessions as described in clause 5.33.2.1 of TS 23.501 [2]. | Optional  (NOTE 10) | Yes | UE context |
| RSN | The RSN as described in clause 5.33.2.1 of TS 23.501 [2]. | Optional  (NOTE 10) | Yes | UE context |
| **Route Selection Validation Criteria**  (NOTE 6, NOTE 7) | *This part defines the Route Validation Criteria components* | Optional |  |  |
| Time Window | The time window when the matching traffic is allowed. The RSD is not considered to be valid if the current time is not in the time window. | Optional | Yes | UE context |
| Location Criteria | The UE location where the matching traffic is allowed. The RSD rule is not considered to be valid if the UE location does not match the location criteria. | Optional | Yes | UE context |
| NOTE 1: Every Route Selection Descriptor in the list shall have a different precedence value.  NOTE 2: At least one of the route selection components shall be present.  NOTE 3: When the Subscription Information contains only one S-NSSAI in UDR, the PCF needs not provision the UE with S-NSSAI in the Network Slice Selection information. The "match all" URSP rule has one S-NSSAI at most.  NOTE 4: If this indication is present in a Route Selection Descriptor, no other components shall be included in the Route Selection Descriptor.  NOTE 5: The SSC Mode 3 shall only be used when the PDU Session Type is IP.  NOTE 6: The Route Selection Descriptor is not considered valid unless all the provided Validation Criteria are met.  NOTE 7: To support VPLMN specific URSP rules, Location Criteria in the Route Selection Descriptor may contain VPLMN-specific values.  NOTE 8: This component shall be present when the Route Selection Component does neither include the "Non-Seamless Offload indication" nor "ProSe Layer-3 UE-to-Network Relay Offload indication".  NOTE 9: If this indication is present in a Route Selection Descriptor, ProSe Layer-3 UE-to-Network Relay Offload indication shall not be included in the Route Selection Descriptor.  NOTE 10: This indication is not applicable for PIN. | | | | |

Each URSP rule contains a Traffic descriptor (containing one or more components described in Table 6.6.2.1-2) that determines when the rule is applicable. A URSP rule is determined to be applicable when every component in the Traffic descriptor (for Traffic descriptor components other than the PIN ID) matches the corresponding information from the application, matches the information configured for a PIN (if the URSP rule contains a PIN ID Traffic descriptor component) or matches the information configured for a Connectivity Group (if the URSP rule contains a Connectivity Group ID Traffic descriptor). A URSP rule is determined not to be applicable when for any given component in the Traffic descriptor:

- No corresponding information from the application/for a PIN/for a Connectivity Group is available; or

- The corresponding information from the application/for a PIN/for a Connectivity Group does not match any of the values in the Traffic descriptor component.

NOTE 1: It is recommended to avoid listing more than two components in the Traffic descriptor of a URSP rule.

If a URSP rule is provided that contains a Traffic descriptor with two or more components, it is recommended to also provide URSP rule(s) with lower precedence and a Traffic descriptor with less components, in order to increase the likelihood of URSP rule matching for a particular application.

Each URSP rule contains a list of Route Selection Descriptors containing one or multiple Route Selection Descriptors each having a different Route Selection Descriptor Precedence value. A Route Selection Descriptor contains one or more of the following components:

- Session and Service Continuity (SSC) Mode: Indicates that the traffic of the matching application/PIN shall be routed via a PDU Session supporting the included SSC Mode.

- Network Slice Selection: Indicates that the traffic of the matching application/PIN shall be routed via a PDU Session supporting any of the included S-NSSAIs, see clause 5.15.4 in TS 23.501 [2]. It includes one or more S-NSSAI(s).

- DNN Selection: Indicates that the traffic of the matching application/PIN shall be routed via a PDU Session supporting any of the included DNNs. It includes one or more DNN(s). If a DNN Selection component is provided in the Route Selection Descriptor then the UE shall use any of the DNNs of the DNN Selection component, instead of the DNN requested by the application for the PDU Session that is used to route the traffic of the matching application. If there is no DNN Selection component in the Route Selection Descriptor, then the UE shall use the DNN requested by the application for the PDU Session that is used to route the traffic of the matching application.

NOTE 2: To provide uniform service experience for UEs from earlier Releases, when a USRP rule with a DNN in both, Traffic descriptor and Route Selection Descriptor, is provided to the UEs, the DNN(s) used in the Traffic descriptor would also need to be included in the policy for DNN replacement in the network. In addition, a lower priority Route Selection Descriptor without a DNN would also need to be provided to the UEs.

