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Title:	**New Rel-6 TS 32.342 v100 (File Transfer IRP: Information Service) - for Information**
Document for:	**Information**
Agenda Item:	**7.5.3**

3GPP TSG-SA5 (Telecom Management) **S5-037247**
Meeting #36, Shanghai, China, 17-21 September 2003

Presentation of Technical Specification to TSG SA

Presentation to:	**TSG SA Meeting #22**
Document for presentation:	**TS 32.342, Version 1.0.0** **File Transfer IRP: Information Service**
Presented for:	**Information**

Abstract of document:

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

The present document is a member of a TS-family consisting of:

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

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

32.343: "File Transfer (FT) Integration Reference Point (IRP): CORBA Solution Set".

32.344: "File Transfer (FT) Integration Reference Point (IRP): CMIP Solution Set".

This TS-family provides a File Transfer mechanism enabling the network manager to list and exchange files containing management information with a management agent in managed systems for Release 6.

Purpose of This Specification:

This TS defines the Information Service for the File Transfer IRP.

Changes since last presentation to TSG-SA:
New

Outstanding Issues:
None

Contentious Issues:
None

3GPP TS 32.342 V1.0.0 (2003-12)

Technical Specification

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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 the 32.34x-series 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".

32.343: "File Transfer (FT) Integration Reference Point (IRP): CORBA Solution Set".

32.344: "File Transfer (FT) Integration Reference Point (IRP): CMIP Solution Set".

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 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 Information Service for the File Transfer Integration Reference Point (FileTransferIRP) as it applies to the Itf-N.

The present document defines the semantics of operations (and their parameters) visible across the Itf-N in a protocol and technology neutral way. It does not define the syntax or encoding of the operations and their parameters.

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 32.111-2: "Telecommunication management; Fault management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".

[4] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

[5] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP): Information Service (IS)".

[6] 3GPP TS 32.32x-series: "Telecommunication management; Test Management Integration Reference Point (IRP)".

[7] 3GPP TS 32.341 "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Requirements".

[8] 3GPP TS 32.41x-series: "Telecommunication management; Performance Management (PM) Integration Reference Point (IRP)".

[9] 3GPP TS 32.421: "Telecommunication Management; Subscriber and Equipment Trace: Trace Concepts and Requirements".

[10] 3GPP TS 32.61x-series: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP)".

[11] 3GPP TS 32.33x-series: "Telecommunication management; Notification Log Integration Reference Point (IRP)".

[12] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

[13] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[14] Charging.. <to be added>

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions defined in 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.341 [7] apply.

3.2 Abbreviations

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

CM	Configuration Management
EM	Element Manager
IOC	Information Object Class
IRP	Integration Reference Point
NE	Network Element
NM	Network Manager
PM	Performance Management
UML	Unified Modelling Language

4 System Overview

4.1 System context

Figures 4.1 and 4.2 identify system contexts of the IRP defined by the present specification in terms of its implementation called IRPAgent and the user of the IRPAgent, called IRPManager. For a definition of IRPManager and IRPAgent, see 3GPP TS 32.102 [2].

The IRPAgent implements and supports this IRP. The IRPAgent can reside in an Element Manager (EM) (see figure 4.1) or a Network Element (NE) (see figure 4.2). In the former case, the interfaces (represented by a thick dotted line) between the EM and the NEs are not the subject of this IRP.

An IRPAgent supports one of the two System Contexts defined here. By observing the interaction across this Itf-N, an IRPManager cannot deduce if EM and NE are integrated in a single system or if they run in separate systems.

