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Technical Specification

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Partial Suspension of Itf-N Integration Reference Point (IRP):
Information Service (IS)
(3GPP TS 32.382 version 8.0.0 Release 8)

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Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification 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:

32.381: Partial Suspension of Itf-N Integration Reference Point (IRP); Requirements.

32.382: Partial Suspension of Itf-N Integration Reference Point (IRP); Information Service (IS).

32.383: Partial Suspension of Itf-N Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set.

32.385: Partial Suspension of Itf-N Integration Reference Point (IRP); eXtensible Markup Language (XML) 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 3GPP TS 32.101 [1] and 3GPP TS 32.102 [2].

Information of an event is carried in a notification. An IRPAgent (typically an EM or a NE) emits notifications (see 3GPP TS 32.302 [3]. The IRPManager (typically a Network Management System) receives notifications. In certain scenarios floods of unwanted notifications including alarms would be sent to the IRP manager by network object instances. Thereby the interface and the management systems bear unnecessary load. Even worse: the Operator's awareness is drawn away from really urgent events.

1 Scope

The purpose of Partial Suspension of Itf-N IRP is to define an interface through which an IRPManager can suspend the forwarding of notifications via Itf-N which were generated in parts of the managed systems.

The present document is the Information Service of Partial Suspension of Itf-N IRP. It defines, for the purpose of suspending generally the forwarding of notifications, the information observable and controlled by management system's client and it also specifies the semantics of the interactions used to carry this information.

2 References

The following documents contain provisions that, 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 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

[4] 3GPP TS 32.381: "Telecommunication management; Partial Suspension of Itf-N Integration Reference Point (IRP); Requirements".

[5] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

[6] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP); Network Resource Model (NRM)".

[7] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP) management; Information Service (IS)".

[8] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); Information Service (SS)".

[9] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM; Information Service (IS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

IRP: See 3GPP TS 32.101 [1].

IRPAgent: See 3GPP TS 32.102 [2].

IRPManager: See 3GPP TS 32.102 [2].

Suspended notification: See 3GPP TS 32.381 [4].

Itf-N suspended managed instance: See 3GPP TS 32.381 [4].

Partial suspension of Itf-N: See 3GPP TS 32.381 [4].

3.2 Abbreviations

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

CM	Configuration Management
EM	Element Manager
IOC	Information Object Class
IRP	Integration Reference Point
IS	Information Service (see 3GPP TS 32.101 [1])
Itf-N	Interface N
MIB	Management Information Base
NE	Network Element

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 [5], clause 4.7.

In addition, the set of related IRP(s) relevant to the present IRP is shown in figures 4.1-1 and 4.1-2.

