**3GPP TSG-SA5 Meeting #129-e *S5-201259***

**Online, , 24th Feb 2020 - 4th Mar 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **28.541** | **CR** | **0245** | **rev** | **-** | **Current version:** | **16.3.0** |  |
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| *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 TS 28.541 Add the RIM parameters of mapping relations for remote interference management |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | eNRM |  | ***Date:*** | 2020-02-14 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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:*** | According to the received LS S5-201166 R3-197540, OAM needs to provide the relationship between set ID and backhaul addresses (gNB ID+TAI) to the gNB CU-CP. According to R1-1903833, set ID value is defined as rim-RS-SetId-of-RS1 for RIM-RS type1 and rim-RS-SetId-of-RS2 for RIM-RS type2. |
|  |  |
| ***Summary of change:*** | Add mapping relationship between set ID and backhaul address of gNBs (gNB ID+TAI) to the GBNCUCPFunction. |
|  |  |
| ***Consequences if not approved:*** | The function of Remote Interference Management(RIM) can not be applicable for all NG-RAN deployment scenarios. |
|  |  |
| ***Clauses affected:*** | 4.3.2.2, 4.3.X (new), 4.4.1,D.4.3 |
|  |  |
|  | **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:*** |  |

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| **First of Changes** |

### 4.3.1 GNBDUFunction

#### 4.3.1.1 Definition

For non-split NG-RAN deployment scenario, this IOC together with GNBCUCPFunction IOC and GNBCUUPFunction IOC provide the management of gNB defined in clause 6.1.1 in 3GPP TS 38.401 [4].

For 2-split and 3-split NG-RAN architecture, this IOC provides the management representation of tgNB-DU defined in clause 6.1.1 in 3GPP TS 38.401 [4].

The following table identifies the necessary end points required for the representation of gNB and en-gNB, of all deployment scenarios.

|  |  |  |  |
| --- | --- | --- | --- |
| ReqRole | End point requirement for 3-split deployment scenario | End point requirement for 2-split deployment scenario | End point requirement for Non-split deployment scenario |
| gNB | <<IOC>>EP\_F1C, <<IOC>>EP\_F1U | <<IOC>>EP\_F1C, <<IOC>>EP\_F1U | None. |
| en-gNB | <<IOC>>EP\_F1C, <<IOC>>EP\_F1U | <<IOC>>EP\_F1C, <<IOC>>EP\_F1U | None. |

#### 4.3.1.2 Attributes

The GNBDUFunction IOC includes attributes inherited from ManagedFunction IOC (defined in TS 28.622[30]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| gNB­DUId | M | T | T | F | T |
| gNBDUName | O | T | T | F | T |
| gNBId | M | T | F | F | T |
| gNBIdLength  | M | T | T | F | T |
| aggressorSetID | CM | T | F | T | T |
| victimSetID | CM | T | F | T | T |

#### 4.3.1.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| aggressorSetID | Condition: Remote Interference Management function is supported. |
| victimSetID | Condition: Remote Interference Management function is supported. |

#### 4.3.1.4 Notifications

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

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| **Second of Changes** |

### 4.3.2 GNBCUCPFunction

#### 4.3.2.1 Definition

For non-split NG-RAN deployment scenario, this IOC together with GNBCUUPFunction IOC and GNBDUFunction IOC provide the management representation of gNB defined in clause 6.1.1 in 3GPP TS 38.401 [4].

For 2-split NG-RAN deployment scenario, this IOC together with GNBCUUPFunction IOC provide management representation of the gNB-CU defined in clause 6.1.1 in 3GPP TS 38.401 [4].

For 3-split NG-RAN deployment scenario, this IOC provides management representation of gNB-CU-CP defined in clause 6.1.2 in 3GPP TS 38.401 [4].

