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**Digital cellular telecommunications system (Phase 2+);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
Telecommunication management;  
Evolved Packet Core (EPC) and non-3GPP access interworking  
system Network Resource Model (NRM)  
Integration Reference Point (IRP);  
Information Service (IS)  
(3GPP TS 28.612 version 12.1.0 Release 12)**



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# Foreword

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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

## Ready for Converged Management

NOTE: This specification is part of a set that has been developed for converged management solutions.

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 28.611: "Evolved Packet Core (EPC) and non-3GPP access interworking system Network Resource Model (NRM) Integration Reference Point (IRP); Requirements";
- TS 28.612: "Evolved Packet Core (EPC) and non-3GPP access interworking system Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)" ;**
- TS 28.616: " Evolved Packet Core (EPC) and non-3GPP access interworking system Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions".

The interface Itf-N, defined in 3GPP TS 32.102 [3], is built up by a number of Integration Reference Points (IRPs) and a related Name Convention, which realize the functional capabilities over this interface. The basic structure of the IRPs is defined in 3GPP TS 32.101 [2], 3GPP TS 32.102 [3] and 3GPP TS 32.103 [13].

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# 1 Scope

The present document is an Integration Reference Point (IRP) named "Evolved Packet Core (EPC) and non-3GPP access interworking system Network resource Model (NRM) IRP; Information Service (IS)", through which an 'IRPagent' (typically an Element Manager or Network Element) can communicate configuration management information to one or several 'IRPManagers' (typically Network Managers) concerning interworking network resources.

The present document specifies the semantics and behaviour of Information Object Class (IOC) attributes and relations visible across the reference point in a protocol and technology neutral way. It does not define their syntax and encoding.

It reuses relevant parts of the generic NRM in 3GPP TS 28.622 [6], either by direct reuse or sub-classing, and in addition to that defines specific IOCs in EPC and non-3GPP access interworking systems.

In order to access the information defined by this NRM, an interface IRP is needed, such as the Basic CM IRP IS (3GPP TS 32.602 [7]) or the Bulk CM IRP IS (3GPP TS 32.612 [8]). However, which interface IRP is applicable is outside the scope of the present document.

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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 25.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".
- [3] 3GPP TS 32.102: "Telecommunication management; Architecture".
- [4] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".
- [5] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".
- [6] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [7] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic Configuration Management Integration Reference Point (IRP); Information Service (IS)".
- [8] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Information Service (IS)".
- [9] Void.
- [10] 3GPP TS 28.708: "Telecommunication management; Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [11] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP); Information Service (IS)".

- [12] 3GPP TS 28.705: "Telecommunication management; IP Multimedia Subsystem (IMS) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [13] 3GPP TS 32.103: "Telecommunication management; Integration Reference Point (IRP) overview and usage guide".
- [14] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".
- [15] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS)".
- [16] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP); Information Service (IS)".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1], TS 32.101 [2], TS 32.102 [3], TS 32.150 [14], TS 28.622 [6], TS 32.600 [4] and the following apply.

A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply.

An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

DN	Distinguished Name
IOC	Information Object Class

## 4 Model

### 4.1 Imported information entities and local labels

Label reference	Local label
3GPP TS 28.622 [6], IOC, Link	Link
3GPP TS 28.708 [10], IOC, PGWFunction	PGWFunction
3GPP TS 28.705 [12], IOC, HSSFunction	HSSFunction

### 4.2 Class diagram

#### 4.2.1 Relationships

This clause depicts the set of classes (e.g. IOCs) encapsulating the information relevant for this IRP. This clause provides an overview of the relationships between relevant classes in UML. Subsequent clauses provide more detailed specification of various aspects of these classes.

