Technical Specification Group Services and System Aspects
Meeting #17, Biarritz, France, 9-12 September 2002

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Source: SA5 (Telecom Management)

Title: Rel-5 CRs 32.622/3/4 (Bulk CM Integration Reference Point (IRP)) - upgrade to Rel-5

Document for: Approval

Agenda Item: 7.5.3

Doc-1st-	Spec	CR	Rev	Phase	Subject	Cat	Version	Doc-	Workite	Relation
SP-020488	32.622	006	-	Rel-5	**Upgrade to Rel-5 (Add new IS method, MOC name convention)**	C	4.3.0	S5-026726	OAM-NIM	**Parent CR**
SP-020488	32.623	004	-	Rel-5	**Upgrade the NRM CORBA Solution Set to Rel-5**	C	4.2.0	S5-026712	OAM-NIM	**Child CR**
SP-020488	32.624	009	-	Rel-5	**Upgrade the NRM CMIP Solution Set to Rel-5**	C	4.4.0	S5-026727	OAM-NIM	**Child CR**

3GPP TSG-SA5 Meeting #30 ***Tdoc ⌘S5-026726***
Tampere, Finnland, 19. Aug. 02 – 23. Aug. 02

CR-Form-v7

CHANGE REQUEST

⌘ **32.622** **CR** **006** ⌘ **rev** **-** ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [ ] Radio Access Network [X] Core Network [X]

Title:	⌘	Move to Rel-5 (Add new IS method, MOC name convention)
Source:	⌘	S5
Work item code:	⌘	OAM-NIM
Date:	⌘	23/08/2002
Category:	⌘	**C**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction 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.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	1. Up from R5 TS 32.622 shall be produced with the new IRP methodology. This CR presents the all technical stuff of R4 with the new IRP methodology. 2. A recommendation for characters in MOC names should be added in order to avoid need for extra translation mechanisms in manager/agent Java environments.
Summary of change:	⌘	1. The whole document was produced with the new IRP methodology. 2. A new annex (Annex A) is added.
Consequences if not approved:	⌘	The new methodology would not be applied and the application of Java would be impossible in some cases.

Clauses affected:	⌘	Chapter 4, 5, 6, 7, 8 and Annex A

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
	X		O&M Specifications	32.623 CORBA SS 32.624 CMIP SS

Other comments:	⌘	

Introduction

The interface Itf-N, defined in 3GPP TS 32.102 [2], 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].

~~Due to the growing number of specifications to model new services and Resource Models for Configuration Management (CM), as well as the expected growth in size of each of them from 3GPP Release 4 onwards, a new structure of the specifications is already needed in Release 4. This structure is needed for several reasons, but mainly to enable more independent development and release for each part, as well as a simpler document identification and version handling. Another benefit would be that it becomes easier for bodies outside 3GPP, such as the ITU-T, to refer to telecom management specifications from 3GPP. The new structure of the specifications does not lose any information or functionality supported by the Release 1999.~~

~~In addition to the restructuring, the need to define some new IRPs for CM, compared to Release 1999, has also been identified. Firstly, a new IRP for the Bulk CM, and secondly, one for each of the NRM parts (Generic, Core Network, UTRAN and GERAN NRM).~~

~~Finally, the Notification IRP (in Release 1999: 32.106-1 to -4) and the Name convention for Managed Objects (in Release 1999: 32.106-8) have been moved to a separate number series used for specifications common between several management areas (e.g. CM, FM, PM).~~

~~Table: Mapping between Release '99 and the new specification numbering scheme~~

~~R99 Old no.~~	~~Old (R99) specification title~~	~~Rel-4 New no.~~	~~New (Rel-4) specification title~~
~~32.106-1~~	~~3G Configuration Management: Concept and Requirements~~	~~32.600~~	~~**3G Configuration Management: Concept and High-level Requirements**~~
~~32.106-1~~	~~<Notification IRP requirements from 32.106-1 and 32.106-2>~~	~~32.301~~	~~**Notification IRP**: Requirements~~
~~32.106-2~~	~~Notification IRP: IS~~	~~32.302~~	~~Notification IRP: Information Service~~
~~32.106-3~~	~~Notification IRP: CORBA SS~~	~~32.303~~	~~Notification IRP: CORBA SS~~
~~32.106-4~~	~~Notification IRP: CMIP SS~~	~~32.304~~	~~Notification IRP: CMIP SS~~
~~32.106-8~~	~~Name convention for Managed Objects~~	~~32.300~~	~~**Name Convention for Managed Objects**~~
~~32.106-1~~	~~<Basic CM IRP IS requirements from 32.106-1 and 32.106-5>~~	~~32.601~~	~~**Basic CM IRP**: Requirements~~
~~32.106-5~~	~~Basic CM IRP IM (Intro & IS part)~~	~~32.602~~	~~Basic CM IRP: Information Service~~
~~32.106-6~~	~~Basic CM IRP CORBA SS (IS related part)~~	~~32.603~~	~~Basic CM IRP: CORBA SS~~
~~32.106-7~~	~~Basic CM IRP CMIP SS (IS related part)~~	~~32.604~~	~~Basic CM IRP: CMIP SS~~
~~32.106-8~~	~~Name convention for Managed Objects~~	~~32.300~~	~~**Name Convention for Managed Objects**~~
~~-~~	~~-~~	~~32.611~~	~~**Bulk CM IRP**: Requirements~~
~~-~~	~~-~~	~~32.612~~	~~Bulk CM IRP: Information Service~~
~~-~~	~~-~~	~~32.613~~	~~Bulk CM IRP: CORBA SS~~
~~-~~	~~-~~	~~32.614~~	~~Bulk CM IRP: CMIP SS~~
		~~32.615~~	~~Bulk CM IRP: XML file format definition~~
~~32.106-1~~	~~<Basic CM IRP Generic NRM requirements from 32.106-1 and 32.106-5>~~	~~32.621~~	~~**Generic Network Resources IRP**: Requirements~~
~~32.106-5~~	~~Basic CM IRP IM (Generic NRM part)~~	~~32.622~~	~~Generic Network Resources IRP: NRM~~
~~32.106-6~~	~~Basic CM IRP CORBA SS (Generic NRM related part)~~	~~32.623~~	~~Generic Network Resources IRP: CORBA SS~~
~~32.106-7~~	~~Basic CM IRP CMIP SS (Generic NRM related part)~~	~~32.624~~	~~Generic Network Resources IRP: CMIP SS~~
~~32.106-1~~	~~<Basic CM IRP CN NRM requirements from 32.106-1 and 32.106-5>~~	~~32.631~~	~~**Core Network Resources IRP**: Requirements~~
~~32.106-5~~	~~Basic CM IRP IM (CN NRM part)~~	~~32.632~~	~~Core Network Resources IRP: NRM~~
~~32.106-6~~	~~Basic CM IRP CORBA SS (CN NRM related part)~~	~~32.633~~	~~Core Network Resources IRP: CORBA SS~~
~~32.106-7~~	~~Basic CM IRP CMIP SS (CN NRM related part)~~	~~32.634~~	~~Core Network Resources IRP: CMIP SS~~
~~32.106-1~~	~~<Basic CM IRP UTRAN NRM requirements from 32.106-1 and 32.106-5>~~	~~32.641~~	~~**UTRAN Network Resources IRP**: Requirements~~
~~32.106-5~~	~~Basic CM IRP IM (UTRAN NRM part)~~	~~32.642~~	~~UTRAN Network Resources IRP: NRM~~
~~32.106-6~~	~~Basic CM IRP CORBA SS (UTRAN NRM related part)~~	~~32.643~~	~~UTRAN Network Resources IRP: CORBA SS~~
~~32.106-7~~	~~Basic CM IRP CMIP SS (UTRAN NRM related part)~~	~~32.644~~	~~UTRAN Network Resources IRP: CMIP SS~~
		~~32.651~~	~~**GERAN Network Resources IRP**: Requirements~~
		~~32.652~~	~~GERAN Network Resources IRP: NRM~~
		~~32.653~~	~~GERAN Network Resources IRP: CORBA SS~~
		~~32.654~~	~~GERAN Network Resources IRP: CMIP SS~~

1 Scope

The present document (Generic Network Resources IRP: Network Resource Model) 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).

The present document specifies a generic Network Resource Model, NRM (also referred to as a Management Information Model - MIM) with definitions of Managed Object Classes.

The Configuration Management (CM) area is very large. The intention is to split the specification of the related interfaces in several IRPs. In addition to the subject IRP, it is expected that IRPs will be defined for functional areas like Security management, Software management, Network & Service provisioning, etc. An important aspect of such a split is that the Network Resource Models (NRMs) defined in different IRPs are consistent. The Generic Network Resources IRP here provides a base for all resource modelling.

To summarize, the Generic Network Resources IRP main purpose is to define a generic Network Resource Model that constitutes a base from which other (more specialized) resource models can inherit or have associations with.

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 32.302: "Telecommunication Management; Configuration Management; Part 2: Notification Integration Reference Point; Information Service Version 1".

[4] ITU-T Recommendation M.3100 (07/95): "Generic Network Information Model".

[5] ITU-T Recommendation M.3100 Corrigendum 1 (07/98)".

[6] ITU-T Recommendation M.3100 Amendment 1 (03/99)".

[7] ITU-T Recommendation X.710 (1991): "Common Management Information Service Definition for CCITT Applications".

[8] ITU-T Recommendation X.721 (02/92): "Information Technology - Open Systems Interconnection – Structure of Management Information: Definition of Management Information".

[9] ITU-T Recommendation X.730 (01/92): "Information Technology - Open Systems Interconnection – Systems Management: Object Management Function".

[10] ITU-T Recommendation X.733 (02/92): "Information Technology - Open Systems Interconnection - Alarm Reporting Function".

[11] 3GPP TS 32.111-2: "Telecommunication Management; Fault Management; Part 2: Alarm Integration Reference Point; Information Service Version 1".

[13] 3GPP TS 32.300: "Name Convention for Managed Objects".

[14] 3GPP TS 32.600: "3G Configuration Management: Concepts and requirements".

[15] 3GPP TS 23.002: "Network Architecture".

[16] 3GPP TS 32.642: "UTRAN Network Resources IRP : Network Resource Model".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply. For terms and definitions not found here, please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.600 [14].

Association: In general it is used to model relationships between Managed Objects. Associations can be implemented in several ways, such as:

(1) name bindings,

(2) reference attributes, and

(3) association objects.

This IRP stipulates that containment associations shall be expressed through name bindings, but it does not stipulate the implementation for other types of associations as a general rule. These are specified as separate entities in the object models (UML diagrams). Currently however, all (non-containment) associations are modelled by means of reference attributes of the participating MOs.

Managed Element (ME): An instance of the Managed Object Class ManagedElement.

Managed Object (MO): In the context of the present document, a Managed Object (MO) is a software object that encapsulates the manageable characteristics and behaviour of a particular Network Resource. The MO is instance of a MO class defined in a MIM/NRM. An MO class has attributes that provide information used to characterize the objects that belong to the class (the term "attribute" is taken from TMN and corresponds to a "property" according to CIM). Furthermore, an MO class can have operations that represent the behaviour relevant for that class (the term "operation" is taken from TMN and corresponds to a "method" according to CIM). An MO class may support notifications that provide information about an event occurrence within a network resource.

Management Information Base (MIB): A MIB is an instance of an NRM and has some values on the defined attributes and associations specific for that instance. In the context of the present document, an MIB consists of:

(1) a Name space (describing the MO containment hierarchy in the MIB through Distinguished Names),

(2) a number of Managed Objects with their attributes and

(3) a number of Associations between these MOs. Also note that TMN (ITU-T Recommendation X.710 [7]) defines a concept of a Management Information Tree (also known as a Naming Tree) that corresponds to the name space (containment hierarchy) portion of this MIB definition. Figure 1 depicts the relationships between a Name space and a number of participating MOs (the shown association is of a non-containment type)

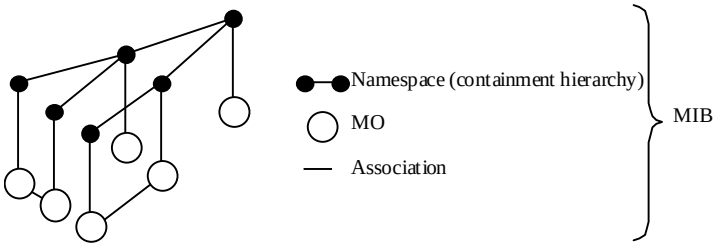


Figure 1: Relationships between a Name space and a number of participating MOs

Management Information Model (MIM): Also referred to as NRM – see the definition below.

Name space: A name space is a collection of names. The IRP name convention (see 3GPP TS 32.300 [13]) restricts the name space to a hierarchical containment structure, including its simplest form - the one-level, flat name space.
All Managed Objects in a MIB shall be included in the corresponding name space and the MIB/name space shall only support a strict hierarchical containment structure (with one root object). A Managed Object that contains another is said to be the superior (parent); the contained Managed Object is referred to as the subordinate (child). The parent of all MOs in a single name space is called a Local Root. The ultimate parent of all MOs of all managed systems is called the Global Root.

Network Resource Model (NRM): A model representing the actual managed telecommunications network resources that a System is providing through the subject IRP. An NRM describes Managed Object Classes, their associations, attributes and operations. The NRM is also referred to as "MIM" (see above), which originates from the ITU-T TMN.

Node B: A logical node responsible for radio transmission/reception in one or more cells to/from the User Equipment. It terminates the Iub interface towards the RNC.

3.2 Abbreviations

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

AUC	AUthentication Centre
BG	Border Gateway
CIM	Common Information Model
CMIP	Common Management Information Protocol
CMIS	Common Management Information Service
CN	Core Network
CORBA	Common Object Request Broker Architecture
DMTF	Distributed Management Task Force
DN	Distinguished Name (see 3GPP TS 32.300 [13])
EIR	Equipment Identity Register
EM	Element Manager
FM	Fault Management
GDMO	Guidelines for the Definition of Managed Objects
GGSN	Gateway GPRS Support Node
GMSC	Gateway MSC
GPRS	General Packet Radio System
HLR	Home Location Register
IDL	Interface Definition Language
IRP	Integration Reference Point
ITU-T	International Telecommunication Union, Telecommunication Sector
Iub	Interface between RNC and Node B
LDAP	Lightweight Directory Access Protocol
ME	Managed Element
MIB	Management Information Base
MIM	Management Information Model

MIT	Management Information Tree (or Naming Tree)
MO	Managed Object
MOC	Managed Object Class
MOI	Managed Object Instance
MSC	Mobile Services Switching Centre
NE	Network Element
NM	Network Manager
NR	Network Resource
NRM	Network Resource Model
OSI	Open Systems Interconnection
PM	Performance Management
RDN	Relative Distinguished Name (see 3GPP TS 32.300 [13])
RNC	Radio Network Controller
SGSN	Serving GPRS Support Node
SMI	Structure of Management Information
SMS	Short Message Service
SMS-GMSC	SMS Gateway MSC
SMS-IWMSC	SMS Interworking MSC
SNMP	Simple Network Management Protocol
SS	Solution Set
TMN	Telecommunications Management Network
UML	Unified Modelling Language
UMTS	Universal Mobile Telecommunications System
VLR	Visitor Location Register
WBEM	Web-Based Enterprise Management
XML	eXtensible Mark-up Language

4 System overview

4.1 System context

Figure 2 and Figure 3 identify system contexts of the subject IRP in terms of its implementation called IRPAgent and the user of the IRPAgent, called IRPManager. For a definition of IRPManager and IRPAgent, see 3GPP TS 32.102 [2].