The following table identifies the necessary end points required for the representation of gNB and en-gNB, of all deployment scenarios.

|  |  |  |  |
| --- | --- | --- | --- |
| Req**Role** | End point requirement for 3-split deployment scenario | End point requirement for 2-split deployment scenario | End point requirement for Non-split deployment scenario |
| gNB  | <<IOC>>EP\_XnC, <<IOC>>EP\_NgC, <<IOC>>EP\_F1C, <<IOC>>EP\_E1. | <<IOC>>EP\_XnC, <<IOC>>EP\_NgC, <<IOC>>EP\_F1C<<IOC>>EP\_F1U. | <<IOC>>EP\_XnC, <<IOC>>EP\_NgC. |
| en-gNB | <<IOC>>EP\_X2C, <<IOC>>EP\_F1C, <<IOC>>EP\_E1. | <<IOC>>EP\_X2C, <<IOC>>EP\_F1C. | <<IOC>>EP\_X2C. |

#### 4.3.2.2 Attributes

The GNBCUCPFunction IOC includes attributes inherited from ManagedFunction IOC (defined in TS 28.622[30]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| gNBId | M | T | T | F | T |
| gNBIdLength  | M  | T | T | F | T |
| gNBCUName | O | T | T | F | T |
| pLMNId | M | T | T | T | T |
| x2BlackList | CM | T | T | F | T |
| x2WhiteList | CM | T | T | F | T |
| xnBlackList | CM | T | T | F | T |
| xnWhiteList | CM | T | T | F | T |
| x2XnHOBlackList | CM | T | T | F | T |
| mappingSetIDBackhaulAddressList | CM | T | T | F | T |

#### 4.3.2.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| x2BlackList | Condition: ANR function is supported *AND* Multi-Radio Dual Connectivity with the EPC (see TS 37.340 [9] clause 4.1.2) is supported. |
| x2WhiteList | Condition: ANR function is supported *AND* Multi-Radio Dual Connectivity with the EPC (see TS 37.340 [9] clause 4.1.2) is supported. |
| xnBlackList | Condition: ANR function is supported. |
| xnWhiteList | Condition: ANR function is supported. |
| x2XnHOBlackList | Condition: ANR function is supported. |
| mappingSetIDBackhaulAddressList  | Condition: Remote Interference Management function is supported. |

#### 4.3.2.4 Notifications

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

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| **Third of Changes** |

### 4.3.X MappingSetIDBackhaulAddress <<dataType>>

#### 4.3.X.1 Definition

This data type represents the properties describing the mapping relationship between set ID and backhaul address of gNB.

#### 4.3.X.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| setID | M | T | T | F | T |
| backhaulAddress | M | T | T | F | T |

#### 4.3.X.3 Attribute constraints

None.

#### 4.3.X.4 Notifications

The subclause 4.5 of the <<IOC>> using this <<dataType>> as one of its attributes, shall be applicable.

### 4.3.X1 BackhaulAddress <<dataType>>

#### 4.3.X1.1 Definition

This data type represents the properties describing the backhaul address of gNB.

#### 4.3.X1.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| gNBId | M | T | T | F | T |
| tAI | M | T | T | F | T |

#### 4.3.X1.3 Attribute constraints

None.

#### 4.3.X1.4 Notifications

The subclause 4.5 of the <<IOC>> using this <<dataType>> as one of its attributes, shall be applicable.

### 4.3.X2 TAI <<dataType>>

#### 4.3.X2.1 Definition

This data type represents the properties describing the TAI of gNB, which is used to uniquely identify a Tracking Area.

#### 4.3.X2.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| pLMNId | M | T | T | F | T |
| nRTAC | M | T | T | F | T |

#### 4.3.X2.3 Attribute constraints

None.

#### 4.3.X2.4 Notifications

The subclause 4.5 of the <<IOC>> using this <<dataType>> as one of its attributes, shall be applicable.

