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Technical Specification

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Generic network resources Integration Reference Point (IRP):
CORBA solution set
(3GPP TS 32.623 version 5.0.0 Release 5)

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Foreword

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- x the first digit:
  - 1 presented to TSG for information;
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Introduction

This is the specification for Generic Network Resource Model (NRM) for Configuration Management (CM).

1 Scope

The TS 32.620 series (Generic Network Resources IRP) defines an Integration Reference Point (IRP) through which an "IRPAgent" (typically an Element Manager or Network Element) can communicate Network Management related information to one or several "IRPManagers" (typically Network Managers).

This series of documents specifies a generic Network Resource Model, NRM (also referred to as a Management Information Model - MIM) with definitions of Information Object Classes and Managed Object Classes.

The present document specifies the Corba Solution set.

This Solution Set specification is related to 3GPP TS 32.622 V5.0.X.

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: "3G Telecom Management principles and high level requirements".

[2] 3GPP TS 32.102: "3G Telecom Management architecture".

[3] 3GPP TS 32.600: "Configuration Management (CM); Concept and main requirements".

[4] 3GPP TS 32.622: "Generic network resources Integration Reference Point (IRP); Network Resource Model (NRM)".

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

[6] OMG Notification Service, Version 1.0.

[7] OMG CORBA services: Common Object Services Specification, Update: November 22, 1996.

[8] The Common Object Request Broker: Architecture and Specification (for specification of valid version, see [1]).

[9] 3GPP TS 32.303: "Configuration Management (CM); Notification Integration Reference Point (IRP); CORBA solution set".

[10] 3GPP TS 32.111-3: "Fault Management; Part 3: Alarm Integration Reference Point (IRP): CORBA solution set".

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 32.622 [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 (OMG)
IRP	Integration Reference Point
MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
OMG	Object Management Group
SS	Solution Set

4 Architectural features

The overall architectural feature of Generic Network Resources IRP is specified in 3GPP TS 32.622 [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 3GPP TS 32.303 [9]).

The contents of the Basic CM IRP notifications are defined in the present document.

4.2 Filter language

The filter language used in the SS is the Extended Trader Constraint Language (see OMG Notification Service [6]). IRPAgents may throw a FilterComplexityLimit exception when a given filter is too complex. However, for 3GPP Release 99 an "empty filter" shall be used i.e. a filter that satisfies all MOs of a scoped search (this does not affect the filter for notifications as defined in the Notification IRP – see 3GPP TS 32.303 [9]).

4.3 Syntax for Distinguished Names and Versions

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

The Version of this IRP is represented as a string.

5 New methodology Mapping

5.1 General mappings

The IS parameter name managedObjectInstance is mapped into DN.

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.

If a reference attribute is changed, an AttributeValueChange notification is emitted.

5.2 Generic NRM 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.

5.2.1 IOC SubNetwork

Table 10: Mapping from NRM IOC SubNetwork attributes to SS equivalent MOC SubNetwork attributes

NRM Attributes of IOC SubNetwork in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
subNetworkId	subNetworkId	string	Read-Only, M
dnPrefix	dnPrefix	string	Read-Only, M
userLabel	userLabel	string	Read-Write, M
userDefinedNetworkType	userDefinedNetworkType	string	Read-Only, M

5.2.2 IOC ManagedElement

Table 11: Mapping from NRM IOC ManagedElement attributes and association roles to SS equivalent MOC ManagedElement attributes

NRM Attributes/Association roles	SS Attributes	SS Type	Qualifier
managedElementId	managedElementId	string	Read-Only, M
dnPrefix	dnPrefix	string	Read-Only, M
userLabel	userLabel	string	Read-Write, M
locationName	locationName	string	Read-Only, M
vendorName	vendorName	string	Read-Only, M
userDefinedState	userDefinedState	string	Read-Write, M
managedElementType	managedElementType	GenericNRIRPSystem::AttributeTypes::StringSet	Read-Only, M
managedBy	managedBy	GenericNRIRPSystem::AttributeTypes::MOReferenceSet	Read-Only, M
swVersion	swVersion	string	Read-Only, M

5.2.3 IOC MeContext

Table 12: Mapping from NRM IOC MeContext attributes to SS equivalent MOC MeContext attributes

NRM Attributes of IOC MeContext in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
meContextId	meContextId	string	Read-Only, M
dnPrefix	dnPrefix	string	Read-Only, M

5.2.4 IOC ManagementNode

Table 13: Mapping from NRM IOC ManagementNode attributes and association roles to SS equivalent MOC ManagementNode attributes

NRM Attributes/association roles of IOC ManagementNode in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
managementNodeId	managementNodeId	string	Read-Only, M
userLabel	userLabel	string	Read-Write, M
locationName	locationName	string	Read-Only, M
vendorName	vendorName	string	Read-Only, M
userDefinedState	userDefinedState	string	Read-Write, M
manages	manages	GenericNRIRPSystem::AttributeTypes::MOReferenceSet	Read-Only, M
swVersion	swVersion	string	Read-Only, M

5.2.5 IOC VsDataContainer

Table 14: Mapping from NRM IOC VsDataContainer attributes and association roles to SS equivalent MOC VsDataContainer attributes

NRM Attributes/association roles of IOC VsDataContainer in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
vsDataContainerId	vsDataContainerId	string	Read-Only, M
vsDataType	vsDataType	string	Read-Only, M
vsData	vsData	any	Read-Write, M
vsDataFormatVersion	vsDataFormatVersion	string	Read-Only, M

5.2.6 IOC ManagedFunction

Table 15: Mapping from NRM IOC ManagedFunction attributes and association roles to SS equivalent MOC ManagedFunction attributes

NRM Attributes/association roles of IOC ManagedFunction in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
userLabel	userLabel	string	Read-Write, M

5.2.7 IOC IRPAgent

Table 16: Mapping from NRM IOC IRPAgent attributes to SS equivalent MOC IRPAgent attributes

NRM Attributes of IOC IRPAgent in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
irpAgentId	irpAgentId	string	Read-Only, M
systemDN	systemDN	string	Read-Only, M

5.2.8 IOC GenericIRP

This Information Object Class is provided for sub-classing only. Therefore no mapping for this class is provided in this document.

