ETSI TS 128 632 V11.0.0 (2013-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Inventory Management (IM) Network Resource Model (NRM)
Integration Reference Point (IRP);
Information Service (IS)
(3GPP TS 28.632 version 11.0.0 Release 11)

Reference

DTS/TSGS-0528632vb00

Keywords

LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

ETSI

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification 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.

Ready for Converged Management

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

Introduction

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

32.690 Inventory Management (IM): Requirements

28.631 Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements

28.632 Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)

28.633 Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

Inventory Management (IM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. IM actions have the objective to monitor the actual configuration on the Network Elements (NEs) and Network Resources (NRs), and they may be initiated by the operator or by functions in the Operations Systems (OSs) or NEs. The final goal of IM is the establishment of an accurate and timely model of the actual inventory in the NEs or NRs.

IM actions may be requested to reflect changes initiated by Configuration Management (CM) actions or to make sure that the inventory model is in synch with the actual inventory. IM actions are initiated either as single actions on single NEs of the 3G network or as part of a complex procedure involving actions on many resources/objects in one or several NEs.

1 Scope

The present document specifies the Inventory Management (IM) Network Resource Model (NRM) that can be communicated between an IRPAgent and an IRPManager for telecommunication network management purposes, including management of converged networks.

The present 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.

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 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

[4]   3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[5]   3GPP TS 28.662: " Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[6]   3GPP TS 28.642: "Telecommunication management; Configuration Management (CM): UTRAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

[7]   3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[8]   3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and Definitions".

[9]   3GPP TS 32.151: "Telecommunication management; Integration Reference Point (IRP) Information Service (IS) template.

[10]   3GPP TS 28.622: " Generic Network Resource Model (NRM) Integration Reference Point (IRP);Information Service (IS)".

[11]   3GPP TS 32.690: "Telecommunication management; Inventory Management (IM): Requirements".

[12]   3GPP TS 25.466: "UTRAN Iuant interface: Application Part".

[13]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

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] and 3GPP TS 32.600 [4] and the following apply:

Association: See definition in TS 28.622 [10].

Managed Element (ME): See definition in TS 28.622 [10].

Managed Object (MO): See definition in TS 28.622 [10].

Management Information Model (MIM): See definition in TS 28.622 [10].

Network Resource Model (NRM): See definition in TS 28.622 [10].

3.2 Abbreviations

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

DN	Distinguished Name (see 3GPP TS 32.300 [7])
IM	Inventory Management
IOC	Information Object Class
IRP	Integration Reference Point
ITU-T	International Telecommunication Union, Telecommunication Sector
MIM	Management Information Model
MO	Managed Object
MOC	Managed Object Class
NE	Network Element
NM	Network Manager
NRM	Network Resource Model
RDN	Relative Distinguished Name (see 3GPP TS 32.300 [7])
TMN	Telecommunications Management Network
UML	Unified Modelling Language
UMTS	Universal Mobile Telecommunications System
UTRAN	UMTS Terrestrial Radio Access Network

4 Model

4.1 Imported information entities and local labels

Label reference	Local label
28.622 [10], Information Object Class, *Top*	Top
28.622 [10], Information Object Class, ManagedElement	ManagedElement
28.622 [10], information object class, *ManagedFunction*	*ManagedFunction*

4.2 Class diagram

4.2.1 Relationships

This clause depicts the set of IOCs that encapsulate information relevant for this service. This clause provides the overview of all information object classes in UML. Subsequent clauses provide more detailed specification of various aspects of these information object classes.

The inventory NRM contains two alternatives for inventory data modeling. Alternative 1 is for NE structure and hardware inventory. Alternative 2 is an extended version for inventory information modeling consisting of NE structure, hardware, software and license data inventory.