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| **Fourth of Changes** |

### 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.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: PLMNIdmultiplicity: 1..12isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| NRCellDU.pLMNIdList | It defines which PLMNs that can be served by the NR cell. The first entry of the list is the PLMN used to construct the nCGI for the NR cell.allowedValues: Not applicable. | type: PLMNIdmultiplicity: 1..12isOrdered: 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 |
| 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 |
| rRMPolicyType | Type of the RRM policy. The value 0 denotes use of the rRMPolicy. The value 1 denotes use of the rRMPolicyNSSIId, rRMPolicyRatioThe value 2 denotes use of the rRMPolicyRatio2.allowedValues: 0 : 65535. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| rRMPolicyNSSIId | The list of S-NSSAIs for which a rRMPolicyRatio value is specifiedallowedValues: Not applicable. | type: DNmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicyRatio | The RRM policy setting the ratio for the split of the Radio resources between the supported S-NSSAI lists A S-NSSAI list is defined in rRMPolicyNSSIId. rRMPolicyRatio is the list of target percentage values assigned to the corresponding rRMPolicyNSSIId values. Every value specifies the percentage of PRBs to be allocated to the corresponding S-NSSAIs, in average over time. The sum of the values shall be less or equal 100.allowedValues: 0 : 100See NOTE 3 and NOTE 4. | type: Integermultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicyRatio2List | The attribute specifies a list of RRMPolicyRatio2 which is defined as a datatype. The attribute is used to set the ratios for the split of the Radio resources between the sNSSAILists for radio resources (e.g. RRC connected users, PDCP resource, etc.) in average time (see NOTE 2 and NOTE 3). The sum of the values included in the item of rRMPolicyRatio2 shall be less or equal 100 (see NOTE 4).allowedValues: Not applicable. | type: RRMPolicyRatio2multiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| groupId | The attribute identifies one sNSSAIList group inside NRCellCU. The rRMPolicyRatio2 is configured for each group. The value of the groupId is unique inside one NRCellCU instance | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| quotaType | The attribute indicates the type of the quota which allows to allocate resources as strictly usable for defined slice(s) ( “strict quota”) or allows that resources to be used by other slice(s) when defined slice(s) 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 S-NSSAIList.This quota can be strict or float quota. Strict quota means resources are not allowed for other sNSSAIs even when they are not used by the defined sNSSAIList. Float quota resources can be used by other sNSSAIs when the defined sNSSAIList 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 specified S-NSSAIList. With the margin ratio, unused resources of the maximum resource quota can be allocated to other S-NSSAIs when the free resources are more than resource amount indicated by the margin. The margin resource quota can only be used for the specific S-NSSAIList. 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 S-NSSAIList. This quota can be strict or float quota. Strict quota means resources are not allowed for other sNSSAIs even when they are not used by the defined sNSSAIList. Float quota resources can be used by other sNSSAIs when the defined sNSSAIList 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 specified S-NSSAIList. With the margin ratio, unused resources of the minimum resource quota can be allocated to other S-NSSAIs when the free resources are more than resource amount indicated by the margin. The margin resource quota can only be used for the specific S-NSSAIList. Value 0 indicates that no margin is used.allowedValues:0 : 100  | type: Integermultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| rRMPolicy | It represents RRM policy which includes guidance for split of radio resources between the S-NSSAIs that the cell supports in case when the rRMPolicyType is absent or equal to 0. The RRM policy is implementation dependent.allowedValues: Not applicable | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: 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

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|  |

 | 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.X). 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.X1). 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 |
| NOTE 1: VoidNOTE 2: The radio resource can be signaling resources (e.g. RRC connected users) or user plane resources (e.g. PDCP). The detail resource and how to map the ratio to exact number of resources is implementation dependant.NOTE 3: The averaging time interval is implementation dependent.NOTE 4: How to calculate the sum of the ratio is implementation dependent. |