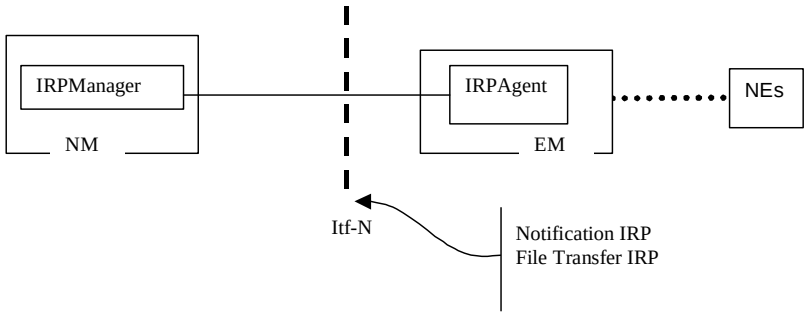

Figure 4.1: System Context A

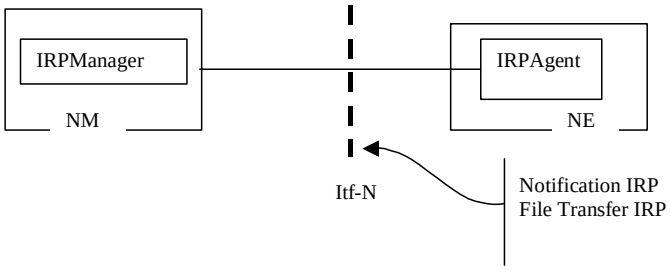

Figure 4.2: System Context B

4.2 Compliance rules

For general definitions of compliance rules related to qualifiers (Mandatory/Optional/Conditional) for *operations, notifications and parameters* (of operations and notifications) please refer to 3GPP TS 32.102 [2].

5 Information Object Classes (IOC)

5.1 Information entities imported and local labels

Label reference	Local label
3GPP TS 32.622 [12], information object class, Top	Top
3GPP TS 32.622 [12], information object class, IRPAgent	IRPAgent
3GPP TS 32.622 [12], information object class, GenericIRP	GenericIRP
3GPP TS 32.312 [5], information object class, ManagedGenericIRP	ManagedGenericIRP
3GPP TS 32.302 [4], information object class, NotificationIRP	NotificationIRP

5.2 Class Diagram

5.2.1 Attributes and relationships

This clause introduces the set of information object classes (IOCs) that encapsulate information within the `IRPAgent`. The intent is to identify the information required for the FileTransferIRP Agent implementation of its operations and notification emission. This clause provides the overview of all support object classes in UML. Subsequent clauses provide more detailed specification of various aspects of these support object classes.

