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Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

Telecommunication management;

File Transfer (FT)

Integration Reference Point (IRP):

Solution Set (SS) definitions

(Release 16)

* *

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

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

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

**32.346: "File Transfer (FT) Integration Reference Point (IRP): Solution Set (SS) definitions"**

The present document is part of a TS-family 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 files are exchanged through Itf-N as well as certain aspects of file management and maintenance. It is anticipated that management functions (e.g. PM, Call Trace, CM) make reuse of capabilities provided by this File Transfer IRP.

# 1 Scope

The present document contains the Solution Sets for the IRP whose semantics are specified in File Transfer IRP: Information Service (3GPP TS 32.342 [15]).

This Solution Set specification is related to 3GPP TS 32.342 V14.0.X [15].

# 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.) 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 32.306: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Solution Set (SS) definitions".

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

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

[8] 3GPP TS 32.316: "Telecommunication management; Generic Integration Reference Point (IRP) management; Solution Set (SS) definitions".

[9] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

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

[11] W3C SOAP 1.1 specification (<http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>)

[12] W3C XPath 1.0 specification (<http://www.w3.org/TR/1999/REC-xpath-19991116>)

[13] W3C WSDL 1.1 specification (<http://www.w3.org/TR/2001/NOTE-wsdl-20010315>)

[14] W3C SOAP 1.2 specification (<http://www.w3.org/TR/soap12-part1/>)

[15] 3GPP TS 32.342: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)".

[16] 3GPP TS 32.336: "Telecommunication management; Notification Log (NL) Integration Reference Point (IRP): Solution Set (SS) definitions".

[17] 3GPP TS 32.331: "Telecommunication management; Notification Log (NL) Integration Reference Point (IRP): Requirements".

# 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 32.150 [9], 3GPP TS 32.331 [17] and 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

FTIRP File Transfer IRP

IDL Interface Definition Language

IRP Integration Reference Point

IS Information Service

NE Network Element

NL Notification Log

NRM Network Resource Model

OMG Object Management Group

PM Performance Management

SS Solution Set

UML Unified Modelling Language

WSDL Web Service Description Language

XML eXtensible Markup Language

# 4 Solution Set Definitions

This specification defines the following 3GPP FT IRP Solution Set Definitions:

Annex A provides the CORBA Solution Set.  
Annex B provides the XML Definitions.  
Annex C provides the SOAP Solution Set.

Annex A (normative):  
CORBA Solution Set

This annex contains the CORBA Solution Set for the IRP whose semantics is specified in FT IRP: Information Service (3GPP TS 32.342 [15]).

# A.1 Architectural features

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

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

## A.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [6].

## A.1.2 Notification Services

In implementations of CORBA SS, IRPAgent conveys FT Information to IRPManager via OMG Notification Service (OMG Notification Service [10]).

A necessary and sufficient sub set of OMG Notification Services shall be used to support FileTransferIRPNotifications notifications as specified in 3GPP TS 32.342 [15].

## A.1.3 Push and Pull Style

OMG Notification Service defines two styles of interaction. One is called push style. In this style, IRPAgent pushes notifications to IRPManager as soon as they are available. The other is called pull style. In this style, IRPAgent keeps the notifications till IRPManager requests for them.

This CORBA SS specifies that support of Push style is Mandatory (M) and that support of Pull style is Optional (O).

## A.1.4 Support multiple notifications in one push operation

For efficiency reasons, IRPAgent may send multiple notifications using one single push operation. To pack multiple notifications into one push operation, IRPAgent may wait and not invoke the push operation as soon as notifications are available. To avoid IRPAgent to wait for an extended period of time that is objectionable to IRPManager, IRPAgent shall implement an IRPAgent wide timer configurable by administrator. On expiration of this timer, IRPAgent shall invoke push if there is at least one notification to be conveyed to IRPManager. This timer is re-started after each push invocation.

## A.1.5 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.

### A.1.5.1 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 [10]). 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.

# A.2 Mapping

## A.2.1 Operation and Notification mapping

FileTransferIRP: IS 3GPP TS 32.342 [15] defines semantics of operation and notification visible across the FileTransferIRP. Table A.2.1 indicates mapping of these operations and notifications to their equivalents defined in this SS.

