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Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Generic Integration Reference Point (IRP) management;
Information Service (IS)
(3GPP TS 32.312 version 15.1.0 Release 15)**

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Foreword

This Technical Specification (TS) 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

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

32.311: Generic Integration Reference Point (IRP) management; Requirements

32.312: Generic Integration Reference Point (IRP) management; Information Service (IS)

32.316: Generic Integration Reference Point (IRP) management; Solution Set (SS) Definitions

The Itf-N interface is built up by a number of IRPs and a related Name Convention, which realise the functional capabilities over this interface. The basic structure of the IRPs is defined in TS 32.101 [1] and TS 32.102 [2].

All IRPs support a set of generic features. Those features allow to retrieve IRP profile and IRP supported versions. The present document contains the specification of those generic features.

1 Scope

The purpose of the present document is to define a common service supported by all IRPs such as AlarmIRP.
The present document is the "Information Service" part. It defines, for the purpose of supporting the common service, the information observable and controllable by management system's client (i.e. IRPManager) via the Itf-N.
It also specifies the semantics of and the interactions used to carry this information.

With this common service supported by all IRPs, an IRPManager can retrieve the profile of operations and notifications supported by a given IRP name-contained by an IRPAgent. An IRPManager can also retrieve the IRPVersions supported by a given IRP.

2 References

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

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

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

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

[3] 3GPP TS 32.301: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Requirements".

[4] Void.

[5] 3GPP TS 32.311: "Telecommunication management; Generic Integration Reference Point (IRP) management; Requirements".

[6] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

[7] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".

[8] 3GPP TS 32.622: "Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

[9] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [9], TS 32.101 [1], TS 32.102 [2], TS 32.301 [3] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [9], TS 32.101 [1], TS 32.102 [2], TS 32.301 [3].

IRP: see TS 32.102 [2].

IRPAgent: see TS 32.102 [2].

IRPManager: see TS 32.102 [2].

IRP document version number string (or "IRPVersion"): see TS 32.311 [5].

Itf-N: see TS 32.102 [2].

SupportIOC: see TS 32.150 [6].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [9] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [9].

CM	Configuration Management
DN	Distinguished Name
IOC	Information Object Class
RDN	Relative Distinguished Name

4 System Overview

4.1 System Context

The general definition of the System Context for the present IRP is found in TS 32.150 [6] clause 4.7.

In addition, the set of related IRP(s) relevant to the present IRP is shown in the two diagrams below.

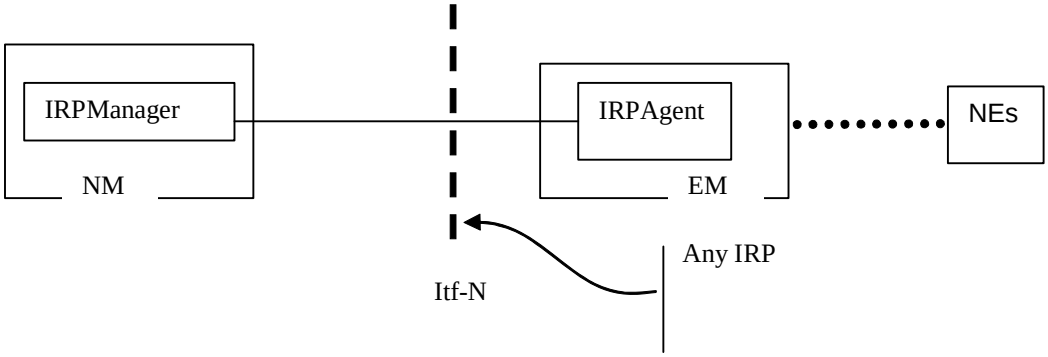


Figure 4.1: System Context A

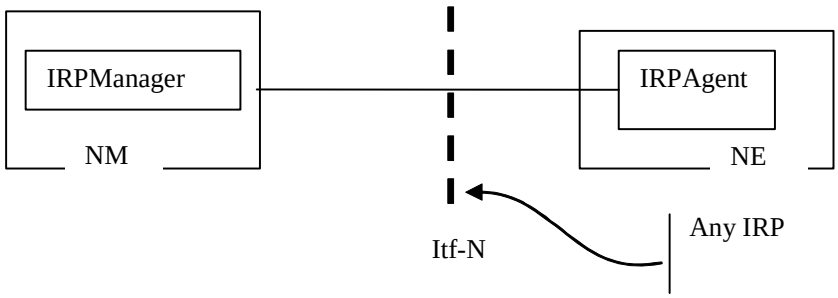


Figure 4.2: System Context B

5 Information Object Classes (IOCs)

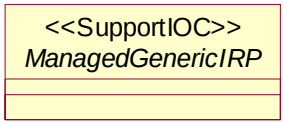
5.1 Imported information entities and local labels

