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Title: New Rel-6 TS 32.332-100 "Telecommunication management; Notification log Integration Reference Point (IRP): Information Service (IS)" - **For SA Information**

Document for: **Information**

Agenda Item: **7.5.3**

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3GPP TSG-SA5 (Telecom Management)
Meeting #37, Málaga, España, 23 – 27 February 2004

S5-046183

Presentation of Technical Specification to TSG SA

Presentation to:	**TSG SA Meeting #23**
Document for presentation:	**TS 32.332, Version 1.0.0** **Notification log IRP: Information Service**
Presented for:	**Information**

Abstract of document:
This TS defines the Information Service (operations, notifications, and support objects) for the Notification Log IRP.

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

Purpose of This Specification:

This TS is intended for Release 6 and is part of the Notification log IRP, which consists of:

Numbe	Title
32.331	Telecommunication management; Notification log Integration Reference Point (IRP): Requirements
32.332	**Telecommunication management; Notification log Integration Reference Point (IRP): Information Service (IS)**
32.333	Telecommunication management; Notification log Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.334	Telecommunication management; Notification log Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)

The purpose of this set of specifications is to provide a Notification Log mechanism enabling the network manager to log and retrieve logged notifications in the managed systems for Release 6.

Changes since last presentation to TSG-SA:
New

Outstanding Issues:
None

Contentious Issues:
None

3GPP TS 32.332 V1.0.0 (2004-03)

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 32.33x-series covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication Management; Notification Log Integration Reference Point (IRP), as identified below:

TS 32.331 "Requirements";

TS 32.332 "Information Service (IS)";

TS 32.333 "Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

TS 32.334 "Common Management Information Protocol (CMIP) Solution Set (SS)".

The present document is part of a set of Technical Specifications, which describes the requirements and information model necessary for Telecommunications Management. The TM principles and TM architecture are specified in 3GPP TS 32.101 [1] and 3GPP TS 32.102 [2].

A communications system is composed of a multitude of Network Elements (NE) of various types and, typically, different vendors, which inter-operate in a co-ordinated manner in order to satisfy the network users' communication requirements.

The occurrence of faults in an NE may cause deterioration or loss of this NE's function. Fault Management is the functional area, which allows the operator to detect the occurrence of faults in the network in real-time. Configuration Management and Performance Management are two more functional areas, which require the operator to be alerted to certain conditions in the network.

A standard general-purpose mechanism for the management of logs containing selected notifications from the network is required to provide an ability to perform historical analysis on faults and conditions, which occurred in the network. The documents series 32.33x, constituting the Notification log IRP, sets forth such a mechanism - and the present document contains the IS definition.

1 Scope

The present document specifies the Information Service for the Notification Log Integration Reference Point (NL IRP) as it applies to Itf-N.

This IRP IS 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 32.30x-series: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP)".

[4] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

[5] 3GPP TS 32.111-series: "Telecommunication management; Fault Management; Alarm Integration Reference Point (IRP)".

[6] 3GPP TS 32.31x-series: "Telecommunication management; Generic Integration Reference Point (IRP) management".

[7] 3GPP TS 32.331: "Telecommunication management; Notification log Integration Reference Point (IRP): Requirements".

[8] 3GPP TS 32.34x-series "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP)".

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 32.111 [5] and 3GPP TS 32.331 [7] apply.

3.2 Abbreviations

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

EM	Element Manager
IRP	Integration Reference Point
M	Mandatory
NE	Network Element
NM	Network Manager
O	Optional
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 IRPManager using this IRP shall choose one of the two System Contexts defined here, for each NE. For instance, if an EM is responsible for managing a number of NEs, the NM shall access this IRP through the EM and not directly to those NEs. For another IRP though, the System Context may be different.

By observing the interaction across this IRP, one cannot deduce if EM and NE are integrated in a single system or if they run in separate systems.

