**3GPP TSG- Meeting #**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Rel-16 CR 28.541 Extend description of NRCellRelation |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | SA5 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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 canbe 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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | Extend the Network Resource Model to support neighbor relationship indication for 5G |
|  |  |
| ***Summary of change:*** | Update attributes |
|  |  |
| ***Consequences if not approved:*** | Suboptimal configuration of network automation procedures |
|  |  |
| ***Clauses affected:*** | 4.3.32; 4.41; C.4.3; D.4.3; E.5.21 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**1st Change**

### 4.3.32 NRCellRelation

#### 4.3.32.1 Definition

This IOC represents a neighbour cell relation from a source cell to a target cell, where the target cell is an NRCellCU or ExternalNRCellCU instance.

The source cell can be a NRCellCU instance. This is the case for an Intra-NR neighbour cell relation.

The source cell can be a EUtranGenericCell instance. This is the case for Inter-LTE-NR neighbour cell relation, from E-UTRAN to NR. See 3GPP TS 28.658 [19].

Neighbour cell relations are unidirectional.

#### 4.3.32.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| nRTCI | O | T | T | F | T |
| cellIndividualOffset | M | T | T | F | T |
| CellProximityCoupling  | O | T | T | F | T |
| CPCCentreofMass  | O | T | T | F | T |
| isRemoveAllowed | CM | T | T | F | T |
| isHOAllowed | CM | T | T | F | T |
| **attribute related to role** |  |  |  |  |  |
| nRFreqRelationRef | M | T | T | F | T |
| adjacentNRCellRef | M | T | T | F | T |

#### 4.3.32.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| isRemoveAllowed | Condition: ANR function is supported in the source cell. |
| isHOAllowed | Condition: ANR function is supported in the source cell. |

