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**Source:** SA5 (Telecom Management)  
**Title:** New Rel-6 TS 32.352 v.100 (Communication Surveillance IRP Information Service) - for Information  
**Document for:** Information  
**Agenda Item:** 7.5.3

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

**S5-037282**

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## Presentation of Technical Specification to TSG SA

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**Presentation to:** TSG SA Meeting #22  
**Document for presentation:** TS 32.352, Version 1.0.0  
**Communication Surveillance IRP: Information Service**  
**Presented for:** Information

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**Abstract of document:**

The present document is part of a TS-family covering:

TS 32.351	Telecommunication management; Communication Surveillance (CS) Integration Reference Point (IRP): Requirements
TS 32.352	<b>Telecommunication management; Communication Surveillance (CS) Integration Reference Point (IRP): Information Service (IS)</b>
TS 32.353	Telecommunication management; Communication Surveillance (CS) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) solution set
TS 32.354	Telecommunication management; Communication Surveillance (CS) Integration Reference Point (IRP): Common Management Information Protocol (CMIP) solution set

To ensure the availability and reliability of the management, an automatic surveillance of the communication between NM and the managed system are required. Communication Surveillance is defined as a capability to achieve this goal for Release 6.

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

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**Purpose of This Specification:**

This TS defines the Information Service for the Communication Surveillance IRP.

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**Changes since last presentation to TSG-SA:**

New.

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**Outstanding Issues:**

None.

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**Contentious Issues:**

None.

# 3GPP TS 32.352 V1.0.0 (2003-12)

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*Technical Specification*

**3rd Generation Partnership Project;  
Technical Specification Group Services and System Aspects;  
Telecommunication management;  
Communication Surveillance (CS)  
Integration Reference Point (IRP):  
Information Service (IS)  
(Release 6)**

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The present document has been developed within the 3<sup>rd</sup> Generation Partnership Project (3GPP<sup>TM</sup>) and may be further elaborated for the purposes of 3GPP.

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Keywords

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communication surveillance, information service

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## Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> 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.

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## Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> Generation Partnership Project: Technical Specification Group Services and System Aspects; Telecommunication management, as identified below:

TS 32.351: "Communication Surveillance (CS) Integration Reference Point (IRP): Requirements";

**TS 32.352: "Communication Surveillance (CS) Integration Reference Point (IRP): Information Service (IS)";**

TS 32.353: "Communication Surveillance (CS) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)";

TS 32.354: "Communication Surveillance (CS) Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)".

The present document is part of a set of technical specifications defining the Telecommunication Management (TM) of 3G systems. The TM principles are described in 3GPP TS 32.101 [1]. The TM architecture is described in 3GPP TS 32.102 [2]. The other specifications define the interface (Itf-N) between the managing system (manager), which is in general the Network Manager (NM) and the managed system (agent), which is either an Element Manager (EM) or the managed NE itself. The Itf-N is composed of a number of Integration Reference Points (IRPs) defining the information in the agent that is visible for the manager, the operations that the manager may perform on this information and the notifications that are sent from the agent to the manager. Communication Surveillance IRP (CSIRP) is one of these IRPs with special function.

To ensure the availability and reliability of the management, an automatic surveillance of the communication between NM and the managed system are required. CSIRP is defined as a capability to achieve this goal.

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# 1 Scope

The present document defines the IS part of the CSIRP, which describes the semantics of the information and the interactions visible across Itf-N in a protocol independent way. The information is specified by means of information object classes and the interactions by means of operations and notifications. The present document does not specify the syntax (encoding) of the information.

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# 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 32.301: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Requirements".
- [4] 3GPP TS 32.351: "Telecommunication management; Communication Surveillance (CS) Integration Reference Point (IRP): Requirements".
- [5] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [6] 3GPP TS 32.312: "Telecommunication management; Generic Integration Reference Point (IRP) management: Information Service (IS)".
- [7] 3GPP TS 32.311: "Telecommunication management; Generic Integration Reference Point (IRP) management: Requirements".

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# 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], 3GPP TS 32.351 [4] and the following apply.