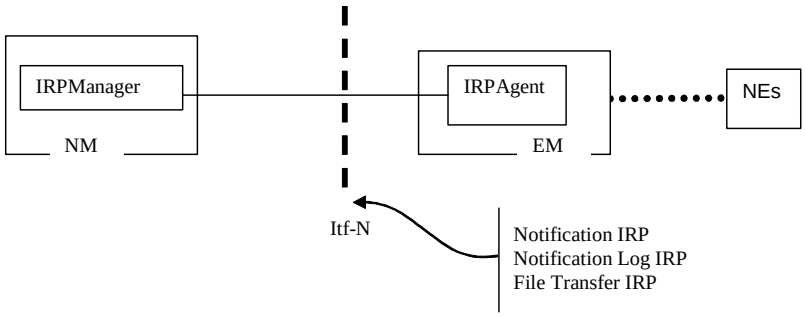

Figure 4.1: System Context A

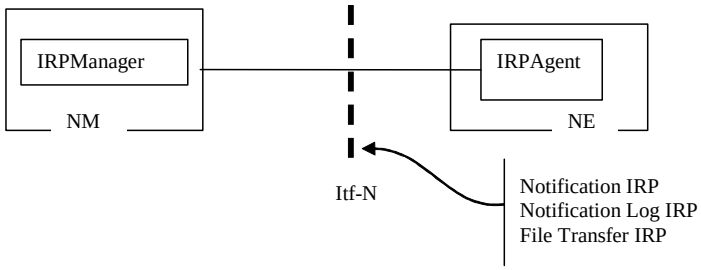

Figure 4.2: System Context B

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

5.1 Information entities imported and local labels

Label reference	Local label
3GPP TS 32.622 [4], information object class, Top	`Top`
3GPP TS 32.312 [6], information object class, ManagedGenericIRP	`ManagedGenericIRP`
3GPP TS 32.342 [8], information object class, FileTransferIRP	`FileTransferIRP`
3GPP TS 32.302 [3], information object class, NotificationIRP	`NotificationIRP`
3GPP TS 32.302 [3], information object class, NotificationIRPNotification	`NotificationIRPNotification`

