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*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);  
Telecommunication management;  
Configuration Management (CM);  
GERAN network resources Integration Reference Point (IRP);  
Common Object Request Broker Architecture (CORBA)  
Solution Set (SS)  
(3GPP TS 32.653 version 9.0.0 Release 9)**

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## Foreword

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  - 1 presented to TSG for information;
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## Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> 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)
- 32.653: Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)**
- 32.655: Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Bulk CM eXtensible Markup Language (XML) file format definition

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.

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# 1 Scope

The purpose of this *GERAN Network Resources IRP: CORBA Solution Set* is to define the mapping of the IRP information model (see 3GPP TS 32.652 [4]) to the protocol specific details necessary for implementation of this IRP in a CORBA/IDL environment.

This Solution Set specification is related to 3GPP TS 32.652 V9.0.X.

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# 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 32.303: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".
- [6] 3GPP TS 32.111-3: "Telecommunication management; Fault Management (FM); Part 3: Alarm Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

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# 3 Definitions and abbreviations

## 3.1 Definitions

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

## 3.2 Abbreviations

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

CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
IS	Information Service
IDL	Interface Definition Language
IOC	Information Object Class
IRP	Integration Reference Point

MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
SS	Solution Set

## 4 Architectural features

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

### 4.1 Notifications

Notifications are sent according to the Notification IRP: CORBA SS (see TS 32.303 [5]).

## 5 Mapping

### 5.1 General mappings

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.

### 5.2 GERAN NRM Information Object Class (IOC) mapping

#### 5.2.1 IOC BssFunction

**Table 5.1: 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
bssFunctionId	bssFunctionId	string	M	M	-
userLabel	userLabel	string	M	M	M

#### 5.2.2 IOC BtsSiteMgr

**Table 5.2: 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
btsSiteMgrId	btsSiteMgrId	string	M	M	-
userLabel	userLabel	string	M	M	M
latitude	latitude	long	O	M	M
longitude	longitude	long	O	M	M
operationalState	operationalState	StateManagementIRP OptConstDefs::OperationalStateTypeOpt	O	M	-

### 5.2.3 IOC GsmCell

Table 5.3: 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
gsmCellId	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	O	M	M
racc	racc	long	O	M	M
tsc	tsc	long	M	M	M
rxLevAccessMin	rxLevAccessMin	long	M	M	M
msTxPwrMaxCCH	msTxPwrMaxCCH	long	M	M	M
hoppingSequenceNumber	hoppingSequenceNumber	long	M	M	M
plmnPermitted	plmnPermitted	long	M	M	M

### 5.2.4 IOC GsmRelation

Table 5.4: 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
gsmRelationId	gsmRelationId	string	M	M	-
adjacentCell	adjacentCell	string	M	M	M
bcchFrequency	bcchFrequency	long	O	M	-
ncc	ncc	long	O	M	-
bcc	bcc	long	O	M	-
lac	lac	long	O	M	-

### 5.2.5 IOC ExternalGsmCell

Table 5.5: 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
externalGsmCellId	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	O	M	M
racc	racc	long	O	M	M



## 5.2.6 IOC ExternalBssFunction

**Table 5.6: 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
externalBssFunctionId	externalBssFunctionId	string	M	M	-
userLabel	userLabel	string	M	M	M

# 6 Rules for management information model 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.

## 6.1 Allowed extensions

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

NRM IOCs may be subclassed. Subclassed IOCs 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 IOC shall support all attributes of its superior class. Vendor-specific attributes cannot be added to 3GPP SA5 NRM IOCs 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 IOCs 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 in 3GPP's Releases 5.

## 6.2 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 IOCs) specified in the present document may not be subclassed or extended. New interfaces may be defined with vendor-specific methods.

## Annex A (normative): CORBA IDL, NRM Definitions

### A.1 IDL specification (file name "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 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 (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Jun 2001	SA_12	SP-010283	--	--	Approved at TSG SA #12 and placed under Change Control	--	2.0.0	4.0.0
Dec 2001	SA_14	SP-010651	0001	--	Addition of MCC and MNC in the object model	F	4.0.0	4.1.0
Dec 2001	SA_14	SP-010646	0002	--	Change type "integer" to "long" in the GERAN Network Resources IRP: CORBA SS	F	4.0.0	4.1.0
Sep 2002	SA_17	SP-020497	0003	--	Upgrade to Rel-5	C	4.1.0	5.0.0
Dec 2002	--	--	--	--	Cosmetics	--	5.0.0	5.0.1
Jun 2003	SA_20	SP-030283	0005	--	Deletion of GERAN attribute relationType from CORBA SS	A	5.0.1	5.1.0
Sep 2003	SA_21	SP-030418	0006	--	Inclusion of External BSS Function in GERAN CORBA solution set - Alignment with 32.652	F	5.1.0	5.2.0
Sep 2004	SA_25	SP-040593	0007	--	Add the operationalState to the BtsSiteMgr – Align the CORBA SS with 32.652 CM; GERAN network resources IRP NRM	F	5.2.0	5.3.0
Sep 2004	SA_25	SP-040567	0008	--	Correction in Rules for NRM extensions - Align with 32.622 (Generic NRM IS)	F	5.2.0	5.3.0
Sep 2004	SA_25	SP-040581	0009	--	Add Inheritance in CORBA IDL	B	5.3.0	6.0.0
Dec 2005	SA_30	SP-050721	0010	--	Correct IDL syntax errors preventing clean compilation	F	6.0.0	6.1.0
Jun 2007	SA_36	--	--	--	Automatic upgrade to Rel-7 (no CR) at freeze of Rel-7. Deleted reference to CMIP SS, discontinued from R7 onwards.	--	6.1.0	7.0.0
Sep 2007	SA_37	SP-070606	0012	--	Correct CORBA Solution Set Tables	A	7.0.0	7.1.0
Dec 2008	SA_42	--	--	--	Upgrade to Release 8	--	7.1.0	8.0.0
Dec 2009	-	-	-	-	Update to Rel-9 version (MCC)	-	8.0.0	9.0.0

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## History

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