Alternative 1, hardware inventory model
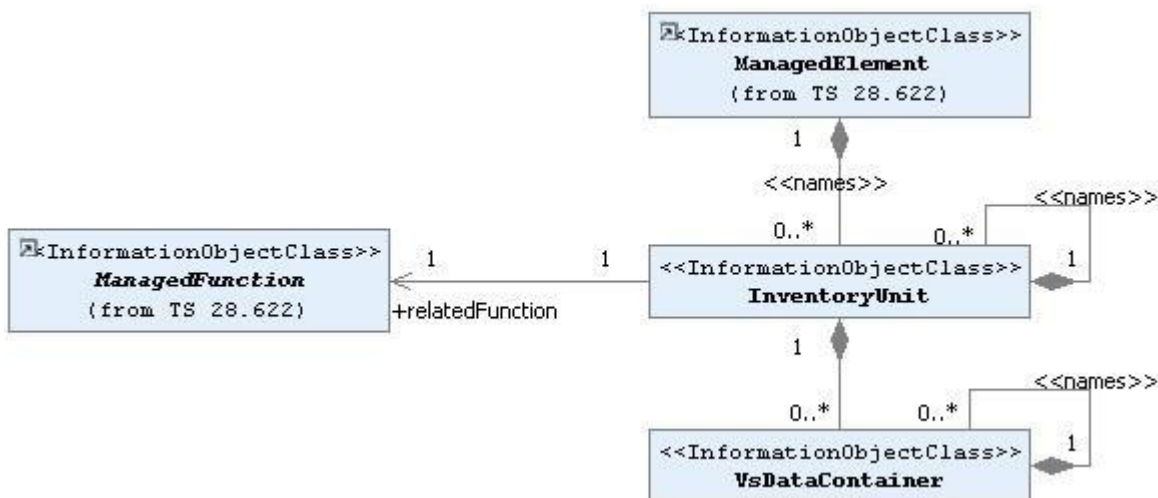
NOTE: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.

Figure 4.2.1-1: Alternative 1 - Inventory Management NRM Containment/Naming and Association diagram

Each IOC instance is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [7] that expresses its containment hierarchy. As an example, the DN of a IOC representing a InventoryUnit could have a format like:

SubNetwork=Sweden,meContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1,InventoryUnit=Inv-1.

Alternative 2, extended model for hardware, software and licence inventory:
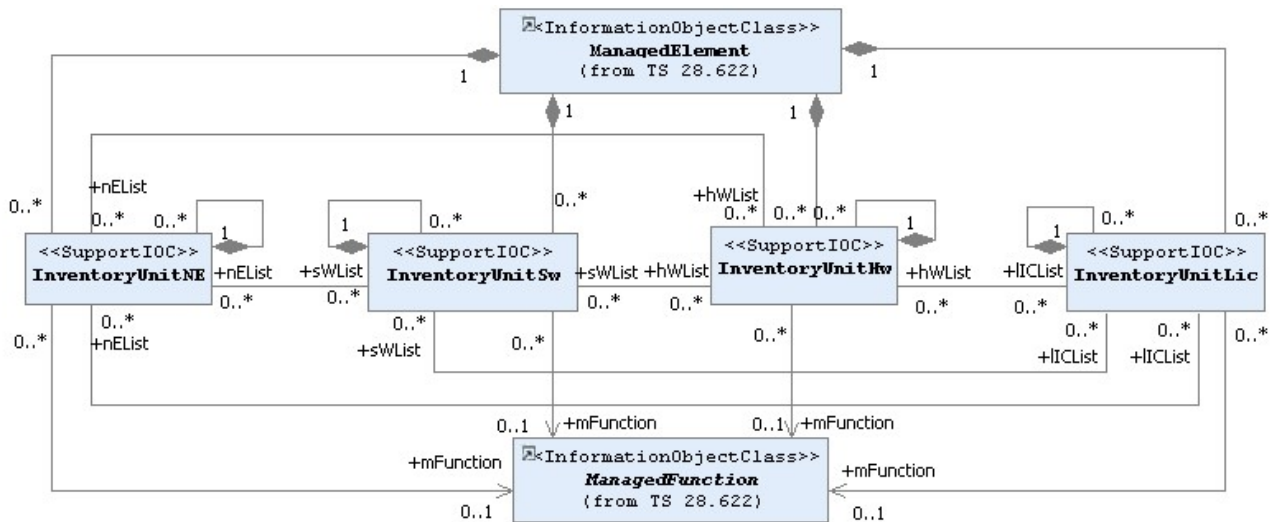
Figure 4.2.1-2: Alternative 2 - Inventory Management NRM Containment/Naming and Association diagram

NOTE: Inventory information upload in alternative 2 is done using the FT IRP and related FT IRP notification capabilities

4.2.2   Inheritance

This subclause depicts the inheritance relationships that exist between IOCs.