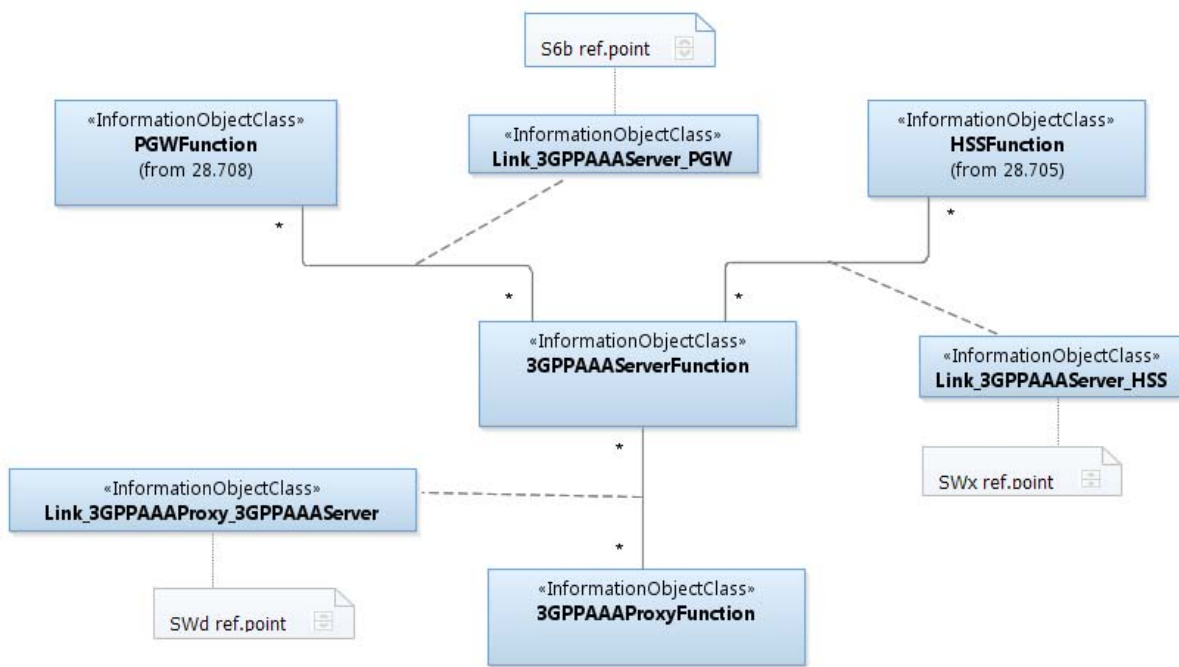


Figure 4.2.1.1 IOC containment and association diagram



## 4.2.2 Inheritance

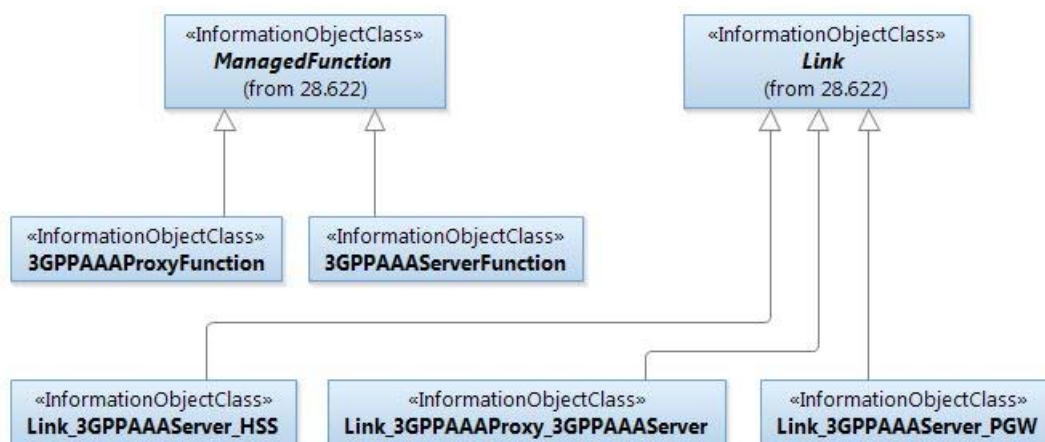


Figure 4.2.2.1: IOC inheritance diagram

## 4.3 Class definitions

### 4.3.1 Link\_3GPPAAAServer\_PGW

#### 4.3.1.1 Definition

This IOC represents the S6b reference point as defined in 3GPP TS 23.402 [5].