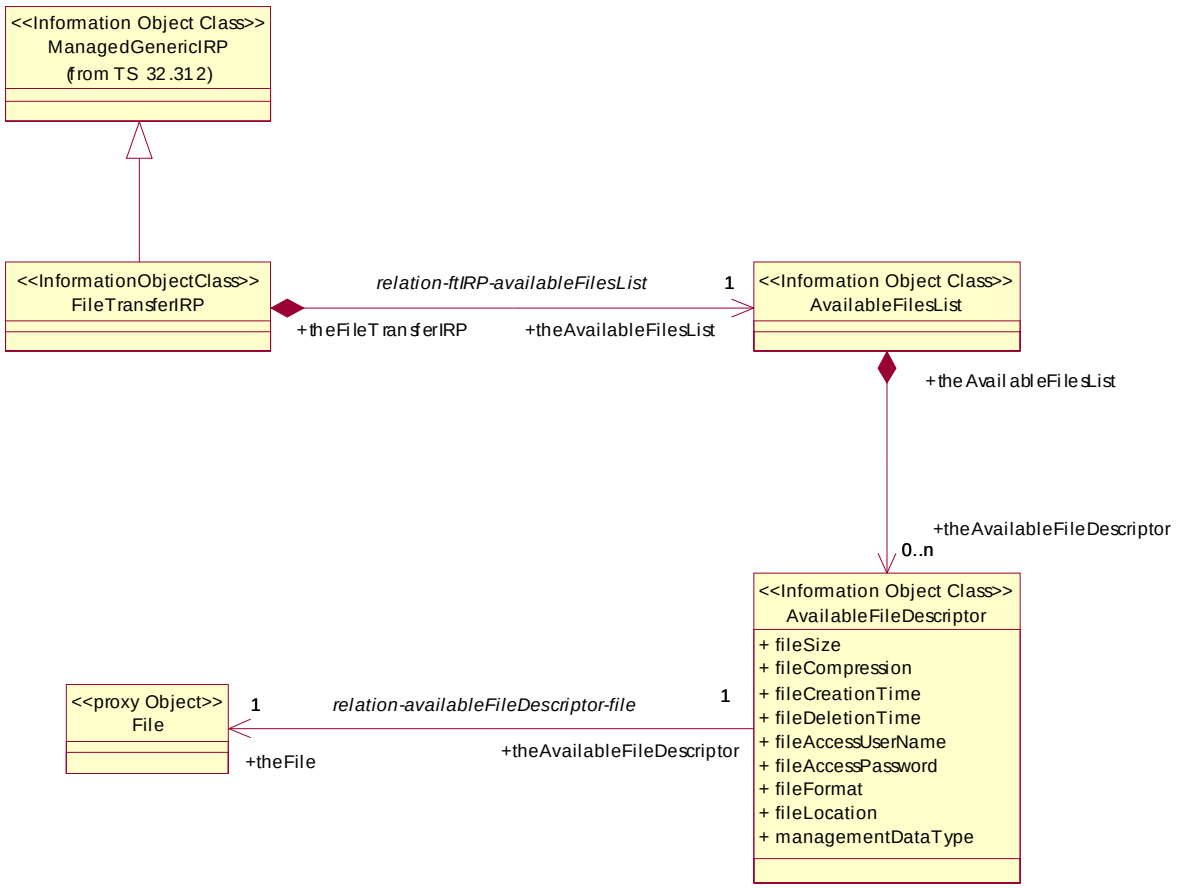

Figure 5.1: Information Object Class (IOC) UML Diagram

5.2.2 Inheritance

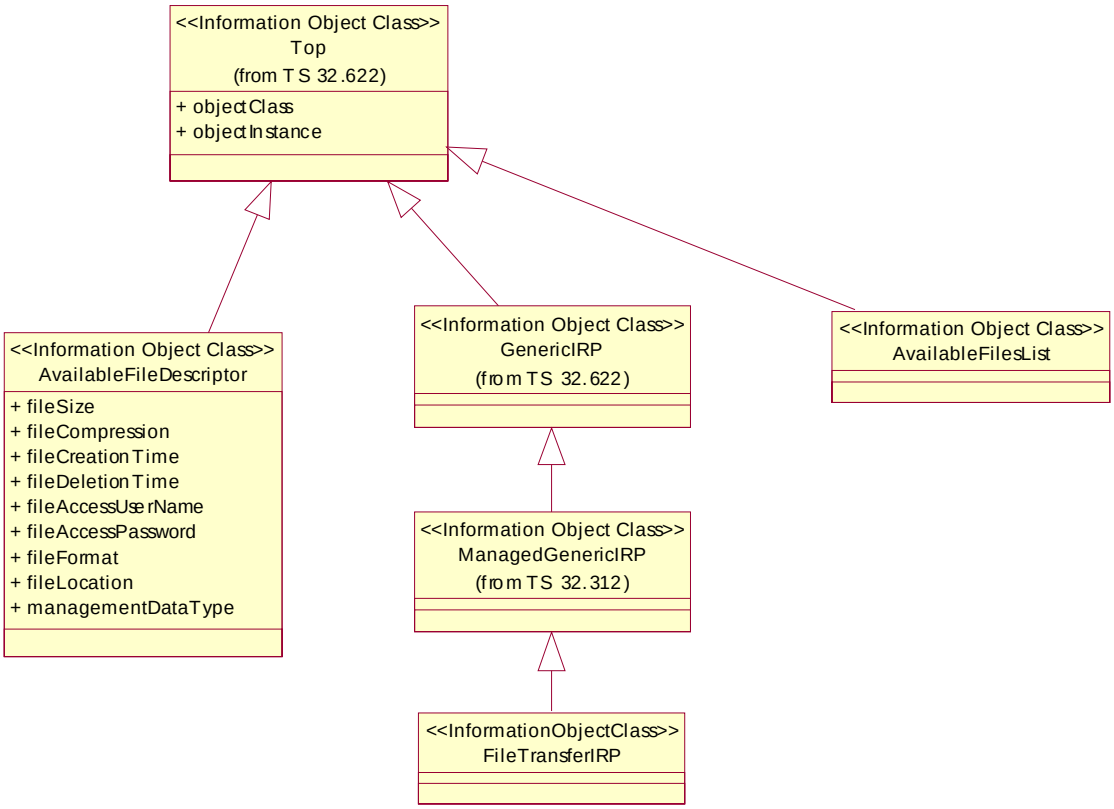

Figure 5.2: Information Object Class (IOC) Inheritance UML Diagram

5.3 Information Object Class Definitions

5.3.1 FileTransferIRP

5.3.1.1 Definition

`FileTransferIRP` is the representation of the file transfer management capabilities specified by the present document. This IOC inherits from `ManagedGenericIRP` IOC specified in 3GPP TS 32.312 [5].

5.3.2 AvailableFileDescriptor

5.3.2.1 Definition

`AvailableFileDescriptor` represents the information about an existing closed file containing management data (performance measurement data, etc.). The file is ready for retrieval by IRPManagers.

5.3.2.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
managementDataType	+	M	M	-
fileSize	+	M	M	-
fileCompression	+	M	M	-
fileCreationTime	+	M	M	-
fileExpirationTime	+	M	M	-
fileFormat	+	M	M	-
fileLocation	+	M	M	-

[Editor's note:

(1) PM specific information here is "JobId". It is proposed to add the jobId in the measurement result file name.

(2) The Visibility of all attributes should "not readable via Itf-N" The visibility column needs to be changed, but awaits conclusion from the URL repertoire discussion how to express this. This applies to the whole clause 5.3.]

5.3.3 AvailableFileList

5.3.3.1 Definition

