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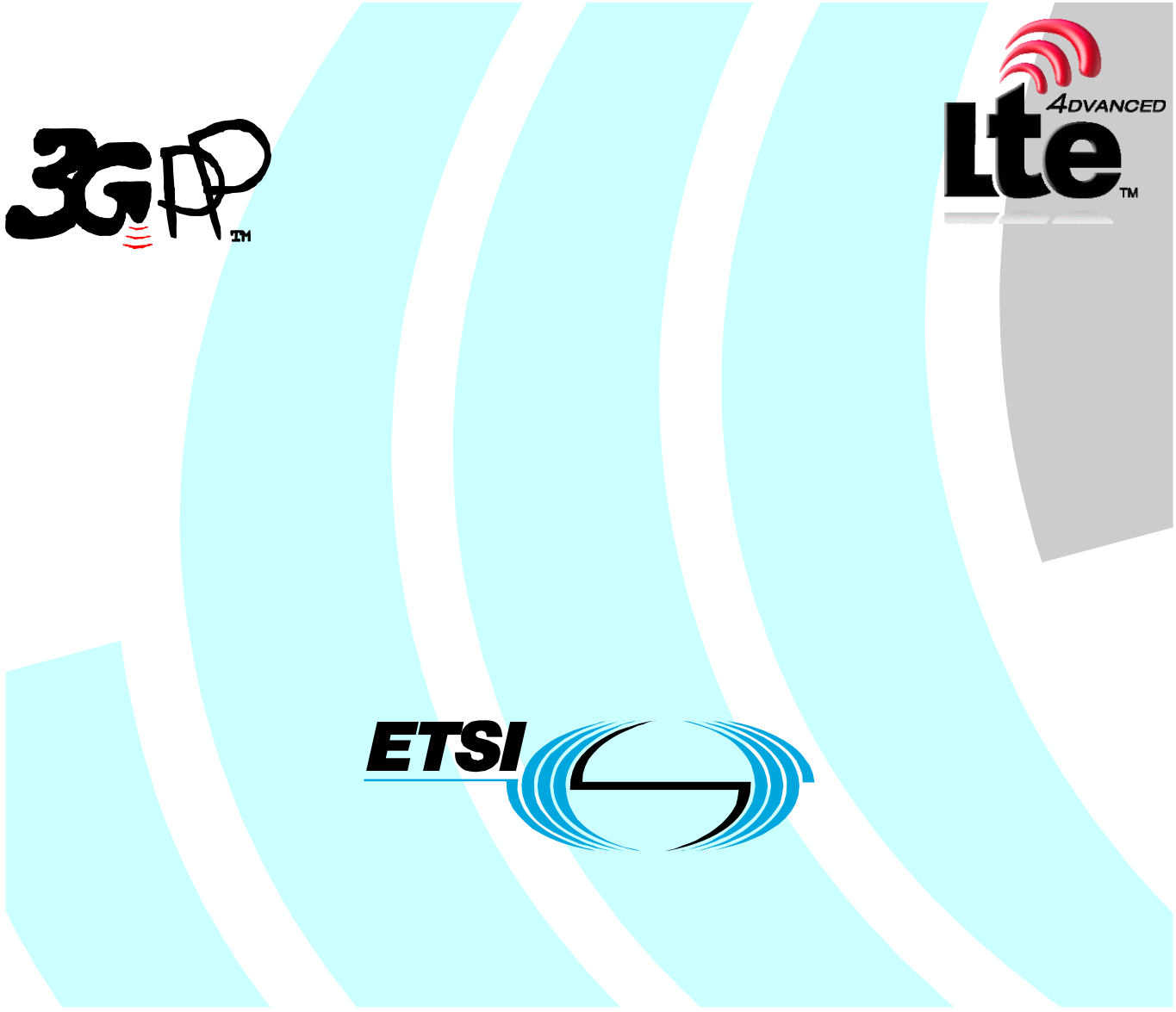
*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);**
**Universal Mobile Telecommunications System (UMTS);**
**LTE;**
**Telecommunication management;**
**Configuration Management (CM);**
**GERAN network resources Integration Reference Point (IRP);**
**Solution Set (SS) definitions**
**(3GPP TS 32.656 version 10.3.0 Release 10)**



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# Foreword

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

# Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

32.651: Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Requirements

32.652: Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)

**32.656: Configuration Management (CM); GERAN network resources Integration Reference Point (IRP); Solution Set (SS) definitions**

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G-network as it evolves. CM actions have the objective to control and monitor the actual configuration on the NEs and NRs, and they may be initiated by the operator or functions in the OSs or NEs.

