**3GPP TSG-SA5 Meeting #141-eS5-221388**

**e-meeting, 17 - 26 January 2022**

**Source: Ericsson, Deutsche Telekom**

**Title: Discussion paper on communication service assurance and monitoring of closed control loops**

**Document for: Endorsement**

**Agenda Item: 6.4.10**

# 1 Decision/action requested

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

# 2 References

[1] [SP 190781](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=SP-190781) New WID Closed loop SLS Assurance

[2] [SP 200196](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=SP-200196) New WID on Enhanced Closed loop SLS assurance

[3] 3GPP [TS 28.535](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3693) Management and orchestration; Management services for communication service assurance; Requirements

[4] 3GPP [TS 28.536](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3701) Management and orchestration; Management services for communication service assurance; Stage 2 and stage 3

[5] 3GPP [TS 28.533](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3416) Management and orchestration; Architecture framework

[6] 3GPP [TS 28.532](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3427) Management and orchestration; Generic management services

[7] 3GPP [TS 28.541](https://www.3gpp.org/DynaReport/28541.htm) Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3

# 3 Rationale

The work item for Closed loop assurance [1] and enhanced Closed loop assurance [2] have produced the following specifications.

- TS 28.535 [3] Management and orchestration; Management services for communication service assurance

- TS 28.536 [4] Management and orchestration; Management services for communication service assurance; Stage 2 and stage 3

**Solution for SLS management services**

The solution for communication service assurance uses generic management services specified in [6] together with the NRM [7],which in a deployment scenario supports the automation brought to bear with a closed control loop. The text below provides some examples of how different management service can be used to support management tasks.

To use communication service assurance an SLS\_Consumer (for example a communication service assurance application) may use the generic management services to create a NetworkSlice (NSI) or NetworkSliceSubnet (NSSI) based on the requirements in the ServiceProfile or SliceProfile. An Assurance Closed Control Loop (ACCL) and the associated Assurance Goal(s) (AG) are created using the Create and Update operations provided by the ProvMnS [6]. After the configuration is completed the SLS\_Consumer can make the ACCL active by setting the adminstrativeState=”Unlocked” and lifecyclePhase=”Operation” using the ProvMnS. When the ACCL is active the SLS\_Consumer determines the goal fulfilment by either reading the attributes of the Assurance Report (AR) using the ProvMnS or by subscribing to notifications from the ProvMnS.

Editor’s Note: AR is IOC but not contained by another IOC. The text assumes that AR is IOC contained by ACCL. A CR for this is submitted to this meeting.



Figure 3.1 SLS\_Consumer interacting with a producer using ProvMnS

The assurance data (measurements and KPI’s) needed to feed the ACCL is produced by a StreamingDataMnS producer or by a FileDataReporting producer. The assurance data producers must be configured to produce the required assurance data. Before an ACCL is operational the SLS\_Consumer configures the StreamingDataMnS or FileDataReportingMnS on each of the assurance data producers. During closed control loop operation the SLS\_Consumer interacts with the Provision MnS to continue meet the assurance goal.

A communication service in the 3GPP management system is identified by an S-NSSAI (the Slice/ServiceType, SST in the S-NSSAI identifies a communication service). The ServiceProfile from which the assurance goal is derived includes the SST and optionally the S-NSSAI(s), see TS 28.541 [7]. The SliceProfile from which the assurance goal is derived includes the SST (serviceType) the S-NSSAI(s) ), see TS 28.541 [7].

In a deployment scenario the SLS\_Consumer may need to filter the measurements and KPI’s per S-NSSAI and aggregate them to get the assurance data per ServiceProfile or per SliceProfile. The management services specified in [6] and shown in Figure 3.2 may be used to get the assurance data from performance measurements and KPI producers.