`AvailableFileList` is the representation of a list of files represented by individual `AvailableFileDescriptor(s).`

5.3.4 File

5.3.4.1 Definition

The Proxy Object File represents the file stored in the managed system.

5.4 Information relationship definitions

5.4.1 Relation-ftIRP-availableFileList (M)

5.4.1.1 Definition

This represents the relationship between `FileTransferIRP` and `AvailableFileList`.

5.4.1.2 Role

Name	Definition
theAvailableFileList	It represents the `AvailableFileList`.
theFileTransferIRP	It represents the `FileTransferIRP`.

5.4.2 Relation-availableFileList-availableFiles (M)

5.4.2.1 Definition

This represents the relationship between `AvailableFileDescriptor` and `AvailableFileList`.

5.4.2.2 Role

Name	Definition
theAvailableFileDescriptor	It represents the `AvailableFileDescriptor`.
theAvailableFileList	It represents the `AvailableFileList`.

5.4.2.3 Constraint

Name	Definition
uniqueFileLocation	The fileLocation, playing the role of the file within the same `FileTransferIRP`, must be unique among all `AvailableFileDescriptors`.

5.4.3 Relation-descriptor-describesFile (M)

5.4.3.1 Definition

This represents the relationship between `AvailableFileDescriptor` and `PhysicalFile`.

5.4.3.2 Role

Name	Definition
theAvailableFileDescriptor	It represents the `AvailableFileDescriptor`.
theAvailableFile	It represents the `PhysicalFile`.

