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Foreword

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

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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:

- 32.361: "Entry Point (EP) Integration Reference Point (IRP): Requirements".
- 32.362: "Entry Point (EP) Integration Reference Point (IRP): Information Service (IS)".
- 32.366: "Entry Point (EP) Integration Reference Point (IRP); Solution Set (SS) defintions".

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.

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 SupportIOCs, 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 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)". 3GPP TS 32.361: "Telecommunication management; Entry Point (EP) Integration Reference Point [6] (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 3GPP TS 32.101 [1], 32.102 [2], 32.150 [10] 32.361 [6] and the following apply.

IRPVersion: See 3GPP TS 32.311 [9].

SupportIOC: See 3GPP TS 32.150 [10].

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 Entry Point IRP EPIRP 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.

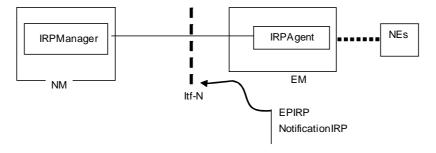


Figure 4.1: System Context A

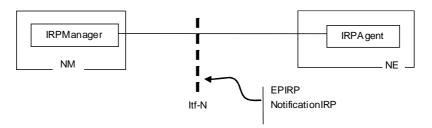


Figure 4.2: System Context B

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

5.1 Imported information entities and local labels

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

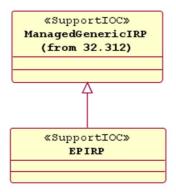
5.2 Class diagram

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



5.3 Information Object Class definitions

5.3.1 EPIRP

5.3.1.1 Definition

The EPIRP SupportIOC is used as an initial access point to the managed systems. This interface implements the entry point management capabilities defined by the present document. EPIRP inherits from the ManagedGenericIRP SupportIOC 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.

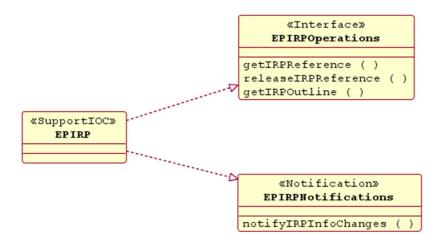
5.3.1.2 Attributes

The EPIRP does not have any own attributes, only those inherited from ManagedGenericIRP.

6 Interface definition

6.1 Class diagram representing interfaces

The following diagram depicts the interfaces of EPIRPwith 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 EPIRPto 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	М		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	М	A sequence of elements.	This parameter will return a sequence of elements.
		Each element contains:	
		-systemDN (M)	The systemDN (defined in [7]) is the Distinguished
		-iRPList (M)	Name (DN) of the that contains the IIRPAgentRPs
			identified by the related iRPList.
		where iRPList is a	Note that this may or may not be tEPIRPhe same
		sequence of	IRPAgent that contained the (that is responding to this
		IRPAgentelements. Each	operation).
		element is:	
		- rDN (M)	The rdn (relative Distinguished Name) sub-parameter
		- iRPVersionSet (M)	contains the class name and the iRPId of the IRP
		- iRPManagementScope (O)	instance. The iRPId (defined in [8]) 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, defined in [9] (see
			note), is used to identify a particular IRP Solution Set specification.
			The iRPManagementScope sub-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	М		An operation may fail because of a specified or
		OperationFailed)	unspecified reason.
NOTE: Each iRPV	ersion n	umber is a version supported b	by the identified Interface IRP, not a version of an NRM
IIXI .			

6.3.1.4 Pre-condition

The precondition must hold true before the operation is invoked.

iRPVersionIsValid

Assertion Name Definition	
iRPVersionIsValid	The implementation 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 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	Comment
		Type	
managerIdentifier	М		It carries the identifier of an IRPManager.
systemDN	M		It carries the systemDN (defined in [7]) of the IRPAgent containing the specific Interface IRP YyyIRP (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 iRPReference 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	М	ENUM (OperationSucceeded,	An operation may fail because of a specified or
		OperationFailed)	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	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 iRPReference. Whether the iRPReference 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	М		It carries the specific iRPReference no longer needed by the
			IRPManager.

6.3.3.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (OperationSucceeded,	An operation may fail because of a
		OperationFailed)	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	Condition: validIRPReference = 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

6.4 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 iRPReference
			information) registered with EPIRP has changed,
changeMode	M, N	ENUM (Register, Deregister,	Register: EPIRP now holds the outline information and
		Modify}	IRP reference information of the IRP whose DN is in
			iRPDN.
			Deregister: EPIRP now no longer holds any information
			of the IRP instance whose DN is in iRPDN.
			Modify: EPIRP has changed some or all information of
			the IRP instance 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		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
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	0009	1	correct wrong ref to iRPId	А	11.0.0	
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
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	16.0.0

History

Document history						
V16.0.0	August 2020	2020 Publication				