**SA WG2 Meeting #166 *S2-24xxxxx***

**18 – 22 Nov, 2024, Orlando, USA** (was\_S2-2410540)

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **23.503** | **CR** | **1424** | **rev** | **1** | **Current version:** | **19.1.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **x** |

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|  |
| ***Title:***  | TS23.503 - UE Energy Credit |
|  |  |
| ***Source to WG:*** | NEC |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | EnergySys |  | ***Date:*** | 2024-11-02 |
|  |  |  |  |  |
| ***Category:*** | ***B*** |  | ***Release:*** | Rel-19 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | SP#105 approved the WID on Energy Efficiency and Energy saving in SP-241388 with the following requirements in WT2:*The objective of this WT is to specify the enhancements for subscription and policy control to enable network energy savings as service criteria based in WT#1. The following enhancements will be specified:**- The definition of energy saving subscription information per UE that is stored as part of the subscription data in the UDM/UDR, to assist the network to perform energy saving strategies for the UE**- The detailed procedures for the PCF to receive UE subscription data and notification related to the energy related information to trigger making policy decisions (reusing the existing parameters).* |
|  |  |
| ***Summary of change:*** | Based on the WT2 requirements from the agreed Energy Efficiency and Energy saving WI and also based on solution #14 from TR23.700-66 on energy usage control, this CR introduces UE Energy Credit for UE energy usage control. |
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| ***Consequences if not approved:*** | A new agreed feature would not be implemented in the 3GPP specifications. |
|  |  |
| ***Clauses affected:*** |  6.2.1.3 |
|  |  |
|  | **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 1st change \* \* \* \*

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6.2.1.3 Policy control subscription information management

The PCF may request subscription information at PDU Session establishment, PDU Session modification, during AM Policy Association Establishment procedure and during the UE Policy Association Establishment procedure.

The PCF may receive notifications on changes in the subscription information. Upon reception of a notification, the PCF shall make the policy control decisions necessary to accommodate the change in the subscription and shall update the SMF and/or the AMF if needed.

NOTE 1: How the PCF provisions/retrieves information related with policy control subscription data is defined in TS 23.501 [2].

The policy control subscription profile information provided by the UDR during the UE Policy Association Establishment procedure using Nudr service for Data Set "Policy Data" and Data Subset "UE context policy control data" is described in Table 6.2.1.3-1:

**Table 6.2.1.3-1: UE context policy control subscription information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Subscriber categories | List of category identifiers associated with the subscriber | Optional |
| Tracing Requirements | Tracing requirements as defined in TS 32.421 [18] | Optional |
| PEI | The Permanent Equipment Identifier of the UE. | Optional |
| OSId | Identifies the operating system supported by UE. | Optional |
| Indication of UE support for ANDSP | Indicates the UE support for ANDSP. | Optional |
| Indication of URSP Provisioning Support in EPS | Indicates the UE support for URSP Provisioning in EPS. | Optional |
| S-NSSAI subscription information | Contains the list of subscribed S-NSSAIs, its associated subscribed DNNs. For each DNN, it includes the Allowed PDU Session types, the Allowed SSC modes, LBO roaming allowed indication and the ATSSS information (NOTE 1). | Optional |
| Subscriber spending limits control | Indicates whether the PCF must enforce UE policies based on subscriber spending limits. | Optional |
| Subscriber spending limits information | List of policy counter identifiers and statuses of these policy counters relevant for UE policy control. | Optional |
| CHF address | The address of the Charging Function and optionally the associated CHF instance ID and CHF set ID (see clause 6.3.1.0 of TS 23.501 [2]). | Optional |
| Restricted Status | Indicates that the UE has a status of Restricted, lists its accompanying reason(s) and the Time stamp of when this status was stored (NOTE 2). | Optional |
| Indication of UE capability of reporting URSP rule enforcement to network | Indicates the UE support for reporting URSP rule enforcement to network. | Optional |
| Indication of VPLMN specific URSP rule support | Indicates the UE support of VPLMN specific URSP rules. | Optional |
| NOTE 1: ATSSS information is defined in Table 5.2.3.3.1-1 of TS 23.502 [3] and Indicates whether MA PDU Session establishment is allowed.NOTE 2: Accompanying reason is according to Exception IDs defined in Table 6.7.5.1-1 of TS 23.288 [24]. For example, Unexpected UE location. |

