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Technical Specification

Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Configuration Management (CM);
Signalling Transport Network (STN)
interface Network Resource Model (NRM)
Integration Reference Point (IRP);
Solution Set (SS) definitions
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Foreword

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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).

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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; Configuration Management (CM); 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)

32.746: Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

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.

1 Scope

The present document is part of an Integration Reference Point (IRP) named Signalling Transport Network (STN) interface Network Resource Model (NRM) IRP, through which an `IRPAgent` can communicate configuration management information to one or several `IRPManagers` concerning STN resources. The STN NRM IRP comprises a set of specifications defining Requirements, a protocol neutral Information Service and one or more Solution Set(s).

The present document specifies the Solution Sets for the STN NRM IRP.

This specification is related to 3GPP TS 32.742 [9] V10.0.X.

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 TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Information Service (IS)".

[3] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Solution Set (SS) definitions".

[4] W3C REC-xml-20001006: "Extensible Markup Language (XML) 1.0 (Second Edition)".

[5] W3C REC-xmlschema-0-20010502: "XML Schema Part 0: Primer".

[6] W3C REC-xmlschema-1-20010502: "XML Schema Part 1: Structures".

[7] W3C REC-xmlschema-2-20010502: "XML Schema Part 2: Datatypes".

[8] W3C REC-xml-names-19990114: "Namespaces in XML".

[9] 3GPP TS 32.742: "Telecommunication management; Configuration Management (CM); Signalling Transport Network (STN) interface Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[10] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

[11] 3GPP TS 32.306: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Solution Set (SS) definitions".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

XML file: file containing an XML document

XML document: composed of the succession of an optional XML declaration followed by a root XML element

NOTE: See [4]; in the scope of the present document.

XML declaration: it specifies the version of XML being used

NOTE: See [4].

XML element: has a type, is identified by a name, may have a set of XML attribute specifications and is either composed of the succession of an XML start-tag followed by the XML content of the XML element followed by an XML end-tag, or composed simply of an XML empty-element tag; each XML element may contain other XML elements

NOTE: See [4].

empty XML element: having an empty XML content; an empty XML element still possibly has a set of XML attribute specifications; an empty XML element is either composed of the succession of an XML start-tag directly followed by an XML end-tag, or composed simply of an XML empty-element tag

NOTE: See [4].

XML content (of an XML element): empty if the XML element is simply composed of an XML empty-element tag; otherwise the part, possibly empty, of the XML element between its XML start-tag and its XML end-tag

XML start-tag: the beginning of a non-empty XML element is marked by an XML start-tag containing the name and the set of XML attribute specifications of the XML element

NOTE: See [4].

XML end-tag: the end of a non-empty XML element is marked by an XML end-tag containing the name of the XML element

NOTE: See [4].

XML empty-element tag: composed simply of an empty-element tag containing the name and the set of XML attribute specifications of the XML element.

NOTE: See [4].

XML attribute specification: has a name and a value

NOTE: See [4].

DTD: defines structure and content constraints to be respected by an XML document to be valid with regard to this DTD

NOTE: See [4].

XML schema: more powerful than a DTD, an XML schema defines structure and content constraints to be respected by an XML document to conform with this XML schema; through the use of XML namespaces several XML schemas can be used together by a single XML document; an XML schema is itself also an XML document that shall conform with the XML schema for XML schemas

NOTE: See [5], [6] and [7].

XML namespace: enables qualifying element and attribute names used in XML documents by associating them with namespaces identified by different XML schemas

NOTE: See [8], in the scope of the present document.

XML complex type: defined in an XML schema; cannot be directly used in an XML document; can be the concrete type or the derivation base type for an XML element type or for another XML complex type; ultimately defines constraints for an XML element on its XML attribute specifications and/or its XML content

NOTE: See [5], [6] and [7].

