**3GPP TSG-SA5 Meeting #135-e *S5-211132***

**Online, 25th Jan 2021 - 3rd Feb 2021**

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.541** | **CR** |  | **rev** | **-** | **Current version:** | **16.7.0** |  |
|  |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network | **x** |

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|  |
| ***Title:***  | Rel-16 CR TS 28.541 Correct the NF name in definition of EP\_NgU |
|  |  |
| ***Source to WG:*** | China Telecommunications, Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | NETSLICE-5GNRM |  | ***Date:*** | 2021-01-15 |
|  |  |  |  |  |
| ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The definition in 4.3.10 of EP\_NgC is “This IOC represents the local end point of the control plane interface (NG-C) between the gNB and NG-Core entity.” But in 4.3.11, EP\_NgU represents the local end point of the NG user plane (NG-U) interface between the gNB and the UPGW. “UPGW” is not defined in 5GS. It should be corrected. |
|  |  |
| ***Summary of change:*** | Correcting the NF name in definition of EP\_NgU. |
|  |  |
| ***Consequences if not approved:*** | The definition for EP\_NgU is not correct. |
|  |  |
| ***Clauses affected:*** | 4.3.11.1, E.5 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

|  |
| --- |
| **1st change** |

### 4.3.11 EP\_NgU

#### 4.3.11.1 Definition

This IOC represents the local end point of the NG user plane (NG-U) interface between the gNB and UPF. The interface provides non‑guaranteed delivery of user plane PDUs between the gNB and UPF. GTP-U is baseline for this interface.

3GPP TS 38.470 [7] noted that "one gNB-CU and a set of gNB-DUs are visible to other logical nodes as a gNB or an en-gNB where the gNB terminates the Xn and the NG interfaces, and the en-gNB terminates the X2 and the S1-U interfaces".

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| --- |
| **Next change** |

# E.5 Modules

This is the list of YANG modules for NR and NG-RAN NRM.

\_3gpp-nr-nrm-beam.yang

\_3gpp-nr-nrm-bwp.yang

\_3gpp-nr-nrm-commonbeamformingfunction.yang

\_3gpp-nr-nrm-ep.yang

\_3gpp-nr-nrm-eutrancellrelation.yang

\_3gpp-nr-nrm-eutranetwork.yang

\_3gpp-nr-nrm-eutranfreqrelation.yang

\_3gpp-nr-nrm-eutranfrequency.yang

\_3gpp-nr-nrm-externalamffunction.yang

\_3gpp-nr-nrm-externalenbfunction.yang

\_3gpp-nr-nrm-externaleutrancell.yang

\_3gpp-nr-nrm-externalgnbcucpfunction.yang

\_3gpp-nr-nrm-externalgnbcuupfunction.yang

\_3gpp-nr-nrm-externalgnbdufunction.yang

\_3gpp-nr-nrm-externalnrcellcu.yang

\_3gpp-nr-nrm-externalservinggwfunction.yang

\_3gpp-nr-nrm-externalupffunction.yang

\_3gpp-nr-nrm-gnbcucpfunction.yang

\_3gpp-nr-nrm-gnbcuupfunction.yang

\_3gpp-nr-nrm-gnbdufunction.yang

\_3gpp-nr-nrm-nrcellcu.yang

\_3gpp-nr-nrm-nrcelldu.yang

\_3gpp-nr-nrm-nrcellrelation.yang

\_3gpp-nr-nrm-nrfreqrelation.yang

\_3gpp-nr-nrm-nrfrequency.yang

\_3gpp-nr-nrm-nrnetwork.yang

\_3gpp-nr-nrm-nrsectorcarrier.yang

These are the YANG modules for NR and NG-RAN NRM.

module \_3gpp-nr-nrm-beam {

 yang-version 1.1;

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

 prefix "beam3gpp";

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

 import \_3gpp-nr-nrm-commonbeamformingfunction { prefix combeamformfunc3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the Beam 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-XX-XX {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 typedef BeamType {

 type enumeration {

 enum SSB-BEAM;

 }

 }

 grouping BeamGrp {

 description "Represents the Beam IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf beamIndex {

 description "Index of the beam.”;

 mandatory true;

 type int32;

 }

 leaf beamType {

 description "The type of the beam.”;

 mandatory false;

 type BeamType;

 }

 leaf beamAzimuth {

 description "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. 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.";

 reference "3GPP TS 38.104, TS 38.901, TS 28.662";

 mandatory false;

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

 units 0.1 degree;

 }

 leaf beamTilt {

 description "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.

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.";

 reference "3GPP TS 38.104, TS 38.901, TS 28.662";

 mandatory false;

 type int32 { range "-900..900"; }

 units 0.1 degree;

 }

 leaf beamHorizWidth {

 description " 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.";

 reference "3GPP TS 38.104, TS 38.901";

 mandatory false;

 type int32 { range "0..3599"; }

 units 0.1 degree;

 }

 leaf beamVertWidth {

 description " 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.";

 reference "3GPP TS 38.104, TS 38.901";

 mandatory false;

 type int32 { range "0..1800"; }

 units 0.1 degree;

 }

 }

 augment "/me3gpp:ManagedElement/combeamformfunc3gpp:CommonBeamformingFunction" {

 list Beam {

 description "Represents the per-Beam information required for, e.g. beam performance management utilizing measurements generated in the RAN. Can have spatial attributes of horizontal/azimuth (ie: Phi φ-axis) and vertical/tilt (ie: Theta θ-axis) beam pointing direction and beam width attributes.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses BeamGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-bwp {

 yang-version 1.1;

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

 prefix "bwp3gpp";

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

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

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

 import \_3gpp-nr-nrm-gnbdufunction { prefix gnbdu3gpp; }

 organization "3GPP SA5";

 description "Defines the YANG mapping of the BWP 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 typedef CyclicPrefix {

 type enumeration {

 enum NORMAL;

 enum EXTENDED;

 }

 }

 typedef BwpContext {

 type enumeration {

 enum DL;

 enum UL;

 enum SUL;

 }

 }

 typedef IsInitialBwp {

 type enumeration {

 enum INITIAL;

 enum OTHER;

 }

 }

 grouping BWPGrp {

 description "Represents the BWP IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf bwpContext {

 description "Identifies whether the object is used for downlink, uplink

 or supplementary uplink.";

 mandatory true;

 type BwpContext;

 }

 leaf isInitialBwp {

 description "Identifies whether the object is used for initial or other

 BWP.";

 mandatory true;

 type IsInitialBwp;

 }

 leaf subCarrierSpacing {

 description "Subcarrier spacing configuration for a BWP.";

 reference "3GPP TS 38.104";

 mandatory true;

 type uint32 { range "5 | 30 | 60 | 120"; }

 units kHz;

 }

 leaf cyclicPrefix {

 description "Cyclic prefix, which may be normal or extended.";

 reference "3GPP TS 38.211";

 mandatory true;

 type CyclicPrefix;

 }

 leaf startRB {

 description "Offset in common resource blocks to common resource block 0

 for the applicable subcarrier spacing for a BWP.";

 reference "N\_BWP\_start in 3GPP TS 38.211";

 mandatory true;

 type uint32;

 }

 leaf numberOfRBs {

 description "Number of physical resource blocks for a BWP.";

 reference "N\_BWP\_size in 3GPP TS 38.211";

 mandatory true;

 type uint32;

 }

 }

 augment "/me3gpp:ManagedElement/gnbdu3gpp:GNBDUFunction" {

 list BWP {

 description "Represents a bandwidth part (BWP).";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses BWPGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-commonbeamformingfunction {

 yang-version 1.1;

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

 prefix "combeamformfunc3gpp";

