



**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Integration Reference Point (IRP)
Information Service (IS) template
(3GPP TS 32.157 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.

1 Scope

The present document contains the template to be used for the production of all Integration Reference Point (IRP) Information Service (IS) specifications for Converged Management.

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 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".
- [4] 3GPP TS 32.156: "Telecommunication management; Fixed Mobile Convergence (FMC) Model Repertoire
- [5] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

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 [3] and the following apply:

IRPAgent: See 3GPP TS 32.150 [3].

IRPManager: See 3GPP TS 32.150 [3].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 32.150 [3] and the following apply:

| | |
|-----|----------------------------------|
| IOC | Information Object Class |
| IRP | Integration Reference Point |
| IS | Information Service |
| OMG | Object Management Group |
| UML | Unified Modelling Language (OMG) |

4 Information Service (IS) template

4.1 General

The present document contains the templates to be used for the production of all Integration Reference Point (IRP) Information Service (IS) specifications for Converged Management.

Clause 4.2 is applicable for NRM IRP IS specifications.

Clause 4.3 is applicable for Interface IRP IS specifications.

For the introductory clauses 2 and 3 of all IRP ISs, the text shall be written conforming to the standard 3GPP TS template (i.e. not this template).

The IS template uses qualifiers M, O, CM, CO and C. The semantics of these qualifiers are defined in [4].

The IS template uses type definition as one characteristic to describe class attributes and operation/notification parameters. The valid type definitions that can be used and their semantics are defined in [4].

Usage of fonts shall be according to the following table.

| Item | Font |
|-------------------------------------------------------------|-------------|
| Class names | Courier New |
| Attribute names | Courier New |
| Operation names | Courier New |
| Parameter names | Courier New |
| Assertion names | Courier New |
| Notification names | Courier New |
| Exception names | Courier New |
| State names | Arial |
| Matching Information | Courier New |
| Information Type | Courier New |
| Legal Values | Courier New |
| NOTE: These font requirements do not apply to UML diagrams. | |

4.2 Template for NRM IRP IS

W1 Scope

The following quoted text is relevant for all NRM IRP ISs. It shall be copied as the first two paragraphs of the NRM IRP IS specification. IRP IS author may add additional paragraph(s) if necessary.

"

The present document specifies the <<n>> (where <<n>> shall be substituted by the name of the NRM IRP IS concerned such as 'HNS', 'E_UTRAN', 'GERAN') network resource information that can be communicated between an IRP Agent and an IRP Manager for telecommunication network management purposes, including management of converged networks.

This document specifies the semantics and behaviour of information object class attributes and relations visible across the reference point in a protocol and technology neutral way. It does not define their syntax and encoding.

"

W2 References

TBD

W3 Definitions and abbreviations

TBD

W4 Model

W4.1 Imported information entities and local labels

This clause identifies a list of information entities (e.g. information object class, interface, attribute) that have been defined in other specifications and that are imported in the present (target) specification. All imported entities shall be treated as if they are defined locally in the target specification. One usage of import is for inheritance purpose.

Each element of this list is a pair (label reference, local label). The label reference contains the name of the specification where the information entity is defined, the information entity type and its name. The local label contains the name of the information entity that appears in the target specification. The local label can then be used throughout the target specification instead of that which appears in the label reference.

This information is provided in a table. An example of such a table is given here below:

| Label reference | Local label |
|----------------------------------------------------|-------------|
| 3GPP TS 32.622 [71], information object class, Top | Top |

W4.2 Class diagram

W4.2.1 Relationships

This first set of diagrams represents all classes defined in this IS with all their relationships and all their attributes, including relationships with imported information entities (if any). These diagrams shall contain class cardinalities (for

associations as well as containment relationships) and may also contain role names. These shall be UML compliant class diagrams (see also [4]).

Characteristics (attributes, relationships) of imported information entities need not to be repeated in the diagrams. Allowable classes are specified in [4].

Use this as the first paragraph: "This clause depicts the set of classes (e.g. IOCs) that encapsulates 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."