Figure 3.2 SLS\_Consumer interacts with various producers

The assurance data (faults, alarms) needed to feed the ACCL is produced by a FaultMnS producer. The assurance data producers must be configured to produce the required assurance data. Before an ACCL is operational the SLS\_Consumer configures the FaultMnS on each of the assurance data producers. During closed control loop operation the SLS\_Consumer interacts with the Provisioning MnS to continue meet the assurance goal.



Figure 3.3 SLS\_Consumer interacts with a producer using FaultMnS

In a deployment scenario the SLS\_Consumer may need to filter the faults/alarms per MF participating in the NetworkSlice (NSI) or NetworkSliceSubnet (NSSI) for which an ACCL is operational. A single fault/alarm may be used as assurance data to multiple ACCL’s. The FaultMns specified in [6] and shown in Figure 3.3 may be used to get the faults/alarms from performance measurements and KPI producers.

As can be seen from the above description an SLS\_Consumer interacts with the different generic management services [6] there is no actual instance of a (Cosla) service that is exposed by an SLS\_Producer. The following could be done to address this:

Option 1 Document theusage of the existing management services that can be provided by an SLS\_Producer

Option 2.Document the use of existing management services for producers that expose a composite management service, such as an SLS-Producer

## 3.1 UML code for the Figures

### 3.1.1 UML code for Figure 3.1

@startuml

skinparam backgroundColor white

skinparam classBackgroundColor white

skinparam classBorderColor black

skinparam rectangleBackgroundColor white

skinparam rectangleBorderColor black

skinparam Shadowing false

skinparam noteBackgroundColor white

skinparam noteBorderColor black

skinparam arrowColor black

hide circle

hide members

rectangle ProvMnS\_P

rectangle FaultMnS\_P

rectangle PerfMnS\_P

rectangle StreamingDataMnS\_P

rectangle FileDataReportingMnS\_P

rectangle SLS\_Consumer #lightgrey {

 rectangle ProvMnS\_C

 rectangle FaultMnS\_C

 rectangle PerfMnS\_C

 rectangle StreamingDataMnS\_C

 rectangle FileDataReportingMnS\_C

}

ProvMnS\_C -(0- ProvMnS\_P

FaultMnS\_C -(0- FaultMnS\_P

PerfMnS\_C -(0- PerfMnS\_P

StreamingDataMnS\_C -(0- StreamingDataMnS\_P

FileDataReportingMnS\_C -(0- FileDataReportingMnS\_P

@enduml

### 3.1.2 UML code for Figure 3.2

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skinparam classBorderColor black

skinparam rectangleBackgroundColor white

skinparam rectangleBorderColor black

skinparam Shadowing false

skinparam noteBackgroundColor white

skinparam noteBorderColor black

skinparam arrowColor black

hide circle

hide members

rectangle PerfMnS\_P

rectangle StreamingDataReportingMnS\_P

rectangle FileDataReportingMnS\_P

rectangle SLS\_Consumer #lightgrey {

 rectangle PerfMnS\_C

 rectangle StreamingDataReportingMnS\_C

 rectangle FileDataReportingMnS\_C

}

PerfMnS\_C -(0- PerfMnS\_P

StreamingDataReportingMnS\_C -(0- StreamingDataReportingMnS\_P

FileDataReportingMnS\_C -(0- FileDataReportingMnS\_P

@enduml

## 3.1.3 UML code for Figure 3.3

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skinparam backgroundColor white

skinparam classBackgroundColor white

skinparam classBorderColor black

skinparam rectangleBackgroundColor white

skinparam rectangleBorderColor black

skinparam Shadowing false

skinparam noteBackgroundColor white

skinparam noteBorderColor black

skinparam arrowColor black

hide circle

hide members

rectangle FaultMnS\_P

rectangle SLS\_Consumer #lightgrey {

 rectangle FaultMnS\_C

}

FaultMnS\_C -(0- FaultMnS\_P

@enduml

@enduml

# 4 Detailed proposal

The group is asked to endorse option 1, which requests to update 28.535 clause 4.3 to clarify how the SLS\_Producer is realized.1