CM actions may be requested as part of an implementation programme (e.g. additions and deletions), as part of an optimisation programme (e.g. modifications), and to maintain the overall Quality of Service (QoS). The CM actions are initiated either as a single action on a Network Element (NE) of the 3G-network or as part of a complex procedure involving actions on many NEs.

The Itf-N interface for Configuration Management is built up by a number of Integration Reference Points (IRPs) and a related Name Convention, which realise the functional capabilities over this interface. The basic structure of the IRPs is defined in 3GPP TS 32.101 [1] and 3GPP TS 32.102 [2]. For CM, a number of IRPs (and the Name Convention) are defined herein, used by this as well as other technical specifications for telecom management produced by 3GPP.

# 1 Scope

The present document specifies the Solution Sets for the GERAN NRM IRP.

This Solution Set specification is related to 3GPP TS 32.652 V10.1.X [4].

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.102: "Telecommunication management; Architecture".

[3] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[4] 3GPP TS 32.652: "Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

[5] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[6] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Information Service (IS)".

[7] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Solution Set (SS) definitions".

[8] W3C REC-xml-20001006: "Extensible Markup Language (XML) 1.0 (Second Edition)".

[9] W3C REC-xmlschema-0-20010502: "XML Schema Part 0: Primer".

[10] W3C REC-xmlschema-1-20010502: "XML Schema Part 1: Structures".

[11] W3C REC-xmlschema-2-20010502: "XML Schema Part 2: Datatypes".

[12] W3C REC-xml-names-19990114: "Namespaces in XML".

# 3 Definitions and abbreviations

## 3.1 Definitions

For terms and definitions please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 32.600 [3] and 3GPP TS 32.652 [4].

**XML file:** file containing an XML document

**XML document:** composed of the succession of an optional XML declaration followed by a root XML element

NOTE: See [8]; in the scope of the present document.

**XML declaration:** it specifies the version of XML being used

NOTE: See [8].

**XML element:** has a type, is identified by a name, may have a set of XML attribute specifications and is either composed of the succession of an XML start-tag followed by the XML content of the XML element followed by an XML end-tag, or composed simply of an XML empty-element tag; each XML element may contain other XML elements

NOTE: See [8].

**empty XML element:** having an empty XML content; an empty XML element still possibly has a set of XML attribute specifications; an empty XML element is either composed of the succession of an XML start-tag directly followed by an XML end-tag, or composed simply of an XML empty-element tag

NOTE: See [8].

**XML content (of an XML element):** empty if the XML element is simply composed of an XML empty-element tag; otherwise the part, possibly empty, of the XML element between its XML start-tag and its XML end-tag

**XML start-tag:** the beginning of a non-empty XML element is marked by an XML start-tag containing the name and the set of XML attribute specifications of the XML element

NOTE: See [8].

**XML end-tag:** the end of a non-empty XML element is marked by an XML end-tag containing the name of the XML element

NOTE: See [8].

**XML empty-element tag:** composed simply of an empty-element tag containing the name and the set of XML attribute specifications of the XML element.

NOTE: See [8].

**XML attribute specification:** has a name and a value

NOTE: See [8].

**DTD:** defines structure and content constraints to be respected by an XML document to be valid with regard to this DTD

NOTE: See [8].

**XML schema:** more powerful than a DTD, an XML schema defines structure and content constraints to be respected by an XML document to conform with this XML schema; through the use of XML namespaces several XML schemas can be used together by a single XML document; an XML schema is itself also an XML document that shall conform with the XML schema for XML schemas

NOTE: See [9], [10] and [11].

**XML namespace:** enables qualifying element and attribute names used in XML documents by associating them with namespaces identified by different XML schemas

NOTE: See [12], in the scope of the present document.

**XML complex type:** defined in an XML schema; cannot be directly used in an XML document; can be the concrete type or the derivation base type for an XML element type or for another XML complex type; ultimately defines constraints for an XML element on its XML attribute specifications and/or its XML content

NOTE: See [9], [10] and [11].

**XML element type:** declared by an XML schema; can be directly used in an XML document; as the concrete type of an XML element, directly or indirectly defines constraints on its XML attribute specifications and/or its XML content; can also be the concrete type or the derivation base type for another XML element type

NOTE: See [9], [10] and [11].

