**3GPP TSG- Meeting #**

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

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| ***Title:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | YANG SS is not matching the approved stage 2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update YANG code to match existing stage 2.  Changes include:  - Implementation of IOC NTNFunction and related datatypes and IOCs  - Implementation of IOC CCOFunction and related datatypes and IOCs  moving the definition of NRTAC to 5G-common-types  - other smaller updates | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 2 and Stage 3 mismatch; interoperability problems. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.4, Forge code | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Forge MR link: <https://forge.3gpp.org/rep/sa5/MnS/-/merge_requests/1111> at commit db6e8993719c754e39086965ca10cdd00c608416 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\* START OF CHANGE 0 \*\*\*

## 7.4 YANG Definitions for NR and NG-RAN

YANG definitions are specified in 3GPP Forge [99].

Directory: yang-models

Files:

\_3gpp-nr-nrm-beam.yang

\_3gpp-nr-nrm-bwp.yang

\_3gpp-nr-nrm-bwpset.yang

\_3gpp-nr-nrm-cco.yang

\_3gpp-nr-nrm-cesmanagementfunction.yang

\_3gpp-nr-nrm-commonbeamformingfunction.yang

\_3gpp-nr-nrm-cpciconfigurationfunction.yang

\_3gpp-nr-nrm-danrmanagementfunction.yang

\_3gpp-nr-nrm-desmanagementfunction.yang

\_3gpp-nr-nrm-dlbofunction.yang

\_3gpp-nr-nrm-dmrofunction.yang

\_3gpp-nr-nrm-dpciconfigurationfunction.yang

\_3gpp-nr-nrm-drachoptimizationfunction.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-nroperatorcelldu.yang

\_3gpp-nr-nrm-nrsectorcarrier.yang

\_3gpp-nr-nrm-ntnfunction.yang

\_3gpp-nr-nrm-operatordu.yang

\_3gpp-nr-nrm-rimrsset.yang

\_3gpp-nr-nrm-rrmpolicy.yang

Mount information

If the class ManagedElement and the underlying hierarchy is contained under a SubNetwork all YANG modules containing IOCs that can be contained under the ManagedElement directly or under other IOCs contained by the ManagedElement and the YANG module for ManagedElement itself shall be mounted at the mountpoint "children-of-SubNetwork" in the YANG module \_3gpp-common-subnetwork.

See IETF RFC 8528 [45] that describes the mechanism that adds the schema trees defined by a set of YANG modules onto a mount point defined in the schema tree in another YANG module.

\*\*\* END OF CHANGE 0 \*\*\*

\*\*\* START OF CHANGE 1 \*\*\*

\*\*\* yang-models/\_3gpp-5g-common-yang-types.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5g-common-yang-types {

yang-version 1.1;

namespace "urn:3gpp:sa5:\_3gpp-5g-common-yang-types";

prefix "types5g3gpp";

import ietf-yang-types { prefix yang; }

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

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "The model defines common types for 5G networks and

network slicing.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-05-10 { reference CR-0916; }

revision 2021-08-05 { reference S5-214053/CR-0518; }

revision 2020-11-05 { reference CR-0412 ; }

revision 2019-10-20 { reference "Initial version."; }

typedef NRTAC {

type string;

description "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

and Extended-TAC is defined in subclause 9.3.1.29 of 3GPP TS 38.473.

d) For a 5G SA (Stand Alone), it has a non-null value.";

}

grouping SNssai {

description

"Single Network Slice Selection Assistance Information(S-NSSAI)";

reference "3GPP TS 23.003";

leaf sd {

description "Slice Differentiator

If not needed, the value can be set to ff:ff:ff.";

type yang:hex-string {

length 8;

}

reference "3GPP TS 23.003";

}

leaf sst {

type uint8;

description "Slice/Service Type.

Values 0 to 127 belong to standardized SST range and are defined in

3GPP TS 23.501. Values 128 to 255 belong to operator-specific range.";

}

}

grouping PlmnIdNid {

description "Represents the SCP domain specific information as defined

in TS 29.510 ";

uses types3gpp:PLMNId;

leaf nid {

type string;

description "This attribute represents network Identity;

Shall be present if PlmnIdNid identifies an SNPN.

(see clauses 5.30.2.3, 5.30.2.9, 6.3.4, and 6.3.8 in TS 23.501";

}

}

grouping PLMNInfo {

description "The PLMNInfo data type define a S-NSSAI member in a specific

PLMNId, and it have two attributes PLMNId and S-NSSAI (PLMNId, S-NSSAI).

The PLMNId represents a data type that is comprised of mcc

(mobile country code) and mnc (mobile network code), (See TS 23.003

subclause 2.2 and 12.1) and S-NSSAI represents an data type, that is

comprised of an SST (Slice/Service type) and an optional

SD (Slice Differentiator) field";

uses types3gpp:PLMNId;

uses SNssai;

}

typedef CommModelType {

reference "3GPP TS 23501";

type enumeration {

enum DIRECT\_COMMUNICATION\_WO\_NRF {

value 0;

description "Directly communicate to other pre-configured NF service.";

}

enum DIRECT\_COMMUNICATION\_WITH\_NRF {

value 1;

description "Directly communicate to other NF service discovered

by NRF.";

}

enum INDIRECT\_COMMUNICATION\_WO\_DEDICATED\_DISCOVERY {

value 2;

description "Communicate to pre-configured other NF service through

SCP as a proxy.";

}

enum INDIRECT\_COMMUNICATION\_WITH\_DEDICATED\_DISCOVERY {

value 3;

description "Communication to NF service discovered by NRF through SCP

as a proxy.";

}

}

}

grouping CommModel {

leaf groupId {

type uint16;

}

leaf commModelType {

type CommModelType;

}

leaf-list targetNFServiceList {

type types3gpp:DistinguishedName;

}

leaf commModelConfiguration {

type string;

}

}

grouping SupportedFunc {

leaf function {

type string;

}

leaf policy {

type string;

}

}

typedef EnergySavingLoadThresholdT {

type uint32 {

range 0..10000;

}

units 1/10000;

}

typedef EnergySavingTimeDurationT {

type uint32 {

range 0..900;

}

units seconds;

}

typedef PhysCellID {

type uint32 {

range "0..1007";

}

reference "clause 7.4.2 of TS 38.211";

}

typedef UTC24TimeOfDayT {

description "Time of day in HH:MM or H:MM 24-hour format per UTC

time zone.";

type string {

pattern "(([01]?[0-9])|(2[0-3])):([0-5][0-9])";

}

}

typedef DayOfWeekT {

type enumeration {

enum Monday;

enum Tuesday;

enum Wednesday;

enum Thursday;

enum Friday;

enum Saturday;

enum Sunday;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 1 \*\*\*

\*\*\* START OF CHANGE 2 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-amfregion.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-amfregion {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-amfregion;

prefix amfr3gpp;

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

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

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

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "This IOC represents the AMF Region which consists one or

multiple AMF Sets.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2022-01-07 { reference CR-0643; }

revision 2020-11-06 { reference CR-0412 ; }

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

revision 2019-06-11 { reference ""; }

grouping AMFRegionGrp {

description "Represents the AMFRegion IOC";

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;

