**3GPP TSG-SA5 Meeting #145-e *S5-225224***

**e-meeting, 9-17 May 2022**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.623** | **CR** | **0182** | **rev** | **-** | **Current version:** | **17.2.2** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Adding missing interface for SMF | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | adNRM | | | | |  | ***Date:*** | | | 2022-7-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***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:*** | | The N16 and N16a interface for SMF is missing in the code. This is also related to S5-223551 and S5-223553 which have been approved during S5#143e meeting. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding missing N16 and N16a interface for SMF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The code related to SMF is not completed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | C.4.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | | **Y** | **x** | O&M Specifications | | | | TS/TR 32.423 CR 0130  32.422 CR 0394 | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Forge link: <https://forge.3gpp.org/rep/sa5/MnS/-/blob/28.623_Rel-17_CR0182_Adding_missing_interface_for_SMF/OpenAPI/TS28623_GenericNrm.yaml> | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

|  |
| --- |
| **1st Change** |

C.4.3 OpenAPI document "TS28623\_GenericNrm.yaml"

openapi: 3.0.1

info:

title: Generic NRM

version: 17.2.0

description: >-

OAS 3.0.1 definition of the Generic NRM

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externalDocs:

description: 3GPP TS 28.623; Generic NRM

url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.623/

paths: {}

components:

schemas:

#-------- Definition of types-----------------------------------------------------

RegistrationState:

type: string

enum:

- REGISTERED

- DEREGISTERED

VnfParameter:

type: object

properties:

vnfInstanceId:

type: string

vnfdId:

type: string

flavourId:

type: string

autoScalable:

type: boolean

PeeParameter:

type: object

properties:

siteIdentification:

type: string

siteDescription:

type: string

siteLatitude:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Latitude'

siteLongitude:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Longitude'

siteAltitude:

type: number

format: float

equipmentType:

type: string

environmentType:

type: string

powerInterface:

type: string

ThresholdInfo:

type: object

properties:

thresholdDirection:

type: string

enum:

- UP

- DOWN

- UP\_AND\_DOWN

thresholdValue:

oneOf:

- type: integer

- $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Float'

hysteresis:

oneOf:

- type: integer

minimum: 0

- type: number

format: float

minimum: 0

Operation:

type: object

properties:

name:

type: string

allowedNFTypes:

$ref: '#/components/schemas/NFType'

operationSemantics:

$ref: '#/components/schemas/OperationSemantics'

NFType:

type: string

description: ' NF name defined in TS 23.501'

enum:

- NRF

- UDM

- AMF

- SMF

- AUSF

- NEF

- PCF

- SMSF

- NSSF

- UDR

- LMF

- GMLC

- 5G\_EIR

- SEPP

- UPF

- N3IWF

- AF

- UDSF

- DN

OperationSemantics:

type: string

enum:

- REQUEST\_RESPONSE

- SUBSCRIBE\_NOTIFY

SAP:

type: object

properties:

host:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/HostAddr'

port:

type: integer

NFServiceType:

type: string

enum:

- Namf\_Communication

- Namf\_EventExposure

- Namf\_MT

- Namf\_Location

- Nsmf\_PDUSession

- Nsmf\_EventExposure

- Others

TransportProtocol:

anyOf:

- type: string

enum:

- TCP

- type: string

SupportedPerfMetricGroup:

type: object

properties:

performanceMetrics:

type: array

items:

type: string

granularityPeriods:

type: array

items:

type: integer

minimum: 1

reportingMethods:

type: array

items:

type: string

enum:

- FILE\_BASED\_LOC\_SET\_BY\_PRODUCER

- FILE\_BASED\_LOC\_SET\_BY\_CONSUMER

- STREAM\_BASED

monitorGranularityPeriods:

type: array

items:

type: integer

minimum: 1

ReportingCtrl:

oneOf:

- type: object

properties:

fileReportingPeriod:

type: integer

- type: object

properties:

fileReportingPeriod:

type: integer

fileLocation:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

- type: object

properties:

streamTarget:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

Scope:

type: object

properties:

scopeType:

type: string

enum:

- BASE\_ONLY

- BASE\_ALL

- BASE\_NTH\_LEVEL

- BASE\_SUBTREE

scopeLevel:

type: integer

ProcessMonitor:

description: >-

This data type is the "ProcessMonitor" data type without specialisations.

type: object

properties:

jobId:

type: string

status:

type: string

enum:

- NOT\_STARTED

- RUNNING

- FINSHED

- FAILED

- PARTIALLY\_FAILED

- CANCELLING

- CANCELLED

progressPercentage:

type: integer

minimum: 0

maximum: 100

progressStateInfo:

type: string

resultStateInfo:

type: string

startTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

timer:

type: integer

FileDownloadJobProcessMonitor:

description: >-

This data type is the "ProcessMonitor" data type with specialisations

for usage in the "FileDownloadJob".

type: object

properties:

jobId:

type: string

status:

type: string

enum:

- NOT\_STARTED

- RUNNING

- FINSHED

- FAILED

- CANCELLING

- CANCELLED

progressPercentage:

type: integer

minimum: 0

maximum: 100

progressStateInfo:

type: string

resultStateInfo:

oneOf:

- type: string

enum:

- NULL

- UNKNOWN

- NO\_STORAGE

- LOW\_MEMROY

- NO\_CONNECTION\_TO\_REMOTE\_SERVER

- FILE\_NOT\_AVAILABLE

- DNS\_CANNOT\_BE\_RESOLVED

- TIMER\_EXPIRED

- OTHER

- type: string

startTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

timer:

type: integer

AreaScope:

oneOf:

- type: array

items:

$ref: '#/components/schemas/EutraCellId'

- type: array

items:

$ref: '#/components/schemas/NrCellId'

- type: array

items:

$ref: '#/components/schemas/Tac'

- type: array

items:

$ref: '#/components/schemas/Tai'

Tai:

type: object

properties:

mcc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mcc'

mnc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mnc'

tac:

$ref: '#/components/schemas/Tac'

AreaConfig:

type: object

properties:

freqInfo:

$ref: '#/components/schemas/FreqInfo'

pciList:

type: array

items:

type: integer

FreqInfo:

description: specifies the carrier frequency and bands used in a cell.

type: object

properties:

arfcn:

type: integer

freqBands:

type: array

items:

type: integer

MbsfnArea:

type: object

properties:

mbsfnAreaId:

type: integer

minimum: 1

earfcn:

type: integer

minimum: 1

Tac:

type: string

pattern: '(^[A-Fa-f0-9]{4}$)|(^[A-Fa-f0-9]{6}$)'

EutraCellId:

type: string

pattern: '^[A-Fa-f0-9]{7}$'

NrCellId:

type: string

pattern: '^[A-Fa-f0-9]{9}$'

IpAddr:

oneOf:

- $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Ipv4Addr'

- $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Ipv6Addr'

ManagementData:

oneOf:

- type: array

items:

type: string

enum:

- COVERAGE

- CAPACITY

- ENERGY\_EFFICIENCY

- MOBILITY

- ACCESSIBILITY

- type: array

items:

type: string

NodeFilter:

type: object

properties:

areaOfInterest:

$ref: 'comDefs.yaml#/components/schemas/AreaOfInterest'

networkDomain:

type: string

enum:

- CN

- RAN

cpUpType:

type: string

enum:

- CP

- UP

sst:

type: integer

#-------- Definition of types used in Trace control NRM fragment------------------

jobType-Type:

type: string

description: Specifies whether the TraceJob represents only MDT, Logged MBSFN MDT, Trace or a combined Trace and MDT job. Applicable for Trace, MDT, RCEF and RLF reporting. See 3GPP TS 32.422 clause 5.9a for additional details.

enum:

- IMMEDIATE\_MDT\_ONLY

- LOGGED\_MDT\_ONLY

- TRACE\_ONLY

- IMMEDIATE\_MDT AND TRACE

- RLF\_REPORT\_ONLY

- RCEF\_REPORT\_ONLY

- LOGGED\_MBSFN\_MDT

listOfInterfaces-Type:

description: The interfaces to be recorded in the Network Element. See 3GPP TS 32.422 clause 5.5 for additional details.

type: object

properties:

MSCServerInterfaces:

type: array

items:

type: string

enum:

- A

- Iu-CS

- Mc

- MAP-G

- MAP-B

- MAP-E

- MAP-F

- MAP-D

- MAP-C

- CAP

MGWInterfaces:

type: array

items:

type: string

enum:

- Mc

- Nb-UP

- Iu-UP

RNCInterfaces:

type: array

items:

type: string

enum:

- Iu-CS

- Iu-PS

- Iur

- Iub

- Uu

SGSNInterfaces:

type: array

items:

type: string

enum:

- Gb

- Iu-PS

- Gn

- MAP-Gr

- MAP-Gd

- MAP-Gf

- Ge

- Gs

- S6d

- S4

- S3

- S13

GGSNInterfaces:

type: array

items:

type: string

enum:

- Gn

- Gi

- Gmb

S-CSCFInterfaces:

type: array

items:

type: string

enum:

- Mw

- Mg

- Mr

- Mi

P-CSCFInterfaces:

type: array

items:

type: string

enum:

- Gm

- Mw

I-CSCFInterfaces:

type: array

items:

type: string

enum:

- Cx

- Dx

- Mg

- Mw

MRFCInterfaces:

type: array

items:

type: string

enum:

- Mp

- Mr

MGCFInterfaces:

type: array

items:

type: string

enum:

- Mg

- Mj

- Mn

IBCFInterfaces:

type: array

items:

type: string

enum:

- Ix

- Mx

E-CSCFInterfaces:

type: array

items:

type: string

enum:

- Mw

- Ml

- Mm

- Mi/Mg

BGCFInterfaces:

type: array

items:

type: string

enum:

- Mi

- Mj

- Mk

ASInterfaces:

type: array

items:

type: string

enum:

- Dh

- Sh

- ISC

- Ut

HSSInterfaces:

type: array

items:

type: string

enum:

- MAP-C

- MAP-D

- Gc

- Gr

- Cx

- S6d

- S6a

- Sh

- N70

- N71

- NU1

EIRInterfaces:

type: array

items:

type: string

enum:

- MAP-F

- S13

- MAP-Gf

BM-SCInterfaces:

type: array

items:

type: string

enum:

- Gmb

MMEInterfaces:

type: array

items:

type: string

enum:

- S1-MME

- S3

- S6a

- S10

- S11

- S13

SGWInterfaces:

type: array

items:

type: string

enum:

- S4

- S5

- S8

- S11

- Gxc

PDN\_GWInterfaces:

type: array

items:

type: string

enum:

- S2a

- S2b

- S2c

- S5

- S6b

- Gx

- S8

- SGi

eNBInterfaces:

type: array

items:

type: string

enum:

- S1-MME

- X2

en-gNBInterfaces:

type: array

items:

type: string

enum:

- S1-MME

- X2

- Uu

- F1-C

- E1

AMFInterfaces:

type: array

items:

type: string

enum:

- N1

- N2

- N8

- N11

- N12

- N14

- N15

- N20

- N22

- N26

AUSFInterfaces:

type: array

items:

type: string

enum:

- N12

- N13

NEFInterfaces:

type: array

items:

type: string

enum:

- N29

- N30

- N33

NRFInterfaces:

type: array

items:

type: string

enum:

- N27

NSSFInterfaces:

type: array

items:

type: string

enum:

- N22

- N31

PCFInterfaces:

type: array

items:

type: string

enum:

- N5

- N7

- N15

SMFInterfaces:

type: array

items:

type: string

enum:

- N4

- N7

- N10

- N11

- S5-C

- N16

- N16a

SMSFInterfaces:

type: array

items:

type: string

enum:

- N20

- N21

UDMInterfaces:

type: array

items:

type: string

enum:

- N8

- N10

- N13

- N21

- NU1

UPFInterfaces:

type: array

items:

type: string

enum:

- N4

ng-eNBInterfaces:

type: array

items:

type: string

enum:

- NG-C

- Xn-C

- Uu

gNB-CU-CPInterfaces:

type: array

items:

type: string

enum:

- NG-C

- Xn-C

- Uu

- F1-C

- E1

- X2-C

gNB-CU-UPInterfaces:

type: array

items:

type: string

enum:

- E1

gNB-DUInterfaces:

type: array

items:

type: string

enum:

- F1-C

listOfNeTypes-Type:

description: The Network Element types where Trace Session activation is needed. See 3GPP TS 32.422 clause 5.4 for additional details.

type: array

items:

type: string

enum:

- MSC\_SERVER

- SGSN

- MGW

- GGSN

- RNC

- BM\_SC

- MME

- SGW

- PGW

- ENB

- EN\_GNB

- GNB\_CU\_CP

- GNB\_CU\_UP

- GNB\_DU

- AMF

- PCF

- SMF

- UPF

- AUSF

- SMSF

- HSS

- UDM

plmnTarget-Type:

type: object

description: 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 (this means that shared cells and not shared cells are allowed for the specified PLMN. Note that the PLMN Target might differ from the PLMN specified in the Trace Reference, as that specifies the PLMN that is containing the management system requesting the Trace Session from the NE. See 3GPP TS 32.422 clause 5.9b for additional details.

properties:

mcc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mcc'

mnc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mnc'

required:

- mcc

- mnc

traceDepth-Type:

description: Specifies how detailed information should be recorded in the Network Element. The Trace Depth is a paremeter for Trace Session level, i.e., the Trace Depth is the same for all of the NEs to be traced in the same Trace Session. See 3GPP TS 32.422 clause 5.3 for additional details.

type: string

enum:

- MINIMUM

- MEDIUM

- MAXIMUM

- VENDORMINIMUM

- VENDORMEDIUM

- VENDORMAXIMUM

traceReference-Type:

type: object

description: The Trace Reference parameter shall be globally unique, therefore the Trace Reference shall compose as follows - MCC+MNC+Trace ID, where the MCC and MNC are coming with the Trace activation request from the management system to identify one PLMN containing the management system, and Trace ID is a 3 byte Octet String. See 3GPP TS 32.422 clause 5.6 for additional details.

properties:

mcc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mcc'

mnc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mnc'

traceId:

type: string

required:

- mcc

- mnc

- traceId

traceReportingFormat-Type:

type: string

description: Specifies whether file-based or streaming reporting shall be used for this Trace Session. See 3GPP TS 32.422 clause 5.11 for additional details.

enum:

- FILE-BASED

- STREAMING

traceTarget-Type:

type: object

description: Trace target conveying both the type and value of the target ID. For additional details see 3GPP TS 32.422

properties:

TargetIdType:

type: string

enum:

- IMSI

- IMEI

- IMEISV

- PUBLIC\_ID

- UTRAN\_CELL

- E-UTRAN\_CELL

- NG-RAN\_CELL

- eNB

- RNC

- gNB

- SUPI

TargetIdValue:

type: string

required:

- TargetIdType

- TargetIdValue

triggeringEvents-Type:

type: object

description: Specifies when to start a Trace Recording Session and which message shall be recorded first, when to stop a Trace Recording Session and which message shall be recorded last respectively. See 3GPP TS 32.422 clause 5.1 for additional detials.

properties:

MSC\_SERVER:

type: array

items:

type: string

enum:

- MO\_MT\_CALLS

- MO\_MT\_SMS

- LU\_IMSIattach\_IMSIdetach

- HANDOVER

- SS

SGSN:

type: array

items:

type: string

enum:

- PDPcontext

- MO\_MT\_SMS

- RAU\_GPRSattach\_GPRSdetach

- MBMScontext

MGW:

type: array

items:

type: string

enum:

- CONTEXT

GGSN:

type: array

items:

type: string

enum:

- PDPcontext

- MBMScontext

IMS:

type: array

items:

type: string

enum:

- SIPsession\_StandaloneTransaction

BM\_SC:

type: array

items:

type: string

enum:

- MBMSactivation

MME:

type: array

items:

type: string

enum:

- UEinitiatedPDNconnectivityRequest

- ServiceRequest

- InitialAttach\_TAU\_Detach

- UEinitiatedPDNdisconnection

- BearerActivationModificationDeletion

- Handover

SGW:

type: array

items:

type: string

enum:

- PDNconnectionCreation

- PDNconnectionTermination

- BearerActivationModificationDeletion

PGW:

type: array

items:

type: string

enum:

- PDNconnectionCreation

- PDNconnectionTermination

- BearerActivationModificationDeletion

AMF:

type: array

items:

type: string

enum:

- Registration

- ServiceRequest

- Handover

- UEderegistration

- NetworkDeregistration

- UEMobilityFromEPC

- UEMobilityToEPC

SMF:

type: array

items:

type: string

enum:

- PDUsessionEstablishment

- PDUsessionModification

- PDUsessionRelease

- PDUsessionUPactivationDeactivation

- MobilityBtw3gppAndN3gppTo5GC

- MobilityFromEpc

PCF:

type: array

items:

type: string

enum:

- AMpolicy

- SMpolicy

- Authorization

- BDTpolicy

UPF:

type: array

items:

type: string

enum:

- N4Session

AUSF:

type: array

items:

type: string

enum:

- UEauthentication

NEF:

type: array

items:

type: string

enum:

- EventExposure

- PFDmanagement

- ParameterProvision

- Trigger

NRF:

type: array

items:

type: string

enum:

- NFmanagement

- NFdiscovery

NSSF:

type: array

items:

type: string

enum:

- NSSelection

- NSSAI

SMSF:

type: array

items:

type: string

enum:

- SMservice

UDM:

type: array

items:

type: string

enum:

- UEcontext

- SubscriberData

- UEauthentication

- EventExposure

anonymizationOfMdtData-Type:

description: Specifies level of MDT anonymization. For additional details see 3GPP TS 32.422 clause 5.10.12.

type: string

enum:

- NO\_IDENTITY

- TAC\_OF\_IMEI

beamLevelMeasurement-Type:

description: Determines whether beam level measurements shall be included in case of immediate MDT M1 measurement in NR. For additional details see 3GPP TS 32.422 clause 5.10.40.

type: boolean

collectionPeriodRrmLte-Type:

description: See details in 3GPP TS 32.422 clause 5.10.20.

type: string

enum:

- 100ms

- 1000ms

- 1024ms

- 1280ms

- 2048ms

- 2560ms

- 5120ms

- 10000ms

- 10240ms

- 60000ms

collectionPeriodM6Lte-Type:

description: See details in 3GPP TS 32.422 clause 5.10.32.

type: string

enum:

- 1024ms

- 2048ms

- 5120ms

- 10240ms

collectionPeriodM7Lte-Type:

description: See details in 3GPP TS 32.422 clause 5.10.33.

type: integer

minimum: 1

maximum: 60

collectionPeriodRrmUmts-Type:

description: See details in 3GPP TS 32.422 clause 5.10.21.

type: string

enum:

- 100ms

- 250ms

- 500ms

- 1000ms

- 2000ms

- 3000ms

- 4000ms

- 6000ms

collectionPeriodRrmNr-Type:

description: See details in 3GPP TS 32.422 clause 5.10.30.

type: string

enum:

- 1024ms

- 2048ms

- 5120ms

- 10240ms

- 60000ms

collectionPeriodM6Nr-Type:

description: See details in 3GPP TS 32.422 clause 5.10.34.

type: string

enum:

- 120ms

- 240ms

- 480ms

- 640ms

- 1024ms

- 2048ms

- 5120ms

- 10240ms

- 20480ms

- 40960ms

- 1min

- 6min

- 12min

- 30min

collectionPeriodM7Nr-Type:

description: See details in 3GPP TS 32.422 clause 5.10.35.

type: integer

minimum: 1

maximum: 60

eventListForEventTriggeredMeasurement-Type:

description: See details in 3GPP TS 32.422 clause 5.10.28.

type: string

enum:

- OUT\_OF\_COVERAGE

- A2\_EVENT

eventThreshold-Type:

description: See details in 3GPP TS 32.422 clause 5.10.7, 5.10.7a, 5.10.13 and 5.10.14.

type: object

properties:

EventThresholdRSRP:

oneOf:

- type: integer

minimum: 0

maximum: 97

- type: integer

minimum: 0

maximum: 127

EventThresholdRSRQ:

oneOf:

- type: integer

minimum: 0

maximum: 34

- type: integer

minimum: 0

maximum: 127

EventThreshold1F:

type: object

properties:

CPICH\_RSCP:

type: integer

minimum: -120

maximum: 25

CPICH\_EcNo:

type: integer

minimum: -24

maximum: 0

PathLoss:

type: integer

minimum: 30

maximum: 165

EventThreshold1I:

type: integer

minimum: -120

maximum: 25

listOfMeasurements-Type:

description: See details in 3GPP TS 32.422 clause 5.10.3 for details.

type: object

properties:

UMTS:

type: array

items:

type: string

enum:

- M1

- M2

- M3

- M4

- M5

- M6\_DL

- M6\_UL

- M7\_DL

- M7\_UL

LTE:

type: array

items:

type: string

enum:

- M1

- M2

- M3

- M4

- M5

- M1\_EVENT\_TRIGGERED

- M6

- M7

- M8

- M9

NR:

type: array

items:

type: string

enum:

- M1

- M2

- M3

- M4

- M5

- M6

- M7

- M1\_EVENT\_TRIGGERED

- M8

- M9

loggingDuration-Type:

description: See details in 3GPP TS 32.422 clause 5.10.9.