For additional terms and definitions please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 32.600 [3] and 3GPP TS 32.652 [4].

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| CM | Configuration Management |
| CORBA | Common Object Request Broker Architecture |
| DN | Distinguished Name |
| DTD | Document Type Definition |
| EDGE | Enhanced Data for GSM Evolution |
| GERAN | GSM/EDGE Radio Access Network |
| GSM | Global System for Mobile communication |
| IS | Information Service |
| IDL | Interface Definition Language (OMG) |
| IOC | Information Object Class |
| IRP | Integration Reference Point |
| IS | Information Service |
| MO | Managed Object |
| MOC | Managed Object Class |
| NRM | Network Resource Model |
| OMG | Object Management Group |
| SS | Solution Set |
| UMTS | Universal Mobile Telecommunications System |
| UTRAN | Universal Terrestrial Radio Access Network |
| XML | eXtensible Markup Language |

# 4 Solution Set Definitions

This specification defines the following 3GPP UTRAN NRM IRP Solution Set Definitions:

- 3GPP GERAN NRM IRP CORBA SS (Annex A)
- 3GPP GERAN NRM IRP XML Definitions (Annex B)

# Annex A (normative): CORBA Solution Set

This annex contains the CORBA Solution Set for the IRP whose semantics is specified in GERAN NRM IRP: Information Service (TS 32.652 [4]).

## A.1 Architectural features

The overall architectural feature of GERAN Network Resources IRP is specified in 3GPP TS 32.652 [4].
This clause specifies features that are specific to the CORBA SS.

### A.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [5].

### A.1.2 Rules for NRM extensions

This clause discusses how the models and IDL definitions provided in the present document can be extended for a particular implementation and still remain compliant with 3GPP SA5's specifications.

#### A.1.2.1 Allowed extensions

Vendor-specific MOCs may be supported. The vendor-specific MOCs may support new types of attributes.
The 3GPP SA5-specified notifications may be issued referring to the vendor-specific MOCs and vendor-specific attributes. New MOCs shall be distinguishable from 3GPP SA5 MOCs by name. 3GPP SA5-specified and vendor-specific attributes may be used in vendor-specific MOCs. Vendor-specific attribute names shall be distinguishable from existing attribute names.

NRM MOCs may be subclassed. Subclassed MOCs shall maintain the specified behaviour of the 3GPP SA5's superior classes. They may add vendor-specific behaviour with vendor-specific attributes. When subclassing, naming attributes cannot be changed. The subclassed MOC shall support all attributes of its superior class. Vendor-specific attributes cannot be added to 3GPP SA5 NRM MOCs without subclassing.

When subclassing, the 3GPP SA5-specified containment rules and their specified cardinality shall still be followed. As an example, ManagementNode (or its subclasses) shall be contained under SubNetwork (or its subclasses).

Managed Object Instances may be instantiated as CORBA objects. This requires that the MOCs be represented in IDL. 3GPP SA5's NRM MOCs are not currently specified in IDL, but may be specified in IDL for instantiation or subclassing purposes. However, management information models should not require that IRPManagers access the instantiated managed objects other than through supported methods in the present document.

Extension rules related to notifications (Notification categories, Event Types, Extended Event Types etc.) are for further study.

#### A.1.2.2 Extensions not allowed

The IDL specifications in the present document cannot be edited or altered. Any additional IDL specifications shall be specified in separate IDL files.

IDL interfaces (note: not MOCs) specified in the present document may not be subclassed or extended. New interfaces may be defined with vendor-specific methods.

# A.2 Mapping

## A.2.1 General mapping

Attributes modelling associations as defined in the NRM (here also called "reference attributes") are in this SS mapped to attributes. The names of the reference attributes in the NRM are mapped to the corresponding attribute names in the MOC. When the cardinality for an association is 0..1 or 1..1 the datatype for the reference attribute is defined as an MOReference. The value of an MO reference contains the distinguished name of the associated MO. When the cardinality for an association allows more than one referred MO, the reference attribute will be of type MOReferenceSet, which contains a sequence of MO references.

## A.2.2 Information Object Class (IOC) mapping

This Solution Set supports reference attributes for relations other than containment relations between objects. Reference attributes are therefore introduced in each MOC where needed.

