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Presentation of Technical Specification to TSG SA

Presentation to: TSG SA Meeting #21
Document for presentation: TS 32.362, Version 1.0.0
Entry Point IRP: Information service
Presented for: Information

Abstract of document:

Work done against the WID contained in SP-020754 (Work Item ID: OAM-NIM).

This TS defines the Information service for the Entry Point IRP.

Purpose of These Specifications:

This Information service TS is intended for Release 6 and is part of the Entry Point IRP TS-family, consisting of:

32.361 Entry Point IRP: Requirements
32.362 Entry Point IRP: Information service (the present TS)
32.363 Entry Point IRP CORBA solution set
32.364 Entry Point IRP CMIP solution set

The purpose of this set of specifications is to provide an Entry Point mechanism enabling the Network Manager to discover the References of IRPs in the managed systems for Release 6.

Changes since last presentation to TSG-SA:

New.

Outstanding Issues:

None.

Contentious Issues:

None.

3GPP TS 32.362 V1.0.0 (2003-09)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Telecommunication management;
Entry Point (EP) Integration Reference Point (IRP):
Information Service (IS);
(Release 6)**



The present document has been developed within the 3rd Generation Partnership Project (3GPPTM) and may be further elaborated for the purposes of 3GPP.

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Keywords

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Foreword

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

The present document is part of a TS-family covering the 3rd Generation Partnership Project: Technical Specification Group Services and System Aspects; Telecommunication management; Entry Point (EP) Integration Reference Point (IRP), as identified below:

TS 32.361: "Requirements";

TS 32.362: "Information Service (IS)";

TS 32.363: "Common Object Request Broker Architecture (CORBA) Solution Set (SS)";

TS 32.364: "Common Management Information Protocol (CMIP) Solution Set (SS)".

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 set of technical specifications defining the telecommunication management (TM) of 3G systems. The TM principles are described in 3GPP TS 32.101 [1]. The TM architecture is described in 3GPP TS 32.102 [2]. The other specifications define the interface (Itf-N) between the managing system (manager), which is in general the network manager (NM) and the managed system (agent), which is either an element manager (EM) or the managed NE itself. The Itf-N is composed of a number of integration reference points (IRPs) defining the information in the agent that is visible for the manager, the operations that the manager may perform on this information and the notifications that are sent from the agent to the manager. EP (Entry Point) IRP is one of these IRPs with special function.

The IRPs defined in 3GPP Release 5 and earlier versions are externally published and the 3GPP specifications of Release 5 and earlier versions do not provide standard mechanism for the NM to discover the references of these top IRPs in the managed systems. The discovery is a vendor-specific matter.

It's difficult for an NM to discover all IRPs in the environment that there are several managed systems and/or if there are multiple IRPs related to each managed systems. This Entry Point is proposed to provide a convenient mechanism for NM to discover the managed systems and their related IRPs.

1 Scope

The present document defines the IS part of the EPIRP, which describes the semantics of the information and the interactions visible across Itf-N in a protocol independent way. The information is specified by means of information object classes and the interactions by means of operations and notifications. The present document does not specify the syntax (encoding) of the information.

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 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".
- [4] 3GPP TS 32.111-1: "Telecommunication management; Fault management; Part 1: 3G fault management requirements".
- [5] 3GPP TS 32.301: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Requirements".
- [6] 3GPP TS 32.361: "Telecommunication management; Entry Point (EP) Integration Reference Point (IRP): Requirements".
- [7] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP); Network Resource Model (NRM)".
- [8] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP): Information Service (IS)".
- [9] 3GPP TS 32.311: "Telecommunication management; Generic Integration Reference Point (IRP): Requirements".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.361 [6] and the following apply.

IRPVersion: see 3GPP TS 32.311 [9].

3.2 Abbreviations

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

CMIP	Common Management Information Protocol
CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
EM	Element Manager
EP	Entry Point
EPIRP	Entry Point IRP
IRP	Integration Reference Point
IOC	Information Object Class
IS	Information Service
NE	Network Element
NM	Network Manager
NRM	Network Resource Model
PM	Performance Management

4 System Overview

Figures 4.1 and 4.2 show the system context of this document in terms of implementations called IRPAgent and IRPManager.

The term IRPManager refers to a process that interacts with IRPAgent for the purpose of test management via this IRP. An example of an IRPManager can be a Network Management System. IRPAgent implements and supports the EPIRP.

IRPAgent can be one Network Element (NE) (figure 4.2) or it can be one Element Manager (EM) with one or more NEs (figure 4.1). In the latter case, the interfaces (represented by a thick dotted line) between the EM and the NEs are not subject of this IRP. Whether EM and NE share the same hardware system is not relevant to this document either. By observing the interaction across the EPIRP, one cannot deduce if EM and NE are integrated in a single system or if they run in separate systems.