- PDU Session Type Selection: Indicates that the traffic of matching application/PIN shall be routed via a PDU Session supporting the included PDU Session Type. The possible PDU Session Types are defined in clause 5.6.10 in TS 23.501 [2].

- Non-Seamless Offload indication: Indicates that traffic of the matching application is to be offloaded to non-3GPP access outside of a PDU Session when the rule is applied. If this component is present in a Route Selection Descriptor, no other components shall be included in the Route Selection Descriptor.

- ProSe Layer-3 UE-to-Network Relay Offload indication: Indicates that the traffic of the matching application is to be sent via a ProSe Layer-3 UE-to-Network Relay outside of a PDU Session when the rule is applied. If this indication is absent and the ProSe Multipath Preference indication is absent then the traffic matching the URSP rule shall not be sent via a ProSe Layer-3 UE-to-Network Relay outside of a PDU Session. If this component is present in a Route Selection Descriptor, no other components shall be included in the Route Selection Descriptor.

- ProSe Multipath Preference indication: Indicates that the traffic of the matching application is preferred to be sent via a PDU Session over the Uu reference point and a ProSe Layer-3 UE-to-Network Relay without N3IWF outside of a PDU Session. The traffic of the matching application may be sent via a PDU Session over Uu reference point or via ProSe Layer-3 UE-to-Network Relay outside of a PDU Session when e.g. one of the paths is not available. If this indication is absent and the ProSe Layer-3 UE-to-Network Relay Offload indication is absent then the traffic matching of the URSP rule shall not be sent via a ProSe Layer-3 UE-to-Network Relay outside of a PDU Session. If this component is present in a Route Selection Descriptor, other components can be included in the Route Selection Descriptor to determine the PDU Session over the Uu reference point.

- Access Type Preference: If the UE needs to establish a PDU Session when the rule is applied, this indicates the Access Type (3GPP or non-3GPP or multi-access) on which the PDU Session should be established. The type "Multi-Access" indicates that the PDU Session should be established as a MA PDU Session, using both 3GPP access and non-3GPP access.

NOTE 3: The Access Type of 3GPP also includes the use of 5G ProSe Layer-2 UE-to-Network Relay access as defined in TS 23.304 [34]. The Access Type of non-3GPP also includes the use of 5G ProSe Layer-3 UE-to-Network Relay with N3IWF as defined in TS 23.304 [34].

- PDU Session Pair ID: An indication shared by redundant PDU Sessions as described in clause 5.33.2.1 of TS 23.501 [2].

- RSN: The RSN for redundant PDU Sessions as described in clause 5.33.2.1 of TS 23.501 [2].

NOTE 4: For backward compatibility, PCF may provide a RSD with PDU Session Pair ID and RSN and a RSD without PDU Session Pair ID and RSN in the URSP rule. In this case, the RSD with PDU Session Pair ID and RSN has a lower precedence value (i.e. higher prioritised) than the one without PDU Session Pair ID. If a non-supporting UE receives the RSD containing PDU Session Pair ID, it ignores this RSD.

NOTE 5: The UE may also set the PDU Session Pair ID and RSN parameters based on UE implementation as described in clause 5.33.2.1 of TS 23.501 [2].

- Time Window: The Route Selection Descriptor is not be considered valid unless the UE is in the time window.

- Location Criteria: The Route Selection Descriptor is not be considered valid unless the UE's location matches the Location Criteria.

NOTE 6: The structure of the URSP does not define how the PCF splits the URSP when URSP cannot be delivered to the UE in a single NAS message.

NOTE 7: It is expected that UE applications will not be able to change or override the PDU Session parameters in the URSP rules. A UE application can express preferences when it requests a network connection (e.g. certain Connection Capabilities), which can be mapped into specific PDU Session parameters by the URSP rules.

NOTE 8: A Route Selection Descriptor can include a Time Window and/or a Location Criteria or neither a Time Window nor a Location Criteria. A URSP rule can include RSDs with or without validation criteria at the same time.

In the case of network rejection of the PDU Session Establishment Request, the UE may trigger a new PDU Session establishment based on the rejection cause and the URSP policy.

When the PCF provisions URSP rules to the UE, one URSP rule with a "match all" Traffic descriptor may be included.