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

 import \_3gpp-nr-nrm-nrsectorcarrier { prefix nrsectcarr3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the CommonBeamformingFuntion 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-XX-XX {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping CommonBeamformingFunctionGrp {

 description "Represents the CommonBeamformingFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 }

 augment "/me3gpp:ManagedElement/nrsectcarr3gpp:NRSectorCarrier" {

 list CommonBeamformingFunction {

 description "Represents common beamforming functionality (eg: SSB beams) for the NRSectorCarrier.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses CommonBeamformingFunctionGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-ep {

 yang-version 1.1;

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

 prefix "ep3gpp";

 import \_3gpp-common-ep-rp { prefix eprp3gpp; }

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

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

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

 import \_3gpp-nr-nrm-gnbcuupfunction { prefix gnbcuup3gpp; }

 import \_3gpp-nr-nrm-gnbdufunction { prefix gnbdu3gpp; }

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NR related endpoint

 Information Object Classes (IOCs) that are part of the NR Network

 Resource Model (NRM).";

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

 revision 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping EP\_E1Grp {

 description "Represents the EP\_E1 IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.401";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_F1CGrp {

 description "Represents the EP\_F1C IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_F1UGrp {

 description "Represents the EP\_F1U IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_XnCGrp {

 description "Represents the EP\_XnC IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.420";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_XnUGrp {

 description "Represents the EP\_XnU IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.420";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_NgCGrp {

 description "Represents the EP\_NgC IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_NgUGrp {

 description "Represents the EP\_NgU IOC.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_X2CGrp {

 description "Represents the EP\_X2C IOC.";

 reference "3GPP TS 28.541, 3GPP TS 36.423";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_X2UGrp {

 description "Represents the EP\_X2U IOC.";

 reference "3GPP TS 28.541, 3GPP TS 36.425";

 uses eprp3gpp:EP\_Common;

 }

 grouping EP\_S1UGrp {

 description "Represents the EP\_S1U IOC.";

 reference "3GPP TS 28.541, 3GPP TS 36.410";

 uses eprp3gpp:EP\_Common;

 }

 augment "/me3gpp:ManagedElement/gnbcucp3gpp:GNBCUCPFunction" {

 list EP\_E1 {

 description "Represents the local end point of the logical link,

 supporting E1 interface between gNB-CU-CP and gNB-CU-UP.";

 reference "3GPP TS 28.541, 3GPP TS 38.401";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_E1Grp;

 }

 }

 list EP\_F1C {

 description "Represents the local end point of the control plane

 interface (F1-C) between the DU and CU or CU-CP.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_F1CGrp;

 }

 }

 list EP\_NgC {

 description "Represents the local end point of the control plane

 interface (NG-C) between the gNB and NG-Core entity.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_NgCGrp;

 }

 }

 list EP\_XnC {

 description "Represents the local gNB node end point of the logical

 link, supporting Xn application protocols, to a neighbour gNB node.";

 reference "3GPP TS 28.541, 3GPP TS 38.420";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_XnCGrp;

 }

 }

 list EP\_X2C {

 description "Represents the local end point of the logical link,

 supporting X2-C application protocols used in EN-DC, to a neighbour

 eNB or en-gNB node.";

 reference "3GPP TS 28.541, 3GPP TS 36.423";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_X2CGrp;

 }

 }

 }

 augment "/me3gpp:ManagedElement/gnbcuup3gpp:GNBCUUPFunction" {

 list EP\_E1 {

 description "Represents the local end point of the logical link,

 supporting E1 interface between gNB-CU-CP and gNB-CU-UP.";

 reference "3GPP TS 28.541, 3GPP TS 38.401";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_E1Grp;

 }

 }

 list EP\_F1U {

 description "Represents the local end point of the user plane

 interface (F1-U) between the DU and CU or CU-UP.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_F1UGrp;

 }

 }

 list EP\_NgU {

 description "Represents the local end point of the NG user plane

 (NG-U) interface between the gNB and UPF.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_NgUGrp;

 }

 }

 list EP\_XnU {

 description "Represents the one end-point of a logical link supporting

 the Xn user plane (Xn-U) interface. The Xn-U interface provides

 non-guaranteed delivery of user plane PDUs between two NG-RAN nodes.";

 reference "3GPP TS 28.541, 3GPP TS 38.420";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_XnUGrp;

 }

 }

 list EP\_X2U {

 description "Represents the local end-point of a logical link supporting

 the X2 user plane (X2-U) interface used in EN-DC.";

 reference "3GPP TS 28.541, 3GPP TS 36.425";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_X2UGrp;

 }

 }

 list EP\_S1U {

 description "Represents the local end point of the logical link,

 supporting S1-U interface towards a S-GW node.";

 reference "3GPP TS 28.541, 3GPP TS 36.410";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_S1UGrp;

 }

 }

 }

 augment "/me3gpp:ManagedElement/gnbdu3gpp:GNBDUFunction" {

 list EP\_F1C {

 description "Represents the local end point of the control plane

 interface (F1-C) between the DU and CU or CU-CP.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_F1CGrp;

 }

 }

 list EP\_F1U {

 description "Represents the local end point of the user plane

 interface (F1-U) between the DU and CU or CU-UP.";

 reference "3GPP TS 28.541, 3GPP TS 38.470";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EP\_F1UGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-eutrancellrelation {

 yang-version 1.1;

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

 prefix "eutrancellrel3gpp";

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

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

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

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

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

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the EUtranCellRelation 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 typedef ActionAllowed {

 type enumeration {

 enum YES;

 enum NO;

 }

 }

 typedef EnergySavingCoverage {

 type enumeration {

 enum YES;

 enum NO;

 enum PARTIAL;

 }

 }

 grouping EUtranCellRelationGrp {

 description "Represents the EUtranCellRelation IOC.";

 reference "3GPP TS 28.541, EUtranRelation in 3GPP TS 28.658";

 uses mf3gpp:ManagedFunctionGrp;

 leaf tCI {

 description "Target Cell Identifier. Consists of E-UTRAN Cell Global

 Identifier (ECGI) and Physical Cell Identifier (PCI) of the target

 cell. Identifies the target cell from the perspective of the parent

 cell instance.";

 mandatory true;

 type uint64;

 }

 leaf isRemoveAllowed {

 description "Indicates if the subject EUtranCellRelation can be removed

 (deleted) or not. If YES, the subject EUtranCellRelation instance can

 be removed (deleted). If NO, the subject EUtranCellRelation instance

 shall not be removed (deleted) by any entity but an IRPManager.";

 mandatory true;

 type ActionAllowed;

 }

 leaf isHOAllowed {

 description "Indicates if handover is allowed or prohibited. If YES,

 handover is allowed from source cell to target cell. Source cell is

 represented by the parent cell instance. Target cell is the adjacent

 cell referenced by this EUtranCellRelation instance. If NO, handover

 shall not be allowed.";

 mandatory true;

 type ActionAllowed;

 }

 leaf isICICInformationSendAllowed {

 description "Indicates if ICIC (Inter Cell Interference Coordination)

 load information message sending is allowed or prohibited. If YES,

 ICIC load information message sending is allowed from source cell to

 target cell. Source cell is represented by the parent cell instance.

