**3GPP TSG-SA5 Meeting #156 *S5-245062***

Maastricht, Netherlands, 19 - 23 August 2024

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **1** | **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-16 CR 28.622 Correction of TraceJob attributes MBSFN Area List and Area Configuration For Neighboring Cells (stage 2) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16 | | | | |  | ***Date:*** | | | 2024-08-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | * Align attribute name "mbsfnAreaList" with data type "MbsfnArea" and attribute "mbsfnAreaId". * Attribute "areaConfigurationForNeighCell" shall have not more than 32 entries. This is not reflected in the attribute properties. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Correct attribute name "mbsfnAreaList" * Correct attribute property multiplicity for "areaConfigurationForNeighCell" * Editorial corrections | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * Inconsistency between SA5 specs TS 28.622 and TS 32.422 * Attribute name "mbsfnAreaList" is inconsistent with Rel-18 and later | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3.30.1, 4.3.30.2, 4.3.30.3, 4.4.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 28.623 CR 0399 | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | S5-243903 | | | | | | | | |

***First change***

### 4.3.30 TraceJob

#### 4.3.30.1 Definition

A TraceJob instance represents the Trace Control and Configuration parameters of a particular Trace Job (see TS 32.421 [29] and TS 32.422 [30] for details). It can be name-contained by SubNetwork, ManagedElement, ManagedFunction.

To activate Trace Jobs, a MnS consumer has to create TraceJob object instances on the MnS producer. A MnS consumer can activate a Trace Job for another MnS consumer since it is not required the value of traceCollectionEntityIpAddress or traceReportingConsumerUri to be his own.

For the details of Trace Job activation see clauses 4.1.1.1.2 and 4.1.2.1.2 of TS 32.422 [30].

When a MnS consumer wishes to deactivate a Trace Job, the MnS consumer shall delete the corresponding TraceJob instance. For details of management Trace Job deactivation see clauses 4.1.3.8 to 4.1.3.11 and 4.1.4.10 to 4.1.4.13 of TS 32.422 [30].

The attribute traceReference specifies a globally unique ID and identifies a Trace session. One Trace Session may be activated to multiple Network Elements. The traceReference is populated by the consumer that makes the request for a Trace Session, TS 32.422 [30].

The attribute traceReportingFormat defines the method for reporting the produced measurements. The selectable options are file-based or stream-based reporting. In case of file-based reporting the attribute traceCollectionEntityIPAddress is used to specify the IP address to which the trace records shall be transferred, while in case of stream-based reporting the attribute traceReportingConsumerUri specifies the streaming target.

The mandatory attribute traceTarget determines the target object of the TraceJob. Dependent on the network element to which the Trace Session is activated different types of the target object are possible. The attribute plmnTarget defines the PLMN for which sessions shall be selected in the Trace Session in case of management based activation when several PLMNs are supported in the RAN.

The attribute jobType specifies the kind of data to collect. Dependent on the selected type various parameters shall be available. The attributes jobType, traceReference, traceRecordingSessionReference, traceCollectionEntityIPAddress, traceTarget and traceReportingFormat are mandatory for all job types. If streaming reporting is selected for traceReportingFormat, traceReportingConsumerUri shall be present additionally. The attribute pLMNTarget shall be present if trace activation method is management based.

For the different job types the attributes are differentiated as follows:

- In case of TRACE\_ONLY additionally the following attributes shall be available: listOfNeTypes, traceDepth, and triggeringEvents.

For this case the optional attribute listOfInterfaces allows to specify the interfaces to be recorded.

- In case of IMMEDIATE\_MDT\_ONLY additionally the following attributes shall be available:

- anonymizationOfMDTData,

- listOfMeasurements,

- collectionPeriodRRMUMTS (conditional for M4 and M5 in UMTS),

- measurementPeriodUMTS (conditional for M6 and M7 in UMTS),

- collectionPeriodRRMLTE (conditional for M3 in LTE),

- measurementPeriodLTE (conditional for M4 and M5 in LTE),

- collectionPeriodM6LTE (conditional for M6 in LTE),

- collectionPeriodM7LTE (conditional for M7 in LTE),

- collectionPeriodRRMNR (conditional for M4 and M5 in NR),

- collectionPeriodM6NR (conditional for M6 in NR),

- collectionPeriodM7NR (conditional for M7 in NR),

- reportInterval (conditional for M1 in LTE or NR and M1/M2 in UMTS),

- reportAmount (conditional for M1 in LTE or NR and M1/M2 in UMTS),

- reportingTrigger (conditional for M1 in LTE or NR and M1/M2 in UMTS),

- eventThreshold (conditional for A2 event reporting or A2 event triggered periodic reporting),

- measurementQuantity (conditional for 1F event reporting).

For this case the optional attribute areaScope allows to specify the area in terms of cells or Tracking Area/Routing Area/Location area where the MDT data collection shall take place and the optional attributes positioningMethod, sensorInformation allow to specify the positioning methods to use or the sensor information to include.

- In case of IMMEDIATE\_MDT\_AND\_TRACE both additional attributes of TRACE\_ONLY and IMMEDIATE\_MDT\_ONLY shall apply.

- In case of LOGGED\_MDT\_ONLY additionally the following attributes shall be available: anonymizationOfMDTData, traceCollectionEntityId, loggingInterval, loggingDuration, reportType, eventListForEventTriggeredMeasurements.

For this case the optional attribute areaScope allows to specify the area in terms of cells or Tracking Area/Routing Area/Location area where the MDT data collection shall take place, the optional attribute plmnList allows to specify the PLMNs where measurement collection, status indication and log reporting is allowed, the optional attribute areaConfigurationForNeighCell allows to specify the area for which UE is requested to perform measurements logging for neighbour cells which have list of frequencies and the optional attribute sensorInformation allows to specify the sensor information to include.

- In case of RLF\_REPORT\_ONLY and RCEF\_REPORT\_ONLY the optional attribute areaScope allows to specify the eNB or list of eNBs or gNB or list of gNBs where the reports should be collected.