5.2 Class diagram

5.2.1 Attributes and relationships

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

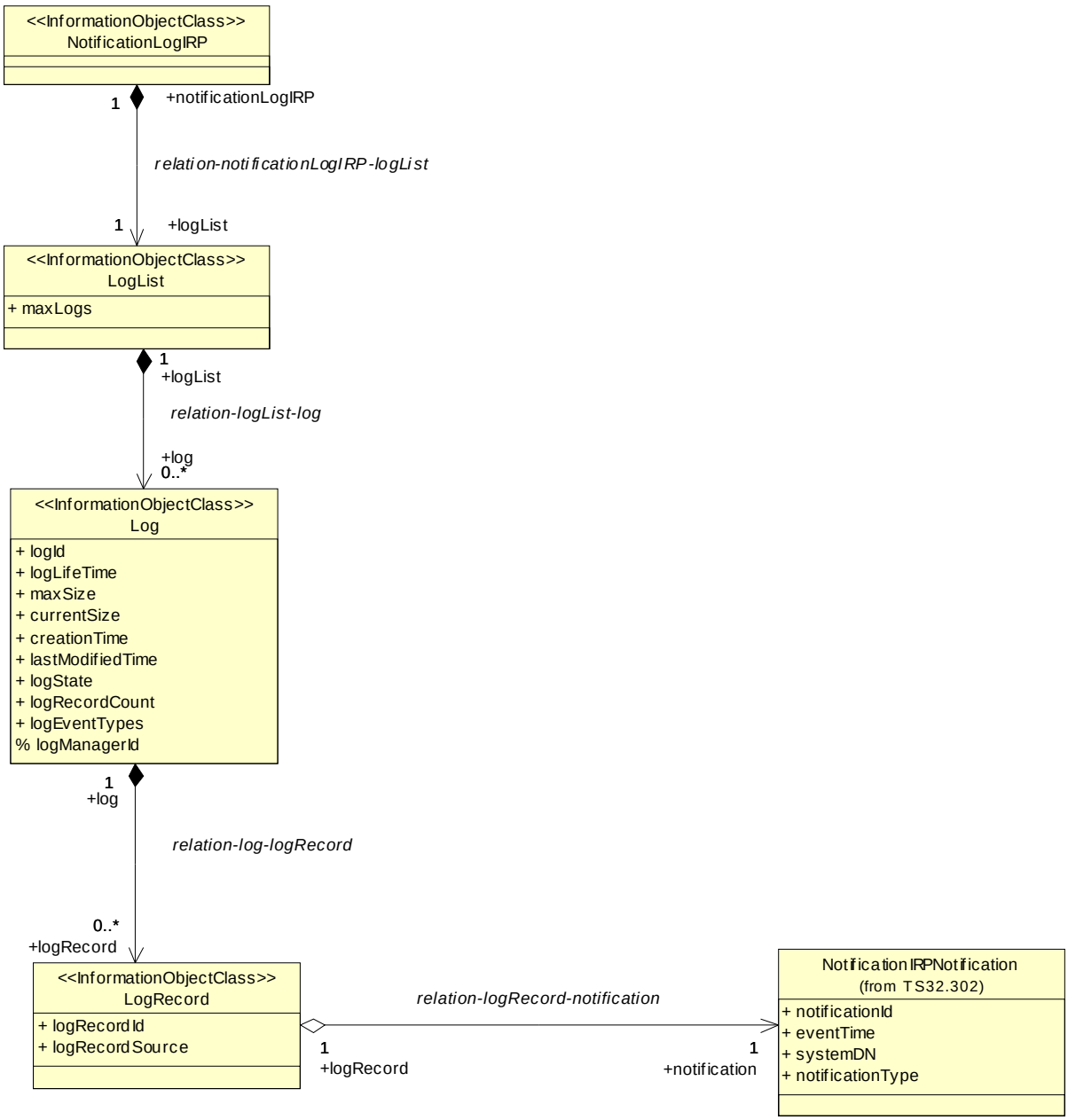

Figure 5.1: Information Object Class UML Diagram

5.2.2 Inheritance

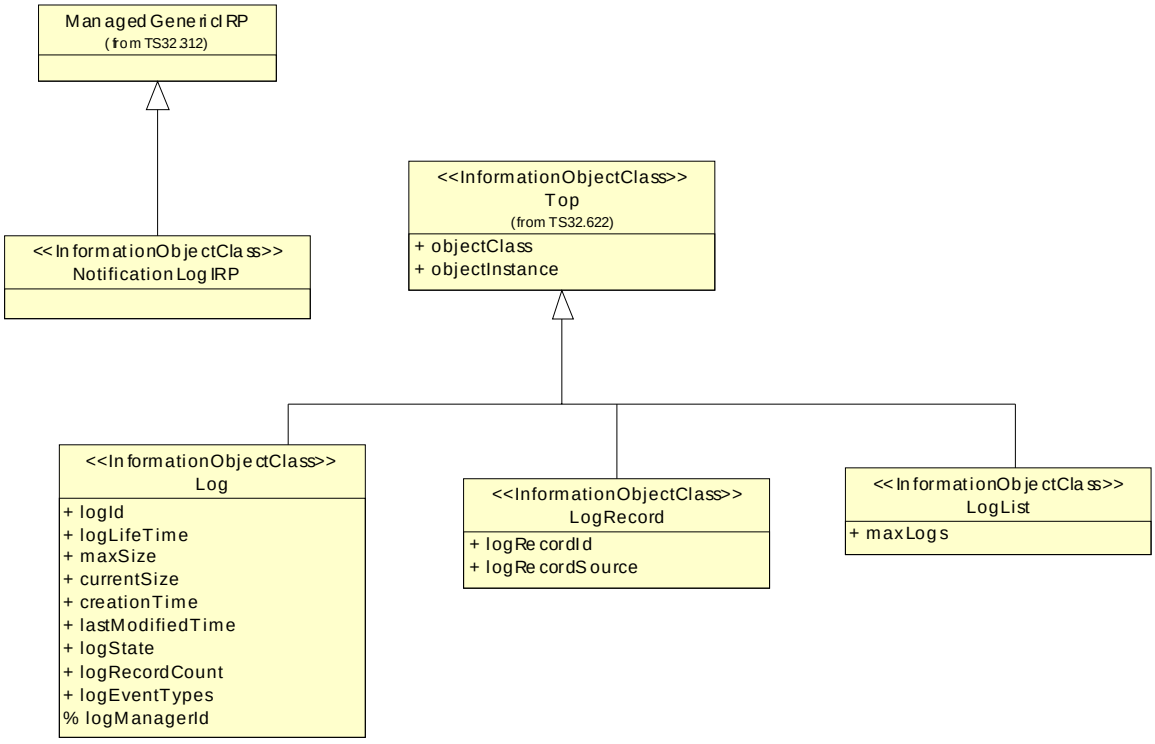

Figure 5.2: Information Object Class Inheritance UML Diagram

5.3 Information Object Class definitions

5.3.1 NotificationLogIRP

5.3.1.1 Definition

`LogIRP` is the representation of the notification log management capabilities specified by the present document. This IOC inherits from `ManagedGenericIRP` IOC specified in 3GPP TS 32.312 [6].