NOTE 9: When URSP rules containing NSSP are available to the UE and the URSP rule with the "match all" Traffic descriptor is not part of them, a UE application that has no matching URSP rule and no UE Local Configuration cannot request a network connection.

The URSP rule with the "match all" Traffic descriptor is used to route the traffic of applications which do not match any other URSP rules and shall therefore be evaluated as the last URSP rule, i.e. with lowest priority. There shall be only one Route Selection Descriptor in this URSP rule. The Route Selection Descriptor in this URSP rule includes at most one value for each Route Selection Component.

NOTE 10: How to set the URSP rule with the "match all" Traffic descriptor as the URSP rule with lowest priority is defined in TS 24.526 [19].

NOTE 11: The URSP rule with the "match all" Traffic descriptor is not applicable to PINE traffic.

If a URSP rule is provided with an Indication for reporting URSP rule enforcement, the UE follows the procedures specified in clause 6.6.2.4.

#### 6.6.2.2 Configuration and Provision of URSP

##### 6.6.2.2.1 General

The UE may be provisioned (signalled) with URSP rules by PCF of the HPLMN. When the UE is roaming, the PCF in the HPLMN may update both the non-VPLMN specific and VPLMN specific URSP rules in the UE. For URSP rules, the UE shall support the provisioning (signalling) from the PCF in the HPLMN, as specified in TS 24.501 [22]. In addition, the UE may be also pre-configured with URSP rules (e.g. by the operator).

Only the URSP rules provisioned (signalled) by the PCF are used by the UE, if both URSP rules provisioned (signalled) by the PCF and pre-configured URSP rules are present. If no URSP rule is provisioned (signalled) by the PCF, and the UE has pre-configured rules configured in both the USIM and ME, then only the pre-configured URSP rules configured in the USIM is used.

If the PCF receives application guidance for URSP determination that may apply to a given UE from UDR or from V-PCF as specified in clause 4.15.6.7 of TS 23.502 [3], the PCF may verify the requested parameters (which are described in clauses 4.15.6.7 and 4.15.6.10 of TS 23.502 [3]) with regards to the existing URSP rules and (re-)compose the URSP rules for the UE as described in clause 6.6 of TS 23.548 [33].

##### 6.6.2.2.2 URSP rules for an SNPN-enabled UE

An SNPN-enabled UE, while registered in an SNPN, may be provisioned (signalled) with URSP rules by the PCF of the SNPN. For URSP rules, the UE shall support the provisioning (signalling) from the PCF in the SNPN as specified in TS 24.501 [22]. In addition, the UE may be also pre-configured with URSP rules for the SNPN (e.g. by the operator of the SNPN).

When an SNPN-enabled UE accesses an SNPN using credentials from a Credentials Holder (CH), the UE may also be provisioned (signalled) with URSP rules for the SNPN by the PCF of the SNPN. However, the UE may be required to not accept URSP rules signalled by any SNPN that the UE accesses using CH credentials from a CH as specified in TS 24.501 [22], as follows:

- by (pre-)configuration by the PLMN or SNPN of which the CH is part of (when applicable); or

- by provisioning (signalling) by the PLMN or SNPN of which the CH is part of, when the UE is registered in that PLMN or SNPN.

NOTE 1: A network (PLMN or SNPN) when operating as a CH (see clause 5.30.2.9 of TS 23.501 [2]) does not provide PCF functionality i.e. the PCF of this network cannot provision (signal) URSP rules to the UE when the UE is accessing an SNPN using CH credentials from this network operating as a CH.

If a UE accesses an SNPN using credentials from a CH, the UE applies URSP rules as follows:

- The UE first evaluates (in precedence order) the URSP rules, if any, provisioned (signalled) by the PCF of this SNPN, except the URSP rule with the "match all" Traffic descriptor, following the procedure described in clause 6.6.2.3.

- If none of the above URSP rules received from this SNPN match, or if there is no URSP rules except the URSP rule with the "match all" Traffic descriptor received from this SNPN (or if the UE is required to not accept any URSP rules from any SNPN), then the UE evaluates (in precedence order) the URSP rules, if any, provisioned (signalled) by the PCF of the network (HPLMN or SNPN) holding the credentials when previously registered in the network holding the credentials, except the URSP rule with the "match all" Traffic descriptor, following the procedure described in clause 6.6.2.3.

- If there is no matching URSP rules according to the above, the UE uses UE Local Configuration if any.

