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Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS) (3GPP TS 32.343 version 6.1.0 Release 6)

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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 (TS) 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 a TS-family covering the 3rd Generation Partnership Project: Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

TS 32.341:   "File Transfer (FT) Integration Reference Point (IRP): Requirements".

TS 32.342:   "File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)".

TS 32.343:   "File Transfer (FT) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set".

TS 32.344:   "File Transfer (FT) Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set".

The present document is part of a set of TSs which describe the requirements and information model necessary for the Telecommunication Management (TM) of 3G systems. The TM principles and TM architecture are specified in 3GPP TS 32.101 [1] and 3GPP TS 32.102 [2].

Network Elements (NEs) under management, element managers as well as network managers generate various management information stored in file format. This IRP is addressing how these file are exchanged through Itf-N as well as certain aspects of file management and maintenance. It is anticipated that all management functions (e.g. PM, Call Trace, CM) as well as associated IRP's making reuse of capabilities provided by this File Transfer IRP.

1   Scope

The present document specifies the Common Object Request Broker Architecture (CORBA) Solution Set (SS) for the IRP whose semantics is specified in File Transfer IRP: Information Service [7].

This Solution Set specification is related to 3GPP TS 32.342 (V6.0.X).

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 32.341: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Requirements".

[4]   3GPP TS 32.311: "Telecommunication management; Generic Integration Reference Point (IRP) management: Requirements".

[5]   3GPP TS 32.303: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

[6]   3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[7]   3GPP TS 32.342: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)".

[8]   3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP) management: Information Service (IS)".

[9]   OMG TC Document telecom/98-11-01: "OMG Notification Service". http://www.omg.org/technology/documents/

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], 3GPP TS 32.341 [3] and the following apply:

IRP document version number string (or "IRPVersion"): See 3GPP TS 32.311 [4].

3.2 Abbreviations

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

CM   Configuration Management
CORBA   Common Object Request Broker Architecture
DN   Distinguished Name
FT   File Transfer
IDL   Interface Definition Language
IS   Information Service
NE   Network Element
OMG   Object Management Group
PM   Performance Management
SS   Solution Set

4 Architectural features

The overall architectural feature of FileTransferIRP is specified in 3GPP TS 32.341 [3].

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 [5]).

The contents of the FileTransferIRP 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 [6].

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

5 Mapping

5.1 Operation and Notification mapping

FileTransferIRP: IS 3GPP TS 32.342 [7] defines semantics of operation and notification visible across the FileTransferIRP. 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 3GPP TS 32.342 [7]	SS Method	Qualifier
listAvailableFiles	list_available_files	M
fileDownloadIndication	file_download_indication	O
getIRPVersion	get_FileTransfer_IRP_versions	M
getOperationProfile (see note)	get_FileTransfer_IRP_operations_profile	O
getNotificationProfile (see note)	get_FileTransfer_IRP_notifications_profile	O
notifyFileReady	push_structured_events (see subclause 6.1)	M
notifyFilePreparationError	push_structured_events (see subclause 6.1)	M
NOTE: This operation is of ManagedGenericIRP IOC specified in 3GPP TS 32.312 [8]. The FileTransferIRP IOC of 3GPP TS 32.342 [7] inherits from it.		

5.2 Operation parameter mapping

The FileTransferIRP: IS 3GPP TS 32.342 [7] defines semantics of parameters carried in operations across the FileTransferIRP. The following tables indicate the mapping of these parameters, as per operation, to their equivalents defined in this SS.

Table 2: Mapping from IS `listAvailableFiles` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managementDataType	const short managementDataType	M
beginTime	FileTransferIRPConstDefs::UTCTimeType beginTime	M
endTime	FileTransferIRPConstDefs::UTCTimeType endTime	M
fileInfoList	Return value of type FileTransferIRPConstDefs::FileInfoListType fileInfoList	M
status	FileTransferIRPConstDefs::ResultType Exception: ListAvailableFiles, InvalidTimes	M

Table 3: Mapping from IS `fileDownloadIndication` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
fileInfoList	FileTransferIRPConstDefs::FileInfoListType fileInfoList	M
status	FileTransferIRPConstDefs::ResultType Exception: FileDownloadIndication, InvalidFileInfoList, ManagedGenericIRPSystem:OperationNotSupported	M

Table 4: 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: GetFileTransferIRPVersions	M

Table 5: 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: GetFileTransferIRPOperationsProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter	M

Table 6: 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: GetFileTransferIRPNotificationsProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter	M

5.3 Notification parameter mapping

The FileTransferIRP: IS 3GPP TS 32.342 [7] 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 [9]) equivalents. The composition of OMG Structured Event, as defined in the OMG Notification Service [9], is:

```
Header
      Fixed Header
            domain_name
            type_name
            event_name
      Variable Header
Body
      filterable_body_fields
      remaining_body
```

The following tables list all OMG Structured Event attributes in the second column. The first column identifies the FileTransferIRP: IS 3GPP TS 32.342 [7] defined notification parameters.