5.3.2 LogList

5.3.2.1 Definition

The LogList IOC represents a list of Notification Logs.

[Editors Note]: Removal of IOC LogList still to be decided (if IOC LogList is being removed than attribute maxLogs to be added to IOC NotificationLogIRP).

5.3.2.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
maxLogs	+	O	M	-

5.3.3 Log

5.3.3.1 Definition

The Log IOC is the representation of a Notification Log.

5.3.3.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
logId	+	M	M	-
logLifeTime	+	M	M	-
logManagerId	%	M	-	-
maxSize	+	O	M	-
currentSize	+	M	M	-
creationTime	+	O	M	-
lastModifiedTime	+	O	M	-
logState	+	M	M	-
logRecordCount	+	O	M	-
logEventTypes	+	O	M	-

5.3.3.3 State diagram

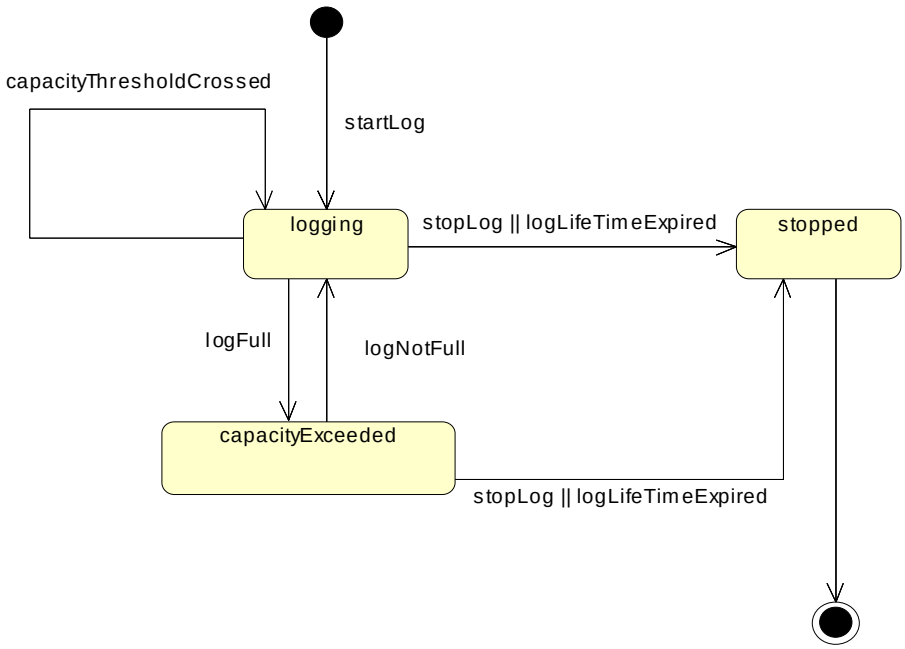

Figure 5.3: State Diagram for Notification Log

The disposition of a log that has been stopped, that is, whether the log remains visible across the Itf-N, is left as vendor specific functionality. The time of the deletion of logs is vendor specific.

5.3.4 LogRecord

5.3.4.1 Definition

The LogRecord IOC is the representation of an individual Notification Log Record.

5.3.4.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
logRecordId	+	M	M	-
logRecordSource	+	M	M	-

5.4 Information relationship definitions

5.4.1 Relation-notificationLogIRP-logList (M)

5.4.1.1 Definition

This represents the relationship between NotificationLogIRP and the LogList.

5.4.1.2 Role

Name	Definition
notificationLogIRP	It represents the NotificationLogIRP.
logList	It represents the LogList.

5.4.1.3 Constraint

Name	Definition
--	--

5.4.2 Relation-logList-log (M)

5.4.2.1 Definition

This represents the relationship between LogList and the Log.

5.4.2.2 Role

Name	Definition
logList	It represents the LogList.
log	It represents the Log.