}

leaf-list nRTACList {

description "List of Tracking Area Codes (legacy TAC or extended TAC)

where the represented management function is serving.";

reference "TS 38.413 clause 9.3.3.10";

min-elements 1;

config false;

type types5g3gpp:NRTAC;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

//conditional support only if the network slicing feature is supported.

reference "3GPP TS 23.003";

key "sd sst";

uses types5g3gpp:SNssai;

}

leaf aMFRegionId {

description "Represents the AMF Region ID, which identifies the region.";

mandatory true;

type types3gpp:AmfRegionId;

}

leaf-list aMFSet {

description "The AMFSet that the AFMRegion is associated with.";

min-elements 1;

type instance-identifier;

}

}

augment "/subnet3gpp:SubNetwork" {

list AMFRegion {

description "5G Core AMFRegion IOC";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses AMFRegionGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 2 \*\*\*

\*\*\* START OF CHANGE 3 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-amfset.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-amfset {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-amfset;

prefix amfset3gpp;

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

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

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

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "This IOC represents the AMF Set which consists of some AMFs

that serve a given area and Network Slice.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2022-01-07 { reference CR-0643; }

revision 2020-11-06 { reference CR-0412 ; }

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

revision 2019-06-11 { reference "Ericsson refactoring."; }

grouping AMFSetGrp {

description "Represents the AMFSet IOC";

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;

}

leaf-list nRTACList {

description "List of Tracking Area Codes (legacy TAC or extended TAC)

where the represented management function is serving.";

reference "TS 38.413 clause 9.3.3.10";

min-elements 1;

config false;

type types5g3gpp:NRTAC;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

//conditional support only if the network slicing feature is supported.

reference "3GPP TS 23.003";

key "sd sst";

uses types5g3gpp:SNssai;

}

leaf aMFRegion {

description "The AMFRegion that the AFMSet is associated with.";

type instance-identifier;

}

leaf-list aMFSetMemberList {

description "List of DNs of AMFFunction instances of the AMFSet.";

min-elements 1;

max-elements 1;

type types3gpp:DistinguishedName;

}

}

augment "/subnet3gpp:SubNetwork" {

list AMFSet {

description "5G Core AMFSet IOC";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses AMFSetGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 3 \*\*\*

\*\*\* START OF CHANGE 4 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-neffunction.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-neffunction {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-neffunction;

prefix nef3gpp;

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

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

import ietf-inet-types { prefix inet; }

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

import \_3gpp-common-yang-extensions { prefix yext3gpp; }

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

import \_3gpp-5gc-nrm-nfprofile { prefix nfp3gpp; }

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "This IOC represents the NEF function in 5GC. For more

information about the NEF, see 3GPP TS 23.501.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-18 { reference CR-1273 ; }

revision 2024-04-12 { reference CR-1218 ; }

revision 2023-09-18 { reference CR-1103 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-04-26 { reference CR-0916; }

revision 2022-01-07 { reference CR-0643; }

revision 2020-11-06 { reference CR-0412 ; }

revision 2019-10-20 { reference "initial revision"; }

grouping DnnInfoItemGrp {

description "This data type represents set of parameters supported by NF

for a given S-NSSAI. (See clause 6.1.6.2.97 of TS 29.510)";

leaf dnn {

type string;

mandatory true;

description "It represents supported DNN or Wildcard DNN if the NF

supports all DNNs for the related S-NSSAI. The DNN shall contain the

Network Identifier and it may additionally contain an Operator

Identifier. If the Operator Identifier is not included, the DNN is

supported for all the PLMNs in the plmnList of the NF Profile.";

}

}

grouping SnssaiInfoItemGrp {

description "This data type represents set of parameters supported by NF

for a given S-NSSAI. (See clause 6.1.6.2.97 of TS 29.510)";

list sNssai {

description "It represents the S-NSSAI the NetworkSlice managed object

is supporting. The S-NSSAI is defined in TS 23.003.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses types5g3gpp:SNssai;

}

list dnnInfoList{

description "It represents list of parameters supported by the

NF per DNN.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses DnnInfoItemGrp;

}

}

grouping AfEventExposureDataGrp {

description "This data type represents the AF Event Exposure data managed

by a given NEF Instance. (See clause 6.1.6.2.50 TS 29.510";

leaf-list afEvents { // stage 2 double defined

type string;

min-elements 1;

description "It represents AF Event(s) exposed by the NEF after

registration of the AF(s) at the NEF.";

}

leaf-list afIds {

type string;

min-elements 1;

description "It represents list of application function identifiers of

the managed PFDs.";

}

leaf-list appIds { // stage 2 shaky

type string;

min-elements 1;

description "It represents list of internal application identifiers.";

}

}

grouping PfdDataGrp {

description "This data type represents the list of Application IDs

and/or AF IDs managed by a given NEF Instance.

(See clause 6.1.6.2.49 TS 29.510)";

leaf-list appIds { // stage 2 shaky

type string;

min-elements 1;

description "It represents list of internal application identifiers.";

}

leaf-list afIds {

type string;

min-elements 1;

description "It represents list of application function identifiers of

the managed PFDs.";

}

}

grouping UnTrustAfInfoGrp {

description "This data type represents information of an untrusted AF

Instance. (See clause 6.1.6.2.95 TS 29.510)";

leaf afId {

type string;

mandatory true;

description "It represents associated AF id.";

}

list sNssaiInfoList {

description "It represents S-NSSAIs and DNNs supported by the AF.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses SnssaiInfoItemGrp;

}

leaf mappingInd {

type boolean;

yext3gpp:initial-value false;

description "When present, this attribute indicates whether the

AF supports mapping between UE IP address (IPv4 address or IPv6 prefix)

and UE ID (i.e. GPSI).

True: the AF supports mapping between UE IP address and UE ID;

False: the AF does not support mapping between UE IP address

and UE ID.";

}

}

grouping NefInfoGrp {

description "This data type represents information of an NEF Instance.

(See clause 6.1.6.2.48 TS 29.510).";

list taiList {

config false;

description "List of TAIs";

yext3gpp:inVariant;

yext3gpp:notNotifyable;

key idx;

leaf idx { type uint32 ; }

uses types3gpp:TaiGrp;

}

list taiRangelist {

config false;

description "Range of TAIs";

yext3gpp:inVariant;

yext3gpp:notNotifyable;

key idx;

leaf idx { type uint32 ; }

uses nfp3gpp:TaiRangeGrp;

}

leaf nefId {

type string;

mandatory true;

description "It represents the NEF ID.

(see clause 6.1.6.3.2 of TS 29.510)";

}

list pfdData {

config false;

description "It represents PFD data, containing the list of internal

application identifiers and/or the list of application function

identifiers for which the PFDs can be provided.