Figure 4.2.2 shows the inheritance hierarchy for the IM NRM.
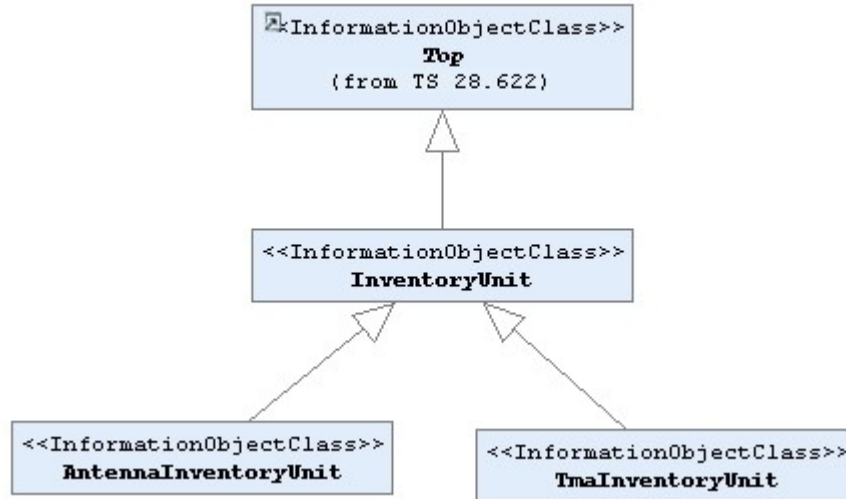
Figure 4.2.2-1: Inventory Management NRM Inheritance Hierarchy

4.3 Class definitions

4.3.1 InventoryUnit

4.3.1.1 Definition

This IOC represents inventory information for an Inventory Unit.

4.3.1.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
inventoryUnitType	M	M	-	-	-
vendorUnitFamilyType	CM	M	-	-	-
vendorUnitTypeNumber	CM	M	-	-	-
versionNumber	O	M	-	-	-
vendorName	M	M	-	-	-
serialNumber	CM	M	-	-	-
dateOfManufacture	O	M	-	-	-
dateOfLastService	O	M	-	-	-
unitPosition	O	M	-	-	-
manufacturerData	O	M	-	-	-
Attribute related to role					
relatedFunction	O	M	-	-	-

4.3.1.3 Attribute constraints

Name	Definition
vendorUnitFamilyType CM Support Qualifier	The inventory is hardware.
vendorUnitTypeNumber CM Support Qualifier	The inventory is hardware.
serialNumber CM Support Qualifier	The inventory is hardware.

4.3.1.4 Notifications

There is no notification defined.

4.3.2 InventoryUnitNE

4.3.2.1 Definition

This SupportIOC represents the logical and physical structure of the NE.

4.3.2.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
neId	M	M	-	-	-
customerIdentifier	O	M	-	-	-
productName	M	M	-	-	-
vendorName	M	M	-	-	-
productType	O	M	-	-	-
salesUniqueId	O	M	-	-	-
operatorUniqueName	O	M	-	-	-
siteId	O	M	-	-	-
additionalInformation	O	M	-	-	-
Attribute related to role					
mFunction	O	M	-	-	-
lICList	O	M	-	-	-
hWList	O	M	-	-	-
sWList	O	M	-	-	-

4.3.2.3 Attribute constraints

None.

4.3.2.4 Notifications

There is no notification defined.

4.3.3 InventoryUnitHw

4.3.3.1 Definition

This SupportIOC represents the hardware components.

4.3.3.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
hwId	M	M	-	-	-
hwType	M	M	-	-	-
hwName	O	M	-	-	-
hwVersion	M	M	-	-	-
vendorName	O	M	-	-	-
salesUniqueId	O	M	-	-	-
hwUnitLocation	M	M	-	-	-
model	O	M	-	-	-
hwCapability	O	M	-	-	-
modificationDate	O	M	-	-	-
manualDataEntry	O	M	-	-	-
additionalInformation	O	M	-	-	-
Attribute related to role					
mFunction	O	M	-	-	-
lICList	O	M	-	-	-
nEList	O	M	-	-	-
sWList	O	M	-	-	-

4.3.3.3   Attribute constraints

None.