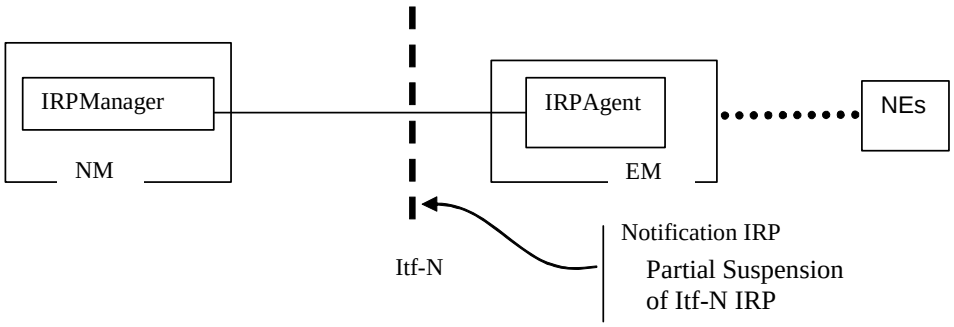

Figure 4.1-1: System Context A

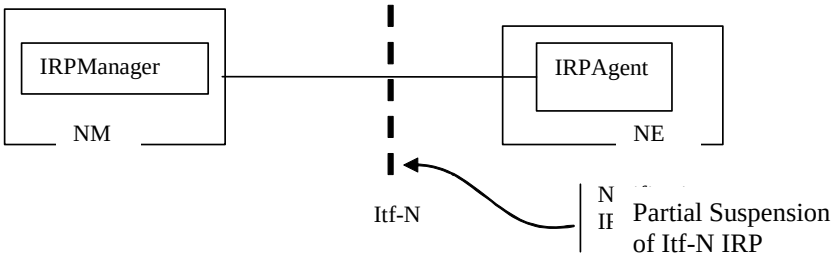

Figure 4.1-2: System Context B

5 Information Object Classes

5.1 Information entities imported and local labels

Label reference	Local label
3GPP TS 32.622 [6], information object class, Top	Top
3GPP TS 32.312 [7], information object class, managedGenericIRP	managedGenericIRP
3GPP TS 32.622 [6], information object class, IRPAgent	IRPAgent

5.2 Class diagram

5.2.1 Attributes and relationships

This clause depicts the set of IOCs that encapsulate information within the partial suspension of Itf-N IRP. The intent is to identify the information required for the partial suspension of Itf-N IRP implementation of its operations and notification emission. This clause provides the overview of all Information Object Classes in UML. Subsequent clauses provide more detailed specification of various aspects of these information object classes.

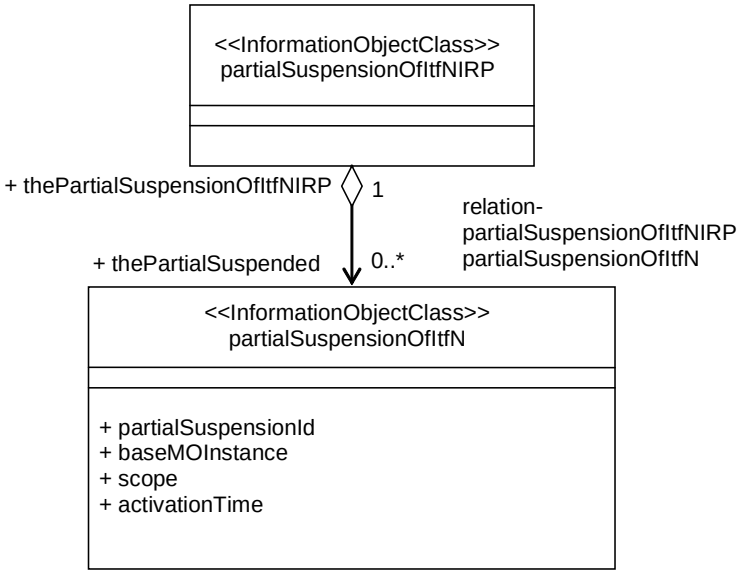

Figure 5.2.1-1: Class Diagram

5.2.2 Inheritance

This clause depicts the inheritance relationships that exist between Information Object Classes.

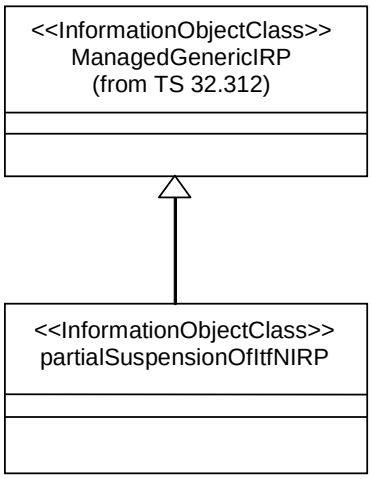

Figure 5.2.2-1: Inheritance Diagram

5.3 Information Object Classes definition

5.3.1 partialSuspendedOfItfN

5.3.1.1 Definition

This information object represents a partial suspension object instance.

A partialSuspensionOfItfN is fully identified by its distinguished name.

A partialSuspensionOfItfN can represent a group of suspended instances depending on its scope.

