**3GPP TSG-SA5 Meeting #145-e *S5-225579***

**e-meeting, 15 - 24 August 2022**

**Source: CMCC, Huawei**

**Title: pCR TR 28.830 Add background**

**Document for: Approval**

**Agenda Item: 6.7.7.1**

# Decision/action requested

***The group is asked to discuss and approve the proposal in section 4***

# 2 References

[1] SP-220153 [:](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3693) "New SID on Fault Supervision Evolution"

[2] S5-224406: "TR 28.830 Fault supervision evolution"; v0.2.0

[3] TS 32.111-1: "Telecommunication management; Fault Management; Part 1: 3G fault management requirements (Release 17)”

[4] TS 28.532: “Management and orchestration; Generic management services; (Release 17)”

# 3 Rationale

This pCR is to add background for TR 28.830.

Some existing concepts that are relevant or included in the FS\_FSEV discussions are listed in Table 1:

**Table 1: Some existing Concepts**

|  |  |  |
| --- | --- | --- |
| No. | Name | Definition  |
| 1 | **Event** | **event[3]:** Network occurrence which has significance for the management of an NE. Events do not have state.**event notification[3]:** Notification used to inform the recipient about the occurrence of an event. **event notification[4]:**This notification notifies the MnS consumer, who has a subscription receiving this type of notification, that certain network events have occurred with potential service impact, for example, system restart and system redundancy shift (backup). |
| 2 | **Alarm** | **alarm[3]:** An alarm signifies an undesired condition of a resource (e.g. network element, link) for which an operator action is required. It emphasizes a key requirement that operators (above Itf-N) should not be informed about an undesired condition unless it requires operator action. Use of this emphasis does not exclude this case: In certain context, it is not possible for alarm reporters (below Itf-N) to know whether a particular undesired condition requires operator action or not. In such context, the NM may receive alarms that do not require operator action.**alarm notification[3]**: Notification used to inform the recipient about the occurrence of an alarm.**managed alarm[3]**: The management representation of the alarm in the NM domain.**active alarm[3]:** An alarm that has not been cleared and which is active until the fault that caused the alarm is corrected and a "clear alarm" is generated. |
| 3 | **Fault** | **Fault[3]:** A deviation of a system from normal operation, which may result in the loss of operational capabilities of the element or the loss of redundancy in case of a redundant configuration.**ADAC Faults[3]:** Faults that are "Automatically Detected and Automatically Cleared" by the system when they occur and when they are repaired.**ADMC Faults[3]:** Faults that are Automatically Detected by the system when they occur and Manually Cleared by the operator when they are repaired. |

The intention of existing fault management is to inform the operator to take care of some undesired condition (occurs or may occur in the near future) and actions may be needed to resolve the issues which trigger the alarms. However in certain context, it is not possible for alarm reporters (below Itf-N) to know whether a particular undesired condition requires operator action or not. In such context, the NM may receive alarms that do not require operator action. In order to identify whether there are really hidden issues or faults or potential risks that may have network or service impacts, some management capabilities are needed.

In Table 2, some analysis is provided to see whether existing concepts can serve the above purposes.

**Table 2 Analysis of Existing Concepts in 3GPP**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Concept | Scope | Granularity | Analysis | Severity |
| 1 | **Event** | Resource (NE) | Roots from a single MOI. | - Neutral concept- may or may not have service or network impacts- may or may not need operator’s actions | Not applicable |
| 2 | **Alarm** | Resource (NE or link) | Roots from a single MOI | - negative concept- have service or network impacts by definition- operator’s actions are needed by definition- The “warning” is used as one of the severity levels which is considered as less severe than an occurrence. It is difficult and lack of flexibility to handle the rich meaning of prediction with its own types and severity levels.- Alarm is a general concept without service characteristics by definition. In reality, information of some typical types and actual service or network impacts are helpful for the operator to take further actions.Gap: May not be able to decide whether an alarm needs actions in reality due to lack of knowledge in resource layer to judge from NM layer’s perspective. | Severity levels: Critical, Major, Minor or Warning.E.g. warning is used to a potential risk and is considered less severe than an occurrence.  |
| 3 | **Fault** | Resource (NE or link) | Roots from a single MOI | - negative concept- It is a deviation condtion from normal operation. It is the internal issues which trigger the alarms.- No one to one mapping between Fault and Alarms.Gap: From interface perspective, existing specification is about alarm notifications, the fault is something hidden behind as internal conditions or problems. Rootcause is different with Fault, they are different concepts. | Not applicable |

From Table 2, it can be observed that something additional concepts and management capabilities may be needed to resolve the gaps.

- To identify and differentiate alarms which need operator’s actions.

- To manage “prediction” type of alarms separately.

- To send only one integrated report to consumers on one abnormal issue, e.g. to send one “link failure” report including related information instead of multiple individual alarms from multiple MOIs.

- To send report with some important service impacts information according to some typical scenarios and use cases, e.g. service outage issues, performance degradation issues, risk of performance degradation or hardware faults etc. More detailed typical subtypes can also be defined.

- To automatically recover the abnormal issue and report its status change, or to support the generation of issue profile (i.e. the trouble tickets for live network operation) for manual handling.

Existing concepts of event, alarm and fault etc have been widely accepted and used in industry, it is proposed to introduce new concepts in order not to avoid confusing as much as possible. In addition, a higher level MnS producer may be needed because sometimes it is not possible for alarm reporters (below Itf-N) to know whether a particular undesired condition requires operator action or not.

# From backward compatibility and cost reduction perspective, it is proposed not to impact existing specifications too much. For example, existing alarms as defined will be operated as today, e.g. they are generated and used as necessary data sources for further handing by the higher level MnS producer. Operators can choose whether to monitor existing alarms in addition to the more sophisticated new report.4 Detailed proposal

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| **Start of modification** |

# X Background and Concepts

## X.1 Background

The intention of existing fault management is to inform the operator to take care of some undesired condition (occurs or may occur in the near future) and actions may be needed to resolve the issues which trigger the alarms. However in certain context, it is not possible for alarm reporters (below Itf-N) to know whether a particular undesired condition requires operator action or not. In such context, the NM may receive alarms that do not require operator action. In order to identify whether there are really hidden issues or faults or potential risks that may have network or service impacts, some management capabilities are needed.

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| **End of modifications** |