- If no UE Local Configuration matches or there is no UE Local Configuration, the UE applies the URSP rule with the "match all" Traffic descriptor as follows:

- The UE first uses the URSP rule with the "match all" Traffic descriptor, if any, provisioned (signalled) by the PCF of this SNPN, following the procedure described in clause 6.6.2.3.

- If there is no URSP rule with the "match all" Traffic descriptor from provisioned (signalled) by the PCF of this SNPN, then the UE uses the URSP rule with the "match all" Traffic descriptor, if any, provisioned (signalled) by the PCF of the network (HPLMN or SNPN) holding the credentials when previously registered in the network holding the credentials, following the procedure described in clause 6.6.2.3.

The UE keeps the received UE policies stored even when registering in another SNPN. The number of UE policies to be kept stored in the UE for SNPNs other than the subscribed SNPN is up to UE implementation. If necessary, the UE may remove earlier stored UE policy in UE.

If the UE is in an SNPN, at Initial Registration:

- The UE provides the list of stored PSIs which identify the Policy Sections associated to the serving SNPN that are currently stored in the UE. If USIM is changed or the selected entry of "list of subscriber data" is updated, the UE does not provide any PSI. If no policies are stored in the UE for the serving SNPN, the UE does not provide any PSI associated to the serving SNPN.

The PCF of the serving SNPN retrieves the list of PSIs and its content stored in the UDR of the serving SNPN for the UEs subscribed to the SNPN; for other UEs, the PCF of the serving SNPN has this information locally configured.

NOTE 2: The PSI list and content stored/configured for a SNPN ID can be structured according to e.g. location areas (e.g. TAs, PRAs). If the UE is in an SNPN, the PCF of the serving SNPN can then provide PSIs and its content only if they correspond to the current UE location.

##### 6.6.2.2.3 Void

#### 6.6.2.3 UE procedure for associating applications to PDU Sessions based on URSP

For every newly detected application/PIN the UE evaluates the URSP rules in the order of Rule Precedence and determines if the application/PIN is matching the Traffic descriptor of any URSP rule. When a URSP rule is determined to be applicable for a given application/PIN (see clause 6.6.2.1), the UE shall select a Route Selection Descriptor within this URSP rule in the order of the Route Selection Descriptor Precedence.

When a valid Route Selection Descriptor is found, the UE determines if there is an existing PDU Session that matches all components in the selected Route Selection Descriptor. The UE compares the components of the selected Route Selection Descriptor with the existing PDU Session(s) as follows:

- For a component which only contains one value (e.g. SSC mode), the value of the PDU Session has to be identical to the value specified in the Route Selection Descriptor.

- For a component which contains a list of values (e.g. Network Slice Selection), the value of the PDU Session has to be identical to one of the values specified in the Route Selection Descriptor.

- When some component(s) is not present in the Route Selection Descriptor, a PDU Session is considered matching only if it was established without including the missing component(s) in the PDU Session Establishment Request.

- When the Route Selection Descriptor includes a Time Window or a Location Criteria, the PDU Session is considered matching only if the PDU Session is associated with an RSD that has the same Time Window or a Location Criteria Validity Conditions.

When a matching PDU Session exists the UE associates the application/PIN to the existing PDU Session, i.e. route the traffic of the detected application/PIN on this PDU Session.

If the UE determines that there is more than one existing PDU Session which matches (e.g. the selected Route Selection Descriptor only specifies the Network Slice Selection, while there are multiple existing PDU Sessions matching the Network Slice Selection with different DNNs), it is up to UE implementation to select one of them to use.

NOTE 1: When more than one PDU Sessions of SSC mode 3 to the same DNN and S-NSSAI exist due to PDU Session anchor change procedure as described in clause 4.3.5.2 of TS 23.502 [3], the UE can take the PDU Session Address Lifetime value into account when selecting the PDU Session.

If none of the existing PDU Sessions matches, the UE tries to establish a new PDU Session using the values specified by the selected Route Selection Descriptor. If the PDU Session Establishment Request is accepted, the UE associates the application/PIN to this new PDU Session. If the PDU Session Establishment Request is rejected, based on the rejection cause, the UE selects another combination of values in the currently selected Route Selection Descriptor if any other value for the rejected component in the same Route Selection Descriptor can be used. Otherwise, the UE selects the next Route Selection Descriptor, which contains a combination of component value which is not rejected by network, in the order of the Route Selection Descriptor Precedence, if any. If the UE fails to establish a PDU Session with any of the Route Selection Descriptors, it tries other URSP rules in the order of Rule Precedence with matching Traffic descriptors, except the URSP rule with the "match-all" Traffic descriptor, if any. The UE shall not use the UE Local Configuration in this case.

