**3GPP TSG-SA5 Meeting #156S5-243548**

**19 – 23 August 2024, Maastricht, NL**

**Source: Nokia**

**Title:** **pCR 28.915 extend support to network automation**

**Document for: Approval**

**Agenda Item: 6.19.5**

# 1 Decision/action requested

***In this box give a very clear / short /concise statement of what is wanted.***

# 2 References

[1] 3GPP TR 28.915-010 “Study on management aspect of Network Digital Twin”.

# 3 Rationale

For a given NDT instance, the consumer needs to define the characteristics of the NDT instance. This pCR extends the use case of NDT support to network automation to enable the MnS consumer to define the characteristics and configurations of the NDT instance.

# 4 Detailed proposal

***Start of change***

# 5 Use cases, potential requirements and solutions

## 5.5 Use case 5: NDT support to network automation

### 5.5.1 Description

NDTs may be used to support many automation use cases. An NDT may be integrated into a network automation function, or it may be external to the network automation function. In the case where the NDT is external to the network automation function, it should be possible for the network automation function to define and configure into the NDT the scenario that should be modelled and simulated by the NDT. Then the NDT should implement the defined scenario, simulate it, and subsequently provide an output representing the statues of different network metrics for the simulated scenario.

An NDT, depending upon the network or service management use case and scenario to be modelled and simulated, might need data originating from various sources (network data, environment data, analytics, UEs data) and suitable hardware/software resources to function properly. MnS consumers would prefer to specify needed NDT characteristics or configurations to the NDT tailored to fulfil consumer specific needs i.e. to define the consumer preference for the specific NDT. For example, consumer preferences may be related to environment data sources e.g. weather, synthetic data etc, data characteristics (e.g. robustness, data granularity, maximum tolerable latency) sync characteristics (such as sync pattern, triggers, frequency, duration, criteria, etc), required NDT output latency, characteristics of the service to be twinned, resource constraints (HW/SW) etc. Furthermore, in the case that consumer’s preference on NDT characteristics or configuration may change over time and MnS consumer may update the NDT with the needed changes.

### 5.5.2 Potential Requirements

REQ-NDT-1: The NDT should support a capability to model the behavior of the network and provide the outcomes of such modelling to consumers.

REQ-NDT-2: The NDT should support a capability enabling an Mns consumer to define the network scenario that should be modelled and simulated.

REQ-NDT-3: The NDT should support a capability to provide an output representing the statues of different network metrics for the simulated scenario.

REQ-NDT-X1: The NDT should support a capability enabling an MnS consumer to specify NDT characteristics or configurations

Note: example characteristics include

* environment data sources (e.g. weather, synthetic data etc), and the related data characteristics (e.g. robustness, data granularity, maximum tolerable latency)
* characteristics on when the NDT updates its data from the network (e.g. whether it is triggered based on some events, frequency, duration, criteria, etc),

REQ-NDT-X2: The NDT should support a capability to inform the MnS consumer whether a specific set of NDT characteristics or configurations defined by the Mns consumer are feasible or if not what changes could be made to the NDT configurations to make then feasible.

### 5.5.3 Potential Solutions

* introduce an information object class representing an NDT, say called NetworkDigitalTwin
* introduce a data type representing the network scenario to be modeled and simulated, say called nDTSimulationScope
* introduce a data type representing the output of modelling and simulating a specific network scenario. The datatype may be called nDTSimulationOutput
  + the NDT may have 1 or more nDTSimulationOutput objects wit
* introduce a data type representing the performance data and/or KPI that are computed by the NDT for the simulated scenario.
* introduce a data type representing the characteristics of the ND, say called nDTcharacteristics. This is configurable by the MnS consumer to include the following information:
  + environment data sources (e.g. weather, synthetic data etc,) and the related data characteristics (e.g. robustness, data granularity, maximum tolerable latency)
  + characteristics on when the NDT should update its data from the network(e.g. whether it is triggered based on some events, frequency, duration, criteria, etc),
* network to NDT synchronization characteristics (e.g. whether it is triggered based on some events, frequency, duration, criteria, etc),

### 5.5.4 Evaluation of solutions

TBD

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| **End of modifications** |