**3GPP TSG-SA5 Meeting #156 *S5-244830***

**Maastricht, Netherlands 19 - 23 August 2024**

**Source: Huawei**

**Title: pCR TR 28.915** **Evaluation of potential solutions for UC1**

**Document for: Approval**

**Agenda Item: 6.19.5**

# 1 Decision/action requested

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TR 28.915: " Study on management aspects of Network Digital Twin"

# 3 Rationale

It’s proposed to add Evaluation of potential solutions for use case Network management policy verification using NDT as described in clause 5.1 of [1]

There are five functional categories can be extracted from existing NDT use cases as below:

* Verification
	+ RAN energy saving policy verification (see clause 5.1)
	+ Signalling storm configuration verification (see clause 5.2)
	+ Emergency preparedness (see clause 5.3)
	+ Configuration verification (see clause 5.9)
* Visualization
	+ Network topology and traffic visualization (see clause 5.8)
* Prediction
	+ Network failure and risk prediction (see clause 5.4)
* Simulated data generation
	+ ML model training data generation (see clause 5.6)
* NDT specific technology
	+ Nested NDT (see clause 5.7)
	+ NDT supporting network and service management automation functions (see clause 5.5)

Therefore one key principle for NDT solution is that a solution should be able to reflect it is for which NDT service category, e.g., verification or visualization. Under each category, the solution for specific use cases should specify the parameters that are applicable only for this use case. For example, NDT solution for RAN energy saving policy verification focuses on the parameters for ES policy that need to verified by NDT, while NDT solution for signalling storm focuses on the configuration parameters related to signalling storm that need to verified by NDT.

# 4 Detailed proposal

This document proposes the following changes in TR 28.915.

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| **1st Change** |

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| 5.1.4 Evaluation of potential solutions |  |  |
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### The common part of solution 1 and solution 2:

1. nDTSimulationScope in solution 2, which represents the scope to be modelled or simulated by the NDT instance, is similar with Simulation scope given in solution 1.

2. nDTConfigurationPlan in solution 2, which indicates the configurations to be verified by NDT, can be specialized by RAN ES Policy given in solution 1.

3. nDTOutput in solution 2, which represents the output of the verification service, is similar with report given in solution 1.

The specific parameters for RAN ES policy verification use case mentioned in solution 1:

1. Simulation scope can further include frequency range and RAT (e.g., NR or E-UTRAN) in this use case.

2. Simulation data can be further focus on energy efficiency, RAN UE throughput, latency as defined in TS 28.552/28.554, CM data for ES management function as defined in TS 28.541, etc.

3. RAN ES Policy is defined in TS 28.310.

4. Impact detectors: specified performance metrics and/or alarm types which include Energy efficiency, RAN UE throughput, latency, etc., that needs to be collected and reported by NDT after the RAN ES Policy executed in NDT.

5. Performance requirements: the expected network simulation performance of NDT. For instance, the time spent for the network simulation, the expected proximity between the network simulation results and the actual network execution outcome.

6. Simulation time: the timestamp indicates if the simulation is for the past, present, or future.

It’s recommended to keep common attributes in a general NDT solution framework, based on which the use case specific attributes are defined case by case.

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| **End of change** |