#### 4.3.32.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

**2nd Change**

## 4.4 Attribute definitions

### 4.4.1 Attribute properties

| **Attribute Name** | **Documentation and Allowed Values** | **Properties** |
| --- | --- | --- |
| administrativeState | It indicates the administrative state of the NRCellDU. It describes the permission to use or prohibition against using the cell, imposed through the OAM services.allowedValues: LOCKED, SHUTTING DOWN, UNLOCKED. The meaning of these values is as defined in ITU‑T Recommendation X.731 [18].See Annex A for Relation between the "Pre-operation state of the gNB-DU Cell" and administrative state relevant in case of 2-split and 3-split deployment scenarios. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: LOCKEDisNullable: False |
| operationalState | It indicates the operational state of the NRCellDU instance. It describes whether the resource is installed and partially or fully operable (Enabled) or the resource is not installed or not operable (Disabled).allowedValues: ENABLED, DISABLED. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: False |
| cellState | It indicates the usage state of the NRCellDU instance. It describes whether the cell is not currently in use (Idle), or currently in use but not configured to carry traffic (Inactive) or is currently in use and is configured to carry traffic (Active).The Inactive and Active definitions are in accordance with TS 38.401 [4]:"Inactive: the cell is known by both the gNB-DU and the gNB-CU. The cell shall not serve UEs;Active: the cell is known by both the gNB-DU and the gNB-CU. The cell should be able to serve UEs.""allowedValues: IDLE, INACTIVE, ACTIVE. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| arfcnDL | NR Absolute Radio Frequency Channel Number (NR-ARFCN) for downlinkallowedValues: See TS 38.104 [12] subclause 5.4.2. Note that allowed values of NR-ARFCN are specified for each band in subclause 5.4.2.3. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| arfcnUL | NR Absolute Radio Frequency Channel Number (NR-ARFCN) for uplinkallowedValues: See TS 38.104 [12] subclause 5.4.2. Note that allowed values of NR-ARFCN are specified for each band in subclause 5.4.2.3. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| arfcnSUL | NR Absolute Radio Frequency Channel Number (NR-ARFCN) for supplementary uplinkallowedValues: See TS 38.104 [12] subclause 5.4.2. Note that allowed values of NR-ARFCN are specified for each band in subclause 5.4.2.3. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| beamAzimuth  | The azimuth of a beam transmission, which means the horizontal beamforming pointing angle (beam peak direction) in the (Phi) φ-axis in 1/10th degree resolution. See subclauses 3.2 in TS 38.104 [12] and 7.3 in TS 38.901 [53] as well as TS 28.662 [11]. The pointing angle is the direction equal to the geometric centre of the half-power contour of the beam relative to the reference plane. Zero degree implies explicit antenna bearing (boresight). Positive angle implies clockwise from the antenna bearing. allowedValues: [-1800 ..1800] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| beamHorizWidth | The Horizontal beamWidth of a beam transmission, which means the horizontal beamforming half-power (3dB down) beamwidth in the (Phi) φ-axis in 1/10th degree resolution. See subclauses 3.2 in TS 38.104 [12] and 7.3 in TS 38.901 [53]. allowedValues: [0..3599] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| beamIndex | Index of the beam.For example, please see subclause 6.6.2 of TS 38.331 [54] where the ssb-Index in the rsIndexResults element of MeasResultNR is defined. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| beamTilt  | The tilt of a beam transmission, which means the vertical beamforming pointing angle (beam peak direction) in the (Theta) θ-axis in 1/10th degree resolution. See subclauses 3.2 in TS 38.104 [12] and 7.3 in TS 38.901 [53] as well as TS 28.662 [11]. The pointing angle is the direction equal to the geometric centre of the half-power contour of the beam relative to the reference plane. Positive value implies downtilt.allowedValues: [-900..900] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| beamType | The type of the beam. allowedValues: "SSB-BEAM" | type: stringmultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| beamVertWidth | The Vertical beamWidth of a beam transmission, which means the vertical beamforming half-power (3dB down) beamwidth in the (Theta) θ-axis in 1/10th degree resolution. See subclauses 3.2 in TS 38.104 [12] and 7.3 in TS 38.901 [53]. allowedValues: [0...1800] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NullisNullable: True |
| bSChannelBwDL  | BS Channel BW in MHz. for downlinkallowedValues: See BS Channel BW in TS 38.104 [12], subclause 5.3.​ | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| bSChannelBwUL  | BS Channel BW in MHz.for uplinkallowedValues:See BS Channel BW in TS 38.104 [12], subclause 5.3.​ | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| bSChannelBwSUL  | BS Channel BW in MHz.for supplementary uplinkallowedValues:See BS Channel BW in TS 38.104 [12], subclause 5.3.​ | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| configuredMaxTxPower | This is the maximum possible for all downlink channels, used simultaneously in a cell, added together.allowedValues:TBD | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| coverageShape | Identifies the sector carrier coverage shape described by the envelope of the contained SSB beams. The coverage shape is implementation dependent.allowedValues: 0 : 65535 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| digitalTilt | Digitally-controlled tilt through beamforming. It represents the vertical pointing direction of the antenna relative to the antenna bore sight, representing the total non-mechanical vertical tilt of the selected coverageShape. Positive value gives downwards tilt and negative value gives upwards tilt.allowedValues: [-900..900] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| digitalAzimuth | Digitally-controlled azimuth through beamforming. It represents the horizontal pointing direction of the antenna relative to the antenna bore sight, representing the total non-mechanical horizontal pan of the selected coverageShape. Positive value gives azimuth to the right and negative value gives an azimuth to the left.allowedValues: [-1800 ..1800] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| cyclicPrefix | Cyclic prefix as defined in TS 38.211 [32], subclause 4.2.allowedValues: NORMAL, EXTENDED. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| localAddress  | This parameter specifies the localAddress including IP address and VLAN ID used for initialization of the underlying transport.First string is IP address, IP address can be an IPv4 address (See RFC 791 [37]) or an IPv6 address (See RFC 2373 [38]).Second string is VLAN Id. (See IEEE 802.1Q [39]), | type: Stringmultiplicity: 2isOrdered: TrueisUnique: N/AdefaultValue: NoneisNullable: False |
| remoteAddress | Remote address including IP address used for initialization of the underlying transport.IP address can be an IPv4 address (See RFC 791 [37]) or an IPv6 address (See RFC 2373 [38]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNBId | It identifies a gNB within a PLMN. The gNB ID is part of the NR Cell Identifier (NCI) of the gNB cells.See "gNB Identifier (gNB ID)" of subclause 8.2 of TS 38.300 [3]). See "Global gNB ID" in subclause 9.3.1.6 of TS 38.413 [5]. allowedValues: 0..4294967295 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNBIdLength | This indicates the number of bits for encoding the gNB ID. See "Global gNB ID" in subclause 9.3.1.6 of TS 38.413 [5].allowedValues: 22 .. 32. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNB­DUId | It uniquely identifies the DU at least within a gNB-CU. See 'gNB-DU ID' in subclause 9.3.1.9 of 3GPP TS 38.473 [8].allowedValues: 0..236-1 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNB­CUUPId | It uniquely identifies the gNB-CU-UP at least within a gNB-CU-CP. See 'gNB-CU-UP ID' in subclause 9.3.1.15 of 3GPP TS 38.463 [48].allowedValues: 0..236-1 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNBCUName | It identifies the Central Entity of a NR node, see subclause 9.2.1.4 of 3GPP TS 38.473 [8].allowedValues: Not applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gNBDUName | It identifies the Distributed Entity of a NR node, see subclause 9.2.1.5 of 3GPP TS 38.473 [8].allowedValues: Not applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| cellLocalId | It identifies a NR cell of a gNB. It, together with the gNB Identifier (using gNBId of the parent GNBCUCPFunction or GNBDUFunction or ExternalCUCPFunction), identifies a NR cell within a PLMN. This is the NR Cell Identity (NCI). See subclause 8.2 of TS 38.300 [3]), The NCI can be constructed by encoding the gNB Identifier using gNBId (of the parent GNBCUCPFunction or GNBDUFunction or ExternalCUCPFunction) and cellLocalId where the gNB Identifier field is of length specified by gNBIdLength (of the parent GNBCUCPFunction or GNBDUFunction or ExternalCUCPFunction). See "Global gNB ID" in subclause 9.3.1.6 of TS 38.413 [5].The NR Cell Global identifier (NCGI) is constructed from the PLMN identity the cell belongs to and the NR Cell Identifier (NCI) of the cell.See relation between NCI and NCGI subclause 8.2 of TS 38.300 [3].allowedValues: Not applicable | type: Integermultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| nRPCI | This holds the Physical Cell Identity (PCI) of the NR cell.allowedValues: See 3GPP TS 36.211 subclause 6.11 for legal values of pci. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| nRTAC | This holds the identity of the common Tracking Area Code for the PLMNs. allowedValues:a) It is the TAC or Extended-TAC. b) A cell can only broadcast one TAC or Extended-TAC. See TS 36.300, subclause 10.1.7 (PLMNID and TAC relation).c) TAC is defined in subclause 19.4.2.3 of 3GPP TS 23.003[13] and Extended-TAC is defined in subclause 9.3.1.29 of 3GPP TS 38.473 [8].d) For a 5G SA (Stand Alone), it has a non-null value. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NULLisNullable: True |
