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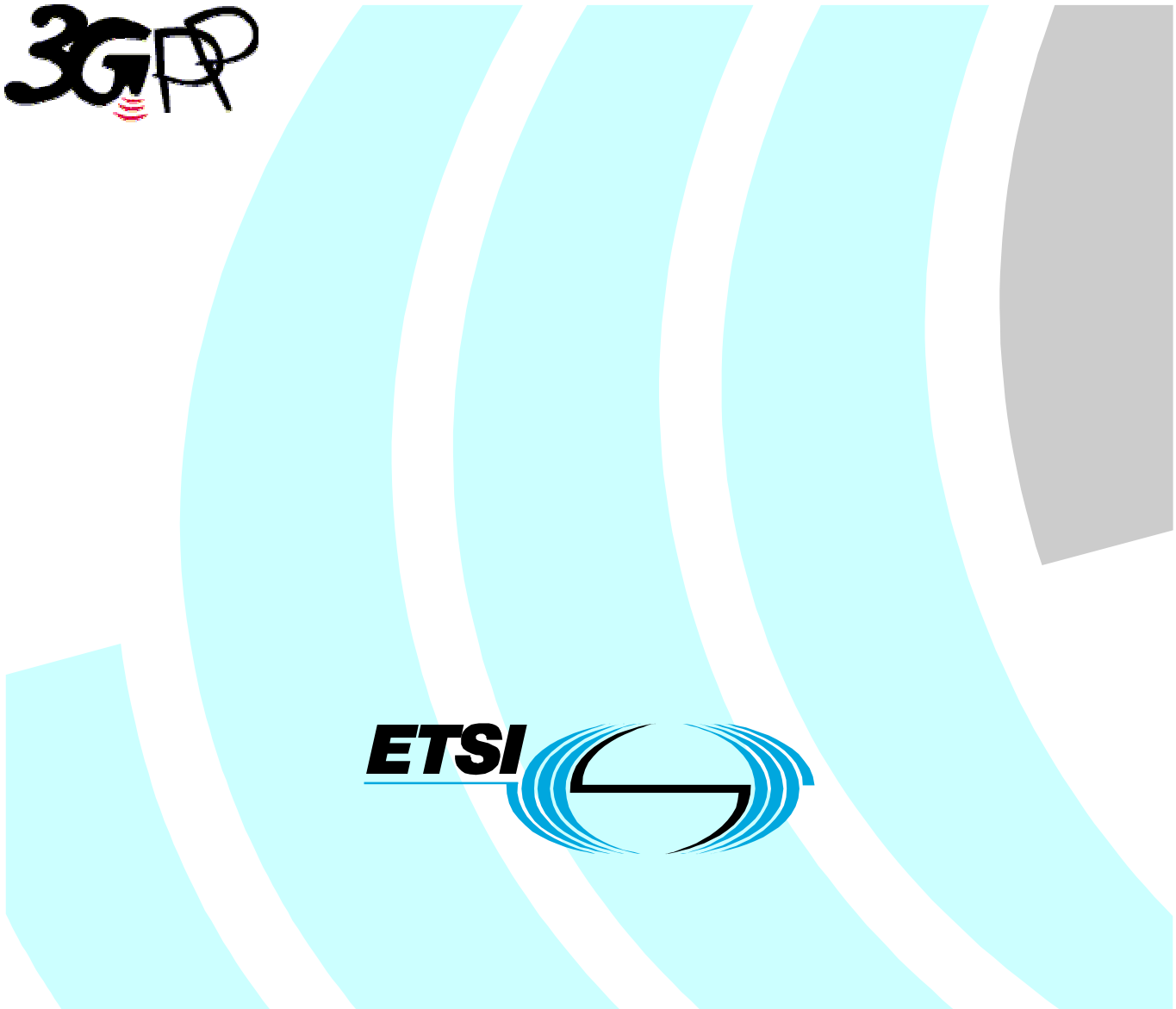
Technical Specification

Universal Mobile Telecommunications System (UMTS);
Telecommunication Management;
Configuration Management;
Basic configuration management IRP CMIP solution set
(3GPP TS 32.604 version 4.2.0 Release 4)



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Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under www.etsi.org/key .

Contents

Foreword

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

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

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

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 Models (Generic, Core Network and UTRAN NRM).

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

The following table shows an overview of the mapping between the old Release 1999 and new Release 4 CM specification structure.

Table: Mapping between Release '99 and the new Rel-4 specifications

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
32.106-1	<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

1 Scope

The present document specifies the Common Management Information Protocol (CMIP) Solution Set (SS) for the Basic CM Integration Reference Point (IRP): Information Service defined in 3GPP TS 32.602 [4]. 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; Notification Management; Part 4: Notification Integration Reference Point; CMIP Solution Set".