Label reference	Local label
3GPP TS 32.111-2 [7], notification, `notifyNewAlarm`	`notifyNewAlarm`
3GPP TS 32.111-2 [7], notification, `notifyChangedAlarm`	`notifyChangedAlarm`
3GPP TS 32.111-2 [7], notification, `notifyClearedAlarm`	`notifyClearedAlarm`
3GPP TS 32.111-2 [7], notification, `notifyAckStateChanged`	`notifyAckStateChanged`
3GPP TS 32.622 [8], information object class, `Top`	`Top`

5.2 Class Diagram

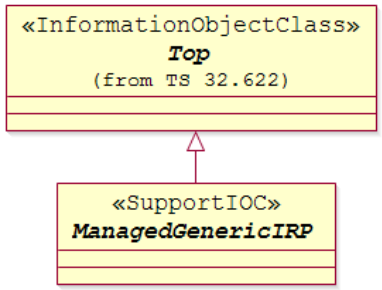
5.2.1 Attributes and relationships

This clause depicts the set of classes (e.g. IOCs) that encapsulates the information relevant for this IRP. This clause provides an overview of the relationships between relevant classes in UML. Subsequent clauses provide more detailed specification of various aspects of these classes.



5.2.2 Inheritance

This clause depicts the inheritance relationships that exist between SupportIOCs.



5.3 Information object class definitions

5.3.1 `ManagedGenericIRP`

5.3.1.1 Definition

This SupportIOC represents a generic IRP which supports generic management capabilities associated with each `IRPAgent`. This SupportIOC cannot be instantiated. It is defined for sub-classing purposes.

5.3.1.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier
iRPId	M	M	-
iRPVersions	M	M	-
operationNameProfile	O	M	-
operationParameterProfile	O	M	-
notificationNameProfile	O	M	-
notificationParameterProfile	O	M	-

5.3.1.3 Notification

Name	Qualifier	Notes
notifyNewAlarm	O	See Alarm IRP (3GPP TS 32.111-2 [7])
notifyChangedAlarm	O	See Alarm IRP (3GPP TS 32.111-2 [7])
notifyClearedAlarm	O	See Alarm IRP (3GPP TS 32.111-2 [7])
notifyComments	O	See Alarm IRP (3GPP TS 32.111-2 [7])
notifyAckStateChanged	O	See Alarm IRP (3GPP TS 32.111-2 [7])

5.4 Information relationship definitions

None

5.5 Information attribute definitions

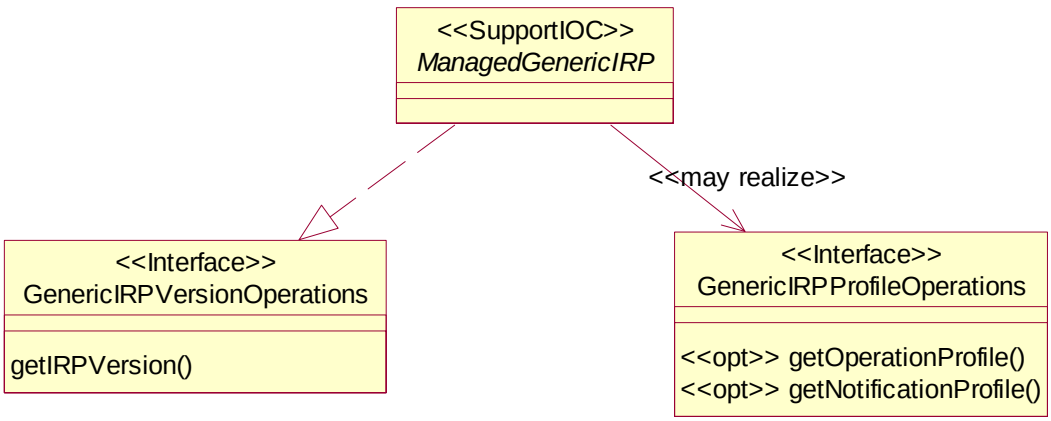
This clause defines the semantics of the attributes used in SupportIOCs.

