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Entry Point IRP: CORBA solution set
Presented for: Information

Abstract of document:

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

This is a Technical Specification defining the CORBA solution set for the Entry Point IRP.

Purpose of These Specifications:

This CORBA solution set 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
32.363 Entry Point IRP CORBA solution set (the present TS)
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 32.363 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):
Common Object Request Broker Architecture (CORBA)
Solution Set (SS)
(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

entry point, CORBA solution set

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 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 specifies the Common Object Request Broker Architecture (CORBA) Solution Set (SS) for the IRP whose semantics is specified in EP(Entry Point) IRP: Information Service [10].

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] Void.
- [4] Void.
- [5] 3GPP TS 32.301: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Requirements". [\(not in doc\)](#)
- [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)". [\(not in doc\)](#)
- [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".
- [10] 3GPP TS 32.362: "Telecommunication management; Entry Point Integration Reference Point (IRP): Information Service (IS)".
- [11] 3GPP TS 32.303: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".
- [12] Object Management Group 98 (November 1998): "Notification Service: Joint Revised Submission OMG TC Document telecom/98-11-01". [\(Can't find title match\)](#)
- [13] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

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:

IRP document version number string (or "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
PM	Performance Management
SS	Solution Set

4 Architectural features

The overall architectural feature of Entry Point IRP is specified in 3GPP TS 32.362 [10].

This clause specifies features that are specific to the CORBA SS.

4.1 Notifications

Notifications are sent according to the Notification IRP: CORBA SS (see 3GPP TS 32.303 [11]).

The contents of the Entry Point IRP notifications are defined in the present document.

4.2 Syntax for Distinguished Names and versions

The format of a Distinguished Name is defined in 3GPP TS 32.300 [13].

The version of this IRP is represented as a string (see also clause 3 for versions).

5 Mapping

5.1 Operation and Notification mapping

Entry Point IRP: IS 3GPP TS 32.362 [10] defines semantics of operation and notification visible across the Entry Point IRP. Table 1 indicates mapping of these operations and notifications to their equivalents defined in this SS.

Table 1: Mapping from IS Operations and Notification to SS equivalents

IS Operations/ notification TS 32.362 [10]	SS Method	Qualifier
getIRPOutline	get_IRP_outline	M
getIRPReference	get_IRP_reference	M
releaseIRPReference	release_IRP_reference	M
notifyIRPInfoChanges	push_structured_event (See subclause 6.1)	M
getIRPVersion	get_EP_IRP_versions	M
getOperationProfile (see note)	get_EP_IRP_operations_profile	O
getNotificationProfile (see note)	get_EP_IRP_notification_profile	O
NOTE: This operation is of ManagedGenericIRP IOC specified in 3GPP TS 32.312 [8]. The EPIRP IOC of [10] inherits from it.		

5.2 Operation parameter mapping

The Entry Point IRP: IS 3GPP TS 32.362 [10] defines semantics of parameters carried in operations across the Entry Point IRP. The following tables indicate the mapping of these parameters, as per operation, to their equivalents defined in this SS.

Table 2: Mapping from IS getIRPOutline parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
iRPVersion	ManagedGenericIRPConstDefs::VersionNumber iRPVersion	M
supportedIRPList	EPIRPSystem::SupportedIRPListType supportedIRPList	M
status	EPIRPSystem::ResultType Exception: GetIRPOutline, InvalidIRPVersion	M

Table 3: Mapping from IS getIRPReference parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerIdentifier	EPIRPSystem::ManagerIdentifierType managerIdentifier	M
systemDn	EPIRPSystem::SystemDNType systemDn	M
iRPId	EPIRPSystem::IRPIdType irpId	M
iRPReference	string iRPReference	M
status	EPIRPSystem::ResultType Exception: GetIRPReference, InvalidRequestedParameters	M

Table 4: Mapping from IS releaseIRPReference parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerIdentifier	EPIRPSystem::ManagerIdentifierType managerIdentifier	M
iRPReference	string iRPReference	M
status	EPIRPSystem::ResultType Exception: ReleaseIRPReference, UnknownIRPReference	M

