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*Technical Specification*

**Digital cellular telecommunications system (Phase 2+);  
Universal Mobile Telecommunications System (UMTS);  
LTE;**

**Telecommunication management;  
Configuration Management (CM);**

**Signalling Transport Network (STN) interface  
Network Resource Model (NRM)**

**Integration Reference Point (IRP): Information Service (IS)  
(3GPP TS 32.742 version 8.0.0 Release 8)**

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## Foreword

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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:

- 32.741: Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Requirements
- 32.742: Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)**
- 32.743: Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set (SS)
- 32.745: Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); eXtensible Markup Language (XML) file format definition

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. CM actions have the objective to control and 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.

CM actions may be requested as part of an implementation programme (e.g. additions and deletions), as part of an optimisation programme (e.g. modifications), and to maintain the overall Quality of Service (QoS). The CM 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.

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# 1 Scope

The present document is part of an Integration Reference Point (IRP) named "Signalling Transport Network (STN) network resources IRP", 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 Signalling Transport resources. This IRP comprises a set of specifications defining Requirements, a protocol neutral Network Resource Model (NRM) and corresponding Solution Set(s).

The present document specifies the protocol neutral STN resources IRP NRM. It reuses relevant parts of the generic NRM in TS 32.622 [6], either by direct reuse or sub-classing, and in addition to that defines Signalling Transport specific Managed Object Classes.

The Configuration Management (CM) area is very large. The intention is to split the specification of the related interfaces in several IRPs - as described in the Introduction clause above. An important aspect of such a split is that the NRMs defined in different IRPs containing NRMs are consistent, and that NRMs supported by an IRPAgent implementation can be accessed as one coherent model through one IRP Information Service (IS).

To summarize, the present document has the following main purpose: to define the applied Signalling Transport Network specific NRM, based on the generic NRM in 3GPP TS 32.622 [6].

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

Finally, regarding the support of the State Management IRP: IS (TS 32.672 [3]), all NRMs of one release shall support the same State Management IRP version.

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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 32.672: "Telecommunication management; Configuration Management (CM); State Management Integration Reference Point (IRP): Information Service (IS)".
- [4] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [5] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".
- [6] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [7] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic CM 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] ITU-T Recommendation Q.700 (03/93): "Introduction to CCITT Signalling System No.7".
- [10] ITU-T Recommendation Q.751.1 (10/95): "Network Element Management Information Model for The Message Transfer Part (MTP)".
- [11] ITU-T Recommendation Q.704 (07/96): "Signalling network functions and messages".
- [12] 3GPP TS 32.111-2: "Telecommunication management; Fault Management (FM); Part 2: Alarm Integration Reference Point (IRP); Information Service (IS)".
- [13] ITU-T Recommendation Q.702 (11/88): "Signalling Data Link".
- [14] 3GPP TS 29.202: "Signalling System No. 7 (SS7) signalling transport in core network; Stage 3".
- [15] 3GPP TS 25.410: "UTRAN Iu Interface: General Aspects and Principles".
- [16] 3GPP TS 25.420: "UTRAN I<sub>ur</sub> interface general aspects and principles".
- [17] 3GPP TS 25.430: "UTRAN Iub interface: general aspects and principles".
- [18] 3GPP TS 48.018: "Base Station System (BSS)-Serving GPRS Support Node (SGSN);BSS GPRS Protocol (BSSGP)".
- [19] 3GPP TS 48.008: "Mobile Switching Centre-Base Station System (MSC-BSS) interface;Layer 3 specification".
- [20] 3GPP TS 32.632: "Telecommunication management; Configuration Management (CM); Core Network Resources Integration Reference Point (IRP);Network Resource Model (NRM)".
- [21] 3GPP TS 32.642: "Telecommunication management; Configuration Management (CM); UTRAN network resources Integration Reference Point (IRP); Network Resource Model (NRM)".
- [22] 3GPP TS 29.060: "GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface".
- [23] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [24] 3GPP TS 29.018: "Serving GPRS Support Node (SGSN)-Visitors Location Register (VLR) Gs interface layer 3 specification".
- [25] 3GPP TS 32.741: "Telecommunication management; Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Requirements".
- [26] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".
- [27] ITU-T Recommendation E.600 (03/93): "Terms and Definitions of traffic engineering".
- [28] IETF RFC 3332: "Signaling System 7 (SS7) Message Transfer Part 3 (MTP3) - User Adaptation Layer (M3UA)".
- [29] IETF RFC 2960: "Stream Control Transmission Protocol (SCTP)".
- [30] IETF RFC 3873: "Stream Control Transmission Protocol (SCTP); Management Information Base (MIB)".

---

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions in 3GPP TS 32.101 [1], 32.102 [2], 32.600 [5], 32.741 [25] and the following apply:



**Association:** in general it is used to model relationships between Managed Objects. Associations can be implemented in several ways, such as:

1. name bindings;
2. reference attributes; and
3. association objects.

This IRP stipulates that containment associations shall be expressed through name bindings, but it does not stipulate the implementation for other types of associations as a general rule. These are specified as separate entities in the object models (UML diagrams).