XML element type: declared by an XML schema; can be directly used in an XML document; as the concrete type of an XML element, directly or indirectly defines constraints on its XML attribute specifications and/or its XML content; can also be the concrete type or the derivation base type for another XML element type

NOTE: See [5], [6] and [7].

3.2 Abbreviations

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

CM	Configuration Management
CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
DTD	Document Type Definition
IDL	Interface Definition Language
IRP	Integration Reference Point
IS	Information Service
MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
OMG	Object Management Group
SS	Solution Set
STN	Signalling Transport Network
UMTS	Universal Mobile Telecommunications System
UTRAN	Universal Terrestrial Radio Access Network
XML	eXtensible Markup Language

4 Solution Set Definitions

This specification defines the following 3GPP STN NRM IRP Solution Set Definitions:

- 3GPP STN NRM IRP CORBA SS (Annex A)
- 3GPP STN NRM IRP XML Definitions (Annex B)

Annex A (normative): CORBA Solution Set

This annex contains the CORBA Solution Set for the IRP whose semantics is specified in STN NRM IRP: Information Service (TS 32.742 [9]).

A.1 Architectural features

The overall architectural feature of STN Network Resources IRP is specified in 3GPP TS 32.742 [9].
This clause specifies features that are specific to the CORBA SS.

A.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [10].

A.1.2 Rules for NRM extensions

This clause discusses how the models and IDL definitions provided in the present document can be extended for a particular implementation and still remain compliant with 3GPP SA5's specifications.

A.1.2.1 Allowed extensions

Vendor-specific MOCs may be supported. The vendor-specific MOCs may support new types of attributes.
The 3GPP SA5-specified notifications may be issued referring to the vendor-specific MOCs and vendor-specific attributes. New MOCs shall be distinguishable from 3GPP SA5 MOCs by name. 3GPP SA5-specified and vendor-specific attributes may be used in vendor-specific MOCs. Vendor-specific attribute names shall be distinguishable from existing attribute names.

NRM MOCs may be subclassed. Subclassed MOCs shall maintain the specified behaviour of the 3GPP SA5's superior classes. They may add vendor-specific behaviour with vendor-specific attributes. When subclassing, naming attributes cannot be changed. The subclassed MOC shall support all attributes of its superior class. Vendor-specific attributes cannot be added to 3GPP SA5 NRM MOCs without subclassing.

When subclassing, the 3GPP SA5-specified containment rules and their specified cardinality shall still be followed. As an example, ManagementNode (or its subclasses) shall be contained under SubNetwork (or its subclasses).

Managed Object Instances may be instantiated as CORBA objects. This requires that the MOCs be represented in IDL. 3GPP SA5's NRM MOCs are not currently specified in IDL, but may be specified in IDL for instantiation or subclassing purposes. However, management information models should not require that IRPManagers access the instantiated managed objects other than through supported methods in the present document.

Extension rules related to notifications (Notification categories, Event Types, Extended Event Types etc.) are for further study.

A.1.2.2 Extensions not allowed

The IDL specifications in the present document cannot be edited or altered. Any additional IDL specifications shall be specified in separate IDL files.

IDL interfaces (note: not MOCs) specified in the present document may not be subclassed or extended. New interfaces may be defined with vendor-specific methods.

A.2 Mapping

A.2.1 General mappings

Attributes modelling associations as defined in the NRM (here also called "reference attributes") are in this SS mapped to attributes.
The names of the reference attributes in the NRM are mapped to the corresponding attribute names in the MOC.
When the cardinality for an association is 0..1 or 1..1 the datatype for the reference attribute is defined as an MOReference. The value of an MO reference contains the distinguished name of the associated MO.
When the cardinality for an association allows more than one referred MO, the reference attribute will be of type MOReferenceSet, which contains a sequence of MO references.

A.2.2 Information Object Class (IOC) mapping

This SS supports reference attributes for relations other than containment relations between objects. Reference attributes are therefore introduced in each MOC where needed.