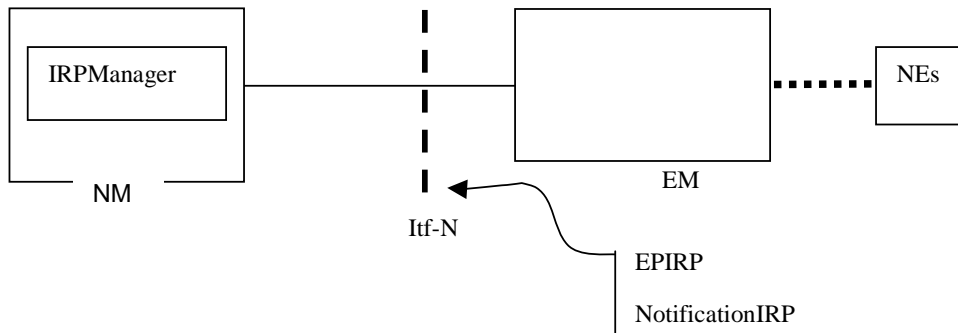


Figure 4.1: System Context A

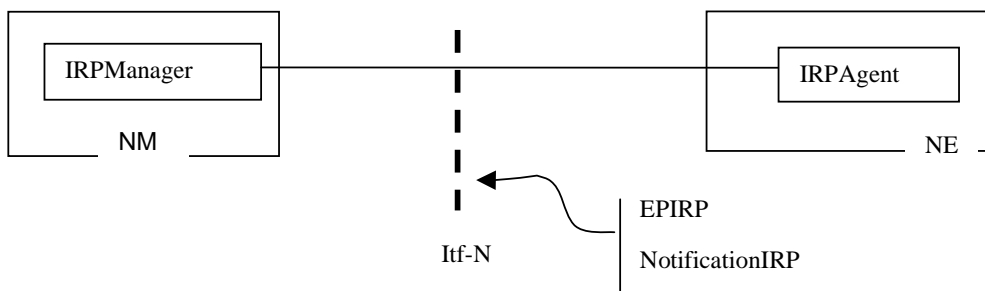


Figure 4.2: System Context B

5 Information Object Classes (IOCs)

5.1 Information entities imported and local labels

Label reference	Local label
32.622 [7], information object class, Top	Top
32.622 [7], information object class, IRPAgent	IRPAgent
32.622 [7], information attribute, systemDN	systemDN
32.622 [7], information object class, GenericIRP	GenericIRP
32.622 [7], information attribute, iRPId	iRPId
32.622 [7], information attribute, iRPVersion	iRPVersion
32.312 [8], information object class, ManagedGenericIRP	ManagedGenericIRP

5.2 Class diagram

5.2.1 Attributes and relationships

This sub-clause introduces the set of information object classes (IOCs) that encapsulate information within the IRPAgent. The intention is to identify the information required for the EPIRP implementation of its operations. This sub-clause provides the overview of all support object classes in UML. Subsequent sub-clauses provide more detailed specification of various aspects of these support object classes.

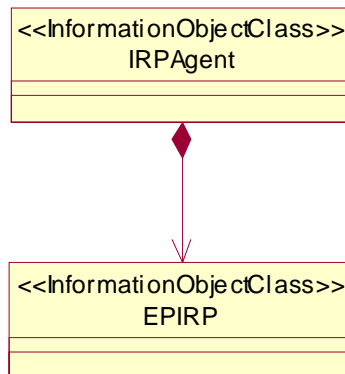


Figure 5.1: Information Object Class UML Diagram

5.2.2 Inheritance

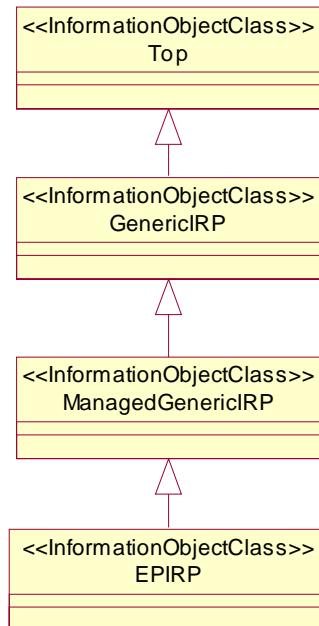


Figure 5.2: Information Object Class Inheritance UML Diagram

5.3 Information Object Classes (IOCs) definition

5.3.1 EPIRP

5.3.1.1 Definition

The IOC EPIRP is used as an initial access point to the managed systems. This interface implements the entry point management capabilities defined by this document. The IOC EPIRP inherits from the IOC ManagedGenericIRP specified in 3GPP TS 32.312 [8]. How the NM gets the reference of the EPIRP is outside the scope of this document.