**Managed Element (ME):** an instance of the Managed Object Class ManagedElement defined in 3GPP TS 32.622 [6].

**Managed Object (MO):** in the context of the present document, a Managed Object (MO) is a software object that encapsulates the manageable characteristics and behaviour of a particular Network Resource. The MO is instance of a MO class defined in a MIM/NRM. This class, called **Information Object Class (IOC)** has **attributes** that provide information used to characterize the objects that belong to the class (the term "attribute" is taken from TMN and corresponds to a "property" according to CIM). Furthermore, the IOC can have **operations** that represent the behaviour relevant for that class (the term "operation" is taken from TMN and corresponds to a "method" according to CIM). The IOC may support the emission of **notifications** that provide information about an event occurrence within a network resource.

**Management Information Model (MIM):** also referred to as NRM - see the definition below.

**Network Resource Model (NRM):** A model representing the actual managed telecommunications network resources that a System is providing through the subject IRP. An NRM identifies and describes the IOCs, their associations, attributes and operations. The NRM is also referred to as "MIM" (see above), which originates from the ITU-T TMN.

## 3.2 Abbreviations

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

|       |   |
|-------|---|
| CIM   | Common Information Model  |
| CM    | Configuration Management  |
| DN    | Distinguished Name  |
| IOC   | Information Object Class  |
| IRP   | Integration Reference Point   |
| ITU-T | International Telecommunication Union, Telecommunication Standardisation Sector |
| ME    | Managed Element   |
| MIM   | Management Information Model  |
| MO    | Managed Object  |
| MTP   | Message Transfer Part   |
| NE    | Network Element   |
| NR    | Network Resource  |
| NRM   | Network Resource Model  |
| OS    | Operations System   |
| RDN   | Relative Distinguished Name   |
| SLC   | Signalling Link Code  |
| SLS   | Signalling Link Selection   |
| SP    | Signalling Point  |
| STN   | Signalling Transport Network  |
| STP   | Signalling Transfer Point   |
| TP    | Termination Point   |
| UML   | Unified Modelling Language  |

## 4 Modelling approach

The modelling approach used in this IRP is described in 3GPP TS 32.150 [26] and 32.622 [6] Generic Network Resources IRP; NRM.

This model allows for combined managed element functionality, where more than one "function IOC" (inherited from ManagedFunction) modelling more specific managed element functionality may be contained in the ManagedElement IOC.

## 5 Information Object Classes

### 5.1 Imported information entities and local labels

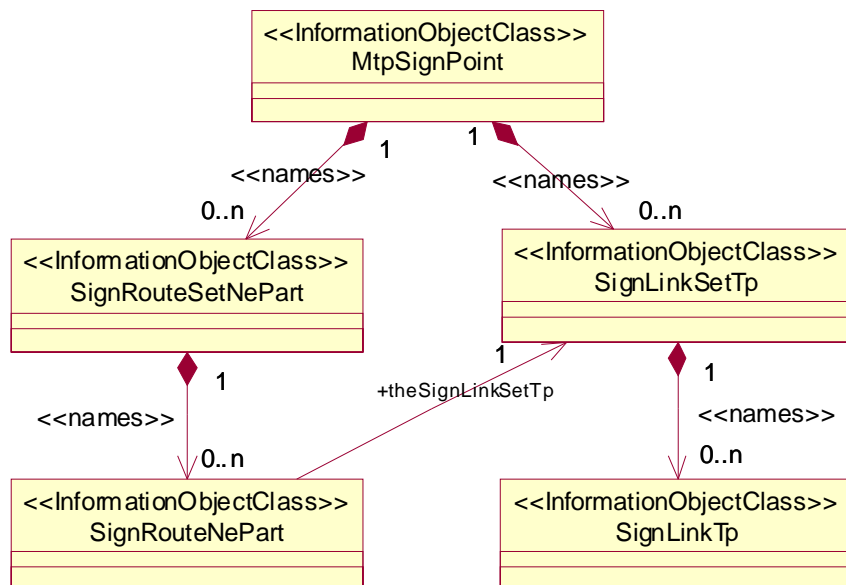
| Label reference                             | Local label |
|---|-------------|
| TS 32.622[6], information object class, Top | Top         |

### 5.2 Class diagram

#### 5.2.1 Attributes and relationships

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

Figure 5.2.1.1 shows the name-containment relation and other types of relations of the STN NRM.



NOTE 1: The name-containment relations between IOCs are indicated by UML "unidirectional aggregation by reference" ("hollow diamonds").

NOTE 2: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.

**Figure 5.2.1.1 : Signalling Transport Network NRM Containment/Naming and Association diagram 1**

Each IOC is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [4] that expresses its containment hierarchy.

