**3GPP TSG-SA5 Meeting #140-e *S5-216260***

**e-meeting, 15 - 24 November 2021**

**Source: China Mobile, HUAWEI**

**Title: pCR 28.104 add alarm analysis**

**Document for: Approval**

**Agenda Item: 6.4.18**

# 1 Decision/action requested

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

# 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

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| **1st Modified Section** |

## 7.2 MDA Capabilities

## 7.2.Z Alarm analysis

#### 7.2.Z.1 Description

This MDA capability is to facilitate alarm analysis and identify root cause(s).

#### 7.2.Z.2 Use cases

Due to the complexity of 5G network system, a large number of alarms are posted to the 3GPP management system every day. These alarms come from network elements, infrastructures, systems of different levels, such as network slices, network slice subnets, NFs (network functions) (that could be running as Virtual NFs (VNFs) or as Physical NFs (PNFs)). These alarms may also come from a specific management domain (e.g., CN or AN).

There is a possibility that a root cause could trigger several alarms from different network sources. The reasons could be 1) there are several topological relations between different network elements; 2) there are several logical relations between different generated alarms. It is desirable for 3GPP management system to do collection, correlation, filter, recognization, analysis to determine fault type, the time, severity, affected objects of the fault and other fault related information. Some ML models and algorithms may be used to group or filter the correlated alarms and indicate the root cause.

To improve the efficiency of network operation and maintenance, MDA can provide the area specific analysis and provide the output based on multiple kinds of data (performance measurement data, configuration data, network topology information, etc.) for alarm demarcation and root cause analysis.

If necessary, MDA could provide recovery mechanism options.

#### 7.2.Z.3 Requirements

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| **Requirement label** | **Description** | **Related use case(s)** |
| **REQ-ALARM\_ MDA-1** | 3GPP management system shall have the capability to provide the alarm related fault demarcation and root cause analysis based on collected data. | Alarm Analysis |
| **REQ-ALARM\_MDA-2** | 3GPP management system shall have the capability to filter the alarms based on collected data. | Alarm Analysis |
| **REQ-ALARM\_ MDA-3** | 3GPP management system shall have the capability to provide the area specific alarm related fault analysis. | Alarm Analysis |
| **REQ-ALARM\_MDA-4** | 3GPP management system should have the capability to provide the analytics output with following information describing the alarm related fault:  - Alarm Fault Identifier  - List of Correlated Alarms  - The raised time and cleared time of the Alarm related Fault  - The root cause(s) of the Alarm related fault  - Severity level  - Affected objects (MOIs, NFs, network slices, etc.) | Alarm Analysis |

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| **End of Modified Sections** |