4.3.3.4   Notifications

There is no notification defined.

4.3.4   InventoryUnitSw

4.3.4.1   Definition

This SupportIOC represents the software components.

4.3.4.2   Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
swId	M	M	-	-	-
swName	O	M	-	-	-
swVersion	O	M	-	-	-
vendorName	O	M	-	-	-
salesUniqueId	O	M	-	-	-
classification	M	M	-	-	-
swStatus	O	M	-	-	-
swInstallationTime	O	M	-	-	-
swActivationTime	O	M	-	-	-
additionalInformation	O	M	-	-	-
Attribute related to role					
mFunction	O	M	-	-	-
lICList	O	M	-	-	-
nEList	O	M	-	-	-
hWList	O	M	-	-	-

4.3.4.3   Attribute constraints

None.

4.3.4.4   Notifications

There is no notification defined.

4.3.5   InventoryUnitLic

4.3.5.1   Definition

This SupportIOC represents the licence components.

4.3.5.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
licId	M	M	-	-	-
licType	O	M	-	-	-
vendorName	O	M	-	-	-
validity	O	M	-	-	-
key	O	M	-	-	-
licStatus	O	M	-	-	-
licActivationTime	O	M	-	-	-
salesUniqueId	O	M	-	-	-
additionalInformation	O	M	-	-	-
Attribute related to role					
mFunction	O	M	-	-	-
sWList	O	M	-	-	-
nEList	O	M	-	-	-
hWList	O	M	-	-	-

4.3.5.3 Attribute constraints

None.

4.3.5.4 Notifications

There is no notification defined.

4.3.6 TmaInventoryUnit

4.3.6.1 Definition

This IOC represents inventory information for a Tower Mounted Amplifier Unit.

4.3.6.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
tmaNumberOfNon-LinearGainValues	CM	M	-	-	-
tmaNon-LinearGainValue	CM	M	O	-	-
tmaAdditionalDataFieldNumber	CO	M	O	-	-
tmaAntennaModelNumber	CO	M	O	-	-
tmaAntennaOperatingBands	CO	M	O	-	-
tmaBeamwidthForEachOpBandInBandOrder	CO	M	O	-	-
tmaGainForEachOpBandInBandOrder	CO	M	O	-	-
tmaInstallationDate	CO	M	O	-	-
tmaInstallersId	CO	M	O	-	-
tmaMaxSupportedGain	CO	M	O	-	-
tmaMinSupportedGain	CO	M	O	-	-

4.3.6.3 Attribute constraints

Name	Definition
tmaNumberOfNon-LinearGainValues CM Support Qualifier	It is supported over the Iuant interface.
tmaNon-LinearGainValue CM Support Qualifier	It is supported over the Iuant interface.
tmaAdditionalDataFieldNumber CO Support Qualifier	It is supported over the Iuant interface.
tmaAntennaModelNumber CO Support Qualifier	It is supported over the Iuant interface.
tmaAntennaOperatingBands CO Support Qualifier	It is supported over the Iuant interface.
tmaBeamwidthForEachOpBandInBandOrder CO Support Qualifier	It is supported over the Iuant interface.
tmaGainForEachOpBandInBandOrder CO Support Qualifier	It is supported over the Iuant interface.
tmaInstallationDate CO Support Qualifier	It is supported over the Iuant interface.
tmaInstallersId CO Support Qualifier	It is supported over the Iuant interface.
tmaMaxSupportedGain CO Support Qualifier	It is supported over the Iuant interface.
tmaMinSupportedGain CO Support Qualifier	It is supported over the Iuant interface.

4.3.6.4 Notifications

There is no notification defined.

4.3.7 AntennaInventoryUnit

4.3.7.1 Definition

This IOC represents inventory information for an Antenna Unit.

4.3.7.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
maxTiltValue	CO	M	O	-	-
minTiltValue	CO	M	O	-	-
mechanicalOffset	CO	M	O	-	-
baseElevation	CO	M	O	-	-
latitude	CO	M	O	-	-
longitude	CO	M	O	-	-
patternLabel	CO	M	O	-	-

4.3.7.3 Attribute constraints

Name	Definition
maxTiltValue CO Support Qualifier	It is supported over the Iuant interface.
minTiltValue CO Support Qualifier	It is supported over the Iuant interface.
mechanicalOffset CO Support Qualifier	It is supported over the Iuant interface.
baseElevation CO Support Qualifier	It is supported over the Iuant interface.
latitude CO Support Qualifier	It is supported over the Iuant interface.
longitude CO Support Qualifier	It is supported over the Iuant interface.
patternLabel CO Support Qualifier	It is supported over the Iuant interface.