Table 5: Mapping from IS getIRPVersion parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
versionNumberSet	Return value of type ManagedGenericIRPConstDefs::VersionNumberSet	M
status	Exception: GetEPIRPVersions	M

Table 6: Mapping from IS `getOperationProfile` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
iRPVersion	ManagedGenericIRPConstDefs::VersionNumber iRPVersion	M
operationNameProfile,operationParameterProfile	Return of type ManagedGenericIRPConstDefs::MethodList	M
status	Exception: GetEPIRPOperationsProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter	M

Table 7: Mapping from IS `getNotificationProfile` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
iRPVersion	ManagedGenericIRPConstDefs::VersionNumber iRPVersion	M
notificationNameProfile,notificationParameterProfile	Return value of type ManagedGenericIRPConstDefs::MethodList	M
status	Exception: GetEPIRPNotificationProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter	M

5.3 Notification parameter mapping

The Entry Point IRP: IS 3GPP TS 32.362 [10] defines semantics of parameters carried in notifications. The following table indicates the mapping of these parameters to their OMG CORBA Structured Event (defined in OMG Notification Service [12]) equivalents. The composition of OMG Structured Event, as defined in the OMG Notification Service [12], is:

```

Header
  Fixed Header
    domain_name
    type_name
    event_name
  Variable Header
Body
  filterable_body_fields
  remaining_body

```

The following table lists all OMG Structured Event attributes in the second column. The first column identifies the Entry Point IRP: IS 3GPP TS 32.362 [10] defined notification parameters.

Table 8: Mapping for notifyIRPInfoChanges

IS Parameters	OMG CORBA Structured Event attribute	Qualifier	Comment
There is no corresponding IS attribute.	domain_name	M	It carries the IRP document version number string. See subclause 3.1. It indicates the syntax and semantics of the Structured Event as defined by the present document.
notificationType	Type_name	M	This is the ET_IRPINFO_CHANGES of module of EPIRPSystem.
There is no corresponding IS attribute	event_name	M	It carries no information.
There is no corresponding IS attribute.	Variable Header		
objectClass, objectInstance	One NV pair of filterable_body_fields	M	NV stands for name-value pair. Order arrangement of NV pairs is not significant. The name of NV-pair is always encoded in string. Name of this NV pair is the MANAGED_OBJECT_INSTANCE of interface AttributeNameValue of module NotificationIRPConstDefs. Value of NV pair is a string. See corresponding table in Notification IRP: CORBA SS [11].
notificationId	One NV pair of filterable_body_fields	M	Name of NV pair is the NOTIFICATION_ID of interface AttributeNameValue of module NotificationIRPConstDefs. Value of NV pair is a long. See corresponding table in Notification IRP: CORBA SS [11].
eventTime	One NV pair of filterable_body_fields	M	Name of NV pair is the EVENT_TIME of interface AttributeNameValue of module NotificationIRPConstDefs. Value of NV pair is IRPTime. See corresponding table in Notification IRP: CORBA SS [11].
systemDN	One NV pair of filterable_body_fields	M	Name of NV pair is the SYSTEM_DN of interface AttributeNameValue of module NotificationIRPConstDefs. Value of NV pair is a string. See corresponding table in Notification IRP: CORBA SS [11].
iRPDn	One NV pair of filterable_body_fields	M	Name of NV pair is the IRP_DN of module EPIRPSystem:: AttributeNameValue. Value of NV pair is IRPDnType of module EPIRPSystem.
changeMode	One NV pair of filterable_body_fields	M	Name of NV pair is the CHANGE_MODE of module EPIRPSystem:: AttributeNameValue. Value of NV pair is a ChangeModeType of module EPIRPSystem.
additionalText	One NV pair of filterable_body_fields	M	Name of NV pair is the ADDITIONAL_TEXT of module EPIRPSystem:: AttributeNameValue. Value of NV pair is a string.
There is no corresponding IS attribute.	remaining_body		

6 EPIRPNotification Interface

OMG CORBA Notification push operation is used to realise the notification of EPIRPNotifications. All the notifications in this interface are implemented using this push_structured_event method.