5.4.2.3 Constraint

Name	Definition
uniqueLogId	The log id must be unique amongst all logs managed by a given NL IRP Agent.
uniqueLogManagerId	The log manager id must be unique amongst all managers utilizing logging services from a given NL IRP Agent.

5.4.3 Relation-log-logRecord (M)

5.4.3.1 Definition

This represents the relationship between Log and the LogRecord.

5.4.3.2 Role

Name	Definition
log	It represents the `Log`.
logRecord	It represents the `LogRecord`.

5.4.3.3 Constraint

Name	Definition
uniqueLogRecordId	The log record id must be unique amongst all logs records within a given log.

5.4.4 Relation-logRecord-notificationIRPNotification (M)

5.4.4.1 Definition

This represents the relationship between `LogRecord` and the notification header represented by `NotificationIRPNotification`.

5.4.4.2 Role

Name	Definition
logRecord	It represents the `LogRecord`.
notification	It represents the `NotificationIRPNotification`.

5.4.4.3 Constraint

Name	Definition
logRecordIdRelatesNotificationId	Within a given log, there is a one-to-one relationship between Notification Id and Log Id (as each notification can only be recorded once).

5.5 Information attribute definition

5.5.1 Definition and legal values

Attribute Name	Definition	Legal Values
creationTime	The time when the log is created.	YYYYMMDDhhmmss
maxLogs	Defines the maximum number of logs that can be supported by a given Notification Log IRP, assigned by the IRP Agent.	Non-zero, positive whole number
maxSize	This attribute defines the maximum number of bytes that may be utilized by a given log, assigned by the IRP Agent.	Either: • Non-zero, positive whole number • Zero indicates no limit on the number of records
currentSize	This attribute provides the number of bytes currently utilized by a given log. When taken in conjunction with maxSize, the amount of space remaining in the log can be determined.	Either: • zero • a positive whole number,
lastModifiedTime	The time when the most recent log record was written.	YYYYMMDDhhmmss
logEventTypes	Specifies the notification types that can be recorded within a given log.	All valid notification types defined by 3GPP SA5.
logId	This attribute contains the id of a log within a given NL IRP Agent, assigned by the IRP Agent.	The value of this attribute must be unique amongst all logs managed by a given NL IRP Agent.
logLifeTime	Defines the life time of a specific log, set during startLog.	If log is created by IRP Manager: one hour ≤ legal value ≤ 31 days; expressed in number of hours; If log is created by IRP Agent: unlimited amount, expressed in number of hours or expressed as “indefinite”.
logManagerId	This attribute contains the id of a manager utilizing logging services from a given NL IRP Agent, assigned by the IRP Agent.	The value of this attribute must be unique amongst all managers utilizing logging services from the given NL IRP Agent.
logRecordCount	The number of log records currently logged within a given log.	positive whole number, including zero
logRecordId	This attribute contains the id of a log record within a given log, assigned by the IRP Agent.	The value of this attribute must be unique amongst all log record contained by a given log.
logRecordSource	Contains the identifier of the Notification IRP that emitted this notification, assigned by the IRP Agent.	Valid DN.
logState	Provides an indication of the current state of a specific log	An ENUM that can have one of the following values: • logging • capacityExceeded • stopped

5.5.2 Constraints

Name	Definition
inv_ lastModifiedTime	Time indicated shall be greater than or equal to creationTime.
inv_ logRecordCount	Number indicated shall be less than or equal to maxSize

6 Interface definition

[Editors Note]: M/O qualifiers within subclause are still tbd.