Table 7: Mapping for `notifyFileReady`

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_FILE_READY of module FileTransferIRPNotifDefs.
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 (3GPP TS 32.303 [5]).
notificationId	One NV pair of remaining_body	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 (3GPP TS 32.303 [5]).
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 (3GPP TS 32.303 [5]).
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 (3GPP TS 32.303 [5]).
fileInfoList	One NV pair of remaining_body	M	Name of NV pair is the FILE_INFO_LIST of module FileTransferIRPNotifDefs::notifyFileReady. Value of NV pair is FileInfoListType of module FileTransferIRPConstDefs.
additionalText	One NV pair of remaining_body	O	Name of NV pair is the ADDITIONAL_TEXT of module FileTransferIRPNotifDefs::notifyFileReady. Value of NV pair is a string.

Table 8: Mapping for `notifyFilePreparationError`

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_FILE_PREPARATION_ERROR of module of FileTransferIRPNotifDefs.
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 (3GPP TS 32.303 [5]).
notificationId	One NV pair of remaining_body	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 (3GPP TS 32.303 [5]).
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 (3GPP TS 32.303 [5]).
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 (3GPP TS 32.303 [5]).
fileInfoList	One NV pair of remaining_body	M	Name of NV pair is the FILE_INFO_LIST of module FileTransferIRPNotifDefs::notifyFilePreparationError . Value of NV pair is FileInfoListType of module FileTransferIRPConstDefs.
reason	One NV pair of remaining_body	M	Name of NV pair is the REASON of module FileTransferIRPNotifDefs::notifyFilePreparationError . Value of NV pair is a string.
additionalText	One NV pair of remaining_body	O	Name of NV pair is the ADDITIONAL_TEXT of module FileTransferIRPNotifDefs:: notifyFilePreparationError . Value of NV pair is a string.

6 FileTransferIRP Notification Interface

OMG CORBA Notification push operation is used to realise the notification of `FileTransferIRP Notifications`. 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 [9]). 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 "FileTransferIRPConstDefs.idl")

```
// File: FileTransferIRPConstDefs.idl

#ifndef _FILETRANSFERIRPCONSTDEFS_IDL_
#define _FILETRANSFERIRPCONSTDEFS_IDL_

#include "TimeBase.idl"

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

/* ## Module: FileTransferIRPConstDefs
This module contains commonly used definitions for FileTransferIRP.
==================================================================
*/
module FileTransferIRPConstDefs
{
  enum ResultType {OK, Failure};

  typedef TimeBase::UtcT UTCTimeType;


  enum LocationChoice {Directory, URL};

  //The FileLocationType may be a directory path or a URL
  union FileLocationType switch (LocationChoice)
  {
    case Directory:  string fileLocationDirectory;
    /* e.g. \\202.112.101.1\D:\user\performanceFiles\<fileName> */
    case URL: string fileLocationURL;
    /* e.g. ftp://nms.telecom_org.com/datastore/<fileName> */
  };

  typedef unsigned long FileSizeType; //the unit is byte
  typedef string FileCompressionType;
  typedef string FileFormatType;

  struct FileInfoType
  {
    FileLocationType fileLocation;
    FileSizeType fileSize;
    UTCTimeType fileReadyTime;
    UTCTimeType fileExpirationTime;
    FileCompressionType fileCompression;
    FileFormatType fileFormat;
  };

  typedef sequence<FileInfoType> FileInfoListType;


  const short PMManagementDataType = 1;//Performance Management
  const short CMManagementDataType = 2;//Configuration Management
  const short IMManagementDataType = 3;//Inventory Management
  const short TMManagementDataType = 4;//Test Management
  const short CTManagementDataType = 5;//Subscriber & Equipment Trace
  const short NLManagementDataType = 6;//Notification Log
  const short CGManagementDataType = 7;//Charging
  const short OTManagementDataType = 8;//Other Types

  /*
  Define the parameters specified in the notifyFileReady
  and notifyFilePreparationError notification.
  */
  interface AttributeNameValue
```

```
    {
        const string FILE_INFO_LIST = "FILE_INFO_LIST";
        const string ADDITIONAL_TEXT = "ADDITIONAL_TEXT";
        const string REASON = "REASON";
    };

};

#endif _FILETRANSFERIRPCONSTDEFS_IDL_
```