6.1 Method push (M)

```

module CosNotifyComm {
  ...
  Interface SequencePushConsumer : NotifyPublish {

```

```
        void push_structured_events(  
            in CosNotification::EventBatch notifications)  
        raises( CosEventComm::Disconnected);  
        ...  
    }; // SequencePushConsumer  
    ...  
}; // CosNotifyComm
```

NOTE 1: The `push_structured_events` method takes an input parameter of type `EventBatch` as defined in the `OMG CosNotification` module (OMG Notification Service [12]). This data type is the same as a sequence of Structured Events. Upon invocation, this parameter will contain a sequence of Structured Events being delivered to `IRPManager` by `IRPAgent` to which it is connected.

NOTE 2: The maximum number of events that will be transmitted within a single invocation of this operation is controlled by `IRPAgent` wide configuration parameter.

NOTE 3: The amount of time the supplier (`IRPAgent`) of a sequence of Structured Events will accumulate individual events into the sequence before invoking this operation is controlled by `IRPAgent` wide configuration parameter as well.

NOTE 4: `IRPAgent` may push `EventBatch` with only one Structured Event.

Annex A (normative): IDL specifications

A.1 IDL specification (file name " EPIRPSystem.idl")

```

#ifndef EPIRPSystem_idl
#define EPIRPSystem_idl

#include "NotificationIRPConstDefs.idl"
#include "ManagedGenericIRPConstDefs.idl"
#include "ManagedGenericIRPSystem.idl"

// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"

/* ## Module: EPIRPSystem
This module implements capabilities of EPIRP.
=====
*/
module EPIRPSystem
{
    enum ResultType {OK, Failure};

    typedef unsigned short IRPIdType;
    typedef string SystemDNType;

    /*
    IRPManagementScopeOpt is a type carrying an optional parameter.
    If the boolean is TRUE, then the value is present.
    Otherwise the value is absent.
    The string holds multiple DNs of base objects. DNs are separated by commas.
    */
    union IRPManagementScopeOpt switch (boolean)
    {
        case TRUE: string value;
    };

    /*
    The IRPElement defines the structure to be returned as part of
    getIRPOutline().
    */
    struct IRPElement
    {
        IRPIdType irpId;
        ManagedGenericIRPConstDefs::VersionNumber irpVersion;
        IRPManagementScopeOpt irpManagementScope;
    };

    /*
    List of all IRPElement and their associated parameters.
    */
    typedef sequence<IRPElement> IRPListType;

    struct SupportedIRPListTypeElement
    {
        SystemDNType systemDN;
        IRPListType irpList;
    };

    typedef sequence<SupportedIRPListTypeElement> SupportedIRPListType;

    typedef string ManagerIdentifierType;

    typedef string IRPDnType;
    enum ChangeModeType {REGISTER, Deregister, MODIFY};

    /*
    Define the parameters specified in
    the notifyEpInfoChanges notification.
    */