| GNBCUCPFunction.pLMNId | It specifies the PLMN identifier to be used as part of the global RAN node identity.allowedValues: Not applicable. | Type: PLMNId multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| GNBCUUPFunction.pLMNIdList | This is a list of PLMN identifiers. It defines from which set of PLMNs an UE must have as its serving PLMN to be allowed to use the GNB-CU-UP.allowedValues: Not applicable. | type: PLMNId multiplicity: 1..12isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| NRCellCU.pLMNInfoList | It defines which PLMNs that can be served by the NR cell,and which S-NSSAIs can be supported by the NR cell for corresponding PLMN in case of network slicing feature is supportedallowedValues: Not applicable. | type: PLMNInfomultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| NRCellDU.pLMNInfoList | It defines which PLMNs that can be served by the NR cell, and which S-NSSAs can be supported by the NR cell for corresponding PLMN in case of network slicing feature is supported. The pLMNId of the first entry of the list is the PLMNId used to construct the nCGI for the NR cell.allowedValues: Not applicable. | type: PLMNInfomultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| ExternalNRCellCU.pLMNIdList | It defines which PLMNs that are assumed to be served by the NR Cell in another gNB-CU-CP. This list is either updated by the managed element itself (e.g. due to ANR, signalling over Xn etc) or by consumer over the standard interface.allowedValues: Not applicable. | Type: PLMNIdmultiplicity: 1..12isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| rRMPolicyMemberList | It represents the list of RRMPolicyMember (s) that the managed object is supporting. A RRMPolicyMember <<dataType>> include the PLMNId <<dataType>> and S-NSSAI <<dataType>>.allowedValues: N/A | type: RRMPolicyMembermultiplicity: 1..\*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| resourceType | The resource type of interest for an RRM Policy. allowedValues:PRB (for NRCellDU)RRC connected users (for NRCellCU)DRB (for GNBCUUPFunction)See NOTE 2, NOTE 3 and NOTE 4 | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| sNSSAIList | It represents the list of S-NSSAI the managed object is supporting. The S-NSSAI is defined in 3GPP TS 23.003 [13].allowedValues: See 3GPP TS 23.003 [13] | type: S-NSSAImultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| sST | This attribute specifies the Slice/Service type (SST) of the network slice.See clause 5.15.2 of 3GPP TS 23.501 [2]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| sD | This attribute specifies the Slice Differentiator (SD), which is optional information that complements the slice/service type(s) to differentiate amongst multiple Network Slices.See clause 5.15.2 of 3GPP TS 23.501 [2]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| quotaType | The attribute indicates the type of the quota which allows to allocate resource as strictly usable for defined rRMPolicyMemberList (“strict quota”) or allows that resource to be used by other rRMPolicyMemberList(s) when defined rRMPolicyMemberList do not need them ( “float quota”).allowedValues: STRICT, FLOAT. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| rRMPolicyMaxRatio | The RRM policy setting the maximum percentage of radio resources to be allocated to the corresponding rRMPolicyMemberList.This quota can be strict or float quota : - Strict quota means the defined rRMPolicyMemberList cannot be allocated resource if its used resource reached maxRatio. - Float quota means the defined rRMPolicyMemberList can use quota from other rRMPolicyMemberList(s) even if its resource has reached maxRatio, if there’s free quota from other rRMPolicyMemberList. In addition, resource of the defined rRMPolicyMemberList can be used by other rRMPolicyMemberList(s) when the defined rRMPolicyMemberList do not need them.Value 0 indicates that there is no maximum limit.allowedValues:0 : 100 | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicyMarginMaxRatio | Maximum quota margin ratio is applicable when maximum quota policy ratio is of type “float quota”. It defines the resource quota within maximum quota to reserve buffers for new resource requirements for the defined rRMPolicyMemberList. With the margin ratio, unused resources of the maximum resource quota can be allocated to other rRMPolicyMemberList(s) when the free resources are more than resource amount indicated by the margin. The margin resource quota can only be used for the defined rRMPolicyMemberList.. Value 0 indicates that no margin is used.allowedValues:0 : 100 | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicyMinRatio | The RRM policy setting the minimum percentage of radio resources to be allocated to the corresponding rRMPolicyMemberList, especially in congestion situation. This quota can be strict or float quota: - Strict quota means resources are not allowed for other rRMPolicyMemberList(s) even when they are not used by the defined rRMPolicyMemberList. -Float quota resources can be used by other rRMPolicyMemberList(s) when the defined rRMPolicyMemberList do not need them.Value 0 indicates that there is no minimum limit.allowedValues: 0 : 100NOTE: The averaging time interval is implementation dependent. | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicyMarginMinRatio | Minimum quota margin ratio is applicable when minimum quota policy ratio is of type “float quota”. It defines the resource quota within minimum quota to reserve buffers for new resource requirements for the defined rRMPolicyMemberList. With the margin ratio, unused resources of the minimum resource quota can be allocated to other rRMPolicyMemberList(s) when the free resources are more than resource amount indicated by the margin. The margin resource quota can only be used for the defined rRMPolicyMemberList. Value 0 indicates that no margin is used.allowedValues:0 : 100  | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| subCarrierSpacing | Subcarrier spacing configuration for a BWP. See subclause 5 in TS 38.104 [12].AllowedValues: [15, 30, 60, 120] depending on the frequency range FR1 or FR2. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| txDirection | Indicates if the transmission direction is downlink (DL), uplink (UL) or both downlink and uplink (DL and UL).allowedValues:  DL, UL, DL and UL | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| bwpContext | It identifies whether the object is used for downlink, uplink or supplementary uplink.allowedValues: DL, UL, SUL | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| isInitialBwp | It identifies whether the object is used for initial or other BWP.allowedValues: INITIAL, OTHER | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| startRB | Offset in common resource blocks to common resource block 0 for the applicable subcarrier spacing for a BWP. This corresponds to N\_BWP\_start, see subclause 4.4.5 in TS 38.211 [32]. allowedValues:0 to N\_grid\_size – 1, where N\_grid\_size equals the number of resource blocks for the BS channel bandwidth, given the subcarrier spacing of the BWP. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| numberOfRBs | Number of physical resource blocks for a BWP. This corresponds to N\_BWP\_size, see subclause 4.4.5 in TS 38.211 [32].allowedValues:1 to N\_grid\_size – startRB of the BWP. Se startRB for definition of N\_grid\_size. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| nRTCI | This is the Target NR Cell Identifier. It consists of NR Cell Identifier (NCI) and Physical Cell Identifier of the target NR cell (nRPCI).The NRRelation.nRTCI identifies the target cell from the perspective of the NRCell, the name-containing instance of the subject NRCellCU instance.allowedValues: Not applicable. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| adjacentCellRef | This attribute contains the DN of an adjacentNRCell (NRCellCU or ExternalNRCellCU) allowedValues: Not applicable. | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| ssbFrequency | Indicates cell defining SSB frequency domain positionFrequency of the cell defining SSB transmission. The frequency provided in this attribute identifies the position of resource element RE=#0 (subcarrier #0) of resource block RB#10 of the SS block. The frequency must be positioned on the NR global frequency raster, as defined in TS 38.101 [42] subclause 5.4.2. and within bSChannelBwDL.allowedValues: 0..3279165 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| nRFrequencyRef | This attribute contains the DN of the referenced NRFrequency.allowedValues: Not applicable. | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| nRSectorCarrierRef | This attribute contains the DN of the referenced NRSectorCarrier.allowedValues: Not applicable. | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| bWPRef | This attribute contains the DN of the referenced BWP.allowedValues: Not applicable. | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| sectorEquipmentFunctionRef | This attribute contains the DN of the referenced NSectorEquipmentFunction.allowedValues: Not applicable. | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| offsetMO | It is a list of offset values applicable to all measured cells with reference signal(s) indicated in this *MeasObjectNR*. See offsetMO of subclause 5.5.4 of TS 38.331 [31].allowedValues: Not applicable. | type: QOffsetRangeListmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: N/AisNullable: False |
| cellIndividualOffset | It is a list of offset values for the neighbour cell. Used when UE is in connected mode. The unit is 1dB. It is defined for rsrpOffsetSSB, rsrqOffsetSSB, sinrOffsetSSB, rsrpOffsetCSI-RS, rsrqOffsetCSI-RS and sinrOffsetCSI-RS. See TS 38.331 [31].  allowedValues: Not applicable. | type: Integermultiplicity: 6isOrdered: TrueisUnique: N/AdefaultValue: 0isNullable: False |
| blackListEntry | It specifies a list of PCI (physical cell identity) that are blacklisted in EUTRAN measurements as described in 3GPP TS 38.331 [31].allowedValues: { 0…1007 } | type: Integermultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| blackListEntryIdleMode | It specifies a list of PCI (physical cell identity) that are blacklisted in SIB4 and SIB5.allowedValues: { 0…1007 } | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| cellReselectionPriority | It is the absolute priority of the carrier frequency used by the cell reselection procedure. See *CellReselectionPriority* IE in TS 38.331 [31].It corresponds to the parameter priority in 3GPP TS 38.304 [49].Value 0 means lowest priority. The UE behaviour when no value is entered is specified in subclause 5.2.4.1 of 3GPP TS 38.304 [49]. The value must not already used by other RAT, i.e. equal priorities between RATs are not supported.allowedValues: N/A | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 0NoneisNullable: False |
| cellReselectionSubPriority | It indicates a fractional value to be added to the value of cellReselectionPriority to obtain the absolute priority of the concerned carrier frequency for E-UTRA and NR. See *CellReselectionSubPriority* IE in TS 38.331 [31].allowedValues: { 0.2, 0.4, 0.6, 0.8 }. | type: Shortmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| pMax | It calculates the parameter Pcompensation (defined in 3GPP TS 38.304 [49]), at cell reselection to an Cell. Its unit is 1 dBm. It corresponds to parameter PEMAX in 3GPP TS 38.101 [??]. allowedValues: { -30..33 }.  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qOffsetFreq | It is the frequency specific offset applied when evaluating candidates for cell reselection. See TS 38.331 [49]. Its unit is 1 dB.allowedValues:{ -24, -22, -20, -18, -16, -14, -12, -10, -8, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 20, 22, 24 } | type: Realmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 0isNullable: False |
| qOffsetRangeList | It is used to indicate a cell, beam or measurement object specific offset to be applied when evaluating candidates for cell re-selection or when evaluating triggering conditions for measurement reporting. The value in dB. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.This is a list of enum values representing, in sequence: rsrpOffsetSSB, rsrqOffsetSSB, sinrOffsetSSB, rsrpOffsetCSI-RS, srqOffsetCSI-RS, sinrOffsetCSI-RS. See Q-OffsetRangeList in subclause of subclause 6.3.1 of TS 38.311 [31].allowedValues: { -24, -22, -20, -18, -16, -14, -12, -10, -8, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24 }  | type: ENUMmultiplicity: 6isOrdered: TrueisUnique: N/AdefaultValue: 0isNullable: False |
| qQualMin | It indicates the minimum required quality level in the cell (dB). See qQualMin in TS 38.304 [49]. Unit is 1 dB.Value 0 means that it is not sent and UE applies in such case the (default) value of negative infinity for Qqualmin. Sent in SIB3 or SIB5.allowedValues: { -34..-3, 0 }  | type: Realmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qRxLevMin | It indicates the required minimum received Reference Symbol Received Power (RSRP) level in the (E-UTRA) frequency for cell reselection. It corresponds to Qrxlevmin defined in 3GPP TS 38.304 [49]. It is broadcast in SIB3 or SIB5, depending on whether the related frequency is intra- or inter-frequency. Its unit is 1 dBm and resolution is 2.allowedValues: { -140..-44 }. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| threshXHighP | This specifies the Srxlev threshold (in dB) used by the UE when reselecting towards a higher priority RAT/ frequency than the current serving frequency. Each frequency of NR and E-UTRAN might have a specific threshold. It corresponds to the ThreshX, HighPin 3GPP TS 38.304 [49]. Its unit is 1 dB and resolution is 2**.**allowedValues: { 0..62 }  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| threshXHighQ | This specifies the Squal threshold (in dB) used by the UE when reselecting towards a higher priority RAT/ frequency than the current serving frequency. Each frequency of NR and E-UTRAN might have a specific threshold. It corresponds to the ThreshX, HighQ in TS 38.304 [49]. Its unit is 1 dB.allowedValues: { 0..31 } | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| threshXLowP | This specifies the Srxlev threshold (in dB) used by the UE when reselecting towards a lower priority RAT/ frequency than the current serving frequency. Each frequency of NR might have a specific threshold. It corresponds to ThreshX,LowP in 3GPP TS 38.304 [49]. Its unit is 1 dB. Its resolution is 2.allowedValues: { 0..62 }  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| threshXLowQ | This specifies the Squal threshold (in dB) used by the UE when reselecting towards a lower priority RAT/ frequency than the current serving frequency. Each frequency of NR might have a specific threshold. It corresponds to ThreshX,Low in TS 38.304 [49]. Its unit is 1 dB.allowedValues: {0..31}. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tReselectionNr | It is the cell reselection timer and corresponds to parameter TreselectionRAT for NR defined in 38.331 [4]. Its unit is in seconds. allowedValues: {0..7}. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tReselectionNRSfHigh | The attribute t-ReselectionNr (a parameter TreselectionNR in TS 38.304 [49]) is multiplied with this factor if the UE is in high mobility state. It corresponds to the parameter Speed dependent ScalingFactor for TreselectionNr for medium high state in 3GPP TS 38.304 [49]. The unit is one %.Value mapping:25 = 0.2550 = 0.575 = 0.75100 = 1.0 allowedValues: {25, 50, 75, 100}.  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tReselectionNRSfMedium | The attribute t-ReselectionNR (a parameter "TreselectionNR in TS 38.304 [49]”) is multiplied with this factor if the UE is in medium mobility state. It corresponds to the parameter Speed dependent ScalingFactor for TreselectionNr for medium mobility state in 3GPP TS 38.304 [49]. Its unit is one %.Value mapping:25 = 0.2550 = 0.575 = 0.75100 = 1.0 allowedValues: {25, 50, 75, 100}.  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| absoluteFrequencySSB | The absolute frequency applicable for a downlink NR carrier frequency associated with the SSB.allowedValues: {0.. 3279165}. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| sSBSubCarrierSpacing | This SSB is used for for synchronization. See subclause 5 in TS 38.104 [12]. Its units are in kHz.allowedValues: {15, 30, 120, 240}.Note that the allowed values of SSB used for representing data, by e.g. a BWP, are: 15, 30, 60 and 120 in units of kHz. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| multiFrequencyBandListNR | It is a list of additional frequency bands the frequency belongs to. The list is automatically set by the gNB.allowedValues: {1..256 }  | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ssbPeriodicity | Indicates cell defined SSB periodicity in number of subframes (ms).The SSB periodicity in msec is used for the rate matching purpose. allowedValues: 5, 10, 20, 40, 80, 160. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ssbOffset