Table A.2.1: Mapping from IS Operations and Notification to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operations/ notification 3GPP TS 32.342 [15] | SS Method | Qualifier |
| listAvailableFiles | list\_available\_files | M |
| fileDownloadIndication | file\_download\_indication | O |
| getIRPVersion (see note) | get\_file\_transfer\_irp\_versions | M |
| getOperationProfile (see note) | get\_file\_transfer\_irp\_operations\_profile | O |
| getNotificationProfile (see note) | get\_file\_transfer\_irp\_notifications\_profile | O |
| notifyFileReady | push\_structured\_events (see subclause A.1.5) | M |
| notifyFilePreparationError | push\_structured\_events (see subclause A.1.5) | M |
| NOTE: This operation is of ManagedGenericIRP IOC specified in 3GPP TS 32.312 [7]. The FileTransferIRP IOC of 3GPP TS 32.342 [15] inherits from it. | | |

## A.2.2 Operation parameter mapping

The FileTransferIRP: IS 3GPP TS 32.342 [15] 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 A.2.2.1: Mapping from IS listAvailableFiles parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS Method parameter | Qualifier |
| managementDataType | short management\_data\_type | M |
| beginTime | FileTransferIRPConstDefs::UTCTime begin\_time | M |
| endTime | FileTransferIRPConstDefs::UTCTime end\_time | M |
| fileInfoList | FileTransferIRPConstDefs::FileInfoList file\_info\_list | M |
| status | Return value of type FileTransferIRPConstDefs::Result  Exception:  ListAvailableFiles, InvalidTimes, ManagedGenericIRPSystem::InvalidParameter | M |

Table A.2.2.2: Mapping from IS fileDownloadIndication parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS Method parameter | Qualifier |
| fileInfoList | FileTransferIRPConstDefs::FileInfoList file\_info\_list | M |
| status | Return value of type FileTransferIRPConstDefs::Result  Exception:  FileDownloadIndication, InvalidFileInfoList, ManagedGenericIRPSystem:OperationNotSupported | M |

Table A.2.2.3: 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 A.2.2.4: Mapping from IS getOperationProfile parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS Method parameter | Qualifier |
| iRPVersion | ManagedGenericIRPConstDefs::VersionNumber irp\_version | M |
| operationNameProfile, operationParameterProfile | Return value of type ManagedGenericIRPConstDefs::MethodList | M |
| status | Exception:  GetFileTransferIRPOperationsProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter | M |

Table A.2.2.5: Mapping from IS getNotificationProfile parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS Method parameter | Qualifier |
| iRPVersion | ManagedGenericIRPConstDefs::VersionNumber irp\_version | M |
| notificationNameProfile, notificationParameterProfile | Return value of type ManagedGenericIRPConstDefs::MethodList | M |
| status | Exception:  GetFileTransferIRPNotificationsProfile, ManagedGenericIRPSystem::OperationNotSupported, ManagedGenericIRPSystem::InvalidParameter | M |

## A.2.3 Notification parameter mapping

The FileTransferIRP: IS 3GPP TS 32.342 [15] 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 [10]) equivalents. The composition of OMG Structured Event, as defined in the OMG Notification Service [10], 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 [15] defined notification parameters.

Table A.2.3.1: 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 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 32.306 [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 32.306 [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 32.306 [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 32.306 [5]). |
| fileInfoList | One NV pair of remaining\_body | M | Name of NV pair is the FILE\_INFO\_LIST of interface NotifyFileReady of module FileTransferIRPNotifications.  Value of NV pair is FileInfoList of module FileTransferIRPConstDefs. |
| additionalText | One NV pair of remaining\_body | O | Name of NV pair is the ADDITIONAL\_TEXT interface NotifyFileReady of module FileTransferIRPNotifications.  Value of NV pair is a string. |

Table A.2.3.2: 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 32.306 [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 32.306 [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 32.306 [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 32.306 [5]). |
| fileInfoList | One NV pair of remaining\_body | M | Name of NV pair is the FILE\_INFO\_LIST of interface NotifyFilePreparationError of module FileTransferIRPNotifications.  Value of NV pair is FileInfoList of module FileTransferIRPConstDefs. |
| reason | One NV pair of remaining\_body | M | Name of NV pair is the REASON of interface NotifyFilePreparationError of module FileTransferIRPNotifications.  Value of NV pair is a string. |
| additionalText | One NV pair of remaining\_body | O | Name of NV pair is the ADDITIONAL\_TEXT of interface NotifyFilePreparationError of module FileTransferIRPNotifications.  Value of NV pair is a string. |

# A.3 Solution Set definitions

## A.3.1 IDL definition structure

Clause A.3.2 defines the constants and types used by the FT IRP.

Clause A.3.3 defines the operations which are performed by the FT IRP agent.

Clause A.3.4 defines the notifications which are emitted by the FT IRP agent.