### A.2.2.1 IOC BssFunction

**Mapping from NRM IOC BssFunction attributes to SS equivalent MOC BssFunction attributes**

| NRM Attributes of IOC BssFunction in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | bssFunctionId | string | M | M | - |
| userLabel | userLabel | string | M | M | M |

### A.2.2.2 IOC BtsSiteMgr

**Mapping from NRM IOC BtsSiteMgr attributes to SS equivalent MOC BtsSiteMgr attributes**

| NRM Attributes of IOC BtsSiteMgr in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | btsSiteMgrId | string | M | M | - |
| userLabel | userLabel | string | M | M | M |
| latitude | latitude | long | O | M | M |
| longitude | longitude | long | O | M | M |
| operationalState | operationalState | StateManagementIRPOptConstDefs::OperationalStateTypeOpt | O | M | - |

### A.2.2.3 IOC GsmCell

**Mapping from NRM IOC GsmCell attributes to SS equivalent MOC GsmCell attributes**

| NRM Attributes of IOC GsmCell in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | gsmCellId | string | M | M | - |
| userLabel | userLabel | string | M | M | M |
| cellIdentity | cellIdentity | long | M | M | M |
| cellAllocation | cellAllocation | GenericNetworkResourcesIRPSystem::AttributesTypes::LongSet | M | M | M |
| ncc | ncc | long | M | M | M |
| bcc | bcc | long | M | M | M |
| lac | lac | long | M | M | M |
| mcc | mcc | long | M | M | M |
| mnc | mnc | long | M | M | M |
| rac | rac | long | CM | M | M |
| racc | racc | long | CM | M | M |
| tsc | tsc | long | M | M | M |
| rxLevAccessMin | rxLevAccessMin | long | M | M | M |
| msTxPwrMaxCCH | msTxPwrMaxCCH | long | M | M | M |
| rfHoppingEnabled | rfHoppingEnabled | boolean | M | M | M |
| hoppingSequenceNumber | hoppingSequenceNumber | long | M | M | M |
| plmnPermitted | plmnPermitted | long | M | M | M |
| NOTE 1: For all support qualifiers with the value “CM” see attribute constraints in TS 32.652 [4]. | | | | | |

### A.2.2.4 IOC GsmRelation

**Mapping from NRM IOC GsmRelation attributes to SS equivalent MOC GsmRelation attributes**

| NRM Attributes of IOC GsmRelation in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | gsmRelationId | string | M | M | - |
| adjacentCell | adjacentCell | string | M | M | M |
| bcchFrequency | bcchFrequency | long | CM | M | - |
| ncc | ncc | long | CM | M | - |
| bcc | bcc | long | CM | M | - |
| lac | lac | long | CM | M | - |
| NOTE 1: For all support qualifiers with the value “CM” see attribute constraints in TS 32.652 [4]. | | | | | |

### A.2.2.5 IOC ExternalGsmCell

**Mapping from NRM IOC ExternalGsmCell attributes to SS equivalent MOC ExternalGsmCell attributes**

| NRM Attributes of IOC ExternalGSMCell in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | externalGsmCellId | string | M | M | - |
| userLabel | userLabel | string | M | M | M |
| cellIdentity | cellIdentity | long | M | M | M |
| bcchFrequency | bcchFrequency | long | M | M | M |
| ncc | ncc | long | M | M | M |
| bcc | bcc | long | M | M | M |
| Lac | lac | long | M | M | M |
| mcc | mcc | long | M | M | M |
| mnc | mnc | long | M | M | M |
| rac | rac | long | CM | M | M |
| racc | racc | long | CM | M | M |
| NOTE 1: For all support qualifiers with the value “CM” see attribute constraints in TS 32.652 [4]. | | | | | |

### A.2.2.6 IOC ExternalBssFunction

**Mapping from NRM IOC ExternalBssFunction attributes to SS equivalent MOC ExternalBssFunction attributes**

| NRM Attributes of IOC ExternalBssFunction in TS 32.652 [4] | SS Attributes | SS Type | Support Qualifier | Read | Write |
|---|---|---|---|---|---|
| id | externalBssFunctionId | string | M | M | - |
| userLabel | userLabel | string | M | M | M |

# A.3 Solution Set definitions

## A.3.1 IDL definition structure

Clause A.3.2 defines the MO classes for the GERAN NRM IRP.