6.1 Class diagram

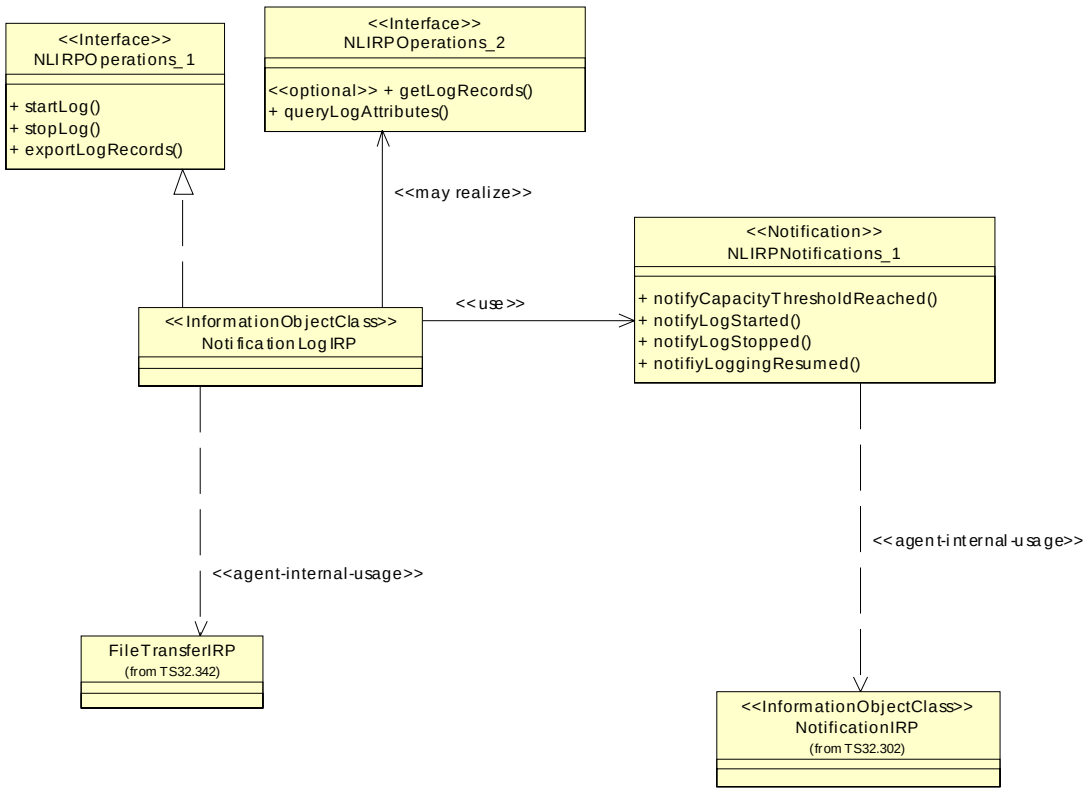

Figure 6.1 Class diagram

[Editors Note]: Wether operation exportLogRecords or getLogRecords/queryLogAttributes should be optional or manadatory is still tbd and depends on careful consideration of alignment with OMG LOG / ITU (implementation simplicity) or performance aspects in an operational environment (considering bulk data transfer to move logs to be more efficient).

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 NLIRPOperations_1 Interface (M)

6.3.1 Operation startLog (M)

6.3.1.1 Definition

Using this operation, an IRP Manager is able to start logging of notifications. Note that the actual life time of the log is determined by either the `logLifeTime` parameter or though the `stopLog` operation.

6.3.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
logLifeTime	M	Log.logLifeTime	See subclause 5.5.1
logEventTypes	O	Log.logEventTypes	See subclause 5.5.1; if logEventTypes is absent than all notifications are logged

6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
logId	M	Log.logId	See subclause 5.5.1
logManagerId	M	Log.logManagerId	See subclause 5.5.1
status	M	ENUM (OperationSucceeded, OperationFailed)	If logLifeTime is valid and eventTypes is valid or absent is, status = OperationSucceeded. If operation_failed is true, status = OperationFailed.

6.3.1.4 Pre-condition

`logsNotMaxed`

Assertion Name	Definition
logsNotMaxed	The number of logs is less than the maximum number of logs allowed.

6.3.1.5 Post-condition

`logStarted`

Assertion Name	Definition
logStarted	A log is started with the specified characteristics (lifetime and event types).

6.3.1.6 Exceptions

Exception Name	Definition
operation_failed	**Condition:** Pre-condition is true AND post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.3.2 Operation stopLog (M)

6.3.2.1 Definition

Using this operation, the IRP Manager that started a specific log is able to stop this log. Note stopping a log implies that the log becomes invisible across Itf-N, independent from the `logLifeTime`; therefore the IRP Manager should retrieve log information of interest before using this `stopLog` operation, e.g. through the `exportLogRecords` operation.

The disposition of a log that has been stopped, that is, whether the log remains visible across the Itf-N, is left as vendor specific functionality. The time of the deletion of logs is vendor specific.

6.3.2.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
logId	M	Log.logId	See subclause 5.5.1
logManagerId	M	Log.logManagerId	See subclause 5.5.1

6.3.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (OperationSucceeded, OperationFailed)	If logId is valid and logManagerId is matching, status = OperationSucceeded. If operation_failed is true, status = OperationFailed.