## A.3.2 IDL specification "FileTransferIRPConstDefs.idl"

//File: FileTransferIRPConstDefs.idl

#ifndef \_FILE\_TRANSFER\_IRP\_CONST\_DEFS\_IDL\_

#define \_FILE\_TRANSFER\_IRP\_CONST\_DEFS\_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 Result {OK, FAILURE};

typedef TimeBase::UtcT UTCTime;

enum LocationChoice {DIRECTORY, URL};

//The FileLocation may be a directory path or a URL

union FileLocation switch (LocationChoice)

{

case DIRECTORY: string file\_location\_directory;

/\* e.g. \\202.112.101.1\D:\user\performanceFiles\<fileName> \*/

case URL: string file\_location\_url;

/\* e.g. ftp://nms.telecom\_org.com/datastore/<fileName> \*/

};

typedef unsigned long FileSize; //the unit is byte

typedef string FileCompression;

typedef string FileFormat;

struct FileInfo

{

FileLocation file\_location;

FileSize file\_size;

UTCTime file\_ready\_time;

UTCTime file\_expiration\_time;

FileCompression file\_compression;

FileFormat file\_format;

};

typedef sequence<FileInfo> FileInfoList;

const short PM\_MANAGEMENT\_DATA\_TYPE = 1; //Performance Management

const short CM\_MANAGEMENT\_DATA\_TYPE = 2; //Configuration Management

const short IM\_MANAGEMENT\_DATA\_TYPE = 3; //Inventory Management

const short TM\_MANAGEMENT\_DATA\_TYPE = 4; //Test Management

const short CT\_MANAGEMENT\_DATA\_TYPE = 5; //Subscriber & Equipment Trace

const short NL\_MANAGEMENT\_DATA\_TYPE = 6; //Notification Log

const short CG\_MANAGEMENT\_DATA\_TYPE = 7; //Charging

const short OT\_MANAGEMENT\_DATA\_TYPE = 8; //Other Types

/\*

Define the parameters specified in the notifyFileReady

and notifyFilePreparationError notifications.

\*/

interface AttributeNameValue

{

const string FILE\_INFO\_LIST = "FILE\_INFO\_LIST";

const string ADDITIONAL\_TEXT = "ADDITIONAL\_TEXT";

const string REASON = "REASON";

};

};

#endif // \_FILE\_TRANSFER\_IRP\_CONST\_DEFS\_IDL\_

## A.3.3 IDL specification "FileTransferIRPSystem.idl"

//File: FileTransferIRPSystem.idl

#ifndef \_FILE\_TRANSFER\_IRP\_SYSTEM\_IDL\_

#define \_FILE\_TRANSFER\_IRP\_SYSTEM\_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::Result list\_available\_files(

in short management\_data\_type,

in FileTransferIRPConstDefs::UTCTime begin\_time,

in FileTransferIRPConstDefs::UTCTime end\_time,

out FileTransferIRPConstDefs::FileInfoList file\_info\_list

)

raises (ListAvailableFiles, InvalidTimes,

ManagedGenericIRPSystem::InvalidParameter);

/\*

\* IRPManager invoke this operation to indicate completion of downloading files to IRPAgent

\*/

FileTransferIRPConstDefs::Result file\_download\_indication(

in FileTransferIRPConstDefs::FileInfoList file\_info\_list

)

raises (FileDownloadIndication, InvalidFileInfoList,

ManagedGenericIRPSystem::OperationNotSupported);

/\*\*

\* Return the list of all supported FileTransferIRP versions.

\*/

ManagedGenericIRPConstDefs::VersionNumberSet get\_file\_transfer\_irp\_versions (

)

raises (GetFileTransferIRPVersions);

/\*\*

\* Return the list of all supported operations and their supported

\* parameters for a specific FileTransferIRP version.

\*/

ManagedGenericIRPConstDefs::MethodList get\_file\_transfer\_irp\_operations\_profile (

in ManagedGenericIRPConstDefs::VersionNumber irp\_version

)

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\_file\_transfer\_irp\_notifications\_profile

(

in ManagedGenericIRPConstDefs::VersionNumber irp\_version

)

raises (GetFileTransferIRPNotificationsProfile,

ManagedGenericIRPSystem::OperationNotSupported,

ManagedGenericIRPSystem::InvalidParameter);

};

};

#endif // \_FILE\_TRANSFER\_IRP\_SYSTEM\_IDL\_

## A.3.4 IDL specification "FileTransferIRPNotifications.idl"

//File: FileTransferIRPNotifications.idl

#ifndef \_FILE\_TRANSFER\_IRP\_NOTIFICATIONS\_IDL\_

#define \_FILE\_TRANSFER\_IRP\_NOTIFICATIONS\_IDL\_

#include <FileTransferIRPConstDefs.idl>

#include <NotificationIRPNotifications.idl>

// This statement must appear after all include statements

#pragma prefix "3gppsa5.org"

/\* ## Module: FileTransferIRPNotifications

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::FileInfoList.

\*/

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::FileInfoList.