The IRPAgent implements and supports the Generic Network Resources IRP. The IRPAgent can be an Element Manager (EM) or a mediator that interfaces one or more NEs (see Figure 2), or it can be a Network Element (NE) (see Figure 3). In the former case, the interfaces (represented by a thick dotted line) between the EM and the NEs are not subject of this IRP.

An IRPManager using this IRP shall choose one of the two System Contexts defined here, for each NE. For instance, if an EM is responsible for managing a number of NEs, the NM shall access this IRP through the EM and not directly to those NEs. For another IRP though, the System Context may be different.

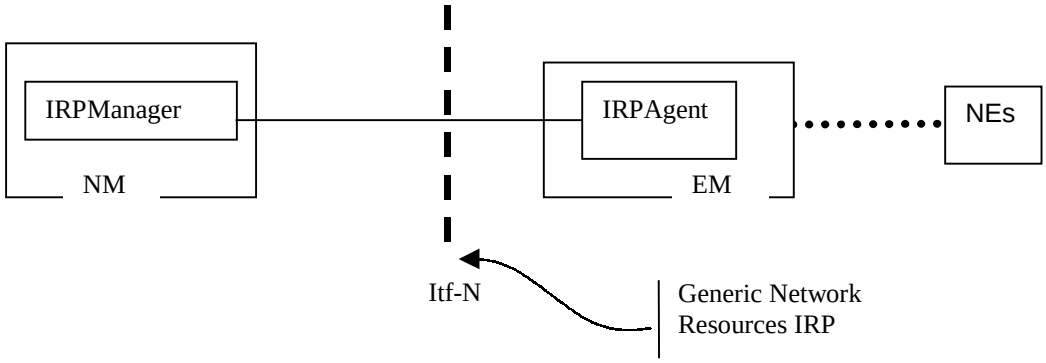


Figure 2: System Context A

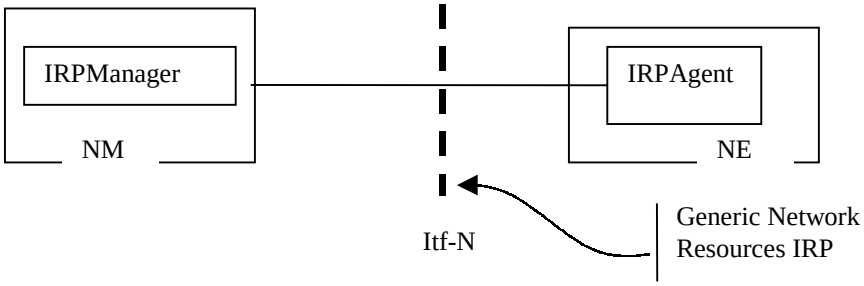


Figure 3: System Context B

4.2 Compliance rules

For general definitions of compliance rules related to qualifiers (Mandatory/Optional/Conditional) for *operations, notifications and parameters* (of operations and notifications) please refer to 3GPP TS 32.102 [2].

The following defines the meaning of Mandatory and Optional MOC attributes and associations between MOCs, in Solution Sets to the Basic CM IRP:

- The IRPManager shall support all mandatory attributes/associations. The IRPManager shall be prepared to receive information related to mandatory as well as optional attributes/associations without failure; however the IRPManager does not have to support handling of the optional attributes/associations.
- The IRPAgent shall support all mandatory attributes/associations. It may support optional attributes/associations.

An IRPAgent that incorporates vendor-specific extensions shall support normal communication with a 3GPP SA5-compliant IRPManager with respect to all Mandatory and Optional managed object classes, attributes, associations, operations, parameters and notifications without requiring the IRPManager to have any knowledge of the extensions.

Given that

- rules for vendor-specific extensions remain to be fully specified, and
- many scenarios under which IRPManager and IRPAgent interwork may exist,

it is recognised that in Release 4/5 the IRPManager, even though it is not required to have knowledge of vendor-specific extensions, may be required to be implemented with an awareness that extensions can exist and behave accordingly.

5 Modelling approach

This clause identifies the modelling approach adopted and used in this IRP.

As previously described, this IRP is structured in:

(1) requirements for a generic Network Resources Model, and

(2) an IRP Network Resource Model (the subject document) that specifies the interface in a protocol neutral manner, and

(3) a number of IRP Solution Sets that provide the actual definitions of object classes defined in the IRP Network Resources Model for each protocol environment.

Figure 4 shows the structure of the Generic Network Resources IRP (including a number of possible Solution Sets).

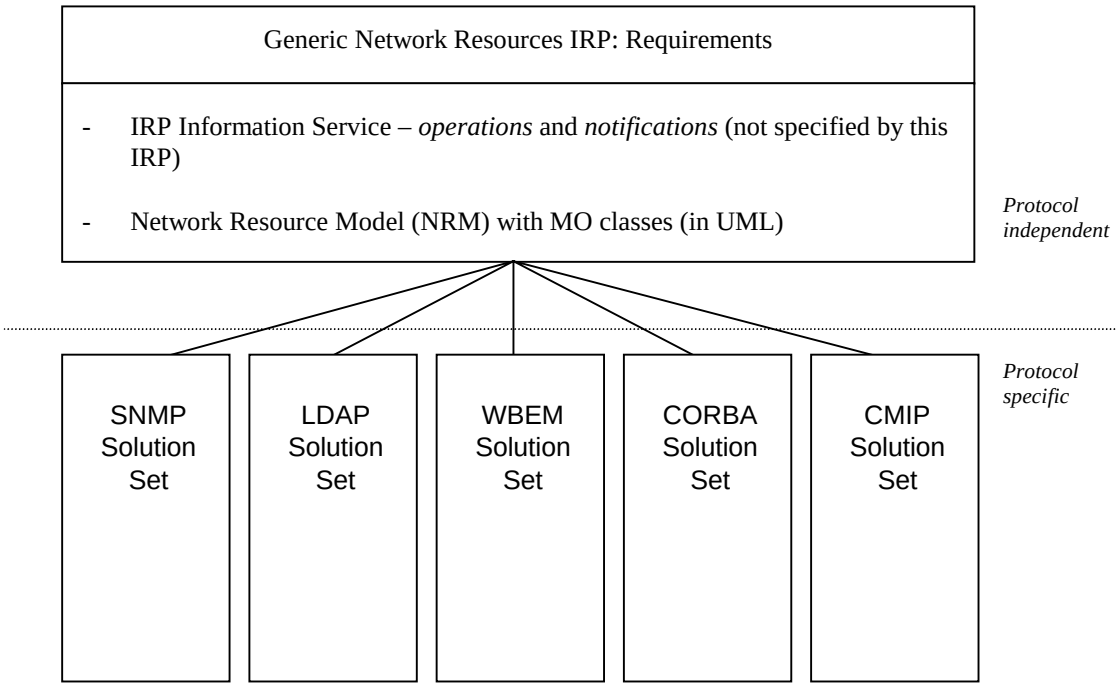


Figure 4: Generic Network Resources IRP Structure with example Solution Sets

The Network Resource Model (NRM)
is a protocol-independent model that specifies a number of Managed Object classes (with attributes and associations), which are relevant in the context of the subject IRP. Each Solution Set shall provide an implementation of this resource model with:

a) references to standard models that are applicable for the corresponding protocol environment, and

b) extensions to these standard models for the parts of the NRM that are not covered.

The NRM defined in the subject IRP bases its design mainly on work captured in ITU-T M.3100 [4], [5], [6]. However, as described in the Scope of the present document (clause 1): The model is highly simplified for the purpose of the NM, based on the assumption that all of the detailed CM actions, including fault correction after one or more alarms, are performed by an Element Manager which knows the vendor-specific NRM and configuration, and which is launched by the NM when necessary.

Moreover, the classes defined herein are very basic, only for the necessary support of Fault Management (FM) and Performance Management (PM), which means that they contain very few attributes – basically only for naming.

In addition, also some basic associations between some of the classes are defined.

Detailed mapping to the actual standard model is described in each Solution Set. It is important to note that if one selects a specific management protocol, one should also as base use existing *de-facto* conventions and standard resource models that are applicable to that protocol environment. Examples:

- SNMP Solution Sets (SMI-specifications) should be consistent with existing standard SNMP MIB-modules in order to function in an SNMP environment.
- CMIP Solution Sets (GDMO-specifications) should be based on standard models like ITU-T X.721 [8] and ITU-T M.3100 [4], [5], [6] in order to function in an OSI/TMN environment.
- WBEM Solution Sets (MOF/XML-specifications) should be based on CIM to function in a WBEM environment.

NOTE: CORBA Solution Sets are special in the sense that no such corresponding de-facto standard models exist, and CORBA/IDL is transparent to any model. Thus, one has full freedom to choose the same model for the CORBA Solution Set to this IRP, as the IRP Information Model defined herein.

Finally, all solution sets shall of course be consistent with the IRP Network Resource Model defined herein.

Clause 6 below defines an information model in terms of Information Object Classes (IOCs), attributes and relationships, according to the modelling approach described in TS 32.102 [2]. ~~Clause 7 defines a management information model in terms of Managed Object Classes (MOCs), according to the modelling approach used in Release 99.~~

6 Information Object Class definitions

6.1 Information object classes

6.1.1 Information entities imported and local labels

Label reference	Local label
32.111-2, notificatio, notifyAckStateChanged	notifyAckStateChanged
32.111-2, notification, notifyChangedAlarm	notifyChangedAlarm
32.111-2, notification, notifyClearedAlarm	notifyClearedAlarm
32.111-2, notification, notifyNewAlarm	notifyNewAlarm
32.111-2, notification, notifyComments	notifyComments
32.662, notification, notifyAttributeValueChanged	notifyAttributeValueChanged
32.662, notification, notifyObjectCreation	notifyObjectCreation
32.662, notification, notifyObjectDeletion	notifyObjectDeletion

~~None.~~

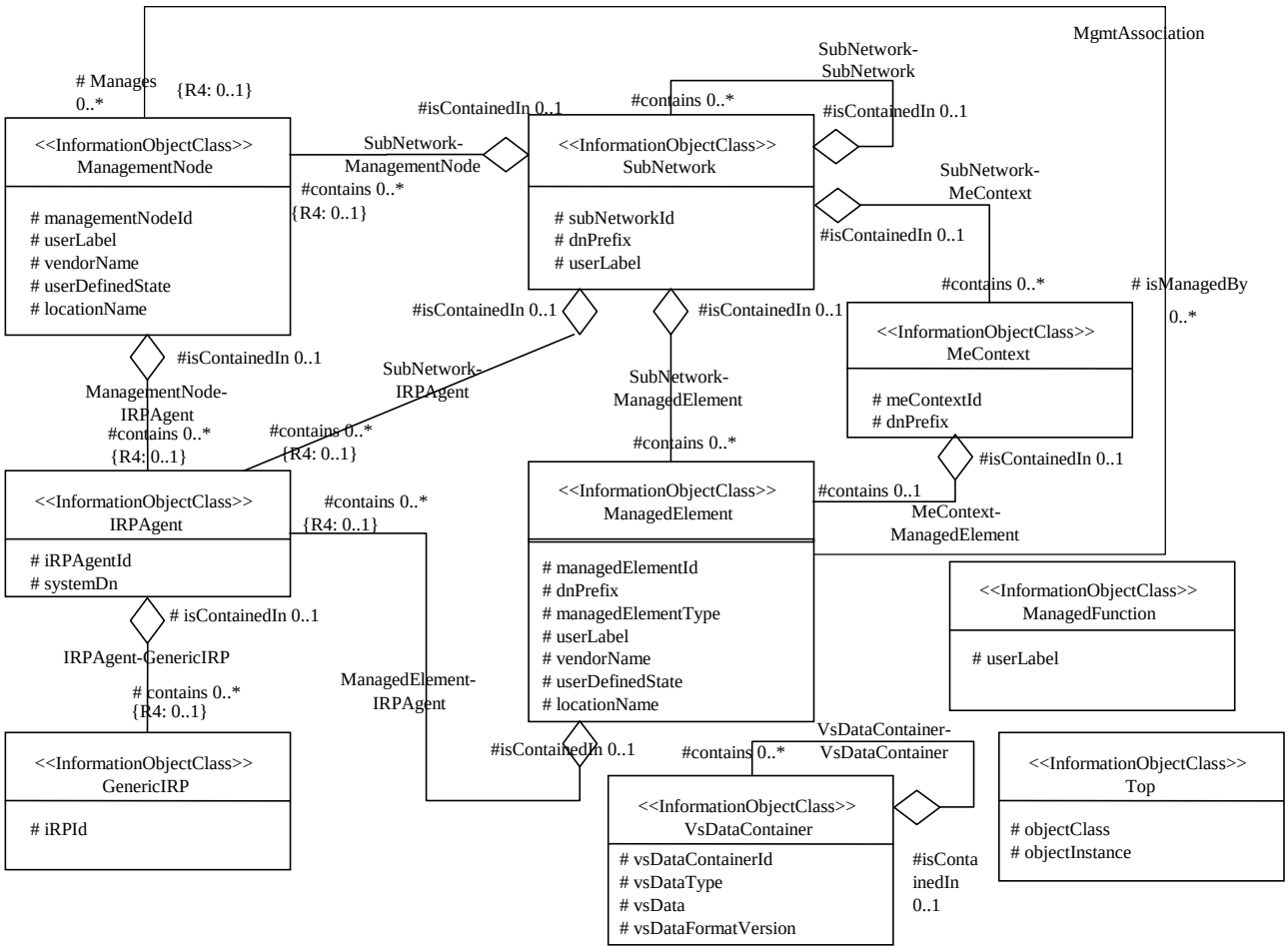
6.1.2 Class diagram

6.1.2.1 Attributes and relationships

This sub-clause depicts the set of IOCs that encapsulate information relevant for this service. This sub-clause provides the overview of all information object classes in UML. Subsequent sub-clauses provide~~s~~ more detailed specification of various aspects of these information object classes.

Figure 5 shows the containment/naming hierarchy and the associations of the generic information object classes defined in this TS.

NOTE: The information object containment relationships are, in the diagram(s) below, indicated by UML "Aggregation by reference" ("hollow diamonds").



NOTE 1: ManagedElement may be contained in either a SubNetwork or an MeContext instance, or have no parent instance at all.
NOTE 2: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.
NOTE 3: Each instance of the vsDataContainer shall only be contained under one MOC. The vsDataContainer can be contained under MOCs defined in other NRMs.
NOTE 4: If the configuration contains several instances of SubNetwork, exactly one SubNetwork instance shall directly or indirectly contain all the other SubNetwork instances.
NOTE 5: The SubNetwork instance not contained in any other instance of SubNetwork is referred to as "the root SubNetwork instance".
NOTE 6: ManagementNode shall be contained in the root SubNetwork instance.
NOTE 7: If contained in a SubNetwork instance, IRPAgent shall be contained in the root SubNetwork instance.

Figure 5: Generic NRM Containment/Naming and Association diagram

Each Managed Object is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [13] that expresses its containment hierarchy. As an example, the DN of a ManagedElement instance could have a format like:

`SubNetwork=Sweden,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1.`

6.1.2.2 Inheritance

This sub-clause depicts the inheritance relationships that exists between information object classes.

Figure 6 shows the inheritance diagram.