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| **Fifth of Changes** |

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

<?xml version="1.0" encoding="UTF-8"?>

<!--

 3GPP TS 28.541 NR Network Resource Model

 XML schema definition

 nrNrm.xsd

-->

<schema xmlns="http://www.w3.org/2001/XMLSchema"

xmlns:xn="http://www.3gpp.org/ftp/specs/archive/28\_series/28.623#genericNrm"

xmlns:nn="http://www.3gpp.org/ftp/specs/archive/28\_series/28.541#nrNrm"

xmlns:en="http://www.3gpp.org/ftp/specs/archive/28\_series/28.659#eutranNrm"

xmlns:epc="http://www.3gpp.org/ftp/specs/archive/28\_series/28.709#epcNrm"

xmlns:sm="http://www.3gpp.org/ftp/specs/archive/28\_series/28.626#stateManagementIRP"

xmlns:ngc="http://www.3gpp.org/ftp/specs/archive/28\_series/28.541#ngcNrm"

xmlns:sp="http://www.3gpp.org/ftp/specs/archive/28\_series/28.629#sonPolicyNrm"

targetNamespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.541#nrNrm" elementFormDefault="qualified">

<import namespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.623#genericNrm"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.709#epcNrm"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.626#stateManagementIRP"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.541#ngcNrm"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/28\_series/28.629#sonPolicyNrm"/>

<simpleType name="GnbId">

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 <maxInclusive value="4294967295"/>

 </restriction>

</simpleType>

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 <minLength value="22"/>

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 </restriction>

</simpleType>

<simpleType name="Nci">

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 <maxInclusive value="68719476735"/>

 </restriction>

</simpleType>

<simpleType name="Pci">

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 <maxInclusive value="503"/>

 <!-- Minimum value is 0, maximum value is 3x167+2=503 -->

 </restriction>

</simpleType>

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 <maxInclusive value="16777215"/>

 <!--5G TAC is 3-octets length -->

 </restriction>

</simpleType>

<simpleType name="GnbDuId">

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 <maxInclusive value="68719476735"/>

 <!-- Minimum value is 0, maximum value is 2^36-1=68719476735 -->

 </restriction>

</simpleType>

<simpleType name="GnbCuupId">

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 <!-- Minimum value is 0, maximum value is 2^36-1=68719476735 -->

 </restriction>

</simpleType>

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 <restriction base="string">

 <minLength value="1"/>

 <maxLength value="150"/>

 </restriction>

</simpleType>

<simpleType name="CyclicPrefix">

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 <enumeration value="60"/>

 <enumeration value="120"/>

 </restriction>

</simpleType>

<simpleType name="QuotaType">

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 </restriction>

</simpleType>

<simpleType name="BwpContext">

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 <enumeration value="DL"/>

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 </restriction>

</simpleType>

<simpleType name="IsInitialBwp">

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 </restriction>

</simpleType>

<simpleType name="qOffsetRangeList">

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 <enumeration value="dB-16"/>

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 <enumeration value="dB-12"/>

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</simpleType>

<simpleType name="cellReselectionPriority">

 <restriction base="unsignedLong">

 <minInclusive value="0"/>

 <maxInclusive value="16"/>

 <!--Value 0 means lowest priority-->

 </restriction>

</simpleType>

<simpleType name="cellReselectionSubPriority">

 <restriction base="unsignedLong">

 <minInclusive value="0"/>

 <maxInclusive value="16"/>

 <!--Value 0 means lowest priority-->

 </restriction>

</simpleType>

<simpleType name="PMaxRangeType">

 <restriction base="short">

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 <maxInclusive value="33"/>

 </restriction>

</simpleType>

<simpleType name="qOffsetFreq">

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 </restriction>

</simpleType>

<simpleType name="qQualMin">

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<simpleType name="qRxLevMin">

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 </restriction>

</simpleType>

<simpleType name="Thresxhighp">

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 <maxInclusive value="62"/>

 </restriction>

</simpleType>

<simpleType name="Threshxhighq">

 <restriction base="integer">

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 </restriction>

</simpleType>

<simpleType name="Threshxlowp">

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 <maxInclusive value="62"/>

 </restriction>

</simpleType>

<simpleType name="Threshxlowq">

 <restriction base="integer">

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<simpleType name="Treselectionnr">

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 <maxInclusive value="7"/>

 </restriction>

</simpleType>

<simpleType name="Treselectionnrsfhigh">

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<simpleType name="Treselectionnrsfmedium">

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<simpleType name="Ssbsubcarrierspacing">

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<simpleType name="Multifrequencybandlistnr">