NOTE 2: An application can match the Traffic descriptor of different URSP rules and be associated with different PDU Sessions simultaneously.

If a UE receives tuple(s) (PLMN ID, list of PSIs associated with the PLMN ID), the UE uses the URSP rules associated with the PSIs indicated in the tuple(s) as VPLMN specific URSP rules and the UE uses the URSP rules associated with the PSI not indicated in the tuple(s) as non-VPLMN specific URSP rules.

If a UE receives VPLMN specific URSP rules and non-VPLMN specific URSP rules (i.e. the URSP rules which are applicable to both HPLMN and VPLMN), the VPLMN specific URSP rules take precedence over the non-VPLMN specific URSP rules and Local UE Configuration and any other URSP rules provided to the UE. The UE determines VPLMN specific URSP rules to be used taking serving PLMN ID into consideration. If the UE does not find a match to the VPLMN specific URSP rules associated to serving PLMN ID, then the UE uses the VPLMN specific URSP rules associated to the equivalent serving PLMN ID, if any. Otherwise, the UE uses the non-VPLMN specific URSP rules.

The UE receives the updated URSP rules and (re-)evaluates their validities in a timely manner when certain conditions are met, for example:

- the URSP is updated by the PCF;

- the UE moves from EPC to 5GC;

- change of Allowed NSSAI or Configured NSSAI;

- change of LADN DNN availability;

- change of PLMN;

- UE registers over 3GPP or non-3GPP access;

- UE establishes a connection with a ProSe Layer-3 UE-to-Network Relay;

- UE establishes connection to a WLAN access.

Details of the conditions are defined by TS 24.526 [19].

NOTE 3: When providing the updated URSP rules to the UE with a new DNN, the PCF can set the SMF selection management trigger in the AMF to contact the PCF at PDU Session establishment (as specified in clause 6.1.2.5) if the old DNN is requested by the UE.

The Route Selection Descriptor of a URSP rule shall be only considered valid if all of the following conditions are fulfilled:

1) If any S-NSSAI(s) is present, the S-NSSAI(s) is in the Allowed NSSAI or in the Partially Allowed NSSAI for the non-roaming case and in the mapping of the Allowed NSSAI (or of the Partially Allowed NSSAI) to HPLMN S-NSSAI(s) for the roaming case.

2) If any DNN is present and the DNN is an LADN DNN, the UE is in the area of availability of this LADN.

3) If Access Type preference is present and set to Multi-Access, the UE supports ATSSS.

4) If a Time Window is present and the time matches what is indicated in the Time Window.

5) If a Location Criteria is present and the UE location matches what is indicated in the Location Criteria.

6) If ProSe Layer-3 UE-to-Network Relay Offload indication is present and the UE supports the ProSe capability of 5G ProSe Layer-3 Remote UE.

7) If ProSe Multipath Preference indication is present and the UE supports the ProSe capability of 5G ProSe Layer-3 Remote UE.

8) If Connectivity Group ID is present and the UE/5G-RG supports the identification of N3GPP device connecting behind the UE/5G-RG for QoS traffic differentiation as defined in TS 23.501 clause x.y.z.

If none of the conditions in bullet 1) are met for all the S-NSSAI(s) in the RSD during the validation of the route selection descriptor, the UE shall attempt to meet the condition by requesting any of the S-NSSAI(s) in the RSD through a Mobility Registration Update procedure to attempt to add the S-NSSAI(s) to the Allowed NSSAI (or to the Partially Allowed NSSAI), as specified in clause 5.15.5.2.2 of TS 23.501 [2]. The UE attempts the Mobility Registration Update for a S-NSSAI only if the S-NSSAI is in the Configured NSSAI or, in the roaming case, in the mapping of the S-NSSAIs of the Configured NSSAI for the VPLMN to the corresponding S-NSSAI values of the HPLMN, and any other restrictions to prevent triggering Mobility Registration Update as defined in TS 24.501 [22].

If a matching URSP rule has no valid RSD, the UE tries other URSP rules in the order of Rule Precedence with matching Traffic descriptors, except the URSP rule with "match-all" Traffic descriptor. The UE shall not use the UE Local Configuration in this case.