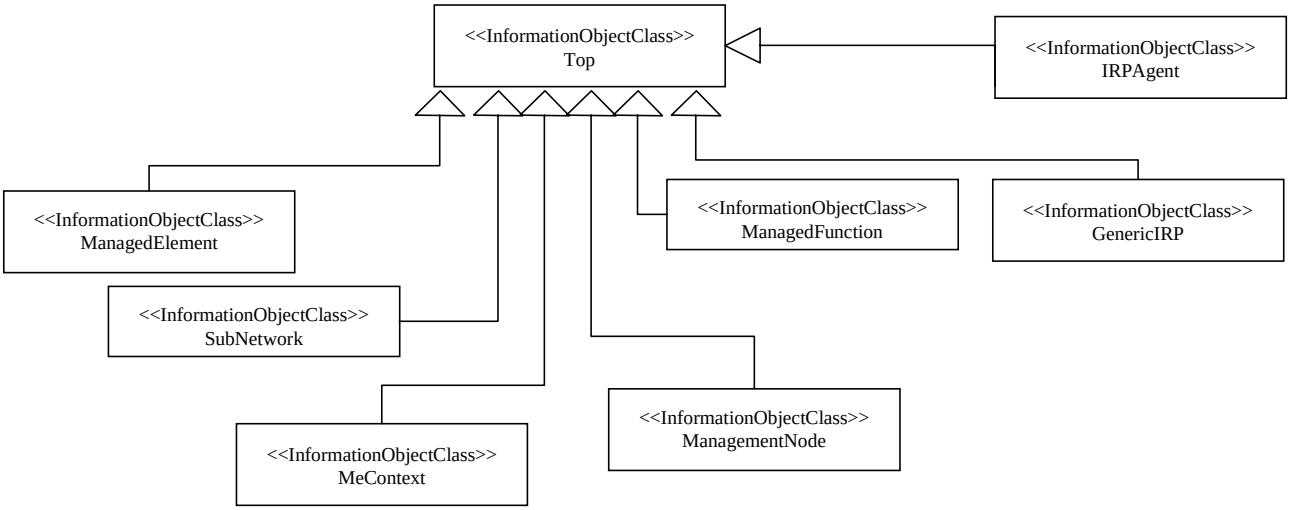


Figure 6: Generic Network Resources Model Inheritance Hierarchy

6.1.3 Information object class definitions

6.1.3.1 GenericIRP

6.1.3.1.1 Definition

This information Object Class represents the IRP capability associated with each IRPAgent. This IOC cannot be instantiated. It is defined for sub-classing purposes. At least one instance of a sub-class of GenericIRP shall be present for every IRPAgent instance.

6.1.3.1.2 Attributes

Table 1: Attributes of `GenericIRP`

Attribute Name	Support Qualifier	Read	Write
IRPId	M	M	-

6.1.3.2 IRPAgent

6.1.3.2.1 Definition

This information Object Class represents the functionality of an IRPAgent. It shall be present. For a definition of IRPAgent, see 3GPP TS 32.102 [2].

Restriction in R4: The IRPAgent will be contained under a managed object as follows (only one of the options shall be used):

1. ManagementNode, if the configuration contains a ManagementNode;
2. SubNetwork, if the configuration contains a SubNetwork and no ManagementNode;
3. ManagedElement, if the configuration contains no ManagementNode or SubNetwork.

6.1.3.2.2 Attributes

Table 2: Attributes of `IRPAgent`

Attribute Name	Support Qualifier	Read	Write
irpAgentId	M	M	-
systemDN	C	M	-

6.1.3.2.3 Notifications

Table 3: Notifications of `IRPAgent`

Name	Qualifier	Notes
NotifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyAttributeValueChange	O	
NotifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyObjectCreation	O	
NotifyObjectDeletion	O	
NotifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

Note that these notifications are issued based on occurrences on the IRPAgent MOC and not on occurrences on other Basic CM IRP managed objects.

6.1.3.3 ManagedElement

6.1.3.3.1 Definition

This information Object Class represents telecommunications equipment or TMN entities within the telecommunications network that performs Managed Element (ME) functions, i.e. provides support and/or service to the subscriber.
An ME communicates with a manager (directly or indirectly) over one or more interfaces for the purpose of being monitored and/or controlled. MEs may or may not additionally perform element management functionality.
An ME contains equipment that may or may not be geographically distributed. An ME is often referred to as a "Network Element". This class is similar to the `Managed Element` class specified in ITU-T M.3100 [4], [5], [6].

A ManagedElement may be contained in either a SubNetwork or in an MeContext instance. A single ManagedElement seen over the Itf-N may also exist stand-alone with no parent at all.

The ManagedElement MOC may be used to represent combined ME functionality (as indicated by the managedElementType attribute and the contained instances of different functional MOCs).

Single function ManagedElement managed object instances will have a 1..1 containment relationship to a function Managed Object (in this context a function MO is an MO derived from the ManagedFunction MOC). Multiple function ManagedElement managed object instances will have a 1..N containment relationship to function Managed Objects.

6.1.3.3.2. Attributes

Table 43: Attributes of ManagedElement

Attribute Name	Support Qualifier	Read	Write
ManagedElementId	M	M	-
DnPrefix	C	M	-
ManagedElementType	M	M	-
UserLabel	M	M	M
VendorName	M	M	-
UserDefinedState	M	M	M
LocationName	M	M	-
SwVersion	M	M	-

6.1.3.3.3 Notifications

Table 5: Notifications of `ManagedElement`

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

6.1.3.4 ManagedFunction

6.1.3.4.1 Definition

This information Object Class is provided for sub-classing only. It provides attribute(s) that are common to functional Information Object Classes. Note that a Managed Element may contain several managed functions. The ManagedFunction may be extended in the future if more common characteristics to functional objects are identified.

6.1.3.4.2 Attributes

Table 64: Attributes of `ManagedFunction`

Attribute Name	Support Qualifier	Read	Write
UserLabel	M	M	M

6.1.3.5 ManagementNode

6.1.3.5.1 Definition

This information Object Class represents a telecommunications management system (EM) within the TMN that contains functionality for managing a number of Managed Elements (MEs). The management system communicates with the MEs directly or indirectly over one or more interfaces for the purpose of monitoring and/or controlling these MEs.

This class has similar characteristics as the ManagedElement. The main difference between these two classes is that the ManagementNode has a special association to the managed elements that it is responsible for managing.

6.1.3.5.2 Attributes

Table 75: Attributes of `ManagementNode`

Attribute Name	Support Qualifier	Read	Write
ManagementNodeId	M	M	-
UserLabel	M	M	M
VendorName	M	M	-
UserDefinedState	M	M	M
LocationName	M	M	-
SwVersion	M	M	-

6.1.3.5.3 Notifications

Table 8: Notifications of `ManagementNode`

Name	Qualifier	Notes
NotifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyAttributeValueChange	O	
NotifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
NotifyObjectCreation	O	
NotifyObjectDeletion	O	
NotifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

6.1.3.6 MeContext

6.1.3.6.1 Definition

This information Object Class is introduced for naming purposes. It may support creation of unique DNs in scenarios when some MEs have the same RDNs due to the fact that they have been manufacturer pre-configured.
If some MEs have the same RDNs (for the above mentioned reason) and they are contained in the same SubNetwork instance, some measure shall be taken in order to assure the global uniqueness of DNs for all MOIs under those MEs. One way could be to set different DnPrefixes for those NEs, but that would require either that:

a) all LDNs or DNs are locally modified using the new DnPrefix for the upper portion of the DNs, or

b) a mapping (translation) of the old LDNs or DNs to the new DNs every time they are used externally, e.g. in alarm notifications.

As both the two alternatives above may involve unacceptable drawbacks (as the old RDNs for the MEs then would have to be changed or mapped to new values), using MeContext offers a new alternative to resolve the DN creation. Using MeContext as part of the naming tree (and thus the DN) means that the DnPrefix, including a unique MeContext for each ME, may be directly concatenated with the LDNs, without any need to change or map the existing ME RDNs to new values.

MeContext have 0..N instances. It may exist even if no SubNetwork exists. Every instance of MeContext contains exactly one ManagedElement during steady-state operations.

6.1.3.6.2 Attributes

Table 96: Attributes of `MeContext`

Attribute Name	Support Qualifier	Read	Writre
MeContextId	M	M	-
DnPrefix	C	M	-

6.1.3.6.2 Notification

Table 10: Notifications of `MeContext`

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

6.1.3.7 SubNetwork

6.1.3.7.1 Definition

This information object class represents a set of managed entities as seen over the Itf-N.

There may be zero or more instances of a SubNetwork. It shall be present if either a ManagementNode or multiple ManagedElements are present (i.e. ManagementNode and multiple ManagedElement instances shall have SubNetwork as parent).

The SubNetwork instance not contained in any other instance of SubNetwork is referred to as "the root SubNetwork instance".

6.1.3.7.2 Attributes

Table 117: Attributes of `SubNetwork`

Attribute Name	Support Qualifier	Read	Write
SubNetworkId	M	M	-
DnPrefix	C	M	-
UserLabel	M	M	M
userDefinedNetworkType	M	M	-

6.1.3.7.3 Notification

Table 12: Notifications of `SubNetwork`

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

6.1.3.8 Top

6.1.3.8.1 Definition

This information object class is introduced for generalisation purposes. All information object classes defined in all TS that claim to be conformant to 32.102[2] shall inherit from Top.

6.1.3.8.2 Attributes

Table 138: Attributes of Top

Attribute Name	Support Qualifier	Read	Write
objectClass	M	M	-
objectInstance	M	M	-

6.1.3.9 Class VsDataContainer

6.1.3.9.1 Definition

The 'VsDataContainer' managed object is a container for vendor specific data. The number of instances of the 'VsDataContainer' can differ from vendor to vendor. This MOC shall only be used by the Bulk CM IRP for the UTRAN, and GERAN and CN object models.

6.1.3.9.2 Attribute

Table 149: Attributes of `VsDataContainer`

Name	Qualifier	Read	Write
VsDataContainerId	M	M	-
VsDataType	M	M	-
VsData	M	M	M
VsDataFormatVersion	M	M	-

6.1.4 Information relationship definitions

6.1.4.1 MgmtAssociation (M)

6.1.4.1.1 Definition

This association is used to represent relationships between one or more MEs and the ManagementNode that is responsible for managing the MEs. It has two roles, named Manages and ManagedBy. The role '`Manages`' models the fact that a ManagementNode is responsible for managing zero or more MEs, and the role ManagedBy models the fact that an ME is managed by zero or one ManagementNode. Each role is in the MOC definition mapped to a reference attribute with the same name.

6.1.4.1.2 Roles

The roles involved in the relation MgmtAssociation are listed in this table.

Table 140: Roles of the relation MgmtAssociation

Name	Definition
Manages	This role refers to a list of the DN(s) of the related ManagedElement instance(s). This is a reference attribute modelling the role (of the association MgmtAssociation) that this managementNode is responsible for managing zero or more MEs.
IsManagedBy	This role refers to the DN of the related managementNode instance. This is a reference attribute modelling the role (of the association MgmtAssociation) that this ME is managed by zero or one managementNode.

6.1.4.1.3 Constraints

There is no constraint for this relationship.

6.1.4.2 SubNetwork-ManagementNode

6.1.4.2.1 Definition

This represents the containment relationship between `SubNetwork` and `ManagementNode`.

6.1.4.2.2 Roles

Name	Definition
contains	This role is played by objects of the information object class ManagementNode.
isContainedIn	This role is played by objects of the information object class SubNetwork.

6.1.4.2.3 Constraints

Name	Definition
ManagementNodeContainedInRootSubNetwork	" An instance of the ManagementNode IOC shall be contained in the root SubNetwork instance. "

6.1.4.3 SubNetwork-MeContext

6.1.4.3.1 Definition

This represents the containment relationship between `SubNetwork` and `MeContext`.

6.1.4.3.2 Roles

Name	Definition
contains	This role is played by objects of the information object class MeContext.
isContainedIn	This role is played by objects of the information object class SubNetwork.

6.1.4.3.3 Constraints

There is no constraint for this relationship.

6.1.4.4 SubNetwork-SubNetwork

6.1.4.4.1 Definition

This represents the containment relationship between `SubNetwork` and `SubNetwork`.

6.1.4.4.2 Roles

Name	Definition
contains	This role is played by objects of the information object class SubNetwork.
isContainedIn	This role is played by objects of the information object class SubNetwork.

6.1.4.4.3 Constraints

Name	Definition
OneSubNetworkContainsAllOthers	" If the configuration contains several instances of the SubNetwork IOC, exactly one SubNetwork instance shall directly or indirectly contain all the other SubNetwork instances. "

6.1.4.5 SubNetwork-IRPAgent

6.1.4.5.1 Definition

This represents the containment relationship between `SubNetwork` and `IRPAgent`.

6.1.4.5.2 Roles

Name	Definition
contains	This role is played by objects of the information object class IRPAgent.
isContainedIn	This role is played by objects of the information object class SubNetwork.

6.1.4.5.3 Constraints

Name	Definition
IRPAgentContainedInRootSubNetwork	" If an instance of the IRPAgent IOC is contained in a SubNetwork instance, this instance shall be the root SubNetwork instance. "

6.1.4.6 SubNetwork-ManagedElement

6.1.4.6.1 Definition

This represents the containment relationship between `SubNetwork` and `ManagedElement`.

6.1.4.6.2 Roles

Name	Definition
contains	This role is played by objects of the information object class ManagedElement.
isContainedIn	This role is played by objects of the information object class SubNetwork.

6.1.4.6.3 Constraints

There is no constraint for this relationship.

6.1.4.7 MeContext-ManagedElement

6.1.4.7.1 Definition

This represents the containment relationship between `MeContext` and `ManagedElement`.

6.1.4.7.2 Roles

Name	Definition
Contains	This role is played by objects of the information object class ManagedElement.
IsContainedIn	This role is played by objects of the information object class MeContext.

6.1.4.7.3 Constraints

There is no constraint for this relationship.

6.1.4.8 ManagedElement-IRPAgent

6.1.4.8.1 Definition

This represents the containment relationship between `ManagedElement` and `IRPAgent`.

6.1.4.8.2 Roles

Name	Definition
Contains	This role is played by objects of the information object class IRPAgent.
IsContainedIn	This role is played by objects of the information object class ManagedElement.

6.1.4.8.3 Constraints

There is no constraint for this relationship.

6.1.4.9 IRPAgent-GenericIRP

6.1.4.9.1 Definition

This represents the containment relationship between `IRPAgent` and `GenericIRP`.

6.1.4.9.2 Roles

Name	Definition
Contains	This role is played by objects of the information object class GenericIRP.
IsContainedIn	This role is played by objects of the information object class IRPAgent.

6.1.4.9.3 Constraints

There is no constraint for this relationship.

6.1.5 Information attribute definitions

6.1.5.1 Definitions and legal values

The table below defines the attributes that are present in several information object classes of this TS.