- In case of LOGGED\_MBSFN\_MDT additionally the following attributes shall be available: anonymizationOfMDTData, loggingInterval, loggingDuration, mbsfnAreaList.

Reporting of measurements and messages can be periodical, event triggered or event triggered periodic depending on the selected job type.

- For trace the reporting is event based, where the triggering event is configured with attribute triggeringEvents. For each triggering event the first and last message (start/stop triggering event) to record are specified.

- For immediate MDT, the reporting is dependent on the configured measurements:

- For measurement M1 in LTE or NR, it is possible to select between periodical, event triggered, event triggered periodic reporting or reporting according to all configured RRM event triggers. For M1 and M2 measurement in UMTS, it is possible to select between periodical, event triggered reporting or reporting according to all configured RRM event triggers. Parameter reportingTrigger determines which of the reporting methods is selected and in case of event triggered or event-triggered periodic, which is the decisive event type. For periodical reporting, parameters reportInterval and reportAmount determine the interval between two successive reports and the number of reports. This means the periodical reporting terminates after reportAmount reports have been sent as long as reportAmount is configured with a value different from infinity. For event-triggered periodic reporting, these two parameters apply in addition to parameter eventThreshold which determines the threshold of the event. In this case up to reportAmount reports are sent with a periodicity of reportInterval after the entering condition is fulfilled. The reporting is stopped, if the leaving condition is fulfulled and is restarted if the configured event reoccurs. For event based reporting, there is only one report sent after the event occurs. The parameters to configure are reportingTrigger and eventThreshold. In case of UMTS and 1f event reporting, additionally parameter measurementQuantity is necessary in order to determine for which measurement(s) the event threshold is applicable.

- For measurement M2 in LTE or NR, reporting is according to RRM configuration, see TS 38.321 [36], TS 36.321 [37] and TS 38.331 [38], TS 36.331 [39]. For measurement M4 in UMTS, reporting is either according to RRM configuration, see TS 25.321 [40] and TS 25.331 [41] or periodic or event triggered periodic using parameter collectionPeriodRRMUMTS and eventThresholdUphUMTS.

- For measurement M3 in UMTS, the reporting is done upon availability, see TS 37.320 [43].

- For measurements M4, M5, M6 and M7 in NR, for measurements M3, M4, M5, M6 and M7 in LTE and for measurements M5, M6 and M7 in UMTS periodical reporting is applied. The configurable parameter is the interval between two measurements (collectionPeriodRRMNR, collectionPeriodM6NR, collectionPeriodM7NR, collectionPeriodRRMLTE, measurementPeriodLTE, collectionPeriodM6LTE, collectionPeriodM7LTE, collectionPeriodRRMUMTS, measurementPeriodUMTS). If no collection period is configured for M5 in UMTS, all available measurements are logged according to RRM configuration.

- For logged MDT in UMTS and LTE, the reporting is periodical. Parameter loggingInterval determines the interval between the reports and parameter loggingDuration determines how long the configuration is valid meaning after this duration has passed no further reports are sent. In NR, the reporting can be periodical or event based, determined by parameter reportType. For periodical reporting the same parameters as in LTE and UMTS apply. For event based reporting, parameter eventListForEventTriggeredMeasurement configures the event type, namely ‘out of coverage’ or ‘L1 event’. In case ‘L1 event’ is selected as event type, the logging is performed according to parameter loggingInterval at regular intervals only when the conditions indicated by eventThreshold L1, hysteresis L1, timeToTrigger L1 (defining the thresholds, hysteresis and time to trigger) are met and if UE is ‘camped normally’ state (TS 38.331 [38], TS 38.304 [42]). In case ‘out of coverage’ is selected as event type, the logging is performed according to parameter loggingInterval at regular intervals only when the UE is in ‘any cell selection’ state. Furthermore, logging is performed immediately upon transition from the ‘any cell selection’ state to the ‘camped normally’ state ( TS 38.331 [38], TS 38.304 [42]).

Creation and deletion of TraceJob instances by MnS consumers is optional; when not supported, the TraceJob instances may be created and deleted by the system or be pre-installed.

#### 4.3.30.2 Attributes

The TraceJob IOC includes attributes inherited from Top IOC (defined in clause 4.3.29) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute Name | S | isReadable | isWritable | isInvariant | isNotifyable |
| jobType | M | T | T | F | T |
| listOfInterfaces | CO | T | T | F | T |
| listOfNeTypes | CM | T | T | F | T |
| PLMNTarget | CM | T | T | F | T |
| traceReportingConsumerUri | CM | T | T | F | T |
| traceCollectionEntityIPAddress | M | T | T | F | T |
| traceDepth | CM | T | T | F | T |
| traceReference | M | T | T | F | T |
| traceReportingFormat | M | T | T | F | T |
| traceTarget | M | T | T | F | T |
| triggeringEvents | CM | T | T | F | T |
| anonymizationOfMDTData | CM | T | T | F | T |
| areaConfigurationForNeighCell | CO | T | T | F | T |
| areaScope | CO | T | T | F | T |
| collectionPeriodRRMLTE | CM | T | T | F | T |
| collectionPeriodM6LTE | CM | T | T | F | T |
| collectionPeriodM7LTE | CM | T | T | F | T |
| collectionPeriodRRMUMTS | CM | T | T | F | T |
| collectionPeriodRRMNR | CM | T | T | F | T |
| collectionPeriodM6NR | CM | T | T | F | T |
| collectionPeriodM7NR | CM | T | T | F | T |
| eventListForEventTriggeredMeasurement | CM | T | T | F | T |
| eventThreshold | CM | T | T | F | T |
| listOfMeasurements | CM | T | T | F | T |
| loggingDuration | CM | T | T | F | T |
| loggingInterval | CM | T | T | F | T |
| eventThresholdL1 | CM | T | T | F | T |
| hysteresisL1 | CM | T | T | F | T |
| timeToTriggerL1 | CM | T | T | F | T |
| mbsfnAreaList | CM | T | T | F | T |
| measurementPeriodLTE | CM | T | T | F | T |
| measurementPeriodUMTS | CM | T | T | F | T |
| measurementQuantity | CM | T | T | F | T |
| eventThresholdUphUMTS | CO | T | T | F | T |
| plmnList | CO | T | T | F | T |
| positioningMethod | CO | T | T | F | T |
| reportAmount | CM | T | T | F | T |
| reportingTrigger | CM | T | T | F | T |
| reportInterval | CM | T | T | F | T |
| reportType | CM | T | T | F | T |
| sensorInformation | CO | T | T | F | T |
| traceCollectionEntityId | CM | T | T | F | T |

