**3GPP TSG-SA5 Meeting #143-e *S5-223463***

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

**Source: Huawei**

**Title: pCR 28.865 Add framework of FS-DCSA**

**Document for: Approval**

**Agenda Item: 6.5.21**

# 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] S5-222745: "draft TR 28.865 Study on deterministic communication service assurance"; v0.1.0

# 3 Rationale

A management framework of the deterministic communication service assurance consists of data collection, service requirement analysis, network preparation, service and network analysis, optimization and verification.

It is proposed to add management framework of deterministic communication service assurance in draft TR 28.865.

# 4 Detailed proposal

This document proposes the following changes in TR 28.865.

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| **1st Change** |

# 4 Overview and Concepts

## 4.1 Overview

*Editor's note: this clause will contain overview of requirements, related network functions and management aspects to support deterministic communication services.*

5G network should satisfy diversified SLA requirements to support different vertical applications. Service requirements are more stringent for deterministic communication services as described in TS 22.261[2] and TS 22.104 [3], e.g., video monitoring for production environment in a factory, remote control etc. The latency/transmission time of a data package is bounded by a given threshold. There are two typical traffic classes or communication patterns for deterministic communication service: deterministic periodic communication and deterministic aperiodic communication. In clause 5 in TS 22.104 [3], performance requirements for some deterministic communication services are provided. In TS 23.501 [4], QoS characteristics are defined for some deterministic communication services, e.g. some 5QIs for delay critical GBR services. Communication service availability and reliability are more important for these services types. Service experience degradation or violation of the latency requirements such as unstable jitter or unexpected packet loss may result in service interruption or severe consequences. Stable and deterministic communication service experience should be assured.

There are some features in the 5G network to support deterministic communication services, e.g. URLLC related network functions for radio interface and 5GC network, 5GS Integration with TSN and Industrial IoT, high accuracy positioning etc. How to support deterministic communication services from management aspects are investigated in this present document, e.g. provisioning of the related network functions, solutions for the assurance of deterministic communication services such as video monitoring and PLC control etc.

## 4.2 Concepts

*Editor's note: this clause will contain concept of deterministic communications, the generic aspects for provisioning and assurance of deterministic communication services.*

### 4.2.x Management framework of deterministic communication service assurance

It is assumed that a dedicated management service is used to manage the deterministic communication service assurance. It may also coordinate with other related management services to provide service assurance for deterministic communications when it is needed. Based on the Service based management architecture, deterministic communication service assurance (DCSA) MnS could reside on 3GPP cross domain, RAN domain or CN domain as shown in the following figure. DCSA MnS producer in 3GPP cross domain coordinates with DCSA MnS producers in RAN domain and CN domain.



**Figure 1: Deployment of DCSA MnS producer**

To investigate how to support deterministic communication service assurance from management aspects, the management framework of DCSA MnS producer is studied. The following figure shows the functional framework of DCSA MnS producer, including modules of data collection, service requirement modeling, network preparation, service and network analysis, optimization and verification. The main functions of each module are as follows:



**Figure 2:** **Functional framework of DCSA MnS producer**

Data collection: Collects network performance and alarm data, signaling-plane and user-plane measurement information and abnormal events, and collects service experience and related network performance information. The collected data is used for the work of other modules.

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.

Network preparation: Based on deterministic communication service requirements, the DCSA MnS producer prepares network capabilities to ensure the SLA, and provides the corresponding network deployment solution, e.g. deployment of network slice, RAN functions and CN functions related to URLLC, Industrial IoT, TSN integration with 5GS to support deterministic communication service.

Service and network analysis: The DCSA MnS producer evaluates and identifies service and network issues through monitoring and analysis, demarcates and analyzes the issues, and provides analysis recommendation for further optimization if needed.

Optimization and verification: The optimization is targeted to improve the service and network performance. For example, the optimization may includes latency related optimization for a network slice instance. The optimization solution is applied and verification conclusion is conducted.If the optimization result deviates from the SLA target, the optimization solution is adjusted accordingly and the iterative optimization process is performed.

Editor Notes: This clause describes the working assumption for the architecture and management framework of DCSA MnS producer. This working assumption may be revisited according to the study of use cases, issues and the corresponding solutions.

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| **End of change** |