4.3.7.4 Notifications

There is no notification defined.

4.4 Attribute definitions

4.4.1 Attribute properties

The following table defines the attributes that are present in several Information Object Classes of the present document.

Attribute Name	Documentation and Allowed Values	Properties
baseElevation	The elevation in meters above sea level at the base of the antenna structure. This value, when subtracted from `height` (see TS 28.662 [5]), provides the height of the antenna above the ground. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Iuant interface according to Ref. 3GPP TS 25.466 [12]. allowedValues: An integral value representing a number of meters in 0.1 meter increments.	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
additionalInformation	Supplementary information about inventory data (if any) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
classification	Name of installed SW (e.g. SW release, SW build, SW patches) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
customerIdentifier	Unique identification of a vendors' customer allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
dateOfManufacture	Date of Manufacture of inventory unit. allowedValues: N/A	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
dateOfLastService	Date of last service or repair of inventory unit. allowedValues: N/A	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
hwCapability	Hardware capability e.g. capacity, size (empty value is possible) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
hwName	Mnemonic of hw inventory unit family type (e.g. Fan, PSU) assigned by vendor. allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

hwType	Type of the HW unit e.g. equipment holder, carriage allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
hwUnitLocation	Unique physical / logical location identifier within NE allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
hwVersion	Version / revision no. of current unit e.g. firmware version (empty value possible in case no versioning is available) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
inventoryUnitId	An attribute whose 'name+value' can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
inventoryUnitType	Type of inventory unit (see TS 32.690 [11]) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
key	License activation key according to the used licensing system allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
licActivationTime	It indicates the date and time when the license was activated. allowedValues: All values indicating valid time.	type: DateTime multiplicity: 0..1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
licId	Unique identifier of a license (e.g. name, code) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
licStatus	License status – applicable only for managed licenses (e.g. scheduled, valid, expired, invalid, capacity violated) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
licType	Describing type of current license (e.g. capacity, particular feature,no. of subscribers) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

manualDataEntry	Indicates whether unit is passive (manual insertion of inventory data is needed) or active (inventory data can be read from the unit) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
latitude	The latitude of the antenna location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to the northern hemisphere. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Iuant interface according to Ref. 3GPP TS 25.466 [12]. allowedValues: Valid values described in 3GPP TS 23.032 [13].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
longitude	The longitude of the antenna location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to degrees east of 0 degrees longitude. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Iuant interface according to Ref. 3GPP TS 25.466 [12]. allowedValues: Valid values described in 3GPP TS 23.032 [13].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
manufacturerData	Manufacturer specific data of inventory unit. allowedValues: N/A	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
model	Equipment configuration, e.g. standard hardware unit or a variant that may contain additional disk capacity (empty value possible) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
modificationDate	Date/time stamp of last change (e.g. repair action) allowedValues: N/A	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
neId	Vendor defined unique identifier of a logical or physical network element unit allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
operatorUniqueName	Unique NE identifier used by operator allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

productName	NE name classifying a vendor's product family or function allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
productType	Identifier of the e.g. platform, in case the product can be based on different HW/SW platforms (not used for logical NEs) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
salesUniqueId	Unique identifier used by vendor (used e.g. for ordering a new unit) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
hwId	Hardware identifier allocated by the vendor, e.g. the serial number allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable:True
maxTiltValue	The maximum amount of tilt the RET system can support. Note: See "Maximum supported tilt" in Ref. 3GPP TS 25.466 [12]. allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
mechanicalOffset	This is a value representing a non-adjustable tilt value, which is imparted to the antenna due to the physical installation. The actual tilt at any point in time is the summation of mechanicalOffset and retTiltValue. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Iuant interface according to Ref. 3GPP TS 25.466 [12]. A single integral value corresponding to an angle in degrees between 0 and 360 with a resolution of 0.1 degrees. allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
minTiltValue	The minimum amount of tilt the RET system can support. Note: See"Minimum supported tilt" in Ref. 3GPP TS 25.466 [12]. allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
patternLabel	The pattern name is a textual, alpha-numeric string to allow identification of the antenna pattern along with the antenna vendor information such as model number, etc. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Iuant interface according to Ref. 3GPP TS 25.466 [12]. allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