 Target cell is the adjacent cell referenced by this EUtranCellRelation

 instance. If NO, ICIC load information message sending shall not be

 allowed.";

 reference "3GPP TS 36.423";

 mandatory true;

 type ActionAllowed;

 }

 leaf isLBAllowed {

 description "Indicates if load balancing is allowed or prohibited from

 source cell to target cell. If YES, load balancing is allowed from

 source cell to target cell. Source cell is represented by the parent

 cell instance. Target cell is the adjacent cell referenced by this

 EUtranCellRelation instance. If NO, load balancing shall be prohibited

 from source cell to target cell.";

 mandatory true;

 type ActionAllowed;

 }

 leaf isESCoveredBy {

 description "Indicates whether the adjacent cell according to this

 planning provides no, partial or full coverage for the parent cell

 instance. Adjacent cells with this attribute equal to YES are

 recommended to be considered as candidate cells to take over the

 coverage when the original cell is about to be transferred to energy

 saving state. The entirety of adjacent cells with this property equal

 to PARTIAL are recommended to be considered as entirety of candidate

 cells to take over the coverage when the original cell is about to be

 transferred to energy saving state.";

 mandatory true;

 type EnergySavingCoverage;

 }

 leaf qOffset {

 description "Offset applicable to a specific neighbouring cell used for

 evaluating the cell as a candidate for cell re-selection. Corresponds

 to parameter q-OffsetCell broadcast in SIB4 for intra-frequency cells

 and in SIB5 for inter-frequency cells. Used for Mobility Robustness

 Optimization.";

 reference "3GPP TS 36.331";

 mandatory true;

 type types3gpp:QOffsetRange;

 }

 leaf cellIndividualOffset {

 description "Offset applicable to a neighbouring cell. It is used for

 evaluating the neighbouring cell for handover in connected mode. Used

 by the HandOver parameter Optimization (HOO) function or Load

 Balancing Optimization (LBO) function.";

 reference "3GPP TS 36.331";

 config false;

 type types3gpp:QOffsetRange;

 }

 leaf adjacentCell {

 description "Reference to an EUtranCellFDD/TDD or

 ExternalEUtranCellFDD/TDD instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

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

 list EUtranCellRelation {

 description "Represents a relation between an NR cell and an E-UTRAN cell.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EUtranCellRelationGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-eutranetwork {

 yang-version 1.1;

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

 prefix "eutranet3gpp";

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the EUtraNetwork 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 feature ExternalsUnderEUtraNetwork {

 description "Classes representing external entities like EUtranFrequency,

 ExternalENBFunction are contained under a EUtraNetwork list/class.";

 }

 grouping EUtraNetworkGrp {

 description "Represents the EUtraNetwork IOC.";

 reference "3GPP TS 28.541";

 uses subnet3gpp:SubNetworkGrp;

 }

 list EUtraNetwork {

 description "A subnetwork containing gNB external E-UTRAN entities.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EUtraNetworkGrp;

 leaf-list parents {

 description "Reference to all containg EUtraNetwork instances

 in strict order from the root EUtraNetwork down to the immediate

 parent EUtraNetwork.

 If EUtraNetworks form a containment hierarchy this is

 modeled using references between the child EUtraNetwork and the parent

 EUtraNetworks.

 This reference MUST NOT be present for the top level EUtraNetwork and

 MUST be present for other EUtraNetworks.";

 type leafref {

 path "../../../EUtraNetwork/id";

 }

 }

 leaf-list containedChildren{

 description "Reference to all directly contained EUtraNetwork instances.

 If EUtraNetworks form a containment hierarchy this is

 modeled using references between the child EUtraNetwork and the parent

 EUtraNetwork.";

 type leafref {

 path "../../../EUtraNetwork/id";

 }

 }

 }

 }

}

module \_3gpp-nr-nrm-eutranfreqrelation {

 yang-version 1.1;

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

 prefix "eutranfreqrel3gpp";

 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 EUtranFreqRelation 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping EUtranFreqRelationGrp {

 description "Represents the EUtranFreqRelation IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf cellIndividualOffset {

 description "Offset applicable to a neighbouring cell. Used for

 evaluating the neighbouring cell for handover in connected mode.

 Used by the HandOver parameter Optimization (HOO) function or

 Load Balancing Optimization (LBO) function.";

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

 default 0;

 type types3gpp:QOffsetRange;

 }

 leaf-list blackListEntry {

 description "A list of Physical Cell Identities (PCIs) that are

 blacklisted in E-UTRAN measurements.";

 reference "3GPP TS 38.331";

 min-elements 0;

 type uint16 { range "0..1007"; }

 }

 leaf-list blackListEntryIdleMode {

 description "A list of Physical Cell Identities (PCIs) that are

 blacklisted in SIB4 and SIB5.";

 min-elements 0;

 type uint16 { range "0..1007"; }

 }

 leaf cellReselectionPriority {

 description "The absolute priority of the carrier frequency used by the

 cell reselection procedure. Value 0 means lowest priority. The value

 must not already used by other RAT, i.e. equal priorities between RATs

 are not supported. The UE behaviour when no value is entered is

 specified in subclause 5.2.4.1 of 3GPP TS 38.304.";

 reference "CellReselectionPriority in 3GPP TS 38.331, priority in

 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..7"; }

 }

 leaf cellReselectionSubPriority {

 description "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.";

 reference "3GPP TS 38.331";

 type uint8 { range "2 | 4 | 6 | 8"; }

 units "0.1";

 }

 leaf pMax {

 description "Used for calculation of the parameter Pcompensation

 (defined in 3GPP TS 38.304), at cell reselection to a cell.";

 reference "PEMAX in 3GPP TS 38.101-1";

 mandatory true;

 type int32 { range "-30..33"; }

 units dBm;

 }

 leaf qOffsetFreq {

 description "The frequency specific offset applied when evaluating

 candidates for cell reselection.";

 type int32;

 default 0;

 }

 leaf qQualMin {

 description "Indicates the minimum required quality level in the cell.

 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.";

 reference "qQualMin in TS 38.304";

 mandatory true;

 type int32 { range "-34..-3 | 0"; }

 units dB;

 }

 leaf qRxLevMin {

 description "Indicates the required minimum received Reference Symbol

 Received Power (RSRP) level in the (E-UTRA) frequency for cell

 reselection. Broadcast in SIB3 or SIB5, depending on whether the

 related frequency is intra- or inter-frequency. Resolution is 2.";

 reference "Qrxlevmin in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "-140..-44"; }

 units dBm;

 }

 leaf threshXHighP {

 description "Specifies the Srxlev threshold 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. Resolution is 2.";

 reference "ThreshX, HighP in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..62"; }

 units dB;

 }

 leaf threshXHighQ {

 description "Specifies the Squal threshold 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.";

 reference "ThreshX, HighQ in 3GPP TS 38.304";

 mandatory true;

 type int32 { range 0..31; }

 units dB;

 }

 leaf threshXLowP {

 description "Specifies the Srxlev threshold used by the UE when

 reselecting towards a lower priority RAT/frequency than the current

 serving frequency. Each frequency of NR and E-UTRAN might have a

 specific threshold. Resolution is 2.";

 reference "ThreshX, LowP in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..62"; }

 units dB;

 }

 leaf threshXLowQ {

 description "Specifies the Squal threshold used by the UE when

 reselecting towards a lower priority RAT/frequency than the current

 serving frequency. Each frequency of NR and E-UTRAN might have a

 specific threshold.";

 reference "ThreshX, LowQ in 3GPP TS 38.304";

 mandatory false;

 type int32 { range "0..31"; }

 units dB;

 }

 leaf tReselectionEutra {

 description "Cell reselection timer for intra frequency E-UTRA cell

 reselection. May be used for Mobility Robustness Optimization.";

 reference "t-ReselectionEUTRA in 3GPP TS 36.331 and in 3GPP TS 23.207";

 mandatory true;

 type uint8 { range "0..7"; }

 units s;

 }

 leaf tReselectionEutraSfHigh {

 description "The attribute tReselectionEutra (parameter TreselectionEUTRA

 in 3GPP TS 38.304) multiplied with this scaling factor if the UE is in

 high mobility state.";

 reference "Speed dependent ScalingFactor for TreselectionEUTRA for high

 mobility state in 3GPP TS 38.304";

 mandatory true;

 type uint8 { range "25 | 50 | 75 | 100"; }

 units %;