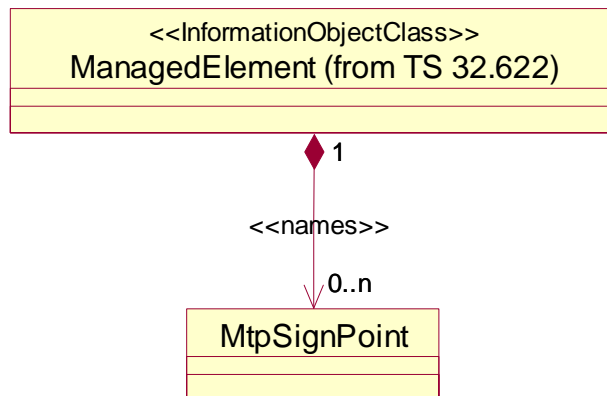
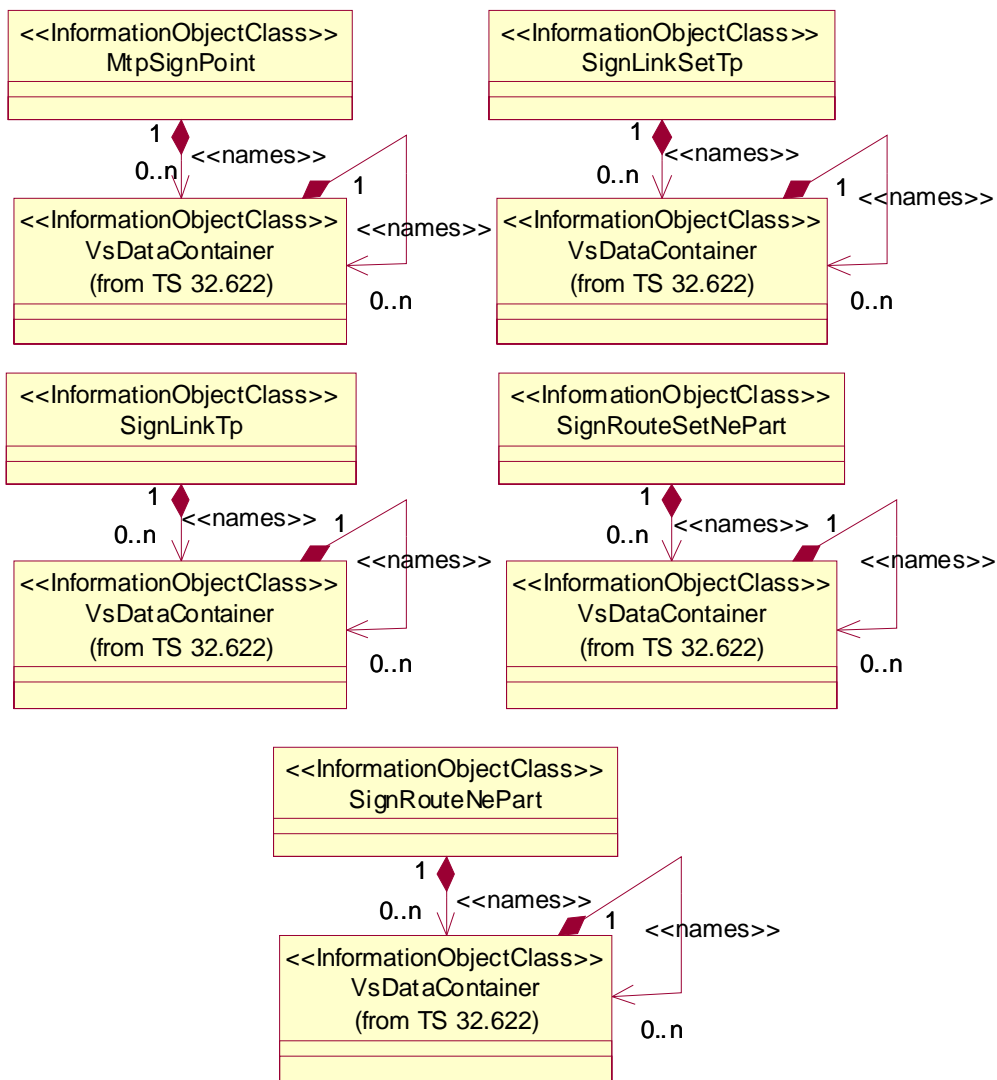


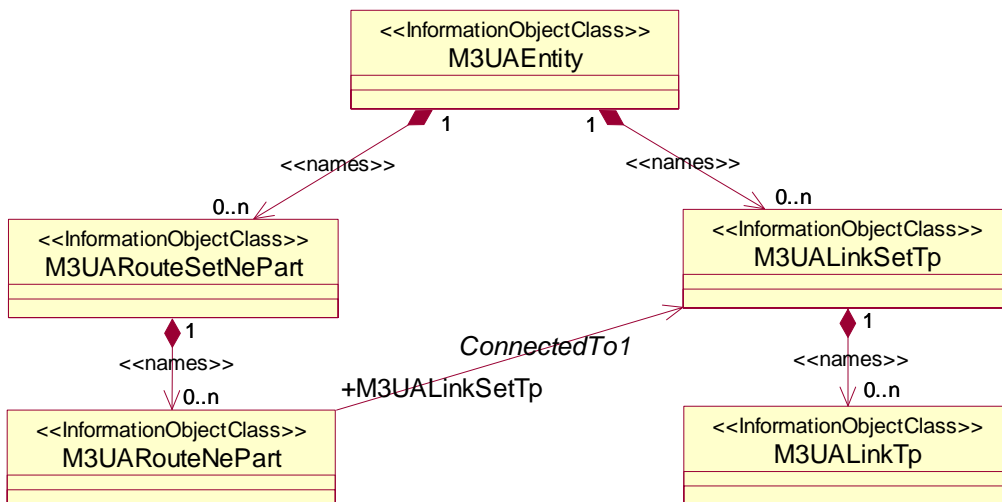
Figure 5.2.1.2 : Signalling Transport Network NRM Containment/Naming and Association diagram 2



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

NOTE 2: Each instance of the vsDataContainer shall only be contained under one IOC.

**Figure 5.2.1.3 : vsDataContainer Containment/Naming and Association in STN NRM diagram**



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

Figure 5.2.1.4: M3UA view of STN NRM Containment/Naming and Association diagram 1

Each Managed Object Instance is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [4] that expresses its containment hierarchy.