It inherits from IOC Top.

5.3.1.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
partialSuspensionId	+	M	M	-
baseMOInstance	+	O	M	-
scope	+	O	M	-
activationTime	+	O	M	-

5.3.2 partialSuspensionOfItfNIRP

5.3.2.1 Definition

This information object represents a partial suspension of Itf-N IRP. It inherits from IOC managedGenericIRP.

5.4 Information relationships definition

5.4.1 relation-partialSuspensionOfItfNIRP-partialSuspensionOfItfN (M)

5.4.1.1 Definition

This relationship defines the relationship between a partialSuspensionOfItfNIRP and the current partially suspended instances.

5.4.1.2 Roles

Name	Definition
thePartiallySuspended	This role represents the one who is partially suspended. It can be played by instances of IOC partialSuspensionOfItfN
thePartialSuspensionOfItfNIRP	This role represents the partial suspension of Itf-N IRP which an IRPManager uses. It is played by instances of IOC partialSuspensionOfItfNIRP

5.4.1.3 Constraints

None

5.5 Information attributes definition

This clause defines the semantics of the Attributes used in Information Object Classes.

5.5.1 Definitions and legal values

Attribute Name	Definition	Legal Values
baseMOInstance	This attribute identifies uniquely a partially suspended base object instance	N/A
scope	This attribute indicates the managed object scope of the partial suspension.	N/A
partialSuspensionId	This attribute identifies uniquely a partial suspension requested by an IRPManager	N/A
activationTime	This attribute identifies the time from which onwards the partial suspension shall be active.	N/A

6 Interface definition

6.1 Class diagram representing interfaces

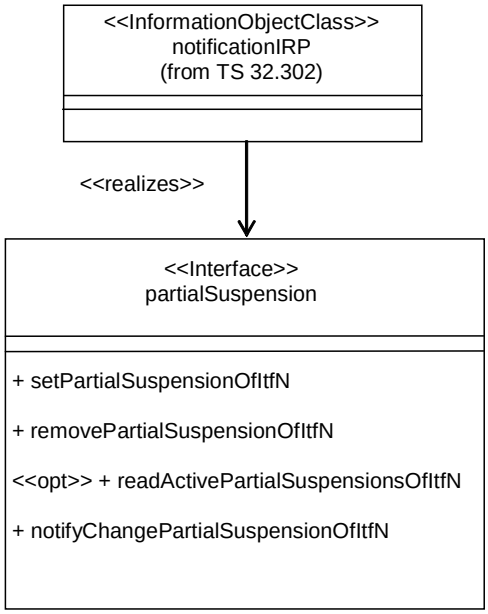

Figure 6.1-1: Class Diagram for AlarmIRPOperation_6 Interface

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 partialSuspension Interface (M)

This interface defines methods for the IRPManager to request from the IRPAgent to generally suspend the forwarding of notifications via the Itf-N for a scope of managed object instances and all other notifications not related to managed NRM IOC instances. For the definition of partial suspension see the requirements document 3GPP TS 32.381 [4].

6.3.1 Operation setPartialSuspensionOfItfN (M)

6.3.1.1 Definition

This operation allows an IRPManager to suspend the forwarding via Itf-N of notifications generated by scoped managed object instances and all other notifications not related to managed NRM IOC instances.

It is the IRPAgent's decision whether or not the suspended notifications are logged, whether or not they go into the AlarmList.

The IRPAgent may apply a time delay before activation of the partial suspension and inform about it in the optional output parameter activationTime of this operation and notification notifyChangeOfPartialSuspensionOfItfN (this allows intervention of other IRPManagers in multi-manager scenarios).