5.5.1 Definitions and legal values

Attribute Name	Definition	Legal Values
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.	
iRPVersions	This attribute contains a set of IRPVersions. The set contains at least one element.	See definition "IRP document version number string" in clause 3.1.
operationNameProfile	This attribute contains a set of elements. The n-th element of this set contains the set of operation names supported for the IRPVersion identified in the n-th element of iRPVersions attribute.	
notificationNameProfile	This attribute contains a set of elements. The n-th element of this set contains the set of notification names supported for the IRPVersion identified in the n-th element of iRPVersions attribute.	
operationParameterProfile	This attribute contains a set of elements. The n-th element of this set contains the set of set of notification parameters supported by the operations identified in the n-th element of operationNameProfile attribute. The set of operation parameters are placed in the set in the same order as the order followed by the operation names in their set.	
notificationParameterProfile	This attribute contains a set of elements. The n-th element of this set contains the set of set of notification parameters supported by the notifications identified in the n-th element of notificationNameProfile attribute. The set of notification parameters are placed in the set in the same order as the order followed by the notification names in their set.	

6 Interface Definition

6.1 Class diagram representing interfaces



6.2 Generic rules

- **Rule 1:** each operation with at least one input parameter supports a pre-condition valid_input_parameter which indicates that all input parameters shall be valid with regards to their information type. Additionally, each such operation supports an exception operation_failed_invalid_input_parameter which is raised when pre-condition valid_input_parameter is false. The exception has the same entry and exit state.

- **Rule 2:** Each operation with at least one optional input parameter supports a set of pre-conditions supported_optional_input_parameter_xxx where "xxx" is the name of the optional input parameter and the pre-condition indicates that the operation supports the named optional input parameter. Additionally, each such operation supports an exception operation_failed_unsupported_optional_input_parameter_xxx which is raised when (a) the pre-condition supported_optional_input_parameter_xxx is false and (b) the named optional input parameter is carrying information. The exception has the same entry and exit state.

- **Rule 3:** each operation shall support a generic exception operation_failed_internal_problem which is raised when an internal problem occurs and that the operation cannot be completed. The exception has the same entry and exit state.

6.3 `genericIRPVersionOperations` Interface (M)

6.3.1 Operation `getIRPVersion` (M)

6.3.1.1 Definition

`IRPManager` wishes to find out the IRP SS versions supported by an IRP. The IRP shall respond with a set of supported IRP SS version(s). The list of returned `IRPVersions` is such that the `IRPManager` can use any of these versions without having to specify an `IRPVersion` to the `IRPAgent`.

6.3.1.2 Input parameters

None

6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
`versionNumberSet`	M	`ManagedGenericIRP.iRPVersions.`	It indicates one or more SS version numbers (`IRPVersion`, as defined by "IRP document version number string" in clause 3.1) supported by the IRP.
`status`	M	ENUM (Operation succeeded, Operation failed)	If operation_failed_internal_problem status = OperationFailed.

6.3.1.4 Pre-condition

None specific

6.3.1.5 Post-condition

None specific

6.3.1.6 Exceptions

None specific

6.4 genericIRPProfileOperations Interface (O)

6.4.1 Operation getOperationProfile (O)

6.4.1.1 Definition

IRPManager invokes this operation to query the detailed profile of an IRP (supported operations and supported parameters) for a specific supported version. The notification profile will provide details about notifications that are specifically defined by this IRP.

6.4.1.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
iRPVersion	M	Element of ManagedGenericIRP.iRPVersions.	It contains a version number.

6.4.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
operationNameProfile	M	Elements of ManagedGenericIRP.operationNameProfile corresponding to the iRPVersion parameter.	If this parameter contains no information, it implies that the IRP does not support any operation.
operationParameterProfile	M	Elements of ManagedGenericIRP.operationParameterProfile corresponding to the iRPVersion parameter.	
status	M	ENUM (Operation succeeded, Operation failed)	If operation_failed_invalid_version status = OperationFailed.

6.4.1.4 Pre-condition

validIRPVersion.

Assertion Name	Definition
validIRPVersion	The iRPVersion input parameter identifies a supported version contained in attribute iRPVersions of the ManagedGenericIRP SupportIOC.