\*/

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 // \_FILE\_TRANSFER\_IRP\_NOTIFICATIONS\_IDL\_

Annex B (normative):  
XML Definitions

This annex contains the XML Definitions for the File Transfer Integration Reference Point (FT IRP) as it applies to Itf-N, in accordance with FT IRP IS definitions [15] as well as Notification Log IRP XML Definitions [16].

Apart from being used for the Notification Log, the XML definitions for FT IRP notifications are also used by the FT IRP SOAP SS.

# B.1 Architectural Features

The overall architectural feature of FT IRP is specified in 3G TS 32.342 [15]. This clause specifies features that are specific to the XML definitions.

## B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [6].

## B.1.2 Notification Services

This annex defines the XML syntax of FT IRP notifications that is to be used for the FT IRP SOAP Solution Set and in conjunction with Notification Log IRP XML Definitions for Notification Log IRP XML Data File and the NL IRP XML Notification Format [16].

## B.1.3 IOC Definitions

This annex defines the XML syntax for the IOC definitions of the FT IRP IS [15], which are used by the XML definitions for the FT IRP notifications and the FT IRP IS operations.

# B.2 Mapping

Not present in the current version of this specification.

# B.3 Solution Set definitions

## B.3.1 XML definition structure

Clause B.3.2 provides a graphical representation of the XML elements.

Clause B.3.3 provides XML definitions of FT IRP notifications as defined in [15]. These definitions are to be used for the FT IRP SOAP Solution Set and in conjunction with Notification Log IRP XML Definitions for Notification Log IRP XML Data File and the NL IRP XML Notification Format [16], as well as considerations for NL IRP XML File Name Conventions defined therein.

Clause B.3.4 provides XML definitions of FT IOC as defined in [15].

## B.3.2 Graphical Representation

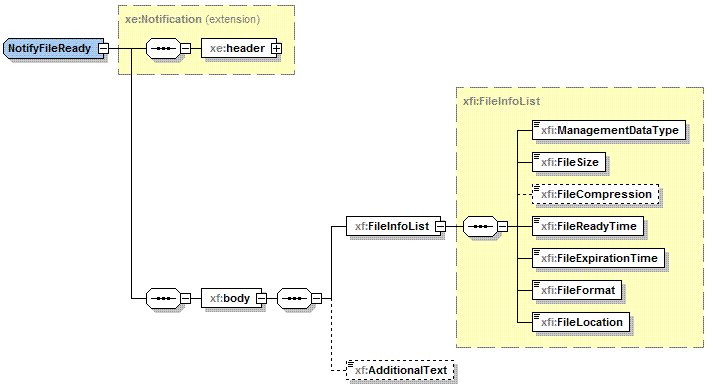


Figure B.3.2.1

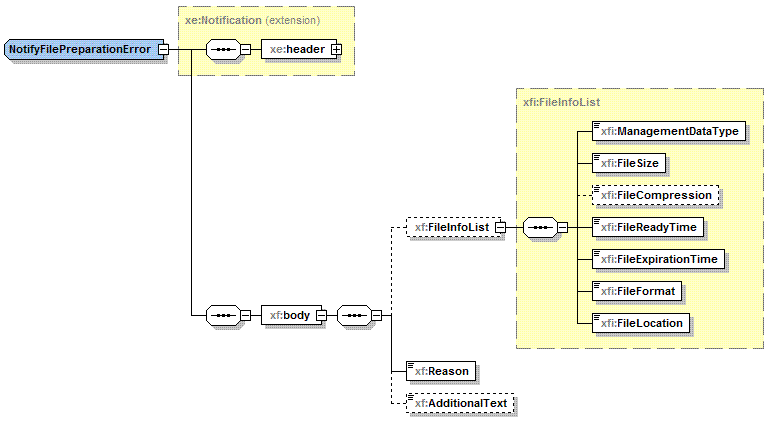


Figure B.3.2.2

NOTE: The use of XML schema key word "sequence" to support IS-defined set (not sequence) is for the purpose of XML processor efficiency. This shall not imply the use of "sequence" in other technology.

## B.3.3 XML Schema “fTIRPNotif.xsd”

<?xml version="1.0" encoding="UTF-8"?>

<!--

3GPP TS 32.346 FTIRP Notification XML Schema

fTIRPNotif.xsd

-->

<schema xmlns:xf="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPNotif" xmlns:xfi="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs" xmlns:xe="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#notification" xmlns="http://www.w3.org/2001/XMLSchema" targetNamespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPNotif" elementFormDefault="qualified" attributeFormDefault="unqualified">

<import namespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#notification"/>