```

```

interface AttributeNameValue
{
    const string IRP_DN = "IRP_DN";
    const string CHANGE_MODE = "CHANGE_MODE";
    const string ADDITIONAL_TEXT = "ADDITIONAL_TEXT";
};

/**
 * Definition of ITU-T defined semantics.
 * These constants are used in the type_name
 * (header.fixed_header.event_type.type_name)
 * field to denote the notification type
 * Note all values are unique among themselves. Other IRP documents
 * cannot use the same values.
 */
const string ET_IRPINFO_CHANGES = "notifyIrpInfoChanges";

exception InvalidIRPVersion { string reason; };
exception InvalidRequestedParameters { string reason; };
exception UnknownIRPReference { string reason; };

/*
System fails to complete the operation. System can provide reason
to qualify the exception. The semantics carried in reason
is outside the scope of this IRP.
*/
exception GetIRPOutline { string reason; };
exception GetIRPReference { string reason; };
exception ReleaseIRPReference { string reason; };
exception GetEPIRPVersions { string reason; };
exception GetEPIRPOperationsProfile { string reason; };
exception GetEPIRPNotificationProfile { string reason; };

/*
*/
interface EPIRP
{
    /**
 * The IRPManager uses this operation to request the EPIRP to
 * return the outline information of the supported IRPs. 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.
 */
    ResultType    get_IRP_outline(
        in ManagedGenericIRPConstDefs::VersionNumber irpVersion,
        out SupportedIRPListType supportedIRPList
    )
    raises (GetIRPOutline,InvalidIRPVersion);

    /**
 * The IRPManager uses this operation to request the Entry Point IRP
 * to return a reference for a specific version of a specific IRP.
 */
    ResultType    get_IRP_reference(
        in ManagerIdentifierType managerIdentifier,
        in SystemDNType systemDn,
        in IRPIdType irpId,
        out string iRPReference
    )
    raises (GetIRPReference,
        InvalidRequestedParameters);

    /**
 * 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.
 */
    ResultType    release_IRP_reference(
        in ManagerIdentifierType managerIdentifier,
        in string iRPReference
    )
    raises (ReleaseIRPReference,
        UnknownIRPReference);

    /**

```

```

* Return the list of all supported EPIRP versions.
*/
ManagedGenericIRPConstDefs::VersionNumberSet get_EP_IRP_versions (
)
raises (GetEPIRPVersions);

/**
* Return the list of all supported operations and their supported
* parameters for a specific EPIRP version.
*/
ManagedGenericIRPConstDefs::MethodList get_EP_IRP_operations_profile (
    in ManagedGenericIRPConstDefs::VersionNumber iRPVersion
)
raises (GetEPIRPOperationsProfile,
    ManagedGenericIRPSystem::OperationNotSupported,
    ManagedGenericIRPSystem::InvalidParameter);

/**
* Return the list of all supported notifications and their supported
* parameters for a specific EPIRP version.
*/
ManagedGenericIRPConstDefs::MethodList get_EP_IRP_notification_profile
(
    in ManagedGenericIRPConstDefs::VersionNumber iRPVersion
)
raises (GetEPIRPNotificationProfile,
    ManagedGenericIRPSystem::OperationNotSupported,
    ManagedGenericIRPSystem::InvalidParameter);
};

/**
* Constant definitions for the EPInfoChanges notification
*/
module notifyIRPInfoChanges
{
    const string MANAGED_OBJECT_CLASS =
        NotificationIRPConstDefs::AttributeNameValue::MANAGED_OBJECT_CLASS;
    const string MANAGED_OBJECT_INSTANCE =
        NotificationIRPConstDefs::AttributeNameValue::MANAGED_OBJECT_INSTANCE;
    const string NOTIFICATION_ID =
        NotificationIRPConstDefs::AttributeNameValue::NOTIFICATION_ID;
    const string EVENT_TIME =
        NotificationIRPConstDefs::AttributeNameValue::EVENT_TIME;
    const string SYSTEM_DN =
        NotificationIRPConstDefs::AttributeNameValue::SYSTEM_DN;
    const string EVENT_TYPE = ET_IRPINFO_CHANGES;

    /**
    * This constant defines the name of the iRPDn property,
    * which is transported in the filterable_body fields.
    * The data type for the value of this property
    * is IRPDnType.
    */
    const string IRP_DN = AttributeNameValue::IRP_DN;

    /**
    * This constant defines the name of the changeMode property,
    * which is transported in the filterable_body fields.
    * The data type for the value of this property is ChangeModeType.
    */
    const string CHANGE_MODE = AttributeNameValue::CHANGE_MODE;

    /**
    * This constant defines the name of the additionalText property,
    * which is transported in the filterable_body fields.
    * The data type for the value of this property is string.
    */
    const string ADDITIONAL_TEXT = AttributeNameValue::ADDITIONAL_TEXT;
};

};

#endif

```

Annex B (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Sep 2003	S_21	SP-030425	--	--	Submitted to TSG SA#21 for Information	1.0.0	