

# ETSI TS 132 362 V9.0.0 (2010-02)

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*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
Telecommunication management;  
Entry Point (EP) Integration Reference Point (IRP);  
Information Service (IS)  
(3GPP TS 32.362 version 9.0.0 Release 9)**

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**Reference**

RTS/TSGS-0532362v900

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**Keywords**

GSM, LTE, UMTS

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## Foreword

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## Foreword

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- z the third digit is incremented when editorial only changes have been incorporated in the document.

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## Introduction

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

- 32.361: "Entry Point (EP) Integration Reference Point (IRP): Requirements"
- 32.362: "Entry Point (EP) Integration Reference Point (IRP): Information Service (IS)"**
- 32.363: "Entry Point (EP) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)"
- 32.365: "Entry Point (EP) Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions"
- 32.367: "Entry Point (EP) Integration Reference Point (IRP): SOAP Solution Set (SS)"

The present document is part of a TS-family 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.

It is 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.

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# 1 Scope

The present document defines the Information Service (IS) part of the Entry Point IRP (EPIRP). It 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 (IOCs) and the interactions by means of operations and notifications. The present document does not specify the syntax (encoding) of the information.

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## 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 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".
  - [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) management: Information Service (IS)".
  - [9] 3GPP TS 32.311: "Telecommunication management; Generic Integration Reference Point (IRP) management: Requirements".
  - [10] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".
- 

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions defined in 32.101 [1], 32.102 [2], 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:

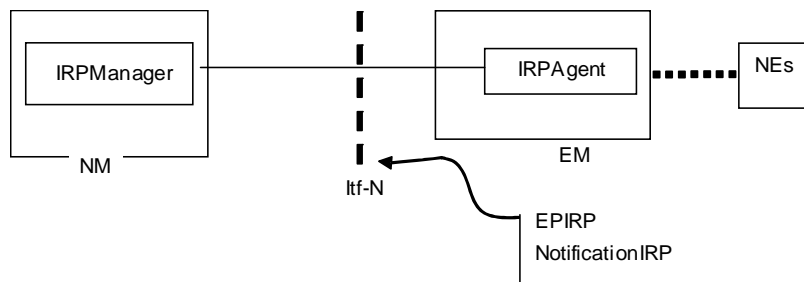
CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
EM	Element Manager
EP	Entry Point
EPIRP	Entry Point IRP
IRP	Integration Reference Point
IOC	Information Object Class
IS	Information Service
NE	Network Element
NM	Network Manager
NRM	Network Resource Model
PM	Performance Management

# 4 System Overview

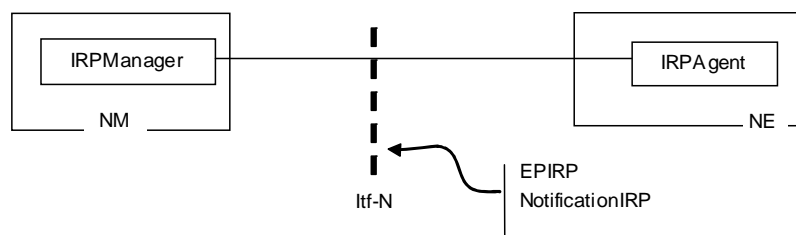
## 4.1 System Context

The general definition of the System Context for the present IRP is found in 3GPP TS 32.150 [10] subclause 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**

## 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 32.150 [10]



## 5 Information Object Classes (IOCs)

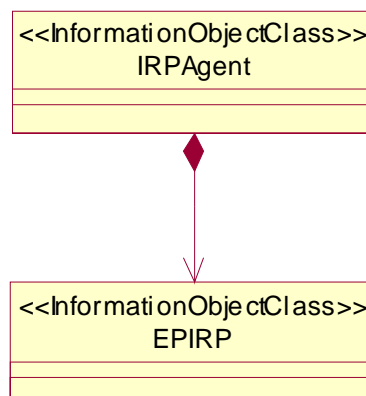
### 5.1 Information entities imported and local labels

Label reference	Local label
3GPP TS 32.622 [7], information object class, Top	Top
3GPP TS 32.622 [7], information object class, IRPAgent	IRPAgent
3GPP TS 32.622 [7], information attribute, systemDN	systemDN
3GPP TS 32.622 [7], information object class, GenericIRP	GenericIRP
3GPP TS 32.622 [7], information attribute, iRPId	iRPId
3GPP TS 32.622 [7], information attribute, iRPVersion	iRPVersion
3GPP TS 32.312 [8], information object class, ManagedGenericIRP	ManagedGenericIRP