 }

 leaf tReselectionEutraSfMedium {

 description "The attribute tReselectionEutra (parameter TreselectionEUTRA

 in 3GPP TS 38.304) multiplied with this scaling factor if the UE is in

 medium mobility state.";

 reference "Speed dependent ScalingFactor for TreselectionEUTRA for medium

 mobility state in 3GPP TS 38.304";

 mandatory true;

 type uint8 { range "25 | 50 | 75 | 100"; }

 units %;

 }

 leaf eUtranFrequencyRef {

 description "Reference to a corresponding EUtranFrequency instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

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

 list EUtranFreqRelation {

 description "Represents a frequency relation between an NR cell and an

 E-UTRAN cell.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EUtranFreqRelationGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-eutranfrequency {

 yang-version 1.1;

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

 prefix "eutraneteutranfreq3gpp";

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

 import \_3gpp-nr-nrm-eutranetwork { prefix eutranet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the EUtranFrequency Information

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

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

 3GPP TS 28.658 (E-UTRAN) Network Resource Model (NRM)";

 revision 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX

 3GPP TS 28.658 V15.X.XX";

 }

 grouping EUtranFrequencyGrp {

 description "Represents the EUtranFrequency IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf earfcnDL {

 description "Specifies the channel number for the central DL frequency.";

 reference "3GPP TS 36.101";

 mandatory true;

 type uint32 { range "0..262143"; }

 }

 leaf-list multiBandInfoListEutra {

 description "List of additional frequency bands the frequency belongs to.";

 config false;

 min-elements 0;

 type uint16 { range "1..256"; }

 }

 }

 grouping EUtranFrequencyWrapper {

 list EUtranFrequency {

 description "Represents certain E-UTRAN frequency properties.";

 reference "3GPP TS 28.658";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses EUtranFrequencyGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses EUtranFrequencyWrapper ;

 }

 augment "/eutranet3gpp:EUtraNetwork" {

 if-feature eutranet3gpp:ExternalsUnderEUtraNetwork;

 uses EUtranFrequencyWrapper ;

 }

}

module \_3gpp-nr-nrm-externalamffunction {

 yang-version 1.1;

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

 prefix "extamf3gpp";

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

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

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

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalAMFFunction 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalAMFFunctionGrp {

 description "Represents the ExternalAMFFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 list pLMNIdList {

 description "List of at most six entries of PLMN Identifiers, but at least

 one (the primary PLMN Id).

 The PLMN Identifier is composed of a Mobile Country Code (MCC) and a

 Mobile Network Code (MNC).";

 min-elements 1;

 max-elements 6;

 key "mcc mnc";

 uses types3gpp:PLMNId;

 }

 container aMFIdentifier {

 presence true;

 description "An AMF identifier, comprising an AMF Region ID, an AMF Set ID and an AMF Pointer.";

 uses types3gpp:AmfIdentifier;

 }

 }

 grouping ExternalAMFFunctionWrapper {

 list ExternalAMFFunction {

 description "Represents the properties, known by the management

 function, of a AMFFunction managed by another management

 function.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalAMFFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalAMFFunctionWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalAMFFunctionWrapper;

 }

}

}module \_3gpp-nr-nrm-externalenbfunction {

 yang-version 1.1;

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

 prefix "extenb3gpp";

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

 import \_3gpp-nr-nrm-eutranetwork { prefix eutranet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalENBFunction

 Information Object Class (IOC) that is part of the NR Network Resource

 Model (NRM).";

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

 3GPP TS 28.658 (E-UTRAN) Network Resource Model (NRM)";

 revision 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX

 3GPP TS 28.658 V15.X.XX";

 }

 grouping ExternalENBFunctionGrp {

 description "Represets the ExternalENBFunction IOC.";

 reference "3GPP TS 28.658";

 uses mf3gpp:ManagedFunctionGrp;

 leaf eNBId {

 description "Unambiguously identifies an eNodeB within a PLMN.";

 reference "3GPP TS 36.413, 3GPP TS 36.300";

 mandatory true;

 type int32 { range "0..268435455"; } // Representing 28 bit eNB ID.

 // 18, 20 and 21 bit eNB IDs also

 // allowed.

 }

 }

 grouping ExternalENBFunctionWrapper {

 list ExternalENBFunction {

 description "Represents an external eNB functionality.";

 reference "3GPP TS 28.658";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalENBFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalENBFunctionWrapper;

 }

 augment "/eutranet3gpp:EUtraNetwork" {

 if-feature eutranet3gpp:ExternalsUnderEUtraNetwork;

 uses ExternalENBFunctionWrapper;

 }

}

}module \_3gpp-nr-nrm-externaleutrancell {

 yang-version 1.1;

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

 prefix "exteutrancell3gpp";

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

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

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-nr-nrm-eutranetwork { prefix eutranet3gpp; }

 import \_3gpp-nr-nrm-externalenbfunction { prefix extenb3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalEUtranCellFDD and

 ExternalEUtranCellTDD Information Object Classes (IOCs) that are part

 of the NR Network Resource Model (NRM).";

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

 3GPP TS 28.658 (E-UTRAN) Network Resource Model (NRM)";

 revision 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX

 3GPP TS 28.658 V15.X.XX";

 }

 grouping ExternalEUtranGenericCellGrp {

 description "Represents the ExternalEUtranGenericCell IOC.";

 reference "3GPP TS 28.658";

 uses mf3gpp:ManagedFunctionGrp;

 leaf pci {

 description "The Physical Cell Identity (PCI) of the cell (for

 NM-Centralized, EM-Centralized and Distributed PCI assignment cases).

 In the case of NM-Centralized PCI assignment, see 3GPP TS 36.300.";

 reference "3GPP TS 36.211";

 mandatory true;

 type int32 { range "0..503"; }

 }

 list plmnIdList {

 description "List of unique identities for PLMNs. A cell can broadcast

 up to 6 PLMN IDs. This is to support the case that one cell can be

 used by up to 6 operator's core networks. The PLMN(s) included in this

 list will use the same single tracking area code (TAC) and the same

 Cell Identity (cellLocalId) for sharing the radio access network

 resources. One member of plmnIdList is the primary PLMN ID. A PLMN ID

 included in this list cannot be included in the cellAccessInfoList.

 The PLMN ID is composed of a Mobile Country Code (MCC) and a Mobile

 Network Code (MNC).";

 reference "3GPP TS 36.300, 3GPP TS 36.331, 3GPP TS 23.003";

 key "mcc mnc";

 min-elements 1;

 max-elements 6;

 uses types3gpp:PLMNId;

 }

 leaf cellLocalId {

 description "Unambiguously identifies a cell within an eNodeB.";

 reference "NCI defined in 3GPP TS 38.300";

 type int32 {range "0..255"; }

 }

 leaf eNBId {

 description "Unambiguously identifies an eNodeB within a PLMN.";

 reference "3GPP TS 36.413, 3GPP TS 36.300";

 mandatory true;

 type int32 { range "0..268435455"; } // Representing 28 bit eNB ID.

 // 18, 20 and 21 bit eNB IDs also

 // allowed.