Table 151: Attributes

Attribute Name	Definition	Legal Values
dnPrefix	It carries the DN Prefix information as defined in Annex C of 32.300 [13]. It shall only be specified if the instance of the information object class supporting this attribute is a local root instance of the MIB. Otherwise the value shall carry the NULL semantics.	
managedElementId	An attribute whose 'name+value' can be used as an RDN when naming an instance of the ManagedElement object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
managedElementType	The type of managed element. It is a multi-valued attribute with one or more elements. Thus, it may represent one ME functionality, e.g. an RNC, or a combination of more than one functionality e.g. an MSC/HLR. The actual syntax and encoding of this attribute is Solution Set specific.	RNC, NodeB, BSS, MSC, HLR, VLR, AuC, EIR, SMS-IWMSC, SMS-GMSC, GMSC, SGSN, GGSN, BG, BS, CBC, CGF, GMLC, GMSC Server, IWF, MGW, MNP-SRF, MSC Server, NPDB, R-SGW, SCF, SMLC, SRF, SSF.
irpAgentId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
irpId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
locationName	The physical location of this entity (e.g. an address).	
managementNodeId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
meContextId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
objectClass	An attribute which captures the name of the class from which the object instance is an occurrence of.	
objectInstance	An information which captures the Distinguished Name of any object.	
subNetworkId	An attribute whose 'name+value' can be used as an RDN when naming an instance of the SubNetwork object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
swVersion	The software version of the ManagementNode or ManagedElement (this is used for determining which version of the vendor specific information is valid for the ManagementNode or ManagedElement).	
systemDN	The Distinguished Name (DN) of IRPAgent. defined in 3GPP TS.32.300.	
userDefinedNetworkType	Textual information regarding the type of network, e.g. UTRAN.	
userDefinedState	An operator defined state for operator specific usage. (See also Note below)	
userLabel	A user-friendly name of this object.	
vendorName	The name of the vendor.	
vsData	Vendor specific attributes of the type vsDataType. The attribute definitions including constraints (value ranges, data types, etc.) are specified in a vendor specific data format file.	
vsDataContainerId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.	
vsDataFormatVersion	Name of the data format file, including version.	
vsDataType	Type of vendor specific data contained by this instance, e.g. relation specific algorithem parameters, cell specific parameters for pewer control or re-selection or a timer. The type itself is also vendor specific.	

7 Mapping from IOCs to MOCs

7.1 IOC to MOC mapping

This table provides a mapping table between Information Object Classes and Managed Object Classes.

Table 12: Information Object Class mapping

Information Object Class	Managed Object Class
GenericIRP	No mapping (GenericIRP is provided for sub-classing only).
IRPAgent	IRPAgent
ManagedElement	ManagedElement
ManagedFunction	ManagedFunction
ManagementNode	ManagementNode
MeContext	MeContext
SubNetwork	SubNetwork
Top	No mapping (Top is provided for sub-classing only)
No mapping due to different modelling approaches. Transient situation	BasicCmIRP
No mapping due to different modelling approaches. Transient situation	AlarmIRP
No mapping due to different modelling approaches. Transient situation	NotificationIRP

7.2 Information relationship mapping

This table provides a mapping table between Information Relationships and the Managed Object Classes model.

Table 13: Information Relationship mapping

Information Relationship	Equivalent in the Managed Object Class Model
MgmtAssociation	MgmtAssociation
SubNetwork-ManagementNode	Mapped on naming / containment relationship.
SubNetwork-MeContext	Mapped on naming / containment relationship.
SubNetwork-SubNetwork	Mapped on naming / containment relationship.
SubNetwork-IRPAgent	Mapped on naming / containment relationship.
SubNetwork-ManagedElement	Mapped on naming / containment relationship.
MeContext-ManagedElement	Mapped on naming / containment relationship.
ManagedElement-IRPAgent	Mapped on naming / containment relationship.
IRPAgent-GenericIRP	Mapped on naming / containment relationship.

7.3 Information attribute mapping

This table provides a mapping table between Information Attributes and the Managed Object Classes model.

Table 14: Information Attribute mapping

Information Relationship	Equivalent in the Managed Object Class Model
dnPrefix	dnPrefix
managedElementId	managedElementId
subNetworkId	subNetworkId
managedElementType	managedElementType
irpAgentId	irpAgentId
irpId	irpId
locationName	locationName
managementNodeId	managementNodeId
meContextId	meContextId
objectClass	No explicit mapping. Solution set dependent.
objectInstance	Managed object DN.
systemDN	systemDN
userDefinedState	userDefinedState
userLabel	userLabel
vendorName	vendorName

8 Managed Object Class definitions

8.1 Introduction

As already introduced in the clause 5, the present clause defines the Generic Network ResourcesIRP Network Resource Model.

The corresponding Solution Set specifications provide protocol dependent object models. They provide the actual definitions of the managed object classes defined in this subclause in each protocol environment. One may find that the class names defined in the protocol neutral model differ from those defined in the Solution Sets (e.g. due to mappings to existing standard models that are applicable for a specific Solution Set).

8.2 Generic Network Resource Model (NRM)

This subclause defines the generic managed object classes supporting the Generic Network Resources IRP. These object classes are protocol environment neutral and the model does not define the syntax or encoding of the classes and attributes.

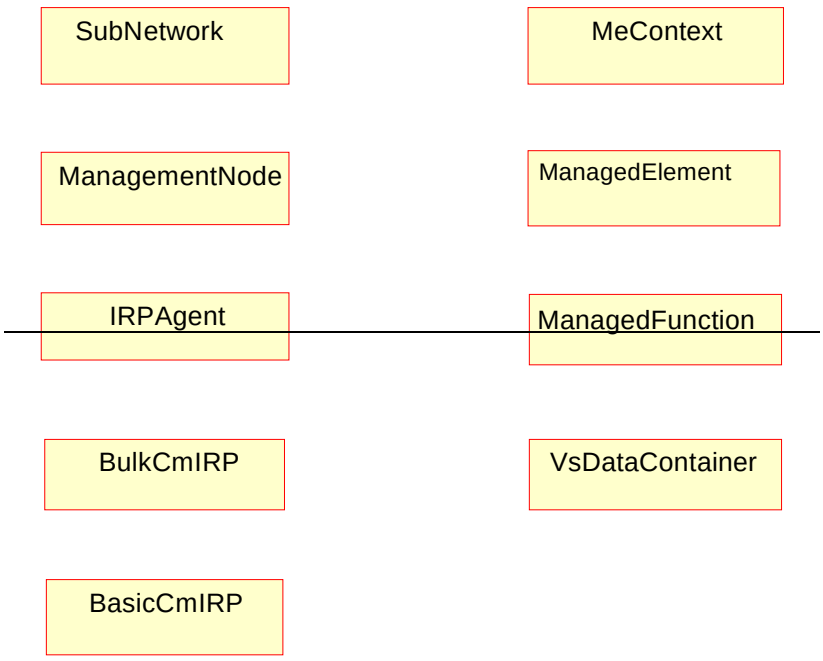
The model described in this subclause allows for Managed Elements to be defined for management purposes according to the functionality contained within them. As an example, a single implementation of a combined MSC and VLR may be required. However, in the implementation it is required to create a single interface for the management of this element. This is expected to be achieved by instantiating a `ManagedElement` MOC that contains the "mscFunction" MOC, the "vlrFunction" MOC (as in the GSM 12.xx series of specifications), and other generic or non-UMTS specific MOCs as appropriate to define the manageable capability of that managed element. See also the `managedElementType` attribute in the `ManagedElement` MOC definition.

It should be noted that, although this model allows for combined managed element functionality as described above, in this subclause only the high level and generic MOCs are defined. UMTS MOCs modelling more specific managed element functionality are defined in IRPs defining NRM.

8.2.1 Managed Object Class (MOC) diagrams

8.2.1.1 Inheritance hierarchy

Figure 7 shows the inheritance hierarchy for the generic MO classes defined in this IRP.

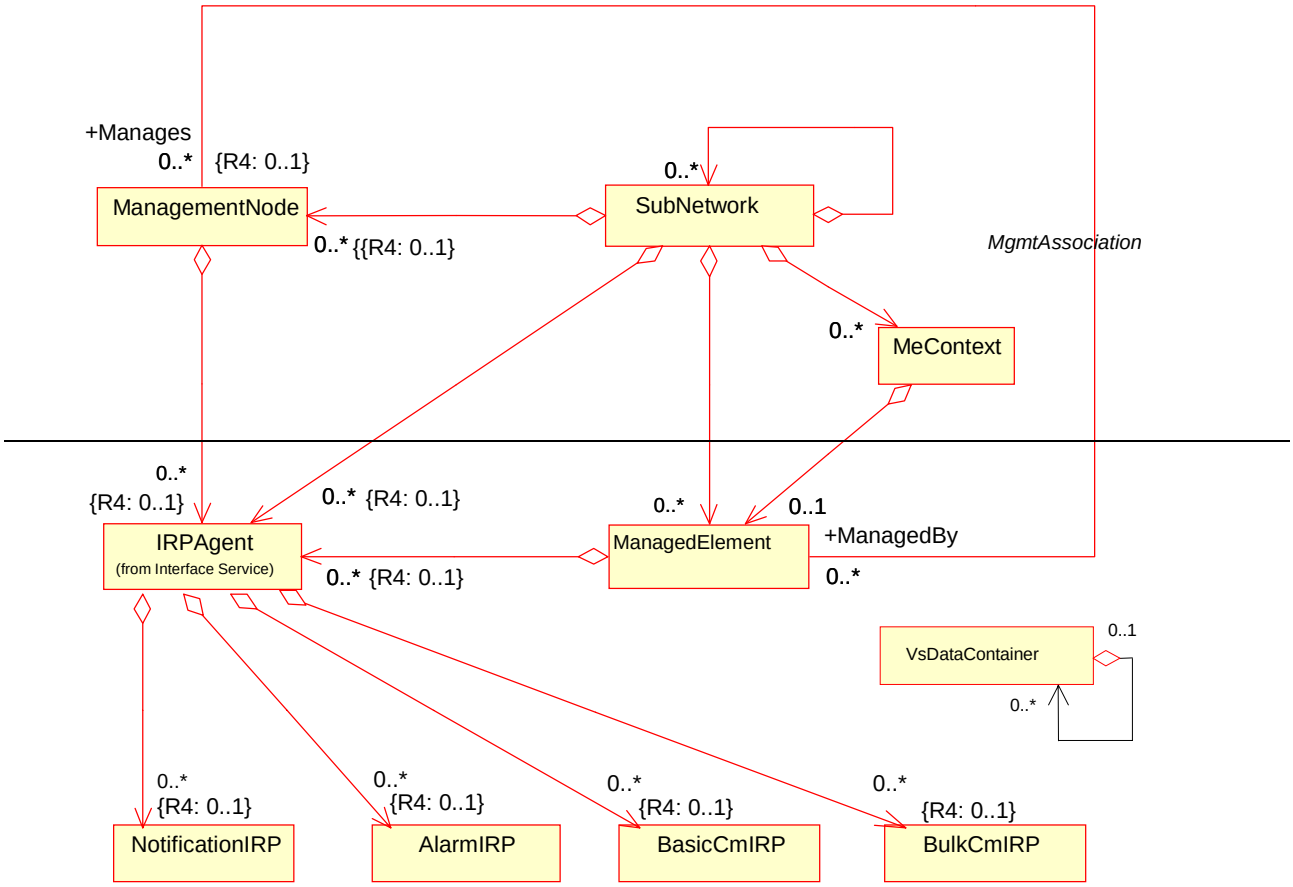


~~Figure 7: Generic NRM Inheritance Hierarchy~~

8.2.1.2 Containment/Naming and Association diagram

Figure 8 shows the containment/naming hierarchy and the associations of the generic MO classes defined by this IRP.

NOTE: The Managed Object containment/naming relationships are in the diagram(s) below indicated by UML "Aggregation by reference" ("hollow diamonds").



NOTE 1: ManagedElement may be contained in either a SubNetwork or an MeContext instance, or have no parent instance at all.
NOTE 2: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.
NOTE 3: Each instance of the vsDataContainer shall only be contained under one MOC. The vsDataContainer can be contained under MOCs defined in other NRMs.
NOTE 4: If the configuration contains several instances of SubNetwork, exactly one SubNetwork instance shall directly or indirectly contain all the other SubNetwork instances.
NOTE 5: The SubNetwork instance not contained in any other instance of SubNetwork is referred to as "the root SubNetwork instance".
NOTE 6: ManagementNode shall be contained in the root SubNetwork instance.
NOTE 7: If contained in a SubNetwork instance, IRPAgent shall be contained in the root SubNetwork instance.

Figure 8: Generic NRM Containment/Naming and Association diagram

Each Managed Object is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [13] that expresses its containment hierarchy. As an example, the DN of a Managed Element instance could have a format like:

`SubNetwork=Sweden,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1.`

Note : Both the NotificationIRP MOC and the AlarmIRP MOC are not defined in the present document. The corresponding IOCs are defined respectively in TS 32.302 and TS 32.111-2.

8.2.2 Managed Object Class (MOC) definitions

A general note regarding all the notification tables defined for each MOC below: Each MOC may potentially send the notifications listed in the notification table for the MOC. The notifications with qualifier (M) shall be supported by the MOC, and the notifications with qualifier (O) may be supported by the MOC.
For example, if Notification notifyObjectCreation defined in Basic CM IRP has the qualifier (M), then if a MOC is defined such that it emits such a notification, this notification shall be emitted when appropriate (i.e. when a new object is created). If Notification notifyChangedAlarm has the qualifier (O) in Alarm IRP (see 3GPP TS 32.111-2 [11]), then if a MOC is defined such that it emits such a notification, this notification may or may not be emitted when appropriate.
Further, if a notification in the qualifier column (of the MOC notification tables) has a reference to another specification, it means that the qualifier for the notification is specified in the referred specification.

8.2.2.1 MOC SubNetwork

This Managed Object Class represents a set of managed entities as seen over the Itf-N.

A SubNetwork may have 0...N instances. It shall be present if either a ManagementNode or multiple ManagedElements are present (i.e. ManagementNode and multiple ManagedElement instances shall have SubNetwork as parent).

If the configuration contains several instances of SubNetwork, exactly one SubNetwork instance shall directly or indirectly contain all the other SubNetwork instances.

The SubNetwork instance not contained in any other instance of SubNetwork is referred to as "the root SubNetwork instance".

Table 15: Attributes of SubNetwork

Name	Qualifier	Description
subNetworkId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of the SubNetwork object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
dnPrefix	READ- ONLY, C	It carries the DN Prefix information as defined in Annex C of 32.300 [13]. It shall only be specified if the instance of SubNetwork is a local root instance of the MIB. Otherwise the value shall carry the NULL semantics.
userLabel	READ-WRITE, M	A user-friendly (and user assigned) name of the associated object.
userDefinedNetworkType	READ-ONLY, M	Textual information regarding the type of network, e.g. UTRAN.

Table 16: Notifications of SubNetwork

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

8.2.2.2 MOC ManagedElement

This Managed Object Class represents telecommunications equipment or TMN entities within the telecommunications network that performs Managed Element (ME) functions, i.e. provides support and/or service to the subscriber.
An ME communicates with a manager (directly or indirectly) over one or more interfaces for the purpose of being

monitored and/or controlled. MEs may or may not additionally perform element management functionality.
An ME contains equipment that may or may not be geographically distributed. An ME is often referred to as a "Network Element". This class is similar to the `Managed Element` class specified in ITU-T M.3100 [4], [5], [6].

A ManagedElement may be contained in either a SubNetwork or in an MeContext instance. A single ManagedElement seen over the Itf-N may also exist stand-alone with no parent at all.

The ManagedElement MOC may be used to represent combined ME functionality (as indicated by the managedElementType attribute and the contained instances of different functional MOCs).

Single function ManagedElement managed object instances will have a 1..1 containment relationship to a function Managed Object (in this context a function MO is an MO derived from the ManagedFunction MOC). Multiple function ManagedElement managed object instances will have a 1..N containment relationship to function Managed Objects.