5.5 Information attribute definition

5.5.1 Definition and legal values

Attribute Name	Definition	Legal Values
fileSize	It identifies the size of the file.	Its value is positive Integer (the unit is byte).
fileCompression	It identifies the name of the compression algorithm used for the file.	An empty fileCompression means that there is no compression on the file. Choice of compression algorithm is vendor-specific but is encouraged to use industrial standard algorithm such as GZIP.
fileCreationTime	It identifies the file creation date and time.	All values that indicate valid time.
fileExpirationTime	It identifies the date and time beyond which the file may be deleted.	All values that indicate valid time. It should be later than fileCreationTime. It shall not be empty.
fileFormat	It identifies the encoding technique used by the file.	Its value should indicate the IRPVersion of the file format specification plus to indicate if "ASN1" or "XML-schema" is used.
fileLocation	It identifies the location of the file described by `AvailableFileDescriptor` in the `IRPAgent`. The location may be a directory path or a URL.	• Any valid FTP directory path. • Any valid URL. E.g.: “\\202.112.101.1\D:\user\performanceFiles\<xxx>“ or “ftp://nms.telecom_org.com/datastore/<xxx>” where <xxx> is the filename and the file naming convention is defined in Annex A File Naming

Attribute Name	Definition	Legal Values
		Convention. [Editors'note: 1. sftp to be considered later 2. whether HTTP directory path is valid to be considered later]
managementDataType	It identifies the type of the management data in the file.	String. Its legal values include: PM (Performance Management IRP [8]), BULKCM (BULKCM IRP [10]), TEST(Test Management IRP [6]), CALLTRACE (Subscriber and Equipment Trace [9]), LOG (Notification Log IRP [11]), ALARMHISTORYINFO, CHARGING([14]), etc. [Editor's note: The legal values of managementDataType need to be discussed and finally be aligned with the naming convention section.]