 }

 }

 grouping ExternalEUtranCellFDDGrp {

 description "Represents the ExternalEUtranCellFDD IOC.";

 reference "3GPP TS 28.658";

 uses ExternalEUtranGenericCellGrp;

 leaf earfcnDL {

 description "The channel number for the central DL frequency.";

 reference "3GPP TS 36.101";

 mandatory true;

 type int32 { range "0..17999 | 46590..262143"; }

 }

 leaf earfcnUL {

 description "The channel number for the central UL frequency. Value 0

 means that the UL channel number is N/A for the DL-only bands.";

 reference "3GPP TS 36.101";

 mandatory true;

 type int32 { range "0 | 18000..35999 | 46590..262143"; }

 }

 }

 grouping ExternalEUtranCellTDDGrp {

 description "Represents the ExternalEUtranCellTDD IOC.";

 reference "3GPP TS 28.658";

 uses ExternalEUtranGenericCellGrp;

 leaf earfcn {

 description "The frequency number for the central frequency.";

 reference "3GPP TS 36.104";

 mandatory true;

 type int32 { range "36000..262143"; }

 }

 }

 grouping ExternalEUtranCellFDDWrapper {

 list ExternalEUtranCellFDD {

 description "Represents the common properties of external E-UTRAN FDD

 cell provided by eNB or NG-RAN FDD cell provided by ng-eNB.";

 reference "3GPP TS 28.658";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalEUtranCellFDDGrp;

 }

 }

 }

 grouping ExternalEUtranCellTDDWrapper {

 list ExternalEUtranCellTDD {

 description "Represents the common properties of external E-UTRAN cell

 TDD provided by eNB or NG-RAN TDD cell provided by ng-eNB.";

 reference "3GPP TS 28.658";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalEUtranCellTDDGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork/extenb3gpp:ExternalENBFunction" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork;

 uses ExternalEUtranCellFDDWrapper;

 }

 augment "/eutranet3gpp:EUtraNetwork/extenb3gpp:ExternalENBFunction" {

 if-feature eutranet3gpp:ExternalsUnderEUtraNetwork;

 uses ExternalEUtranCellFDDWrapper;

 }

 augment "/subnet3gpp:SubNetwork/extenb3gpp:ExternalENBFunction" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork;

 uses ExternalEUtranCellTDDWrapper;

 }

 augment "/eutranet3gpp:EUtraNetwork/extenb3gpp:ExternalENBFunction" {

 if-feature eutranet3gpp:ExternalsUnderEUtraNetwork;

 uses ExternalEUtranCellTDDWrapper;

 }

}

}module \_3gpp-nr-nrm-externalgnbcucpfunction {

 yang-version 1.1;

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

 prefix "extgnbcucp3gpp";

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

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

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalGNBCUCPFunction

 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalGNBCUCPFunctionGrp {

 description "Represets the ExternalGNBCUCPFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBId {

 description "Identifies a gNB within a PLMN.";

 reference "gNB Identifier (gNB ID) in 3GPP TS 38.300, Global gNB ID

 in 3GPP TS 38.413";

 mandatory true;

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

 }

 leaf gNBIdLength {

 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";

 mandatory true;

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

 }

 list pLMNId {

 description "Specifies the PLMN identifier to be used as part of the

 global RAN node identity.";

 key "mcc mnc";

 min-elements 1;

 max-elements 1;

 uses types3gpp:PLMNId;

 }

 }

 grouping ExternalGNBCUCPFunctionWrapper {

 list ExternalGNBCUCPFunction {

 description "Represents the properties, known by the management function,

 of a GNBCUCPFunction managed by another management function.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalGNBCUCPFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalGNBCUCPFunctionWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalGNBCUCPFunctionWrapper;

 }

}

module \_3gpp-nr-nrm-externalgnbcuupfunction {

 yang-version 1.1;

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

 prefix "extgnbcuup3gpp";

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

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalGNBCUUPFunction

 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalGNBCUUPFunctionGrp {

 description "Represets the ExternalGNBCUUPFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBId {

 description "Identifies a gNB within a PLMN.";

 reference "gNB Identifier (gNB ID) in 3GPP TS 38.300, Global gNB ID

 in 3GPP TS 38.413";

 mandatory true;

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

 }

 leaf gNBIdLength {

 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";

 mandatory true;

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

 }

 }

 grouping ExternalGNBCUUPFunctionWrapper {

 list ExternalGNBCUUPFunction {

 description "Represents the properties, known by the management function,

 of a GNBCUUPFunction managed by another management function.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalGNBCUUPFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalGNBCUUPFunctionWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalGNBCUUPFunctionWrapper;

 }

}

module \_3gpp-nr-nrm-externalgnbdufunction {

 yang-version 1.1;

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

 prefix "extgnbdu3gpp";

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

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

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalGNBDUFunction

 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalGNBDUFunctionGrp {

 description "Represets the ExternalGNBDUFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBId {

 description "Identifies a gNB within a PLMN.";

 reference "gNB Identifier (gNB ID) in 3GPP TS 38.300, Global gNB ID

 in 3GPP TS 38.413";

 mandatory true;

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

 }

 leaf gNBIdLength {

 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";

 mandatory true;

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

 }

 list pLMNId {

 description "Specifies the PLMN identifier to be used as part of the

 global RAN node identity.";

 key "mcc mnc";

 min-elements 1;

 max-elements 1;

 uses types3gpp:PLMNId;

 }

 }

 grouping ExternalGNBDUFunctionWrapper {

 list ExternalGNBDUFunction {

 description "Represents the properties, known by the management function,

 of a GNBDUFunction managed by another management function.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalGNBDUFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalGNBDUFunctionWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalGNBDUFunctionWrapper;

 }

}

module \_3gpp-nr-nrm-externalnrcellcu {

 yang-version 1.1;

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

 prefix "extnrcellcu3gpp";

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

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

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-nr-nrm-externalgnbcucpfunction { prefix extgnbcucp3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalNRCellCU 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalNRCellCUGrp {

 description "Represents the ExternalNRCellCU IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf cellLocalId {

 description "Identifies an NR cell of a gNB. Together with corresponding

 gNB ID it forms the NR Cell Identifier (NCI).";

 reference "NCI in 3GPP TS 38.300";

 mandatory true;

 type int32 {range "0..16383"; }

 }

 leaf nRPCI {

 description "The Physical Cell Identity (PCI) of the NR cell.";

 reference "3GPP TS 36.211";

 mandatory true;

 type int32 { range "0..1007"; }

 }

 list pLMNIdList {

 description "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.";

 key "mcc mnc";

 min-elements 1;

 max-elements 12;

 uses types3gpp:PLMNId;

 }

 leaf nRFrequencyRef {

 description "Reference to corresponding NRFrequency instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

 grouping ExternalNRCellCUWrapper {

 list ExternalNRCellCU {

 description "Represents the properties of an NRCellCU controlled by

 another Management Service Provider.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalNRCellCUGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork/extgnbcucp3gpp:ExternalGNBCUCPFunction" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalNRCellCUWrapper;

 }

 augment "/nrnet3gpp:NRNetwork/extgnbcucp3gpp:ExternalGNBCUCPFunction" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalNRCellCUWrapper;

 }

}

module \_3gpp-nr-nrm-externalservinggwfunction {

 yang-version 1.1;

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

 prefix "extservgw3gpp";

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

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-nr-nrm-eutranetwork { prefix eutranet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalServingGWFunction

 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalServingGWFunctionGrp {

 description "Represents the ExternalServingGWFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 }

 grouping ExternalServingGWFunctionWrapper {

 list ExternalServingGWFunction {

 description "Represents the properties, known by the management

 function, of a ServingGWFunction managed by another management

 function.";

 reference "3GPP TS 28.658";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalServingGWFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalServingGWFunctionWrapper;

 }

 augment "/eutranet3gpp:EUtraNetwork" {

 if-feature eutranet3gpp:ExternalsUnderEUtraNetwork;

 uses ExternalServingGWFunctionWrapper;

 }

}

module \_3gpp-nr-nrm-externalupffunction {

 yang-version 1.1;

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

 prefix "extupf3gpp";