<simpleType name="Reason">

<restriction base="string">

<enumeration value="errorInPreparation"/>

<enumeration value="hardDiskFull"/>

<enumeration value="hardDiskFailure"/>

<enumeration value="tooManyFiles"/>

<enumeration value="collectionTimeOut"/>

<enumeration value="incompleteTruncatedFile"/>

<enumeration value="corruptedFile"/>

<enumeration value="lowMemory"/>

<enumeration value="dataNotAvailable"/>

</restriction>

</simpleType>

<complexType name="NotifyFileReady">

<complexContent>

<extension base="xe:Notification">

<sequence>

<element name="body">

<complexType>

<sequence>

<element name="FileInfoList" type="xfi:FileInfoList" **maxOccurs="unbounded"/>**

<element name="AdditionalText" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="NotifyFilePreparationError">

<complexContent>

<extension base="xe:Notification">

<sequence>

<element name="body">

<complexType>

<sequence>

<element name="FileInfoList" type="xfi:FileInfoList" minOccurs="0"/>

<element name="Reason" type="xf:Reason"/>

<element name="AdditionalText" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<element name="NotifyFileReady" type="xf:NotifyFileReady"/>

<element name="NotifyFilePreparationError" type="xf:NotifyFilePreparationError"/>

</schema>

## B.3.4 XML Schema “fTIRPIOCs.xsd”

<?xml version="1.0" encoding="UTF-8"?>

<!--

3GPP TS 32.346 FTIRP Notification XML Schema

fTIRPIOCs.xsd

-->

<schema xmlns:xfi="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs" xmlns:xe="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#notification" xmlns="http://www.w3.org/2001/XMLSchema" targetNamespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs" elementFormDefault="qualified" attributeFormDefault="unqualified">

<simpleType name="FileFormat">

<restriction base="string">

<enumeration value="ASN1"/>

<enumeration value="XML-schema"/>

</restriction>

</simpleType>

<simpleType name="ManagementDataType">

<restriction base="string">

<enumeration value="CG"/>

<enumeration value="CM"/>

<enumeration value="CT"/>

<enumeration value="IM"/>

<enumeration value="NL"/>

<enumeration value="OT"/>

<enumeration value="PM"/>

<enumeration value="TE"/>

</restriction>

</simpleType>

<complexType name="FileInfoList">

<sequence>

<element name="ManagementDataType" type="xfi:ManagementDataType"/>

<element name="FileSize" type="unsignedLong"/>

<element name="FileCompression" type="string" minOccurs="0"/>

<element name="FileReadyTime" type="dateTime"/>

<element name="FileExpirationTime" type="dateTime"/>

<element name="FileFormat" type="xfi:FileFormat"/>

<element name="FileLocation" type="string"/>

</sequence>

</complexType>

<!-- Attributes of the AvailableFileDescriptor IOC -->

<element name="managementDataType" type="xfi:ManagementDataType"/>

<element name="fileSize" type="unsignedLong"/>

<element name="fileCompression" type="string"/>

<element name="fileReadyTime" type="dateTime"/>

<element name="fileExpirationTime" type="dateTime"/>

<element name="fileFormat" type="xfi:FileFormat"/>

<element name="fileLocation" type="string"/>

</schema>

Annex C (normative):  
SOAP Solution Set

This annex specifies the SOAP Solution Set for the IRP whose semantics are specified in FT IRP: Information Service (3GPP TS 32.342 [15]).

# C.1 Architectural features

The overall architectural feature of the FT IRP is specified in 3GPP TS 32.342 [15]. This clause specifies features that are specific to the SOAP Solution Set.

## C.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [6].

## C.1.2 Notification Services

The FT IRP SOAP SS uses the Notification IRP SOAP SS of 3GPP TS 32.336 [16]. The IRPAgent shall support the push interface model, which means that the IRPAgent sends FT notifications to the IRPManager as soon as new events occur. The IRPManager does not need to check ("pull") for events.

Relevant definitions are imported from the FT IRP XML definitions in Annex B.

## C.1.3 Supported W3C specifications

The SOAP 1.1 specification [11] and WSDL 1.1 specification [13] are supported.

The SOAP 1.2 specification [14] is supported optionally.

This specification uses "document" style in WSDL file.

This specification uses "literal" encoding style in WSDL file.

The filter language used in the SS is the XPath Language (see W3C XPath 1.0 specification [12]). IRPAgents may throw a FilterComplexityLimit fault when a given filter is too complex.

The FT IRP SOAP SS uses the Notification IRP SOAP SS of 3GPP TS 32.336 [5]. The IRPAgent shall support the push interface model, which means that the IRPAgent sends FT notifications to the IRPManager as soon as new events occur. The IRPManager does not need to check ("pull") for events.

## C.1.4 Prefixes and namespaces

This specification uses a number of namespace prefixes throughout that are listed in Table C.1.4.