When URSP rules are updated or their validity according to the conditions above change, the association of existing applications/PINs to PDU Sessions may need to be re-evaluated. The UE may also re-evaluate the application/PIN to PDU Session association due to the following reasons:

- periodic re-evaluation based on UE implementation;

- an existing PDU Session that is used for routing traffic of an application/PIN based on a URSP rule is released;

- The expiration of Time Window in Route Selection Validation Criteria, i.e. the expiration of Time Window, or UE's location no longer matches the Location Criteria.

- change of PLMN.

NOTE 4: It is up to UE implementation to avoid frequent re-evaluation due to location change.

If the re-evaluation leads to a change of the application/PIN to PDU Session association, e.g. the application/PIN is to be associated with another PDU Session or a new PDU Session needs to be established, the UE may enforce such changes in a timely manner based on implementation, e.g. immediately or when UE enters CM-IDLE state.

If the selected Route Selection Descriptor contains a Non-Seamless Offload indication and the UE has established a connection to a WLAN access, the UE routes the traffic matching the Traffic descriptor of the URSP rule via the WLAN access outside of a PDU Session.

If the selected Route Selection Descriptor contains a ProSe Layer-3 UE-to-Network Relay Offload indication and the UE has established a connection with a ProSe Layer-3 UE-to-Network Relay, the UE routes the traffic matching the Traffic descriptor of the URSP rule (including the URSP rule with the "match-all" Traffic descriptor) via the ProSe Layer-3 UE-to-Network Relay outside of a PDU Session.

The 5G-RG and FN-RG procedure for associating applications to PDU Sessions based on URSP is defined in clause 9.5.2 of TS 23.316 [27].

\* \* \* \* Fifth change \* \* \* \*

The text in yellow is the text in 23.316 to be changed in case that Connecity group is added as solution

### 9.5.2 UE access selection and PDU Session selection related policy information

#### 9.5.2.1 5G-RG

This clause specifies the delta related to UE policy distribution defined in TS 23.503 [4] clause 6.1.2.2 and related to URSP defined in TS 23.503 [4] clause 6.6. for 5G-RG.

If the PCF provides the URSP policy to the 5G-RG, the PCF should neither include NSWO indication nor any ANDSP policies. The 5G-RG shall ignore any NSWO indication or any ANDSP policies if received from the 5GC. The 5G-RG shall use the URSP policy as specified in TS 23.503 [4], for example for the association of application and PDU session, slices, etc.

The URSP indicates for the application of Auto-Configuration Server (ACS) which PDU session type, NSSAI and/or DNN is to be used. The 5G-RG establishes the connectivity to the management entity (e.g. ACS) via user plane connection on a PDU session according to the URSP.

UE Policy procedures defined in clause 6.1.2.2 of TS 23.503 [4] are applicable as follows:

- Roaming is not applicable to W-5GAN access in this release of specification.

In order to support the case when AUN3 devices may be connected via 5G-RG, specific URSP rules may be configured by the PCF for the SUPI associated with the AUN3 device.

UE Route Selection Policy information targeting an AUN3 device (i.e. sent to a 5G-RG in the NAS connection corresponding to an AUN3 device) follows the structure defined in clause 6.2.2 of TS 23.503 [4] with following differences:

- As an AUN3 can have only one PDU Session, its URSP shall contain a match all TD.

In order to support the case when NAUN3 devices may be connected via 5G-RG, specific URSP rules may be configured by the PCF on 5G-RG.

URSP rules for NAUN3 devices connected to 5G-RG follow the structure defined in clause 6.6.2 of TS 23.503 [4] and may contain any combination of the following traffic descriptors:

- **IP Descriptors:** For IP traffic from NAUN3 devices connected to 5G-RG, IP descriptors are matched against header information contained in IP packets sent by NAUN3 devices; IP descriptors are only applicable for traffic from NAUN3 devices if network address translation (NAT) is performed for that traffic.

- **Non-IP descriptors:** For Ethernet traffic from NAUN3 devices connected to 5G-RG, Non-IP descriptors are matched against header information contained in Ethernet frames sent by NAUN3 devices.

- **Connectivity Group ID:** For traffic from a NAUN3 device connected to 5G-RG, Connectivity Group ID in the URSP rule is matched against the Connectivity Group ID that the NAUN3 device is associated with (see clause 4.10b).

\* \* \* \* End of changes \* \* \* \*