## A.3.2 IDL specification "GeranNetworkResourcesNRMDefs.idl"

```
//File: GeranNetworkResourcesNRMDefs.idl
#ifndef GeranNetworkResourcesNRMDefs_idl
#define GeranNetworkResourcesNRMDefs_idl
#include "GenericNetworkResourcesNRMDefs.idl"
#pragma prefix "3gppsa5.org"
/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module GeranNetworkResourcesNRMDefs
{

      /**
       *  Definitions for MO class BssFunction
       */
      interface BssFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "BssFunction";
         // Attribute Names
         //
         const string bssFunctionId = "bssFunctionId";
};
      /**
       *  Definitions for MO class BtsSiteMgr
       */
      interface BtsSiteMgr : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "BtsSiteMgr";
         // Attribute Names
         //
         const string btsSiteMgrId = "btsSiteMgrId";
         const string latitude = "latitude";
         const string longitude = "longitude";
         const string operationalState = "operationalState";
};
      /**
       *  Definitions for MO class GsmCell
       */
      interface GsmCell : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "GsmCell";
         // Attribute Names
         //
         const string gsmCellId = "gsmCellId";
         const string cellIdentity = "cellIdentity";
         const string cellAllocation = "cellAllocation";
         const string ncc = "ncc";
         const string bcc = "bcc";
         const string lac = "lac";
         const string mcc = "mcc";
         const string mnc = "mnc";
         const string rac = "rac";
         const string racc = "racc";
         const string tsc = "tsc";
         const string rxLevAccessMin = "rxLevAccessMin";
         const string msTxPwrMaxCCH = "msTxPwrMaxCCH";
         const boolean rfHoppingEnabled = "rfHoppingEnabled";
         const string hoppingSequenceNumber = "hoppingSequenceNumber";
         const string plmnPermitted = "plmnPermitted";
};
      /**
       *  Definitions for MO class GsmRelation
       */
```

```
      interface GsmRelation :GenericNetworkResourcesNRMDefs::Top
      {
         const string CLASS = "GsmRelation";
         // Attribute Names
         //
         const string gsmRelationId = "gsmRelationId";
         const string adjacentCell = "adjacentCell";
         const string bcchFrequency = "bcchFrequency";
         const string ncc = "ncc";
         const string bcc = "bcc";
         const string lac = "lac";
};
      /**
       *  Definitions for MO class ExternalGsmCell
       */
      interface ExternalGsmCell : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "ExternalGsmCell";
         // Attribute Names
         //
         const string externalGsmCellId = "externalGsmCellId";
         const string cellIdentity = "cellIdentity";
         const string bcchFrequency = "bcchFrequency";
         const string ncc = "ncc";
         const string bcc = "bcc";
         const string lac = "lac";
         const string mcc = "mcc";
         const string mnc = "mnc";
         const string rac = "rac";
         const string racc = "racc";
};
      /**
       *  Definitions for MO class ExternalBssFunction
       */
      interface ExternalBssFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "ExternalBssFunction";
         // Attribute Names
         //
         const string externalBssFunctionId = "externalBssFunctionId";
};
};
#endif
```

# Annex B (normative): XML Definitions

This annex contains the XML Definitions for the GERAN NRM IRP as it applies to Itf-N, in accordance with GERAN NRM IRP IS definitions [4].

## B.1 Architectural features

The overall architectural feature of GERAN Network Resources IRP is specified in 3GPP TS 32.652 [4].
This clause specifies features that are specific to the Schema definitions.

### B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [5].

## B.2 Mapping

### B.2.1 General mapping

An IOC maps to an XML element of the same name as the IOC's name in the IS. An IOC attribute maps to a sub-element of the corresponding IOC's XML element, and the name of this sub-element is the same as the attribute's name in the IS.

### B.2.2 Information Object Class (IOC) mapping

Not present in the current version of this specification.

# B.3 Solution Set definitions

## B.3.1 XML definition structure

The overall description of the file format of configuration data XML files is provided by 3GPP TS 32.616 [7].

Annex B.3.3 of the present document defines the NRM-specific XML schema `geranNrm.xsd` for the GERAN Network Resources IRP NRM defined in 3GPP TS 32.652 [4].

XML schema `geranNrm.xsd` explicitly declares NRM-specific XML element types for the related NRM.

The definition of those NRM-specific XML element types complies with the generic mapping rules defined in 3GPP TS 32.616 [7].

## B.3.2 Graphical Representation

Not present in the current version of this specification.