Absence of this attribute indicates that the PFDs for any internal

application identifier and for any application function identifier

can be provided.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses PfdDataGrp;

}

list afEeData {

config false;

description "It represents the AF provided event exposure data. The NEF

registers such information in the NRF on behalf of the AF.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses AfEventExposureDataGrp;

}

list gpsiRanges {

description "It represents list of ranges of GPSIs whose profile data

is available.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses nfp3gpp:IdentityRange;

}

list externalGroupIdentifiersRanges {

description "It represents list of ranges of external groups whose

profile data is available."; // stage 2 definition is shaky

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses nfp3gpp:IdentityRange;

}

leaf-list servedFqdnList {

type string;

min-elements 1;

description "It represents pattern (regular expression according to

the ECMA-262 dialect [75]) representing the Domain names served by

the NEF.";

}

leaf-list dnaiList {

type string;

min-elements 1;

description "It represents list of Data network access identifiers

supported by the NEF. The absence of this attribute indicates that

the NEF can be selected for any DNAI.";

}

list unTrustAfInfoList {

description "It represents list of information corresponding to the AFs.";

min-elements 1;

key idx;

leaf idx { type uint32 ; }

uses UnTrustAfInfoGrp;

}

leaf uasNfFunctionalityInd {

type boolean;

yext3gpp:initial-value false;

description "When present, this attribute shall indicate whether the ,

NEF supports UAS NF functionality:

- True: UAS NF functionality is supported by the NEF.

- False (default): UAS NF functionality is not supported by the NEF";

}

leaf multiMemAfSessQosInd {

type boolean;

default false;

description "This attribute indicates whether the NEF supports

Multi-member AF session with required QoS functionality:

- TRUE: Multi-member AF session with required QoS functionality is

supported by the NEF

- FALSE (default): Multi-member AF session with required QoS

functionality is not supported by the NEF.";

}

leaf memberUESelAssistInd {

type boolean;

default false;

description "This attribute indicates whether the NEF supports member

UE selection assistance functionality:

- TRUE: member UE selection assistance functionality is supported by

the NEF

- FALSE (default): member UE selection assistance functionality is

not supported by the NEF.";

}

}

grouping NEFFunctionGrp {

description "Represents the NEFFunction IOC";

uses mf3gpp:ManagedFunctionGrp;

leaf sBIFQDN {

description "The FQDN of the registered NF instance in the

service-based interface.";

type inet:domain-name;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

key "sd sst";

uses types5g3gpp:SNssai;

}

list managedNFProfile {

description "This parameter defines profile for managed NF(See TS 23.501)";

min-elements 1;

max-elements 1;

key idx;

uses types3gpp:ManagedNFProfile;

}

leaf-list capabilityList {

description "List of supported capabilities of the NEF.";

reference "3GPP TS 23.003";

type string;

}

leaf isCAPIFSup {

type boolean;

yext3gpp:inVariant;

}

list nefInfo {

description "This attribute represents information of an NEF NF Instance.";

key idx;

leaf idx { type uint32 ; }

uses NefInfoGrp;

}

}

augment "/me3gpp:ManagedElement" {

list NEFFunction {

description "5G Core NEF Function";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses NEFFunctionGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 4 \*\*\*

\*\*\* START OF CHANGE 5 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-pcffunction.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-pcffunction {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-pcffunction;

prefix pcf3gpp;

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

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

import ietf-inet-types { prefix inet; }

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

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

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "This IOC represents the PCF function in 5GC. For more

information about the PCF, see 3GPP TS 23.501.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-04-26 { reference CR-0916; }

revision 2020-11-08 { reference CR-0412 ; }

revision 2020-08-06 { reference "CR-0333"; }

revision 2020-08-06 { reference "CR-0331"; }

revision 2019-10-25 { reference "S5-194457 S5-193518"; }

revision 2019-05-22 { reference "initial revision"; }

grouping PCFFunctionGrp {

description "Represents the PCFFunction IOC";

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;

}

leaf sBIFQDN {

description "The FQDN of the registered NF instance in the service-based

interface.";

type inet:domain-name;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

//optional support

reference "3GPP TS 23.003";

key "sd sst";

uses types5g3gpp:SNssai;

}

list managedNFProfile {

key idx;

min-elements 1;

max-elements 1;

description "Profile definition of a Managed NF (See TS 23.501)";

uses types3gpp:ManagedNFProfile;

}

list commModelList {

min-elements 1;

key "groupId";

description "Specifies a list of commModel. It can be used by NF and

NF services to interact with each other in 5G Core network ";

reference "3GPP TS 23.501";

uses types5g3gpp:CommModel;

}

leaf dynamic5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Dynamic5QISet that the PCFFunction supports

(is associated to).";

}

leaf configurable5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Configurable5QISet that the PCFFunction supports

(is associated to).";

}

}

augment "/me3gpp:ManagedElement" {

list PCFFunction {

description "5G Core PCF Function";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses PCFFunctionGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 5 \*\*\*

\*\*\* START OF CHANGE 6 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-smffunction.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-smffunction {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-smffunction;

prefix smf3gpp;

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

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

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

import ietf-inet-types { prefix inet; }

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

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "SMFFunction derived from basic ManagedFunction.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-04-26 { reference CR-0916; }

revision 2020-11-08 { reference CR-0412 ; }

revision 2020-08-06 { reference "CR-0333"; }

revision 2020-06-03 { reference "CR-0286"; }

revision 2019-10-25 { reference "S5-194457 S5-193518"; }

revision 2019-05-31 {reference "Ericsson refactoring."; }

revision 2018-08-07 { reference "Initial revision";}

grouping SMFFunctionGrp {

description "Represents the SMFFuntion IOC";

uses mf3gpp:ManagedFunctionGrp;

list pLMNIdList {

min-elements 1;

description "A list of PLMN identifiers (Mobile Country Code and Mobile

Network Code).";

key "mcc mnc";

uses types3gpp:PLMNId;

}

leaf-list nRTACList {

description "List of Tracking Area Codes (legacy TAC or extended TAC)

where the represented management function is serving.";

reference "TS 38.413 clause 9.3.3.10";

min-elements 1;

config false;

type types5g3gpp:NRTAC;

}

leaf sBIFQDN {

description "The FQDN of the registered NF instance in the service-based

interface.";

type inet:domain-name;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

reference "3GPP TS 23.003";

key "sd sst";

uses types5g3gpp:SNssai;

}

list managedNFProfile {

key idx;

min-elements 1;

max-elements 1;

description "Profile definition of a Managed NF (See TS 23.501)";

uses types3gpp:ManagedNFProfile;

}

list commModelList {

min-elements 1;

key "groupId";

description "Specifies a list of commModel. It can be used by NF and

NF services to interact with each other in 5G Core network ";

reference "3GPP TS 23.501";

uses types5g3gpp:CommModel;

}

leaf configurable5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Configurable5QISet that the SMFFunction supports

(is associated to).";

}

leaf dynamic5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Dynamic5QISet that the SMFFunction supports

(is associated to).";

}

list dnaiSatelliteMappingList {

description "List of the mapping relationship between

satellite ID and at least one DNAI.";

min-elements 1;

key "satelliteid";

uses dnaiSatelliteMapping;

}

}

grouping dnaiSatelliteMapping {

leaf-list dnaiList {

description "List of Data network access identifiers.";

min-elements 1;

type string;

}

leaf satelliteid {

description "Unique identifier of a GEO satellite.";

type string;

}

}

augment "/me3gpp:ManagedElement" {

list SMFFunction {

description "5G Core SMF Function";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses SMFFunctionGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 6 \*\*\*

\*\*\* START OF CHANGE 7 \*\*\*

\*\*\* yang-models/\_3gpp-5gc-nrm-upffunction.yang \*\*\*

<CODE BEGINS>

module \_3gpp-5gc-nrm-upffunction {

yang-version 1.1;

namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-upffunction;

prefix upf3gpp;

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

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

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

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

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "UPFFunction derived from basic ManagedFunction.