A.2.2.1 IOC MtpSignPoint

Mapping from NRM IOC MtpSignPoint attributes to SS equivalent MOC MtpSignPoint attributes

NRM Attributes of IOC MtpSignPoint in 32.742 [9]	SS Attributes	SS Type	Qualifier
mtpSignPointId	mtpSignPointId	string	Read-Only, M
pointCode	pointCode	unsigned long	Read-Only, M
networkIndicator	networkIndicator	STNNetworkResourcesIRPSystem::AttributeTypes::NetworkIndicatorType	Read-Only, M
pointCodeLength	pointCodeLength	STNNetworkResourcesIRPSystem::AttributeTypes::PointCodeLengthType	Read-Only, M
spType	spType	STNNetworkResourcesIRPSystem::AttributeTypes::SPTypeType	Read-Only, M
userLabel	userLabel	string	Read-Write, M

A.2.2.2 IOC SignLinkSetTp

Mapping from NRM IOC SignLinkSetTp attributes to SS equivalent MOC SignLinkSetTp attributes

NRM Attributes of IOC SignLinkSetTp in 32.742 [9]	SS Attributes	SS Type	Qualifier
signLinkSetTpId	signLinkSetTpId	string	Read-Only, M
adjPc	adjPc	unsigned long	Read-Only, M
userLabel	userLabel	string	Read-Write, M
maxCapacityLS	maxCapacityLS	float	Read-Only, M

A.2.2.3 IOC SignLinkTp

Mapping from NRM IOC SignLinkTp attributes to SS equivalent MOC SignLinkTp attributes

NRM Attributes of IOC SignLinkTp in 32.742 [9]	SS Attributes	SS Type	Qualifier
signLinkTpId	signLinkTpId	string	Read-Only, M
slCode	slCode	unsigned long	Read-Only, M
slsCodeNormalList	slsCodeNormalList	STNNetworkResourcesIRPSystem::AttributeTypes::SLSListType	Read-Only, O
slsCodeCurrentList	slsCodeCurrentList	STNNetworkResourcesIRPSystem::AttributeTypes::SLSListType	Read-Only, M
linkTpStatus	linkTpStatus	STNNetworkResourcesIRPSystem::AttributeTypes::LinkStatusType	Read-Only, M
maxCapacitySL	maxCapacitySL	float	Read-Only, M
userLabel	userLabel	string	Read-Write, M
signLinkType	signLinkType	STNNetworkResourcesIRPSystem::AttributeTypes::SignLinkTypeType	Read-Only, M

A.2.2.4 IOC SignRouteSetNePart

Mapping from NRM IOC SignRouteSetNePart attributes to SS equivalent MOC SignRouteSetNePart attributes

NRM Attributes of IOC SignRouteSetNePart in 32.742 [9]	SS Attributes	SS Type	Qualifier
signRouteSetNePartId	signRouteSetNePartId	string	Read-Only, M
destinationPc	destinationPc	unsigned long	Read-Only, M
userLabel	userLabel	string	Read-Write, M
loadsharingInformationRouteSetNePart	loadsharingInformationRouteSetNePart	string	Read-Only, M

A.2.2.5 IOC SignRouteNePart

Mapping from NRM IOC SignRouteNePart attributes and association roles to SS equivalent MOC SignRouteNePart attributes

NRM Attributes/association roles of IOC SignRouteNePart in 32.742 [9]	SS Attributes	SS Type	Qualifier
signRouteNePartId	signRouteNePartId	string	Read-Only, M
signLinkSetTpPointer	signLinkSetTpPointer	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference	Read-Only, M
fixedPriority	fixedPriority	unsigned long	Read-Only, M
userLabel	userLabel	string	Read-Write, M

A.2.3 Information Object Class (IOC) Mapping

This SS supports reference attributes for relations other than containment relations between objects. Reference attributes are therefore introduced in each MOC where needed.