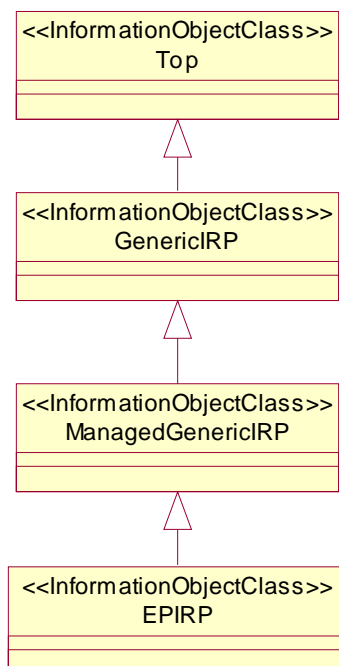
### 5.2 Class diagram

#### 5.2.1 Attributes and relationships

This 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 clause provides the overview of all support object classes in UML. Subsequent clauses provide more detailed specification of various aspects of these support object classes.



## 5.2.2 Inheritance



## 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 the present document. The IOC EPIRP inherits from the IOC ManagedGenericIRP specified in 3GPP TS 32.312 [8]. How the NM gets the IRP Reference of the EPIRP is outside the scope of the present document.

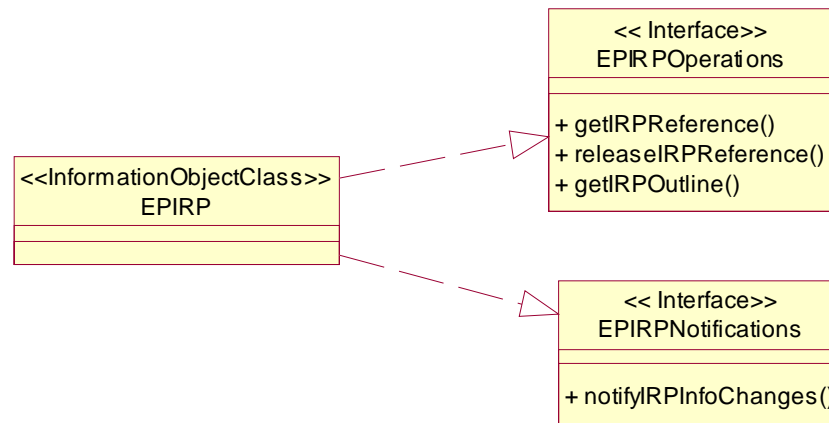
#### 5.3.1.2 Attributes

The IOC EPIRP does not have any 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 its corresponding operations and notifications.



### 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 EPIRPOperations (M)

#### 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, including itself and other `EPIRP` instances that it knows, supported by the `IRPAgent` that contains the `EPIRP`.

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

### 6.3.1.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
iRPVersion	M	--	It specifies an IRPVersion that IRPAgent shall use when constructing its output parameter supportedIRPList. If this parameter is absent, then all the supported IRPVersions shall be used to construct its supportedIRPList.

### 6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
supportedIRPList	M	A sequence of elements. Each element contains: - systemDN (M) - iRPList (M)  where iRPList is a sequence of elements. Each element is: - rDN (M) - iRPVersionSet (M) - iRPManagementScope (O)	This parameter will return a sequence of elements.  The systemDN (defined in [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 rDN (relative Distinguished Name) contains the class name and the iRPId of the IRP instance. The iRPId (defined in [7]) is the identifier of a specific Interface IRP (e.g. AlarmIRP 32.111-1 [4], PMIRP 32.401 [3]) contained by the IRPAgent identified by the systemDN sub-parameter.  The iRPVersionSet (defined in [8]) is the set of IRPVersions supported by the IRP identified by the rDN sub-parameter. IRPVersion is used to identify a particular IRP Solution Set specification defined in [9] (see note).  The iRPManagementScope parameter, when present, shall carry a list of the DNs that identify the sub trees under the management of the IRP. This parameter, if present, shall contain no information if the IRP is EPIRP.  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.

NOTE: Each IRPVersion number is a version supported by the identified interface IRP, not a version of a NRM IRP.

### 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	<b>Condition:</b> iRPVersionIsValid = FALSE <b>Returned information:</b> The response parameter is returned <b>Exit state:</b> Entry state
operationFailed	<b>Condition:</b> Pre-condition is false or post-condition is false <b>Returned Information:</b> The output parameter status <b>Exit state:</b> Entry state

## 6.3.2 Operation getIRPReference (M)

### 6.3.2.1 Definition

The IRPManager uses this operation to request the EPIRP to return an IRP Reference for a specific version of a specific IRP, including EPIRP.