#### 4.3.30.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| listOfInterfaces (support qualifier) | This attribute shall be present when jobType includes Trace. |
| listOfNeTypes (support qualifier) | This attribute shall be present only for Trace with Signalling Based Activation |
| PLMNTarget (support qualifier) | This attribute shall be present for management based activation when several PLMNs are supported in the RAN. |
| traceReportingConsumerUri (support qualifier) | This attribute shall be present if streaming trace data reporting is supported. |
| traceDepth (support qualifier) | This attribute shall be present when jobType includes Trace. |
| triggeringEvents (support qualifier) | This attribute shall be present when jobType includes Trace. |
| anonymizationOfMDTData (support qualifier) | This attribute shall be present only if MDT is supported and the areaScope attribute is present. This attribute is only applicable for management based activation. |
| areaConfigurationForNeighCell (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| areaScope (support qualifier) | This attribute shall be present if MDT is supported. |
| collectionPeriodRRMLTE (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute has any of M2, M3 measurement set in case of LTE. |
| collectionPeriodRRMUMTS (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute has any of M3, M4, M5 measurement set in case of UMTS. |
| eventListForEventTriggeredMeasurement (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| eventThreshold (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the reportingTrigger attribute is configured for A2EventReporting in LTE and NR or 1f/1IEventReporting in UMTS. |
| listOfMeasurements (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT. |
| loggingDuration (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Logged MDT or Logged MBSFN MDT. |
| loggingInterval (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Logged MDT or Logged MBSFN MDT. |
| eventThresholdL1 (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| hysteresisL1 (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| timeToTriggerL1 (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| mbsfnAreaList (support qualifier) | This attribute shall be present only if Logged MBSFN MDT is supported and the jobType attribute is set to Logged MBSFN MDT. This is applicable only for eUTRAN. |
| measurementPeriodLTE (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute for LTE has either M4 or M5 measurement set. |
| collectionPeriodM6LTE (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute for LTE has M6 measurement set. |
| collectionPeriodM7LTE (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute for LTE has M7 measurement set. |
| measurementPeriodUMTS (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute for UMTS has M6 or M7 measurements set. |
| collectionPeriodRRMNR (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute has any of M4, M5 measurement set in case of NR. |
| collectionPeriodM6NR (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute has M6 measurement set in case of NR. |
| collectionPeriodM7NR (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute has any of M7 measurement set in case of NR. |
| measurementQuantity (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combined Trace and Immediate MDT and the reportingTrigger parameter is set to event 1F. |
| eventThresholdUphUMTS (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combined Trace and Immediate MDT and the listOfMeasurements attribute has M4 measurement set in case of UMTS. |
| plmnList (support qualifier) | This attribute shall be present only if MDT is supported, several PLMNs are supported in the RAN and the jobType attribute is set to Logged MDT. |
| positioningMethod (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT. |
| reportAmount (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the reportingTrigger attribute is configured for periodic measurements or event triggered periodic measurements. |
| reportingTrigger (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT and the listOfMeasurements attribute is configured for M1 (for UMTS, LTE and NR) or M2 (only for UMTS). |
| reportInterval (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Immediate MDT or combine Trace and Immediate MDT, the listOfMeasurements attribute is configured for M1 (for UMTS, LTE and NR) or M2 (only for UMTS) and the reportingTrigger is configured for periodic measurements or event triggered periodic measurements. |
| reportType (support qualifier) | This attribute shall be present only if NR MDT is supported and the jobType attribute is set to Logged MDT. |
| sensorInformation (support qualifier) | This attribute shall be present only if NR MDT is supported. |
| traceCollectionEntityId (support qualifier) | This attribute shall be present only if MDT is supported and the jobType attribute is set to Logged MDT. |

#### 4.3.30.4 Notifications

The common notifications defined in clause 4.5 are valid for this IOC, without exceptions.

***Next change***

## 4.4 Attribute definitions

### 4.4.1 Attribute properties

The following table defines the properties of attributes specified in the present document.

