**3GPP TSG-SA5 Meeting #145-e *S5-225101***

e-meeting, 15 - 24 Aug 2022

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0005** | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Rel-17 CR 28.104 Rectifying attribute properties for MDA assisted Failure Prediction usecase | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2022-08-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Incorrect attribute properties specified for attributes with multiplicity more than 1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Incorrect attributes properties are corrected for attributes with multiplicity more than 1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect attribute properties for attributes with multiplicity more than 1 leading to ambiguity | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.4.3.1, 8.4.5.1, 8.4.2.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

***Start of first change***

### 8.4.3 MDA assisted fault management

#### 8.4.3.1 MDA assisted failure prediction

##### 8.4.3.1.1 MDA type

The MDA type for failure prediction analysis is: MDAAssistedFaultManagement.FailurePrediction.

##### 8.4.3.1.2 Enabling data

The enabling data for MDAAssistedFaultManagement.FailurePrediction MDA type are provided in table 8.4.3.1.2-1.

For general information about enabling data, see clause 8.2.1.

Table 8.4.3.1.2-1: Enabling data for fault predication analysis

|  |  |  |
| --- | --- | --- |
| Data category | Description | References |
| Performance measurements | The deteriorated performance or the abnormal performance measurements based on certain performance monitoring threshold.  3GPP management system may monitor a set of performance measurements and their thresholds, so as to support the analytics of prediction of a network service failure. | The performance measurements as defined in TS 28.552 [4] |
| Alarm notifications | Alarm information, e.g. the alarm notification of network functions. | Alarm information and notifications as per TS 28.532 [11] |
| Configuration data | MOIs of the cells, UPFs and SMFs. | TS 28.541 [15] |
| Network analytics data | The control plane analysis result from the NWDAF, e.g. observed service experience related network data analytics. | TS 23.288 [10] |

##### 8.4.3.1.3 Analytics output

The specific information elements of the analytics output for failure prediction analysis, in addition to the common information elements of the analytics outputs (see clause 8.3), are provided in table 8.4.3.1.3-1.

Table 8.4.3.1.3-1: Analytics output for fault prediction analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Information element | Definition | Support qualifier | Properties |
| failurePredictionObject | Indication of NR cells or NFs where the failure related issues occurred or potentially occur. | M | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| potentialFailureType | Indication of type of issues that can cause the failures.  NOTE 1: The values can be defined as a list of example values: "Operational Violation", "Physical Violation" and "Time Domain Violation". See alarmType described in TS 28.532 [11]. | M | type: string  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eventTime | This field holds the time of potential failure predicted.  Examples: "20:15:00", "20:15:00-08:00" (for 8 hours behind UTC). | M | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| issueID | This filed holds the ID of this failure prediction which is reported.  When reports, this identifier can be used to provide the information to management system to maintain. | M | type: string  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| perceivedSeverity | This field holds the value to indicate relative level of urgency for operator attention.  NOTE 2: The value can be Critical, Major, Minor, Warning, Indeterminate, Cleared, see Recommendation ITU-T X.733 [27]. | M | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |

***Start of next changes***

#### 8.4.5.1 Mobility performance analysis

##### 8.4.5.1.1 MDA type

The MDA type for mobility performance analysis is: MobilityManagementAnalytics.MobilityPerformanceAnalysis.

##### 8.4.5.1.2 Enabling data

The enabling data for MobilityManagementAnalytics.MobilityPerformanceAnalysis MDA type are provided in table 8.4.5.1.2-1.

For general information about enabling data, see clause 8.2.1.

Table 8.4.5.1.2-1: Enabling data for mobility performance analysis

|  |  |  |
| --- | --- | --- |
| Data category | Description | References |
| Performance measurements | Inter-gNB handovers | Inter-gNB handovers (clause 5.1.1.6.1 of TS 28.552 [4]). |
| Intra-gNB handovers | Inter-gNB handovers (clause 5.1.1.6.4 of TS 28.552 [4]). |
| Inter-gNB DAPS handovers | Inter-gNB handovers (clause 5.1.1.6.2 of TS 28.552 [4]). |
| Intra-gNB DAPS handovers | Inter-gNB handovers (clause 5.1.1.6.3 of TS 28.552 [4]). |
| Inter-gNB conditional handovers | Inter-gNB handovers (clause 5.1.1.6.6 of TS 28.552 [4]). |
| Intra-gNB conditional handovers | Inter-gNB handovers (clause 5.1.1.6.7 of TS 28.552 [4]). |

##### 8.4.5.1.3 Analytics output

The specific information elements of the analytics output (MDA report) for mobility performance analysis, in addition to the common information elements of the analytics outputs (see clause 8.3), are provided in table 8.4.5.1.3‑1.