type: string

enum:

- 600s

- 1200s

- 2400s

- 3600s

- 5400s

- 7200s

loggingInterval-Type:

description: See details in 3GPP TS 32.422 clause 5.10.8.

type: object

properties:

UMTS:

type: array

items:

type: string

enum:

- 1.28s

- 2.56s

- 5.12s

- 10.24s

- 20.48s

- 30.72s

- 40.96s

- 61.44s

LTE:

type: array

items:

type: string

enum:

- 1.28s

- 2.56s

- 5.12s

- 10.24s

- 20.48s

- 30.72s

- 40.96s

- 61.44s

NR:

type: array

items:

type: string

enum:

- 0.32s

- 0.64s

- 1.28s

- 2.56s

- 5.12s

- 10.24s

- 20.48s

- 30.72s

- 40.96s

- 61.44s

- INFINITY

eventThresholdL1-Type:

description: See details in 3GPP TS 32.422 clause 5.10.X.

type: object

properties:

RSRP:

type: integer

minimum: 0

maximum: 127

RSRQ:

type: integer

minimum: 0

maximum: 127

hysteresisL1-Type:

description: See details in 3GPP TS 32.422 clause 5.10.Y.

type: integer

minimum: 0

maximum: 30

timeToTriggerL1-Type:

description: See details in 3GPP TS 32.422 clause 5.10.Z.

type: string

enum:

- 0ms

- 40ms

- 64ms

- 80ms

- 100ms

- 128ms

- 160ms

- 256ms

- 320ms

- 480ms

- 512ms

- 640ms

- 1024ms

- 1280ms

- 2560ms

- 5120ms

measurementPeriodLte-Type:

description: See details in 3GPP TS 32.422 clause 5.10.23.

type: string

enum:

- 1024ms

- 2048ms

- 5120ms

- 10240ms

- 1min

measurementPeriodUmts-Type:

description: See details in 3GPP TS 32.422 clause 5.10.22.

type: string

enum:

- 1000ms

- 2000ms

- 3000ms

- 4000ms

- 6000ms

- 8000ms

- 12000ms

- 16000ms

- 20000ms

- 24000ms

- 28000ms

- 32000ms

- 64000ms

measurementQuantity-Type:

description: See details in 3GPP TS 32.422 clause 5.10.15.

type: string

enum:

- CPICH\_EcNo

- CPICH\_RSCP

- PathLoss

eventThresholdUphUmts-Type:

description: See details in 3GPP TS 32.422 clause 5.10.A.

type: integer

minimum: 0

maximum: 31

plmnList-Type:

description: See details in 3GPP TS 32.422 clause 5.10.24.

type: array

items:

type: object

properties:

mcc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mcc'

mnc:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mnc'

required:

- mcc

- mnc

maxItems: 16

positioningMethod-Type:

description: See details in 3GPP TS 32.422 clause 5.10.19.

type: string

enum:

- GNSS

- E-CELL\_ID

reportAmount-Type:

description: See details in 3GPP TS 32.422 clause 5.10.6.

type: string

enum:

- 1

- 2

- 4

- 8

- 16

- 32

- 64

- INFINITY

reportingTrigger-Type:

description: See details in 3GPP TS 32.422 clause 5.10.4.

type: array

items:

type: string

enum:

- PERIODICAL

- A2\_FOR\_LTE\_NR

- 1F\_FOR\_UMTS

- 1I\_FOR\_UMTS\_MCPS\_TDD

- A2\_TRIGGERED\_PERIODIC\_FOR\_LTE\_NR

- ALL\_CONFIGURED\_RRM\_FOR\_LTE\_NR

- ALL\_CONFIGURED\_RRM\_FOR\_UMTS

reportInterval-Type:

description: See details in 3GPP TS 32.422 clause 5.10.5.

type: object

properties:

UMTS:

type: array

items:

type: string

enum:

- 250ms

- 500ms

- 1000ms

- 2000ms

- 3000ms

- 4000ms

- 6000ms

- 8000ms

- 12000ms

- 16000ms

- 20000ms

- 24000ms

- 28000ms

- 32000ms

- 64000ms

LTE:

type: array

items:

type: string

enum:

- 120ms

- 240ms

- 480ms

- 640ms

- 1024ms

- 2048ms

- 5120ms

- 10240ms

- 60000ms

- 360000ms

- 720000ms

- 1800000ms

- 3600000ms

NR:

type: array

items:

type: string

enum:

- 120ms

- 240ms

- 480ms

- 640ms

- 1024ms

- 2048ms

- 5120ms

- 10240ms

- 20480ms

- 40960ms

- 60000ms

- 360000ms

- 720000ms

- 1800000ms

reportType-Type:

description: Report type for logged NR MDT. See details in 3GPP TS 32.422 clause 5.10.27.

type: string

enum:

- PERIODICAL

- EVENT\_TRIGGERED

sensorInformation-Type:

description: See details in 3GPP TS 32.422 clause 5.10.29.

type: array

items:

type: string

enum:

- BAROMETRIC\_PRESSURE

- UE\_SPEED

- UE\_ORIENTATION

traceCollectionEntityId-Type:

description: See details in 3GPP TS 32.422 clause 5.10.11. Only TCE Id value may be sent over the air to the UE being configured for Logged MDT.

type: integer

#-------- end of Definition of types used in Trace control NRM fragment ----------