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| heartbeatNtfPeriod | Periodicity of the heartbeat notification emission. The value of zero has the special meaning of stopping the heartbeat notification emission.  Unit is in seconds.  AllowedValues: non-negative integers | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: 0  isNullable: False |
| triggerHeartbeatNtf | Setting this attribute to TRUE triggers an immediate additional heartbeat notification emission. Setting the value to FALSE has no observable result.  The periodicity of notifyHeartbeat emission is not changed.  AllowedValues: TRUE, FALSE | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: FALSE  isNullable: False |
| notificationRecipientAddress | Address of the notification recipient.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| notificationTypes | Notification types of notifications that are candidates for being forwarding to the notification recipient. If this attribute is absent, notifications of all types are candidates for being forwarding to the notification recipient.  If the notificationFilter attribute is absent, all candidate notifications are forwarded to the notification recipient, otherwise the candidate notifications are discriminated by the filter specified by the notificationFilter attribute.  Below is a list of notificationType values that are defined in 3GPP specifications. If the notificationType itself is supported by the system, it shall be supported in the NtfSubscriptionControl.notificationTypes attribute as well. Other notificationTypes defined by SDOs or enterprises may also be supported.  AllowedValues:  - notifyMOICreation  - notifyMOIDeletion  - notifyMOIAttributeValueChanges  - notifyMOIChanges  - notifyEvent  - notifyNewAlarm  - notifyChangedAlarm  - notifyAckStateChanged  - notifyComments  - notifyCorrelatedNotificationChanged  - notifyChangedAlarmGeneral  - notifyClearedAlarm  - notifyAlarmListRebuilt  - notifyPotentialFaultyAlarmList  - notifyFileReady  - notifyFilePreparationError  - notifyThresholdCrossing | type: ENUM  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| notificationFilter | Filter to be applied to candidate notifications identified by the notificationTypes attribute. Only notifications that pass the filter criteria are forwarded to the notification recipient. All other notifications are discarded.  The filter can be applied to any field of a notification.  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| scope | Scopes the managed object instances included in the notification subscription. If this attribute is absent, all objects below and including the base object are scoped.  allowedValues: N/A | type: Scope  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| scopeType | If the optional scopeLevel attribute is not supported or absent, allowed values of scopeType are BASE\_ONLY and BASE\_ALL.  The value BASE\_ONLY indicates only the base object is selected.  The value BASE\_ALL indicates the base object and all of its subordinate objects (incl. the leaf objects) are selected.  If the scopeLevel attribute is supported and present, allowed values of scopeType are BASE\_NTH\_LEVEL and BASE\_SUBTREE.  The value BASE\_NTH\_LEVEL indicates all objects on the level, which is specified by the scopeLevel attribute, below the base object are selected. The base object is at scopeLevel zero.  The value BASE\_SUBTREE indicates the base object and all subordinate objects down to and including the objects on the level, which is specified by the scopeLevel attribute, are selected. The base object is at scopeLevel zero.  allowedValues: N/A | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| scopeLevel | See definition of scopeType attribute.  allowedValues: N/A | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| farEndEntity | The value of this attribute shall be the Distinguished Name of the far end network entity to which the reference point is related.  As an example, with EP\_Iucs, if the instance of EP\_Iucs is contained by one RncFunction instance, the farEndEntity is the Distinguished Name of the MscServerFunction instance to which this Iucs reference point is related.  allowedValues: N/A | type: DN  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| linkType | This attribute defines the type of the link.  allowedValues: Signalling, Bearer, OAM&P, Other or multiple combinations of this type. | type: String  multiplicity: 0..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| locationName | The physical location of this entity (e.g. an address).  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| monitorGranularityPeriod | Granularity period used to monitor performance metrics for threshold crossings. The period is defined in seconds.  See Note 5  allowedValues: a multiple of a supported GP of the associated performance metrics. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| reportingPeriods | Reporting periods supported for the associated performance metrics. The period is defined in seconds.  allowedValues: Integer with a minimum value of 1 | type: Integer  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| thresholdInfoList | List of threshold infos. | type: ThresholdInfo  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| thresholdValue | Value against which the monitored performance metric is compared at a threshold level in case the hysteresis is zero.  allowedValues: float or integer | type: Float or Integer  multiplicity: 1  isOrdered: NA  isUnique: NA  defaultValue: None  isNullable: False |
| hysteresis | Hysteresis of a threshold. If this attribute is present the monitored performance metric is not compared against the threshold value as specified by the thresholdValue attribute but against a high and low threshold value given by  highThresholdValue- = thresholdValue + hysteresis  lowThresholdValue = thresholdValue - hysteresis  When going up, the threshold is triggered when the performance metric reaches or crosses the high threshold value. When going down, the threshold is triggered when the performance metric reaches or crosses the low threshold value.  A hysteresis may be present only when the monitored performance metric is not of type counter that can go up only. If present for a performance metric of type counter, it shall be ignored.  allowedValues: non-negative float or integer | type: Float or Integer  multiplicity: 0..1  isOrdered: NA  isUnique: NA  defaultValue: None  isNullable: False |
| thresholdDirection | Direction of a threshold indicating the direction for which a threshold crossing triggers a threshold.  When the threshold direction is configured to "UP", the associated treshold is triggered only when the performance metric value is going up upon reaching or crossing the threshold value. The treshold is not triggered, when the performance metric is going down upon reaching or crossing the threshold value.  Vice versa, when the threshold direction is configured to "DOWN", the associated treshold is triggered only when the performance metric is going down upon reaching or crossing the threshold value. The treshold is not triggered, when the performance metric is going up upon reaching or crossing the threshold value.  When the threshold direction is set to "UP\_AND\_DOWN" the treshold is active in both direcions.  In case a threshold with hysteresis is configured, the threshold direction attribute shall be set to "UP\_AND\_DOWN".  allowedValues:  - UP  - DOWN  - UP\_AND\_DOWN | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| objectClass | Class of a managed object instance.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| objectInstance | Managed object instance identified by its DN.