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-04-26 { reference CR-0916; }

revision 2020-11-08 { reference CR-0412 ; }

revision 2019-10-25 { reference "S5-194457 S5-193518"; }

revision 2019-05-31 { reference "Ericsson refactoring."; }

revision 2018-08-07 { reference "Initial revision"; }

grouping UPFFunctionGrp {

description "Represents the UPFFunction IOC";

uses mf3gpp:ManagedFunctionGrp;

list pLMNIdList {

description "A list of PLMN identifiers (Mobile Country Code and Mobile

Network Code).";

min-elements 1;

key "mcc mnc";

uses types3gpp:PLMNId;

}

leaf-list nRTACList {

description "List of Tracking Area Codes (legacy TAC or extended TAC)

where the represented management function is serving.";

reference "TS 38.413 clause 9.3.3.10";

min-elements 1;

config false;

type types5g3gpp:NRTAC;

}

list sNSSAIList {

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

(Single Network Slice Selection Assistance Information)

An S-NSSAI has an SST (Slice/Service type) and an optional SD

(Slice Differentiator) field.";

reference "3GPP TS 23.003";

key "sd sst";

uses types5g3gpp:SNssai;

}

list managedNFProfile {

key idx;

min-elements 1;

max-elements 1;

description "Profile definition of a Managed NF (See TS 23.501)";

uses types3gpp:ManagedNFProfile;

}

leaf-list supportedBMOList {

type string;

description "List of supported BMOs (Bridge Managed Objects) required

for integration with TSN system.";

}

}

augment /me3gpp:ManagedElement {

list UPFFunction {

description "5G Core UPF Function";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses UPFFunctionGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 7 \*\*\*

\*\*\* START OF CHANGE 13 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-cco.yang \*\*\*

<CODE BEGINS>

module \_3gpp-nr-nrm-cco {

yang-version 1.1;

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

prefix cco3gpp;

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

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

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Implements support the C-SON function of Capacity and

Coverage optimization .

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-24 { reference CR-1273 ; }

grouping ParameterRangeGrp {

description "This data type represents the adjustment range for parameters.";

leaf maxValue {

type int64;

mandatory true;

description "It indicates the maximum value of the parameter.";

}

leaf minValue {

type int64;

mandatory true;

description "It indicates the minimum value of the parameter.";

}

}

grouping CCOParametersGrp {

description "Represents the CCOParameters IOC";

list downlinkTransmitPowerRange {

description "It indicates adjustment range (including maximum value,

minimum value) of downlinkTransmitPower to optimize radio coverage.";

key minValue;

min-elements 1;

max-elements 1;

uses ParameterRangeGrp {

refine minValue {

must '. >= 0 and . <= 100';

}

refine maxValue {

must '. >= 0 and . <= 100';

}

}

}

list antennaTiltRange {

description "It indicates adjustment range (including maximum value,

minimum value) of antennaTilt to optimize radio coverage.

units 0.1 degree";

key minValue;

min-elements 1;

max-elements 1;

uses ParameterRangeGrp {

refine minValue {

must '. >= -900 and . <= 900';

}

refine maxValue {

must '. >= -900 and . <= 900';

}

}

}

list antennaAzimuthRange {

description "It indicates adjustment range (including maximum value,

minimum value) of antennaAzimuth to optimize radio coverage.

units 0.1 degree";

key minValue;

min-elements 1;

max-elements 1;

uses ParameterRangeGrp {

refine minValue {

must '. >= -1800 and . <= 1800';

}

refine maxValue {

must '. >= -1800 and . <= 1800';

}

}

}

list digitalTiltRange {

description "It indicates adjustment range (including maximum value,

minimum value) of digitalTilt to optimize radio coverage.

units 0.1 degree";

key minValue;

min-elements 1;

max-elements 1;

uses ParameterRangeGrp {

refine minValue {

must '. >= -900 and . <= 900';

}

refine maxValue {

must '. >= -900 and . <= 900';

}

}

}

list digitalAzimuthRange {

description "It indicates adjustment range (including maximum value,

minimum value) of digitalAzimuth to optimize radio coverage.

units 0.1 degree";

key minValue;

min-elements 1;

max-elements 1;

uses ParameterRangeGrp {

refine minValue {

must '. >= -1800 and . <= 1800';

}

refine maxValue {

must '. >= -1800 and . <= 1800';

}

} }

leaf-list coverageShapeList {

type uint16;

ordered-by user;

description "It indicates the coverage shape of specific sites which

can be selected to optimize radio coverage.";

}

}

grouping CCOWeakCoverageParametersGrp {

description "Represents the CCOWeakCoverageParameters IOC";

uses CCOParametersGrp;

}

grouping CCOPilotPollutionParametersGrp {

description "Represents the CCOPilotPollutionParameters IOC";

uses CCOParametersGrp;

}

grouping CCOOvershootCoverageParametersGrp {

description "Represents the CCOOvershootCoverageParameters IOC";

uses CCOParametersGrp;

}

grouping CCOFunctionGrp {

description "Represents the CCOFunction IOC";

leaf cCOControl {

description "This attribute determines whether the centralized

SON CCO Function is enabled or disabled.";

mandatory true;

type boolean;

}

}

augment "/subnet3gpp:SubNetwork" {

list CCOFunction {

description "This IOC contains attributes to support the C-SON

function of Capacity and Coverage optimization

(See clause 7.2.3 in TS 28.313).

NOTE: in the case where multiple CCOFunction MOIs exist at different

levels of the containment tree, the CCOFunction MOI at the lower

level overrides the CCOFunction MOIs at higher level(s) of the same

containment tree.";

key id;

max-elements 1;

uses top3gpp:Top\_Grp;

container attributes {

uses CCOFunctionGrp;

}

list CCOWeakCoverageParameters {

description "This IOC represents the properties of

CCOWeakCoverageParameters. CCOWeakCoverageParameters is one

realization of abstract CCOParameters IOC.";

key id;

max-elements 1;

uses top3gpp:Top\_Grp;

container attributes {

uses CCOWeakCoverageParametersGrp;

}

}

list CCOPilotPollutionParameters {

description "This IOC represents the properties of

CCOPilotPollutionParameters. CCOPilotPollutionParameters is one

realization of abstract CCOParameters IOC.";

key id;

max-elements 1;

uses top3gpp:Top\_Grp;

container attributes {

uses CCOPilotPollutionParametersGrp;

}

}

list CCOOvershootCoverageParameters {

description "This IOC represents the properties of

CCOOvershootCoverageParameters. CCOOvershootCoverageParameters is

one realization of abstract CCOParameters IOC.";

key id;

max-elements 1;

uses top3gpp:Top\_Grp;

container attributes {

uses CCOOvershootCoverageParametersGrp;

}

}

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 13 \*\*\*

\*\*\* START OF CHANGE 14 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-gnbcucpfunction.yang \*\*\*