Table C.1.4: Prefixes and Namespaces used in this specification

|  |  |
| --- | --- |
| **PREFIX** | **NAMESPACE** |
| (no prefix) | http://schemas.xmlsoap.org/wsdl/ |
| soap | http://schemas.xmlsoap.org/wsdl/soap/ |
| fTIRPSystem | http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPSystem |
| fTIRPData | http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPData |
| xfi | http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs |
| genericIRPSystem | http://www.3gpp.org/ftp/specs/archive/32\_series/32.316#GenericIRPSystem |
| ntfIRPNtfSystem | http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#NotificationIRPNtfSystem |

# C.2 Mapping

## C.2.1 Operation and notification mapping

The FT IRP IS (3GPP TS 32.342 [15]) defines the operations and their semantics.

Table C.2.1 maps the operations defined in the FT IRP IS to their equivalent port type and binding operations in this Solution Set (SS).

Table C.2.1 also maps the notifications of the FT IRP IS, as well as inherited operations.

Table C.2.1 also qualifies if an operation is Mandatory (M) or Optional (O).

Table C.2.1: Mapping from IS Operation to SS Equivalents

|  |  |  |  |
| --- | --- | --- | --- |
| IS Operation in 3GPP TS 32.342 [15] | SS: Operation for WSDL port type and WSDL binding | SS: Port of FileTransferIRPService | Qualifier |
| listAvailableFiles | listAvailableFiles (note 1) | FileTransferIRPPort | M |
| fileDownloadIndication | fileDownloadIndication (note 1) | FileTransferIRPPort | O |
| notifyFileReady | notify (note 2) | NotificationIRPNtfPort | M |
| notifyFilePreparationError | notify (note 2) | NotificationIRPNtfPort | M |
| getIRPVersion (note 3) | See TS 32.316 [8] | GenericIRPPort | M |
| getOperationProfile (note 3) | See TS 32.316 [8] | GenericIRPPort | O |
| getNotificationProfile (note 3) | See TS 32.316 [8] | GenericIRPPort | O |
| NOTE 1: The operation is under the port type fTIRPSystem:FileTransferIRPPortType and under the binding fTIRPSystem:FileTransferIRPBinding. | | | |
| NOTE 2: The IS equivalent maps to an XML definition defined in Annex B, and this being an input parameter to the operation notify under the port type ntfIRPNtfSystem:NotificationIRPNtf and under the binding ntfIRPNtfSystem:NotificationIRPNtf of 3GPP TS 32.306 [5]. This binding is linked to a port of the FileTransferIRPService as indicated in the table above. | | | |
| NOTE 3: The IS operation is inherited from the ManagedGenericIRP IOC specified in 3GPP TS 32.312 [7].  This inheritance is by the FileTransferIRP IOC of 3GPP TS 32.342 [15] inheriting from the ManagedGenericIRP IOC. The corresponding binding is linked to a port of the FileTransferIRPService as indicated in the table above. | | | |

## C.2.2 Operation parameter mapping

The FT IRP IS (3GPP TS 32.342 [15]) defines semantics of parameters carried in the operations. The tables below show the mapping of these parameters, as per operation, to their equivalents defined in this SS.

### C.2.2.1 Operation listAvailableFiles

#### C.2.2.1.1 Input parameters

Table C.2.2.1.1: Mapping from IS listAvailableFiles input parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS WSDL type sub-element  used in corresponding input message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| managementDataType | managementDataType | M |
| beginTime | beginTime | M |
| endTime | endTime | M |

#### C.2.2.1.2 Output parameters

Table C.2.2.1.2: Mapping from IS listAvailableFiles output parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS WSDL type sub-element  used in corresponding output message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| fileInfoList | fileInfoList | M |
| status | status | M |

#### C.2.2.1.3 Fault definition

Table C.2.2.1.3: Mapping from IS listAvailableFiles exceptions to SS equivalents

|  |  |  |
| --- | --- | --- |
| Assertion name | SS WSDL type enumeration value  used in corresponding fault message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| invalidTimes | InvalidTimes | M |

### C.2.2.2 Operation fileDownloadIndication

#### C.2.2.2.1 Input parameters

Table C.2.2.2.1: Mapping from IS fileDownloadIndication input parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS WSDL type sub-element  used in corresponding input message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| fileInfoList | fileInfoList | M |

#### C.2.2.2.2 Output parameters

Table C.2.2.2.2: Mapping from IS fileDownloadIndication output parameters to SS equivalents

|  |  |  |
| --- | --- | --- |
| IS Operation parameter | SS WSDL type sub-element  used in corresponding output message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| status | status | M |

#### C.2.2.2.3 Fault definition

Table C.2.2.2.3: Mapping from IS fileDownloadIndication exceptions to SS equivalents

|  |  |  |
| --- | --- | --- |
| Assertion name | SS WSDL type enumeration value  used in corresponding fault message  under corresponding port type operation  as indicated in Table 5.1 | Qualifier |
| InvalidFileInfoList | InvalidFileInfoList | M |

# C.3 Solution Set definitions

## C.3.1 WSDL definition structure

Clause C.3.2 provides a graphical representation of the FT IRP service.