Table 8.4.5.1.3-1: Analytics output for Mobility Performance analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Information element | Definition | Support qualifier | Properties |
| mobilityPerformance IssueIdentifier | The identifier of the mobility performance issue analysis; | M | type: integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mobilityPerformance IssueRootCause | The root cause of mobility performance issues.  The allowed value is one of the enumerated values: too long mobility interruption time, poor coverage of the cell-edge, inappropriate handover parameters, other. | M | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mobilityPerformance IssueLocation | Geographical location areas where the mobility performance issue occurred. | O | type: GeoCoordinate (TS 28.622 [19])  multiplicity: \*  isOrdered: True  isUnique: True  defaultValue: None  isNullable: False |

***Start of next changes***

#### 8.4.2.5 Network slice load analysis

##### 8.4.2.5.1 MDA type

The MDA type for Capability- Network slice load analysis is: SLSAnalysis.NetworkSliceLoadAnalysis.

##### 8.4.2.5.2 Enabling data

The enabling data for SLSAnalysis.NetworkSliceLoadAnalysis MDA type are provided in table 8.4.2.5.2-1.

Table 8.4.2.5.2-1: Enabling data for network slice load analysis

|  |  |  |
| --- | --- | --- |
| Data category | Description | References |
| Performance measurements | Number of PDU sessions of network slice | Mean number of PDU sessions of network and network Slice Instance (clause 6.4.1 in TS 28.554 [5]). |
| Number of PDU Sessions successfully setup | Number of PDU Sessions successfully setup (clause 5.1.1.5 in TS28.552 [4]). |
| Mean Number of PDU sessions | Number of PDU sessions(Mean) (clause 5.3.1.1 in TS 28.552 [4]). |
| Network Data Analytics | Analysis results from the control plane produced by NWDAF | Analytics data from NWDAF in TS 23.288 [10] including e.g. Slice load level related network data analytics clause 6.3, and the analytics for user plane performance (i.e. average/maximum traffic rate, average/maximum packet delay, average packet loss rate in clause 6.14. |
| Configuration data | MOIs of the cells, NW slice/NW slice subnet, 5GC NFs | NRM information TS 28.541 [15]. |

##### 8.4.2.5.3 Analytics output

The specific information elements of the analytics output for network slice load analysis, in addition to the common information elements of the analytics outputs (see clause 8.3), are provided in table 8.4.2.5.3-1.

Table 8.4.2.5.3-1: Analytics output for network slice load analysis

|  |  |  |  |
| --- | --- | --- | --- |
| Information element | Definition | Support qualifier | Properties |
| networkSliceLoadIssueId | The identifier indicates the output is for Network slice instance load analysis | M | type: string  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| networkSliceLoadIssueDomain | Indicates the domain of the network slice instance load issue  The allowed value is one of the enumerated values:  - RAN issue;  - CN issue | M | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| networkSliceLoadIssuePhase | Indicates the phase of the network slice instance load issue  The allowed value is one of the enumerated values: historic network slice load issue, ongoing network slice load issue, potential network slice load issue | M | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| networkSliceLoadIssueType | Indicates the type of the network slice instance load issue  The allowed value is one of the enumerated values: overload network slice load issue, underutilized network slice load issue | M | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| affectedObjects | The managed object instances involved in the network slice instance load problem | O | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| networkSliceLoadDistribution | Describes the detailed load distribution or predictive distribution, e.g. load distribution for a network slice instance at a certain location or in a certain time period | O | type: Integer  multiplicity: \*  isOrdered: True  isUnique: False  defaultValue: None  isNullable: False |

***End of changes***