<CODE BEGINS>

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-yang-extensions { prefix yext3gpp; }

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

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

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

import \_3gpp-5gc-nrm-configurable5qiset { prefix fiveqi3gpp; }

import ietf-inet-types { prefix inet; }

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Defines the YANG mapping of the GNBCUCPFunction Information

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

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2024-04-04 { reference CR-1139; }

revision 2024-02-24 { reference CR-1218; }

revision 2024-01-12 { reference CR-1138; }

revision 2023-09-18 { reference CR-1043; }

revision 2023-04-26 { reference CR-0916; }

revision 2022-07-28 { reference "CR-0770"; }

revision 2021-11-06 { reference "CR-0611" ; }

revision 2021-11-05 { reference "CR-0609"; }

revision 2020-10-02 { reference CR-0384; }

revision 2020-08-06 { reference "CR-0333"; }

revision 2020-08-03 { reference "CR-0321"; }

revision 2020-06-03 { reference "CR-0286"; }

revision 2020-05-08 { reference S5-203316 ; }

revision 2020-04-28 { reference "0260"; }

revision 2020-02-14 { reference S5-20XXXX ; }

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

revision 2019-06-17 { reference "Initial revision"; }

feature Configurable5QISetUnderGNBCUCPFunction {

description "The Configurable5QISet shall be contained under

GNBCUCPFunction";

}

feature DESManagementFunction {

description "Class representing Distributed SON Energy Saving feature";

}

feature DANRManagementFunction {

description "Class representing D-SON function of ANR Management feature";

}

feature DMROFunction {

description "Class representing D-SON function of MRO feature";

}

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;

yext3gpp:inVariant;

uses types3gpp:PLMNId;

}

leaf-list x2BlockList {

type string;

description "List of nodes to which X2 connections are prohibited.";

}

leaf-list x2AllowList {

type string;

description "List of nodes to which X2 connections are enforced.";

}

leaf-list xnBlockList {

type string;

description "List of nodes to which Xn connections are prohibited.";

}

leaf-list xnAllowList {

type string;

description "List of nodes to which X2 connections are enforced.";

}

leaf-list xnHOBlockList {

type string;

description "List of nodes to which handovers over Xn are prohibited.";

}

leaf configurable5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Configurable5QISet that the GNBCUCPFunction

supports (is associated to).";

}

leaf-list x2HOBlockList {

type string;

description "List of nodes to which handovers over X2 are prohibited.";

}

leaf dynamic5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Dynamic5QISet that the GNBCUCPFunction supports

(is associated to).";

}

leaf dCHOControl {

type boolean;

description "This attribute determines whether the CHO function is

enabled or disabled.";

}

leaf dDAPSHOControl {

type boolean;

description "This attribute determines whether the DAPS handover function

is enabled or disabled.";

}

list qceIdMappingInfoList {

description "List of the mapping relationship between QoE collection entity

identity, PLMN where QoE collection entity resides, and the IP address of

the QoE collection entity.";

key idx;

min-elements 1;

uses QceIdMappingInfoGrp;

leaf idx { type string; }

}

leaf-list mdtUserConsentReqList {

type enumeration {

enum M1;

enum M2;

enum M3;

enum M4;

enum M5;

enum M6;

enum M7;

enum M8;

enum M9;

enum MDT\_UE\_LOCATION;

}

description "represents a list of MDT measurement names that are

subject to user consent at MDT activation.

Any MDT measurement, whose name is not specified in this list, is not

subject to user consent at MDT activation.";

}

leaf ephemerisInfoSetRef {

type types3gpp:DistinguishedName;

description "This is the DN of EphemerisInfoSet.";

}

}

grouping QceIdMappingInfoGrp {

leaf qoECollectionEntityAddress {

type inet:ip-address;

description "Specifies the address to which the QMC reports shall be

transferred. Ipv4 or Ipv6 address may be used.";

}

leaf qoECollectionEntityIdentity {

type string;

description "Specifies the unique identity to which the QMC reports

shall be transferred.";

}

list pLMNTarget {

description "The PLMN identifier where QoE collection entity

resides. ";

key "mcc mnc";

min-elements 1;

max-elements 1;

yext3gpp:inVariant;

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;

}

uses mf3gpp:ManagedFunctionContainedClasses;

uses fiveqi3gpp:Configurable5QISetSubtree {

if-feature Configurable5QISetUnderGNBCUCPFunction;

}

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 14 \*\*\*

\*\*\* START OF CHANGE 15 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-gnbcuupfunction.yang \*\*\*

<CODE BEGINS>

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-yang-extensions { prefix yext3gpp; }

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

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

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

import \_3gpp-5gc-nrm-configurable5qiset { prefix fiveqi3gpp; }

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Defines the YANG mapping of the GNBCUUPFunction Information

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

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2023-04-26 { reference CR-0916; }

revision 2022-07-28 { reference "CR-0770"; }

revision 2020-11-05 { reference CR-0412 ; }

revision 2020-08-06 { reference "CR-0333"; }

revision 2020-08-03 { reference "CR-0321"; }

revision 2020-06-03 { reference "CR-0286"; }

revision 2020-05-28 { reference "CR-0318"; }

revision 2020-03-12 { reference "SP-200233 S5-201547"; }

revision 2020-02-14 { reference S5-20XXXX ; }

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

revision 2019-08-21 { reference "Initial revision"; }

feature Configurable5QISetUnderGNBCUUPFunction {

description "The Configurable5QISet shall be contained under

GNBCUUPFunction";

}

grouping TAIGrp {

description "Tracking Area Identity";

list pLMNId {

key "mcc mnc";

description "PLMN IDs for the Tracking area";

uses types3gpp:PLMNId;

}

leaf nRTAC {

type types5g3gpp:NRTAC;

description "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 and

Extended-TAC is defined in subclause 9.3.1.29 of 3GPP TS 38.473.

d) For a 5G SA (Stand Alone), it has a non-null value.";

}

}

grouping BackhaulAddressGrp {

description "Indicates the backhauladdress of gNB.";

leaf gNBId {

type uint32 {

range "0..4294967295";

}

description "It identifies a gNB within a PLMN. The gNB ID is part of

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

reference "gNB Identifier (gNB ID) of subclause 8.2 of TS 38.300.

Global gNB ID in subclause 9.3.1.6 of TS 38.413";

}

list tAI {

key nRTAC;

min-elements 1;

max-elements 1;

description "Tracking Area Identity";

reference "subclause 9.3.3.11 in TS 38.413";

uses TAIGrp;

}

}

grouping MappingSetIDBackhaulAddressGrp {

description "Mapping relationship between setID and backhaulAddress of gNB";

leaf idx {

type uint32 ;

description "ID value";

}

leaf setID {

type uint32;

mandatory true;

description "Indicates the setID of gNB.";

reference "Subclause 7.4.1.6 in TS 38.211";

}

list backhaulAddress {

key gNBId;

min-elements 1;

max-elements 1;

description "Indicates the backhauladdress of gNB.";

uses BackhaulAddressGrp;

}

}

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;

yext3gpp:inVariant;

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 uint32;

mandatory true;

description "Identifies a gNB within a PLMN. The gNB ID is part of the

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

reference "gNB Identifier (gNB ID) of subclause 8.2 of TS 38.300.