Table 17: Attributes of ManagedElement

Name	Qualifier	Description
managedElementId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of the ManagedElement object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
dnPrefix	READ- ONLY, C	It carries the DN Prefix information as defined in Annex C of 32.300 [13]. It shall only be specified if the instance of ManagedElement is a local root instance of the MIB. Otherwise the value shall carry the NULL-semantics.
managedElementType	READ-ONLY, M	The type of managed element. It is a multi-valued attribute with one or more elements. Thus, it may represent one ME functionality, e.g. an RNC, or a combination of more than one functionality e.g. an MSC/HLR. The allowed members of this attribute are: RNC, NodeB, BSS, MSC, HLR, VLR, AuC, EIR, SMS-IWMSC, SMS-GMSC, GMSC, SGSN, GGSN, BG, BS, CBC, CGF, GMLC, GMSC Server, IWF, MGW, MNP-SRF, MSC Server, NPDB, R-SGW, SCF, SMLC, SRF, SSF. The actual syntax and encoding of this attribute is Solution Set specific.
userLabel	READ-WRITE, M	A user-friendly name of this object.
vendorName	READ-ONLY, M	The name of the ManagedElement vendor.
userDefinedState	READ-WRITE, M	An operator-defined state for operator specific usage. (See also Note below)
locationName	READ-ONLY, M	The physical location of this entity (e.g. an address).
swVersion	READ-ONLY, M	The software version of the ManagedElement (this is used for determining which version of the vendor specific information is valid for the ManagedElement).
managedBy	READ-ONLY, M	The value of this attribute shall be the DN of the related managementNode instance. This is a reference attribute modelling the role (of the association MgmtAssociation) that this ME is managed by 0-1 managementNode.
NOTE: In addition to the userDefinedState, state management attributes are expected to be included in the next release.		

Table 18: Notifications of `ManagedElement`

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

8.2.2.3 MOC MeContext

This Managed Object Class (MOC) is introduced for naming purposes. It may support creation of unique DNs in scenarios when some MEs have the same RDNs due to the fact that they have been manufacturer pre-configured. If some MEs have the same RDNs (for the above mentioned reason) and they are contained in the same SubNetwork instance, some measure shall be taken in order to assure the global uniqueness of DNs for all MOIs under those MEs. One way could be to set different DnPrefixes for those NEs, but that would require either that:

a)all LDNs or DNs are locally modified using the new DnPrefix for the upper portion of the DNs, or

b)a mapping (translation) of the old LDNs or DNs to the new DNs every time they are used externally, e.g. in alarm notifications.

As both the two alternatives above may involve unacceptable drawbacks (as the old RDNs for the MEs then would have to be changed or mapped to new values), using MeContext offers a new alternative to resolve the DN creation. Using MeContext as part of the naming tree (and thus the DN) means that the DnPrefix, including a unique MeContext for each ME, may be directly concatenated with the LDNs, without any need to change or map the existing ME RDNs to new values.

MeContext have 0..N instances. It may exist even if no SubNetwork exists. Every instance of MeContext contains exactly one ManagedElement during steady-state operations.

Table 19: Attributes of MeContext

Name	Qualifier	Description
meContextId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
dnPrefix	READ- ONLY, C	It carries the DN Prefix information as defined in Annex C of 3GPP TS 32.300 [13]. It shall only be specified if the instance of MeContext is a local root instance of the MIB. Otherwise the value shall carry the NULL semantics.

Table 20: Notifications of MeContext

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

8.2.2.4 MOC ManagementNode

This Managed Object Class represents a telecommunications management system (EM) within the TMN that contains functionality for managing a number of Managed Elements (MEs). The management system communicates with the MEs directly or indirectly over one or more interfaces for the purpose of monitoring and/or controlling these MEs.

This class has similar characteristics as the ManagedElement. The main difference between these two classes is that the ManagementNode has a special association to the managed elements that it is responsible for managing.

A ManagementNode instance shall be contained in the root SubNetwork instance.

Table 21: Attributes of ManagementNode

Name	Qualifier	Description
managementNodeId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
userLabel	READ-WRITE, M	A user-friendly name of this object.
vendorName	READ-ONLY, M	The name of the ManagementNode vendor.
userDefinedState	READ-WRITE, M	An operator defined state for operator specific usage.
locationName	READ-ONLY, M	The physical location of this entity (e.g. an address).
swVersion	READ-ONLY, M	The software version of the management node (this is used for determining which version of the vendor specific information is valid for the management node).
manages	READ-ONLY, M	The value of this attribute shall be a list of the DN(s) of the related ManagedElement instance(s). This is a reference attribute modelling the role (of the association MgmtAssociation) that this managementNode is responsible for managing 0-N MEs.

Table 22: Notifications of ManagementNode

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

8.2.2.5 MOC ManagedFunction

This Managed Object Class is similar to the class gsmManagedFunction defined in GSM 12.20 [12] and is provided for sub-classing only. It provides the attributes that are common to functional MO classes. Note that a Managed Element may contain several managed functions. The ManagedFunction may be extended in the future if more common characteristics to functional objects are identified.

Table 23: Attributes of ManagedFunction

Name	Qualifier	Description
userLabel	READ-WRITE, M	A user-friendly name of the associated object.

8.2.2.6 MOC IRPAgent

This Managed Object Class represents the functionality of an IRPAgent. It shall be present. For a definition of IRPAgent, see 3GPP TS 32.102 [2].

If an IRPAgent instance is contained in a SubNetwork instance, this instance shall be the root SubNetwork instance.

Restriction in R4: The IRPAgent will be contained under a managed object as follows (only one of the options shall be used):

4.ManagementNode, if the configuration contains a ManagementNode;

5.SubNetwork, if the configuration contains a SubNetwork and no ManagementNode;

6.ManagedElement, if the configuration contains no ManagementNode or SubNetwork.

Table 24: Attributes of IRPAgent

Name	Qualifier	Description
irpAgentId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
systemDN	READ-ONLY, C	The Distinguished Name (DN) of IRPAgent. Defined in 3GPP TS 32.302 [3].

Table 25: Notifications of IRPAgent

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [11])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [11])	

Note that these notifications are issued based on occurrences on the IRPAgent MOC and not on occurrences on other Basic CM IRP managed objects.

8.2.2.7 MOC VsDataContainer

The 'VsDataContainer' managed object is a container for vendor specific data. The number of instances of the 'VsDataContainer' can differ from vendor to vendor. This MOC shall only be used by the Bulk CM IRP for the UTRAN and GERAN object models.

Table 26: Attributes of VsDataContainer

Name	Qualifier	Description
vsDataContainerId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
vsDataType	READ-ONLY, M	Type of vendor specific data contained by this instance, e.g. relation specific algorithem parameters, cell specific parameters for pewer control or re-selection or a timer. The type itself is also vendor specific.
vsData	READ-WRITE, M	Vendor specific attributes of the type vsDataType. The attribute definitions including constraints (value ranges, data types, etc.) are specified in a vendor specific data format file.
vsDataFormatVersion	READ- ONLY,M	Name of the data format file, including version.

8.2.2.8 MOC NotificationIRP

This Managed Object Class represents the Notification IRP capability associated with each IRPAgent. At least one instance shall be present for every IRPAgent instance. Restriction in R4: Number of instances = 1.

Table 27: Attributes of NotificationIRP

Name	Qualifier	Description
notificationIRPId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
irpVersion	READ-ONLY, M	One or more Notification IRP version entries.

8.2.2.9 MOC AlarmIRP

This Managed Object Class represents the Alarm IRP (see 3GPP TS 32.111-2 [11]) capability associated with each IRPAgent. Restriction in R4: Number of instances = 0..1.

Table 28: Attributes of AlarmIRP

Name	Qualifier	Description
alarmIRPId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
irpVersion	READ-ONLY, M	One or more Alarm IRP (see 3GPP TS 32.111-2 [11]) version entries.

Table 29: Notifications of AlarmIRP

Name	Qualifier	Notes
notifyAlarmListRebuilt	See Alarm IRP (3GPP TS 32.111-2 [11])	

8.2.2.10 MOC BasicCmIRP

This Managed Object Class represents the Basic CM IRP capability associated with each IRPAgent. Restriction in R4: Number of instances = 0..1.

Table 30: Attributes of BasicCmIRP

Name	Qualifier	Description
basicCmIRPId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
irpVersion	READ-ONLY, M	One or more Basic CM IRP version entries.

8.2.2.11 MOC BulkCmIRP

This Managed Object Class represents the Bulk CM IRP capability associated with each IRPAgent. Restriction in Rel 4: Number of instances = 0..1.

Table 31: Attributes of BulkCmIRP

Name	Qualifier	Description
bulkCmIRPId	READ-ONLY, M	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.
irpVersion	READ-ONLY, M	One or more Bulk CM IRP version entries.

Table 32: Notifications of BulkCmIRP

Name	Qualifier	Notes
notifySessionStateChange	M	
notifySessionLogStatus	M	

8.3.3 Associations

8.3.3.1 Association `MgmtAssociation` (M)

This association is used to represent relationships between one or more MEs and the ManagementNode that is responsible for managing the MEs. It has two roles, named Manages and ManagedBy. The role 'Manages' models the fact that a ManagementNode is responsible for managing zero or more MEs, and the role ManagedBy models the fact that an ME is managed by zero or one ManagementNode. Each role is in the MOC definition mapped to a reference attribute with the same name.

Annex A (informative): MOC name recommendation

Recommendation:

3GPP considers the use of many non-alphanumeric characters as valid characters for constructing the MOC name. The Java programming language considers the use of alphanumeric characters plus only two non-alphanumeric characters, i.e., "$" and "_", as valid characters for Java Packages and Java Class names. Because the names of the Java Packages and Java Classes generated by Java programming tools may include MO Class names, a Java environment would have to include a translation mechanism that replaces the invalid characters (if they are used by the MOC author to name a MOC) to valid characters. For example, replace "-" to " ". This translation mechanism causes unwanted complexity and reduction in performance of the implementation. Given Java may become popular for coding IRP Manager and/or IRP Agent capabilities, this note recommends the MOC author to use valid Java name characters (i.e., all alphanumeric characters plus “$” and “ ”) to name their MOCs.

Annex BA (informative):

Change history

…….

3GPP TSG-SA5 (Telecom Management) Meeting #30 **S5-026712**
Tampere, Finland, 19 – 23 August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **32.623** **CR** **004** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network **X** Core Network **X**

Title:	⌘	Upgrade the NRM CORBA Solution Set to Rel-5
Source:	⌘	S5
Work item code:	⌘	OAM-NIM
Date:	⌘	23/08/02
Category:	⌘	**C**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction 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.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	changes required to move from R4 -> R5.
Summary of change:	⌘	Remove reference back to R99. Remove old methodology references. Remove redundant objects.
Consequences if not approved:	⌘	No R5 version of 32.623 Generic NRM CORBA Solution Set

Clauses affected:	⌘	Sub-clause Introduction. Clauses 1, 5 table 14,16,17, Annex B

Other specs affected: ⌘	Y	N		⌘
	☐	☐	Other core specifications	
	☐	☐	Test specifications	
	☐	☐	O&M Specifications	S5-026xxx for 32.622

Other comments:	⌘	Corresponding 32.622 changes are specified in S5-026xxx

Introduction

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

~~Due to the growing number of specifications to model new services and Resource Models for Configuration Management (CM), as well as the expected growth in size of each of them from 3GPP Release 4 onwards, a new structure of the specifications is already needed in Release 4. This structure is needed for several reasons, but mainly to enable more independent development and release for each part, as well as a simpler document identification and version handling. Another benefit would be that it becomes easier for bodies outside 3GPP, such as the ITU-T, to refer to telecom management specifications from 3GPP. The new structure of the specifications does not lose any information or functionality supported by the Release 1999. The restructuring also includes defining new IRPs for the Network Resource Model (NRM) parts of R99 Basic CM IRP (Generic, Core Network and UTRAN NRM). These IRPs are named "Network Resources IRP".~~

~~Further, the Notification IRP (in Release 1999: 32.106-1 to -4) and the Name convention for Managed Objects (in Release 1999: 32.106-8) have been moved to a separate number series used for specifications common between several management areas (e.g. CM, FM, PM).~~

~~Finally, in addition to the restructuring mentioned above, the need to define some new functionality and IRPs for CM compared to Release 1999, has also been identified. Firstly, a new Bulk CM IRP, and secondly an a GERAN Network Resources IRP, have been created. Thirdly, the Generic, UTRAN and GERAN Network Resources IRPs have been extended with support for GSM-UMTS Inter-system handover (ISH), and the 32.600 (Concept and High-level Requirements) has been modified to cover the high-level Bulk CM and ISH requirements.~~

Table: Mapping between Release '99 and the new specification numbering scheme

R99 Old no.	Old (R99) specification title	Rel-4 New no.	New (Rel-4) specification title
32.106-1	3G Configuration Management: Concept and Requirements	32.600	**3G Configuration Management: Concept and High-level Requirements**
32.106-1	<Notification IRP requirements from 32.106-1 and 32.106-2>	32.301	**Notification IRP**: Requirements
32.106-2	Notification IRP: IS	32.302	Notification IRP: Information Service
32.106-3	Notification IRP: CORBA SS	32.303	Notification IRP: CORBA SS
32.106-4	Notification IRP: CMIP SS	32.304	Notification IRP: CMIP SS
32.106-8	Name convention for Managed Objects	32.300	**Name Convention for Managed Objects**
32.106-1	<Basic CM IRP IS requirements from 32.106-1 and 32.106-5>	32.601	**Basic CM IRP**: Requirements
32.106-5	Basic CM IRP IM (Intro & IS part)	32.602	Basic CM IRP: Information Service
32.106-6	Basic CM IRP CORBA SS (IS related part)	32.603	Basic CM IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (IS related part)	32.604	Basic CM IRP: CMIP SS
32.106-8	Name convention for Managed Objects	32.300	**Name Convention for Managed Objects**
-	-	32.611	**Bulk CM IRP**: Requirements
-	-	32.612	Bulk CM IRP: Information Service
-	-	32.613	Bulk CM IRP: CORBA SS
-	-	32.614	Bulk CM IRP: CMIP SS
		32.615	Bulk CM IRP: XML file format definition
32.106-1	<Basic CM IRP Generic NRM requirements from 32.106-1 and 32.106-5>	32.621	**Generic Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (Generic NRM part)	32.622	Generic Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (Generic NRM related part)	32.623	Generic Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (Generic NRM related part)	32.624	Generic Network Resources IRP: CMIP SS
32.106-1	<Basic CM IRP CN NRM requirements from 32.106-1 and 32.106-5>	32.631	**Core Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (CN NRM part)	32.632	Core Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (CN NRM related part)	32.633	Core Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (CN NRM related part)	32.634	Core Network Resources IRP: CMIP SS
32.106-1	<Basic CM IRP UTRAN NRM requirements from 32.106-1 and 32.106-5>	32.641	**UTRAN Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (UTRAN NRM part)	32.642	UTRAN Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (UTRAN NRM related part)	32.643	UTRAN Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (UTRAN NRM related part)	32.644	UTRAN Network Resources IRP: CMIP SS
		32.651	**GERAN Network Resources IRP**: Requirements
		32.652	GERAN Network Resources IRP: NRM
		32.653	GERAN Network Resources IRP: CORBA SS
		32.654	GERAN Network Resources IRP: CMIP SS

:

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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.

