**3GPP TSG-SA5 Meeting #156 *S5-244711***

Maastricht, Netherlands, 19-23 August 2024

**Source: Huawei**

**Title: pCR TR 28.871 add potential solutions for PM investigation**

**Document for: Approval**

**Agenda Item: 6.19.8**

# 1 Decision/action requested

***The group is asked to discuss and approval.***

# 2 References

[1] TR 28.871 Study on Service Based Management Architecture (SBMA) enhancement phase 3

# 3 Rationale

According to the agreements in last meeting, a number of potential solutions are proposed in Section 6.1[1].

This contribution proposes to add tables for solution proposal4 to clearly instruct the PM category.

# 4 Detailed proposal

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| **1st change** |

## 6.1 PM investigation

**Solution proposal 1**

Do nothing.

Pro: No risk for inconsistencies. No work needs to be done.

Con: Non SA5 PM experts continue to have the problem of understanding how the 3GPP 5G performance TSs relate to each other.

**Solution proposal 2**

Describe the dependencies in a more understandable way in a 900-series TR.

Pro: Non SA5 PM experts have an easier way of understanding how SA5 performance specifications relate to each other. Since this would be a 900-series TR it would be visible to organizations outside 3GPP and kept up-to-date across releases.

Con: As the information is duplicated, it is a risk for not being consistent.

**Solution proposal 3a**

Change the structure of the performance TSs. E.g. One TS could be for RAN NFs, another for Core Network NFs, a third for management system MnFs.

Pro: The understanding for which performance metrics are produced would be better. It would mitigate compliance work.

Con: All dependances might not be visible. It is a very large work.

**Solution proposal 3b**

Change the structure of the Subscriber and Equipment Trace and the Quality of Experience (QoE) measurement collection. The other PM specifications are divided into mechanism and performance data, which is not the case for the Subscriber and Equipment Trace and the Quality of Experience (QoE) measurement collection, so also these specifications can be changed to the structure of separating mechanism and performance data.

Pro: The mechanism is common for different 3GPP systems, while the performance data may differ. It will be very clear on what data is valid for which 3GPP system.

Con: When performance data is used for several 3GPP systems (e.g. NSA), the description of these cases needs to refer to another TS.

**Solution proposal 4**

Augment the “5G specifications overview” [28.533, Annex E] to include the performance components. For example, the column currently headed “Related specifications” could be split into one describing use cases and requirements, and another defining performance data. A separate column could also be added, including not only the TS but the specific performance data definitions defined in it that are related to the management feature. To increase visibility, and promote maintenance, the Annex could be promoted to normative, or even moved into the main body of the TS. Different releases can have different clauses or annexes in the TS.

For example, the performance components table can be summarized as follows:

Editor notes: where to put the following table in normartive work needs FFS.

**Table 4-1: QoE measurements collection**

|  |  |  |
| --- | --- | --- |
| **Category** | **Performance Measurements** | **Related specifications** |
| QoE measurements | QoE metrics for 3GP-DASH  QoE metrics for MTSI  QoE metrics for VR | TS 28.404 [18] for the requirements of QoE measurement collection  TS 28.405 [19] for the procedure of QoE measurement collection  TS 28.406 [20] for the definition of recording content of QoE measurement |