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| objectInstances | List of managed object instances. Each object instance is identified by its DN.  allowedValues: N/A | type: Dn  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| peeParametersList | This attribute contains the parameter list for the control and monitoring of power, energy and environmental parameters of ManagedFunction instance(s). This list contains the following parameters:  - siteIdentification  - siteLatitude (optional)  - siteLongitude (optional)  - siteDescription  - equipmentType  - environmentType  - powerInterface  siteIdentification: The identification of the site where the ManagedFunction resides.  allowedValues: N/A  siteLatitude: The latitude of the site where the ManagedFunction instance resides, based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to the northern hemisphere. This attribute is optional in case of BTSFunction and RNCFunction instance(s).  allowedValues: -90.0000 to +90.0000  siteLongitude: The longitude of the site where the ManagedFunction instance resides, based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to degrees east of 0 degrees longitude. This attribute is optional in case of BTSFunction and RNCFunction instance(s).  allowedValues: -180.0000 to +180.0000  siteDescription: An operator defined description of the site where the ManagedFunction instance resides.  allowedValues: N/A  equipmentType: The type of equipment where the managedFunction instance resides.  allowedValues: see clause 4.4.1 of ETSI ES 202 336-12 [18].  environmentType: The type of environment where the managedFunction instance resides.  allowedValues: see clause 4.4.1 of ETSI ES 202 336-12 [18].  powerInterface: The type of power.  allowedValues: see clause 4.4.1 of ETSI ES 202 336-12 [18]. | type: String  multiplicity: 0..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| priorityLabel | This is a label that consumer would assign a value on a concrete instance of the managed object. The management system takes the value of this attribute into account. The effect of this attribute value to the subject managed entity is not standardized | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| protocolVersion | Versions(s) and additional descriptive information for the protocol(s) used for the associated communication link. Syntax and semantic is not specified.  allowedValues: N/A | type: String  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| setOfMcc | Set of Mobile Country Code (MCC). The MCC uniquely identifies the country of domicile of the mobile subscriber. MCC is part of the IMSI (TS 23.003 [5])  This list contains all the MCC values in subordinate object instances to this SubNetwork instance.  allowedValues: See clause 2.3 of TS 23.003 [5] for MCC allocation principles. | type: Integer  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| swVersion | The software version of the ManagementNode or ManagedElement (this is used for determining which version of the vendor specific information is valid for the ManagementNode or ManagedElement).  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| systemDN | Distinguished Name (DN) of a MnSAgent.  allowedValues: N/A | type: DN  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| userDefinedState | An operator defined state for operator specific usage.  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| userLabel | A user-friendly (and user assignable) name of this object.  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| vendorName | The name of the vendor.  allowedValues: N/A | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| vnfParametersList | This attribute contains the parameter set of the VNF instance(s) corresponding to an NE. Each entry in the list contains:  - vnfInstanceId  - vnfdId (optional)  - flavourId (optional)  - autoScalable (optional)  vnfInstanceId: VNF instance identifier (vnfInstanceId, see section 9.4.2 of [16] and section B2.4.2.1.2.3 of [17]).  See Note 1.  vnfdId: Identifier of the VNFD on which the VNF instance is based, see section 9.4.2 of [16]. This attribute is optional.  Note: the value of this attribute is identical to that of the same attribute in clause 9.4.2 of ETSI GS NFV-IFA 008 [16].  flavourId: Identifier of the VNF Deployment Flavour applied to this VNF instance, see section 9.4.3 of [16]. This attribute is optional.  Note: the value of this attribute is identical to that of the same attribute in clause 9.4.3 of ETSI GS NFV-IFA 008 [16].  autoScalable: Indicator of whether the auto-scaling of this VNF instance is enabled or disabled. The type is Boolean.  This attribute is optional.  See Note2.  The presence of this attribute indicates that the ManagedFunction represented by the MOI is a virtualized function.  See Note 3.  allowedValues: N/A  A string length of zero for vnfInstanceId means the VNF instance(s) corresponding to the MOI does not exist (e.g. has not been instantiated yet, has already been terminated). | type: String  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| vsData | Vendor specific attributes of the type vsDataType. The attribute definitions including constraints (value ranges, data types, etc.) are specified in a vendor specific data format file.  allowedValues: -- | type: --  multiplicity: --  isOrdered: --  isUnique: --  defaultValue: --  isNullable: False |
| vsDataFormatVersion | Name of the data format file, including version.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| vsDataType | Type of vendor specific data contained by this instance, e.g. relation specific algorithm parameters, cell specific parameters for power control or re-selection or a timer. The type itself is also vendor specific.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| supportedPerfMetricGroups | A set of performance metric groups. When this attribute is contained in a managed object it may define performance metrics for this object and all descendant objects.  allowedValues: N/A | type: SupportedPerfMetricGroup  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| performanceMetrics | List of performance metrics.  Performance metrics include measurements defined in TS 28.552 [20] and KPIs defined in TS 28.554 [28]. Performance metrics can also be specified by other SDOs, or be vendor specific. Performance metrics are identified with their names.  For measurements defined in TS 28.552 [20] the name is constructed as follows:  - "family.measurementName.subcounter" for measurement types with subcounters  - "family.measurementName" for measurement types without subcounters  - "family" for measurement families  The individual components of the name are defined in the measurement definition template, see clause 3.3 in TS 32.404 [49], as the component designated with e).  For KPIs defined in TS 28.554 [28] the name is defined in the KPI definitions template, see chapter 5 in TS 28.554 [28], as the component designated with a).  A name can also identify a vendor specific performance metric or a group of vendor specific performance metrics.  allowedValues: N/A | type: String  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| rootObjectInstances | List of object instances. Each object instance is identified by its DN and designates the root of a subtree that contains the root object and all descendant objects. | type: Dn  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| reportingMethods | List of reporting methods for performance metrics  allowedValues:  - "FILE\_BASED\_LOC\_SET\_BY\_PRODUCER",  - "FILE\_BASED\_LOC\_SET\_BY\_CONSUMER",  - "STREAM\_BASED" | type: ENUM  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| nFServiceType | The parameter defines the type of the managed NF service instance  allowedValues: See clause 7.2 of TS 23.501[22] | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| operations | This parameter defines set of operations supported by the managed NF service instance.  allowedValues: See TS 23.502[23] for supporting operations | type: Operation  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| Operation.name | This parameter defines the name of the operation of the managed NF service instance.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| allowedNFTypes | This parameter identifies the type of network functions allowed to access the operation of the managed NF service instance.  