NOTE 2: S-NSSAI subscription information can be part of UE context policy control subscription information and Session Management Subscription data/Slice Selection Subscription data. UDR implementation and the provisioning system are responsible for keeping the consistency of this information when both Data Sets are stored in the same UDR. The provisioning system is responsible for keeping the consistency of this information when both Data Sets are stored in different UDRs.

The policy control subscription profile information provided by the UDR at PDU Session establishment, using Nudr service for Data Set "Policy Data" and Data Subset "PDU Session policy control data" is described in Table 6.2.1.3-2.

**Table 6.2.1.3-2: PDU Session policy control subscription information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Allowed services | List of subscriber's allowed service identifiers. | Optional |
| Subscriber categories  | List of category identifiers associated with the subscriber. | Optional |
| Subscribed GBR | Maximum aggregate bitrate that can be provided across all GBR QoS Flows for the DNN and S-NSSAI. | Optional |
| ADC support | Indicates whether application detection and control can be enabled for a subscriber. | Optional |
| Subscriber spending limits control | Indicates whether the PCF must enforce session management related policies based on subscriber spending limits. | Optional |
| Subscriber spending limits information | List of policy counter identifiers and statuses of the policy counters relevant for session management related policy control. | Optional |
| IP index information | Information that identifies the IP Address allocation method during PDU Session establishment. | Optional |
| Background Data Transfer Reference ID(s) | Reference ID(s) for Background Data Transfer Policies that apply to the UE. | Optional |
| Local routing indication | Indication on whether AF influence on traffic routing is allowed or not allowed. | Optional |
| Service Function Chaining influence indication | Indication on whether AF influence on Service Function Chaining is allowed or not allowed. | Optional |
| Subscribed UE-Slice-MBR(s) | List of maximum aggregated uplink and downlink MBRs to be shared across all GBR and Non-GBR QoS Flows related to the same S-NSSAI according to the subscription of the user. There is a single uplink and a single downlink value per S-NSSAI. | Conditional (NOTE 2) |
| Restricted Status | Indicates that the UE has a status of Restricted, lists its accompanying reason(s) and the Time stamp of when this status was stored (NOTE 3). | Optional |
| **Charging related information** | This part defines the charging related information in the policy control subscription profile. |  |
| Default charging method | Default charging method for the PDU Session (online / offline). | Optional |
| CHF address | The address of the Charging Function and optionally the associated CHF instance ID and CHF set ID (see clause 6.3.1.0 of TS 23.501 [2]). | Optional |
| **Usage monitoring related information** | This part includes a list of usage monitoring profiles associated with the subscriber. Each usage monitoring profile is logically associated with a particular operator offer, and includes the following elements. |  |
| Monitoring key | An identifier to a usage monitoring control instance that includes one or more PCC rules. | Conditional (NOTE 1) |
| Usage monitoring level | Indicates the scope of the usage monitoring instance (PDU Session level or per Service). | Optional |
| Start date | Start date and time when the usage monitoring profile applies. | Optional |
| End date | End date and time when the usage monitoring profile applies. | Optional |
| Volume limit | Maximum allowed traffic volume. | Optional |
| Time limit | Maximum allowed resource time usage. | Optional |
| Reset period | Time period to reset the remaining allowed consumed usage for periodic usage monitoring control (postpaid subscriptions). | Optional |
| **MPS subscription data** | This part defines the MPS subscription information in the policy control subscription profile. |  |
| MPS priority | Indicates subscription to MPS priority service; priority applies to all traffic on the PDU Session. | Conditional (NOTE 1) |
| IMS signalling priority | Indicates subscription to IMS signalling priority service; priority only applies to IMS signalling traffic. | Conditional (NOTE 1) |
| MPS priority level | Relative priority level for multimedia priority services. | Conditional (NOTE 1) |
| MCS priority | Indicates subscription to MCS priority service; priority applies to all traffic on the PDU Session. | Conditional (NOTE 1) |
| MCS priority level | Relative priority level for MCS services. | Conditional (NOTE 1) |
| **Energy Credit related information** | Energy Credit information in the policy control subscription profile. |  |
| UE Energy Credit | The available energy credit per UE | Conditional (NOTE 1) |
| NOTE 1: The information is mandatory if the specific part is included in the subscription information (e.g. the monitoring key is mandatory if the usage monitoring information part is included).NOTE 2: The information is used in PCF as described in clause 6.2.1.9 when the monitoring of the UE-Slice-MBR for an S-NSSAI is performed at the PCF. There may be a UE-Slice-MBR value for each S-NSSAI, if applicable.NOTE 3: Accompanying reason is according to Exception IDs defined in Table 6.7.5.1-1 of TS 23.288 [24]. For example, Unexpected UE location. |