**Table 4-2: PM/KPI for 5G networks**

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| --- | --- | --- |
| **Category** | **Performance Measurements** | **Related specifications** |
| Performance measurements for gNB | Packet related measurements | TS 28.552 [26] for the definition of performance measurements  TS 28.550 [25] for the performance measurements management services |
| Radio resource utilization related measurements |
| UE throughput measurements |
| RRC related measurements |
| Mobility related measurements |
| TB related Measurements |
| DRB related measurements |
| QoS related measurements |
| Energy related measurements |
| Random access related measurements |
| Signal related measurements |
| MRO related measurements |
| Paging Measurement |
| MU-MIMO related measurements |
| GTP related measurements |
| Performance measurements for 5GC | Performance measurements for NSOEU |
| Performance measurements for AMF |
| Performance measurements for SMF |
| Performance measurements for UPF |
| Performance measurements for PCF |
| Performance measurements for UDM |
| Common performance measurements for NFs |
| Performance measurements for N3IWF |
| Performance measurements for NEF |
| Performance measurements for NRF |
| Performance measurements for NSSF |
| Performance measurements for SMSF |
| Performance measurements for UDR |
| Performance measurements for ECS |
| Performance measurements for EES |
| Performance measurements for LMF |
| Performance measurements for NWDAF |
| Performance measurements for network slicing | Measurements related to end-to-end 5G network and network slicing | TS 28.552 [26] for the definition of performance measurements  TS 28.550 [25] for the performance measurements management services |
| Key Performance Indicators (KPIs) | Accessibility KPI | TS 28.554 [27] for the definition of the Key Performance Indicators  TS 28.550 [25] for the performance measurements management services |
| Integrity KPI |
| Utilization KPI |
| Retainability KPI |
| Mobility KPI |
| Energy Efficiency (EE) KPI |
| Reliability KPI |
| Average air-interface efficiency KPI |
| Network and Service Operations for Energy Utilities (NSOEU) KPI |

**Table 4-3: performance measurements for UE**

|  |  |  |
| --- | --- | --- |
| **Category** | **Performance Measurements** | **Related specifications** |
| UE level measurements for UPF | Packet delay related UE level measurements | TS 28.558 [28] for the definition of UE performance measurements  TS 32.421 [31], TS 32.422 [32], TS 32.423 [33] for the definition of UE performance measurements reporting and recording content |
| UE level measurements for gNB | Packet delay related UE level measurements |
| Packet Loss related UE level measurements |
| UE throughput related UE level measurements |

**Table 4-4: MDT/Trace measurements for 5G networks**

|  |  |  |
| --- | --- | --- |
| **Category** | **Performance Measurements** | **Related specifications** |
| MDT/Trace measurements | AMF Trace Record  SMF Trace Record  PCF Trace Record  AUSF Trace Record  NEF Trace Record  NRF Trace Record  NSSF Trace Record  UDM Trace Record  UPF Trace Record  SMSF Trace Record  AF Trace Record  gNB-CU-CP Trace Record  gNB-CU-UP Trace Record  gNB-DU Trace Record  ng-eNB Trace Record  NR MDT Trace Record Content  5GC UE level measurement Trace Record | TS 32.421[31] for the requirements of MDT/Trace measurements reporting  TS 32.422[32] for the definition of MDT/Trace measurements reporting procedure  TS 32.423[33] for the definition of recording content of MDT/Trace measurement |

Pro: The mapping between specifications, management features, and performance data definitions would be captured in a single location.

Con: The amount of information in the table could be large and difficult to maintain.

**Solution proposal 5**

Augment the existing specifications containing performance information to indicate a clear “entry point” or “root” NRM component for each management feature. E.g. the “PerfMetricJob” IOC for PM measurements, “TraceJob” IOC for Subscriber and Equipment trace, etc. Each of these would then document the management feature(s) to which it applies and the other IOCs/DTs which comprise the complete solution.  
Note: this solution could also be combined with Proposal 4 to reduce the amount of information required in the table.

Pro: Existing information is retained and augmented with more detail. The documentation on dependencies could be kept to the minimal number of ‘root’ NRM components.

Con: Could be difficult for multi-release maintenance when some components (or parts thereof) only apply to specific release(s).

**Solution proposal 6**

Create a new type of document, such as a web/wiki page, to document the performance data dependencies.

Pro: Could be easier to maintain and have least impact on existing specs. Method to introduce different ‘views’ on usage performance information for potentially different audiences. E.g. Rel-17 vs. Rel-18 view, Slice vs. NF mgmt., ORAN centric implementation, etc.

Con: Separation of the information from the actual specs could lead to inconsistencies.

Different solutions proposals can be combined. E.g. the proposals 4 and 3b can be combined, which would mean that the structure for Subscriber and Equipment Trace and the Quality of Experience (QoE) measurement collection is changed and the relations between the specifications are described in the annex in 28.533.

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| **End of change** |