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Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

Telecommunication management;

Generic Integration Reference Point (IRP) management;

Information Service (IS)

(Release 16)

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***3GPP***

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis

Valbonne - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

http://www.3gpp.org

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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

## 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 InformationObject 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

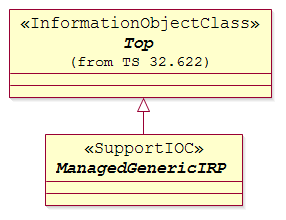
### 5.2.1 Attributes and relationships

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 |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | **16.0.0** |