NOTE 3: Subscribed UE-Slice-MBR can be part of the Access and Mobility Subscription data as described in clause 5.2.3.3.1 of TS 23.502 [3] and can be part of the PDU Session policy control subscription information as described in Table 6.2.1.3-2. UDR implementation and the provisioning system are responsible for keeping the consistency of this information when both Data Sets are stored in the same UDR. The provisioning system is responsible for keeping the consistency of this information when both Data Sets are stored in different UDRs.

**Table 6.2.1.3-3: Remaining allowed usage subscription information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| **Remaining allowed usage related information** | *This part includes a list of Remaining allowed usage associated with the subscriber.* |  |
| Monitoring key | An identifier to a usage monitoring control included one or more PCC rules. | Conditional (NOTE 1) |
| Usage monitoring level | Indicates the scope of the usage monitoring (PDU Session level or service level). | Optional |
| Volume usage | Remaining allowed traffic volume. | Optional |
| Time usage | Remaining allowed resource time usage. | Optional |
| NOTE 1: The information is mandatory if the specific part is included in the subscription information (e.g. the monitoring key is mandatory if the usage monitoring information part is included). |

The *Allowed services* may comprise any number of service identifiers allowed for the subscriber in the PDU Session. The PCF maps those service identifiers into PCC rules according to local configuration and operator policies.

The *Subscriber category* may comprise any number of identifiers associated with the subscriber (e.g. gold, silver, etc.). Each identifier associates operator defined policies to the subscriber that belong to that category.

The *Usage monitoring related information* may comprise any number of usage monitoring control instances associated with the subscriber. In each usage monitoring control instance is mandatory to include the *Monitoring key*. The *Reset period* only applies to usage monitoring control instances that periodically reset the allowed usage (e.g. daily, monthly, etc.). If the Reset period is not specified, the usage monitoring control instance ends when the allowed data is consumed or when the *End date* is reached. The usage monitoring related information is used by the PCF instead of the respective information for the subscriber category.

The policy subscription profile may be extended with operator-specific information. Operator-specific extensions may be added both to any specific part of the policy control subscription information (e.g. to the subscriber category part), or as a new optional information block.

Handling of operator specific policy data by the PCF is out of scope of this specification in this release.

The latest list of PSIs and list of PSIs for the VPLMN ID(s) and its content delivered to the UE provided by the UDR during the UE Policy Association Establishment procedure using Nudr service for Data Set "Policy Data" and Data Subset "Policy Set Entry" is described in Table 6.2.1.3-4.