[4] 3GPP TS 32.602: "Telecommunication Management; Configuration Management: Basic CM Integration Reference Point; Information Services".

[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 32.602 [4] 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 CMIP specific aspects

This clause describes some technical details specific to CMIP technology, which are not easy to be handled in the related GDMO definitions.

4.1.1 About Associations

In the GDMO definitions, except the containment relations, all associations among different object classes and object instances are modelled with dedicated pointers of the concerned objects, i.e. various relation role attributes. These pointers are normal object attributes and don't require any special treatment. The service operation *getMoAttributes* defined in 3GPP TS 32.602 [4] and mapped on M-GET in this CMIP solution set is applied for managers to retrieve the values of these association pointers and the notification *attributeValueChang*e is applied for agents to report any change of the values of these association pointers.

4.1.2 About getContainment

In the GDMO definition the containment relations of the Managed Object Classes and those of the managed object instances are described by the name bindings. The service operation *getContainment* is defined in 3GPP TS 32.602 [4] to enable managers to retrieve the management information about the containment tree of the local MIB of an agent. This service operation is mapped to CMISE *M-GET* in this CMIP solution set. The information about the containment relation of a local MIB is consists of all MOIs abstracted from the output parameter *AttributeList* of a *M-GET* operation.

4.1.3 About getMoAttributes

The service operation *getMoAttributes* defined in the Basic CM IRP IS (3GPP TS 32.602 [4]) provides the basic functionality required to retrieve managed objects and their attributes, which is a subset of the functionality provided by the corresponding CMISE service operation *M-GET*. *getMoAttributes* is mapped to *M-GET* in this standard. This doesn't mean any limitation for using *M-GET*. Users of this standard are encouraged to use the whole functionality provided by *M-Get*, especially the input parameter "Attribute Identifier List" (see ITU-T X.710 [7]).

4.1.4 About cancelOperation

The service operation *cancelOperation* defined in the Basic CM IRP IS (3GPP TS 32.602 [4]) provides the basic functionality required to cancel an on-going getContainment or getMoAttributes operation, which is a subset of the functionality provided by the corresponding CMISE service operation *M-CANCEL-GET*. *cancelOperation* is mapped to *M-CANCEL-GET* in this standard. This doesn't mean any limitation for using *M-Cancel*. Users of this standard are encouraged to use the whole functionality provided by *M-CANCEL-GET*.

4.2 Mapping

The semantics of the Basic CM IRP IS are defined in 3GPP TS 32.602 [4]. The definitions of the management services and management information defined there are 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 Basic CM IRP.

4.2.1 Mapping of Operations

Table 2 maps the operations defined in the Basic CM IRP Information Service onto the equivalent Actions/Services of the CMIP Solution Set. The CMIP Actions/Services are qualified as Mandatory (M) or Optional (O).

Table 1: Mapping of operations

Operations of Information Services of the Basic CM IRP defined in 3GPP TS 32.602	Equivalent operation of the CMIP solution set of the Basic CM IRP	Qualifier
GetMoAttributes	M-GET (CMISE Service)	M
GetContainment	M-GET (CMISE Service)	O
CancelOperation	M-CANCEL-GET (CMISE Service)	O
GetBasicCmIRPVersion	M-ACTION getBCmIRPVersion	M

4.2.2 Mapping of operation parameters

Tables 3, 4 and 5 in the following subclauses show the parameters of each operation defined in the Information Service described in 3GPP TS 32.602 and their equivalences in the CMIP Solution Set.

4.2.2.1 Mapping of Parameters of 'getMoAttributes'

Table 2: Mapping of parameters of 'getMoAttributes'

Parameters of the operation 'getMoAttributes' defined in 3GPP TS 32.602	CMISE M-GET parameters	Qualifier
invokeIdentifierIn	Invoke identifier (used in the Req/Ind primitives of M-GET)	M
baseObjectInstance	Base object instance	M
scope	Scope	M
filter	Filter	M
invokeIdentifierOut	Invoke identifier, if this is the last M-GET response during a Get procedure. Linked identifier, if this is not the last M-GET response during a Get procedure.(These parameters are used in the Rsp/Conf primitives of M-GET).	M
no equivalence	Base object class This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getMoAttributes'.	M
no equivalence	Access Control This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getMoAttributes'.	O
no equivalence	Synchronization This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getMoAttributes'.	O
attributeListIn	Attribute identifier list	M
managedObjectClass	Managed object class	M
managedObjectInstance	Managed object instance	M
attributeListOut	Attribute list	M
status	Errors	M
no equivalence	Current time This is a CMISE specific parameter. There is no equivalence parameter defined in the Information Service for 'getMoAttributes'.	O