serialNumber	Serial number of inventory unit. allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
siteId	NE site in customer network allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swActivationTime	It indicates the date and time when the software was activated. allowedValues: All values indicating valid time.	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swId	Unique identifier of a SW unit allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swName	Software release name used allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swInstallationTime	It indicates the date and time when the software installation process ended and the sotware was installed. allowedValues: All values indicating valid time.	type: DateTime multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swStatus	Status of the SW unit (e.g. installed, archived) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
swVersion	Version identifier of the software unit allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaAdditionalDataFieldNumber	This attribute identifies a standard data field which has no operational impact. Used by the procedures SetDeviceData and GetDevicedata. Defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaAntennaModelNumber	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

tmaAntennaOperatingBands	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaBeamwidthForEachOpBandIn BandOrder	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: BitString multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaGainForEachOpBandInBandO rder	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: BitString multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaInstallationDate	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaInstallersId	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaMaxSupportedGain	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaMinSupportedGain	A data field defined in Table B.3 of 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaNon-LinearGainValue	Defined in 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
tmaNumberOfNon- LinearGainValues	Defined in 3GPP TS 25.466 [12]. allowedValues: See TS 25.466 [12].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

unitPosition	Position of inventory unit (e.g. Rack, shelf, slot, etc.).
	
	Depending on the implementation of the inventory unit in the managed system, the value and meaning of this attribute may vary.
	
	For example, if a system has three levels and types of inventory units representing Rack, Shelf and Slot respectively (i.e. the Managed Element contains multiple Rack inventory units, each Rack inventory unit contains multiple Shelf inventory units and each Shelf inventory unit contains multiple Slot inventory units), then for this example:
	   – for the Inventory Unit representing a Rack, the Frame Identification code may be used as the value of this attribute;
	   – for the Inventory Unit representing a Shelf, the Rack Shelf code may be used as the value of this attribute;
	   – for the Inventory Unit representing a Slot, the position code may be used as the value of this attribute.
	
	allowedValues: N/A
		type: String
		multiplicity: 1
		isOrdered: N/A
		isUnique: N/A
		defaultValue: None
		isNullable: True

validity	License validity which may include one of the elements duration, end (expiration date) or forever allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
vendorName	Name of inventory unit vendor (or vendors may provide manufacturer name) allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
vendorUnitFamilyType	Mnemonic of inventory unit family type (e.g. Fan, PSU) assigned by vendor. allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
vendorUnitTypeNumber	A vendor/manufacturer defined and assigned number which uniquely identifies the unit type and optionally for backward compatibility reasons only, also version (used for replacing HW units, spares). allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
versionNumber	The version information related to vendorUnitTypeNumber. allowedValues: N/A	type: String multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
Attribute related to role		
hWList	This attribute carries the set of DN(s) of related InventoryUnitHw(s). allowedValues: N/A	type: DN multiplicity: 1..* isOrdered:False isUnique: True defaultValue: None isNullable: True

lICList	This attribute carries the set of DN(s) of related InventoryUnitLic(s). allowedValues: N/A	type: DN multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True
mFunction	This attribute carries the DN of related ManagedFunction. allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
nEList	This attribute carries the set of DN(s) of related InventoryUnitNE(s). allowedValues: N/A	type: DN multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True
relatedFunction	This attribute carries the DN of related ManagedFunction. allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
sWList	This attribute carries the set of DN(s) of related InventoryUnitSw(s). allowedValues: N/A	type: DN multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True

4.4.2   Constraints

None.

4.5   Common notifications

4.5.1   Alarm notifications

None.

4.5.2   Configuration notifications

None.

Annex A (informative):
Change history

Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2012-10						---	0.0.0
2012-12	SA#58				Draft sent for Information & Approval		1.0.0
2012-12					New version after approval	1.0.0	11.0.0

History

Document history		
V11.0.0	January 2013	Publication