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

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the ExternalUPFFunction 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping ExternalUPFFunctionGrp {

 description "Represents the ExternalUPFFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 }

 grouping ExternalUPFFunctionWrapper {

 list ExternalUPFFunction {

 description "Represents the properties, known by the management

 function, of a UPFFunction managed by another management

 function.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses ExternalUPFFunctionGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses ExternalUPFFunctionWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses ExternalUPFFunctionWrapper;

 }

}

module \_3gpp-nr-nrm-gnbcucpfunction {

 yang-version 1.1;

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

 prefix "gnbcucp3gpp";

 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 GNBCUCPFunction 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping GNBCUCPFunctionGrp {

 description "Represents the GNBCUCPFunction IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf gNBId {

 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";

 mandatory true;

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

 }

 leaf gNBIdLength {

 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";

 mandatory true;

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

 }

 leaf gNBCUName {

 description "Identifies the Central Unit of an gNB.";

 reference "3GPP TS 38.473";

 mandatory true;

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

 }

 list pLMNId {

 description "The PLMN identifier to be used as part of the global RAN

 node identity.";

 key "mcc mnc";

 min-elements 1;

 max-elements 1;

 uses types3gpp:PLMNId;

 }

 }

 augment "/me3gpp:ManagedElement" {

 list GNBCUCPFunction {

 description "Represents the logical function CU-CP of gNB and en-gNB.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses GNBCUCPFunctionGrp;

 }

 }

 }

}

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 2019-08-21 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 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 {

 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";

 }

 list pLMNIdList {

 key "mcc mnc";

 min-elements 1;

 max-elements 12;

 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;

 }

 }

 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;

 }

 }

 }

}

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 2019-08-21 {

 description "Initial revision.";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 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"; }

 mandatory true;

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

 reference "3GPP TS 38.473";

 }

 }

 augment "/me3gpp:ManagedElement" {

 list GNBDUFunction {

 key id;

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

 reference "3GPP TS 28.541";

 uses top3gpp:Top\_Grp;

 container attributes {

 uses GNBDUFunctionGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-nrcellcu {

 yang-version 1.1;

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

 prefix "nrcellcu3gpp";

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

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

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

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

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRCellCU 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 typedef quotaType {

 type enumeration {

 enum STRICT;

 enum FLOAT;

 }

 }

 grouping RRMPolicyRatio1 {

 description "Represents properties of RRMPolicyRatio1.";

 leaf groupId {

 description "Uniquely identifies one sNSSAIList group inside an

 NRCellCU instance.";

 type uint32;

 }

 leaf-list sNSSAIList {

 description "List of S-NSSAIs the managed object is supporting. NSSAI is

 a set of supported S-NSSAIs. An S-NSSAI is comprised of an

 SST (Slice/Service type) and an optional SD (Slice Differentiator)

 field.";

 reference "3GPP TS 23.003";

 type types3gpp:SNssai;

 }

 leaf rRRMPolicyRatio {

 description "Percentage of PRBs to be allocated to the corresponding

 S-NSSAIs, in average over time. The sum of the values for

 rRMPolicyRatio described in rRMPolicyRatio1List shall be less or

 equal to 100.";

 type uint8 { range "0..100"; }

 units %;

 }

 }

 grouping RRMPolicyRatio2 {

 description "Represents properties of RRMPolicyRatio2. The RRM policy

 setting the ratios for the split of the radio resources between the

 supported S-NSSAI lists, in average over time.";

 leaf groupId {

 description "Uniquely identifies one sNSSAIList group inside an

 NRCellCU instance.";

 type uint32;

 }

 leaf-list sNSSAIList {

 description "List of S-NSSAIs the managed object is supporting. NSSAI

 is a set of supported S-NSSAI(s). An S-NSSAI is comprised of an

 SST (Slice/Service type) and an optional SD (Slice Differentiator)

 field.";

 reference "3GPP TS 23.003";

 type types3gpp:SNssai;

 }

 leaf quotaType {

 description "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).";

 type quotaType;

 }

 leaf rRMPolicyMaxRatio {

 description "The RRM policy setting the maximum percentage of radio

 resources to be allocated to the corresponding S-NSSAI list. 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.";

 type uint8 { range "0..100"; }

 units %;

 }

 leaf rRMPolicyMarginMaxRatio {

 description "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-NSSAI list. 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-NSSAI list. Value 0 indicates that no margin is used.";

 type uint8 { range "0..100"; }

 units %;

 }

 leaf rRMPolicyMinRatio {

 description "The RRM policy setting the minimum percentage of radio

 resources to be allocated to the corresponding S-NSSAI list. 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.";

 type uint8 { range "0..100"; }

 units %;

 }

 leaf rRMPolicyMarginMinRatio {

 description "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-NSSAI list. 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-NSSAI list. Value 0 indicates that no margin is used. Value 0

 indicates that there is no minimum limit.";

 type uint8 { range "0..100"; }

 units %;

 }

 }

 grouping NRCellCUGrp {

 description "Represents the NRCellCU IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf cellLocalId {

 description "Identifies an NR cell of a gNB. Together with corresponding

 gNB ID it forms the NR Cell Identifier (NCI).";

 mandatory true;

 type int32 { range "0..16383"; }

 }

 list pLMNIdList {

 description "Defines which PLMNs that can be served by the NR cell.";

 // Note: Whether this attribute can be writable depends on the implementation.

 key "mcc mnc";

 min-elements 1;

 max-elements 12;

 uses types3gpp:PLMNId;

 }

 leaf-list sNSSAIList {

 description "List of S-NSSAIs the cell is capable of supporting. An

 S-NSSAI is comprised of an SST (Slice/Service Type) and an optional

 SD (Slice Differentiator) field.";

 reference "3GPP TS 23.003";

 min-elements 0;

 type types3gpp:SNssai;

 }

 leaf rRMPolicyType {

 description "Type of RRM policy. The value 0 denotes use of the

 rRMPolicy. The value 1 denotes use of the rRMPolicyRatio1List.

 The value 2 denotes use of the rRMPolicyRatio2.";

 mandatory true;

 type uint16 { range "0..65535"; }

 }

 leaf rRMPolicy {

 description "RRM policy which includes guidance for split of radio

 resources between multiple slices the cell supports.";

 mandatory true;

 type string;

 }

 list rRMPolicyRatio1List {

 description "List of RRMPolicyRatio1. Used for setting the ratio for the

 split of the radio resources (i.e. PRBs) between the supported S-NSSAI

 lists.";

 key groupId;

 min-elements 1;

 uses RRMPolicyRatio1;

 }

 list rRMPolicyRatio2 {

 description "List of RRMPolicyRatio2. Used for setting the ratio for the

 split of the radio resources between the S-NSSAI lists for radio

 resources (e.g. RRC connected users, PDCP resource, etc.), in average

 time.";

 key groupId;

 min-elements 1;

 uses RRMPolicyRatio2;

 }

 leaf nRFrequencyRef {

 description "Reference to corresponding NRFrequency instance.";

 config false;

 type types3gpp:DistinguishedName;

 }

 }

 augment "/me3gpp:ManagedElement/gnbcucp3gpp:GNBCUCPFunction" {

 list NRCellCU {

 description "Represents the information required by CU that is

 responsible for the management of inter-cell mobility and neighbour

 relations via ANR.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRCellCUGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-nrcelldu {

 yang-version 1.1;

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

 prefix "nrcelldu3gpp";

 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-gnbdufunction { prefix gnbdu3gpp; }