A.2   IDL specification (file name "FileTransferIRPSystem.idl")

```
// File: FileTransferIRPSystem.idl

#ifndef _FILETRANSFERIRPSYSTEM_IDL_
#define _FILETRANSFERIRPSYSTEM_IDL_

#include "ManagedGenericIRPConstDefs.idl"
#include "ManagedGenericIRPSystem.idl"
#include "FileTransferIRPConstDefs.idl"

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

/* ## Module: FileTransferIRPSystem
This module implements capabilities of FileTransferIRP.
===================================================================
*/
module FileTransferIRPSystem
{

  exception InvalidTimes { string reason; };
  exception InvalidFileInfoList { 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 ListAvailableFiles { string reason; };
  exception FileDownloadIndication { string reason; };
  exception GetFileTransferIRPVersions { string reason; };
  exception GetFileTransferIRPOperationsProfile { string reason; };
  exception GetFileTransferIRPNotificationsProfile { string reason; };

  /*
  */
   interface FileTransferIRP
   {
     /*
      * IRPManager invoke this operation to get the files information
      */
     FileTransferIRPConstDefs::ResultType    list_available_files(
       in short managementDataType,
       in FileTransferIRPConstDefs::UTCTimeType beginTime,
       in FileTransferIRPConstDefs::UTCTimeType endTime,
       out FileTransferIRPConstDefs::FileInfoListType fileInfoList
     )
     raises (ListAvailableFiles, InvalidTimes,
       ManagedGenericIRPSystem::InvalidParameter);

     /*
      * IRPManager invoke this operation to indicate completion of downloading files to IRPAgent
      */
     FileTransferIRPConstDefs::ResultType    file_download_indication(
       in FileTransferIRPConstDefs::FileInfoListType fileInfoList
     )
     raises (FileDownloadIndication,InvalidFileInfoList,
       ManagedGenericIRPSystem::OperationNotSupported);

      /**
       * Return the list of all supported FileTransferIRP versions.
```

```
         */
        ManagedGenericIRPConstDefs::VersionNumberSet get_FileTransfer_IRP_versions (
        )
        raises (GetFileTransferIRPVersions);


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

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

};

#endif _FILETRANSFERIRPSYSTEM_IDL_
```

A.3 IDL specification (file name "FileTransferIRPNotifications.idl")

```
// File: FileTransferIRPNotifications.idl

#ifndef _FILETRANSFERIRPNOTIFICATIONS_IDL_
#define _FILETRANSFERIRPNOTIFICATIONS_IDL_

#include "FileTransferIRPConstDefs.idl"
#include "NotificationIRPConstDefs.idl"
#include "NotificationIRPNotifications.idl"


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

/* ## Module: FileTransferIRPNotifDefs
This contains the specification of notifications of FileTransferIRP.
====================================================================
*/
module FileTransferIRPNotifications
{

    /**
    *  Constant definitions for the FileReady notification
    */
    interface notifyFileReady: NotificationIRPNotifications::Notify
    {
      const string EVENT_TYPE = "notifyFileReady";

      /**
      * This constant defines the name of the fileInfoList property,
      * which is transported in the filterable_body fields.
      * The data type for the value of this property is
      * FileTransferIRPConstDefs::FileInfoListType.
      */
      const string FILE_INFO_LIST =
```

```
            FileTransferIRPConstDefs::AttributeNameValue::FILE_INFO_LIST;

     /**
      * 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 =
          FileTransferIRPConstDefs::AttributeNameValue::ADDITIONAL_TEXT;
     };

   /**
    *  Constant definitions for the FilePreparationError notification
    */
   interface notifyFilePreparationError:
        NotificationIRPNotifications::Notify
   {
     const string EVENT_TYPE = "notifyFilePreparationError";

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

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

     /**
      * 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 =
          FileTransferIRPConstDefs::AttributeNameValue::ADDITIONAL_TEXT;
     };

};
#endif _FILETRANSFERIRPNOTIFICATIONS_IDL_
```

Annex B (informative):
Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Mar 2004	S_23	SP-040127	--	--	Submitted to TSG SA#23 for Information	1.0.0	
Sep 2004	S_25	SP-040563	--	--	Submitted to TSG SA#25 for Approval	2.0.0	6.0.0
Dec 2004	S_26	SP-040800	001	--	Correct mapping of IS-defined non-filterable parameters to SS-defined non-filterable fields - Align IDL style in FT IRP CORBA SS with IDL Style Guide in 32.150	6.0.0	6.1.0

History

Document history		
V6.1.0	December 2004	Publication