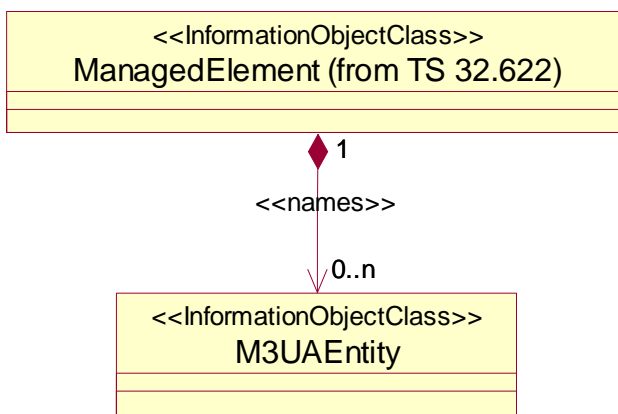
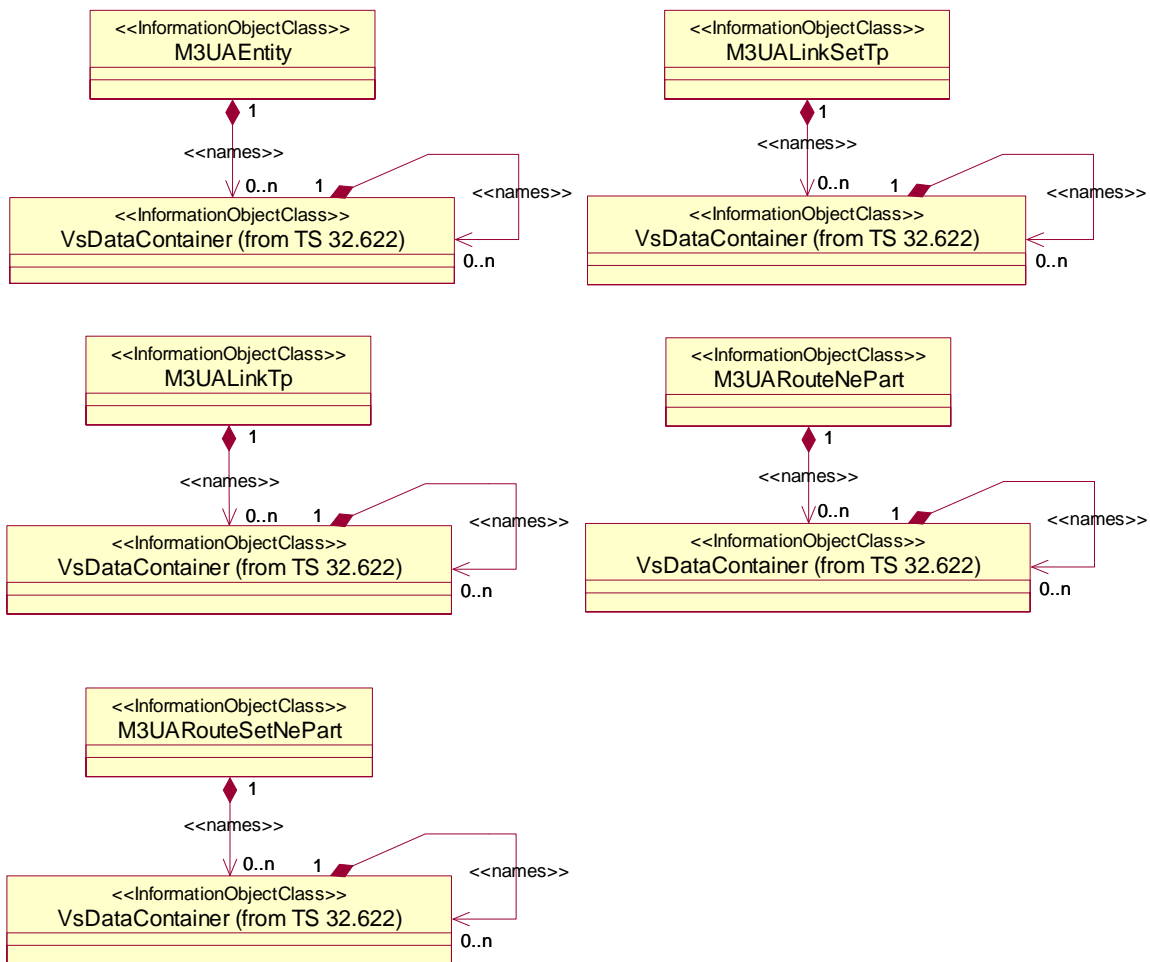


Figure 5.2.1.5: M3UA view of STN NRM Containment/Naming and Association diagram 2



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

NOTE 2: Each instance of the vsDataContainer shall only be contained under one IOC.

Figure 5.2.1.6: vsDataContainer Containment/Naming and Association in M3UA STN NRM diagram

## 5.2.2 Inheritance

This clause depicts the inheritance relationships that exist between IOCs.

The following figure shows the inheritance hierarchy for the STN NRM.