6.3.2.4 Pre-condition

There are no pre-conditions, other than those established by the generic rules (see subclause 6.2).

6.3.2.5 Post-condition

`logStopped`

Assertion Name	Definition
logStopped	The specified log is stopped.

6.3.2.6 Exceptions

Exception Name	Definition
operation_failed	**Condition:** Pre-condition is true AND post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.3.3 Operation exportLogRecords (M)

6.3.3.1 Definition

Using this operation, an IRP Manager can initiate export of all or part of a log into a file. This file than is being transferred to the IRP Manager using the File Transfer IRP.

6.3.3.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
logId	M	Log.logId	See subclause 5.5.1
logEventTypes	M	Log.logEventTypes	See subclause 5.5.1
logRecordDiscriminator	M	Either logStartTime-logStopTime Or List of logRecordId's	If logRecordDiscriminator is empty then all LogRecords of Log will be exported.

6.3.3.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (OperationSucceeded, OperationPartiallySucceeded, OperationFailed)	If logId is valid and (logRecordId's are valid or startTime/stopTime interval is valid), status = OperationSucceeded. If logId is valid and (some logRecordId's are valid or either startTime or stopTime is valid), status = OperationPartiallySucceeded. If operation_failed is true, status = OperationFailed.

6.3.3.4 Pre-condition

There are no pre-conditions, other than those established by the generic rules (see subclause 6.2).

6.3.3.5 Post-condition

`logRecordsExported`

Assertion Name	Definition
logRecordsExported	The specified log records have been exported as requested.

6.3.3.6 Exceptions

Exception Name	Definition
exportFailed	The NL IRP Agent was unable to export the specified records.
operation_failed	**Condition:** Pre-condition is true AND post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.4 NLIRPOperations_2 Interface (O)

6.4.1 Operation queryLogAttributes (M)

6.4.1.1 Definition

Using this operation, an IRP Manager can query the NL IRP for all available logs or query the attributes of an individual log.

6.4.1.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
logId	M	Log.logId	See subclause 5.5.1; in case the logId is empty, than the NL IRP will return a list of all available logId's

6.4.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
queryLogResult	M	Either List of logId's Or Attribute list of specified Log IOC	See subclause 5.5.1
status	M	ENUM (OperationSucceeded, OperationFailed)	If logId is valid or empty, status = OperationSucceeded. If operation_failed is true, status = OperationFailed.

6.4.1.4 Pre-condition

There are no pre-conditions, other than those established by the generic rules (see subclause 6.2).

6.4.1.5 Post-condition

There are no post-conditions. Querying of log attributes does not result in any changes within the NL IRP Agent.

6.4.1.6 Exceptions

Exception Name	Definition
operation_failed	**Condition:** Pre-condition is true AND post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.4.2 Operation getLogRecords (O)

6.4.2.1 Definition

Using this operation, an IRP Manager can retrieve one or more log records from a certain log. Note that this operations is being provided for retrieval of small amounts of log records only; operation `exportLogRecords` shall be used for retrieval of medium to large amounts of log records, as providing a more efficient bulk transfer mechanisms.

6.4.2.2 Input parameters

Parameter Name	Qualifier	Information type	Comment
logId	M	Log.logId	See subclause 5.5.1
logRecordIdList	M	List of logRecordId's	If logRecordIdList is empty then a list of all LogRecordId's of this Log will be returned.

6.4.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
getLogRecordsResult	M	Either List of logRecordId's Or List of logRecord's	See subclause 5.5.1
status	M	ENUM (OperationSucceeded, OperationPartiallySucceeded, OperationFailed)	If logId is valid and (logRecordIdList is empty or logRecordIdList contains valid Id's), status = OperationSucceeded. If logId is valid and some logRecordId's are valid, status = OperationPartiallySucceeded. If operation_failed is true, status = OperationFailed.

6.4.2.4 Pre-condition

There are no pre-conditions, other than those established by the generic rules (see subclause 6.2).

6.4.2.5 Post-condition

There are no post-conditions. Querying of log attributes does not result in any changes within the NL IRP Agent.