**IRPVersion:** See 3GPP TS 32.311 [7].

### 3.2 Abbreviations

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

CMIP	Common Management Information Protocol
CORBA	Common Object Request Broker Architecture
CS	Communication Surveillance
CSIRP	Communication Surveillance Integration Reference Point
DN	Distinguished Name
EM	Element Manager
IRP	Integration Reference Point
IOC	Information Object Class
IS	Information Service
NE	Network Element
NM	Network Manager
NRM	Network Resource Model

## 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.

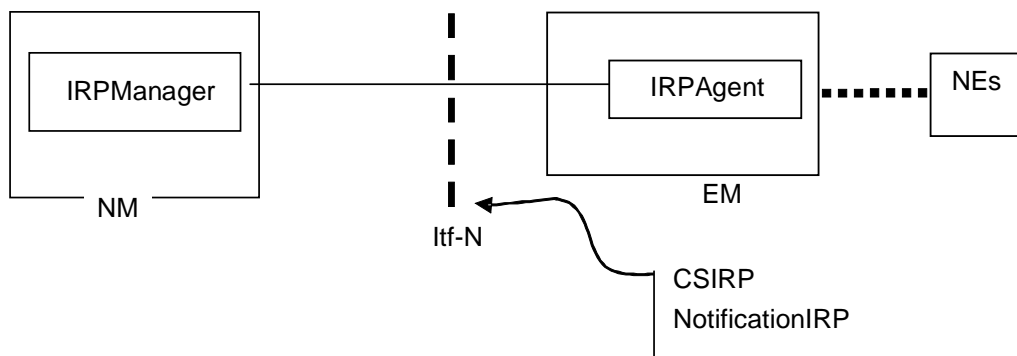


Figure 4.1: System Context A

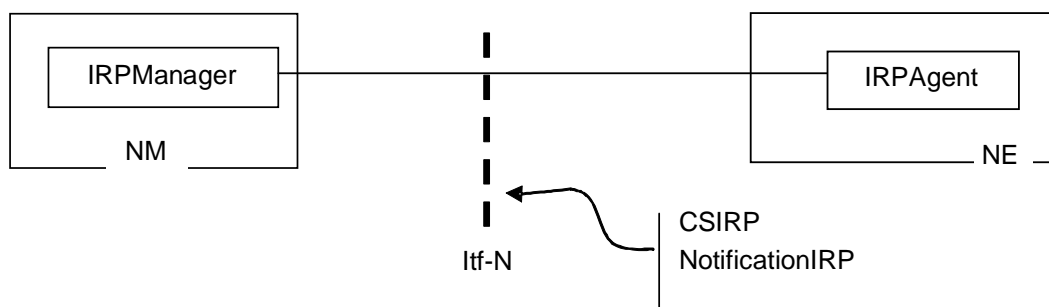


Figure 4.2: System Context B



## 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].

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# 5 Information Object Classes (IOCs)

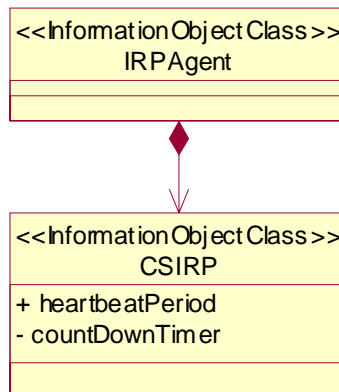
## 5.1 Information entities imported and local labels

Label reference	Local label
3GPP TS 32.622 [5], information object class, Top	Top
3GPP TS 32.622 [5], information object class, IRPAgent	IRPAgent
3GPP TS 32.622 [5], information attribute, systemDN	systemDN
3GPP TS 32.622 [5], information object class, GenericIRP	GenericIRP
3GPP TS 32.312 [6], information object class, ManagedGenericIRP	ManagedGenericIRP

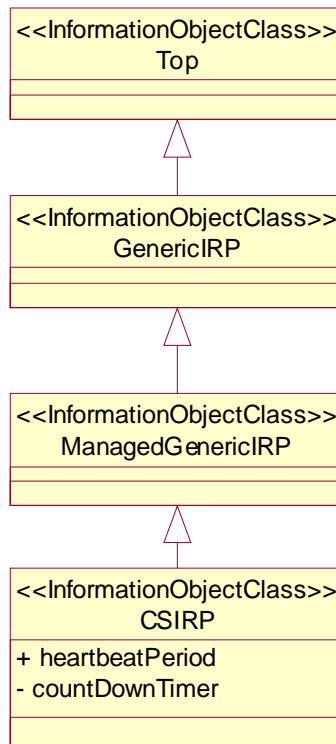
## 5.2 Class diagram

### 5.2.1 Attributes and relationships

This clause introduces the set of Information Object Classes (IOCs) that encapsulate information within the IRPAgent. The intention is to identify the information required for the CSIRP implementation of its operations. 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.