W4.2.2 Inheritance

This second set of diagrams represents the inheritance hierarchy of all classes defined in this specification. These diagrams do not need to contain the complete inheritance hierarchy but shall at least contain the parent classes of all classes defined in the present document. By default, a class inherits from the class "top".

Characteristics (attributes, relationships) of imported classes need not to be repeated in the diagrams.

NOTE: some inheritance relationships presented in clause W4.2.2 can be repeated in clause W4.2.1 to enhance readability.

Use "This subclass depicts the inheritance relationships." as the first paragraph.

W4.3 Class definitions

Each class is defined using the following structure.

Inherited items (attributes etc.) shall not be shown, as they are defined in the parent class(es) and thus valid for the subclass.

W4.3.a InformationObjectClassName

InformationObjectClassName is the name of the information object class.

The "a" represents a number, starting at 1 and increasing by 1 with each new definition of a class.

W4.3.a.1 Definition

The <definition> clause is written in natural language. The <definition> clause refers to the class itself.

Optionally, information on traceability back to one or more requirements supported by this class can be defined here, in the following form:

| Referenced TS | Requirement label | Comment |
|---------------------|-------------------|------------------------|
| 3GPP TS 32.xyz [xy] | REQ-SM-CON-23 | Optional clarification |
| 3GPP TS 32.xyz [xy] | REQ-SM-FUN-11 | Optional clarification |

W4.3.a.2 Attributes

The <attributes> clause presents the list of attributes, which are the manageable properties of the class. Each attribute is characterised by some of the attribute properties (see Table 1 of [4]), i.e. supportQualifier, isReadable, isWritable, isInvariant and isNotifiable.

The legal values and their semantics for attribute properties are defined in [4].

This information is provided in a table.

An example below indicates

| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifiable |
|----------------|-------------------|------------|------------|-------------|--------------|
| eNodeBId | M | M | - | M | M |

Another example below indicates that the attribute `password1` is not readable, is writable, is not an invariant and no `notifyAttributeValueChange` will be emitted when the attribute value is changed.

| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifiable |
|------------------------|-------------------|------------|------------|-------------|--------------|
| <code>password1</code> | O | - | M | - | - |

Another example below indicates that the attribute `password2` and `password1` (in example above) has same qualifiers for the shown properties except that of `isReadable`. In the case of `password1`, the standard specification determines the qualifier to be M, i.e. it is readable. In the case of `password2`, the standard specification does not make a determination. The vendor would make the determination if the attribute is readable or not readable.

| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifiable |
|------------------------|-------------------|------------|------------|-------------|--------------|
| <code>password2</code> | O | O | M | - | - |

In case there is one or more attributes related to role (see section 5.2.9 of [4]), the attributes related to role shall be specified at the bottom of the table with a divider "Attribute related to role", as shown in the following example:

| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifiable |
|-------------------------------------------|-------------------|------------|------------|-------------|--------------|
| <code>aTMChannelTerminationPointId</code> | M | M | - | M | M |
| ... | | | | | |
| ... | | | | | |
| Attribute related to role | | | | | |
| <code>theATMPATHTerminationPoint</code> | M | M | - | - | M |
| <code>theIubLink</code> | M | M | - | - | M |

This clause shall state "None." when there is no attribute to define.

W4.3.a.3 Attribute constraints

The <attribute constraints> clause presents constraints for the attributes, and one use is to present the predicates for conditional qualifiers (CM/CO).

This information is provided in a table. An example of such a table is given here below:

| Name | Definition |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>pci</code> CM write qualifier | Centralized PCI assignment (see TS 32.500, ref [15] clause 6.1.6) is supported. |
| <code>pciList</code> CM support qualifier | Distributed PCI assignment (see TS 32.500, ref [15] clause 6.1.6) is supported. |
| <code>partOfSectorPower</code> CM support qualifier | The IOC <code>SectorEquipmentFunction</code> is used. |
| <code>attributeX</code> max value | The value of <code>attributeX</code> shall be within the specified value range but may never be higher than the value of <code>attributeY</code> . |

This clause shall state "None." when there is no attribute constraint to define.

