**3GPP TSG-SA5 Meeting #143-eS5-223273**

**e-meeting, 9 - 17 May 2022**

**Source: Huawei**

**Title: pCR 28.104 Add clause for energy saving analysis**

**Document for: Approval**

**Agenda Item: 6.6.5**

# 1 Decision/action requested

***For approval***

# 2 References

[1] 3GPP TR 28.104 V1.1.0 Management and orchestration; Management Data Analytics (MDA)

# 3 Rationale

Clause 8.4.4 is inconsistent with the other subclauses in clause 8. The structure of 8.4.4 will make it difficult to add other analytics related to energy saving in the future.

This contribution aligns 8.4.4 with the structure of the other subclauses in clause 8.

# 4 Detailed proposal

This contribution proposes to make the following changes in [1].

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| **1st change** |

### 8.4.4 MDA assisted energy saving

#### 8.4.4.1 Energy saving analysis

#### 8.4.4.1.1 MDA type

The MDA type for energy saving analysis is: MDAAssistedEnergySaving.EnergySavingAnalysis.

#### 8.4.4.1.2 Enabling data

The enabling data for coverage problem analysis are provided in table 8.4.4.1.2-1.

For general information about enabling data, see clause 8.2.1.

Table 8.4.4.1.2-1: Enabling data for energy saving analysis

|  |  |  |
| --- | --- | --- |
| Data category | Description | References |
| Performance measurements | PNF Power Consumption: power consumed over the measurement period | Clause 5.1.1.19.2 of TS 28.552 [4] |
| PNF Energy consumption: energy consumed | Clause 5.1.1.19.3 of TS 28.552 [4] |
| SS-RSRP distribution per SSB (beam) of serving NR cell | Clause 5.1.1.22.1 of TS 28.552 [4]. |
| SS-RSRP distribution per SSB (beam) of neighbor NR cell | Clause 5.1.1.22.1 of TS 28.552 [4]. |
| PDCP Data Volume of NR cells: PDCP data volume delivered in the downlink and uplink; | Clause 5.1.2.1 and 5.1.3.6 of TS 28.552 [4] |
| Traffic load variation: PRB utilization rate, RRC connection number, etc. | Clause 5.1.1.2 and 5.1.1.4 of TS 28.552 [4] |
| UE throughput: UE throughput in downlink and uplink | Clause 5.1.1.3 of TS 28.552 [4] |
| Delay related measurements of UPF | Clause 5.4 of TS 28.552 [4] |
| Data volume of UPF | Clause 5.4 of TS 28.552 [4] |
| Virtual resource usage of NF: The virtual CPU usage, virtual memory usage, virtual disk usage of virtual network functions; | Clause 5.7.1 of TS 28.552 [4] |
| MDT reports | The RSRPs of UE measurements. | RSRPs of M1 measurements in TS 32.422 [6] and TS 32.423 [7]. |
| The RSRQs of UE measurements. | RSRQs of M1 measurements in TS 32.422 [6] and TS 32.423 [7]. |
| The UE location information. | UE location of M1 measurements in TS 32.422 [6] and TS 32.423 [7]. |
| QoE Data | The measurements that are collected are DASH and MTSI measurements. | TS 28.406 [9] |
| Configuration data | MOIs of the cells, UPFs and SMFs. | TS 28.541 [15] |
| Network analytics data | The control plane analysis result from the NWDAF, e.g., observed service experience related network data analytics. | TS 23.288 [10] |

#### 8.4.4.1.3 Analytics output

The specific information elements of the analytics output for energy saving analysis, in addition to the common information elements of the analytics outputs (see clause 8.3), are provided in table 8.4.4.1.3-1.

Table 8.4.4.1.3-1: Analytics output for energy saving analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Information element | Definition | Support qualifier | Properties |
| EnergyEfficiencyProblematicObject | Indication of NR cells or NFs where the energy efficiency issues occurred or potentially occur. | M | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EnergyEfficiencyProblemType | Indication of type of the energy efficiency issues.  The allowed value is one of the enumerated values: HighEnergyConsumption, LowEenergyEfficiency, Other, Unknown. | M | type: enumeration  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| TrafficLoadTrends | The predictions of the trends of traffic load in a certain time period. The predictions include the traffic load of the issue cell(s) and neighboring cell(s). | M | type:TrafficLoadTrend  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| EnergySavingRecommendations | The recommendation shall contain the energy saving policy.  For ES on NR cells. It may contain a set of  - recommended NR Cell (ES-Cell) to enter energySaving state.  - recommended candidate cells with precedence for taking over the traffic of the ES-Cell.  - the time to enter and terminate the energy saving state.  - the load threshold to enter and terminate the energy saving state for the ES-Cell  For ES on UPFs. It contains a set of  - recommended UPF (ES-UPF) to conduct energy saving;  - recommended candidate UPFs with precedence for taking over the traffic of the ES-UPF.  - the time to conduct energy saving for the ES-UPF | M | type: EsRecommendation  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| StatisticsOfCellsEsState | The statistic result of current energy saving state of the cells at a certain time, which can be used by consumers to make analysis (e.g., observed service experience analysis made by NWDAF) or to make decision (e.g., enter/exit the energy saving state based on the current energy saving state). | O | type: StatisticOfCellEsState  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |

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| **End of changes** |