5.3.1.2 Attributes

The IOC EPIRP has no own attributes, only those inherited from the IOC ManagedGenericIRP.

6 Interface Definition

6.1 Class diagram representing interfaces

The following diagram depicts the interfaces of the EPIRP IOC with their corresponding operations. There is no notification associated with this EPIRP IOC.

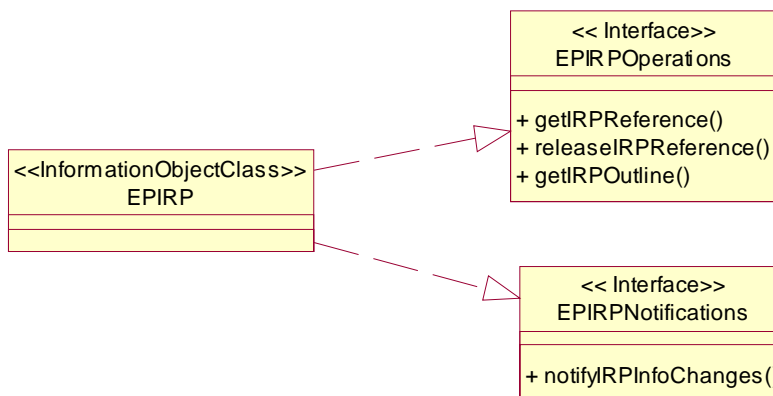


Figure 6.1 Class diagram

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` that 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 Interface EPIRP_operations

6.3.1 Operation `getIRPOutline` (M)

6.3.1.1 Definition

The IRPManager uses this operation to request the EPIRP to return the outline information of the supported IRPs. IRPManager could set a filter constraint on the returned information according to specific requirements.

The EPIRP shall return the outline information of all the IRPs supported by the IRPAgent that contains the EPIRP.

The EPIRP may additionally return the outline information of all the IRPs supported by other IRPAgents.

6.3.1.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
irPVersion	M	String	It specifies an IRPVersion that IRPAgent shall use when constructing its output parameter <code>supportedIRPList</code> . If this parameter is absent, then all the supported IRPVersion shall be used to construct its <code>supportedIRPList</code> .

6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
supportedIRPList	M	A sequence of elements. Each element is: systemDN (M) iRPList (M) sequence of elements. Each element is: iRPId (M) iRPVersionSet (M) iRPManagementScope (O)	This parameter will return a sequence of elements. The systemDN (as defined in 3GPP TS 32.622 [7]) is the Distinguished Name (DN) of the IRPAgent that contains the IRPs identified by the related iRPList. Note that this IRPAgent may or may not be the same IRPAgent that contained the EPIRP (that is responding to this operation). The iRPId (as defined in 3GPP TS 32.622 [7]) is the identifier of a specific Interface IRP (e.g. AlarmIRP 3GPP TS 32.111-1 [4], PMIRP 3GPP TS 32.401 [3]) contained by the IRPAgent identified by the systemDN sub-parameter. The iRPVersionSet (as defined in 3GPP TS 32.312 [8]) is the set of IRPVersions supported by the xxxIRP identified by the iRPId sub-parameter. IRPVersion is used to identify a particular IRP solution set specification. (as defined in 3GPP TS 32.311 [9]). [Note]: Each IRPVersion number is a version supported by the identified interface IRP, not a version of NRM. The iRPManagementScope parameter, when present, shall carry a list of the DNs that identify the sub trees under the management of the xxxIRP. In case there is no supported IRP, this sequence shall contain no element. The operation is considered successful.
status	M	ENUM (OperationSucceeded, OperationFailed)	An operation may fail because of a specified or unspecified reason.

6.3.1.4 Pre-condition

The precondition must hold true before the operation is invoked.

iRPVersionIsValid

Assertion Name	Definition
iRPVersionIsValid	The iRPVersion specified is valid

6.3.1.5 Post-condition

None.

6.3.1.6 Exceptions

Exception Name	Definition
invalidIRPVersion	Condition: iRPVersionIsValid = FALSE Returned information: The response parameter is returned Exit state: Entry state
operationFailed	Condition: Pre-condition is false or post-condition is false Returned Information: The output parameter status Exit state: Entry state

6.3.2 Operation getIRPReference (M)

6.3.2.1 Definition

The IRPManager uses this operation to request the EPIRP to return a reference for a specific version of a specific IRP.

Whether IRP references are statically or dynamically allocated is outside the scope of this document.