W4.3.a.4 Notifications

The < Notifications> clause, for this class, presents one of the following options:

- The class defines (and independent from those inherited) the support of a set of notifications that is identical to that defined in clause W.4.5. In such case, use "The common notifications defined in clause W.4.5 are valid for this class, without exceptions or additions." as the lone sentence of this clause.
- The class defines (and independent from those inherited) the support of a set of notifications that is a superset of that defined in clause W.4.5. In such case, use "The common notifications defined in clause W.4.5 are valid for this IOC. In addition, the following set of notification is also valid." as the lone paragraph of this clause. Then, define the 'additional' notifications in a table. See clause W.4.5 for the notification table format.

- c) *The class defines (and independent from those inherited) the support of a set of notifications that is not identical to, nor a superset of, that defined in clause W4.5. In such case, use "The common notifications defined in clause W4.5 are not valid for this IOC. The set of notifications defined in the following table is valid." as the lone paragraph of this clause. Specify the set of notifications in a table. See clause W4.5 for the notification table format.*
- d) *The class does not define (and independent from those inherited) the support of any notification. In such case, use "There is no notification defined." as the lone sentence of this clause.*

The notifications identified (i.e. option-a, option-b and option-c above) in this clause are notifications that can be emitted across the If-N, where the "object class" and "object instance" parameters of the notification header (see note 2) of these notifications identifies an instance of the class (or its direct or indirect derived class) defined by the encapsulating clause (i.e. clause W4.3.a).

The notifications identified (i.e. option-a and option-b above) in this clause, may originate from implementation object(s) whose identifier may or may not be the same as that carried in the notification parameters "object class" and "object instance". Hence the identification of notifications in this clause does not imply nor identify those notifications as being originated from an instance of the class (or its direct or indirect derived class) defined by the encapsulating clause (i.e. clause W4.3.a).

NOTE 1: This clause shall state "This class does not support any notification." (see option-c) when there is no notification defined for this class. (Note that if its parent class has defined some notifications, the implementation of this class is capable of emitting those inherited defined notifications.)

NOTE 2: The notification header is defined in the notification IRP Information service TS 32.302 [5].

NOTE 3: The qualifier of a notification, specified in Notification Table, indicates if an implementation can generate a notification carrying the DN of the subject class. The qualifier of a notification, specified in an Interface IRP, indicates if an implementation of the Interface IRP can generate such notification in general.

An IRPManager can receive notification-XYZ that carries DN (the "object class" and "object instance") of class-ABC instance if and only if:

- a) *The class-ABC Notification Table defines the notification-XYZ and*
- b) *The class-ABC instance implementation supports this notification-XYZ and*
- c) *An Interface IRP defines the notification-XYZ and*
- d) *The Interface IRP implementation supports this notification-XYZ.*

W4.4 Attribute definitions

Void.

W4.4.1 Attribute properties

It has a lone paragraph "The following table defines the properties of attributes that are specified in the present document. ".

Each information attribute is defined using the following structure.

Inherited attributes shall not be shown, as they are defined in the parent class(es) and thus valid for this class.

An attribute has properties (see Table 1 of [4]). Some properties of an attribute are defined in W4.3.a.2 (e.g. Support Qualifier). The remaining properties of an attribute (e.g. documentation, default value) are defined here.

The information is provided in a table. In case a) attributes of the same name are specified in more than one class and b) the attributes have different properties, then the attribute names (first column) should be prefixed with the class name followed by a period.