### 5.2.2 Inheritance



## 5.3 Information Object Classes (IOCs) definition

### 5.3.1 CSIRP

#### 5.3.1.1 Definition

This information object represents a capability that can emit heartbeat notification periodically. The emission frequency is controlled by an attribute named heartbeatPeriod. The notifications are submitted to NotificationIRP that will distribute them to NtfSubscriber(s) according to their related NtfSubscription(s). In addition, the CSIRP provide a method for IRPManager to trigger a heartbeat notification at any time. The IOC CSIRP inherits from the IOC ManagedGenericIRP specified in 3GPP TS 32.312 [6].

#### 5.3.1.2 Attributes

Attribute name	Visibility	Support Qualifier	Read Qualifier	Write Qualifier
heartbeatPeriod	+	M	M	M
countDownTimer	-	M	-	-

## 5.4 Information attributes definition

This clause defines the semantics of the Attributes used in Information Object Classes (IOCs).

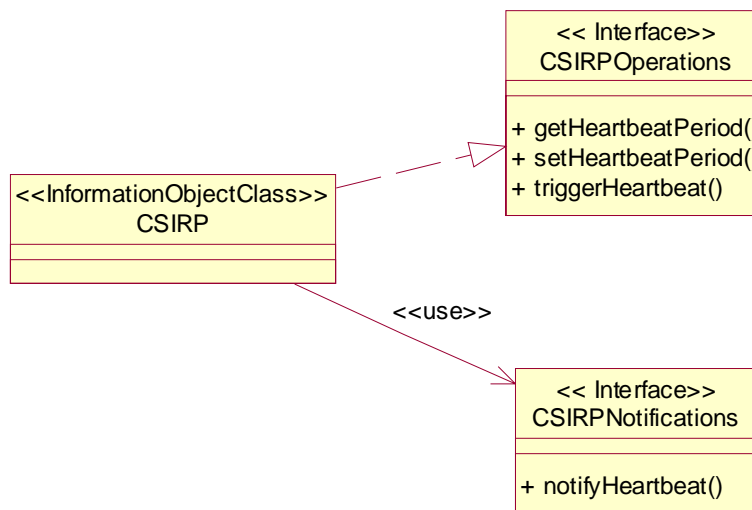
### 5.4.1 Definitions and legal values

Attribute Name	Definition	Legal Values
heartbeatPeriod	It specifies the time between two emissions of heartbeat notifications. A value of zero implies there is no heartbeat emission.	Range: x minutes or higher. The default, including system startup value is Y minutes
countDownTimer	It represents the current value of a count down timer.	

## 6 Interface definition

### 6.1 Class diagram representing interfaces

The following diagram depicts the interfaces of the CSIRP IOC with their corresponding operations.



### 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` that 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 Interface CSIRPOperations (M)

### 6.3.1 Operation getHeartbeatPeriod (M)

#### 6.3.1.1 Definition

IRPManager invokes this operation to obtain the current heartbeat period.

#### 6.3.1.2 Input parameters

There is no input parameter.

#### 6.3.1.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
heartbeatPeriod	M	CSIRP.heartbeatPeriod	
status	M	ENUM (Operation succeeded, Operation fails)	

#### 6.3.1.4 Pre-condition

There is no pre-condition.

#### 6.3.1.5 Post-condition

There is no post-condition.

#### 6.3.1.6 Exceptions

There is no exception.

### 6.3.2 Operation setHeartbeatPeriod (M)

[Editor's note: M/O to be further decided]

[Editor's note: The operation rejection condition to be further decided]

#### 6.3.2.1 Definition

The IRPManager invokes this operation to set the `heartBeatPeriod`. As a consequence and indicative of successful completion of the operation the IRPAgent shall emit the `notifyHeartbeat` specified in clause 6.4.1 immediately to all subscribed IRPManagers. If the operation fails there shall be no change of `heartbeatPeriod`.

If the `heartbeatPeriod` specified is the same as the current value in IRPAgent, it should be rejected.

#### 6.3.2.2 Input parameters

Parameter Name	Qualifier	Information Type	Comment
heartbeatPeriod	M	CSIRP.heartbeatPeriod	
managerIdentifier	M	string	

#### 6.3.2.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (Operation succeeded, Operation failed)	

### 6.3.2.4 Pre-condition

validHeartbeatPeriod AND noconflictingHeartbeatPeriod.

Assertion Name	Definition
validHeartbeatPeriod	The valid heartbeatPeriod as defined in clause 5.4.1 (Definitions and legal values).
noconflictingHeartbeatPeriod	The heartbeatPeriod specified is not same as the current value in IRPAgent.

### 6.3.2.5 Post-condition

heartbeatPeriodChanged AND notifyHeartbeatEmitted.