#### 4.3.1.2 Attributes

None.

#### 4.3.1.3 Attribute constraints

None.

#### 4.3.1.4 Notifications

The common notifications defined in clause 4.5 are valid without exceptions or additions for this IOC.

### 4.3.2 Link\_3GPPAAAServer\_HSS

#### 4.3.2.1 Definition

This IOC represents the SWx reference point as defined in 3GPP 23.402 [5].

#### 4.3.2.2 Attributes

None.

#### 4.3.2.3 Attribute constraints

None.

#### 4.3.2.4 Notifications

The common notifications defined in clause 4.5 are valid without exceptions or additions for this IOC.

### 4.3.3 Link\_3GPPAAAProxy\_3GPPAAAServer

#### 4.3.3.1 Definition

This IOC represents the SWd reference point as defined in 3GPP 23.402 [5].

#### 4.3.3.2 Attributes

None.

#### 4.3.3.3 Attribute constraints

None.

#### 4.3.3.4 Notifications

The common notifications defined in subclause 4.5 are valid without exceptions or additions for this IOC.

### 4.3.4 3GPPAAAProxyFunction

#### 4.3.4.1 Definition

This IOC represents the 3GPP Access, Authentication and Authorisation (AAA) Proxy functionality. For more information about the 3GPP AAA Proxy, see 3GPP TS 23.402 [5].

#### 4.3.4.2 Attributes

None.

#### 4.3.4.3 Attribute constraints

None.

#### 4.3.4.4 Notifications

The common notifications defined in clause 4.5 are valid without exceptions or additions for this IOC.

### 4.3.5 3GPPAAAServerFunction

#### 4.3.5.1 Definition

This IOC represents the 3GPP Access, Authentication and Authorisation (AAA) Server functionality. For more information about the 3GPP AAA server, see 3GPP TS 23.402 [5].

#### 4.3.5.2 Attributes

None.

### 4.3.5.3 Attribute constraints

None.

### 4.3.5.4 Notifications

The common notifications defined in subclause 4.5 are valid without exceptions or additions for this IOC.

## 4.4 Attribute definitions

### 4.4.1 Attribute properties

None.

### 4.4.2 Constraints

None.

## 4.5 Common notifications

### 4.5.1 Alarm notifications

This clause presents a list of notifications, defined in 3GPP TS 32.111-2 [11], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in 3GPP TS 32.302 [16], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
<code>notifyAckStateChanged</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyChangedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyClearedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyNewAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyComments</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyAlarmListRebuilt</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyPotentialFaultyAlarmList</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	

### 4.5.2 Configuration notifications

This clause presents a list of notifications, defined in 3GPP TS 32.662 [15], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in 3GPP TS 32.302 [16], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
<code>notifyAttributeValueChange</code>	O	
<code>notifyObjectCreation</code>	O	
<code>notifyObjectDeletion</code>	O	

## Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Feb 2012			--	--	Initial draft	--	0.0.1
Dec 2012					Add IOCs definition	0.0.1	0.1.1
May 2013					Revise the skeleton align with TS 28.622 according to the agreed S5-131062	0.1.1	0.1.2
Jun 2013					Add common notifications according to agreed pCR S5-131065	0.1.2	0.2.0
Aug 2013					Revise the NRM diagram to align with 28- series	0.2.0	0.3.0
Sep 2013	SA#61	SP-130449			Presented for information	0.3.0	1.0.0
Sep 2013	-	-			MCC clean-up	1.0.0	1.0.1
Nov 2013					Align with IS template	1.0.1	1.0.2
Dec 2013	SA#62	SP-130634			Presented for approval	1.0.2	2.0.0
Dec 2013					Version after approval	2.0.0	12.0.0
Sep 2014	SA#65	SP-140614	001	1	Move IOCs from discontinued TS 28.602 - align with TSG SA decision to remove I-WLAN	12.0.0	12.1.0

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## History

<b>Document history</b>		
V12.1.0	October 2014	Publication