**3GPP TSG-SA5 Meeting #145-e *S5-225481***

**e-meeting, 15 - 24 August 2022**

**Source: Huawei**

**Title: pCR 28.865 Add solultion of service requirement modeling**

**Document for: Approval**

**Agenda Item: 6.9.5.2**

# 1 Decision/action requested

***The group is asked to discuss and approve the proposal.***

# 2 References

[1]  [SP-211442](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3693): "New SID on deterministic communication service assurance"

[2] S5-224421: "TR 28.865 Study on deterministic communication service assurance"; v0.3.0

[3] 3GPP TS 28.541: "5G Network Resource Model (NRM); Stage 2 and stage 3"; v17.6.0

# 3 Rationale

This tdoc addresses the solution of service requirement modeling related to DCSA. In [2], it is described that service requirement modelling is within the functional framework of DCSA MnS producer.

*Service requirement modeling: The three-layer model of service experience, service quality, network performance is used for service requirement modeling.The service experience and service quality targets are analysed to derive the network capability requirements.*

In TS 28.541, there are some service requirements in ServiceProfile for network slice directly related to deterministic communications, e.g., availability, delayTolerance, dLDeterministicComm, uLDeterministicComm, survivalTime, jitter, reliability, synchronicity, positioning etc, in addition to some common requirements such as dLLatency, uLLatency, dLThptPerSlice, uLThptPerSlice, dLThptPerUE, uLThptPerUE, maxNumberofPDUSessions, termDensity etc. Most of the above requirements are also available in RANSliceSubnetProfile and/or CNSliceSubnetProfile.

Therefore it is important to study the service and network modelling and their relationship in order to meet the requirements of deterministic communications more accurately.

It is proposed to add generic solution of service requirement modeling for DCSA.

# 4 Detailed proposal

This document proposes the following changes in TR 28.865.

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| **1st Change** |

# 5 Issues and potential solutions

*Editor's note: this clause will contain the issues and potential solutions for deterministic communication service assurance. Relation and potential enhancements to eCOSLA will also be studied for the related issues.*

### 5.X.2 Potential solutions

#### 5.X.2.a Potential solution #1: service requirement modeling

##### 5.X.2.a.1 Introduction

Editor's Note: This clause describes briefly the potential solution for issue#1 at a high-level.

Some industry applications require deterministic service assurance. Many uncertainties exist from the production system to the network. How to quantify the micro-dynamic impact of these uncertainties on service status and construct deterministic measurement and performance mapping model is a key challenge.

Industry applications involve a wide variety of scenarios, e.g. motion control, electrical distribution etc described in TS 22.104 [3]. To achieve generic modeling mapping, another challenge is to build a set of unified metrics to associate networks with services.

##### 5.X.2.a.2 Description

Editor's Note: This clause further details the potential solution and any assumptions made for issue#1.

The three-layer figure from the user experience to the network performance benchmark is implemented through two-step hierarchical relationship from experience to quality and from quality to network. Due to metric differences in different layers, relationship between different layers may be independent of each other. Some main tasks for service modelling and network performance modelling could be observed:

Service modeling: Identify the actual service processes of industry applications, including service types, service operation environments, and service-related configurations, accurately obtain the service requirements, e.g. according to the ServiceProfile of a network slice, and build a basis for network requirement conversion. For example, some measurements for service experience are frame rate, stalling rate, operation response time etc. Some measurements for service quality are throughput, end to end RTT, packet loss rate etc.

Network performance modeling: Converts service requirements into network requirements based on the output of service modeling and provides SLS targets that can be identified in network performance preparation, such as reliability, network delay, and network bandwidth, measurements related to radio interface, etc to guide the network deployment and feature provisioning.

For deterministic communication services, the service requirements for each QoS index should be determined first, and then the availability should be evaluated. The key to evaluating availability is to calculate the percentage of indicators that exceed the QoS requirements. Therefore, KPIs such as unstable delay, unstable packet interval, etc need to be considered.



Figure x: generic 3-layer figurefrom service requirement to network performance

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| **End of change** |