6.3.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
managerReference	M	See 3GPP TS 32.302 [3]	
baseMOInstance	O	See 3GPP TS 32.602 [8]	If this parameter is not present, then all instances under the control of the IRPAgent are suspended.
scope	CM	See 3GPP TS 32.662 [9]	Condition: `baseMOInstance` is present

6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
partialSuspensionId	CM	INTEGER	Condition: `status==Success`. It uniquely identifies the new suspension in the IRPAgent.

conflictingPartialSuspension-List	CM	LIST OF PartialSuspension
		`STRUCT (`
		`partialSuspensionId,`
		
		`[partialSuspensionParameterList]`
		`LIST OF`
		`partialSuspensionParameter`
		`STRUCT`
		
		`([baseObjectInstance,`
		`scope,]`
		`[activationTime]`
		`)`
		`)`
			Condition:
			failure reason is `AtLeastOneInstanceAlreadySuspended`.
			
			It contains the corresponding partialSuspensionId of instances which are already suspended.
			
			[ ] signifies optional parts of the output parameter.
			
			`activationTime` can be omitted if it is has already expired or if it was not used.
			`partialSuspensionParameterList` is absent if no scoping was applied at activation of the partialSuspension and `activationTime` is not present, i.e. the list would be empty.

activationTime	O	GeneralizedTime	This is the IRPAgent's time, when this partial suspension will become active.

status	M	`ENUM (`
		`Success,`
		`Failure`
		`)`
			Failure reasons are:
			`AtLeastOneInstanceAlreadySuspended`, `TooBusy` and other unspecified reasons.

6.3.1.4 Pre-condition

baseMOInstanceExists AND instancesNotYetSuspended

Assertion Name	Definition
baseMOInstance Exists	The specified baseMOInstance does exist.
instancesNotYet-Suspended	None of the scoped instances is already suspended.

6.3.1.5 Post-condition

partialSuspensionIsApplied

Assertion Name	Definition
partialSuspensionIsApplied	The requested partial suspension of Itf-N is applied by the IRPAgent.

6.3.1.6 Exceptions

Name	Properties
operation_failed	**Condition:** the pre-condition is false or the post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.3.2 Operation removePartialSuspensionOfItfN (M)

6.3.2.1 Definition

This operation allows any IRPManager to remove a previously defined partial suspension of Itf-N.

6.3.2.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
managerReference	M	See 3GPP TS 32.302 [3]	See 3GPP TS 32.302 [3]
partialSuspensionId	M	See clause 6.3.1.3	= output of an earlier setPartialSuspensionOfItfN operation

6.3.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (Success, Failure)	

6.3.2.4 Pre-condition

partialSuspensionIdExists

Assertion Name	Definition
partialSuspensionIdExists	The specified suspension does exist in the IRPAgent.

6.3.2.5 Post-condition

partialSuspensionIsRemoved

Assertion Name	Definition
partialSuspensionIsRemoved	The specified partial suspension is not applied anymore.

6.3.2.6 Exceptions

Name	Properties
operation_failed	**Condition:** the pre-condition is false or the post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.3.3 Operation readActivePartialSuspensionsOfItfN (O)

6.3.3.1 Definition

This operation allows an IRPManager to determine which partial suspensions are active in the IRPAgent, independently of the IRPManagers which requested the suspensions.

6.3.3.2 Input parameters

None.

6.3.3.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment

activePartialSuspension-List	CM	LIST OF PartialSuspension
		`STRUCT (`
		`partialSuspensionId,`
		`[partialSuspensionParameterList]`
		`LIST OF`
		`partialSuspensionParameter`
		`STRUCT`
		`(baseObjectInstance,`
		`scope,`
		`[activationTime]`
		`)`
		`)`
			If the IRPAgent does not detect an active suspension, then `status==Success` and activePartialSuspensionList is empty. A partial suspension whose activationTime is not yet reached shall also be in this activePartialSuspensionList.
			