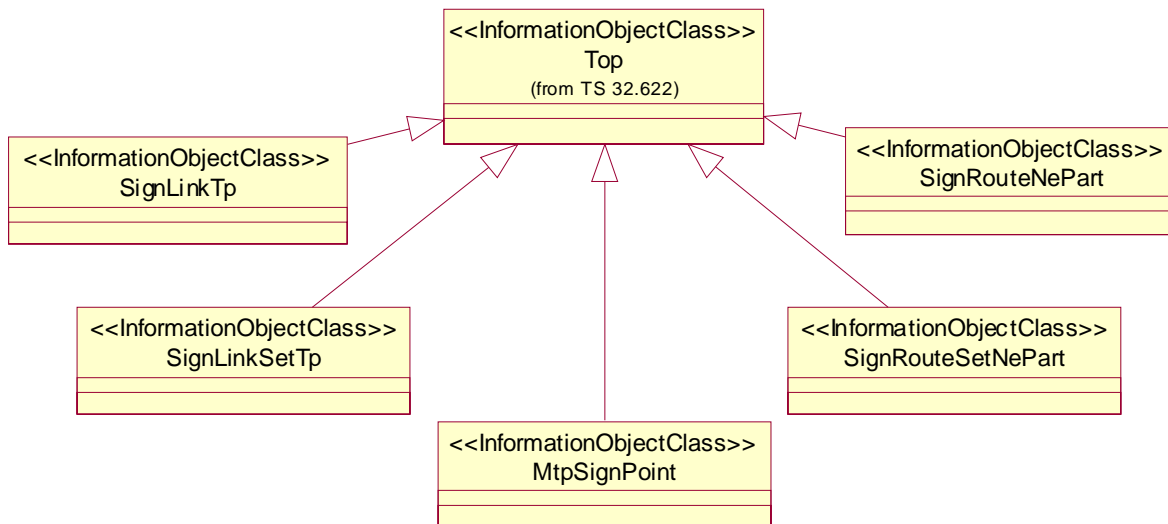


Figure 5.2.2.1 : Signalling Transport Network NRM Inheritance Hierarchy

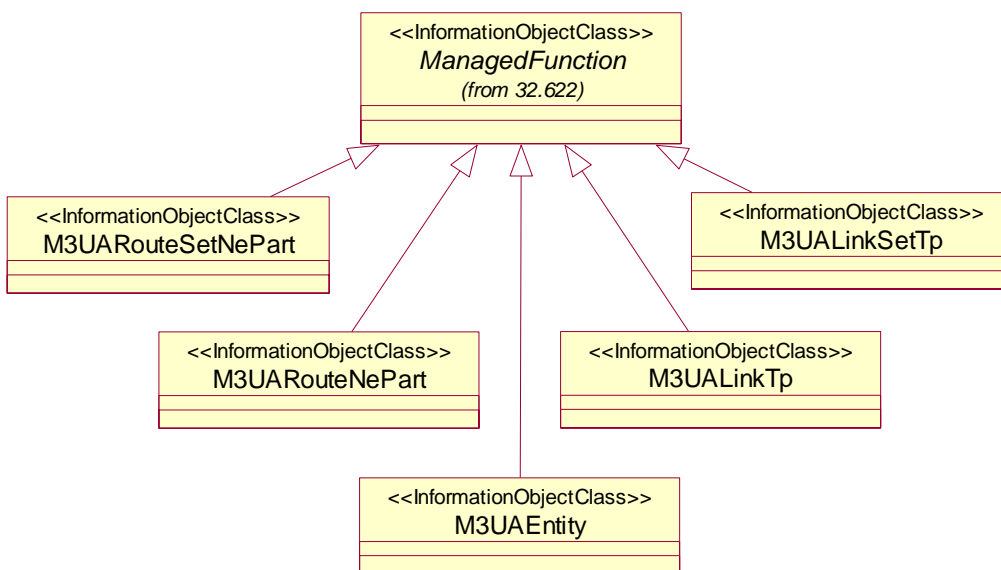


Figure 5.2.2.2: M3UA view of Signalling Transport Network Resource Model Inheritance Hierarchy

## 5.3 Information object class definitions

### 5.3.1 MtpSignPoint

#### 5.3.1.1 Definition

This IOC represents the Signalling Point functionality. For more information about the Signalling Point, see ITU-T Q.700 [9] and ITU-T Q751.1 [10].

#### 5.3.1.2 Attributes

**Table 5.3.1.2.1 : Attributes of MtpSignPoint**

| Attribute name   | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|------------------|------------|-------------------|----------------|-----------------|
| mtpSignPointId   | +          | M                 | M              | -               |
| pointCode        | +          | M                 | M              | -               |
| networkIndicator | +          | M                 | M              | -               |
| pointCodeLength  | +          | M                 | M              | -               |
| spType           | +          | M                 | M              | -               |
| userLabel        | +          | M                 | M              | M               |

**Table 5.3.1.2.2 : Notifications of MtpSignPoint**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |



## 5.3.2 SignLinkSetTp

### 5.3.2.1 Definition

This IOC represents a bi-directional Signalling Link Set Termination Point functionality.  
For more information about the Signalling Link Set Termination Point, see ITU-T Q.700 [9] and ITU-T Q751.1 [10].

### 5.3.2.2 Attributes

**Table 5.3.2.2.1 : Attributes of SignLinkSetTp**

| Attribute name  | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|-----------------|------------|-------------------|----------------|-----------------|
| signLinkSetTpId | +          | M                 | M              | -               |
| adjPc           | +          | M                 | M              | -               |
| userLabel       | +          | M                 | M              | M               |
| maxCapacityLS   | +          | M                 | M              | -               |

**Table 5.3.2.2.2 : Notifications of SignLinkSetTp**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.3 SignLinkTp

### 5.3.3.1 Definition

This IOC represents a bi-directional Signalling Link Termination Point functionality.

For more information about the Signalling Link Termination Point, see ITU-T Q.700 [9] and ITU-T Q751.1 [10].