## B.3.3 XML schema "geranNrm.xsd"

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

<!--
  3GPP TS 32.656 GERAN Network Resources IRP
  Bulk CM Configuration data file NRM-specific XML schema
  geranNrm.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.656#geranNrm"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:xn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.626#genericNrm"
  xmlns:un=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.646#utranNrm"
  xmlns:gn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.656#geranNrm"
  xmlns:sm=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.676#stateManagementIRP"
>

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.626#genericNrm"
  />
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.646#utranNrm"
  />
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.676#stateManagementIRP"
  />

  <!-- GERAN Network Resources IRP NRM class associated XML elements -->

  <element
    name="BssFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
                <complexType>
                <all>
                  <element name="userLabel"/>
                </all>
              </complexType>
              </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="gn:BtsSiteMgr"/>
              <element ref="xn:VsDataContainer"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <element name="BtsSiteMgr">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
                <complexType>
                <all>
                  <element name="userLabel"/>
                  <element name="latitude" minOccurs="0"/>
                  <element name="longitude" minOccurs="0"/>
```

```
              <element
                 name="operationalState"
                 type="sm:operationalStateType"
                 minOccurs="0"
              />
             </all>
           </complexType>
           </element>
         <choice minOccurs="0" maxOccurs="unbounded">
           <element ref="gn:GsmCell"/>
           <element ref="xn:VsDataContainer"/>
         </choice>
       </sequence>
     </extension>
   </complexContent>
  </complexType>
</element>

<element name="GsmCell">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
              <complexType>
              <all>
                <element name="userLabel"/>
                <element name="cellIdentity"/>
                <element name="cellAllocation"/>
                <element name="ncc"/>
                <element name="bcc"/>
                <element name="lac"/>
                <element name="mcc"/>
                <element name="mnc"/>
                <element name="rac" minOccurs="0"/>
                <element name="racc" minOccurs="0"/>
                <element name="tsc" minOccurs="0"/>
                <element name="rxLevAccessMin"/>
                <element name="msTxPwrMaxCCH"/>
                <element name="hoppingSequenceNumber"/>
                <element name="plmnPermitted"/>
              </all>
            </complexType>
            </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="gn:GsmRelation"/>
            <element ref="un:UtranRelation"/>
            <element ref="xn:VsDataContainer"/>
            <element ref="gn:GsmCellOptionallyContainedNrmClass"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="GsmRelation">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
              <complexType>
              <all>
                <element name="adjacentCell"/>
                <element name="bcchFrequency" minOccurs="0"/>
                <element name="ncc" minOccurs="0"/>
                <element name="bcc" minOccurs="0"/>
                <element name="lac" minOccurs="0"/>
              </all>
            </complexType>
            </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
```

```
    </complexType>
  </element>

  <element
    name="ExternalGsmCell"
    substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
                <complexType>
                <all>
                  <element name="userLabel"/>
                  <element name="cellIdentity"/>
                  <element name="bcchFrequency"/>
                  <element name="ncc"/>
                  <element name="bcc"/>
                  <element name="lac"/>
                  <element name="mcc"/>
                  <element name="mnc"/>
                  <element name="rac" minOccurs="0"/>
                  <element name="racc" minOccurs="0"/>
                </all>
              </complexType>
              </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="xn:VsDataContainer"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <element
    name="ExternalBssFunction"
    substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
                <complexType>
                <all>
                  <element name="userLabel"/>
                </all>
              </complexType>
              </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="gn:ExternalGsmCell"/>
              <element ref="xn:VsDataContainer"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>
<element name="GsmCellOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
</schema>
```

# Annex C (informative): Change history

| Change history | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Cat** | **Old** | **New** |
| 05-2010 | SA-48 | SP-100276 | -- | -- | Presentation to SA for information and approval | -- | --- | 1.0.0 |
| 06-2010 | SA-48 | -- | -- | -- | Publication | -- | 1.0.0 | 10.0.0 |
| 10-2010 | SA-49 | SP-100489 | 001 | -- | Add rfHoppingEnabled attribute in GsmCell IOC | B | 10.0.0 | 10.1.0 |
| 12-2010 | SA-50 | SP-100833 | 002 | 1 | Correcting XML schema of GERAN NRM - Align with 32.652 IS | F | 10.1.0 | 10.2.0 |
| 03-2011 | SA-51 | SP-110096 | 003 | 2 | Correcting the support qualifier of attributes tsc and bcchFrequency - Align with GERAN NRM IS | | 10.2.0 | 10.3.0 |
| 03-2011 | SA-51 | SP-110095 | 004 | -- | Alignment with IS 32.652; Cleanup | | 10.2.0 | 10.3.0 |

# History

| Document history | | |
|---|---|---|
| V10.3.0 | April 2011 | Publication |
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