6.3.2.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
managerIdentifier	M	string	It carries the identifier of an IRPManager
systemDn	M		It carries the systemDN (as defined in 3GPP TS 32.622 [7]) of the IRPAgent containing the specific interface IRP xxxIRP (e.g. AlarmIRP, PMIRP) needed by the IRPManager
iRPIId	M		It carries the iRPIId (as defined in 3GPP TS 32.622 [7]) of the specific interface IRP xxxIRP (e.g. AlarmIRP, PMIRP) needed by the IRPManager

6.3.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
iRPReference	M		This parameter will return a reference for the specified IRPVersion of the specified xxxIRP
status	M	ENUM (OperationSucceeded, OperationFailed)	An operation may fail because of a specified or unspecified reason

6.3.2.4 Pre-condition

requestedParametersAreValid

Assertion Name	Definition
requestedParametersAreValid	The systemDn and iRPIId are respectively valid and their combination is valid for the specified xxxIRP

6.3.2.5 Post-condition

None.

6.3.2.6 Exceptions

Exception Name	Definition
invalidRequestedParameters	Condition: requestParametersAreValid = FALSE Returned information: The response parameter and detailed reason are returned Exit state: Entry state
operationFailed	Condition: Pre-condition is false or post-condition is false Returned Information: The output parameter status. Exit state: Entry state

6.3.3 Operation releaseIRPReference (M)

6.3.3.1 Definition

The IRPManager uses this operation to request the IRPAgent to release a specific IRP reference. Whether the IRP reference is really released or not in the IRPAgent is outside the scope of this document.

6.3.3.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
managerIdentifier	M	string	It carries the identifier of an IRPManager
iRPReference	M		It carries the specific IRP reference no longer needed by the IRPManager

6.3.3.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (OperationSucceeded, OperationFailed)	An operation may fail because of a specified or unspecified reason

6.3.3.4 Pre-condition

The precondition must hold true before the operation is invoked.

validIRPReference

Assertion Name	Definition
validIRPReference	The iRPReference is valid

6.3.3.5 Post-condition

None.

6.3.3.6 Exceptions

Exception Name	Definition
unknownIRPReference	<p>Condition: validIRPReference = FALSE</p> <p>Returned information: The response parameter is returned</p> <p>Exit state: Entry state</p>
operationFailed	<p>Condition: Pre-condition is false or post-condition is false</p> <p>Returned Information: The output parameter status</p> <p>Exit state: Entry state</p>

6.4 Interface EPIRP_notifications

6.4.1 Notification `notifyIRPInfoChanges` (M)

6.4.1.1 Definition

The subscribed IRPManager instances are notified that the information (management scope, Reference, etc.) of one IRP stored in EPIRP has changed.

6.4.1.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
<code>objectClass</code>	M,F	<code>EPIRP.objectClass</code>	Notification header - see 3GPP TS 32.301 [5]
<code>objectInstance</code>	M,F	<code>EPIRP.objectInstance</code>	Notification header - see 3GPP TS 32.301 [5]. This and object class shall contain the same information as <code>systemDN</code>
<code>notificationId</code>	M	This carries the semantics of notification identifier	Notification header - see 3GPP TS 32.301 [5]
<code>eventTime</code>	M,F		Notification header - see 3GPP TS 32.301 [5]
<code>systemDN</code>	C,F	<code>IRPAgent.systemDN</code> where the <code>IRPAgent</code> is related to the EPIRP	Notification header - see 3GPP TS 32.301 [5]
<code>notificationType</code>	M,F	" <code>notifyIRPInfoChanges</code> "	Notification header - see 3GPP TS 32.301 [5]
<code>iRPDn</code>	M	STRUCT { <code>IRPAgent.systemDN</code> ; <code>xxxIRP.iRPId</code> }	The <code>IRPAgent</code> is related to the specific interface IRP <code>xxxIRP</code> (e.g. <code>AlarmIRP</code> , <code>PMIRP</code>) whose information stored in EPIRP changed, and <code>xxxIRP.iRPId</code> is the <code>iRPId</code> of that <code>xxxIRP</code>
<code>changeMode</code>	M	ENUM {REGISTER, DEREGISTER, MODIFY}	It carries the information change mode of that <code>xxxIRP</code>
<code>additionalText</code>	O	Text	It can contain further information on this notification

6.4.1.3 Triggering Event

6.4.1.3.1 From-state

`iRPInfoChange`.

Assertion Name	Definition
<code>iRPInfoChange</code>	The information of IRP (<code>iRPVersionSet</code> , <code>iRPManagementScope</code> , <code>iRPReference</code>) stored in EPIRP changes.

6.4.1.3.2 To-state

`successEmitNotification`

Assertion Name	Definition
<code>successEmitNotification</code>	EPIRPAgent finished emitting <code>notifyIRPInfoChanges</code> notification.

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Sep 2003	S_21	SP-030424	--	--	Submitted to TSG SA#21 for Information	1.0.0	