|  |
| --- |
|  |

 | Indicates cell defining SSB time domain position. Defined as the offset of the measurement window, in number of subframes (ms), in which to receive SS/PBCH blocks, where allowed values depend on the ssbPeriodicity.allowedValues: ssbPeriodicity5 ms 0..4,ssbPeriodicity10 ms 0..9,ssbPeriodicity20 ms 0..19,ssbPeriodicity40 ms 0..39,ssbPeriodicity80 ms 0..79,ssbPeriodicity160 ms 0..159. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ssbDuration

|  |
| --- |
|  |

 | Duration of the measurement window in which to receive SS/PBCH blocks. It is given in number of subframes (ms) (see 38.213 [41], subclause 4.1.allowedValues: 1, 2, 3, 4, 5. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| rimRSMonitoringStartTime | This field configures the UTC time when the gNB attempts to start RIM-RS monitoring.allowedValues: containing the information same with xsd: dateTime. | type: String multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| rimRSMonitoringStopTime | This field configures the UTC time when the gNB stops RIM-RS monitoring.allowedValues: containing the information same with xsd: dateTime. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| aggressorSetID | This attributer indicates the associated aggressor gNB Set ID of the cell. (See subclause 7.4.1.6 in TS 38.211 [32]). Editor's Note: The definition of aggressorSetID needs further clarification with RAN1.allowedValues:The bit length of the set ID is maximum 22bit. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| victimSetID | This attributer indicates the associated Victim gNB Set ID of the cell. (See subclause 7.4.1.6 in TS 38.211 [32]). Editor's Note: The definition of victimSetID needs further clarification with RAN1.allowedValues:The bit length of the set ID is maximum 22bit. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| mappingSetIDBackhaulAddressList | The attribute specifies a list of mappingSetIDBackhaulAddress which is defined as a datatype (see clause 4.3.47). Which is used to retrieve the backhaul address of the victim set.allowedValues: Not applicable | type: MappingSetIDBackhaulAddressmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| backhaulAddress | The attribute specifies backhaulAddress which is defined as a datatype (see clause 4.3.48). allowedValues: Not applicable | type: BackhaulAddressmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| setID | This specifies the set ID. (See subclause 7.4.1.6 in TS 38.211 [32]). allowedValues:The bit length of the set ID is maximum 22bit. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tAI | Indicates the TAI (see subclause 9.3.3.11 in TS 38.413[5]), including PpLMNId ID and nRTAC. allowedValues: Not applicable  | type: TAImultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| CellProximityCoupling | This field describes how much the coverage of the neighbour cell overlaps that of the source cell. It is the measure of neighborliness/overlap indicating how much the coverage of the target neighbor cell overlaps the coverage of the source neighbor cell. The CPC is expected to be between 0% the case where there no overlap at all between the two cells and 100% the case where the target cell completely overlaps the source cell (i.e. in this case the coverage area of the source cell is completely contained within the coverage area of the target cell, but not necessarily vice versa). Correspondingly, the CPC should be the integer values in the range [0,100].Value 0 indicates that there is the cell coverage just touches each other with no measurable overlap.allowedValues: 0 : 100 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| CPCCentreofMass.distance | The CPCCentreofMass indicates where in the source cell the coverage overlap with the target cell is centred. Since the center of mass is dependent on the specific antenna configurations, it is identified by the tuple [rs, γs] of integer values of the distance from the antenna site and the angle relative to the antenna bore site. The CPCCentreofMass.distance rs in the range [0,100] is the distance relative to the cell range to the center of mass from the transmission point expressed as a ratio of the distance to the cell range, while γs in the range [-180,180] is the angle to the antenna boresight.allowedValues: 0 : 100 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: 0isNullable: False |
| CPCCentreofMass.angle | The CPCCentreofMass indicates where in the source cell the coverage overlap with the target cell is centred. Since the center of mass is dependent on the specific antenna configurations, it is identified by the tuple [rs, γs] of integer values of the distance from the antenna site and the angle relative to the antenna bore site. The CPCCentreofMass.angle γs in the range [-180,180] is the the horizontal angle in the (Phi) φ-axis of the centre of the overlap region to the antenna boresight in 1/10th degree resolution.allowedValues: [-1800 ..1800] 0.1 degree | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True  |
|  |  |  |
| NOTE 1: VoidNOTE 2: The radio resource can be signaling resources (e.g. RRC connected users) or user plane resources (e.g. PRB, DRB). NOTE 3: The averaging time interval is implementation dependent.NOTE 4: A RRM Policy can make use of the defined policy RRMPolicyRatio or a vendor specific RRM Policy. |

**3rd Change**

## C.4.3 XML schema "nRNrm.xsd"

…..

<element name="NRCellRelation">

 <complexType>

 <complexContent>

 <extension base="xn:NrmClass">

 <sequence>

 <element name="attributes">

 <complexType>

 <all>

 <!-- Inherited attributes from ManagedFunction -->

 <element name="userLabel" type="string" minOccurs="0"/>

 <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>

 <element name="peeParametersList" type="xn:peeParametersListType" minOccurs="0"/>

 <element name="priority" type="integer" minOccurs="0"/>

 <element name="measurements" type="xn:MeasurementTypesAndGPsList" minOccurs="0"/>

 <!--End of inherited attributes from ManagedFunction -->

 <element name="nRTCI" type="nn:Nrtci"/>

 <element name="cellIndividualOffset" type="en:CellIndividualOffset"/>

 <element name="nRFreqRelationRef" type="xn:dn" minOccurs="0"/>

 <element name="adjacentNRCellRef" type="xn:dn" minOccurs="0"/>

 <element name="isRemoveAllowed" type="boolean" minOccurs="0"/>

 <element name="isHOAllowed" type="boolean" minOccurs="0"/>

 </all>

 </complexType>

 </element>

 <choice minOccurs="0" maxOccurs="unbounded">

 <element ref="xn:VsDataContainer"/>

 </choice>

 <choice minOccurs="0" maxOccurs="1">

 <element ref="sp:EnergySavingProperties"/>

 <element ref="sp:ESPolicies"/>

 </choice>

 <choice minOccurs="0" maxOccurs="unbounded">

 <element ref="xn:MeasurementControl"/>

 </choice>

 </sequence>

 </extension>

 </complexContent>

 </complexType>

</element>

<element name="NRCellRelation">

 <complexType>

 <complexContent>

 <extension base="xn:NrmClass">

 <sequence>

 <element name="attributes">

 <complexType>

 <all>

 <!-- Inherited attributes from ManagedFunction -->

 <element name="userLabel" type="string" minOccurs="0"/>

 <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>

 <element name="peeParametersList" type="xn:peeParametersListType" minOccurs="0"/>

 <element name="priority" type="integer" minOccurs="0"/>

 <element name="measurements" type="xn:MeasurementTypesAndGPsList" minOccurs="0"/>

 <!--End of inherited attributes from ManagedFunction -->

 <element name="nRTCI" type="nn:Nrtci"/>

 <element name="cellIndividualOffset" type="en:CellIndividualOffset"/>

 <element name="nRFreqRelationRef" type="xn:dn" minOccurs="0"/>

 <element name="adjacentNRCellRef" type="xn:dn" minOccurs="0"/>

 <element name="CellProximityCoupling" type="en:CellProximityCoupling"

<element name=" CPCCenterOfMass ">

 <complexType>

 <complexContent>

 <extension base="xn:NrmClass">

 <sequence>

 <element name="attributes">

 <complexType>

 <all>

 <element name="distance" type="distance" minOccurs="0"/>

 <element name="angle" type="angle" minOccurs="0"/>

 </all>

 </sequence>

 </extension>

 </complexContent>

 </complexType>

</element>

 </all>

 </complexType>

 </element>

 <choice minOccurs="0" maxOccurs="unbounded">

 <element ref="xn:VsDataContainer"/>

 </choice>

 <choice minOccurs="0" maxOccurs="1">

 <element ref="sp:EnergySavingProperties"/>

 <element ref="sp:ESPolicies"/>

 </choice>

 <choice minOccurs="0" maxOccurs="unbounded">

 <element ref="xn:MeasurementControl"/>

 </choice>

 </sequence>

 </extension>

 </complexContent>

 </complexType>

</element>

…..