A.2.3.1 IOC M3UAEntity

Mapping from NRM IOC M3UAEntity attributes to SS equivalent MOC M3UAEntity attributes

NRM Attributes of IOC m3UAEntity in 32.742 [9]	SS Attributes	SS Type	Qualifier
m3UAEntityId	m3UAEntityId	string	Read-Only, M
m3UAEntityPointCode	m3UAEntityPoint Code	unsigned long	Read-Only, M
m3UAEntityType	m3UAEntityType	STNNetworkResourcesIRPSystem::AttributeTypes::m3UAEntityTypeType	Read-Only, M
networkIndicator	networkIndicator	STNNetworkResourcesIRPSystem::AttributeTypes::networkIndicatorType	Read-Only, M
pointCodeLength	pointCodeLength	STNNetworkResourcesIRPSystem::AttributeTypes::PointCodeLengthType	Read-Only, M

A.2.3.2 IOC M3UALinkSetTp

Mapping from NRM IOC m3UALinkSetTp attributes to SS equivalent MOC m3UALinkSetTp attributes

NRM Attributes of IOC m3UALinkSetTp in 32.742 [9]	SS Attributes	SS Type	Qualifier
m3UALinkSetTPId	m3UALinkSetTPId	string	Read-Only, M
adjPc	adjPc	unsigned long	Read-Only, M
trafficMode	trafficMode	STNNetworkResourcesIRPSystem::AttributeTypes::trafficModeType	Read-Only, M

A.2.3.3 IOC M3UALinkTp

Mapping from NRM IOC m3UALinkTp attributes to SS equivalent MOC m3UALinkTp attributes

NRM Attributes of IOC m3UALinkTp in 32.742 [9]	SS Attributes	SS Type	Qualifier
m3UALinkTpId	m3UALinkTpId	string	Read-Only, M
m3UALinkTPState	m3UALinkTPState	STNNetworkResourcesIRPSystem::AttributeTypes::m3UALinkTPStateType	Read-Only, M
sCTPAssocLocalAddr	sCTPAssocLocalAddr	STNNetworkResourcesIRPSystem::AttributeTypes::sCTPAssocAddrType	Read-Only, M
sCTPAssocRemoteAddr	sCTPAssocRemoteAddr	STNNetworkResourcesIRPSystem::AttributeTypes::sCTPAssocAddrType	Read-Only, O

A.2.3.4 IOC M3UARouteSetNePart

Mapping from NRM IOC m3UARouteSetNePart attributes to SS equivalent MOC m3UARouteSetNePart attributes

NRM Attributes of IOC m3UARouteSetNePart in 32.742 [9]	SS Attributes	SS Type	Qualifier
m3UARouteSetNePartId	m3UARouteSetNePartId	string	Read-Only, M
destinationPc	destinationPc	unsigned long	Read-Only, M
m3UARouteNePartm3UALinkSetTP	m3UARouteNePart m3UALinkSetTP	GenericNetworkResourcesIRPSystem::AttributeTypes::MOReference	Read-Only, M

A.2.3.5 IOC M3UARouteNePart

Mapping from NRM IOC m3UARouteNePart attributes to SS equivalent MOC m3UARouteNePart attributes

NRM Attributes of IOC m3UARouteNePart in 32.742 [9]	SS Attributes	SS Type	Qualifier
m3UARouteNePartId	m3UARouteNePartId	string	Read-Only, M
m3UALinkSetTPId	m3UALinkSetTPId	unsigned long	Read-Only, M
fixedPriority	fixedPriority	STNNetworkResourcesIRPSystem::AttributeTypes::fixedPriorityType	Read-Only, M

A.2.3.6 Roles

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.

A.3 Solution Set definitions

A.3.1 IDL definition structure

Clause A.3.2 defines the types which are used by the STN NRM IRP.

Clause A.3.3 defines the MO classes for the STN NRM IRP.