6 Interface Definition

6.1 Class diagram

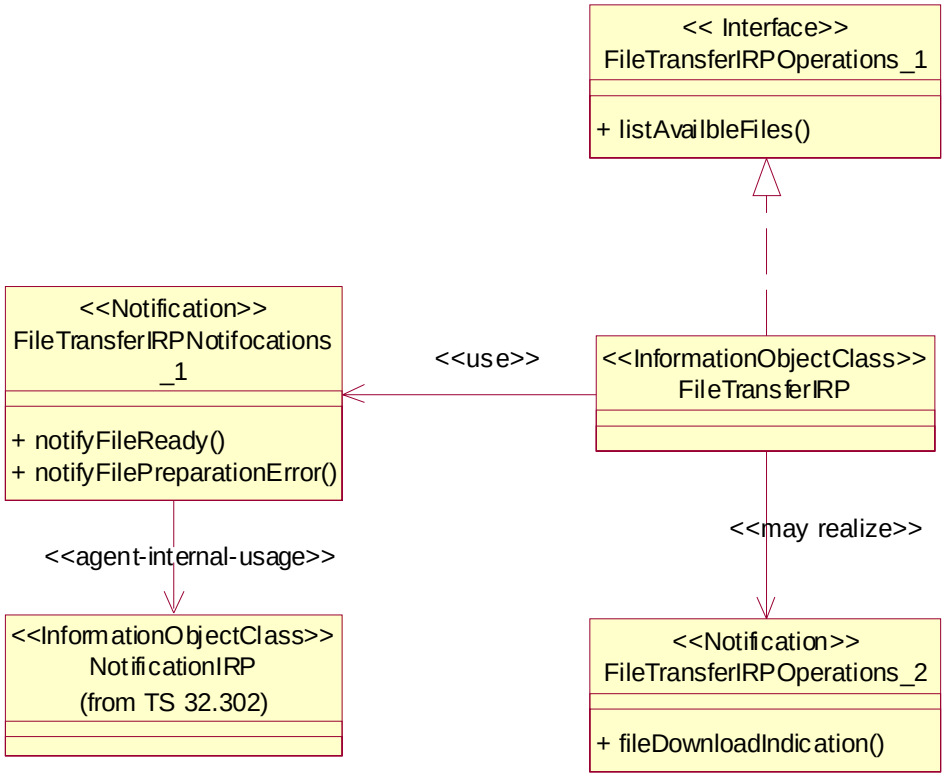

Figure 6.1: Class Diagram

6.2 Generic rules

- **Rule 1:** each operation with at least one input parameter supports a pre-condition valid_input_parameter which indicates that all input parameters shall be valid with regards to their information type. Additionally, each such operation supports an exception operation_failed_invalid_input_parameter which is raised when pre-condition valid_input_parameter is false. The exception has the same entry and exit state.

- **Rule 2:** each operation with at least one optional input parameter supports a set of pre-conditions supported_optional_input_parameter_xxx where "xxx" is the name of the optional input parameter and the pre-condition indicates that the operation supports the named optional input parameter. Additionally, each such operation supports an exception operation_failed_unsupported_optional_input_parameter_xxx which is raised when (a) the pre-condition supported_optional_input_parameter_xxx is false and (b) the named optional input parameter is carrying information. The exception has the same entry and exit state.

- **Rule 3:** each operation shall support a generic exception operation_failed_internal_problem which is raised when an internal problem occurs and that the operation cannot be completed. The exception has the same entry and exit state.

6.3 FileTransferIRPOperations_1 Interface

6.3.1 Operation listAvailableFiles (M)

6.3.1.1 Definition

This operation allows IRPManager to list all or specified available management data files stored in the NE/EM.

A Solution Set may choose to split this operation in several operations (e.g. operations to get "iterator" which fulfill the criteria and other operations to retrieve the detailed information of the files from the "iterator").

6.3.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
managementDataType	M	AvailableFileDescriptor. managementDataType	It specifies the type of the management data stored in the file. The legal values include: PM, BULKCM, TEST, CALLTRACE, LOG, ALARMHISTORYINFO, etc.
beginTime	M	The IRPManager wants a list of the available file(s) whose creation times are later or equal to this time.	This parameter indicates date and time. If this parameter is empty, no beginTime-restriction should be applied on the creationTime.
endTime	M	The IRPManager wants to list information about the available file(s) whose creation times are before or equal to this time.	This parameter indicates date and time. If this parameter is empty, it means that the invocation time of this operation should be used as endTime.

6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
hfileInfoList	M	STRUCT < AvailableFileDescriptor.fileUserName(M), AvailableFileDescriptor.filePassword(M), AvailableFileDescriptor,fileCompression(M), AvailableFileDescriptor.fileFormat(M), RelatedFileList(M) LIST of STRUCT < AvailableFileDescriptor.fileLocation(M), AvailableFileDescriptor.fileSize(M) AvailableFileDescriptor.fileCreationTime(M) AvailableFileDescriptor. fileExpirationTime (M) > >	The output parameter specifies the required file information. [Editor's note: The representation of the file info list is still an open issue.]
status	M	ENUM (Success, Failure)	An operation may fail because of a specified or unspecified reason.

6.3.1.4 Pre-condition

validTimes

Assertion Name	Definition
validTimes	The beginTime is before the invocation time of the operation and the endTime is after beginTime.

6.3.1.5 Post-condition

requiredFileInfoIsReturned

Assertion Name	Definition
requiredFileInfoIsReturned	The required file information is returned.

6.3.1.6 Exceptions

Exception Name	Definition
invalidTimes	**Condition:** (validTimes) not verified. **Returned information:** output parameter status is set to Failure. **Exit state:** Entry State.

6.4 FileTransferIRPOperations_2 Interface

6.4.1 Operation fileDownloadIndication (O)

6.4.1.1 Definition

This operation allows IRPManager to indicate IRPAgent about completion of the file exchange procedure and the necessary descriptive file information and parameters when IRPManager download one or more files to the IRPAgent.