6.4.2.6 Exceptions

Exception Name	Definition
operation_failed	**Condition:** Pre-condition is true AND post-condition is false. **Returned Information:** The output parameter status. **Exit state:** Entry state.

6.5 NLIRPNotifications_1 Interface (M)

6.5.1 Notification notifyLogStarted (M)

6.5.1.1 Definition

Using this notification, an IRP Agent informs all subscribed IRP Managers that a log has been started.

6.5.1.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
logId	M,F	Log.logId	See subclause 5.5.1
logLifeTime	M,F	Log.logLifeTime	See subclause 5.5.1
logEventTypes	O,F	Log.logEventTypes	See subclause 5.5.1; if logEventTypes is absent than all notifications are being logged

6.5.1.3 Triggering Event

6.5.1.3.1 From-state

`startLog`

Assertion Name	Definition
startLog	An IRPManager requests that a new log be started.

6.5.1.3.2 To-state

`logStarted`

Assertion Name	Definition
logStarted	The NL IRP Agent has started the requested log.

6.5.2 Notification notifyLogStopped (M)

6.5.2.1 Definition

Using this notification, an IRP Agent informs all subscribed IRP Manager that a log has stopped.

6.5.2.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
logId	M,F	Log.logId	See subclause 5.5.1

6.5.2.3 Triggering Event

6.5.2.3.1 From-state

`stopLog` OR `logLifeTimeExpired`

Assertion Name	Definition
stopLog	The IRPManager that started the log requests that the log be stopped.
logLifeTimeExpired	The end of the lifetime specified for the log at log startup has been reached.

6.5.2.3.2 To-state

`logStopped`

Assertion Name	Definition
logStopped	The log has been stopped.

6.5.3 Notification notifyCapacityThresholdReached (M)

6.5.3.1 Definition

Using this notification, an IRP Agent informs all subscribed IRP Managers that the capacity threshold of a certain log has been reached. Capacity thresholds are set at 50 % full, 75 % full, 90 % full, 95 % full, and 100 % full - note that the IRP Agent may than delete a portion of the oldest log records within this log (e.g. 10 %) as soon as the 100 % level is reached.

6.5.3.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
logId	M,F	Log.logId	See subclause 5.1.1
thresholdReached	M,F	--	Contains the crossed threshold – valid thresholds: 50 %, 75 %, 90 %, 95 %, and 100 %

6.5.3.3 Triggering Event

6.5.3.3.1 From-state

`logFull` OR `capacityThresholdCrossed`

Assertion Name	Definition
logFull	The log is full, that is, the number of log records contained within the log has exceeded the maximum number of log records that was established at log startup (log capacity has reached 100 %).
capacityThresholdCrossed	The number of log records within the log has crossed one of the threshold boundaries (50 %, 75 %, 90 %, 95 %).

6.5.3.3.2 To-state

Assertion Name	Definition
capacityExceeded	The number of log records within the log has exceeded the maximum number of allowed log records (100 % capacity has been crossed). The logging of new records will cause the oldest records within the log to be deleted and replaced (first in, first out). The deletion of records may occur in a block, such that the log transitions back to the “started” state prior to any new records being written.
logging	The number of log records within the log is below the maximum number of allowed records. The generation of the notification is done to inform the subscribed IRPManagers that the log is filling up.

6.5.3 Notification notifyLoggingResumed (M)

6.5.3.1 Definition

Using this notification, an IRP Agent informs all subscribed IRP Managers that the amount of data within a given log has been reduced, allowing logging to resume (according to the information provided when the log was created).

6.5.3.2 Input Parameters

Parameter Name	Qualifier	Matching Information	Comment
logId	M,F	Log.logId	See subclause 5.1.1

6.5.3.3 Triggering Event

6.5.3.3.1 From-state

logFull

Assertion Name	Definition
logFull	The log is full, that is, the number of log records contained within the log has exceeded the maximum number of log records that was established at log startup (log capacity has reached 100 %).
capacityThresholdCrossed	The number of log records within the log has crossed one of the threshold boundaries (50 %, 75 %, 90 %, 95 %).

6.5.3.3.2 To-state

Assertion Name	Definition
logging	The number of log records within the log is below the maximum number of allowed records. The generation of the notification is done to inform the subscribed IRPManagers that the log is filling up.

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Mar 2004	S_23	SP-040123	--	--	Submitted to TSG SA#23 for information	1.0.0	