Assertion Name	Definition
heartbeatPeriodChanged	CSIRP.heartbeatPeriod and CSIRP.countDownTimer are both set to input parameter heartbeatPeriod. CSIRP.countDownTimer begins to start counting down.
notifyHeartbeatEmitted	IRPAgent emits the notifyHeartbeat specified in clause 6.4.1 to all subscribed IRPManagers.

### 6.3.2.6 Exceptions

Name	Definition
InvalidHeartbeatPeriod	<b>Condition:</b> The input parameter of heartbeatPeriod is not within the allowed range. <b>Returned Information:</b> The output parameter status. <b>Exit state:</b> Entry State
ConflictingHeartbeatPeriod	<b>Condition:</b> The input parameter of heartbeatPeriod is same as the current value in IRPAgent. <b>Returned Information:</b> The output parameter status. <b>Exit state:</b> Entry State

## 6.3.3 Operation triggerHeartbeat (M)

### 6.3.3.1 Definition

The IRPManager invokes this operation to solicit a notifyHeartbeat notification. After the successful completion of the operation, the IRPAgent shall emit the notifyHeartbeat notification as specified in clause 6.4.1 immediately. One notification shall be emitted as follows:

- a) one notification to the soliciting IRPManager; or
- b) one notification to each of the subscribed IRPManagers.

If the operation fails the notification shall not be emitted.

One of the two options above shall be chosen depending on system performance considerations. Alternative a) is the preferred option.

Before invoking this operation, the soliciting IRPManager should make sure it has subscribed the notifyHeartbeat notification.

### 6.3.3.2 Input parameters

Parameter Name	Qualifier	Matching Information	Comment
managerIdentifier	M	String	The identifier for the triggering IRPManager.

### 6.3.3.3 Output parameters

Parameter Name	Qualifier	Matching Information	Comment
status	M	ENUM (Operation succeeded, Operation failed)	

#### 6.3.3.4 Pre-condition

There is no pre-condition.

#### 6.3.3.5 Post-condition

There is no post-condition.

#### 6.3.3.6 Exceptions

There is no exception.

### 6.4 Interface CSIRPNotifications (M)

#### 6.4.1 Notification notifyHeartbeat (M)

##### 6.4.1.1 Definition

The subscribed IRPManager instances are notified that the resources supporting the communication path between the Notification IRPAgent and the notification receiving IRPManager are working.

##### 6.4.1.2 Input parameters

Parameter Name	Qualifier	Matching Information	Comment
objectClass	M, Y	CSIRP.objectClass.	Notification header - see 3GPP TS 32.301 [3].
objectInstance	M, Y	CSIRP.objectInstance.	Notification header - see 3GPP TS 32.301 [3]. This and object class shall contain the same information as systemDN.
eventTime	M, Y	--	Notification header - see 3GPP TS 32.301 [3].
notificationId	O, N	This carries the semantics of notification identifier.	Notification header - see 3GPP TS 32.301 [3].
systemDN	C, Y	IRPAgent.systemDN	Notification header - see 3GPP TS 32.301 [3].
notificationType	M, Y	"notifyHeartbeat"	Notification header - see 3GPP TS 32.301 [3].
heartbeatPeriod	M, N	CSIRP.heartbeatPeriod	
ntfIRPDn	M, N	DN of NotificationIRP	
triggerFlag	M, N	ENUM {IRPManager, IRPAgent}	If this notification is triggered by NM positively by invoking "triggerHeartbeat" operation, the value of this parameter shall be "IRPManager", otherwise, it shall be "IRPAgent".
managerIdentifier	M, N	String	If the value of triggerFlag is "IRPManager", this field is the same as the value of input parameter "managerIdentifier" of "triggerHeartbeat" operation; If the value of triggerFlag is "IRPAgent", this field is null.

NOTE: F in the Qualifier column denotes a Filterable Parameter.

##### 6.4.1.3 Triggering Event

###### 6.4.1.3.1 From-state

heartbeatPeriodCountDownZero OR heartbeatPeriodReset OR heartbeatTriggeredByNM.

Assertion Name	Definition
countDownTimerZero	CSIRP.countDownTimer becomes zero.
heartbeatPeriodReset	CSIRP.heartbeatPeriod is set, to a new or same value, by setHeartbeatPeriod operation.
heartbeatTriggeredByNM	NM invoke "triggerHeartbeat" operation to trigger "notifyHeartbeat" notification positively.

6.4.1.3.2 To-state

countDownTimerReset.

Assertion Name	Definition
countDownTimerReset	CSIRP.countDownTimer is set to CSIRP.heartbeatPeriod.

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## Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Dec 2003	S_22	SP-030633	--	--	Submitted to TSG SA#22 for Information	1.0.0	