**4th Change**

## D.4.3 OpenAPI document "nrNrm.yaml"

 openapi: 3.0.1

info:

 title: NR NRM

 version: 16.4.0

 description: >-

 OAS 3.0.1 specification of the NR NRM

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externalDocs:

 description: 3GPP TS 28.541 V16.4.0; 5G NRM, NR NRM

 url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.541/

paths: {}

components:

 schemas:

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

 GnbId:

 type: string

 GnbIdLength:

 type: integer

 minimum: 22

 maximum: 32

 GnbName:

 type: string

 maxLength: 150

 GnbDuId:

 type: number

 minimum: 0

 maximum: 68719476735

 GnbCuUpId:

 type: number

 minimum: 0

 maximum: 68719476735

 Sst:

 type: integer

 maximum: 255

 Snssai:

 type: object

 properties:

 sst:

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

 sd:

 type: string

 SnssaiList:

 type: array

 items:

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

 Mnc:

 type: string

 pattern: '[0-9]{3}|[0-9]{2}'

 PlmnId:

 type: object

 properties:

 mcc:

 $ref: 'genericNrm.yaml#/components/schemas/Mcc'

 mnc:

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

 PlmnIdList:

 type: array

 items:

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

 PlmnInfo:

 type: object

 properties:

 plmnId":

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

 snssai:

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

 PlmnInfoList:

 type: array

 items:

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

 NrPci:

 type: integer

 maximum: 503

 NrTac:

 type: integer

 maximum: 16777215

 Tai:

 type: object

 properties:

 plmnId:

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

 nrTac:

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

 BackhaulAddress:

 type: object

 properties:

 gnbId:

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

 tai:

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

 MappingSetIDBackhaulAddress:

 type: object

 properties:

 setID:

 type: integer

 backhaulAddress:

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

 CellState:

 type: string

 enum:

 - IDLE

 - INACTIVE

 - ACTIVE

 CyclicPrefix:

 type: string

 enum:

 - '15'

 - '30'

 - '60'

 - '120'

 TxDirection:

 type: string

 enum:

 - DL

 - UL

 - DL and UL

 BwpContext:

 type: string

 enum:

 - DL

 - UL

 - SUL

 IsInitialBwp:

 type: string

 enum:

 - INITIAL

 - OTHER

 - SUL

 QuotaType:

 type: string

 enum:

 - STRICT

 - FLOAT

 RrmPolicyMember:

 type: object

 properties:

 plmnId:

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

 snssai:

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

 RrmPolicyMemberList:

 type: array

 items:

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

 LocalAddress:

 type: object

 properties:

 ipv4Address:

 $ref: 'genericNrm.yaml#/components/schemas/Ipv4Addr'

 ipv6Address:

 $ref: 'genericNrm.yaml#/components/schemas/Ipv6Addr'

 vlanId:

 type: integer

 minimum: 0

 maximum: 4096

 port:

 type: integer

 minimum: 0

 maximum: 65535

 RemoteAddress:

 type: object

 properties:

 ipv4Address:

 $ref: 'genericNrm.yaml#/components/schemas/Ipv4Addr'

 ipv6Address:

 $ref: 'genericNrm.yaml#/components/schemas/Ipv6Addr'

 CellIndividualOffset:

 type: object

 properties:

 rsrpOffsetSSB:

 type: integer

 rsrqOffsetSSB:

 type: integer

 sinrOffsetSSB:

 type: integer

 rsrpOffsetCSI-RS:

 type: integer

 rsrqOffsetCSI-RS:

 type: integer

 sinrOffsetCSI-RS:

 type: integer

 QOffsetRange:

 type: integer

 enum:

 - -24

 - -22

 - -20

 - -18

 - -16

 - -14

 - -12

 - -10

 - -8

 - -6

 - -5

 - -4

 - -3

 - -2

 - -1

 - 0

 - 24

 - 22

 - 20

 - 18

 - 16

 - 14

 - 12

 - 10

 - 8

 - 6

 - 5

 - 4

 - 3

 - 2

 - 1

 QOffsetRangeList:

 type: object

 properties:

 rsrpOffsetSSB:

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

 rsrqOffsetSSB:

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

 sinrOffsetSSB:

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

 rsrpOffsetCSI-RS:

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

 rsrqOffsetCSI-RS:

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

 sinrOffsetCSI-RS:

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

 QOffsetFreq:

 type: number

 TReselectionNRSf:

 type: integer

 enum:

 - 25

 - 50

 - 75

 - 100

 SsbPeriodicity:

 type: integer

 enum:

 - 5

 - 10

 - 20

 - 40

 - 80

 - 160

 SsbDuration:

 type: integer

 enum:

 - 1

 - 2

 - 3

 - 4

 - 5

 SsbSubCarrierSpacing:

 type: integer

 enum:

 - 15

 - 30

 - 120

 - 240

 CoverageShape:

 type: integer

 maximum: 65535

 DigitalTilt:

 type: integer

 minimum: -900

 maximum: 900

 DigitalAzimuth:

 type: integer

 minimum: -1800

 maximum: 1800

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

 RrmPolicy\_-Attr:

 type: object

 properties:

 resourceType:

 type: string

 rRMPolicyMemberList:

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

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

 SubNetwork-Single:

 allOf:

 - $ref: 'genericNrm.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 $ref: 'genericNrm.yaml#/components/schemas/SubNetwork-Attr'

 - $ref: 'genericNrm.yaml#/components/schemas/SubNetwork-ncO'

 - type: object

 properties:

 SubNetwork:

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

 ManagedElement:

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

 NRFrequency:

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

 ExternalGnbCuCpFunction:

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

 ExternalENBFunction:

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

 EUtranFrequency:

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

 ManagedElement-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 $ref: 'genericNRM.yaml#/components/schemas/ManagedElement-Attr'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedElement-ncO'

 - type: object

 properties:

 GnbDuFunction:

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

 GnbCuUpFunction:

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

 GnbCuCpFunction:

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

 GnbDuFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 gnbDuId:

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

 gnbDuName:

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

 gnbId:

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

 gnbIdLength:

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

 aggressorSetID:

 type: integer

 victimSetID:

 type: integer

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 RRMPolicyRatio:

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

 NrCellDu:

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

 Bwp-Multiple:

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

 NrSectorCarrier-Multiple:

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

 EP\_F1C:

 $ref: '#/components/schemas/EP\_F1C-Single'

 EP\_F1U:

 $ref: '#/components/schemas/EP\_F1U-Multiple'

 GnbCuUpFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 gnbId:

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

 gnbIdLength:

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

 gnbCuUpId:

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

 plmnInfoList:

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

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 RRMPolicyRatio:

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

 EP\_E1:

 $ref: '#/components/schemas/EP\_E1-Single'

 EP\_XnU:

 $ref: '#/components/schemas/EP\_XnU-Multiple'

 EP\_F1U:

 $ref: '#/components/schemas/EP\_F1U-Multiple'

 EP\_NgU:

 $ref: '#/components/schemas/EP\_NgU-Multiple'

 EP\_X2U:

 $ref: '#/components/schemas/EP\_X2U-Multiple'

 EP\_S1U:

 $ref: '#/components/schemas/EP\_S1U-Multiple'

 GnbCuCpFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 gnbId:

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

 gnbIdLength:

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

 gnbCuName:

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

 plmnId:

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

 x2BlackList:

 $ref: 'genericNRM.yaml#/components/schemas/DnList'

 xnWhiteList:

 $ref: 'genericNRM.yaml#/components/schemas/DnList'

 x2XnHOBlackList:

 $ref: 'genericNRM.yaml#/components/schemas/DnList'

 mappingSetIDBackhaulAddress:

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

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 RRMPolicyRatio:

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

 NrCellCu:

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

 EP\_XnC:

 $ref: '#/components/schemas/EP\_XnC-Multiple'

 EP\_E1:

 $ref: '#/components/schemas/EP\_E1-Multiple'