4.2.2.2 Mapping of Parameters of 'getContainment'

Table 3: Mapping of parameters of 'getContainment'

Parameters of the operation 'getContainment' defined in 3GPP TS 32.602	CMISE M-GET parameter	Qualifier
invokeIdentifierIn	Invoke identifier	M
baseObjectInstance	Base object instance	M
scope	Scope	O
no equivalence	Filter This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getContainment'. The value of this parameter shall be 'empty'.	O
invokeIdentifierOut	Invoke identifier, if this is the last M-GET response during a Get procedure. Linked identifier, if this is not the last M-GET response during a Get procedure. (These parameters are used in the Rsp/Conf primitives of M-GET).	M
no equivalence	Base object class This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getContainment'.	M
no equivalence	Access Control This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getContainment'.	O
no equivalence	Synchronization This is a CMISE specific parameter. There is no equivalent parameter defined in the Information Service for 'getContainment'.	O
no equivalence	Attribute identifier list This is a CMISE specific parameter. There is no equivalence parameter defined in the Information Service for 'getContainment'. It is recommended to use 'objectClass' or/and 'nameBinding' defined in X.721 for the MOC top as the value of this input parameter.	O
containment	Managed object class	M
	Managed object instance	M
	Attribute list	M
status	Errors	M
no equivalence	Current time This is a CMISE specific parameter. There is no equivalence parameter defined in the Information Service for 'getMoAttributes'.	O
status	Errors	M
no equivalence	Current time This is a CMISE specific parameter. There is no equivalence parameter defined in the Information Service for 'getMoAttributes'.	O

4.2.2.3 Mapping of parameters of 'getBasicCmIRPVersion'

Table 4: Mapping of parameters of "getBasicCmIRPVersion"

Operation parameters of the Basic CM IRP Information Services	CMISE M-ACTION Parameters	Qualifier
no equivalence	Invoke identifier	M
no equivalence	Linked identifier	O
no equivalence	Mode	M
no equivalence	Base object class (input)	M
no equivalence	Base object instance (input)	M
no equivalence	Scope	O
no equivalence	Filter	O
no equivalence	Managed object class (output)	O
no equivalence	Managed object instance (output)	O
no equivalence	Access control	O
no equivalence	Synchronization	O
no equivalence	Action type	M
no equivalence	Action information	O
no equivalence	Current time	O
versionNumberList, status	Action reply	O
no equivalence	Errors	O

4.2.2.4 Mapping of Parameters of 'cancelOperation'

Table 5: Mapping of parameters of 'cancelOperation'

Parameters of the operation 'getContainment' defined in 3GPP TS 32.602	CMISE M-CANCEL-GET parameter	Qualifier
No equivalence	Invoke identifier	M
invokeIdentifier	Get invoke identifier	M
status	Errors	M

4.2.3 Mapping of notifications

Table 6 maps the notifications defined in the Basic CM IRP Information Service onto the equivalent notification of the CMIP Solution Set. The CMIP notifications are qualified as Mandatory (M) or Optional (O).

Table 6: Mapping of notifications

Notifications of Basic CM IRP Information Service	Notifications of the Basic CM IRP CMIP solution set	Qualifier
notifyObjectCreation	objectCreation ITU-T X.721 {smi2Notification 6}	O
notifyObjectDeletion	objectDeletion ITU-T X.721 {smi2Notification 7}	O
notifyAttributeValueChange	AttributeValueChange ITU-T X.721 {smi2Notification 1}	O

4.2.4 Mapping of notification parameters

Tables 7, 8 and 9 in the following subclauses show the parameters of each notification defined in the Information Service described in 3GPP TS 32.602 and their equivalence in the CMIP Solution Set.

The mapping of common parameters of all kinds of notifications defined in 3GPP TS 32.602 is described in 3GPP TS 32.304 [3] and will not be repeated in the present document. These common parameters are *managedObjectClass, managedObjectInstance, NotificationId, eventType, extendedEventType, eventTime* and *systemDN*.

4.2.4.1 Mapping of parameters of the notification 'notifyObjectCreation'

Table 7: Mapping of parameters of the notification 'notifyObjectCreation'

Parameters of the Basic CM IRP IS notification 'notifyObjectCreation'	Parameters of the CMIP SS notification 'objectCreation'	Qualifier
correlatedNotifications	correlatedNotifications (ITU-T X.721)	O
sourceIndicator	sourceIndicator (ITU-T X.721)	O
attributeList	attributeList (ITU-T X.721)	O
no equivalence	additionalText (ITU-T X.721)	O
no equivalence	additionalInformation (ITU-T X.721)	O

4.2.4.2 Mapping of parameters of the notification 'notifyObjectDeletion'

Table 8: Mapping of parameters of the notification 'notifyObjectDeletion'