 <restriction base="integer">

 <minInclusive value="1"/>

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</simpleType>

<simpleType name="beamType">

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 <enumeration value="SSB-BEAM"/>

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<simpleType name="beamHorizWidth">

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</simpleType>

<simpleType name="beamVertWidth">

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</complexType>

<complexType name="RemoteEndPoint">

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</complexType>

<complexType name="RRMPolicyRation2">

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 <element name="groupId" type="integer"/>

 <element name="sNSSAIList" type="ngc:SnssaiList"/>

 <element name="quotaType" type="QuotaType"/>

 <element name="rRMPolicyMaxRation" type="integer"/>

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 <element name="rRMPolicyMinRation" type="integer"/>

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 <!-- The first pLMNId of the pLMNIdList is primary PLMN id -->

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 <element name="rsrqOffsetSSB" type="qOffsetRangeList"/>

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 <element name="rsrpOffsetCSI-RS" type="qOffsetRangeList"/>

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

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

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 <element name="gnbDuName" type="nn:GnbName" minOccurs="0"/>

 <element name="x2Blacklist" type="xn:dnList" minOccurs="0"/>

 <element name="x2Whitelist" type="xn:dnList" minOccurs="0"/>

 <element name="xnBlacklist" type="xn:dnList" minOccurs="0"/>

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 <element name="x2XnHOBlackList" type="xn:dnList" minOccurs="0"/>

 <element name="aggressorSetID" type="nn:AggressorSetID"/>

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 <element ref="nn:BWP"/>

 <element ref="nn:NRSectorCarrier"/>

 <element ref="nn:EP\_F1C"/>

 <element ref="nn:EP\_F1U"/>

 </choice>

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

 <element ref="xn:MeasurementControl"/>

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 </complexType>

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 <element ref="nn:EP\_F1C"/>

 <element ref="nn:EP\_E1"/>

 <element ref="nn:EP\_XnC"/>

 <element ref="nn:EP\_X2C"/>

 <element ref="nn:EP\_NgC"/>

 <element ref="xn:VsDataContainer"/>

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

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 <element ref="xn:VsDataContainer"/>

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 <element name="sNSSAIList" type="ngc:SnssaiList" minOccurs="0"/>

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

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

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

 <element ref="sp:EnergySavingProperties"/>

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 <element name="bSChannelBwDL" type="integer"/>

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

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

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 <!-- End of inherited attributes from EP\_RP -->

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 <!-- End of inherited attributes from EP\_RP -->

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## D.4.3 JSON schema "nrNrm.json"

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 "version": "16.1.0",

 "description": "OAS 3.0.1 specification compatible schema for 3GPP NR NRM"

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 "GnbCuUpId": {

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 "NrPci": {

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 "NrCellId": {

 "type": "integer",

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 "rsrqOffsetCSI-RS": {

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 "GnbCuUpFunction": {

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 },

 "TAI": {

 "type": "object",

 "properties": {

 "pLMNId": {

 "type": "string"

 },

 "nRTAC": {

 "type": "string"

 }

 }

 }

 }

 }

}

|  |
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| **SiXth of Changes** |

## E.5.17 module\_3gpp-nr-nrm-gnbcuupfunction@2019-10-28.yang

module \_3gpp-nr-nrm-gnbcuupfunction {

 yang-version 1.1;

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

 prefix "gnbcuup3gpp";

 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; }

 organization "3GPP SA5";

 description "Defines the YANG mapping of the GNBCUUPFunction 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 2019-08-21 {

 description "Initial revision";

 }

 grouping GNBCUUPFunctionGrp {

 description "Represents the GNBCUUPFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBCUUPId {

 type uint64 {

 range "0..68719476735" ;

 }

 config false;

 mandatory true;

 description "Identifies the gNB-CU-UP at least within a gNB-CU-CP";

 reference "'gNB-CU-UP ID' in subclause 9.3.1.15 of 3GPP TS 38.463";