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5 VoidMapping

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 Managed Object Classes (MOCs) 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 MOC SubNetwork

Table 1: Mapping from NRM MOC SubNetwork attributes to SS equivalent MOC SubNetwork attributes

NRM Attributes of MOC 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 MOC ManagedElement

Table 2: Mapping from NRM MOC ManagedElement attributes and association roles to SS equivalent MOC ManagedElement attributes

NRM Attributes/Association roles in 3GPP TS 32.622 [4]	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 MOC MeContext

Table 3: Mapping from NRM MOC MeContext attributes to SS equivalent MOC MeContext attributes

NRM Attributes of MOC 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 MOC ManagementNode

Table 4: Mapping from NRM MOC ManagementNode attributes and association roles to SS equivalent MOC ManagementNode attributes

NRM Attributes/association roles of MOC 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 MOC ManagedFunction

Table 5: Mapping from NRM MOC ManagedFunction attributes to SS equivalent MOC ManagedFunction attributes

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

5.2.6 MOC IRPAgent

Table 6: Mapping from NRM MOC IRPAgent attributes to SS equivalent MOC IRPAgent attributes

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

5.2.7 MOC BasicCmIRP

Table 7: Mapping from NRM MOC BasicCmIRP attributes to SS equivalent MOC BasicCmIRP attributes

NRM Attributes of MOC BasicCmIRP in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
basicCmIRPId	basicCmIRPid	string	Read Only, M
irpVersion	irpVersion	CommonIRPConstDefs::VersionNumberSet	Read Only, M

5.2.8 MOC BulkCmIRP

Table 8: Mapping from NRM MOC BulkCmIRP attributes to SS equivalent MOC BulkCmIRP attributes

NRM Attributes of MOC BulkCmIRP in 3GPP TS 32.622 [4]	SS Attributes	SS Type	Qualifier
bulkCmIRPId	bulkCmIRPId	string	Read Only, M
irpVersion	irpVersion	CommonIRPConstDefs::VersionNumberSet	Read Only, M

5.2.9 MOC VsDataContainer

Table 9: Mapping from NRM MOC VsDataContainer attributes to SS equivalent MOC VsDataContainer attributes

NRM Attributes of MOC 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	vsDataType	Read Write, M
vsDataFormatVersion	vsDataFormatVersion	string	Read Only, M

6 ~~New methodology~~ Mapping

:

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6.2.5 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	~~vsDataType~~any	Read-Write, M
vsDataFormatVersion	vsDataFormatVersion	string	Read-Only, M

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6.2.7 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
i~~I~~rpAgentId	irpAgentId	string	Read-Only, M
s~~S~~ystemDN	systemDN	string	Read-Only, M

:

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6.2.8 IOC GenericIRP

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

6.2.9 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
o~~O~~bjectClass	CLASS	string	Read-Only, M
o~~O~~bjectInstance	No direct mapping.		

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.
 */
●●●


      /**
       *  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”;
      };

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

         // Attribute Names
         //
         const string basicCmIRPId = "basicCmIRPId";
         const string irpVersion = "irpVersion";
      };


      /**
       *  Definitions for MO class BulkCmIRP
       */
      interface BulkCmIRP
      {
```

```
        const string CLASS = "BulkCmIRP";

        // Attribute Names
        //
        const string bulkCmIRPId = "bulkCmIRPId";
        const string irpVersion = "irpVersion";
    };

};

#endif
```

3GPP TSG-SA5 Meeting #30
Tampere, Finland, 19. Aug. 02 – 23. Aug. 02

Tdoc ⌘SA5-026727

CR-Form-v7

CHANGE REQUEST

⌘ **32.624** **CR** **009** ⌘ **rev** **-** ⌘ Current version: **4.4.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network [X] Core Network [X]

Title:	⌘	Upgrade the NRM CMIP Solution Set to Rel-5
Source:	⌘	S5
Work item code:	⌘	OAM-NIM
Date:	⌘	23/08/2002
Category:	⌘	**C**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction 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.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	There shall be a R5 CMIP SS of the Generic NRM.
Summary of change:	⌘	1. Unnecessary GDMO and ASN.1 codes are removed 2. Mapping tables are updated
Consequences if not approved:	⌘	There would be no R5 CMIP SS of the Generic NRM.

Clauses affected:	⌘	Chapter 4, 5 and 6.

Other specs affected: ⌘

Y	N	
	X	Other core specifications
	X	Test specifications
	X	O&M Specifications

⌘

Other comments: ⌘ This CR applies only after S5-026726 is implemented.

Introduction

The interface Itf-N, defined in 3GPP TS 32.102 [2], 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].

~~Due to the growing number of specifications to model new services and Resource Models for Configuration Management (CM), as well as the expected growth in size of each of them from 3GPP Release 4 onwards, a new structure of the specifications is already needed in Release 4. This structure is needed for several reasons, but mainly to enable more independent development and release for each part, as well as a simpler document identification and version handling. Another benefit would be that it becomes easier for bodies outside 3GPP, such as the ITU-T, to refer to telecom management specifications from 3GPP. The new structure of the specifications does not lose any information or functionality supported by the Release 1999. The restructuring also includes defining new IRPs for the Network Resource Model (NRM) parts of R99 Basic CM IRP (Generic, Core Network and UTRAN NRM). These IRPs are named "Network Resources IRP".~~

~~Further, the Notification IRP (in Release 1999: 32.106-1 to -4) and the Name convention for Managed Objects (in Release 1999: 32.106-8) have been moved to a separate number series used for specifications common between several management areas (e.g. CM, FM, PM).~~

~~Finally, in addition to the restructuring mentioned above, the need to define some new functionality and IRPs for CM compared to Release 1999, has also been identified. Firstly, a new Bulk CM IRP, and secondly an a GERAN Network Resources IRP, have been created. Thirdly, the Generic, UTRAN and GERAN Network Resources IRPs have been extended with support for GSM-UMTS Inter-system handover (ISH), and the 32.600 (Concept and High-level Requirements) has been modified to cover the high-level Bulk CM and ISH requirements.~~

Table: Mapping between Release '99 and the new specification numbering scheme

R99 Old no.	Old (R99) specification title	Rel-4 New no.	New (Rel-4) specification title
32.106-1	3G Configuration Management: Concept and Requirements	32.600	**3G Configuration Management: Concept and High-level Requirements**
32.106-1	<Notification IRP requirements from 32.106-1 and 32.106-2>	32.301	**Notification IRP**: Requirements
32.106-2	Notification IRP: IS	32.302	Notification IRP: Information Service
32.106-3	Notification IRP: CORBA SS	32.303	Notification IRP: CORBA SS
32.106-4	Notification IRP: CMIP SS	32.304	Notification IRP: CMIP SS
32.106-8	Name convention for Managed Objects	32.300	**Name Convention for Managed Objects**
32.106-1	<Basic CM IRP IS requirements from 32.106-1 and 32.106-5>	32.601	**Basic CM IRP**: Requirements
32.106-5	Basic CM IRP IM (Intro & IS part)	32.602	Basic CM IRP: Information Service
32.106-6	Basic CM IRP CORBA SS (IS related part)	32.603	Basic CM IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (IS related part)	32.604	Basic CM IRP: CMIP SS
32.106-8	Name convention for Managed Objects	32.300	**Name Convention for Managed Objects**
-	-	32.611	**Bulk CM IRP**: Requirements
-	-	32.612	Bulk CM IRP: Information Service
-	-	32.613	Bulk CM IRP: CORBA SS
-	-	32.614	Bulk CM IRP: CMIP SS
		32.615	Bulk CM IRP: XML file format definition
32.106-1	<Basic CM IRP Generic NRM requirements from 32.106-1 and 32.106-5>	32.621	**Generic Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (Generic NRM part)	32.622	Generic Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (Generic NRM related part)	32.623	Generic Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (Generic NRM related part)	32.624	Generic Network Resources IRP: CMIP SS
32.106-1	<Basic CM IRP CN NRM requirements from 32.106-1 and 32.106-5>	32.631	**Core Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (CN NRM part)	32.632	Core Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (CN NRM related part)	32.633	Core Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (CN NRM related part)	32.634	Core Network Resources IRP: CMIP SS
32.106-1	<Basic CM IRP UTRAN NRM requirements from 32.106-1 and 32.106-5>	32.641	**UTRAN Network Resources IRP**: Requirements
32.106-5	Basic CM IRP IM (UTRAN NRM part)	32.642	UTRAN Network Resources IRP: NRM
32.106-6	Basic CM IRP CORBA SS (UTRAN NRM related part)	32.643	UTRAN Network Resources IRP: CORBA SS
32.106-7	Basic CM IRP CMIP SS (UTRAN NRM related part)	32.644	UTRAN Network Resources IRP: CMIP SS
		32.651	**GERAN Network Resources IRP**: Requirements
		32.652	GERAN Network Resources IRP: NRM
		32.653	GERAN Network Resources IRP: CORBA SS
		32.654	GERAN Network Resources IRP: CMIP SS

1 Scope

The present document specifies the Common Management Information Protocol (CMIP) Solution Set (SS) for the Generic Network Resource Integration Reference Point (IRP): Network Resource Model defined in 3GPP TS 32.622. This Solution Set specification is related to 3GPP TS 32.622 V5.0.x.

In detail:

- Clause 4 contains an introduction to some concepts that are the base for some specific aspects of the CMIP interfaces.
- Clause 5 contains the GDMO definitions for the Alarm Management over the CMIP interfaces
- Clause 6 contains the ASN.1 definitions supporting the GDMO definitions provided in clause 5.

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 32.304: "Telecommunication Management; Notificaion Management; Part 4: Notification Integration Reference Point; CMIP Solution Set".

[4] 3GPP TS 32.622: "Telecommunication Management; Configuration Management: Generic Network Resource Integration Reference Point: Network Resource Model".

[5] ITU-T Recommendation X.710 (1991): "Common Management Information Service Definition for CCITT Applications".

[6] ITU-T Recommendation X.721 (02/92): "Information Technology - Open Systems Interconnection – Structure of Management Information: Definition of Management Information".

[7] ITU-T Recommendation X.730 (01/92): "Information Technology - Open Systems Interconnection – Systems Management: Object Management Function".

[8] ITU-T Recommendation X.733 (02/92): "Information Technology - Open Systems Interconnection - Alarm Reporting Function".

[9] ITU-T Recommendation M.3100 (07/95): "Maintenance Telecommunications Management Network – Generic Network Information Model".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 32.600 and 3GPP TS 32.622 apply.

3.2 Abbreviations

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

CMIP	Common Management Information Protocol
DN	Distinguished Name
GDMO	Guidelines for the Definition of Managed Objects
IDL	Interface Definition Language
IEC	International Electro-technical Commission
ISO	International Standards Organization
ITU-T	International Telecommunication Union, Telecommunication Sector
MIB	Management Information Base
MIM	Management Information Model
MIT	Management Information Tree (or Naming Tree)
MOC	Managed Object Class
MOI	Managed Object Instance
NE	Network Element
NR	Network Resource
NRM	Network Resource Model
TMN	Telecommunications Management Network

4 Basic aspects

4.1 Explanation

A technology independent generic network resource model is defined in 3GPP TS 32.622 for 3G networks. This document provides an implementation of this generic network resource model by using CMIP technology.

4.2 Allowed Alarms of MOCs

Table 1 defines the allowed alarms of each MOCs for this CMIP Solution Set. The MOCs, which do not appear in table 1, may not issue any alarm except the alarms that are defined as allowed for its super-class MOC(s) in the inheritance tree.

Table 1: Allowed alarms of MOCs

MOCs	Legal Alarms
SubNetwork	EnvironmentalAlarm
ManagedElement	environmentalAlarm equipmentAlarm communicationsAlarm processingErrorAlarm
ManagementNode	environmentalAlarm equipmentAlarm communicationsAlarm processingErrorAlarm
ManagedFunction	communicationsAlarm processingErrorAlarm QualityofServiceAlarm
IrpAgent	communicationsAlarm processingErrorAlarm
~~alarmControl (TS 32.111-4)~~	~~alarmListRebuiltAlarm~~

4.3 Mapping

The semantic of the Generic Network Resource Model is defined in 3GPP TS 32.622. The specification of the information object classes defined there is independent of any implementation technology and protocol.
This subclause maps these technology and protocol independent definitions onto the equivalencies of the CMIP Solution Set of the Generic Network Resource IRP.

4.3.1 Mapping ~~of~~ from IOCs to MOCs

Table 2 maps the information~~managed~~ object classes defined in the Generic Network Resource Model onto the equivalent MOCs of the CMIP Solution Set.

Table 2: Mapping of MOCs

Information~~Managed~~ Objects of the Generic NR IRP NRM	MOCs of this CMIP SS
ManagedElement	managedElement
SubNetwork	subNetwork
IRPAgent	irpAgent
ManagedFunction	managedFunction
ManagementNode	managementNode
MeContext	meContext
~~BasicCmIRP~~GenericIRP	~~bcmControl~~ no equivalence
VsDataContainer	~~VsDataContainer~~no equivalence
~~BulkCmIRP~~Top	~~BulkCmControl~~top (ITU-T X.721)

4.3.2 Mapping of Attributes

Table 3: Mapping of Attributes

Attribute defined in 3GPP TS 32.622	Attribute defined in this CMIP SS
DnPrefix	systemTitle (ITU-T Recommendation X.721: 1992)
ManagedElementId	managedElementId
SubNetworkId	subNetworkId
IrpAgentId	irpAgentId
LocationName	locationName (ITU-T Recommendation M.3100: 1995)
~~ManagedBy~~	~~meManagedBy~~
ManagedElementType	managedElementType
ManagementNodeId	managementNodeId
~~Manages~~IrpId	~~mnManagesList~~ No equivalence
MeContextId	meContextId
SystemDN	~~not needed~~No equivalence
UserDefinedState	userDefinedState
UserLabel	userLabel (ITU-T Recommendation M.3100: 1995)
VendorName	vendorName (ITU-T Recommendation M.3100: 1995)
VsDataContainerId	No equivalence~~vsDataContainerId~~
VsDataType	No equivalence~~vsDataType~~
VsData	No equivalence~~vsData~~
VsDataFormatVersion	No equivalence~~vsDataFormatVersion~~
~~BulkCmIrpId~~objectClass	~~BulkCmControlId~~objectClass (ITU-T Recommendation X.721: 1992)
~~IrpVersion~~objectInstance	~~IrpVersion~~objectInstance (ITU-T Recommendation X.721: 1992)
UserDefinedNetworkType	userDefinedNetworkType
SwVersion	swVersion

5 GDMO Definitions

5.1 Managed Object Classes

5.1.1 subNetwork