**Table 6.2.1.3-4: Policy Set Entry**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Policy Set Entry | List of PSIs and content for each PSI. Content may be Access Network Discovery & Selection Policy Information or UE Route Selection Policy information or both.The list of tuples (PLMN ID, list of PSIs associated with the PLMN ID) may also be included. | Optional |

The network slice specific policy control information is per S-NSSAI information stored by the UDR and updated by the PCF during PDU Session Establishment or Modification procedure using Nudr service for Data Set "Policy Data" and Data Subset "Network Slice Specific Control Data" is described in Table 6.2.1.3-5:

**Table 6.2.1.3-5: Network slice specific policy control information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Maximum Slice Data Rate for UL (per S-NSSAI) | The maximum uplink data rate for the specific network slice. | Optional(NOTE 2) |
| Maximum Slice Data Rate for DL (per S-NSSAI) | The maximum downlink data rate for the specific network slice. | Optional(NOTE 2) |
| Remaining Maximum Slice Data Rate for UL (per S-NSSAI) | The remaining maximum uplink data rate for the specific network slice (NOTE 1). | Optional(NOTE 3) |
| Remaining Maximum Slice Data Rate for DL (per S-NSSAI) | The remaining maximum downlink data rate limited for the specific network slice (NOTE 1). | Optional(NOTE 3) |
| NOTE 1: The initial value is set to the Maximum Slice Data Rate for UL/DL value.NOTE 2: The information is only used for limitation of data rate per network slice with assistance of the NWDAF.NOTE 3: The information is only used for limitation of data rate per network slice with PCF based monitoring. |

The policy control subscription profile information is per SUPI information, provided by the UDR using Nudr service for Data Set "Policy Data" and Data Subset " Access and Mobility policy control data" is described in Table 6.2.1.3-6:

**Table 6.2.1.3-6: Access and Mobility policy control subscription information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Subscriber spending limits control | Indicates whether the PCF must enforce Access and Mobility management related policies based on subscriber spending limits. | Optional |
| Subscriber spending limits information | List of policy counter identifiers and statuses of these policy counters relevant for access and mobility related policy control. | Optional |
| CHF address | The address of the Charging Function and optionally the associated CHF instance ID and CHF set ID (see clause 6.3.1.0 of TS 23.501 [2]). | Optional |
| Restricted Status | Indicates that the UE has a status of Restricted, lists its accompanying reason(s) and the Time stamp of when this status was stored (NOTE 1). | Optional |
| NOTE 1: Accompanying reason is according to Exception IDs defined in Table 6.7.5.1-1 of TS 23.288 [24]. For example, Unexpected UE location. |

The 5G VN group specific policy control information is per group information stored by the UDR and updated by the PCF during PDU Session Establishment or Modification procedure using Nudr service for Data Set "Policy Data" and Data Subset "5G VN Group Specific Control Data" is described in Table 6.2.1.3-7:

**Table 6.2.1.3-7: 5G VN Group specific policy control information**

| **Information name** | **Description** | **Category** |
| --- | --- | --- |
| Maximum Group Data Rate for UL | The maximum uplink data rate for the specific 5G VN group (see clause 6.1.5). (NOTE 1) | Optional |
| Maximum Group Data Rate for DL | The maximum downlink data rate for the specific 5G VN group (see clause 6.1.5). (NOTE 1) | Optional |
| Remaining Maximum Group Data Rate for UL | The remaining maximum uplink data rate for the specific 5G VN group (NOTE 1). | Optional |
| Remaining Maximum Group Data Rate for DL | The remaining maximum downlink data rate for the specific 5G VN group (NOTE 1). | Optional |
| NOTE 1: The initial value is set to the Maximum Group Data Rate for UL/DL value (as part of the 5G VN group data stored at the UDR subscription data) as described in clause 6.1.5 and/or operator policies. |

\* \* \* \* end of 1st change \* \* \* \*