### 5.3.3.2 Attributes

**Table 5.3.3.2.1 : Attributes of SignLinkTp**

| Attribute name     | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|--------------------|------------|-------------------|----------------|-----------------|
| signLinkTpId       | +          | M                 | M              | -               |
| slCode             | +          | M                 | M              | -               |
| slsCodeNormalList  | +          | O                 | M              | -               |
| slsCodeCurrentList | +          | M                 | M              | -               |
| linkTpStatus       | +          | M                 | M              | -               |
| maxCapacitySL      | +          | M                 | M              | -               |
| userLabel          | +          | M                 | M              | M               |
| signLinkType       | +          | M                 | M              | -               |

**Table 5.3.3.2.2 : Notifications of SignLinkTp**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.4 SignRouteSetNePart

### 5.3.4.1 Definition

This IOC represents a Signalling Route Set functionality.

For more information about the Signalling Route Set Network Element Part, see ITU-T Q.700 [9] and ITU-T Q751.1 [10].

### 5.3.4.2 Attributes

**Table 5.3.4.2.1 : Attributes of SignRouteSetNePart**

| Attribute name                       | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|--------------------------------------|------------|-------------------|----------------|-----------------|
| signRouteSetNePartId                 | +          | M                 | M              | -               |
| destinationPc                        | +          | M                 | M              | -               |
| userLabel                            | +          | M                 | M              | M               |
| loadsharingInformationRouteSetNePart | +          | M                 | M              | -               |

**Table 5.3.4.2.2 : Notifications of SignRouteSetNePart**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.5 SignRouteNePart

### 5.3.5.1 Definition

This IOC represents a Signalling Route functionality.

For more information about the Signalling Route Network Element Part, see ITU-T Q.700 [9] and ITU-T Q751.1 [10].

### 5.3.5.2 Attributes

**Table 5.3.5.2.1 : Attributes of SignRouteNePart**

| Attribute name       | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------------|------------|-------------------|----------------|-----------------|
| signRouteNePartId    | +          | M                 | M              | -               |
| signLinkSetTpPointer | +          | M                 | M              | -               |
| fixedPriority        | +          | M                 | M              | -               |
| userLabel            | +          | M                 | M              | M               |

**Table 5.3.5.2.2 : Notifications of SignRouteNePart**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.6 M3UAEntity

### 5.3.6.1 Definition

This IOC represents a functionality entity which processes M3UA signalling. For more information about M3UA, see [14] and [28].

### 5.3.6.2 Attributes

**Table 5.3.6.2.1 : Attributes of M3UAEntity**

| Attribute name      | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|---------------------|------------|-------------------|----------------|-----------------|
| m3UAEntityId        | +          | M                 | M              | -               |
| m3UAEntityPointCode | +          | M                 | M              | -               |
| m3UAEntityType      | +          | M                 | M              | -               |
| networkIndicator    | +          | M                 | M              | -               |
| pointCodeLength     | +          | M                 | M              | -               |

**Table 5.3.6.2.2 : Notifications of M3UAEntity**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.7 M3UALinkSetTp

### 5.3.7.1 Definition

This IOC represents a bi-directional termination point functionality of M3UA signalling link set which is the set of M3UA signalling links between M3UA\_AS and SG or between M3UA\_AS and M3UA\_AS. For more information about M3UA\_AS and SG, see [14] and [28].

### 5.3.7.2 Attributes

**Table 5.3.7.2.1 : Attributes of M3UALinkSetTp**

| Attribute name  | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|-----------------|------------|-------------------|----------------|-----------------|
| m3UALinkSetTPId | +          | M                 | M              | -               |
| adjPc           | +          | M                 | M              | -               |
| trafficMode     | +          | M                 | M              | -               |

**Table 5.3.7.2.2 : Notifications of M3UALinkSetTp**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.8 M3UALinkTp

### 5.3.8.1 Definition

This IOC represents a termination point functionality of M3UA signalling link which is a bi-directional M3UA logical communication channel between the particular SCTP termination points of signalling gateway process (SGP) and application server process (ASP) or the logical communication channel between the particular SCTP termination points of two IP server processes (IPSPs).

For more information about M3UA and SCTP signalling information, see [14] and [28].

### 5.3.8.2 Attributes

**Table 5.3.8.2.1 : Attributes of M3UALinkTp**

| Attribute name      | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|---------------------|------------|-------------------|----------------|-----------------|
| m3UALinkTpId        | +          | M                 | M              | -               |
| m3UALinkTpState     | +          | M                 | M              | -               |
| sCTPAssocLocalAddr  | +          | M                 | M              | -               |
| sCTPAssocRemoteAddr | +          | O                 | M              | -               |

**Table 5.3.8.2.2 : Notifications of M3UALinkTp**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.3.9 M3UARouteSetNePart

### 5.3.9.1 Definition

This IOC represents a set of the M3UA signalling route between M3UA local entity and M3UA destination entity. For M3UA signalling information, see [14] and [28].

### 5.3.9.2 Attributes

**Table 5.3.9.2.1 : Attributes of M3UARouteSetNePart**

| Attribute name                | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|-------------------------------|------------|-------------------|----------------|-----------------|
| m3UARouteSetNePartId          | +          | M                 | M              | -               |
| destinationPc                 | +          | M                 | M              | -               |
| m3UARouteNePart-m3UALinkSetTP | +          | M                 | M              | -               |

**Table 5.3.9.2.2 : Notifications of M3UARouteSetNePart**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |



## 5.3.10 M3UARouteNePart

### 5.3.10.1 Definition

This IOC represents a path between local M3UA entity and destination M3UA entity. For more information about M3UA signalling, see [14] and [28].