An example is given below:

| Attribute Name | Documentation and Allowed Values | Properties |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| xyzId | It identifies ... allowedValues: ... | type: Integer multiplicity: ... isOrdered: ... isUnique: ... defaultValue: ... isNullable: False |
| Abc.state | It indicates ... allowedValues: "ON": the state is on; "OFF": the state is off. | type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: False isNullable: False |
| Zyz.state | It indicates ... allowedValues: "HIGH": the state is high; "MEDIUM": the state is medium; "LOW": the state is low. | type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: False isNullable: False |
| abc | It defines... allowedValues: ... | type: ... multiplicity: ... isOrdered: ... isUnique: ... defaultValue: ... isNullable: ... |

In case there is one or more attributes related to role (see section 5.2.9 of [4]), the attributes related to role shall be specified at the bottom of the table with a divider "Attribute related to role". See example below.

| Attribute Name | Documentation and Allowed Values | Properties |
|----------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| abc | It defines... allowedValues: ... | type: <<dataType>> multiplicity: ... isOrdered: ... isUnique: ... defaultValue: ... isNullable: ... |
| Attribute related to role | | |
| aEnd | It defines... allowedValues: Values to be conformant to TS 32.300 [13] ... | type: DN multiplicity: ... isOrdered: ... isUnique: ... defaultValue: ... isNullable: False |

This clause shall state "None." if there is no attribute to define.

W4.4.2 Constraints

The <constraints> clause indicates whether there are any constraints affecting attributes. Each constraint is defined by a pair (propertyName, propertyDefinition). PropertyDefinitions are expressed in natural language.

An example is given here below:

| Name | Definition |
|----------------------|-------------------------------------------------------------|
| inv_TimerConstraints | The ntftimeTickTimer is lower than or equal to ntftimeTick. |

This clause shall state "None." if there is no constraint.

W4.5 Common Notifications

This <Common Notifications> clause presents notifications that can be referred to by any class defined in the specification. This information is provided in tables.

W4.5.1 Alarm notifications

The following quoted text shall be copied as the only paragraph of this clause.

"This clause presents a list of notifications, defined in [x], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in [y], shall capture the DN of an instance of a class defined in this specification."

The information is provided in a table. The following is an example.

| Name | Qualifier | Notes |
|----------------|-----------|-------|
| notifyNewAlarm | M | -- |

W4.5.2 Configuration notifications

The following quoted text shall be copied as the only paragraph of this clause.

"This clause presents a list of notifications, defined in [x], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in [z], shall capture the DN of an instance of a class defined in this specification."

The information is provided in a table. The following is an example.

| Name | Qualifier | Notes |
|----------------------------|-----------|-------|
| notifyAttributeValueChange | O | -- |
| notifyObjectCreation | O | -- |
| notifyObjectDeletion | O | -- |

4.3 Template for Interface IRP IS

Y1 Scope

TBD

Y2 References

TBD

Y3 Definitions and abbreviations

TBD

Y4 TBD

TBD

Annex A (informative): Change history

| Change history | | | | | | | |
|----------------|-------|-----------|-----|-----|-----------------------------------------------------------|--------|---------------|
| Date | TSG # | TSG Doc. | CR | Rev | Subject/Comment | Old | New |
| 2013-06 | SA#60 | SP-130304 | 001 | 1 | Correct the description of the attribute definition table | 11.0.0 | 11.1.0 |
| 2013-09 | SA#61 | SP-130433 | 002 | 1 | Correction of ambiguous statements | 11.1.0 | 11.2.0 |
| 2013-12 | SA#62 | SP-130614 | 003 | 1 | Move instruction to the correct subclause | 11.2.0 | 11.3.0 |
| 2014-06 | SA#64 | SP-140359 | 004 | - | remove the feature support statements | 11.3.0 | 11.4.0 |
| 2014-10 | - | - | - | - | Update to Rel-12 version (MCC) | 11.4.0 | 12.0.0 |

| Change history | | | | | | | |
|----------------|---------|-----------|------|-----|-----|------------------------------------|-------------|
| Date | Meeting | TDoc | CR | Rev | Cat | Subject/Comment | New version |
| 2018-06 | SA#80 | SP-180423 | 0007 | 1 | A | Correction of references and table | 12.1.0 |

History

| Document history | | |
|------------------|--------------|-------------|
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| V12.1.0 | June 2018 | Publication |
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