Clause C.3.3 defines the services which are supported the FT IRP agent.

## C.3.2 Graphical Representation

The WSDL structure is depicted in Figure C.3.2 below, depicting port type, binding and service. The port type contains port type operations, which again contains input, output and fault messages. The binding contains binding operations, which have the same name as the port type operations. The binding connects to a port inside the service.

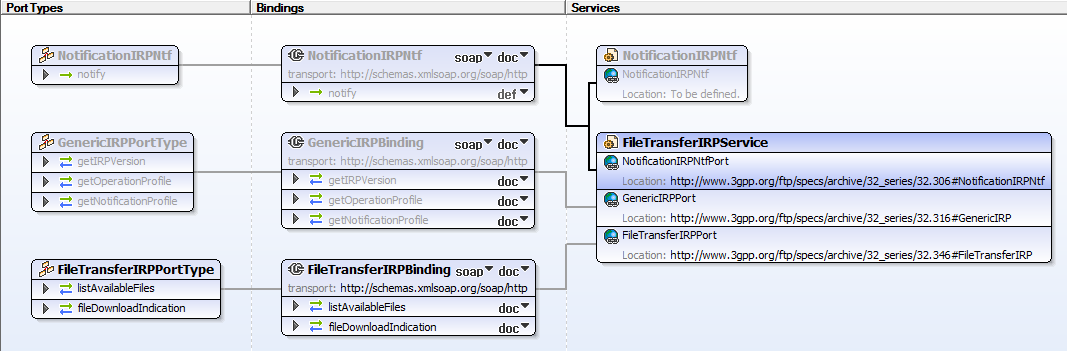


Figure C.3.2: File Transfer IRP SOAP Solution Set WSDL structure

## C.3.3 WSDL specification “FTRPSystem.wsdl”

<?xml version="1.0" encoding="UTF-8"?>

<!--

3GPP TS 32.346 File Transfer (FT) IRP SOAP Solution Set

-->

<definitions xmlns="http://schemas.xmlsoap.org/wsdl/" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:fTIRPSystem="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPSystem" xmlns:fTIRPData="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPData" xmlns:xfi="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs" xmlns:genericIRPSystem="http://www.3gpp.org/ftp/specs/archive/32\_series/32.316#GenericIRPSystem" xmlns:ntfIRPNtfSystem="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#NotificationIRPNtfSystem" targetNamespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPSystem">

<import namespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#NotificationIRPNtfSystem"/>

<import namespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.316#GenericIRPSystem"/>

<types>

<schema targetNamespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FTIRPData" xmlns="http://www.w3.org/2001/XMLSchema">

<import namespace="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fTIRPIOCs"/>

<!-- The following types are defined for the File Transfer IRP operations -->

<simpleType name="OperationStatusTwo">

<restriction base="string">

<enumeration value="OperationSucceeded"/>

<enumeration value="OperationFailed"/>

</restriction>

</simpleType>

<complexType name="FileInfo">

<sequence>

<element ref="xfi:fileLocation"/>

<element ref="xfi:fileSize"/>

<element ref="xfi:fileReadyTime"/>

<element ref="xfi:fileExpirationTime"/>

<element ref="xfi:fileCompression"/>

<element ref="xfi:fileFormat"/>

</sequence>

</complexType>

<complexType name="FileInfoList">

<sequence>

<element name="fileInfo" type="fTIRPData:FileInfo" minOccurs="0" maxOccurs="unbounded"/>