6.4.1.5 Post-condition

None specific

6.4.1.6 Exceptions

Name	Definition
Operation_failed_invalid_version	**Condition:** validIRPVersion is false **Returned Information:** The output parameter status **Exit state:** Entry State

6.4.2 Operation `getNotificationProfile` (O)

6.4.2.1 Definition

`IRPManager` invokes this operation to query the detailed notification profile of an IRP (supported notifications and supported parameters) for a specific supported version. The notification profile will provide details about notifications that are specifically defined by this IRP. For example, if this IRP is notification IRP R4, then `getNotificationProfile` will not return any information since no notification is defined in notification IRP R4.

6.4.2.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
`iRPVersion`	M	Element of `ManagedGenericIRP.iRPVersion`	It contains a version number.

6.4.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
`notificationNameProfile`	M	Element of `ManagedGenericIRP.notificationNameProfile` corresponding to the `iRPVersion` parameter.	If this parameter contains no information, it implies that the IRP does not support any notification.
`notificationParameterProfile`	M	Element of `ManagedGenericIRP.notificationParameterProfile` corresponding to the `iRPVersion` parameter.	
`status`	M	ENUM (Operation succeeded, Operation failed)	If operation_failed_invalid_version status = OperationFailed.

6.4.2.4 Pre-condition

`validIRPVersion.`

Assertion Name	Definition
`validIRPVersion`	The `iRPVersion` input parameter identifies a supported version contained in attribute `iRPVersions` of the `ManagedGenericIRP` SupportIOC.

6.4.2.5 Post-condition

None specific

6.4.2.6 Exceptions

Name	Definition
`Operation_failed_invalid_version`	**Condition:** `validIRPVersion` is false **Returned Information:** The output parameter status **Exit state:** Entry State

Annex A (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Cat**	**Old**	**New**
Jun 2001	SA_12	SP-010285	--	--	Approved at TSG SA #12 and placed under Change Control	--	2.0.0	4.0.0
Mar 2002	SA_15	--	--	--	Automatic upgrade to Rel-5 (no Rel-5 CR)	--	4.0.0	5.0.0
Dec 2002	--	--	--	--	Cosmetics	--	5.0.0	5.0.1
Dec 2003	SA_22	SP-030640	0002	--	Align with 32.102 and 32.311	A	5.0.1	5.1.0
Mar 2004	SA_23	SP-040105	--	--	Automatic upgrade to Rel-6 (no CR)	--	5.1.0	6.0.0
Dec 2004	SA_26	SP-040794	0003	--	Update UML diagrams, Add reference to its CORBA/CMIP SSs	F	6.0.0	6.1.0
Jun 2005	SA_28	SP-050329	0004	--	Apply Generic System Context – Align with TS 32.150	F	6.1.0	6.2.0
Dec 2006	SA_34	SP-060708	0005	--	Add missing Notification Table for ManagedGenericIRP	F	6.2.0	6.3.0
Jun 2007	SA_36	--	--	--	Automatic upgrade to Rel-7 (no CR) at freeze of Rel-7. Deleted reference to CMIP SS, discontinued from R7 onwards.	--	6.3.0	7.0.0
Dec 2008	SA_42	--	--	--	Upgrade to Release 8	--	7.0.0	8.0.0
Dec 2009	SA_46	SP-090719	0006	--	Align usage of SupportIOC according to repertoire and template	C	8.0.0	9.0.0
Mar 2011	-	-	-	-	Update to Rel-10 version (MCC)	-	9.0.0	10.0.0
2012-09	-	-	-	-	Update to Rel-11 version (MCC)		10.0.0	**11.0.0**
2013-03	SA_59	SP-130049	0012	-	add missing iRPId etc.	A	11.0.0	**11.1.0**
2014-10	-	-	-	-	Update to Rel-12 version (MCC)		11.1.0	**12.0.0**
2016-01	-	-	-	-	Update to Rel-13 version (MCC)		12.0.0	**13.0.0**
2017-03	SA#75	-	-	-	Promotion to Release 14 without technical change		13.0.0	**14.0.0**

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2018-06						Update to Rel-15 version (MCC)	15.0.0
2019-09	SA#85	SP-190752	0014	-	F	Remove wrong definition of NR as abbreviation to avoid misalignment with RAN2	15.1.0

History

Document history		
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