### 5.3.10.2 Attributes

**Table 5.3.10.2.1 : Attributes of M3UARouteNePart**

| Attribute name    | Visibility | Support Qualifier | Read Qualifier | Write Qualifier |
|-------------------|------------|-------------------|----------------|-----------------|
| m3UARouteNePartId | +          | M                 | M              | -               |
| m3UALinkSetTPIId  | +          | M                 | M              | -               |
| fixedPriority     | +          | M                 | M              | -               |

**Table 5.3.10.2.2 : Notifications of M3UARouteNePart**

| Name                           | Qualifier                             | Notes |
|--------------------------------|---------------------------------------|-------|
| notifyAckStateChanged          | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAlarmListRebuilt         | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyAttributeValueChange     | O                                     |       |
| notifyChangedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyClearedAlarm             | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyComments                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyNewAlarm                 | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |
| notifyObjectCreation           | O                                     |       |
| notifyObjectDeletion           | O                                     |       |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [12]) |       |

## 5.4 Information relationship definitions

### 5.4.1 ConnectedTo1 (M)

#### 5.4.1.1 Definition

This represents a uni-directional relation between the M3UARouteNePart and M3UALinkSetTP.

The role of the relation shall be mapped to a reference attribute of the IOC.

#### 5.4.1.2 Roles

**Table 5.4.1.2.1: Roles of the relation ConnectedTo1**

| Name                            | Definition  |
|---------------------------------|---|
| m3UARouteNePart - M3UALinkSetTP | This role (when present) represents M3UARouteNePart capability to identify the connected M3UALinkSetTP. When the role is present, the m3UARouteNePart - M3UALinkSetTP shall carry the M3UALinkSetTP DN. |

#### 5.4.1.3 Constraints

| Name | Definition |
|------|------------|
| -    | -          |

## 5.5 Information attribute definitions

### 5.5.1 Definition and legal values

Table 5.5.1 defines the attributes that are present in several IOCs of the present document.

Table 5.5.1 : Attributes

| Attribute Name       | Definition   | Legal Values  |
|----------------------|--|---|
| adjPc                | The signalling point code information of the signalling point adjacent to the signalling link set. (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10])  | Type: Integral numeric value  |
| destinationPc        | The signalling point code information of the destination signalling point of the signalling route set. (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10])  | Type: Integral numeric value  |
| fixedPriority        | This attribute determines, if the signallingRoute is used as current route. The signallingRoute instances contained in the same signallingRouteSet are chosen in ascending order as current routes (The lower the value, the higher the priority).<br><br>The priority is defined by means of assigning priorities to all involved route segments. If from a particular SP two or more route segments are used with the same priority, loadsharing between Signalling Routes may occur (Ref ITU-T Q.751.1 [10]). | Type: Integral numeric value<br>Range: (0...255)<br><br>-- maximum value is implementation dependent  |
| linkTpStatus         | This is a set-valued attribute. It contains the functional statuses as described in ITU-T Q.704 [11]. (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10])   | Type: a set of enumerated types, where the legal statuses can be:<br><br><ul style="list-style-type: none"> <li>• localBlocked</li> <li>• remoteBlocked</li> <li>• localInhibited</li> <li>• remoteInhibited</li> <li>• failed</li> <li>• deactivated</li> </ul><br>The absence of any value indicates a status of available. |
| maxCapacityLS        | The maximum capacity of a signalling linkset is the maximum load that should be placed on the linkset, when all links that could be active in the linkset are, and are working in service. Unit: Erlang (Ref ITU-T E.600 [27])   | Type: Numeric value   |
| maxCapacitySL        | This attribute describes the maximum capacity for the signLinkTp. The maximum capacity of a signalling link is the maximum load that should be placed on the signalling link. Unit: Erlang (Ref ITU-T E.600 [27])  | Type: Numeric value   |
| m3UAEntityId         | An attribute whose "name+value" can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.  |   |
| m3UAEntityPointCode  | The M3UA signalling point code information of the signalling point. (Ref ITU-T Q.704[11],Ref ITU-T Q.751.1[10])  |   |
| m3UAEntityType       | It identifies the M3UA entity Type.  | Type: Enumerated, Range: M3UA Application Server (M3UA_AS), Signalling Gateway (SG).<br>Note: M3UA_AS is defined as AS in Ref.[28].   |
| m3UALinkTPState      | This attribute represents the state of M3UA signalling link.   | Type:Enumerated, Range: INTEGER<br>{<br>UNESTABLISH (0): SCTP association of the m3ua link is not established.<br>ESTABLISHED (1): SCTP association of the M3UA link is established, but the ASP state is down.<br>INACTIVE (2): ASP state is up.<br>ACTIVE (3): ASP state is active.<br>}<br>(Ref. [28],Ref. [29])           |
| m3UALinkSetTPId      | An attribute whose "name+value" can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.  |   |
| m3UALinkTPId         | An attribute whose "name+value" can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.  |   |
| m3UARouteId          | An attribute whose "name+value" can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.  |   |
| m3UARouteSetNePartId | An attribute whose "name+value" can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.  |   |
| networkIndicator     | The network indicator information of the signalling point, (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10])  | Type: Enumerated, Range: International, Spare, National, NationalSpare  |
| pointCode            | The signalling point code information of the signalling point. (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10])  | Type: Integral numeric value  |
| pointCodeLength      | The signalling point code length information of the signalling point. (Ref ITU-T Q.704 [11])   | Type: Enumerated, Range: 14, 24   |