Global gNB ID in subclause 9.3.1.6 of TS 38.413";

}

leaf gNBIdLength {

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 pLMNInfoList {

description "The PLMNInfoList is a list of PLMNInfo data type. It

defines which PLMNs that can be served by the GNBCUUPFunction and

which S-NSSAIs can be supported by the GNBCUUPFunction for

corresponding PLMN in case of network slicing feature is supported";

key "mcc mnc sd sst";

uses types5g3gpp:PLMNInfo;

}

list mappingSetIDBackhaulAddressList {

key idx;

description "Specifies a list of mappingSetIDBackhaulAddress used to

retrieve the backhaul address of the victim set.

Must be present if Remote Interference Management function is

supported.";

uses MappingSetIDBackhaulAddressGrp;

}

leaf configurable5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Configurable5QISet that the GNBCUUPFunction

supports (is associated to).";

}

leaf dynamic5QISetRef {

type types3gpp:DistinguishedName;

description "DN of the Dynamic5QISet that the GNBCUUPFunction

supports (is associated to).";

}

}

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;

uses fiveqi3gpp:Configurable5QISetSubtree {

if-feature Configurable5QISetUnderGNBCUUPFunction;

}

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 15 \*\*\*

\*\*\* START OF CHANGE 16 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-nrcelldu.yang \*\*\*

<CODE BEGINS>

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; }

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

import ietf-yang-types { prefix yang; }

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Defines the YANG mapping of the NRCellDU Information Object

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

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2022-07-28 { reference "CR-0770"; }

revision 2022-06-29 { reference CR-0756 ; }

revision 2021-10-28 { reference CR-0607 ; }

revision 2021-01-25 { reference CR-0454 ; }

revision 2020-11-25 { reference CR-0386 ; }

revision 2020-11-05 { reference CR-0412 ; }

revision 2020-10-02 { reference CR-0384 ; }

revision 2020-05-08 { reference S5-203316 ; }

revision 2020-02-14 { reference S5-20XXXX ; }

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

revision 2019-09-03 { reference "Initial revision"; }

feature DRACHOptimizationFunction {

description "Class representing D-SON function of RACH optimization

feature";

}

feature CPCIConfigurationFunction {

description "Class representing Centralized SON function of

PCI configuration feature";

}

grouping NPNIdentityGrp {

description "Represents the NPN supported by the <<IOC>> using this

<<dataType>> as one of its attributes in case of the cell is a

NPN-only cell.";

list plmnid {

key "mcc mnc";

min-elements 1;

description "PLMNId";

uses types3gpp:PLMNId;

}

leaf cAGIdList {

type string;

mandatory true;

description "It identifies a CAG list containing up to 12 CAG-identifiers

per PLMN Identity, see TS 38.331.

CAG is used for the PNI-NPNs to prevent UE(s), which are not allowed

to access the NPN via the associated cell(s), from automatically

selecting and accessing the associated CAG cell(s).

CAG ID is used to combine with PLMN ID to identify a PNI-NPN.

Exist if the cell is a NPN-only cell see TS 38.331";

}

leaf nIDList {

type string;

mandatory true;

description "It identifies a list of NIDs containing up to 12 NIDs per

PLMN Identity, see TS 38.331.

NID is used to combine with PLMN ID to identify an SNPN.

Exist if the cell is a NPN-only cell see TS 38.331";

}

}

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.";

type types3gpp:AdministrativeState;

default LOCKED;

}

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 pLMNInfoList {

description "The PLMNInfoList is a list of PLMNInfo data type. It

defines which PLMNs that can be served by the NR cell, and which

S-NSSAIs that can be supported by the NR cell for corresponding PLMN

in case of network slicing feature is supported. The plMNId of the

first entry of the list is the PLMNId used to construct the nCGI for

the NR cell.";

key "mcc mnc sd sst";

min-elements 1;

ordered-by user;

uses types5g3gpp:PLMNInfo;

}

list nPNIdentityList {

key idx ;

min-elements 1;

ordered-by user;

description "It defines which NPNs that can be served by the NR cell,

and which CAG IDs or NIDs can be supported by the NR cell for

corresponding PNI-NPN or SNPN in case of the cell is NPN-only cell.";

reference "3GPP TS 38.331";

leaf idx { type uint32 ; }

uses NPNIdentityGrp;

}

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";

type types5g3gpp:NRTAC;

}

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";

type int32;

}

leaf arfcnSUL {

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

supplementary uplink.";

reference "3GPP TS 38.104";

type int32;

}

leaf bSChannelBwDL {

description "Base station channel bandwidth for downlink.";

reference "3GPP TS 38.104";

type int32;

units MHz;

}

leaf rimRSMonitoringStartTime {

type yang:date-and-time ;

mandatory true;

description "Configures the UTC time when the gNB attempts to start

RIM-RS monitoring.";

}

leaf rimRSMonitoringStopTime {

type yang:date-and-time ;

mandatory true;

description "Configures the UTC time when the gNB stops RIM-RS

monitoring.";

}

leaf rimRSMonitoringWindowDuration {

type uint32 {

range 1..16384 ;

}

mandatory true;

description "Configures a duration of the monitoring window in which

gNB monitors the RIM-RS, in unit of P\_t, where P\_t is the RIM-RS

transmission periodicity in units of uplink-downlink switching period (

see 38.211 subclause 7.4.1.6).

This field is configured together with rimRSMonitoringInterval,

rimRSMonitoringWindowStartingOffset, rimRSMonitoringOccasionInterval

and rimRSMonitoringOccasionStartingOffset.

The duration of the monitoring window is expected to be larger than

or equal to M\*P\_t, where M is the interval between adjacent monitoring

occasions within the monitoring window

(configured by rimRSMonitoringInterval).

The absolute duration of the monitoring window is not expected to be

larger than the periodicity of the monitoring window (configured by

rimRSMonitoringWindowPeriodicity).

See 3GPP TS 28.541 attribute descrition rimRSMonitoringWindowDuration

for the exact math formulas.

Only the earliest N\_T consecutive detection durations in each RIM-RS

transmission periodicity (P\_t) in the monitoring window are taken as

valid time for monitoring potential interference, and they are

consecutively monitored in the monitoring window, while the residual

part of each RIM-RS transmission periodicity is not used for

discovering potential interference, where, a consecutive detection

duration spans P1\*R1 (if only P1 is configured) or ((P1+P2))/2\*R1 (

if both P1 and P2 are configured), where,

R1 is the number of consecutive uplink-downlinkswitching periods

for RS-1 (configured by nrofConsecutiveRIMRS1),

P1 is the first uplink-downlinkswitching period (configured by

dlULSwitchingPeriod1),

P2 is the second uplink-downlink switching period (configured by

dlULSwitchingPeriod2), and

N\_T=

((N\_setID # RIM,1)/(N\_f # RI N\_s # RIM,1)

if enableEnoughNotEnoughIndication is 'disable'

(2N\_setID # RIM,1)/(N\_f # RIM N\_s # RIM,1)

if enableEnoughNotEnoughIndication is 'enable'

N\_setID # 'RIM,1' is the total number of set IDs for RIM RS-1

(configured by totalnrofSetIdofRS1),

N\_f # RIM is the number of candidate frequency resources in the whole

network (configured by nrofGlobalRIMRSFrequencyCandidates), and

N\_s # 'RIM,1' is the number of candidate sequences assigned for

RIM RS-1 (configured by nrofRIMRSSequenceCandidatesofRS1).";

}

leaf rimRSMonitoringWindowStartingOffset {

type uint8 {

range 0..23 ;

}

mandatory true;

units hours;

description "Configures the start offset of the first monitoring window

within one day, in unit of hours.";

}

leaf rimRSMonitoringWindowPeriodicity {

type uint8 {

range 1|2|3|4|6|8|12|24 ;

}

units hours;

mandatory true;

description "Configures the periodicity of the monitoring window, in

unit of hours";

}

leaf rimRSMonitoringOccasionInterval {

type uint32 {

range 1..max ;

}

mandatory true;

description "Configures the interval between adjacent monitoring

occasions (M) within the monitoring window, in unit of consecutive

detection duration.