#-------- Definition of abstract IOC Top -----------------------------------------

Top-Attr:

# This definition will be deprecated, when all occurances of Top-Attr

# are replaced by Top.

type: object

properties:

id:

type: string

nullable: true

objectClass:

type: string

objectInstance:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

VsDataContainer:

$ref: '#/components/schemas/VsDataContainer-Multiple'

required:

- id

Top:

type: object

properties:

id:

type: string

nullable: true

objectClass:

type: string

objectInstance:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

VsDataContainer:

$ref: '#/components/schemas/VsDataContainer-Multiple'

required:

- id

#-------- Definition of IOCs with new name-containments defined in other TS ------

SubNetwork-Attr:

type: object

properties:

dnPrefix:

type: string

userLabel:

type: string

userDefinedNetworkType:

type: string

setOfMcc:

type: array

items:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Mcc'

priorityLabel:

type: integer

supportedPerfMetricGroups:

type: array

items:

$ref: '#/components/schemas/SupportedPerfMetricGroup'

supportedTraceMetrics:

type: array

items:

type: string

ManagedElement-Attr:

type: object

properties:

dnPrefix:

type: string

managedElementTypeList:

type: array

items:

type: string

userLabel:

type: string

locationName:

type: string

managedBy:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

vendorName:

type: string

userDefinedState:

type: string

swVersion:

type: string

priorityLabel:

type: integer

supportedPerfMetricGroups:

type: array

items:

$ref: '#/components/schemas/SupportedPerfMetricGroup'

supportedTraceMetrics:

type: array

items:

type: string

SubNetwork-ncO:

type: object

properties:

ManagementNode:

$ref: '#/components/schemas/ManagementNode-Multiple'

MnsAgent:

$ref: '#/components/schemas/MnsAgent-Multiple'

MeContext:

$ref: '#/components/schemas/MeContext-Multiple'

PerfMetricJob:

$ref: '#/components/schemas/PerfMetricJob-Multiple'

ThresholdMonitor:

$ref: '#/components/schemas/ThresholdMonitor-Multiple'

TraceJob:

$ref: '#/components/schemas/TraceJob-Multiple'

ManagementDataCollection:

$ref: '#/components/schemas/ManagementDataCollection-Multiple'

NtfSubscriptionControl:

$ref: '#/components/schemas/NtfSubscriptionControl-Multiple'

AlarmList:

$ref: '#/components/schemas/AlarmList-Single'

Files:

$ref: '#/components/schemas/Files-Multiple'

FileDownloadJob:

$ref: '#/components/schemas/FileDownloadJob-Multiple'

MnsRegistry:

$ref: '#/components/schemas/MnsRegistry-Single'

ManagedElement-ncO:

type: object

properties:

MnsAgent:

$ref: '#/components/schemas/MnsAgent-Multiple'

PerfMetricJob:

$ref: '#/components/schemas/PerfMetricJob-Multiple'

ThresholdMonitor:

$ref: '#/components/schemas/ThresholdMonitor-Multiple'

TraceJob:

$ref: '#/components/schemas/TraceJob-Multiple'

NtfSubscriptionControl:

$ref: '#/components/schemas/NtfSubscriptionControl-Multiple'

AlarmList:

$ref: '#/components/schemas/AlarmList-Single'

FileDownloadJob:

$ref: '#/components/schemas/FileDownloadJob-Multiple'

Files:

$ref: '#/components/schemas/Files-Multiple'

#-------- Definition of abstract IOCs --------------------------------------------

ManagedFunction-Attr:

type: object

properties:

userLabel:

type: string

vnfParametersList:

type: array

items:

$ref: '#/components/schemas/VnfParameter'

peeParametersList:

type: array

items:

$ref: '#/components/schemas/PeeParameter'

priorityLabel:

type: integer

supportedPerfMetricGroups:

type: array

items:

$ref: '#/components/schemas/SupportedPerfMetricGroup'

supportedTraceMetrics:

type: array

items:

type: string

EP\_RP-Attr:

type: object

properties:

userLabel:

type: string

farEndEntity:

type: string

supportedPerfMetricGroups:

type: array

items:

$ref: '#/components/schemas/SupportedPerfMetricGroup'

TraceJob-Attr:

type: object

description: abstract class used as a container of all TraceJob attributes

properties:

jobType:

$ref: '#/components/schemas/jobType-Type'

listOfInterfaces:

$ref: '#/components/schemas/listOfInterfaces-Type'

listOfNeTypes:

$ref: '#/components/schemas/listOfNeTypes-Type'

plmnTarget:

$ref: '#/components/schemas/plmnTarget-Type'

traceReportingConsumerUri:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

traceCollectionEntityIpAddress:

$ref: '#/components/schemas/IpAddr'

traceDepth:

$ref: '#/components/schemas/traceDepth-Type'

traceReference:

$ref: '#/components/schemas/traceReference-Type'

traceRecordingSessionReference:

type: string

jobId:

type: string

traceReportingFormat:

$ref: '#/components/schemas/traceReportingFormat-Type'

traceTarget:

$ref: '#/components/schemas/traceTarget-Type'

triggeringEvents:

$ref: '#/components/schemas/triggeringEvents-Type'

anonymizationOfMdtData:

$ref: '#/components/schemas/anonymizationOfMdtData-Type'

areaConfigurationForNeighCell:

$ref: '#/components/schemas/AreaConfig'

areaScope:

type: array

items:

$ref: '#/components/schemas/AreaScope'

beamLevelMeasurement:

$ref: '#/components/schemas/beamLevelMeasurement-Type'

collectionPeriodRrmLte:

$ref: '#/components/schemas/collectionPeriodRrmLte-Type'

collectionPeriodM6Lte:

$ref: '#/components/schemas/collectionPeriodM6Lte-Type'

collectionPeriodM7Lte:

$ref: '#/components/schemas/collectionPeriodM7Lte-Type'

collectionPeriodRrmUmts:

$ref: '#/components/schemas/collectionPeriodRrmUmts-Type'

collectionPeriodRrmNr:

$ref: '#/components/schemas/collectionPeriodRrmNr-Type'

collectionPeriodM6Nr:

$ref: '#/components/schemas/collectionPeriodM6Nr-Type'

collectionPeriodM7Nr:

$ref: '#/components/schemas/collectionPeriodM7Nr-Type'

eventListForEventTriggeredMeasurement:

$ref: '#/components/schemas/eventListForEventTriggeredMeasurement-Type'

eventThreshold:

$ref: '#/components/schemas/eventThreshold-Type'

listOfMeasurements:

$ref: '#/components/schemas/listOfMeasurements-Type'

loggingDuration:

$ref: '#/components/schemas/loggingDuration-Type'

loggingInterval:

$ref: '#/components/schemas/loggingInterval-Type'

eventThresholdL1:

$ref: '#/components/schemas/eventThresholdL1-Type'

hysteresisL1:

$ref: '#/components/schemas/hysteresisL1-Type'

timeToTriggerL1:

$ref: '#/components/schemas/timeToTriggerL1-Type'

mbsfnAreaList:

type: array

items:

$ref: '#/components/schemas/MbsfnArea'

measurementPeriodLte:

$ref: '#/components/schemas/measurementPeriodLte-Type'

measurementPeriodUmts:

$ref: '#/components/schemas/measurementPeriodUmts-Type'

measurementQuantity:

$ref: '#/components/schemas/measurementQuantity-Type'

eventThresholdUphUmts:

$ref: '#/components/schemas/eventThresholdUphUmts-Type'

plmnList:

$ref: '#/components/schemas/plmnList-Type'

positioningMethod:

$ref: '#/components/schemas/positioningMethod-Type'

reportAmount:

$ref: '#/components/schemas/reportAmount-Type'

reportingTrigger:

$ref: '#/components/schemas/reportingTrigger-Type'

reportInterval:

$ref: '#/components/schemas/reportInterval-Type'

reportType:

$ref: '#/components/schemas/reportType-Type'

sensorInformation:

$ref: '#/components/schemas/sensorInformation-Type'

traceCollectionEntityId:

$ref: '#/components/schemas/traceCollectionEntityId-Type'

ManagedFunction-ncO:

type: object

properties:

PerfMetricJob:

$ref: '#/components/schemas/PerfMetricJob-Multiple'

ThresholdMonitor:

$ref: '#/components/schemas/ThresholdMonitor-Multiple'

ManagedNFService:

$ref: '#/components/schemas/ManagedNFService-Multiple'

TraceJob:

$ref: '#/components/schemas/TraceJob-Multiple'

MnsRegistry-Single:

type: object

properties:

MnsInfo:

$ref: '#/components/schemas/MnsInfo-Multiple'

#-------- Definition of concrete IOCs --------------------------------------------

VsDataContainer-Single:

type: object

properties:

id:

type: string

attributes:

type: object

properties:

vsDataType:

type: string

vsDataFormatVersion:

type: string

vsData:

nullable: true

VsDataContainer:

$ref: '#/components/schemas/VsDataContainer-Multiple'

ManagedNFService-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

userLabel:

type: string

nFServiceType:

$ref: '#/components/schemas/NFServiceType'

sAP:

$ref: '#/components/schemas/SAP'

operations:

type: array

items:

$ref: '#/components/schemas/Operation'

administrativeState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/AdministrativeState'

operationalState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/OperationalState'

usageState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/UsageState'

registrationState:

$ref: '#/components/schemas/RegistrationState'

ManagementNode-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

userLabel:

type: string

managedElements:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

vendorName:

type: string

userDefinedState:

type: string

locationName:

type: string

swVersion:

type: string

MnsAgent:

$ref: '#/components/schemas/MnsAgent-Multiple'

MnsAgent-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

systemDN:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

MeContext-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

dnPrefix:

type: string

PerfMetricJob-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

administrativeState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/AdministrativeState'

operationalState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/OperationalState'

jobId:

type: string

performanceMetrics:

type: array

items:

type: string

granularityPeriod:

type: integer

minimum: 1

objectInstances:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

rootObjectInstances:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

reportingCtrl:

$ref: '#/components/schemas/ReportingCtrl'

Files:

$ref: '#/components/schemas/Files-Multiple'

ThresholdMonitor-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

administrativeState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/AdministrativeState'

operationalState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/OperationalState'

performanceMetrics:

type: array

items:

type: string

thresholdInfoList:

type: array

items:

$ref: '#/components/schemas/ThresholdInfo'

monitorGranularityPeriod:

type: integer

minimum: 1

objectInstances:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

rootObjectInstances:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

NtfSubscriptionControl-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

notificationRecipientAddress:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

notificationTypes:

type: array

items:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/NotificationType'

scope:

$ref: '#/components/schemas/Scope'

notificationFilter:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Filter'

HeartbeatControl:

$ref: '#/components/schemas/HeartbeatControl-Single'

HeartbeatControl-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

heartbeatNtfPeriod:

type: integer

minimum: 0

triggerHeartbeatNtf:

type: boolean

TraceJob-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

$ref: '#/components/schemas/TraceJob-Attr'

Files:

$ref: '#/components/schemas/Files-Multiple'

ManagementDataCollection-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

managementData:

$ref: '#/components/schemas/ManagementData'

targetNodeFilter:

$ref: '#/components/schemas/NodeFilter'

collectionTimeWindow:

$ref: 'comDefs.yaml#/components/schemas/TimeWindow'

reportingCtrl:

type: string

dataScope:

type: string

enum:

- SNSSAI

- 5QI

AlarmList-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

administrativeState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/AdministrativeState'

operationalState:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/OperationalState'

numOfAlarmRecords:

type: integer

lastModification:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

alarmRecords:

description: >-

This resource represents a map of alarm records.

The alarmIds are used as keys in the map.

type: object

additionalProperties:

$ref: 'TS28532\_FaultMnS.yaml#/components/schemas/AlarmRecord'

FileDownloadJob-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

fileLocation:

type: string

notificationRecipientAddress:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

cancelJob:

type: string

enum:

- TRUE

- FALSE

jobMonitor:

$ref: '#/components/schemas/FileDownloadJobProcessMonitor'

Files-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

numberOfFiles:

type: integer

jobRef:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

jobId:

type: string

File:

$ref: '#/components/schemas/File-Multiple'

File-Single:

allOf:

- $ref: '#/components/schemas/Top'

- type: object

properties:

attributes:

type: object

properties:

fileLocation:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

fileCompression:

type: string

fileSize:

type: integer

fileDataType:

type: string

enum:

- PERFORMANCE

- TRACE

- ANALYTICS

- PROPRIETARY

fileFormat:

type: string

fileReadyTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

fileExpirationTime:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

fileContent:

type: string

jobRef:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

jobId:

type: string

MnsInfo-Single:

type: object

properties:

mnsLabel:

type: string

mnsType:

type: string

enum:

- ProvMnS

- FaultSupervisionMnS

- StreamingDataReportingMnS

- FileDataReportingMnS

mnsVersion:

type: string

mnsAddress:

description: Resource URI as defined in the relevant Technical Specification

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Uri'

mnsScope:

description: >-

List of the managed object instances that can be accessed using the MnS.

If a complete SubNetwork can be accessed using the MnS, this attribute may contain the

DN of the SubNetwork instead of the DNs of the individual managed entities within the

SubNetwork.

type: array

items:

$ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

#-------- Definition of YAML arrays for name-contained IOCs ----------------------

VsDataContainer-Multiple:

type: array

items:

$ref: '#/components/schemas/VsDataContainer-Single'

ManagedNFService-Multiple:

type: array

items:

$ref: '#/components/schemas/ManagedNFService-Single'

ManagementNode-Multiple:

type: array

items:

$ref: '#/components/schemas/ManagementNode-Single'

MnsAgent-Multiple:

type: array

items:

$ref: '#/components/schemas/MnsAgent-Single'

MeContext-Multiple:

type: array

items:

$ref: '#/components/schemas/MeContext-Single'

PerfMetricJob-Multiple:

type: array

items:

$ref: '#/components/schemas/PerfMetricJob-Single'

ThresholdMonitor-Multiple:

type: array

items:

$ref: '#/components/schemas/ThresholdMonitor-Single'

TraceJob-Multiple:

type: array

items:

$ref: '#/components/schemas/TraceJob-Single'

ManagementDataCollection-Multiple:

type: array

items:

$ref: '#/components/schemas/ManagementDataCollection-Single'

NtfSubscriptionControl-Multiple:

type: array

items:

$ref: '#/components/schemas/NtfSubscriptionControl-Single'

FileDownloadJob-Multiple:

type: array

items:

$ref: '#/components/schemas/FileDownloadJob-Single'

Files-Multiple:

type: array

items:

$ref: '#/components/schemas/Files-Single'

File-Multiple:

type: array

items:

$ref: '#/components/schemas/File-Single'

MnsInfo-Multiple:

type: array

items:

$ref: '#/components/schemas/MnsInfo-Single'

#-------- Definitions in TS 28.623 for TS 28.532 ---------------------------------

resources-genericNrm:

oneOf:

- $ref: '#/components/schemas/VsDataContainer-Single'

- $ref: '#/components/schemas/ManagementNode-Single'

- $ref: '#/components/schemas/MnsAgent-Single'

- $ref: '#/components/schemas/MeContext-Single'

- $ref: '#/components/schemas/ManagedNFService-Single'

- $ref: '#/components/schemas/PerfMetricJob-Single'

- $ref: '#/components/schemas/ThresholdMonitor-Single'

- $ref: '#/components/schemas/TraceJob-Single'

- $ref: '#/components/schemas/ManagementDataCollection-Single'

- $ref: '#/components/schemas/NtfSubscriptionControl-Single'

- $ref: '#/components/schemas/HeartbeatControl-Single'

- $ref: '#/components/schemas/AlarmList-Single'

- $ref: '#/components/schemas/FileDownloadJob-Single'

- $ref: '#/components/schemas/Files-Single'

- $ref: '#/components/schemas/File-Single'

- $ref: '#/components/schemas/MnsRegistry-Single'

- $ref: '#/components/schemas/MnsInfo-Single'