 EP\_F1C:

 $ref: '#/components/schemas/EP\_F1C-Multiple'

 EP\_NgC:

 $ref: '#/components/schemas/EP\_NgC-Multiple'

 EP\_X2C:

 $ref: '#/components/schemas/EP\_X2C-Multiple'

 NrCellCu-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 cellLocalId:

 type: integer

 plmnInfoList:

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

 nRFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 RRMPolicyRatio:

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

 NRCellRelation:

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

 EUtranCellRelation:

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

 NRFreqRelation:

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

 EUtranFreqRelation:

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

 NrCellDu-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 administrativeState:

 $ref: 'genericNRM.yaml#/components/schemas/AdministrativeState'

 operationalState:

 $ref: 'genericNRM.yaml#/components/schemas/OperationalState'

 cellLocalId:

 type: integer

 cellState:

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

 plmnInfoList:

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

 nrPci:

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

 nrTac:

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

 arfcnDL:

 type: integer

 arfcnUL:

 type: integer

 arfcnSUL:

 type: integer

 bSChannelBwDL:

 type: integer

 bSChannelBwUL:

 type: integer

 bSChannelBwSUL:

 type: integer

 ssbFrequency:

 type: integer

 minimum: 0

 maximum: 3279165

 ssbPeriodicity:

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

 ssbSubCarrierSpacing:

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

 ssbOffset:

 type: integer

 minimum: 0

 maximum: 159

 ssbDuration:

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

 nrSectorCarrierRef:

 type: array

 items:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 bwpRef:

 type: array

 items:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 nRFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 RRMPolicyRatio:

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

 NRFrequency-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 absoluteFrequencySSB:

 type: integer

 minimum: 0

 maximum: 3279165

 ssbSubCarrierSpacing:

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

 multiFrequencyBandListNR:

 type: integer

 minimum: 1

 maximum: 256

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 EUtranFrequency-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 NrSectorCarrier-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 txDirection:

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

 configuredMaxTxPower:

 type: integer

 arfcnDL:

 type: integer

 arfcnUL:

 type: integer

 bSChannelBwDL:

 type: integer

 bSChannelBwUL:

 type: integer

 sectorEquipmentFunctionRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 CommonBeamformingFunction:

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

 Bwp-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 bwpContext:

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

 isInitialBwp:

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

 subCarrierSpacing:

 type: integer

 cyclicPrefix:

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

 startRB:

 type: integer

 numberOfRBs:

 type: integer

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 CommonBeamformingFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 coverageShape:

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

 digitalAzimuth:

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

 digitalTilt:

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

 - type: object

 properties:

 Beam:

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

 Beam-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 beamIndex:

 type: integer

 beamType:

 type: string

 enum:

 - SSB-BEAM

 beamAzimuth:

 type: integer

 minimum: -1800

 maximum: 1800

 beamTilt:

 type: integer

 minimum: -900

 maximum: 900

 beamHorizWidth:

 type: integer

 minimum: 0

 maximum: 3599

 beamVertWidth:

 type: integer

 minimum: 0

 maximum: 1800

 RRMPolicyRatio-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: '#/components/schemas/RrmPolicy\_-Attr'

 - type: object

 properties:

 quotaType:

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

 rRMPolicyMaxRatio:

 type: integer

 rRMPolicyMarginMaxRatio:

 type: integer

 rRMPolicyMinRatio:

 type: integer

 rRMPolicyMarginMinRatio:

 type: integer

 NRCellRelation-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 nRTCI:

 type: integer

 cellIndividualOffset:

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

 adjacentNRCellRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 nRFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 cellProximityCoupling:

 type: integer

 CPCCenterOfMass:

 type: object

 properties:

 distance:

 type: integer

 angle:

 type: integer

 isRemoveAllowed:

 type: boolean

 isHOAllowed:

 type: boolean

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 EUtranCellRelation-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 adjacentEUtranCellRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 NRFreqRelation-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 offsetMO:

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

 blackListEntry:

 type: array

 items:

 type: integer

 minimum: 0

 maximum: 1007

 blackListEntryIdleMode:

 type: integer

 cellReselectionPriority:

 type: integer

 cellReselectionSubPriority:

 type: number

 minimum: 0.2

 maximum: 0.8

 multipleOf: 0.2

 pMax:

 type: integer

 minimum: -30

 maximum: 33

 qOffsetFreq:

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

 qQualMin:

 type: number

 qRxLevMin:

 type: integer

 minimum: -140

 maximum: -44

 threshXHighP:

 type: integer

 minimum: 0

 maximum: 62

 threshXHighQ:

 type: integer

 minimum: 0

 maximum: 31

 threshXLowP:

 type: integer

 minimum: 0

 maximum: 62

 threshXLowQ:

 type: integer

 minimum: 0

 maximum: 31

 tReselectionNr:

 type: integer

 minimum: 0

 maximum: 7

 tReselectionNRSfHigh:

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

 tReselectionNRSfMedium:

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

 nRFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 EUtranFreqRelation-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 eUTranFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 ExternalGnbDuFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 gnbId:

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

 gnbIdLength:

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

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 EP\_F1C:

 $ref: '#/components/schemas/EP\_F1C-Multiple'

 EP\_F1U:

 $ref: '#/components/schemas/EP\_F1U-Multiple'

 ExternalGnbCuUpFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 gnbId:

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

 gnbIdLength:

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

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 EP\_E1:

 $ref: '#/components/schemas/EP\_E1-Multiple'

 EP\_F1U:

 $ref: '#/components/schemas/EP\_F1U-Multiple'

 EP\_XnU:

 $ref: '#/components/schemas/EP\_XnU-Multiple'

 ExternalGnbCuCpFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: >-

 genericNRM.yaml#/components/schemas/ManagedFunction-Attr

 - type: object

 properties:

 gnbId:

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

 gnbIdLength:

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

 plmnId:

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

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 ExternalNrCellCu:

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

 EP\_XnC:

 $ref: '#/components/schemas/EP\_XnC-Multiple'

 EP\_E1:

 $ref: '#/components/schemas/EP\_E1-Multiple'

 EP\_F1C:

 $ref: '#/components/schemas/EP\_F1C-Multiple'

 ExternalNrCellCu-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 cellLocalId:

 type: integer

 nrPci:

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

 plmnIdList:

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

 nRFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 ExternalENBFunction-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 eNBId:

 type: integer

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 ExternalEUTranCell:

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

 ExternalEUTranCell-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 EUtranFrequencyRef:

 $ref: 'genericNRM.yaml#/components/schemas/Dn'

 - $ref: 'genericNRM.yaml#/components/schemas/ManagedFunction-ncO'

 EP\_XnC-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_E1-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_F1C-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_NgC-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_X2C-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_XnU-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_F1U-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_NgU-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_X2U-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

 EP\_S1U-Single:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/Top-Attr'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'genericNRM.yaml#/components/schemas/EP\_RP-Attr'

 - type: object

 properties:

 localAddress:

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

 remoteAddress:

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

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

 SubNetwork-Multiple:

 type: array

 items:

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

 ManagedElement-Multiple:

 type: array

 items:

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

 GnbDuFunction-Multiple:

 type: array

 items:

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

 GnbCuUpFunction-Multiple:

 type: array

 items:

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

 GnbCuCpFunction-Multiple:

 type: array

 items:

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

 NrCellDu-Multiple:

 type: array

 items:

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

 NrCellCu-Multiple:

 type: array

 items:

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

 NRFrequency-Multiple:

 type: array

 minItems: 1

 items:

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

 EUtranFrequency-Multiple:

 type: array

 minItems: 1

 items:

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

 NrSectorCarrier-Multiple:

 type: array

 items:

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

 Bwp-Multiple:

 type: array

 items:

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

 Beam-Multiple:

 type: array

 items:

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

 RRMPolicyRatio-Multiple:

 type: array

 items:

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

 NRCellRelation-Multiple:

 type: array

 items:

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

 EUtranCellRelation-Multiple:

 type: array

 items:

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

 NRFreqRelation-Multiple:

 type: array

 items:

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

 EUtranFreqRelation-Multiple:

 type: array

 items:

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

 ExternalGnbDuFunction-Multiple:

 type: array

 items:

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

 ExternalGnbCuUpFunction-Multiple:

 type: array

 items:

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

 ExternalGnbCuCpFunction-Multiple:

 type: array

 items:

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

 ExternalNrCellCu-Multiple:

 type: array

 items:

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

 ExternalENBFunction-Multiple:

 type: array

 items:

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

 ExternalEUTranCell-Multiple:

 type: array

 items:

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

 EP\_E1-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_E1-Single'

 EP\_XnC-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_XnC-Single'

 EP\_F1C-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_F1C-Single'

 EP\_NgC-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_NgC-Single'

 EP\_X2C-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_X2C-Single'

 EP\_XnU-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_XnU-Single'

 EP\_F1U-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_F1U-Single'

 EP\_NgU-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_NgU-Single'

 EP\_X2U-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_X2U-Single'

 EP\_S1U-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_S1U-Single'

#-------- Definitions in TS 28.541 for TS 28.532 ---------------------------------

 resources-nrNrm:

 oneOf:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

 - $ref: '#/components/schemas/EP\_XnC-Single'

 - $ref: '#/components/schemas/EP\_E1-Single'

 - $ref: '#/components/schemas/EP\_F1C-Single'

 - $ref: '#/components/schemas/EP\_NgC-Single'

 - $ref: '#/components/schemas/EP\_X2C-Single'

 - $ref: '#/components/schemas/EP\_XnU-Single'

 - $ref: '#/components/schemas/EP\_F1U-Single'

 - $ref: '#/components/schemas/EP\_NgU-Single'

 - $ref: '#/components/schemas/EP\_X2U-Single'

 - $ref: '#/components/schemas/EP\_S1U-Single'

**5th Change**

## E.5.21 module \_3gpp-nr-nrm-nrcellrelation@2019-10-28.yang

module \_3gpp-nr-nrm-nrcellrelation {

 yang-version 1.1;

 namespace "urn:3gpp:sa5:\_3gpp-nr-nrm-nrcellrelation";

 prefix "nrcellrel3gpp";

 import \_3gpp-common-yang-types { prefix types3gpp; }

 import \_3gpp-common-managed-function { prefix mf3gpp; }

 import \_3gpp-common-managed-element { prefix me3gpp; }

 import \_3gpp-common-top { prefix top3gpp; }

 import \_3gpp-nr-nrm-gnbcucpfunction { prefix gnbcucp3gpp; }

 import \_3gpp-nr-nrm-nrcellcu { prefix nrcellcu3gpp; }

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRCellRelation Information

 Object Class (IOC) that is part of the NR Network Resource Model (NRM).";

 reference "3GPP TS 28.541 5G Network Resource Model (NRM)";

 revision 2019-10-28 { reference S5-193518 ; }

 revision 2019-08-30 {

 description "Initial revision";

 }

 grouping NRCellRelationGrp {

 description "Represents the NRCellRelation IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf nRTCI {

 description "Target NR Cell Identifier. It consists of NR Cell

 Identifier (NCI) and Physical Cell Identifier of the target NR cell

 (nRPCI).";

 type uint64;

 }

 container cellIndividualOffset {

 description "A set of offset values for the neighbour cell. Used when

 UE is in connected mode. Defined for rsrpOffsetSSB, rsrqOffsetSSB,

 sinrOffsetSSB, rsrpOffsetCSI-RS, rsrqOffsetCSI-RS and

 sinrOffsetCSI-RS.";

 reference "cellIndividualOffset in MeasObjectNR in 3GPP TS 38.331";

 leaf rsrpOffsetSsb {

 description "Offset value of rsrpOffsetSSB.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf rsrqOffsetSsb{

 description "Offset value of rsrqOffsetSSB.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf sinrOffsetSsb {

 description "Offset value of sinrOffsetSSB.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf rsrpOffsetCsiRs{

 description "Offset value of rsrpOffsetCSI-RS.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf rsrqOffsetCsiRs {

 description "Offset value of rsrqOffsetCSI-RS.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf sinrOffsetCsiRs {

 description "Offset value of sinrOffsetCSI-RS.";

 default 0;

 type types3gpp:QOffsetRange;

 }

 }

 leaf nRFreqRelationRef {

 description "Reference to a corresponding NRFreqRelation instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 leaf adjacentNRCellRef {

 description "Reference to an adjacent NR cell (NRCellCU or

 ExternalNRCellCU).";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 leaf CellProximityCoupling {

description "Description (value) of the degree of neighborlihood (coverage overlap) of the NRCellRelation.";

 default 0;

 type int32 { range "0..100"; };

 }

grouping CPCCenterOfMass {

 description "Represents the CPCCenterOfMass IOC.";

 uses mf3gpp:ManagedFunctionGrp;

 leaf distance {

 description "Description (location) of the centre of coverage overlap with the NRCellRelation.";

 type types3gpp: uint32 { range "0..100"; };

 }

Leaf angle {

description " The CPCCentreofMass.angle γs in the range [-180,180] is the the horizontal angle in the (Phi) φ-axis of the centre of the overlap region to the antenna boresight in 1/10th degree resolution. Zero degree implies explicit antenna bearing (boresight). Positive angle implies clockwise from the antenna bearing.";

 type int32 { range "-1800..1800"; }

 units "0.1";

 }

 leaf isRemoveAllowed {

 type boolean;

 default true;

 description "True if the ANR function in the node is allowed to remove this relation.";

 }

 leaf isHOAllowed {

 type boolean;

 default true;

 description "True if handovers are allowed over this relation.";

 }

 }

 augment /me3gpp:ManagedElement/gnbcucp3gpp:GNBCUCPFunction/nrcellcu3gpp:NRCellCU {

 list NRCellRelation {

 description "Represents a neighbour cell relation from a source cell

 to a target cell, where the target cell is an NRCellCU or

 ExternalNRCellCU instance.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRCellRelationGrp;

 }

 uses mf3gpp:ManagedFunctionContainedClasses;

 }

 }

}

**End of changes**