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRCellDU 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping NRCellDUGrp {

 description "Represents the NRCellDU IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf cellLocalId {

 description "Identifies an NR cell of a gNB. Together with the

 corresponding gNB identifier in forms the NR Cell Identity (NCI).";

 reference "NCI in 3GPP TS 38.300";

 mandatory true;

 type int32 { range "0..16383"; }

 }

 leaf operationalState {

 description "Operational state of the NRCellDU instance. Indicates

 whether the resource is installed and partially or fully operable

 (ENABLED) or the resource is not installed or not operable

 (DISABLED).";

 config false;

 type types3gpp:OperationalState;

 }

 leaf administrativeState {

 description "Administrative state of the NRCellDU. Indicates the

 permission to use or prohibition against using the cell, imposed

 through the OAM services.";

 mandatory true;

 type types3gpp:AdministrativeState;

 }

 leaf cellState {

 description "Cell state of the NRCellDU instance. Indicates whether the

 cell is not currently in use (IDLE), or currently in use but not

 configured to carry traffic (INACTIVE), or currently in use and is

 configured to carry traffic (ACTIVE).";

 config false;

 type types3gpp:CellState;

 }

 list pLMNIdList {

 description "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.";

 key "mcc mnc";

 min-elements 1;

 max-elements 12;

 uses types3gpp:PLMNId;

 }

 leaf-list sNSSAIList {

 description "List of S-NSSAIs the NR cell is supporting. NSSAI is a set

 of supported S-NSSAI(s), and an S-NSSAI is comprised of a SST

 (Slice/Service type) and an optional SD (Slice Differentiator) field.";

 reference "3GPP TS 23.003";

 min-elements 0;

 type types3gpp:SNssai;

 }

 leaf nRPCI {

 description "The Physical Cell Identity (PCI) of the NR cell.";

 reference "3GPP TS 36.211";

 mandatory true;

 type int32 { range "0..1007"; }

 }

 leaf nRTAC {

 description "The common 5GS Tracking Area Code for the PLMNs.";

 reference "3GPP TS 23.003, 3GPP TS 38.473";

 mandatory true;

 type types3gpp:Tac;

 }

 leaf arfcnDL {

 description "NR Absolute Radio Frequency Channel Number (NR-ARFCN) for

 downlink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32;

 }

 leaf arfcnUL {

 description "NR Absolute Radio Frequency Channel Number (NR-ARFCN) for

 uplink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32;

 }

 leaf arfcnSUL {

 description "NR Absolute Radio Frequency Channel Number (NR-ARFCN) for

 supplementary uplink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32;

 }

 leaf bSChannelBwDL {

 description "Base station channel bandwidth for downlink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32;

 units MHz;

 }

 leaf bSChannelBwUL {

 description "Base station channel bandwidth for uplink.";

 reference "3GPP TS 38.104";

 mandatory false;

 type int32;

 units MHz;

 }

 leaf bSChannelBwSUL {

 description "Base station channel bandwidth for supplementary uplink.";

 reference "3GPP TS 38.104";

 mandatory false;

 type int32;

 units MHz;

 }

 leaf ssbFrequency {

 description "Indicates cell defining SSB frequency domain position.

 Frequency (in terms of NR-ARFCN) of the cell defining SSB transmission.

 The frequency 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

 3GPP TS 38.101-1, and within bSChannelBwDL.";

 mandatory true;

 type int32 { range "0..3279165"; }

 }

 leaf ssbPeriodicity {

 description "Indicates cell defined SSB periodicity. The SSB periodicity

 is used for the rate matching purpose.";

 mandatory true;

 type int32 { range "5 | 10 | 20 | 40 | 80 | 160"; }

 units "subframes (ms)";

 }

 leaf ssbSubCarrierSpacing {

 description "Subcarrier spacing of SSB. Only the values 15 kHz or 30 kHz

 (< 6 GHz), 120 kHz or 240 kHz (> 6 GHz) are applicable.";

 reference "3GPP TS 38.211";

 mandatory true;

 type int32 { range "15 | 30 | 120 | 240"; }

 units kHz;

 }

 leaf ssbOffset {

 description "Indicates cell defining SSB time domain position. Defined

 as the offset of the measurement window, in which to receive SS/PBCH

 blocks, where allowed values depend on the ssbPeriodicity

 (ssbOffset < ssbPeriodicity).";

 mandatory true;

 type int32 { range "0..159"; }

 units "subframes (ms)";

 }

 leaf ssbDuration {

 description "Duration of the measurement window in which to receive

 SS/PBCH blocks.";

 reference "3GPP TS 38.213";

 mandatory true;

 type int32 { range "1..5"; }

 units "subframes (ms)";

 }

 leaf-list nRSectorCarrierRef {

 description "Reference to corresponding NRSectorCarrier instance.";

 min-elements 1;

 type types3gpp:DistinguishedName;

 }

 leaf-list bWPRef {

 description "Reference to corresponding BWP instance.";

 min-elements 0;

 type types3gpp:DistinguishedName;

 }

 leaf-list nRFrequencyRef {

 description "Reference to corresponding NRFrequency instance.";

 min-elements 0;

 type types3gpp:DistinguishedName;

 }

 }

 augment "/me3gpp:ManagedElement/gnbdu3gpp:GNBDUFunction" {

 list NRCellDU {

 description "Represents the information of a cell known by DU.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRCellDUGrp;

 }

 }

 }

}

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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 revision 2020-04-23 {

 reference "CR0282” ;

 }

 grouping NRCellRelationGrp {

 description "Represents the NRCellRelation IOC.";

 reference "3GPP TS 28.541";

 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 NRFrequency instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 leaf adjacentNRCellRef {

 description "Reference to an adjacent NR cell (NRCellCU or

 ExternalNRCellCU).";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

 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;

 }

 }

 }

}

module \_3gpp-nr-nrm-nrfreqrelation {

 yang-version 1.1;

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

 prefix "nrfreqrel3gpp";

 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 NRFreqRelation 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 2020-04-23 {

 reference "CR0282";

 }

 revision 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping NRFreqRelationGrp {

 description "Represents the NRFreqRelation IOC.";

 reference "3GPP TS 28.541";

 container offsetMO {

 description "A set of offset values applicable to all measured cells

 with reference signal(s) indicated in corresponding MeasObjectNR. 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. It is

 defined for rsrpOffsetSSB, rsrqOffsetSSB, sinrOffsetSSB,

 rsrpOffsetCSI-RS, rsrqOffsetCSI-RS and sinrOffsetCSI-RS.";

 reference "offsetMO 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-list blackListEntry {

 description "A list of Physical Cell Identities (PCIs) that are

 blacklisted in NR measurements.";

 reference "3GPP TS 38.331";

 min-elements 0;

 type uint16 { range "0..1007"; }

 }

 leaf-list blackListEntryIdleMode {

 description "A list of Physical Cell Identities (PCIs) that are

 blacklisted in SIB4 and SIB5.";

 min-elements 0;

 type uint16 { range "0..1007"; }

 }

 leaf cellReselectionPriority {

 description "The absolute priority of the carrier frequency used by the

 cell reselection procedure. Value 0 means lowest priority. The value

 must not already used by other RAT, i.e. equal priorities between RATs

 are not supported. The UE behaviour when no value is entered is

 specified in subclause 5.2.4.1 of 3GPP TS 38.304.";

 reference "CellReselectionPriority in 3GPP TS 38.331, priority in

 3GPP TS 38.304";

 type uint32;

 default 0;

 }

 leaf cellReselectionSubPriority {

 description "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.";

 reference "3GPP TS 38.331";

 type uint8 { range "2 | 4 | 6 | 8"; }

 units "0.1";

 }

 leaf pMax {

 description "Used for calculation of the parameter Pcompensation

 (defined in 3GPP TS 38.304), at cell reselection to a cell.";

 reference "PEMAX in 3GPP TS 38.101-1";

 mandatory false;

 type int32 { range "-30..33"; }

 units dBm;

 }

 leaf qOffsetFreq {

 description "The frequency specific offset applied when evaluating

 candidates for cell reselection.";

 mandatory false;

 type types3gpp:QOffsetRange;

 default 0;

 }

 leaf qQualMin {

 description "Indicates the minimum required quality level in the cell.