```
subNetwork MANAGED OBJECT CLASS
  DERIVED FROM      "Recommendation X.721: 1992":top;
  CHARACTERIZED BY
    subNetworkBasicPackage;
  CONDITIONAL PACKAGES
     "Recommendation M.3100: 1995":attributeValueChangeNotificationPackage  PRESENT IF
       "the attributeValueChange notifications defined in Recommendation X.721
        are supported by an instance of this class.",
    "Recommendation M.3100: 1995":environmentalAlarmPackage  PRESENT IF
       "the environmentalAlarm notifications defined in Recommendation X.721
        are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 1};
```

5.1.2 managedElement

managedElement MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721: 1992":top;
CHARACTERIZED BY
managedElementBasicPackage,
managedElementAssociationPackage;
CONDITIONAL PACKAGES
rootOptionalPackage PRESENT IF
"An instance of managedElement is the accessing root of a MIB.",
"Recommendation M.3100: 1995":createDeleteNotificationsPackage PRESENT IF
"the objectCreation and the objectDeletion defined in Recommendation
X.721 are supported by an instance of this class.",
"Recommendation M.3100: 1995":attributeValueChangeNotificationPackage PRESENT IF
"the attributeValueChange notifications defined in Recommendation X.721
are supported by an instance of this class.",
"Recommendation M.3100: 1995":processingErrorAlarmPackage PRESENT IF
"the processingErrorAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
"Recommendation M.3100: 1995":environmentalAlarmPackage PRESENT IF
"the environmentalAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
communicationsAlarmPackage PRESENT IF
"the communicationsAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
equipmentAlarmPackage PRESENT IF
"the equipmentAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 2};

5.1.3 managementNode

managementNode MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721: 1992":top;
CHARACTERIZED BY
managementNodeBasicPackage,
managementNodeAssociationPackage;
CONDITIONAL PACKAGES
"Recommendation M.3100: 1995":createDeleteNotificationsPackage PRESENT IF
"the objectCreation and the objectDeletion defined in Recommendation
X.721 are supported by an instance of this class.",
"Recommendation M.3100: 1995":attributeValueChangeNotificationPackage PRESENT IF
"the attributeValueChange notifications defined in Recommendation X.721
are supported by an instance of this class.",
"Recommendation M.3100: 1995":processingErrorAlarmPackage PRESENT IF
"the processingErrorAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",

"Recommendation M.3100: 1995":environmentalAlarmPackage PRESENT IF
"the environmentalAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
communicationsAlarmPackage PRESENT IF
"the communicationsAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
equipmentAlarmPackage PRESENT IF
"the equipmentAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 3};

~~5.1.4 vsDataContainer~~

~~**vsDataContainer** MANAGED OBJECT CLASS~~
~~DERIVED FROM "Recommendation X.721: 1992":top;~~
~~CHARACTERIZED BY~~
~~vsDataContainerBasicPackage;~~
~~REGISTERED AS {ts32-624ObjectClass 4};~~

~~5.1.5 bulkCmControl~~

~~**bulkCmControl** MANAGED OBJECT CLASS~~
~~DERIVED FROM "Recommendation X.721: 1992":top;~~
~~CHARACTERIZED BY~~
~~bulkCmControlBasicPackage,~~
~~bulkCmControlActionPackage,~~
~~bulkCmControlNotificationPackage;~~
~~REGISTERED AS {ts32-624ObjectClass 5};~~

5.1.4~~6~~ irpAgent

irpAgent MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721: 1992":top;
CHARACTERIZED BY
irpAgentBasicPackage;
CONDITIONAL PACKAGES
"Recommendation M.3100: 1995":processingErrorAlarmPackage PRESENT IF
"the processingErrorAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
communicationsAlarmPackage PRESENT IF
"the communicationsAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 6};

5.1.57 managedFunction

managedFunction MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721: 1992":top;
CHARACTERIZED BY
managedFunctionBasicPackage;
CONDITIONAL PACKAGES
"Recommendation M.3100: 1995":createDeleteNotificationsPackage PRESENT IF
"the objectCreation and the objectDeletion defined in Recommendation
X.721 are supported by an instance of this class.",
"Recommendation M.3100: 1995":attributeValueChangeNotificationPackage PRESENT IF
"the attributeValueChange notifications defined in Recommendation X.721
are supported by an instance of this class.",
"Recommendation M.3100: 1995":processingErrorAlarmPackage PRESENT IF
"the processingErrorAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
communicationsAlarmPackage PRESENT IF
"the communicationsAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.",
qualityOfServiceAlarmPackage PRESENT IF
"the qualityOfServiceAlarm notifications defined in Recommendation X.721
are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 7};

5.1.68 meContext

meContext MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721: 1992":top;
CHARACTERIZED BY
meContextBasicPackage;
CONDITIONAL PACKAGES
rootOptionalPackage PRESENT IF
“An instance of meContext is the accessing root of a MIB.”,
"Recommendation M.3100: 1995":createDeleteNotificationsPackage PRESENT IF
"the objectCreation and the objectDeletion defined in Recommendation
X.721 are supported by an instance of this class.";
REGISTERED AS {ts32-624ObjectClass 8};

~~5.1.9 bcmControl~~

~~**bcmControl** MANAGED OBJECT CLASS~~
~~DERIVED FROM "Recommendation X.721: 1992":top;~~
~~CHARACTERIZED BY~~
~~bcmControlBasicPackage,~~
~~bcmIRPVersionPackage;~~
~~REGISTERED AS {ts32-624ObjectClass 9};~~

5.2 Packages

5.2.1 subNetworkBasicPackage

subNetworkBasicPackage PACKAGE
  BEHAVIOUR
    subNetworkBasicPackageBehaviour;
  ATTRIBUTES
    subNetworkId GET,
    "Recommendation X.721: 1992": systemTitle GET,
    "Recommendation M.3100: 1995" : userLabel GET-REPLACE,
    userDefinedNetworkType GET;
REGISTERED AS {ts32-624Package 1};

subNetworkBasicPackageBehaviour BEHAVIOUR
  DEFINED AS
    "This managed object class represents collections of interconnected telecommunications and management objects (logical or physical) capable of exchanging information. A network may be nested within another (larger) network, thereby forming a containment relationship.";

5.2.2 managedElementBasicPackage

managedElementBasicPackage PACKAGE
  BEHAVIOUR
    managedElementBasicPackageBehaviour;
  ATTRIBUTES
    managedElementId GET,
    managedElementType GET,
    userDefinedState GET-REPLACE,
    "Recommendation M.3100: 1995" : userLabel GET-REPLACE,
    "Recommendation M.3100: 1995" : vendorName GET,
    "Recommendation M.3100: 1995" : locationName GET,
    swVersion GET;
REGISTERED AS {ts32-624Package 2};

managedElementBasicPackageBehaviour BEHAVIOUR
  DEFINED AS
    "This managed object class represents telecommunications equipment within the telecommunications network that performs managed element functions, i.e. provides support and/or service to the subscriber. A managed element communicates with a manager (directly or indirectly) over one or more standard interfaces for the purpose of being monitored and/or controlled. A managed element contains equipment that may or may not be geographically distributed. A Managed Element is often referred to as a 'node' or a 'network element'.";

5.2.3 managedElementAssociationPackage

managedElementAssociationPackage PACKAGE
  BEHAVIOUR
    managedElementAssociationPackageBehaviour;
  ATTRIBUTES
    meManagedBy GET;
REGISTERED AS {ts32-624Package 3};

managedElementAssociationPackageBehaviour BEHAVIOUR
  DEFINED AS
    "The attribute 'meManagedBy' points to the managmentNode instance which manages this managedElement instance. It implements the attribute *managedBy* of MOC ManagedElement defined in TS32.622.";

~~5.2.4 vsDataContainerBasicPackage~~

~~**vsDataContainerBasicPackage** PACKAGE~~
~~BEHAVIOUR~~
~~vsDataContainerBasicPackageBehaviour;~~
~~ATTRIBUTES~~
~~vsDataContainerId GET,~~
~~vsDataType GET,~~
~~vsData GET-REPLACE,~~
~~vsDataFormatVersion GET;~~
~~REGISTERED AS {ts32-624Package 4};~~

~~**vsDataContainerBasicPackageBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"The 'VsDataContainer' managed object is a container for vendor specific data. The number of instances of the 'VsDataContainer' can differ from vendor to vendor. This MOC shall only be used by the Bulk CM IRP for the UTRAN and GERAN object models.";~~

~~5.2.5 bulkCmControlBasicPackage~~

~~**bulkCmControlBasicPackage** PACKAGE~~
~~BEHAVIOUR~~
~~bulkCmControlBasicPackageBehaviour;~~
~~ATTRIBUTES~~
~~bulkCmControlId GET,~~
~~irpVersion GET;~~
~~REGISTERED AS {ts32-624Package 5};~~

~~**bulkCmControlBasicPackageBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This Managed Object Class represents the Bulk CM IRP capability associated with each IRPAgent. Restriction in Rel-4: Number of instances = 0..1.";~~

5.2.6 bulkCmControlActionPackage

bulkCmControlActionPackage PACKAGE
BEHAVIOUR
bulkCmControlActionPackageBehaviour;
ACTIONS
"3GPP TS 32.614 Release 4": startSession,
"3GPP TS 32.614 Release 4": endSession,
"3GPP TS 32.614 Release 4": upload,
"3GPP TS 32.614 Release 4": download,
"3GPP TS 32.614 Release 4": activate,
"3GPP TS 32.614 Release 4": fallback,
"3GPP TS 32.614 Release 4": abortSessionOperation,
"3GPP TS 32.614 Release 4": getSessionIds,
"3GPP TS 32.614 Release 4": getSessionStatus,
"3GPP TS 32.614 Release 4": getSessionLog,
"3GPP TS 32.614 Release 4": getBulkCmIrpVersion;
REGISTERED AS {ts32-624Package 6};

bulkCmControlActionPackageBehaviour BEHAVIOUR
DEFINED AS
"This package specifies all actions a bulkCmControl shall provide.";

5.2.7 bulkCmControlNotificationPackage

bulkCmControlNotificationPackage PACKAGE
BEHAVIOUR
bulkCmControlNotificationPackageBehaviour;
NOTIFICATIONS
"3GPP TS 32.614 Release 4": sessionStateChanged,
"3GPP TS 32.614 Release 4": getSessionLogEnded;
REGISTERED AS {ts32-624Package 7};

bulkCmControlNotificationPackageBehaviour BEHAVIOUR
DEFINED AS
"This package specifies all notifications a bulkCmControl shall provide.";

5.2.8 managementNodeBasicPackage

managementNodeBasicPackage PACKAGE
ATTRIBUTES
managementNodeId GET,
userDefinedState GET-REPLACE,
"Recommendation M.3100: 1995" : userLabel GET-REPLACE,

"Recommendation M.3100: 1995" : vendorName GET,
"Recommendation M.3100: 1995" : locationName GET;
swVersion: GET;
REGISTERED AS {ts32-624Package 8};

managementNodeBasicPackageBehaviour BEHAVIOUR
DEFINED AS
"This managed object class represents a telecommunications management system (EM or NM) within the TMN, that manages a number of Managed Elements. The management system communicates with the MEs directly or indirectly over one or more standard interfaces for the purpose of monitoring and/or controlling these MEs.";

5.2.9 managementNodeAssociationPackage

managementNodeAssociationPackage PACKAGE
BEHAVIOUR
managementNodeAssociationPackageBehaviour;
ATTRIBUTES
mnManagesList GET;
REGISTERED AS {ts32-624Package 9};

managementNodeAssociationPackageBehaviour BEHAVIOUR
DEFINED AS
"The attribute 'mnManagesList' points to all managedElement instances which this managementNode instance manages. It implements the attribute *manages* of MOC ManagementNode defined in TS32.622.";

5.2.10 irpAgentBasicPackage

irpAgentBasicPackage PACKAGE
BEHAVIOUR
irpAgentBasicPackageBehaviour;
ATTRIBUTES
irpAgentId GET,
"Recommendation M.3100: 1995" : userLabel GET-REPLACE,
supportedIRPs GET;
REGISTERED AS {ts32-624Package 10};

irpAgentBasicPackageBehaviour BEHAVIOUR
DEFINED AS
"irpAgent may have only one instance in R99 and R4. The instance of this MOC represents the behavior of an IRP Agent which implements one or more IRPs";

5.2.11 managedFunctionBasicPackage

managedFunctionBasicPackage PACKAGE
BEHAVIOUR
managementFunctionBasicPackageBehaviour;
ATTRIBUTES
"Recommendation M.3100: 1995" : userLabel GET-REPLACE;
REGISTERED AS {ts32-624Package 11};

managedFunctionBasicPackageBehaviour BEHAVIOUR
DEFINED AS
"This Managed Object class corresponds to the class gsmManagedFunction defined in GSM 12.20 0 and is provided for sub-classing only. It provides the attributes that are common to functional MO classes. Note that a managed element may contain several managed functions. The ManagedFunction may be extended in the future if more common characteristics to functional objects are identified.";

5.2.12 meContextBasicPackage

meContextBasicPackage PACKAGE
BEHAVIOUR
meContextBasicPackageBehaviour;
ATTRIBUTES
meContextId GET;
REGISTERED AS {ts32-624Package 12};

meContextBasicPackageBehaviour BEHAVIOUR
DEFINED AS
"This managed object class represents the Managed Element from the network perspective. It can be used to hold surveillance status information, and also planning status information for the case when the managed element is part of a planned configuration in a management system, before it has been taken into service. It can also support unambiguous naming in all cases, also for scenarios when the Managed Elements have been pre-configured where some of them may have equal names (to avoid necessary administration to make all of them globally unique at creation/installation time). Thus, by means of globally unique names for the MEContext instances, and by using these in the DN, the DNs for all MEs (and MOIs contained in them) can be assured to be globally unique, even in such a scenario as described above.";

~~5.2.13 bcmControlBasicPackage~~

~~**bcmControlBasicPackage** PACKAGE~~

~~BEHAVIOUR~~
~~bcmControlBasicPackageBehaviour;~~
~~ATTRIBUTES~~
~~bcmControlId GET;~~
~~REGISTERED AS {ts32-624Package 13};~~

~~**bcmControlBasicPackageBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"The object class bcmControl offers the functions defined in the CM IRP IS~~
~~enabling to control the behaviour and to retrieve the management information~~
~~related a Basic CM IRP agent.~~
~~An instance of the 'BCmControl' MOC is identified by the value of the attribute~~
~~'bcmControlId'.";~~

~~5.2.14 bcmIRPVersionPackage~~

~~**bcmIRPVersionPackage** PACKAGE~~
~~BEHAVIOUR~~
~~bcmIRPVersionPackageBehaviour;~~
~~ATTRIBUTES~~
~~supportedBcmIRPVersions GET;~~
~~ACTIONS~~
~~"3GPP TS 32.604 Release 4":getBCmIRPVersion;~~
~~REGISTERED AS {ts32-624Package 14};~~

~~**bcmIRPVersionPackageBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This package has been defined to allow the Manager to get information about the~~
~~Basic CM IRP versions supported by the Agent.~~
~~The attribute 'supportedBCmIRPVersions' indicates all versions of the Basic IRP~~
~~currently supported by the Agent. .~~
~~With the action 'getBasicCmIRPVersion' a manager can find out the versions of~~
~~the Basic CM IRP CMIP solution sets the Agent supports.";~~

5.2.15 communicationsAlarmPackage

communicationsAlarmPackage PACKAGE
NOTIFICATIONS
"Recommendation X.721:1992": communicationsAlarm;
REGISTERED AS {ts32-624Package 15};

5.2.16 equipmentAlarmPackage

equipmentAlarmPackage PACKAGE
NOTIFICATIONS

"Recommendation X.721:1992": equipmentAlarm;
REGISTERED AS {ts32-624Package 16};

5.2.17 qualityOfServiceAlarmPackage

qualityOfServiceAlarmPackage PACKAGE
NOTIFICATIONS
"Recommendation X.721:1992": qualityofServiceAlarm;
REGISTERED AS {ts32-624Package 17};

5.2.18 rootOptionalPackage

rootOptionalPackage PACKAGE
BEHAVIOUR
rootOptionalPackageBehaviour;
ATTRIBUTES
"Recommendation X.721: 1992" : systemTitle GET;
REGISTERED AS {ts32-624Package 18};

rootOptionalPackageBehaviour BEHAVIOUR
DEFINED AS
"This package shall be present in an instance of meContext or managedElement when it is the accessing point (root) of a MIB.";

5.3 Attributes

5.3.1 managedElementType

managedElementType ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule .ManagedElementType;
MATCHES FOR EQUALITY;
BEHAVIOUR
managedElementTypeBehaviour;
REGISTERED AS {ts32-624Attribute 1};

managedElementTypeBehaviour BEHAVIOUR
DEFINED AS
"This attribute specifies which managed functions a managed element contains.";

5.3.2 subNetworkId

subNetworkId ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR

subNetworkIdBehaviour;
REGISTERED AS {ts32-624Attribute 2};

subNetworkIdBehaviour BEHAVIOUR
DEFINED AS
"This attribute identifies a subNetwork instance.";

~~5.3.3 vsDataContainerId~~

~~**vsDataContainerId** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~vsDataContainerIdBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 2};~~

~~**vsDataContainerIdBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This attribute identifies a vsDataContainer instance.";~~

~~5.3.4 vsDataType~~

~~**vsDataType** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.VsDataType;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~vsDataTypeBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 3};~~

~~**vsDataTypeBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"Type of vendor specific data contained by this instance, e.g. relation specific algorithem parameters, cell specific parameters for pewer control or re-selection or a timer. The type itself is also vendor specific.";~~

~~5.3.5 vsData~~

~~**vsData** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.VsData;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~vsDataBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 4};~~

~~**vsDataBehaviour** BEHAVIOUR~~
~~DEFINED AS~~

~~"Vendor specific attributes of the type vsDataType. The attribute definitions including constraints (value ranges, data types, etc.) are specified in a vendor specific data format file.";~~

~~5.3.6 vsDataFormatVersion~~

~~**vsDataFormatVersion** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.VsDataFormatVersion;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~vsDataFormatVersionBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 5};~~

~~**vsDataFormatVersionBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"Name of the data format file, including version.";~~

~~5.3.7 bulkCmControlId~~

~~**bulkCmControlId** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~bulkCmControlIdBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 6};~~

~~**bulkCmControlIdBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This attribute identifies a bulkCmControl instance.";~~

~~5.3.8 irpVersion~~

~~**irpVersion** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.IrpVersion;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~irpVersionBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 7};~~

~~**irpVersionBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"One or more Bulk CM IRP version entries.";~~

5.3.3~~9~~ userDefinedNetworkType

userDefinedNetworkType ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.UserDefinedNetworkType;

MATCHES FOR EQUALITY;
BEHAVIOUR
userDefinedNetworkTypeBehaviour;
REGISTERED AS {ts32-624Attribute 8};

userDefinedNetworkTypeBehaviour BEHAVIOUR
DEFINED AS
"Textual information regarding the type of network, e.g. UTRAN.";

5.3.4~~10~~ swVersion

swVersion ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.SwVersion;
MATCHES FOR EQUALITY;
BEHAVIOUR
swVersionBehaviour;
REGISTERED AS {ts32-624Attribute 9};

swVersionBehaviour BEHAVIOUR
DEFINED AS
"The software version of the managed element (this is used for determin which version of the vendor specific information that is valid for the managed element).";

5.3.5~~11~~ managedElementId

managedElementId ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule .GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
managedElementIdBehaviour;
REGISTERED AS {ts32-624Attribute 10};

managedElementIdBehaviour BEHAVIOUR
DEFINED AS
"This attribute names an instance of the '3gManagedElement' object class.";

5.3.6~~12~~ userDefinedState

userDefinedState ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.UserDefinedState;
MATCHES FOR EQUALITY;
BEHAVIOUR
userDefinedStateBehaviour;
REGISTERED AS {ts32-624Attribute 11};

userDefinedStateBehaviour BEHAVIOUR
DEFINED AS
"This attribute specifies an operator defined state for operator specific usage.";

5.3.713 meManagedBy

meManagedBy ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectPointer;
MATCHES FOR EQUALITY;
BEHAVIOUR
meManagedByBehaviour;
REGISTERED AS {ts32-624Attribute 12};

meManagedByBehaviour BEHAVIOUR
DEFINED AS
"This attribute points to the managementNode instance which manages the related 3gManagedElement instance.";

5.3.814 managementNodeId

managementNodeId ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;
MATCHES FOR EQUALITY;
BEHAVIOUR
managmentNodeIdBehaviour;
REGISTERED AS {ts32-624Attribute 13};

managmentNodeIdBehaviour BEHAVIOUR
DEFINED AS
"This attribute names an instance of the 'managmentNode' object class.";

5.3.915 mnManagesList

mnManagesList ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectPointerList;
MATCHES FOR EQUALITY;
BEHAVIOUR
mnManagesListBehaviour;
REGISTERED AS {ts32-624Attribute 14};

mnManagesListBehaviour BEHAVIOUR
DEFINED AS
"This attribute points to all 3gManagedElement instances which this 3gManagmentNode instance manages.";

5.3.106 irpAgentId

irpAgentId ATTRIBUTE
  WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    irpAgentIdBehaviour;
REGISTERED AS {ts32-624 Attribute 15};

irpAgentIdBehaviour BEHAVIOUR
  DEFINED AS
    "This attribute identifies an irpAgent instance.";

5.3.117 supportedIRPs

supportedIRPs ATTRIBUTE
WITH ATTRIBUTE SYNTAX TS32-624TypeModule.SupportedIRPs;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    supportedIRPsBehaviour;
REGISTERED AS {ts32-624Attribute 16};

supportedIRPsBehaviour BEHAVIOUR
  DEFINED AS
    "This attribute provides the information about IRPs an IRPAgent supports.";

5.3.128 meContextId

meContextId ATTRIBUTE
  WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    meContextIdBehaviour;
REGISTERED AS {ts32-624Attribute 17};

meContextIdBehaviour BEHAVIOUR
  DEFINED AS
    "This attribute names an instance of the 'MEContext' object class.";

~~5.3.19 bcmControlId~~

~~**bcmControlId** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.GeneralObjectId;~~
~~MATCHES FOR EQUALITY;~~

~~BEHAVIOUR~~
~~bcmControlIdBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 18};~~

~~**bcmControlIdBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This attribute names an instance of the 'bcmControl' object class.";~~

~~5.3.20 supportedBcmIRPVersions~~

~~**supportedBcmIRPVersions** ATTRIBUTE~~
~~WITH ATTRIBUTE SYNTAX TS32-624TypeModule.SupportedBCmIRPVersions;~~
~~MATCHES FOR EQUALITY;~~
~~BEHAVIOUR~~
~~supportedBCmIRPVersionsBehaviour;~~
~~REGISTERED AS {ts32-624Attribute 19};~~

~~**supportedBCmIRPVersionsBehaviour** BEHAVIOUR~~
~~DEFINED AS~~
~~"This attribute provides the information concerning the Basic CM IRP versions~~
~~currently supported by the Agent.";~~

~~5.4 Actions~~

~~Void.~~

~~5.4.1 getBcmIRPVersion~~

~~Void.~~

5.4~~5~~ Name Binding

5.4~~5~~.1 managedElement - meContext

managedElement-meContext NAME BINDING
SUBORDINATE OBJECT CLASS managedElement;
NAMED BY SUPERIOR OBJECT CLASS meContext;
WITH ATTRIBUTE managedElementId;
BEHAVIOUR
managedElement-meContextBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 1};

managedElement-meContextBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a meContext contains and

controls a managedElement. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.2 managedElement - subNetwork

managedElement-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS managedElement;
NAMED BY SUPERIOR OBJECT CLASS subNetwork;
WITH ATTRIBUTE managedElementId;
BEHAVIOUR
managedElement-subNetworkBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 2};

managedElement-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a subNetwork contains and controls a managedElement. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.3 meContext - subNetwork

meContext-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS meContext;
NAMED BY SUPERIOR OBJECT CLASS subNetwork;
WITH ATTRIBUTE meContextId;
BEHAVIOUR
meContext-subNetworkBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 3};

meContext-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a subNetwork contains and controls a meContext. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.4 subNetworkbulkCmControl - subNetworkirpAgent

bulkCmControl-irpAgentsubNetwork-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS **subNetwork**bulkCmControl;
NAMED BY SUPERIOR OBJECT CLASS **subNetwork**irpAgent;
WITH ATTRIBUTE **subNetwork**bulkCmControlId;
BEHAVIOUR
subNetwork-subNetworkbulkCmControl-irpAgentBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;

DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 114};

bulkCmControl-irpAgentBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a **subNetwork**~~irpAgent~~ contains and controls another **subNetwork**~~bulkCmControl~~. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.5 irpAgent - subNetwork

irpAgent-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS irpAgent;
NAMED BY SUPERIOR OBJECT CLASS subNetwork;
WITH ATTRIBUTE irpAgentId;
BEHAVIOUR
irpAgent-subNetworkBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 5};

irpAgent-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a subNetwork contains and controls a irpAgent. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.6 irpAgent - managementNode

irpAgent - managementNode NAME BINDING
SUBORDINATE OBJECT CLASS irpAgent;
NAMED BY SUPERIOR OBJECT CLASS managementNode;
WITH ATTRIBUTE “3GPP TS 32.624: 6.2001”: irpAgentId;
BEHAVIOUR
irpAgent-managementNodeBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 6};

irpAgent-managementNodeBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a managedNode contains and controls a irpAgent. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.7 managementNode - subNetwork

managementNode-subNetwork NAME BINDING
SUBORDINATE OBJECT CLASS managementNode;
NAMED BY SUPERIOR OBJECT CLASS subNetwork;
WITH ATTRIBUTE managementNodeId;
BEHAVIOUR
managementNode-subNetworkBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 7};

managementNode-subNetworkBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a subNetwork contains and controls a managementNode. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.45.8 irpAgent - managedElement

irpAgent-managedElement NAME BINDING
SUBORDINATE OBJECT CLASS irpAgent;
NAMED BY SUPERIOR OBJECT CLASS managedElement;
WITH ATTRIBUTE irpAgentId;
BEHAVIOUR
irpAgent-managedElementBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 8};

irpAgent-managedElementBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a managedElement contains and controls an irpAgent. When automatic instance naming is used, the choice of name bindings left as a local matter.";

~~5.5.9 bcmControl - irpAgent~~

~~**bcmControl-irpAgent** NAME BINDING~~
~~SUBORDINATE OBJECT CLASS bcmControl;~~
~~NAMED BY SUPERIOR OBJECT CLASS irpAgent;~~
~~WITH ATTRIBUTE bcmControlId;~~
~~BEHAVIOUR~~
~~bcmControl-irpAgentBehavior;~~
~~CREATE WITH-AUTOMATIC-INSTANCE-NAMING;~~
~~DELETE ONLY-IF-NO-CONTAINED-OBJECTS;~~

REGISTERED AS {ts32-624NameBinding 9};

bcmControl-irpAgentBehavior BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a irpAgent contains and controls an bcmControl. When automatic instance naming is used, the choice of name bindings left as a local matter.";

5.5.10 vsDataContainer - vsDataContainer

vsDataContainer-vsDataContainer NAME BINDING
SUBORDINATE OBJECT CLASS vsDataContainer;
NAMED BY SUPERIOR OBJECT CLASS vsDataContainer;
WITH ATTRIBUTE vsDataContainerId;
BEHAVIOUR
vsDataContainer-vsDataContainerBehaviour;
CREATE WITH-REFERENCE-OBJECT, WITH-AUTOMATIC-INSTANCE-NAMING;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS {ts32-624NameBinding 10};

vsDataContainer-vsDataContainerBehaviour BEHAVIOUR
DEFINED AS
"The name binding represents a relationship in which a vsDataContainer contains and controls another vsDataContainer. When automatic instance naming is used, the choice of name bindings is left as a local matter. This containment relation shall be used only with Bulk CM IRP CMIP SS defined in 3GPP TS 32.614.";

6 ASN.1 Definitions