5.2.9 IOC Top

Table 17: Mapping from NRM IOC Top attributes to SS equivalent attributes in all MOCs

NRM Attributes of IOC Top in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
objectClass	CLASS	string	Read-Only, M
objectInstance	No direct mapping.		

6 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.

6.1 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). Also, in Rel-4, there may only be 0 or 1 ManagementNode (or its subclasses) 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.

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 MOCs) 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, Access Protocol

```
#ifndef GenericNetworkResourcesIRPSystem_idl
#define GenericNetworkResourcesIRPSystem_idl


#pragma prefix "3gppsa5.org"


module GenericNetworkResourcesIRPSystem
{
   /**
    * The format of Distinguished Name (DN) is specified in "Name Conventions
    * for Managed Objects revision B".
    */
   typedef string DN;


   /**
    *  This module adds datatype definitions for types
    *  used in the NRM which are not basic datatypes defined
    *  already in CORBA.
    */
   module AttributeTypes
   {
      /**
       * An MO reference referres to an MO instance.
       * "otherMO" contains the  distinguished name of the referred MO.
       * A conceptual "null" reference (meaning no MO is referenced)
       * is represented as an empty string ("").
       *
       */
      struct MOReference
      {
         DN otherMO;
      };

      /**
       * MOReferenceSet represents a set of MO references.
       * This type is used to hold 0..n MO references.
       * A referred MO is not allowed to be repeated (therefore
       * it is denoted as a "Set")
       */
      typedef sequence<MOReference> MOReferenceSet;


      /**
       *  A set of strings.
       */
      typedef sequence<string> StringSet;

      /**
       *  A set of long.
       */
      typedef sequence<long> LongSet;
   };

};
```

```
#endif
```

Annex B (normative): CORBA IDL, NRM Definitions

```
#ifndef GenericNetworkResourcesNRMDefs_idl
#define 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 GenericNetworkResourcesNRMDefs
{

      /**
       *  Definitions for MO class SubNetwork
       */
      interface SubNetwork
      {
         const string CLASS = "SubNetwork";

         // Attribute Names
         //
         const string subNetworkId = "subNetworkId";
         const string dnPrefix = "dnPrefix";
         const string userLabel = "userLabel";
         const string userDefinedNetworkType = "userDefinedNetworkType";
      };

      /**
       *  Definitions for MO class ManagedElement
       */
      interface ManagedElement
      {
         const string CLASS = "ManagedElement";

         // Attribute Names
         //
         const string managedElementId = "managedElementId";
         const string dnPrefix = "dnPrefix";
         const string managedElementType = "managedElementType";
         const string userLabel = "userLabel";
         const string vendorName = "vendorName";
         const string userDefinedState ="userDefinedState";
         const string locationName ="locationName";

         const string managedBy = "managedBy";

         const string swVersion = "swVersion";

      };


      /**
       *  Definitions for MO class MeContext
       */
      interface MeContext
      {
         const string CLASS = "MeContext";
```

```
   // Attribute Names
   //
   const string meContextId = "meContextId";
   const string dnPrefix = "dnPrefix";
};

/**
 *  Definitions for MO class ManagementNode
 */
interface ManagementNode
{
   const string CLASS = "ManagementNode";

   // Attribute Names
   //
   const string managementNodeId = "managementNodeId";
   const string userLabel = "userLabel";
   const string vendorName = "vendorName";
   const string userDefinedState = "userDefinedState";
   const string locationName = "locationName";
   const string manages = "manages";

   const string swVersion = "swVersion";
};


/**
 *  Definitions for abstract MO class ManagedFunction
 *
 */
interface ManagedFunction
{
   const string CLASS = "ManagedFunction";

   // Attribute Names
   //
   const string userLabel = "userLabel";
};


/**
 *  Definitions for MO class IRPAgent
 */
interface IRPAgent
{
   const string CLASS = "IRPAgent";

   // Attribute Names
   //
   const string irpAgentId = "irpAgentId";
   const string systemDN = "systemDN";
};
/**
 *  Definitions for MO class VsDataContainer
 */
interface VsDataContainer
{
   const string CLASS = “VsDataContainer”;

   // Attribute Names
   //
   const string vsDataContainerId = “vsDataContainerId”;
```

```
         const string vsDataType = “vsDataType”;
         const string vsData = “vsData”;
         const string vsDataFormatVersion = “vsDataFormatVersion”;
      };

};

#endif
```

Annex C (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Jun 2001	S_12	SP-010283	--	--	Approved at TSG SA #12 and placed under Change Control	2.0.0	4.0.0
Sep 2001	S_13	SP-010479	001	--	Missing Mapping table added and attribute qualifier corrected	4.0.0	4.1.0
Dec 2001	S_14	SP-010646	002	--	Change type "integer" to "long" in the Generic Network Resources IRP: CORBA SS	4.1.0	4.2.0
Dec 2001	S_14	SP-010647	003	--	Correction of Generic NRM CORBA Solution Set IDL definitions	4.1.0	4.2.0
Sep 2002	S_17	SP-020488	004	--	Upgrade the NRM CORBA Solution Set to Rel-5	4.2.0	5.0.0

History

Document history		
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