 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.";

 reference "3GPP TS 38.304";

 type int32 { range "-34..-3 | 0"; }

 units dB;

 default 0;

 }

 leaf qRxLevMin {

 description "Indicates the required minimum received Reference Symbol

 Received Power (RSRP) level in the NR frequency for cell reselection.

 Broadcast in SIB3 or SIB5, depending on whether the related frequency

 is intra- or inter-frequency. Resolution is 2.";

 reference "3GPP TS 38.304";

 mandatory true;

 type int32 { range "-140..-44"; }

 units dBm;

 }

 leaf threshXHighP {

 description "Specifies the Srxlev threshold 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. Resolution is 2.";

 reference "ThreshX, HighP in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..62"; }

 units dB;

 }

 leaf threshXHighQ {

 description "Specifies the Squal threshold 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.";

 reference "ThreshX, HighQ in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..31"; }

 units dB;

 }

 leaf threshXLowP {

 description "Specifies the Srxlev threshold used by the UE when

 reselecting towards a lower priority RAT/frequency than the current

 serving frequency. Each frequency of NR and E-UTRAN might have a

 specific threshold. Resolution is 2.";

 reference "ThreshX, LowP in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..62"; }

 units dB;

 }

 leaf threshXLowQ {

 description "Specifies the Squal threshold used by the UE when

 reselecting towards a lower priority RAT/frequency than the current

 serving frequency. Each frequency of NR and E-UTRAN might have a

 specific threshold.";

 reference "ThreshX, LowQ in 3GPP TS 38.304";

 mandatory true;

 type int32 { range "0..31"; }

 units dB;

 }

 leaf tReselectionNR {

 description "Cell reselection timer for NR.";

 reference "TreselectionRAT for NR in 3GPP TS 38.331";

 mandatory true;

 type int32 { range "0..7"; }

 units s;

 }

 leaf tReselectionNRSfHigh {

 description "The attribute tReselectionNr (parameter TreselectionNR in

 3GPP TS 38.304) is multiplied with this scaling factor if the UE is

 in high mobility state.";

 reference "Speed dependent ScalingFactor for TreselectionNR for high

 mobility state in 3GPP TS 38.304";

 mandatory true;

 type uint8 { range "25 | 50 | 75 | 100"; }

 units %;

 }

 leaf tReselectionNRSfMedium {

 description "The attribute tReselectionNr (parameter TreselectionNR in

 3GPP TS 38.304) multiplied with this scaling factor if the UE is in

 medium mobility state.";

 reference "Speed dependent ScalingFactor for TreselectionNR for medium

 mobility state in 3GPP TS 38.304";

 mandatory true;

 type uint8 { range "25 | 50 | 75 | 100"; }

 units %;

 }

 leaf nRFrequencyRef {

 description "Reference to a corresponding NRFrequency instance.";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

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

 list NRFreqRelation {

 description "Together with the target NRFrequency, it represents the

 frequency properties applicable to the referencing NRFreqRelation.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRFreqRelationGrp;

 }

 }

 }

}

module \_3gpp-nr-nrm-nrfrequency {

 yang-version 1.1;

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

 prefix "nrfreq3gpp";

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

 import \_3gpp-nr-nrm-nrnetwork { prefix nrnet3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRFrequency 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping NRFrequencyGrp {

 description "Represents the NRFrequency IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf absoluteFrequencySSB {

 description "The absolute frequency applicable for a downlink NR carrier

 frequency associated with the SSB, in terms of NR-ARFCN.";

 mandatory true;

 type uint32 { range "0.. 3279165"; }

 }

 leaf sSBSubCarrierSpacing {

 description "Sub-carrier spacing of the SSB.";

 mandatory true;

 type uint8 { range "15 | 30 | 60 | 120"; }

 units "kHz";

 }

 leaf-list multiFrequencyBandListNR {

 description "List of additional frequency bands the frequency belongs to.

 The list is automatically set by the gNB.";

 config false;

 min-elements 0;

 type uint16 { range "1..256"; }

 }

 }

 grouping NRFrequencyWrapper {

 list NRFrequency {

 description "Represents certain NR frequency properties.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRFrequencyGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 if-feature subnet3gpp:ExternalsUnderSubNetwork ;

 uses NRFrequencyWrapper;

 }

 augment "/nrnet3gpp:NRNetwork" {

 if-feature nrnet3gpp:ExternalsUnderNRNetwork;

 uses NRFrequencyWrapper;

 }

}

module \_3gpp-nr-nrm-nrnetwork {

 yang-version 1.1;

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

 prefix "nrnet3gpp";

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRNetwork 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 feature ExternalsUnderNRNetwork {

 description "Classes representing external entities like NRFrequency,

 ExternalGNBCUCPFunction, ExternalGNBDUFunction

 are contained under a NRNetwork list/class.";

 }

 grouping NRNetworkGrp {

 description "Represents the NRNetwork IOC.";

 reference "3GPP TS 28.541";

 uses subnet3gpp:SubNetworkGrp;

 }

 list NRNetwork {

 description "A subnetwork containing gNB external NR entities.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRNetworkGrp;

 }

 }

}

module \_3gpp-nr-nrm-nrsectorcarrier {

 yang-version 1.1;

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

 prefix "nrsectcarr3gpp";

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

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

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

 import \_3gpp-nr-nrm-gnbdufunction { prefix gnbdu3gpp; }

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

 organization "3GPP SA5";

 description "Defines the YANG mapping of the NRSectorCarrier 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 2019-06-17 {

 description "Initial revision";

 reference "Based on

 3GPP TS 28.541 V15.X.XX";

 }

 grouping NRSectorCarrierGrp {

 description "Represents the NRSectorCarrier IOC.";

 reference "3GPP TS 28.541";

 uses mf3gpp:ManagedFunctionGrp;

 leaf txDirection {

 description "Indicates if the transmission direction is downlink,

 uplink, or both downlink and uplink.";

 mandatory true;

 type types3gpp:TxDirection;

 }

 leaf configuredMaxTxPower {

 description "Maximum possible transmisssion power for all downlink

 channels, used simultaneously in a sector-carrier, added together.";

 mandatory true;

 type int32;

 units mW;

 }

 leaf arfcnDL {

 description "NR Absolute Radio Frequency Channel Number (NR-ARFCN)

 for downlink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32 { range "0..3279165"; }

 }

 leaf arfcnUL {

 description "NR Absolute Radio Frequency Channel Number (NR-ARFCN)

 for uplink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32 { range "0..3279165"; }

 }

 leaf bSChannelBwDL {

 description "Base station channel bandwitdth for downlink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32 { range "5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |

 90 | 100"; }

 units MHz;

 }

 leaf bSChannelBwUL {

 description "Base station channel bandwitdth for uplink.";

 reference "3GPP TS 38.104";

 mandatory true;

 type int32 { range "5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |

 90 | 100"; }

 units MHz;

 }

 leaf sectorEquipmentFunctionRef {

 description "Reference to corresponding SectorEquipmentFunction

 instance.";

 reference "3GPP TS 23.622";

 mandatory true;

 type types3gpp:DistinguishedName;

 }

 }

 augment "/me3gpp:ManagedElement/gnbdu3gpp:GNBDUFunction" {

 list NRSectorCarrier {

 description "Represents the resources of each transmission point

 included in the cell.";

 reference "3GPP TS 28.541";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses NRSectorCarrierGrp;

 }

 }

 }

}

|  |
| --- |
| **End of changes** |