allowedValues: See TS 23.501[22] for NF types | type: ENUM  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| operationSemantics | This paramerter identifies the semantics type of the operation. See TS 23.502[23]  allowedValues: “Request/Response”, “Subscribe/Notify”. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| sAP | This parameter specifies the service access point of the managed NF service instance.  allowedValues: N/A | type: SAP  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| host | This parameter specifies the host address of the managed NF service instance. It can be FQDN (See TS 23.003 [5]) or an IPv4 address (See RFC 791 [24]) or an IPv6 address (See RFC 2373 [25]).  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| port | This parameter specifies the transport port of the managed NF service instance.  allowedValues: 1 - 65535 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| usageState | Usage state of a managed object instance. It describes whether the resource is actively in use at a specific instant, and if so, whether or not it has spare capacity for additional users at that instant.  allowedValues: "IDLE", "ACTIVE", "BUSY".  The meaning of these values is as defined in 3GPP TS 28.625 [21] and ITU-T X.731 [19]. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| registrationState | This parameter defines the registration status of the managed NF service instance.  allowedValues: "Registered", "Deregistered". | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: Deregistered  isNullable: False |
| jobId | Identifier of a PerfMetricJob job. | type: String  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| granularityPeriod | Granularity period used to produce performance metrics. The period is defined in seconds.  See Note 4.  allowedValues: Integer with a minimum value of 1 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| granularityPeriods | Granularity periods supported for the production of associated performance metrics. The period is defined in seconds.  allowedValues: Integer with a minimum value of 1 | type: Integer  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| reportingCtrl | Selecting the reporting method and defining associated control parameters. | type: ReportingCtrl  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| fileReportingPeriod | For the file-based reporting method this is the time window during which collected measurements are stored into the same file before the file is closed and a new file is opened. The period is defined in minutes.  allowedValues: Multiples of granularityPeriod | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| fileLocation | File location  allowedValues: Not applicable. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| streamTarget | The stream target for the stream-based reporting method.  allowedValues: N/A | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| administrativeState | Administrative state of a managed object instance. The administrative state describes the permission to use or prohibition against using the object instance. The adminstrative state is set by the MnS consumer.  allowedValues: LOCKED, UNLOCKED. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: LOCKED  isNullable: False |
| operationalState | Operational state of manged object instance. The operational state describes if an object instance is operable ("ENABLED") or inoperable ("DISABLED"). This state is set by the object instance or the MnS producer and is hence READ-ONLY.  allowedValues: ENABLED, DISABLED. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: DISABLED  isNullable: False |
| alarmRecords | List of alarm records  allowedValues: N/A | type: AlarmRecord  multiplicity: \*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| numOfAlarmRecords | Number of alarm records in the AlarmList.  allowedValues: 0 to x where x is vendor specific. | type: integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| lastModification | Time an alarm record was modified the last time  allowedValues: N/A | type: DateTime  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| jobType | It specifies the MDT mode and it specifies also whether the TraceJob represents only MDT, Logged MBSFN MDT, Trace or a combined Trace and MDT job. The attribute is applicable for Trace, MDT, RCEF and RLF reporting.  See the clause 5.9a of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: TRACE\_ONLY  isNullable: False |
| listOfInterfaces | It specifies the interfaces that need to be traced.The attribute is applicable only for Trace. In case this attribute is not used, it carries a null semantic.  See the clause 5.5 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| listOfNeTypes | It specifies the network element types where the trace should be activated. The attribute is applicable only for Trace with Signalling Based Trace activation. In case this attribute is not used, it carries a null semantic.  See the clause 5.4 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| PLMNTarget | It specifies which PLMN that the subscriber of the session to be recorded uses as selected PLMN. PLMN Target might differ from the PLMN specified in the Trace Reference.  See the clause 5.9b of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: PlmnId  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| traceReportingConsumerUri | It specifies the Uniform Resource Identifier (URI) of the Streaming Trace data reporting MnS consumer (a.k.a. streaming target).  See the clause 5.9 c of TS 32.422 [30] for additional details on the allowed values. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| traceCollectionEntityIPAddress | It specifies the address of the Trace Collection Entity when the attribute traceReportingFormat is configured for the file-based reporting. The attribute is applicable for both Trace and MDT.  See the clause 5.9 of TS 32.422 [30] for additional details on the allowed values. | type: IpAddress  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| traceDepth | It specifies the trace depth. The attribute is applicable only for Trace. In case this attribute is not used, it carries a null semantic.  See the clause 5.3 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: MAXIMUM  isNullable: True |
| traceReference | A globally unique identifier, which uniquely identifies the Trace Session that is created by the TraceJob.  In case of shared network, it is the MCC and  MNC of the Participating Operator that request the trace session that shall be provided.  The attribute is applicable for both Trace and MDT.  See the clause 5.6 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: TraceReference  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| traceRecordingSessionReference | An identifier, which identifies the Trace Recording Session.  The attribute is applicable for both Trace and MDT.  See the clause 5.7 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| traceReportingFormat | It specifies the trace reporting format - streaming trace reporting or file-based trace reporting.  AllowedValues: FILE-BASED, STREAMING | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: FILE-BASED  isNullable: False |
