**3GPP TSG-SA5 Meeting #142-e *S5-222376rev4***

**e-meeting, 4-12 April 2022**

**Source: China Mobile, HUAWEI**

**Title: pCR 28.104 Add alarm analysis use case**

**Document for: Approval**

**Agenda Item: 6.6.5**

# 1 Decision/action requested

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

# 2 References

[1] 3GPP TR 28.809 Management and orchestration; Study on enhancement of Management Data Analytics (MDA)

[2] 3GPP TS 28.104-000 “Management and orchestration; Management Data Analytics”

# 3 Rationale

In 5G system, millions of alarms are generated due to the more complex network with high density of network functions and end users. Huge amount of alarms brings difficulties in network operation and maintenance. Therefore, the alarms and deteriorated performance measurements of same root cause should be correlated and analysed to relieve the stress of manually alarm handling.

This contribution is proposed to add alarm analysis capability of MDAS in [2].

# 4 Detailed proposal

It proposes to make the following changes to TS 28.104[1].

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| **1st Modified Section** |

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## 7.2 MDA Capabilities

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### 7.2.3 MDA assisted fault management

#### 7.2.3.1 Fault analysis and prediction

##### 7.2.3.1.1 Description

This MDA capability is for fault analysis and prediction.

##### 7.2.3.1.2 Use case

There are multiple types of faults and alarms generated caused by faults in the 5G system and it needs extensive troubleshooting. In order to reduce network and service failure time and performance degradation by faults, it is necessary to collect and analyse the alarms related faults generated from a single domain or multiple domains to identify the root causes, fault locations, affected objets, etc. Meanwhile, it is also necessary to supervise the status of various network functions and resources, and predict the running trend of network and potential faults to intervene in advance.

Due to the fact that fault analysis and prediction could depend on the existing alarm incidents and relevant historical and real-time data (performance measurement information, configuration data, network topology information, etc.), there is a possibility for MDA to be used in conjunction with AI/ML technologies for model training, fault analysis and potential faults prediction.In order to resolve occurred faults, avoid the occurrence of faults and abnormal network states, it is necessary for users to obtain the required details of existing fault and alarm, potential fault and the corresponding degradation trend (abnormal KPI, performance measurement information, possible alarm type, fault root cause, etc.).

Therefore, MDA, may in conjunction with AI/ML technology, be required to obtain basic health maintenance knowledge (e.g., the relationship between the faults or potential faults and the related maintenance actions) through predefined expertise or model training, so as to effectively analyse existing faults and predict potential faults. The basic health maintenance knowledge could be updated with feedback.

If necessary, MDA could provide corresponding recommended actions for fault recovery and prevention.

##### 7.2.3.1.3 Requirements

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| **Requirement label** | **Description** | **Related use case(s)** |
| **REQ-FAULT\_PRED\_MDA-01** | MDA capability for fault analysis and prediction shall be able to collect, correlate, filter and analyse the required data (including, alarm information, historical and real-time data) as inputs for analytics and provide the analytics output. | Fault analysis and prediction |
| **REQ-FAULT\_PRED\_MDA-02** | MDA capability for fault analysis and prediction shall be able to obtain basic health maintenance knowledges (including, the relationship between the faults or potential faults and the related maintenance actions) through predefined expertise or model training. | Fault analysis and prediction |
| **REQ-FAULT\_PRED\_MDA-03** | MDA capability for fault analysis and prediction shall be able to provide the fault prediction analytics output including predictions of potential faults, as well as the possible recommendation options for the fault prediction process.  | Fault analysis and prediction |
| **REQ-FAULT\_PRED\_MDA-04** | MDA capability for fault analysis and prediction shall be able to provide the fault analysis analytics output with the following information:- Identifier of analysed alarms/faults- The root cause(s) of the Alarm related fault(s)- Severity level- Affected objects (MOIs, NFs, etc.) - The recommended recovery action(s) | Fault analysis and prediction |

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| **End of Modified Sections** |