| Attribute Name                       | Definition  | Legal Values  |
|--------------------------------------|---|---|
| sCTPAssocLocalAddr                   | This attribute represents the SCTP association local port and IP Address.   | portId: Unique identification of port(port number, integer) □<br>List of { AddrType(IPv4, IPv6), IPAddr (string)}. (Ref.[30]).                |
| sCTPAssocRemoteAddr                  | This attribute represents the corresponding SCTP association port and IP address.   | portId: Unique identification of port(port number, integer) □<br>List of { AddrType(IPv4, IPv6), IPAddr(string)} (Ref. [30])                  |
| sCTPAssocLocalAddr                   | This attribute represents the SCTP association local port and IP Address.   | portId: Unique identification of port(port number, integer) □<br>List of { AddrType(IPv4, IPv6), IPAddr (string)}. (Ref.[30]).                |
| signLinkSetTpPointer                 | It references the signallingLinkSetTp which is intended to be used as first segment of the succession of linksets, which form the signalling route on the network level.  |   |
| signLinkSetTpId                      | 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  |   |
| signLinkTpId                         | 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  |   |
| mtpSignPointId                       | 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  |   |
| spType                               | The type of the signalling point. (Ref ITU-T Q.700[9], Ref ITU-T Q.751.1 [10])  | Type: Enumerated<br>Range: SEP, STP, STEP   |
| signRouteNePartId                    | 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  |   |
| signRouteSetNePartId                 | 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  |   |
| slCode                               | The Signalling Link Code (SLC) is used to distinguish signalling link in the signalling link set. It is the same value (between 0 and 15) at each end of the link, and is different from that of any other link between the same two adjacent signalling points. (Ref ITU-T Q.704 [11], Ref ITU-T Q.751.1 [10]) | Type: Integral numeric value<br>Range: (0...15)   |
| slsCodeCurrentList                   | This attribute represents the SLS-Code which is currently used on the signallingLinkTp. It may be different from the slsNormalList, in case some fault has occurred. (Ref ITU-T Q.751.1 [10])   | SET SIZE (0..16) OF Sls<br>-- Each Sls value can occur at most once in a given SET<br><br>Sls Type: Integral numeric value<br>Range: (0...15) |
| slsCodeNormalList                    | This attribute indicates which SLS-Codes are initially administratively assigned to this signallingLinkTp for the normal operation. (Ref ITU-T Q.751.1 [10])  | SET SIZE (0..16) OF Sls<br>-- Each Sls value can occur at most once in a given SET<br><br>Sls Type: Integral numeric value<br>Range: (0...15) |
| signLinkType                         | This attribute represents the type of signalling link.  | Type: Enumerated<br>Range: 64K, 2M  |
| trafficMode                          | It identifies the selected mode of M3UA signalling link.  | Type: Enumerated, Range: Override mode, Load share mode and broadcast mode. (Ref. [28])   |
| loadsharingInformationRouteSetNePart | This attribute contains specific information for target specific loadsharing via the current routes working on a routeset basis via the current routes. (Ref ITU-T Q.751.1 [10])  |   |
| userLabel                            | A user-friendly name of this object.  |   |

## 5.5.2 Constraints

None.

## Annex A (informative): Change history

| Change history |       |           |      |     |  |     |       |       |
|----------------|-------|-----------|------|-----|--|-----|-------|-------|
| Date           | TSG # | TSG Doc.  | CR   | Rev | Subject/Comment  | Cat | Old   | New   |
| Jun 2004       | SA_24 | SP-040263 | --   | --  | Submitted to TSG SA#24 for Information   | --  | 1.0.0 |       |
| Sep 2004       | SA_25 | SP-040601 | --   | --  | Submitted to TSG SA#25 for Approval  | --  | 2.0.0 | 6.0.0 |
| Dec 2005       | SA_30 | SP-050720 | 0001 | --  | Correct definition of linkTpStatus in IS - Align with ITU-T Q.751.1  | F   | 6.0.0 | 6.1.0 |
| Mar 2006       | SA_31 | SP-060104 | 0002 | --  | Correct the linkTpStatus definition  | F   | 6.1.0 | 6.2.0 |
| Sep 2006       | SA_33 | SP-060538 | 0003 | --  | Deletion of ManagedFunction and relatedObjects in MTPSignPoint   | F   | 6.2.0 | 6.3.0 |
| Sep 2006       | SA_33 | SP-060554 | 0004 | --  | Add M3UA related Information in STN NRM IS   | B   | 6.3.0 | 7.0.0 |
| Mar 2007       | --    | --        | --   | --  | Delete reference to the 32.744 CMIP SS. Reason: SA#35 endorsed the SA5 decision to not propagate the CMIP Solution Sets to Rel-7 (TS 32.3x4, TS 32.4x4, TS 32.6x4) | --  | 7.0.0 | 7.0.1 |
| Dec 2008       | SA_42 | --        | --   | --  | Upgrade to Release 8   |     | 7.0.1 | 8.0.0 |

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# History

| <b>Document history</b> |              |             |
|-------------------------|--------------|-------------|
| V8.0.0                  | January 2009 | Publication |
|                         |              |             |
|                         |              |             |
|                         |              |             |
|                         |              |             |