Whether IRP References are statically or dynamically allocated is outside the scope of the present document.

### 6.3.2.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
managerIdentifier	M	--	It carries the identifier of an IRPManager.
systemDN	M	--	It carries the systemDN (defined in [7]) of the IRPAgent containing the specific interface IRP xxxIRP (e.g. AlarmIRP, PMIRP) needed by the IRPManager.
rDN	M	--	It carries the class name and the iRPId of the IRP instance. The systemDN (above) and this rDN form the DN of the IRP instance whose IRP reference is requested by the IRPManager.

### 6.3.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
iRPReference	M	--	This parameter carries an IRP Reference for the specified IRPVersion of the specified IRP.
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 rDN are valid and their combination is valid in a way that the EPIRP is aware of the IRP instance and its associated IRPReference.

### 6.3.2.5 Post-condition

None.

### 6.3.2.6 Exceptions

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

### 6.3.3.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
managerIdentifier	M	--	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	<b>Condition:</b> validIRPReference = FALSE <b>Returned information:</b> The response parameter is returned <b>Exit state:</b> Entry state
operationFailed	<b>Condition:</b> Pre-condition is false or post-condition is false <b>Returned Information:</b> The output parameter status <b>Exit state:</b> Entry state

## 6.4 Interface EPIRPNotifications (M)

### 6.4.1 Notification notifyIRPInfoChanges (M)

#### 6.4.1.1 Definition

The subscribed IRPManager instances are notified that the information (management scope, IRP Reference, etc.) of one IRP, including itself and other EPIRP instances, stored in EPIRP has changed. This behaviour of sending notifyIRPInfoChanges shall cover the case when the EPIRP is installed in the operating environment and the information of IRPs are entered into the EPIRP via the EPIRP non-standardized local interface.

#### 6.4.1.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
objectClass	M, Y	EPIRP.objectClass	Notification header - see [5]. It shall carry the class name of the EPIRP.
objectInstance	M, Y	EPIRP.objectInstance	Notification header - see [5]. It shall carry the DN of the EPIRP.
notificationId	M, N	--	Notification header - see [5].
eventTime	M, Y	--	Notification header - see [5].
systemDN	C, Y	--	Notification header - see [5].
notificationType	M, Y	"notifyIRPInfoChanges"	Notification header - see [5]
iRPDN	M, N	--	This is the DN of the IRP instance whose information (i.e., outline information and IRP reference information) registered with EPIRP has changed,
changeMode	M, N	ENUM {Register, Deregister, Modify}	Register: EPIRP now holds the outline information and IRP reference information of IRP whose DN is in iRPDN.  Deregister: EPIRP now no longer holds any information of IRP whose DN is in iRPDN.  Modify: EPIRP has changed some or all information of IRP whose DN is in iRPDN.
additionalText	O, N	--	It can contain further next information for this notification.

#### 6.4.1.3 Triggering Event

##### 6.4.1.3.1 From-state

iRPInfoChange.

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

##### 6.4.1.3.2 To-state

successEmitNotification

Assertion Name	Definition
successEmitNotification	EPIRPAgent finished emitting notifyIRPInfoChanges notification.

## Annex A (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Sep 2003	SA_21	SP-030424	--	--	Submitted to TSG SA#21 for Information	--	1.0.0	
Dec 2003	SA_22	SP-030635	--	--	Submitted to TSG SA#22 for Approval	--	2.0.0	6.0.0
Mar 2004	SA_23	SP-040121	0001	--	Clarification on Entry Point (EP IRP) Information Service	F	6.0.0	6.1.0
Jun 2004	SA_24	SP-040247	0002	--	Correct and clarify semantics of notification parameters and notification table	F	6.1.0	6.2.0
Dec 2005	SA_30	SP-050711	0003	--	Apply Generic System Context	F	6.2.0	6.3.0
Mar 2006	SA_31	SP-060089	0004	--	Correct semantics of notification object class and object instance in Comment	F	6.3.0	6.4.0
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.	--	6.4.0	7.0.0
Sep 2007	SA_37	SP-070614	0005	--	Add IRP class name to operations	C	7.0.0	8.0.0
Mar 2009	SA_43	SP-090207	0006	--	Include reference to SOAP Solution Set specification	D	8.0.0	8.1.0
Dec 2009	-	-	-	-	Update to Rel-9 version (MCC)	--	8.1.0	9.0.0



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## History

<b>Document history</b>		
V9.0.0	February 2010	Publication