M is expected to be prime to N\_T, where N\_T is given in above

attribute rimRSMonitoringWindowDuration.

allowedValues: 1,2..N\_T-1";

}

leaf rimRSMonitoringOccasionStartingOffset {

type uint32 ;

mandatory true;

description "Configures the start offset of the first monitoring occasions

within the monitoring window (S\_M), in unit of consecutive detection

duration.

gNB starts monitoring potential interference from the S\_M-th consecutive

detection duration in the first complete RIM-RS transmission

periodicity (P\_t) within the monitoring window.

allowedValues: 0,1,2..M-1

where M is the the interval between adjacent monitoring occasions

within the monitoring window

(configured by rimRSMonitoringOccasionInterval)";

}

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 bSChannelBwUL {

description "Base station channel bandwidth for uplink.";

reference "3GPP TS 38.104";

type int32;

units MHz;

}

leaf bSChannelBwSUL {

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

reference "3GPP TS 38.104";

type int32;

units MHz;

}

leaf-list nRSectorCarrierRef {

description "Reference to corresponding NRSectorCarrier instance.";

min-elements 1;

type types3gpp:DistinguishedName;

}

leaf-list bWPRef {

description "Reference to corresponding BWP instance.";

type types3gpp:DistinguishedName;

}

leaf-list bWPSetRef {

description "Reference to corresponding BWPSet instance.";

type types3gpp:DistinguishedName;

}

leaf-list nRFrequencyRef {

description "Reference to corresponding NRFrequency instance.";

type types3gpp:DistinguishedName;

}

leaf victimSetRef {

type types3gpp:DistinguishedName;

mandatory true;

description "DN of a victim Set (RimRSSet)

Implemented if RIM feature is supported";

}

leaf aggressorSetRef {

type types3gpp:DistinguishedName;

mandatory true;

description "DN of an aggressor Set (RimRSSet)";

}

}

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

list NRCellDU {

description "This IOC represents the part of NR cell information that

describes s the specific resources instances.

An NR cell transmits SS/PBCH block and always requires downlink

transmission at a certain carrier frequency with a certain channel

bandwidth. Transmission may be performed from multiple sector-carriers

using different transmission points, and these may be configured with

different carrier frequencies and channel bandwidths, as long as they

are aligned to the cell's downlink resource grids as defined in

subclause 4.4 in TS 38.211. The values of arfcnDL and bSChannelBwDL

attributes define the resource grids which each sector-carrier needs to

be aligned to. See subclauses 5.3 and 5.4.2 of TS 38.104 for definitions

of BS channel bandwidth and NR-ARFCN, respectively.

An NR cell requires an uplink in order to provide initial access. In

case of TDD, the values of arfcnUL and bSChannelBwUL have to always be

set to the same values as for the corresponding DL attributes. For both

FDD and TDD, the arfcnUL and bSChannelBwUL define uplink resource grids

to which each sector-carrier needs to align to.

An NR cell can in addition be configured with a supplementary uplink,

which has its own arfcnSUL and bSChannelBwSUL, which define resource

grids for supplementary uplink sector-carriers.

Each of downlink, uplink and supplementary uplink (if configured) need

an initial bandwidth part (BWP), which defines resources to be used by

UEs during and immediately after initial access. Additional BWPs can be

either configured or calculated by gNB internally and be applied to UEs

dynamically by gNB based on e.g. UE capability and bandwidth need of

each UE.";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses NRCellDUGrp;

}

uses mf3gpp:ManagedFunctionContainedClasses;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 16 \*\*\*

\*\*\* START OF CHANGE 17 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-nroperatorcelldu.yang \*\*\*

<CODE BEGINS>

module \_3gpp-nr-nrm-nroperatorcelldu {

yang-version 1.1;

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

prefix "nropcelld3gpp";

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

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

import \_3gpp-nr-nrm-operatordu { prefix operdu3gpp; }

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

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

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

organization "3GPP SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Defines the YANG mapping of the OperatorDU Information Object

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

Copyright 2024, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI,

TTA, TTC). All rights reserved.";

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

revision 2024-05-24 { reference CR-1273 ; }

revision 2023-09-18 { reference CR-1043 ; }

revision 2021-10-01 { reference "Initial revision"; }

grouping NROperatorCellDUGrp {

description "Represents the NROperatorCellDU IOC.";

reference "3GPP TS 28.541";

uses operdu3gpp:OperatorDUGrp;

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";

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

}

leaf administrativeState {

description "Administrative state of the NROperatorCellDU. Indicates the

permission to use or prohibition against using the cell, imposed

through the OAM services.";

type types3gpp:AdministrativeState;

default LOCKED;

}

list pLMNInfoList {

description "The PLMNInfoList is a list of PLMNInfo data type. It

defines which PLMNs that can be served by the NR cell, and which

S-NSSAIs that can be supported by the NR cell for corresponding PLMN

in case of network slicing feature is supported. The plMNId of the

first entry of the list is the PLMNId used to construct the nCGI for

the NR cell.";

key "mcc mnc sd sst";

min-elements 1;

ordered-by user;

uses types5g3gpp:PLMNInfo;

}

leaf nRTAC {

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

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

type types5g3gpp:NRTAC;

}

leaf-list nRCellDURef {

description "Reference to corresponding NRCellDU instance.";

type types3gpp:DistinguishedName;

}

}

augment "/me3gpp:ManagedElement/gnbdu3gpp:GNBDUFunction/operdu3gpp:OperatorDU"

{

list NROperatorCellDU {

description "Contains attributes to support 5G MOCN network sharing.";

reference "3GPP TS 28.541";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses NROperatorCellDUGrp;

}

uses gnbdu3gpp:GNBDUFunctionGrp;

}

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 17 \*\*\*

\*\*\* START OF CHANGE 18 \*\*\*

\*\*\* yang-models/\_3gpp-nr-nrm-ntnfunction.yang \*\*\*

<CODE BEGINS>

module \_3gpp-nr-nrm-ntnfunction {

yang-version 1.1;

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

prefix ntn3gpp;

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

import \_3gpp-5g-common-yang-types { prefix types5g3gpp; }

import ietf-yang-types { prefix yang; }

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

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

organization "3gpp SA5";

contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

description "Implements support the C-SON function of Capacity and

Coverage optimization .

