**3GPP TSG-SA WG4 Meeting #127e S4-240714**

**eMeeting, 4**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **26.942** | **pCR** |  | **rev** | **02** | **Current version:** | **1.0.0** |  |
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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 | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Energy consumption collection at OAM | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_MediaGREEN | | | | |  | ***Date:*** | | | 29-03-2024 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | One of the objectives of [S4-240](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_127_Sophia-Antipolis/Docs/S4-240515.zip)468 states the following:  “Document existing APIs, metrics and mechanisms inside or outside 3GPP that could be used for energy measurement, reporting and exposure of media services. This includes whether and what information is exposed, how it is exposed, and at what granularity (QoE measurement and reporting, QoS measurement and reporting, audience measurement and reporting, event exposure, CMCD reporting, etc.).”  In this context, it is proposed to add the proposed content to the latest draft of TR 26.439 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 26.439 on “Energy consumption collection at OAM” | | | | | | | | |
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| ***Consequences if not approved:*** | | Proposed objectives will not be met. | | | | | | | | |
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| ***Clauses affected:*** | | 4.4 (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

[1] 3GPP TS 28.554: "5G end to end Key Performance Indicators (KPI)".

[2] 3GPP TS 28.532: "Management and orchestration; Generic management services".

[3] 3GPP TS 28.533: "Management and orchestration; Architecture framework".

[4] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[5] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

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| 2nd Change |

## 3.3 Abbreviations

OAM Operations, Administration and Maintenance

SBMA Service-Based Management Architecture

VNF Virtualized Network Function

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| 3rd Change |

# 4.4 Energy consumption collection at OAM

# 4.4.1 General

This clause provides a brief reference to 3GPP SA WG5 and ETSI specifications relating to the evaluation and collection of energy consumption evaluation by the Operations, Administration and Maintenance (OAM) capability of the 5G System specified in 3GPP Release 18.

## 4.4.1.1 Collection of network energy related information

Clause 6.7.3 of TS 28.554 [1] defines the Energy Consumption KPI of a Physical Node. The network energy related information that can be collected by the OAM capability includes that listed in table X.1.1-1.

Table X.1.1-1: Network energy related information collected by OAM

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| --- | --- | --- | --- |
| KPI category | Description | Reference | Clause |
| Energy Consumption (EC) information | Energy Consumption of a gNodeB | TS 28.554 [6] | 6.7.3.4.2 |
| Energy Consumption of the NG-RAN | 6.7.3.4.1 |
| Energy Consumption of the 5GC | 6.7.3.2.1 |
| Energy Consumption of a 5G Network Function | 6.7.3.1.1 |
| Estimated Energy Consumption of a Virtualized Network Function | 6.7.3.1.2 |
| Energy Consumption of a network slice | 6.7.3.3 |
| Energy Consumption of a Physical Network Function (PNF) as well as other Power, Energy, Environmental (PEE) measurements | TS 28.552 [5] | 5.1.1.19.2 |
| Energy Efficiency KPIs | Energy Efficiency of the NG-RAN data | TS 28.554 [6] | 6.7.1 |
| Energy Efficiency of the 5GC | 6.7.4.1 |
| Energy Efficiency of a network slice | 6.7.2 |

In the case of a Virtualized Network Function (VNF) hosted on a physical node, the energy consumption of the VNF is estimated as a portion of the total energy consumption of the physical node on which the VNF is executing, based on its relative virtual CPU usage, virtual memory usage, virtual disk usage and I/O traffic (all metrics collected from ETSI MANO) as defined in clause 6.3.1.2 of TS 28.554 [1].

## 4.1.2 Exposure of network energy related information

Network energy information may be collected by OAM and exposed (other mechanisms may exist) as defined by the Service-Based Management Architecture (SBMA) in TS 28.533 [3]. Any authorized consumer willing to collect such measurements or KPIs shouldfirst create an instance of a *performance metrics production job* (i.e. an instance of the PerfMetricJob information object class – see clause 4.3.31 of TS 28.622 [4]) by invoking the createMOI operation of the Provisioning Management Service (MnS) (see clause 11.1.1.1 of TS 28.532 [2]). The consumer should specify:

- Which measurement(s) or KPI(s) are required to be collected, e.g. the energy consumption of a 5G NF, etc..

- From which network entities (represented by *managed objects*) the information is required to be collected (e.g. a SMF x, UPF y, etc.).

- The granularity period (expressed in seconds) over which the measurements or KPIs are required to be reported;

- The required reporting method, mainly:

- *File-based reporting:* Performance data is accumulated for a certain time before it is reported; the data is delivered as a file; the file content encoding may be either XML or ASN.1,

- *Stream-based reporting:* The producer sends the performance data to the consumer as when they are ready. The volume of the performance data reported is expected to be small, and the granularity period is expected to be short. The stream content encoding technique may be either GPB or ASN.1.

Depending on the selected reporting method, the consumer collects the measurements or KPIs as follows:

- In the case of file-based reporting, the producer sends the notification NotifyFileReady to subscribed consumer(s) when a new file becomes available on the producer for upload by consumer(s);

- In the case of stream-based reporting, the producer sends units of streaming data to the consumer by invoking the reportStreamData operation.

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| End of change |