			Condition:
			Present if and only if `status==Success`
			
			`activationTime` can be omitted if it is has already expired or if it was not used. `partialSuspensionParameterList` is absent if no scoping was applied at activation of the partialSuspension and `activationTime` is not present, i.e. the list would be empty.

status	M	ENUM (Success, Failure)	

6.3.3.4 Pre-condition

atLeastOnePartialSuspensionIsActive

Assertion Name	Definition
atLeastOnePartialSuspensionIsActive	There is at least one suspension in the IRPAgent.

6.3.3.5 Post-condition

allActivePartialSuspensionsAreDelivered

Assertion Name	Definition
allActivePartialSuspensionsAreDelivered	All partial suspensions which are active are listed in the output.

6.3.3.6 Exceptions

Name	Properties
operation_failed	**Condition:** the pre-condition is false or the post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.3.4 Notification notifyChangeOfPartialSuspensionOfItfN (M)

6.3.4.1 Definition

This notification is sent:

- after the IRPAgent has successfully performed a set`PartialSuspensionOfItfN` request and possibly (if this is supported) before the `activationTime` of this partial suspension;
- after the IRPAgent has successfully performed a `removePartialSuspensionOfItfN` request.

IRPManagers should be aware that the IRPAgent can not deliver reliable results for some operations while partial suspension is active. Therefore the IRPManager should not use such operations, e.g. CM and FM or TM etc. operations in the scoped branch of the MIB, which is suspended.

This notification can also be sent to an IRPManager who nevertheless requested an operation for an instance whose notification forwarding is suspended.

6.3.4.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
objectClass	M, Y	--	Notification header - see 3GPP TS 32.302 [3]: it shall carry the PartialSuspensionOfItfNIRP class name
objectInstance	M, Y	--	Notification header - see 3GPP TS 32.302 [3]: it shall carry the DN of the PartialSuspensionOfItfNIRP instance.
notificationId	M, N	--	Notification header - see 3GPP TS 32.302 [3]
eventTime	M, Y	--	Notification header - see 3GPP TS 32.302 [3]
notificationType	M, Y	"notifyPartialSuspensionOfItfN"	Notification header - see 3GPP TS 32.302 [3]
systemDN	C, Y	IRPAgent.systemDN.	Notification header - see 3GPP TS 32.302 [3]
typeOfChange	M, Y	ENUM(`SetPartialSuspension,` `RemovePartialSuspension`)	
partialSuspensionId	M, Y	partialSuspensionIRP.partialSuspensionId	See clause 6.3.1.3
managerReference	M, Y	partialSuspensionIRP.managerReference	See clause 6.3.1.2
baseMOInstance	CO, Y	partialSuspensionIRP.baseMOInstance, see clause 6.3.1.2	Condition: scoping was used at activation of this partial suspension
scope	CM, Y	partialSuspensionIRP.scope, see clause 6.3.1.2	Condition: scoping was used at activation of this partial suspension
activationTime	CO, N	Same type as eventTime	Condition: `typeOfChange== SetPartialSuspension`

6.3.4.3 Triggering Event

6.3.4.3.1 From-state

`aPartialSuspensionWasSetOrRemoved`

Assertion Name	Definition
aPartialSuspensionWasSetOrRemoved	The IRPAgent has successfully set or removed a partial suspension.

6.3.4.3.2 To-state

`subcribedManagersInformedAboutChangeInSuspension`

Assertion Name	Definition
subcribedManagersInformed AboutSuspension	All subscribed IRPManagers are informed about the change in the suspension.

Annex A (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Jun 2006	SA_32	SP-060255	--	--	Submitted to SA#32 for Information	--	1.0.0	
Jun 2006	--	--	--	--	History box clean-up	--	1.0.0	1.0.1
Mar 2007	SA_35	SP-070059	--	--	Submitted to SA#35 for Approval	--	2.0.0	7.0.0
Jun 2008	SA_40	SP-080328	0001	--	Correct operation name	F	7.0.0	7.1.0
Dec 2008	SA_42	--	--	--	Upgrade to Release 8	--	7.1.0	8.0.0

History

Document history		
V8.0.0	January 2009	Publication