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TTA, TTC). All rights reserved.";

reference "3GPP TS 28.541";

revision 2024-05-24 { reference CR-1273 ; }

feature NTNFunctionUnderSubNetwork {

description "The NTNFunction shall be contained under SubNetwork";

}

feature NTNFunctionUnderManagedElement {

description "The NTNFunction shall be contained under ManagedElement";

}

grouping PositionVelocityGrp {

description "This data type defines configuration parameters to support

satellite position and velocity state";

leaf positionX {

type uint32 {

range 0..604800;

}

config false;

default 0;

units meter;

description "X, Y, Z coordinate of satellite position state vector

in ECEF. Unit is meter.

Step of 1.3 m. Actual value = field value \* 1.3.";

}

leaf positionY {

type uint32 {

range 0..604800;

}

config false;

default 0;

units meter;

description "X, Y, Z coordinate of satellite position state vector

in ECEF. Unit is meter.

Step of 1.3 m. Actual value = field value \* 1.3.";

}

leaf positionZ {

type uint32 {

range 0..604800;

}

config false;

default 0;

units meter;

description "X, Y, Z coordinate of satellite position state vector

in ECEF. Unit is meter.

Step of 1.3 m. Actual value = field value \* 1.3.";

}

leaf velocityVX {

type int32 {

range -131072..131071;

}

config false;

default 0;

units meter/second;

description "X, Y, Z coordinate of satellite velocity state vector

in ECEF.

Step of 0.06 m/s. Actual value = field value \* 0.06.";

}

leaf velocityVY {

type int32 {

range -131072..131071;

}

config false;

default 0;

units meter/second;

description "X, Y, Z coordinate of satellite velocity state vector

in ECEF.

Step of 0.06 m/s. Actual value = field value \* 0.06.";

}

leaf velocityVZ {

type int32 {

range -131072..131071;

}

config false;

default 0;

units meter/second;

description "X, Y, Z coordinate of satellite velocity state vector

in ECEF.

Step of 0.06 m/s. Actual value = field value \* 0.06.";

}

}

grouping OrbitalGrp {

description "This data type defines configuration parameters of orbital

trajectory information to support satellite access.";

leaf semiMajorAxis {

type uint64 {

range 0..8589934591;

}

config false;

default 0;

units meter;

description "Satellite orbital parameter: semi major axis alpha,

see NIMA TR 8350.2.

Step of 4.249 \* 10\*\*-3 m.

Actual value = 6500000 + field value \* (4.249 \* 10\*\*-3).";

}

leaf eccentricity {

type int32 {

range -524288..524287;

}

config false;

default 0;

description "Satellite orbital parameter: eccentricity e,

see NIMA TR 8350.2.

Step 1.431 \* 10\*\*-8.

Actual value = field value \* (1.431 \* 10\*\*-8).";

}

leaf periapsis {

type uint32 {

range 0..16777215;

}

config false;

default 0;

units radian;

description "Satellite orbital parameter: argument of periapsis omega,

see NIMA TR 8350.2.

Step of 2.341\* 10\*\*-8 rad.

Actual value = field value \* (2.341\* 10\*\*-8).";

}

leaf longitude {

type uint32 {

range 0..2097151;

}

config false;

default 0;

units radian;

description "Satellite orbital parameter: longitude of ascending node

OMEGA, see NIMA TR 8350.2.

Step of 2.341\* 10\*\*-8 rad.

Actual value = field value \* (2.341\* 10\*\*-8).";

}

leaf inclination {

type int32 {

range -524288..524287;

}

config false;

default 0;

units radian;

description "Satellite orbital parameter: inclination i,

see NIMA TR 8350.2.

Step of 2.341\* 10\*\*-8 rad.

Actual value = field value \* (2.341\* 10\*\*-8).";

}

leaf meanAnomaly {

type uint32 {

range 0..16777215;

}

config false;

default 0;

units radian;

description "Satellite orbital parameter: Mean anomaly M at epoch time,

see NIMA TR 8350.2.

Step of 2.341\* 10\*\*-8 rad.

Actual value = field value \* (2.341\* 10\*\*-8).";

}

}

grouping EphemerisGrp {

description "This data type represents the satellite ephemeris related

information. The ephemeris data format may be expressed either in

format of position and velocity state vector or in format of orbital

parameters.";

leaf satelliteId {

type string {

pattern "00([01][0-9][0-9])|(2[0-4][0-9]|(25[0-5]))";

}

config false;

description "This attribute indicates satellite Id.number.

It shall be formatted as a fixed 5-digit string, padding with

leading digits '0' to complete a 5-digit length.

allowedValues: 00000..00255";

}

leaf epochTime {

type yang:date-and-time;

config false;

description "It defines the ephemeris reference time.";

}

choice positionVelocity-or-orbital {

list positionVelocity {

description "It indicates ephemeris is in format of NTN payload

position and velocity state vectors.";

max-elements 1;

config false;

uses PositionVelocityGrp;

}

list orbital {

description "It indicates ephemeris is in orbital parameter ephemeris

format, as specified in NIMA TR 8350.2";

max-elements 1;

config false;

uses OrbitalGrp;

}

}

}

grouping EphemerisInfoSetGrp {

description "Represents the EphemerisInfoSet IOC";

list EphemerisInfos {

description "This is the list of Ephemeris related information.";

min-elements 1;

key idx;

leaf idx { type uint32; }

uses EphemerisGrp;

}

}

grouping NTNFunctionGrp {

description "Represents the NTNFunction IOC";

list nTNpLMNInfoList {

description "It defines which PLMNs that can be served by the NR NTN cell,

and which S-NSSAIs can be supported by the NR NTN cell for

corresponding PLMN in case of network slicing feature is supported.

The pLMNId of the first entry of the list is the PLMNId used to

construct the nCGI for the NR cell.";

min-elements 1;

ordered-by user;

key idx;

leaf idx { type uint32; }

uses types5g3gpp:PLMNInfo;

}

leaf-list nTNTAClist {

type types5g3gpp:NRTAC;

min-elements 1;

description "It is the list of Tracking Area Codes (either legacy TAC or

extended TAC) for NR NTN.

Legacy TAC and Extended TAC are defined in clause 9.3.3.10 of

TS 38.413.";

}

}

grouping NTNFunctionSubtreeGrp {

list NTNFunction {

description "This IOC contains attributes to support the non-terrestrial

NR access.";

key id;

max-elements 1;

uses top3gpp:Top\_Grp;

container attributes {

uses NTNFunctionGrp;

}

list EphemerisInfoSet {

description "This IOC represents the satellite ephemeris information

describing the orbital trajectory information or coordinates for the

NTN vehicles.";

key id;

uses top3gpp:Top\_Grp;

container attributes {

uses EphemerisInfoSetGrp;

}

}

}

}

augment "/subnet3gpp:SubNetwork" {

if-feature NTNFunctionUnderSubNetwork;

uses NTNFunctionSubtreeGrp;

}

augment "/me3gpp:ManagedElement" {

if-feature NTNFunctionUnderManagedElement;

uses NTNFunctionSubtreeGrp;

}

}

<CODE ENDS>

\*\*\* END OF CHANGE 18 \*\*\*