</sequence>

</complexType>

<!-- listAvailableFiles Request-->

<element name="listAvailableFiles">

<complexType>

<sequence>

<element ref="xfi:managementDataType"/>

<element name="beginTime" type="dateTime" minOccurs="0"/>

<element name="endTime" type="dateTime" minOccurs="0"/>

</sequence>

</complexType>

</element>

<!-- listAvailableFiles Response -->

<element name="listAvailableFilesResponse">

<complexType>

<sequence>

<element name="fileInfoList" type="fTIRPData:FileInfoList"/>

<element name="status" type="fTIRPData:OperationStatusTwo"/>

</sequence>

</complexType>

</element>

<!-- listAvailableFiles Fault -->

<element name="listAvailableFilesFault">

<simpleType>

<restriction base="string">

<enumeration value="InvalidTimes"/>

</restriction>

</simpleType>

</element>

<!-- fileDownloadIndication Request-->

<element name="fileDownloadIndication">

<complexType>

<sequence>

<element name="fileInfoList" type="fTIRPData:FileInfoList"/>

</sequence>

</complexType>

</element>

<!-- fileDownloadIndication Response -->

<element name="fileDownloadIndicationResponse">

<complexType>

<sequence>

<element name="status" type="fTIRPData:OperationStatusTwo"/>

</sequence>

</complexType>

</element>

<!-- fileDownloadIndication Fault -->

<element name="fileDownloadIndicationFault">

<simpleType>

<restriction base="string">

<enumeration value="InvalidFileInfoList"/>

</restriction>

</simpleType>

</element>

</schema>

</types>

<message name="listAvailableFiles">

<part name="parameter" element="fTIRPData:listAvailableFiles"/>

</message>

<message name="listAvailableFilesResponse">

<part name="parameter" element="fTIRPData:listAvailableFilesResponse"/>

</message>

<message name="listAvailableFilesFault">

<part name="parameter" element="fTIRPData:listAvailableFilesFault"/>

</message>

<message name="fileDownloadIndication">

<part name="parameter" element="fTIRPData:fileDownloadIndication"/>

</message>

<message name="fileDownloadIndicationResponse">

<part name="parameter" element="fTIRPData:fileDownloadIndicationResponse"/>

</message>

<message name="fileDownloadIndicationFault">

<part name="parameter" element="fTIRPData:fileDownloadIndicationFault"/>

</message>

<portType name="FileTransferIRPPortType">

<operation name="listAvailableFiles">

<input message="fTIRPSystem:listAvailableFiles"/>

<output message="fTIRPSystem:listAvailableFilesResponse"/>

<fault name="listAvailableFilesFault" message="fTIRPSystem:listAvailableFilesFault"/>

</operation>

<operation name="fileDownloadIndication">

<input message="fTIRPSystem:fileDownloadIndication"/>

<output message="fTIRPSystem:fileDownloadIndicationResponse"/>

<fault name="fileDownloadIndicationFault" message="fTIRPSystem:fileDownloadIndicationFault"/>

</operation>

</portType>

<binding name="FileTransferIRPBinding" type="fTIRPSystem:FileTransferIRPPortType">

<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>

<operation name="listAvailableFiles">

<soap:operation soapAction="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#listAvailableFiles" style="document"/>

<input>

<soap:body use="literal"/>

</input>

<output>

<soap:body use="literal"/>

</output>

<fault name="listAvailableFilesFault">

<soap:fault name="listAvailableFilesFault" use="literal"/>

</fault>

</operation>

<operation name="fileDownloadIndication">

<soap:operation soapAction="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#fileDownloadIndication" style="document"/>

<input>

<soap:body use="literal"/>

</input>

<output>

<soap:body use="literal"/>

</output>

<fault name="fileDownloadIndicationFault">

<soap:fault name="fileDownloadIndicationFault" use="literal"/>

</fault>

</operation>

</binding>

<service name="FileTransferIRPService">

<port name="FileTransferIRPPort" binding="fTIRPSystem:FileTransferIRPBinding">

<soap:address location="http://www.3gpp.org/ftp/specs/archive/32\_series/32.346#FileTransferIRP"/>

</port>

<port name="GenericIRPPort" binding="genericIRPSystem:GenericIRPBinding">

<soap:address location="http://www.3gpp.org/ftp/specs/archive/32\_series/32.316#GenericIRP"/>

</port>

<port name="NotificationIRPNtfPort" binding="ntfIRPNtfSystem:NotificationIRPNtf">

<soap:address location="http://www.3gpp.org/ftp/specs/archive/32\_series/32.306#NotificationIRPNtf"/>

</port>

</service>

</definitions>

Annex D (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2010-09 | SA#49 | SP-100516 | -- | -- |  | Presentation to SA for Information and Approval | 1.0.0 |
| 2010-10 | -- | -- | -- | -- |  | Publication | 10.0.0 |
| 2012-09 | SA#57 | - | - | - |  | Automatic upgrade from previous Release version 10.0.0 | 11.0.0 |
| 2014-09 | SA#65 | SP-140559 | 001 | - |  | Update the link from Solution Set to Information Service due to the end of Release 12 | 12.0.0 |
| 2016-01 | - | - | - | - |  | Update to Rel-13 version (MCC) | 13.0.0 |
| 2016-06 | SA#72 | SP-160407 | 0002 | - | F | Update the link from IRP Solution Set to IRP Information | 13.1.0 |
| 2017-03 | SA#75 | - | - | - |  | Promotion to Release 14 without technical change | 14.0.0 |
| 2017-06 | SA#76 | SP-170502 | 0003 | - | F | Update the link from IRP Solution Set to IRP Information Service | 14.1.0 |
| 2018-06 | - | - | - | - | - | Update to Rel-15 version (MCC) | **15.0.0** |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | **16.0.0** |