Parameter of the Basic CM IRP IS notification 'notifyObjectDeletion'	Parameter of the CMIP SS notification 'objectDeletion'	Qualifier
correlatedNotifications	correlatedNotifications (ITU-T X.721)	O
sourceIndicator	sourceIndicator (ITU-T X.721)	O
attributeList	attributeList (ITU-T X.721)	O
no equivalence	additionalText (ITU-T X.721)	O
no equivalence	additionalInformation (ITU-T X.721)	O

4.2.4.3 Mapping of parameters of the notification 'notifyAttributeValueChange'

Table 9: Mapping of parameters of the notification 'notifyAttributeValueChange'

Parameter of the Basic CM IRP IS notification 'notifyAttributeValueChange'	Parameter of the CMIP SS notification 'attributeValueChange'	Qualifier
correlatedNotifications	correlatedNotifications (ITU-T X.721)	O
sourceIndicator	sourceIndicator (ITU-T X.721)	O
attributeValueChangeDefinition	attributeValueChangeDefinition (ITU-T X.721)	M
no equivalence	attributeIdentifierList (ITU-T X.721)	O
no equivalence	additionalText (ITU-T X.721)	O
no equivalence	additionalInformation (ITU-T X.721)	O

5 GDMO Definitions

5.1 Actions

getBCmIRPVersion ACTION
  BEHAVIOUR
    getBCmIRPVersionBehaviour;
  MODE CONFIRMED;
  WITH REPLY SYNTAX TS32-604TypeModule.GetBCmIRPVersionReply;
REGISTERED AS {ts32-604Action 1};

getBCmIRPVersionBehaviour BEHAVIOUR
  DEFINED AS
    "A Manager invokes this action to enquiry about the versions of the Basic CM IRP
    CMIP solution set which the concerned Agent supports.
    The 'Action information' field contains no data.
    The 'Action response' is composed of the following data:
    * versionNumbersLis
        It contains a list of versions supported by the concerned
        agent which are backwards compatible. A list containing no element, i.e. a NULL
        list means that the concerned agent doesn't support any version of the
        Notification IRP.
    * status
        It contains the results of this action. Possible values: noError (0),
        error (the value indicates the reason of the error).";

6 ASN.1 Definitions

```
TS32-604TypeModule {ccitt (0) identified-organization (4) etsi (0)
        mobileDomain (0) umts-Operation-Maintenance (3) ts32-604 (604)
        informationModel (0) asn1Module (2) version1 (1)}

DEFINITIONS IMPLICIT TAGS ::=
BEGIN
--EXPORTS everything

--IMPORTS nothing

-- 3GPP TS 32.604 related Object Identifiers

baseNodeUMTS  OBJECT IDENTIFIER ::= {itu-t(0) identified-organization(4) etsi(0) mobileDomain(0)
                        umts-Operation-Maintenance(3)}
ts32-604 OBJECT IDENTIFIER ::= { baseNodeUMTS ts32-604(604)}
ts32-604InfoModel     OBJECT IDENTIFIER ::= { ts32-604 informationModel(0)}

ts32-604ObjectClass   OBJECT IDENTIFIER ::= { ts32-604InfoModel managedObjectClass(3)}
ts32-604Package       OBJECT IDENTIFIER ::= { ts32-604InfoModel package(4)}
ts32-604Parameter     OBJECT IDENTIFIER ::= { ts32-604InfoModel parameter(5)}
ts32-604NameBinding   OBJECT IDENTIFIER ::= { ts32-604InfoModel nameBinding(6)}
ts32-604Attribute     OBJECT IDENTIFIER ::= { ts32-604InfoModel attribute(7)}
ts32-604Action        OBJECT IDENTIFIER ::= { ts32-604InfoModel action(9)}
ts32-604Notification  OBJECT IDENTIFIER ::= { ts32-604InfoModel notification(10)}

-- Start of 3gPP SA5 own definitions

ErrorCauses ::= ENUMERATED
{
noError (0),
wrongInput (1),
unspecifiedErrorReason (255)
}
GetBCmIRPVersionReply ::= SEQUENCE
{
versionNumbersList      SupportedBCmIRPVersions,
status                  ErrorCauses
}
IRPVersionNumber ::= GraphicString
SupportedBCmIRPVersions ::= SET OF IRPVersionNumber

END  -- of TS32-604TypeModule
```

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-010476	002	--	Correction of invokeIdentifier usage	4.0.0	4.1.0
Dec 2001	S_14	SP-010643	003		Alignment with ITU-T Rec. X.710 (CMISE) 1997	4.1.0	4.2.0

History

Document history		
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V4.2.0	December 2001	Publication