**3GPP TSG-SA5 Meeting #157 *S5-246025***

Hyderabad, India, 14 - 18 October 2024 (rev of S5-245803)

**Source: NTT DOCOMO, Deutsche Telekom**

**Title: pCR TR 28.867 Add potential requirements and a potential solution for CCL for fault mgmt**

**Document for: Approval**

**Agenda Item: 6.19.4**

# 1 Decision/action requested

***The group is asked to discuss and approval.***

# 2 References

[1] 3GPP TS 28.535: "Management services for communication service assurance; Requirements"

[2] 3GPP TS 28.536: "Management services for communication service assurance; Stage 2 and stage 3"

# 3 Rationale

This contribution proposes to add potential requirements and a potential solution to Clause 5.5 Use case on CCL for Fault Management.

# 4 Detailed proposal

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| **1st Change** |

# 5. Use Cases

5.5 CCL for fault management

5.5.1 Description

Current fault management has some issues.

Alarms contain information like probableCause, specificProblem, and rootCauseIndicator, etc. However, in some scenarios, it is difficult for operators to directly identify the root cause just from these alarm attributes. Additional troubleshooting steps are usually required to dig into the root cause.

Fault management procedures often require operators to follow a sequence of troubleshooting steps to narrow down the issue before they can identify the root cause. This multi-step process introduces complexity and is resource intensive. Thus fault recovery response time and network and service downtime may be prolonged.

CCL can be extended to automate and optimize fault management:

* Monitor: PM/KPIs，performance threshold monitoring events and fault supervision events
* Analyse：analyse fault alarms and correlate them with other PMs/KPIs etc. to identify likely root causes
* Decide: provide automated decision making according to the fault root causes and propose fixing solutions
* Execute: execute through provisioning services to fix network and service faults

5.5.2 Potential Requirements

**REQ-CCLM\_ FAULT -01** The 3GPP management system should have the capability to allow MnS consumer to request a closed control loop that identifies the root cause and takes actions to mitigate or solve the root cause.

**REQ-CCLM\_ FAULT -02** The 3GPP management system should have the capability to allow MnS consumer to get the results from the closed control loop, including the identified root cause and taken actions.

5.5.3 Potential Solutions

5.5.3.1 Solution-x

5.5.3.2 Solution-y

5.5.3.3 Closed Control Loop for Fault Management

The solution requires the following information to be maintained as part of CCL NRM:

* An attribute for clearUserId which indicates the user is allowed to clear the alarms as per specifications in TS 28.111
* A <<dataType>> for FaultManagementTargetList which can include a list of fault management targets including alarmId, of which alarms will be handled by the FaultManagementClosedControlLoop. An alarmId identifies an AlarmRecord in the Alarm List as specified in TS 28.111, which can include information such as alarmRaisedTime, eventType, probableCause, monitoredAttributes, rootCauseIndicator and correlatedNotifications etc. This information can be leveraged by the Closed Control Loop to further enhance the correlation of alarms, for example correlation of alarms with change in PM/KPIs and/or fault supervision events, and to identify the root causes in order to find solutions to mitigate or resolve them in order to clear the alarms that otherwise have to be manually cleared by the MnS consumer according to TS 28.111.
* A <<dataType>> for FaultManagementPolicies which can include required policies and preparation actions in order to mitigate and resolve the root cause and clear the alarms by closed control loop, for example,
	+ Fault management deadline that indicates when the time the identified root causes are resolved or mitigated to clear the alarms that are associated with the fault.
	+ A list of thresholds for specific KPIs that indicates faults associated with selected alarms should be managed when these thresholds are passed/exceeded
	+ A list of preparation actions required to manage the faults, such as changing the operational state of managed object
* Attributes for managed object ID that faults are associated with and attribute for observationTime.

Also a report can be provided to represent the result of fault management targets associated with specific alarms, with identified root causes. The report will include the information regarding status of the fault management with following attributes:

- Identified root causes for each fault management target

- The status of fault management targets, for observed and predicted, which can indicate the successful mitigation/resolving of root causes for target fault

- Any other relevant information related to the fault management which can be vendor specific.

5.5.4 Evaluation of solutions

TBD

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| **End of change** |