```
TS32-624TypeModule {ccitt (0) identified-organization (4) etsi (0)
        mobileDomain (0) umts-Operation-Maintenance (3) ts32-624 (624)
        informationModel (0) asn1Module (2) version1 (1)}


DEFINITIONS IMPLICIT TAGS ::=
BEGIN
--EXPORTS everything

IMPORTS
ObjectInstance FROM CMIP-1 {joint-iso-ccitt ms(9) cmip(1) modules(0) protocol(3)}


-- 3GPP TS 32.624 related Object Identifiers

baseNodeUMTS  OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
                        umts-Operation-Maintenance(3)}
ts32-624      OBJECT IDENTIFIER ::= { baseNodeUMTS ts32-624(624)}
ts32-624InfoModel     OBJECT IDENTIFIER ::= { ts32-624 informationModel(0)}

ts32-624ObjectClass   OBJECT IDENTIFIER ::= { ts32-624InfoModel managedObjectClass(3)}
ts32-624Package       OBJECT IDENTIFIER ::= { ts32-624InfoModel package(4)}
ts32-624Parameter     OBJECT IDENTIFIER ::= { ts32-624InfoModel parameter(5)}
ts32-624NameBinding   OBJECT IDENTIFIER ::= { ts32-624InfoModel nameBinding(6)}
ts32-624Attribute     OBJECT IDENTIFIER ::= { ts32-624InfoModel attribute(7)}
ts32-624Action    OBJECT IDENTIFIER ::= { ts32-624InfoModel action(9)}
ts32-624Notification  OBJECT IDENTIFIER ::= { ts32-624InfoModel notification(10)}

-- Start of 3GPP SA5 own definitions

ManagedElementType::= GraphicString
GeneralObjectId ::= INTEGER
UserDefinedState ::= GraphicString
GeneralObjectPointer ::= ObjectInstance
GeneralObjectPointerList ::= SEQUENCE OF ObjectInstance
IRPNames::= SET OF ENUMERATED
{
notificationIRP     (1),
alarmIRP            (2),
basicCmIRP          (3),
bulkCmIRP           (4),
genericNRM          (5),
cnNRM               (6),
```

```
utranNRM        (7),
geranNRM        (8)
}
SupportedIRPs ::= SET OF IRPNames
VsDataType ::= GraphicString
VsData ::= GraphicString
VsDataFormatVersion ::= GraphicString
UserDefinedNetworkType ::= GraphicString
SwVersion ::= GraphicString

END  -- of TS32-624TypeModule
```

Annex A (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-010478	001	--	Correction due to TS renumbering	4.0.0	4.1.0
Sep 2001	S_13	SP-010479	002	--	Change the attribute “systemTitle” from mandatory to optional	4.0.0	4.1.0
Dec 2001	S_14	SP-010648	003	--	Change to Read/Write the attribute “userDefinedState” in MOC “ManagementNode”	4.1.0	4.2.0
Mar 2002	S_15	SP-020021	004	--	Removal of redundant GDMO/ASN.1 Code	4.2.0	4.3.0
Mar 2002	S_15	SP-020021	005	--	Making ‘elementType’ consistent	4.2.0	4.3.0
Mar 2002	S_15	SP-020021	006	--	Change the attribute "userLabel" from Read-Only to Read-Write	4.2.0	4.3.0
Jun 2002	S_16	SP-020300	007	--	Making 32.624 (CMIP SS) consistent with 32.622 (IS) and 32.623 (CORBA SS)	4.3.0	4.4.0
Jun 2002	S_16	SP-020300	008	--	Align with 32.622 (IS) by changing "userDefinedState" from read-only to read-write	4.3.0	4.4.0