6.4.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
downloadFileInfo	M	LIST of STRUCT < AvailableFileDescriptor.fileCompression, AvailableFileDescriptor.fileFormat, AvailableFileDescriptor.fileSize, AvailableFileDescriptor.fileCreationTime, AvailableFileDescriptor. fileExpirationTime, AvailableFileDescriptor.fileLocation >	It carries the informations of the files downloaded to IRPAgent.

6.4.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (Success, Failure)	An operation may fail because of a specified or unspecified reason.

6.4.1.4 Pre-condition

validDownloadFileInfo

Assertion Name	Definition
validDownloadFileInfo	The downloadedFileInfo is valid.

6.4.1.5 Post-condition

none.

6.4.1.6 Exceptions

Exception Name	Definition
InvalidDownloadFileInfo	**Condition:** (validDownloadFileInfo) not verified. **Returned information:** output parameter status is set to Failure. **Exit state:** Entry State.

6.5 FileTransferIRPNotifications_1 Interface

6.5.1 Notification notifyFileReady (M)

6.5.1.1 Definition

After the management data files have been prepared ready in the IRPAgent, IRPAgent will emit notification to subscribed IRPManager(s) to notify the availability of the file(s).

This notification is to be used/imported by other IRP's as applicable (e.g. PM IRP). FileTransferIRP does not emit this notification.

6.5.1.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
objectClass	M, Y	--	Notification header - see 3GPP TS 32.302 [4]
objectInstance	M, Y	--	Notification header - see 3GPP TS 32.302 [4]. This and object class shall contain the same information as systemDN.
notificationId	M, N		Notification header - see 3GPP TS 32.302 [4]
eventTime	M, Y	--	Notification header - see 3GPP TS 32.302 [4]
notificationType	M, Y	"notifyFileReady ".	Notification header - see 3GPP TS 32.302 [4]
systemDN	C, Y	IRPAgent.systemDN.	Notification header - see 3GPP TS 32.302 [4]
managementDataType	M, N	AvailableFileDescriptor.managementDataType	
fileInfoList	M, N	See clause 6.3.1.3 (output parameters of listAvailableFiles operation).	The parameter specifies the information of the available file. Alternative of fileReference.
fileReference	M, N	See clause 6.3.1.3 (output parameters of listAvailableFiles operation)	The parameter specifies the information of the available file Alternative of fileInfoList.
additionalText	O, N	String	It carries vendor-specific semantics not defined in the present document.

6.5.1.3 Triggering Event

6.5.1.3.1 From-state

Assertion Name	Definition
filesAreReadyAndClosed	IRPAgent has stored the result data into one or more files which corresponds to management operations.

6.5.1.3.2 To-state

Assertion Name	Definition
newNotificationReported	The 'notifyFileReady ' notification is emitted to the subscribed IRPManager(s). Based on the information contained in the notification, the IRPManager can get the file(s) through file transfer mechanism.

6.5.2 Notification notifyFilePreparationError (M)

6.5.2.1 Definition

The subscribed IRPManagers are notified regarding the occurrence of an error during the preparation of the file. This notification is an event and will not be treated as alarms defined in Alarm IRP IS (3GPP TS 32.111-2 [3]).

This notification is to be used/imported by other IRP's as applicable (e.g. PM IRP). FileTransferIRP does not emit this notification.

[Editor's note: This notification should notably indicate whether the preparation error is fatal or not (file preparation aborted or continued). To be further discussed.]

6.5.2.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
objectClass	M, Y	--	Notification header - see 3GPP TS 32.302 [4]
objectInstance	M, Y	--	Notification header - see 3GPP TS 32.302 [4]. This and object class shall contain the same information as systemDN.
notificationId	M, N	--	Notification header - see 3GPP TS 32.302 [4]
eventTime	M, Y	--	Notification header - see 3GPP TS 32.302 [4]
systemDN	C, Y	IRPAgent.systemDN	Notification header - see 3GPP TS 32.302 [4]
notificationType	M, Y	"notifyFilePreparationError"	
managementDataType	M, N	AvailableFileDescriptor.managementDataType	
additionalText	M, N		It carries vendor-specific semantics not defined in the present document.