 }

 leaf gNBId {

 mandatory true;

 type int32 { range "22..32"; }

 description "Indicates the number of bits for encoding the gNB ID.";

 reference "gNB ID in 3GPP TS 38.300, Global gNB ID in 3GPP TS 38.413";

 }

 list pLMNIdList {

 description "A list of PLMN identifiers. Defines from which set of PLMNs

 an UE must have as its serving PLMN to be allowed to use the

 gNB CU-UP.";

 uses types3gpp:PLMNId;

 }

 grouping MappingSetIDBackhaulAddress{

 description "List of mappingSetIDBackhaulAddress. Used used to retrieve the backhaul address of the victim set.";

 leaf setID {

 description "Indicates the setID of gNB.";

 type int32;

 }

 leaf backhaulAddress {

 description "Indicates the backhauladdress of gNB.";

 key groupId;

 min-elements 1;

 uses BackhaulAddress;

 }

 grouping BackhaulAddress{

 description "Indicates the backhauladdress of gNB.";

 leaf gNBId {

 description "Indicates the number of bits for encoding the gNB ID.";

 type int32;

 }

 leaf tAI {

 description "TAI is comprised of a pLMNID and an nRTAC field.";

 type TAI;

 }

 list mappingSetIDBackhaulAddress {

 description "List of mappingSetIDBackhaulAddress. Used used to retrieve the backhaul address of the victim set.";

 key groupId;

 min-elements 1;

 uses MappingSetIDBackhaulAddress;

 }

 }

 augment "/me3gpp:ManagedElement" {

 list GNBCUUPFunction {

 key id;

 description "Represents the logical function CU-UP of gNB or en-gNB.";

 reference "3GPP TS 28.541";

 uses top3gpp:Top\_Grp;

 container attributes {

 uses GNBCUUPFunctionGrp;

 }

 uses mf3gpp:ManagedFunctionContainedClasses;

 }

 }

## }E.5.18 module\_3gpp-nr-nrm-gnbdufunction@2019-10-28.yang

module \_3gpp-nr-nrm-gnbdufunction {

 yang-version 1.1;

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

 prefix "gnbdu3gpp";

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

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

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the GNBDUFunction 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 2019-08-21 {

 description "Initial revision.";

 }

 grouping GNBDUFunctionGrp {

 description "Represents the GNBDUFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBId {

 type int64 { range "0..4294967295"; }

 mandatory true;

 description "Identifies a gNB within a PLMN. The gNB Identifier (gNB ID)

 is part of the NR Cell Identifier (NCI) of the gNB cells.";

 reference "gNB ID in 3GPP TS 38.300, Global gNB ID in 3GPP TS 38.413";

 }

 leaf gNBIdLength {

 type int32 { range "22..32"; }

 mandatory true;

 description "Indicates the number of bits for encoding the gNB ID.";

 reference "gNB ID in 3GPP TS 38.300, Global gNB ID in 3GPP TS 38.413";

 }

 leaf gNBDUId {

 type int64 { range "0..68719476735"; }

 mandatory true;

 description "Uniquely identifies the DU at least within a gNB.";

 reference "3GPP TS 38.473";

 }

 leaf gNBDUName {

 type string { length "1..150"; }

 description "Identifies the Distributed Unit of an NR node";

 reference "3GPP TS 38.473";

 }

 leaf aggressorSetID victimSetID {

 type int32 { range "22..32"; }

 description "Indicates the associated aggressor gNB Set ID of the cell";

 reference "3GPP TS 38.211";

 }

 leaf victimSetID {

 type int32 { range "22..32"; }

 description "Indicates the associated victim gNB Set ID of the cell";

 reference "3GPP TS 38.211";

 }

 }

 augment "/me3gpp:ManagedElement" {

 list GNBDUFunction {

 description "Represents the logical function DU of gNB or en-gNB.";

 reference "3GPP TS 28.541";

 uses top3gpp:Top\_Grp;

 container attributes {

 uses GNBDUFunctionGrp;

 }

 uses mf3gpp:ManagedFunctionContainedClasses;

 }

 }

}

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| **End of Changes** |