| traceTarget | It specifies the target object of the Trace and MDT. The attribute is applicable for both Trace and MDT. This attribute includes the ID type of the target as an enumeration and the ID value(s).  The traceTarget shall be "PUBLIC\_ID" in case of a Management Based Activation is done to an SCSCFFunction (Serving Call Session Control Function) or PCSCFFunction (Proxy Call Session Control Function) (TS 28.705[44]). The traceTarget shall be "UTRAN\_CELL" only in case of the UTRAN cell traffic trace function.  The traceTarget shall be "E-UTRAN\_CELL" only in case of E-UTRAN cell traffic trace function.  The traceTarget shall be "NG-RAN\_CELL" only in case of NR cell traffic trace function.  The traceTarget shall be either "IMSI", "IMEI" or "IMEISV" if the Trace Session is activated to any of the following ManagedEntity(ies):  - HSSFunction (Home Subscriber Server) (TS 28.705 [44])  - MscServerFunction (Mobile Switching Centre Server) (TS 28.702 [45])  - SgsnFunction (Serving GPRS Support Node) (TS 28.702[45])  - GgsnFunction (Gateway GPRS Support Node) (TS 28.702[45])  - BmscFunction (Broadcast Multicast Service Centre) (TS 28.702[45])  - RncFunction (Radio Network Controller) (TS 28.652[46])  - MmeFunction (Mobility Management Entity) (TS 28.708[47])  - ServingGWFunction (Serving Gateway) (TS 28.708[47])  - PGWFunction (PDN Gateway) (TS 28.708[47]).  The traceTarget shall be either “SUPI” or “IMEISV” if the Trace Session is activated to any of the following ManagedEntity(ies) (TS 28.541[48]):  - AFFunction  - AMFFunction  - AUSFunction  - NEFFunction  - NRFFunction  - NSSFFunction  - PCFFunction  - SMFFunction  - UPFFunction  - UDMFunction  In case of signalling based MDT, the traceTarget attribute shall be able to carry "PUBLIC\_ID", "IMSI", "IMEI", "IMEISV)" or "SUPI".  In case of management based Immediate MDT, the traceTarget attribute shall be null value.  In case of management based Logged MDT, the traceTarget attribute shall carry an "eNB" or a "gNB" or an "RNC". The Logged MDT should be initiated on the specified eNB/gNB/RNC in traceTarget.  In case of RLF reporting, or RCEF reporting, the traceTarget attribute shall be null value. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| triggeringEvents | It specifies the triggering event parameter of the trace session. The attribute is applicable only for Trace. In case this attribute is not used, it carries a null semantic.  See the clause 5.1 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| anonymizationOfMDTData | It specifies the level of anonymization for management based MDT.  See the clause 5.10.12 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: NO\_IDENTITY  isNullable: True |
| areaConfigurationForNeighCell | It specifies the area for which UE is requested to perform measurement logging for neighbour cells which have list of frequencies. If it is not configured, the UE shall perform measurement logging for all the neighbour cells.  Applicable only to NR Logged MDT.  See the clause 5.10.26 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: AreaConfig  multiplicity: 1..32  isOrdered: False  isUnique: True  defaultValue: No  isNullable: True |
| areaScope | It specifies MDT area scope when activates an MDT job.  For RLF and RCEF reporting it specifies the eNB/gNB or list of eNBs/gNBs where the RLF or RCEF reports should be collected.  List of cells/TA/LA/RA for signalling based MDT or management based Logged MDT.  List of cells for management based Immediate MDT.  Cell, TA, LA, RA are mutually exclusive.  One or list of eNBs/gNBs for RLF and RCEF reporting  See the clause 5.10.2 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: AreaScope  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| collectionPeriodRRMLTE | It specifies the collection period for collecting RRM configured measurement samples for M3 in LTE. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.20 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodRRMUMTS | It specifies the collection period for collecting RRM configured measurement samples for M3, M4, M5 in UMTS. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.21 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| eventListForEventTriggeredMeasurement | It specifies event types for event triggered measurement in the case of logged NR MDT. Each trace session may configure at most one event. The UE shall perform logging of measurements only upon certain condition being fulfilled:  - Out of coverage.  - A2 event.  See the clause 5.10.28 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| eventThreshold | It specifies the threshold which should trigger  the reporting in case A2 event reporting in LTE and NR or 1F/1l event in UMTS. The attribute is applicable only for Immediate MDT and when reportingTrigger is configured for A2 event in LTE and NR or 1F event or 1l event in UMTS. In case this attribute is not used, it carries a null semantic.  See the clauses 5.10.7 and 5.10.7a of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| listOfMeasurements | It specifies the UE measurements that shall be collected in an Immediate MDT job. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.3 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| loggingDuration | It specifies how long the MDT configuration is valid at the UE in case of Logged MDT. The attribute is applicable only for Logged MDT and Logged MBSFN MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.9 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| loggingInterval | It specifies the periodicty for Logged MDT. The attribute is applicable only for Logged MDT and Logged MBSFN MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.8 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| eventThresholdL1 | It specifies the threshold which should trigger  the reporting in case of event based reporting of logged NR MDT. The attribute is applicable only for Logged MDT and when reportType is configured for event triggered reporting and when eventListForEventTriggeredMeasurement is configured for L1 event. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.36 of TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| hysteresisL1 | It specifies the hysteresis used within the entry and leave condition of the L1 event based reporting of logged NR MDT. The attribute is applicable only for Logged MDT, when reportType is configured for event triggered reporting and when eventListForEventTriggeredMeasurement is configured for L1 event. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.37 of TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| timeToTriggerL1 | It specifies the threshold which should trigger  the reporting in case of event based reporting of logged NR MDT. The attribute is applicable only for Logged MDT, when reportType is configured for event triggered reporting and when eventListForEventTriggeredMeasurement is configured for L1 event. In case this attribute is not used, it carries a null semantic.  See the clauses 5.10.38 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| mbsfnAreaList | The MBSFN Area consists of a MBSFN Area ID and Carrier Frequency (EARFCN). The target MBSFN area list can have up to 8 entries. This parameter is applicable only if the job type is Logged MBSFN MDT.  See the clause 5.10.25 of TS 32.422 [30] for additional details on the allowed values. | type: MbsfnArea  multiplicity: 1..8  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| measurementPeriodLTE | It specifies the collection period for the Data Volume (M4) and Scheduled IP throughput measurements (M5) for LTE MDT taken by the eNB. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.23 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodM6LTE | It specifies the collection period for the Packet Delay measurement (M6) for MDT taken by the eNB. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.32 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodM7LTE | It specifies the collection period for the Packet Loss Rate measurement (M7) for LTE MDT taken by the eNB. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.33 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| measurementPeriodUMTS | It specifies the collection period for the Data Volume (M6) and Throughput measurements (M7) for UMTS MDT taken by RNC. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.22 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodRRMNR | It specifies the collection period for collecting RRM configured measurement samples for M4, M5 in NR. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.30 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodM6NR | It specifies the collection period for the Packet Delay measurement (M6) for NR MDT taken by the gNB. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.34 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| collectionPeriodM7NR | It specifies the collection period for the Packet Loss Rate measurement (M7) for NR MDT taken by the gNB. The attribute is applicable only for Immediate MDT. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.35 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| eventThresholdUphUMTS | It specifies the threshold which should trigger  the reporting in case of event-triggered periodic reporting for M4 (UE power headroom measurement) in UMTS. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.39 of TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| measurementQuantity | It specifies the measurements that are collected in an MDT job for a UMTS MDT configured for event triggered reporting.  See the clause 5.10.15 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| plmnList | It indicates the PLMNs where measurement collection, status indication and log reporting are allowed.  See the clause 5.10.24 of TS 32.422 [30] for additional details on the allowed values. | type: PlmnId  multiplicity: 1..16  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| positioningMethod | It specifies what positioning method should be used in the MDT job.  See the clause 5.10.19 of TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| reportAmount | It specifies the number of measurement reports that shall be taken for periodic reporting while the UE is in connected. The attribute is applicable only for Immediate MDT and when reportingTrigger is configured for periodical measurements. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.6 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| reportingTrigger | It specifies whether periodic or event based measurements should be collected. The attribute is applicable only for Immediate MDT and when the listOfMeasurements is configured for M1 (for UMTS, LTE and NR) or M2 (only for UMTS). In case this attribute is not used, it carries a null semantic.  See the clause 5.10.4 of TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| reportInterval | It specifies the interval between the periodical measurements that shall be taken when the UE is in connected mode. The attribute is applicable only for Immediate MDT and when reportingTrigger is configured for periodical measurements. In case this attribute is not used, it carries a null semantic.  See the clause 5.10.5 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| reportType | It specifies report type for logged NR MDT as:  - periodical.  - event triggered.  See the clause 5.10.27 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| sensorInformation | It specifies which sensor information shall be included in logged NR MDT and immediate NR MDT measurement if they are available. The following sensor measurement can be included or excluded for the UE:  - Barometric pressure.  - UE speed.  - UE orientation.  See the clause 5.10.29 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: ENUM  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| traceCollectionEntityId | It specifies the TCE Id which is sent to the UE in Logged MDT.  See the clause 5.10.11 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| mcc | Mobile Country Code  allowedValues: As defined by the data type | type: Mcc  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mnc | Mobile Network  allowedValues: As defined by the data type | type: Mnc  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| traceId | An identifier, which identifies the Trace (together with MCC and MNC). This is a 3 byte Octet String.  See the clause 5.6 of 3GPP TS 32.422 [30] for additional details on the allowed values. | type: String  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| freqInfo | It specifies the carrier frequency and bands used in a cell. | type: FreqInfo  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| arfcn | RF Reference Frequency as defined in TS 38.104 [35], clause 5.4.2.1. The frequency provided identifies the absolute frequency position of the reference resource block (Common RB 0) of the carrier. Its lowest subcarrier is also known as Point A.  allowedValues: 0, 1, …,3279165 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| freqBands | List of NR frequency operating bands. Primary NR Operating Band as defined in TS 38.104 [35], clause 5.4.2.3.  The value 1 corresponds to n1, value 2 corresponds to NR operating band n2, etc.  allowedValues: 1, 2, …,1024 | type: Integer  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: Nonee  isNullable: False |
| pciList | List of neighbour cells subject for MDT scope.  allowedValues: 0, 1, …,1007 | type: Integer  multiplicity: 1..32  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| tac | Tracking Area Code  allowedValues: As defined by the data type | type: Tac  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| eutraCellIdList | List of E-UTRAN cells identified by E-UTRAN-CGI  allowedValues: As defined by the data type | type: EutraCellId  multiplicity: 1..32  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| nrCellIdList | List of NR cells identified by NG-RAN CGI  allowedValues: As defined by the data type | type: NrCellId  multiplicity: 1..32  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| tacList | Tracking Area Code list  allowedValues: As defined by the data type | type: Tac  multiplicity: 1..8  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| taiList | Tracking Area Identity list  allowedValues: As defined by the data type | type: Tai  multiplicity: 1..8  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| mbsfnAreaId | MBSFN Area Identifier  AllowedValues: 1, 2, … | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| earfcn | Carrier Frequency  AllowedValues: 1, 2, … | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| dnPrefix | It carries the DN Prefix information or no information. See Annex C of 32.300 [13] for one usage of this attribute.  allowedValues: N/A | type: DN  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| NOTE 1: The value of this attribute is identical to that of the same attribute in clause 9.4.2 of ETSI GS NFV-IFA 008 [16].  NOTE 2: The value of this attribute is identical to that of the attribute isAutoscaleEnabled included in vnfConfigurableProperty in clause 9.4.2 of ETSI GS NFV-IFA 008 [16].  NOTE 3: The presence of the attribute vnfParametersList, whose vnfInstanceId with a string length of zero, in createMO operation can trigger the instantiation of the related VNF/VNFC instances.  NOTE 4: The GP defines the measurement data production rate. The supported rates are dependent on the capacity of the producer involved (e.g. the processing power of the producer, the complexity of the measurement type involved etc) and therefore, it cannot be standardized for all producers involved. The supported GPs reflects the agreement between producer and the consumer involved.  NOTE 5: The monitoring granularity period defines the measurements monitoring period. The supported monitoring periods are dependent on the capacity of the producer involved (e.g. the processing power of the producer, the complexity of the measurement type involved etc) and therefore, it cannot be standardized for all producers involved. The supported monitoring GPs reflect the agreement between producer and the consumer involved.  NOTE 6: The supported threshold levels are dependent on the capacity of the producer involved (e.g. the processing power of the producer, number of measurements being measured by the producer at the time, the complexity of the measurement type involved etc) and therefore, it cannot be standardized for all producers involved. The supported levels can only reflect the negotiated agreement between producer and the consumer involved. | | |

### 4.4.2 Constraints

None

***End of changes***