6.5.2.3 Triggering Event

6.5.2.3.1 From-state

Assertion Name	Definition
errorInPreparation	There is unspecified error when IRPAgent prepares the files.
hardDiskFull	The file system is full and no more files can be opened.
hardDiskFailure	The hard disk has failed and normal input/output cannot be performed.
tooManyFiles	The file system lacks resource to open a new file to capture management data.
collectionTimeOut	The collection time of management data into files takes too long.
incompleteTruncatedFile	The file is truncated for unspecified reason. The suspect flag should be set in the files.
corruptedFile	The file is corrupted for unspecified reason. The suspect flag should be set in the files.
lowMemory	The system lacks sufficient memory to open a new file to capture management data.
dataNotAvailable	Management data is not available when the collected management object(s) is being read.

6.5.2.3.2 To-state

Assertion Name	Definition
fileIsKept	The file, whose preparation provokes an error, is kept (if possible) for a period after which the file may be removed. The period is vendor specific.

Annex A (normative): File Naming Convention

The following convention shall be applied for file naming:

<managementData_type><separator1><generation_date><separator2>< generation_time>[<separator1><jobId>] [<separator3><RC>]

[Editor's note: To be aligned with Siemens's comments about file convention.]

1) The managementData_type field is the type of the management data contained in the file, the value of managementData_type field including "PM", "BULKCM", "TEST", "CALLTRACE", "LOG", "ALARMHISTORYINFO", "CHARGING", etc. [Editor's note: The legal values of managementDataType need to be discussed]

2) The separator1 field is "_".

3) The generation_date field is of the form YYYYMMDD, where:

   - YYYY is the year in four-digit notation;
   - MM is the month in two digit notation (01 - 12);
   - DD is the day in two digit notation (01 - 31).

4) The separator2 field is ".".

5) The generation_time field is of the form HHMMshhmm, where:

   - HH is the two digit hour of the day (local time), based on 24 hour clock (00 - 23);
   - MM is the two digit minute of the hour (local time, 00 - 59);
   - s is the sign of the local time differential from UTC (+ or -), in case the time differential to UTC is 0 then the sign may be arbitrarily set to "+" or "-";
   - hh is the two digit number of hours of the local time differential from UTC (00 - 23);
   - mm is the two digit number of minutes of the local time differential from UTC (00 - 59).

6) The jobId field exists only when the value of managementData_type field is "PM". It carries the jobId of the measurementJob to which the content of the file is related.

7) The RC parameter is a running count, starting with the value of "1", and shall be appended only if the filename is otherwise not unanimous, i.e. more than one file is generated and all other parameters of the file name are identical. Therefore it may only be used by the EM, since the described situation can not occur with NE generated files.

8) The separator3 field is "_-_", which is an underscore character (_), followed by a minus character (-), followed by an underscore character (_).

Some examples describing file naming convention:

1) file name: PM_20030626.2315+0200_job10,
   meaning: performance measurement result file corresponding to job10 produced by on June 26, 2003, the file is generated on 23:15 local, with a time differential of +2 hours against UTC.

2) file name: BULKCM_20021224.1700-1130,
   meaning: BulkCM file produced on December 24, 2002, 17:00 local, with a time differential of -11:30 hours against UTC.

3) file name: LOG_20050907.1030+0000_-_2,
   meaning: Notification log file produced on September 07, 2005, 10:30 local, with a time differential of 0 against UTC. This file is produced by the EM managing the domain, and it is the second file for this notification log result.

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Dec 2003	S_22	SP-030637	--	--	Submitted to TSG SA#22 for Information	1.0.0	