**3GPP TSG-SA WG4 Meeting #128 S4-241011 is revision of S4-240802**

**is revision of S4-240715**

**Jeju, Korea, 20th - 24th May 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.942** | **pCR** |  | **rev** | **03** | **Current version:** | **0.1.1** |  |
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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 | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Key Issue #2: Monitoring and measurement | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_MediaEnergyGREEN | | | | |  | ***Date:*** | | | 14-05-2024 |
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| ***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 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)* | |
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| ***Reason for change:*** | | The latest draft of 3GPP TR 26.942 contains clause 5.2 on Key Issue #2: Monitoring and Measurement. In this context, it is proposed to add the proposed content to the latest draft of TR 26.942 v 1.0.0 so that it is not left incomplete. | | | | | | | | |
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| ***Summary of change:*** | | This CR proposes new text to be added in TR 26.942 on “Key Issue #2: Monitoring and Measurement” section. | | | | | | | | |
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| ***Consequences if not approved:*** | | Proposed objectives will not be met. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1 (new), 5.1.1 (new), 5.1.2 (new) | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| 1st Change |

# 2 References

[23288] 3GPP TS 22.882: "Study on Energy Efficiency as a service criteria".[28310] 3GPP TS 28.310: "Management and orchestration; Energy efficiency of 5G".

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| 2nd Change |

## 5.2 Key Issue #2: Application actions based on monitoring, measurement and timely prediction of energy consumption

### 5.2.1 Description

Advanced media services such as XR services, Split Rendered media services, etc. are expected to incur substantial energy consumption both at the device and network levels, presenting significant challenges for operators and service providers.

For instance, when a Mobile Network Operator (MNO) deploys a communication service to fulfill application service requirements, such as those of a gaming application, it's crucial for the customer – whether an Application Service Provider (ASP) or an industry vertical– to ensure that the application service minimises energy consumption for both end users and the data network. Failure to do so could necessitate short-notice application layer adaptations within the Application Service Provider's domain. This may result in adjustments to being made to service levels in response to anticipated high energy consumption in specific service areas or during peak hours that adversely affect the Quality of Exeprience for service users.

The use case described in clause 5.8 of TR 23.288 [23288] envisages that Application Service Energy Efficiency (AEE) may be predicted based on monitoring Application Service Energy Consumption (AEC) within the 5G System. This data may be shared with the Service Provider to enable timely application layer actions. Monitoring of application energy consumption may occur periodically or may be event-triggered, depending on the ASP's requirements, which are typically outlined in the Service Level Agreement (SLA).

In a practical scenario, an ASP intends to deploy a gaming service within a designated service area, served by an MNO's 5G network. Various service levels may exist, each associated with specific Key Performance Indicators (KPIs), such as automation levels or video quality targets. To ensure energy efficiency, the ASP subscribes to the MNO's “Appplication Energy Efficiency Monitoring" feature, allowing the ASP to monitor the energy efficiency of its application service across specified service levels. The MNO and ASP have agreed on a certain energy efficiency target for the application service and optionally for given service levels.

### 5.1.2 Potential new requirements

Based on TS 28.310 [28310], the following potential requirements need to be considered in this Key Issue:

1. Based on the collected and/or predicted energy efficiency information exposed from the 5G System, the Application Service Provider should be able to adapt the application service parameters based on the 5GS feedback. Such adaptation of the application service parameters can be, for instance, relocation of the Application Server to an edge Data Network to enhance the energy efficiency of the application. In order to perform such operations, the Application Service Provider requires relevant APIs to be exposed by the 5G System.

2. Based on the derived energy efficiency information notifications for one or more application services exposed by the 5G System, the Application Service Provider needs to be able to decide to, e.g., switch dynamically to a different service level, which may have different associated service KPIs, or request the 5G System to provide appropriate connectivity based on service KPIs. The switching of service level applies across all users/UEs subscribed to the application. In order to perform such operations, the Application Service Provider requires appropriate APIs to be exposed by the 5G system.

#### 5.1.2.1 Analysis required

The subsequent analysis by this Key Issue should consider:

1. The extent to which different service levels can be described by applications provisioning these systems.

2. The extent to which application flows are adaptable (possibly in real time) to these different service levels in reaction to reported energy consumption information.

3. The extent to which service levels can adjusted heterogeneously across different target service areas of a 5G System with different energy consumption status.

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| End of change |