A.3.2 IDL specification "STNNetworkResourcesIRPSystem.idl"

```
// File: STNNetworkResourcesIRPSystem.idl
#ifndef _STN_NETWORK_RESOURCES_IRP_SYSTEM_IDL_
#define _STN_NETWORK_RESOURCES_IRP_SYSTEM_IDL_
#pragma prefix "3gppsa5.org"
module STNNetworkResourcesIRPSystem
{
   /**
   *  This module adds datatype definitions for types
   *  used in the NRM which are not basic datatypes defined
   *  already in CORBA.
   */
   module AttributeTypes
   {
     enum NetworkIndicatorType
     {
       INTERNATIONAL,
       SPARE,
       NATIONAL,
       NATIONAL_SPARE
     };
     enum PointCodeLengthType
     {
       BITS_24,
       BITS_14
     };
     enum SPTypeType
     {
       SEP,
       STP,
       STEP
```

```
      };
      typedef unsigned long SLSType; // 0..15
      typedef sequence<SLSType,16> SLSListType;
      enum LinkStati
      {
        DEACTIVATED,
        FAILED,
        LOCAL_BLOCKED,
        REMOTE_BLOCKED,
        LOCAL_INHIBITED,
        REMOTE_INHIBITED
      };
      typedef sequence <LinkStati,6> LinkStatusType;
      enum SignLinkTypeType
      {
        ST_64K,
        ST_2M
      };
      enum m3UAEntityType
      {
        M3UA_AS,
        SG
      };
      enum m3UALinkTPStateType
      {
        UNESTABLISH,
        ESTABLISHED,
        INACTIVE,
        ACTIVE
      };
      enum AddrType
      {
        IPV4,
        IPV6
      };
      struct sCTPAssocAddrType
      {
        unsigned long portId;
        AddrType addrType;
        string IPaddr;
      };
      enum trafficModeType
      {
        OVERRIDE,
        LOAD_SHARE,
        BROADCAST
      };
     };
};
#endif // _STN_NETWORK_RESOURCES_IRP_SYSTEM_IDL_
```

A.3.3 IDL specification "STNNetworkResourcesIRPDefs.idl"

```
// File: STNNetworkResourcesIRPDefs.idl
#ifndef _STN_NETWORK_RESOURCES_IRP_DEFS_IDL_
#define _STN_NETWORK_RESOURCES_IRP_DEFS_IDL_

#include "GenericNetworkResourcesNRMDefs.idl"

#pragma prefix "3gppsa5.org"

/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module STNNetworkResourcesIRPDefs
{

 /**
       *  Definitions for MO class MtpSignPoint
       */
      interface MtpSignPoint: GenericNetworkResourcesNRMDefs::Top
      {
         const string CLASS = "MtpSignPoint";

         // Attribute Names
         //
```

```
      const string mtpSignPointId = "mtpSignPointId";
      const string pointCode = "pointCode";
      const string networkIndicator = "networkIndicator";
      const string pointCodeLength = "pointCodeLength";
      const string spType = "spType";
      const string userLabel = "userLabel";
   };

   /**
    *  Definitions for MO class SignLinkSetTp
    */
   interface SignLinkSetTp: GenericNetworkResourcesNRMDefs::Top
   {
      const string CLASS = "SignLinkSetTp";

      // Attribute Names
      //
           const string signLinkSetTpId = "signLinkSetTpId";
           const string adjPc = "adjPc";
           const string userLabel = "userLabel";
           const string maxCapacityLS = "maxCapacityLS";

   };


   /**
    *  Definitions for MO class SignLinkTp
    */
   interface SignLinkTp: GenericNetworkResourcesNRMDefs::Top
   {
      const string CLASS = "SignLinkTp";

      // Attribute Names
      //
      const string signLinkTpId = "signLinkTpId";
      const string slCode = "slCode";
      const string slsCodeNormalList = "slsCodeNormalList";
      const string slsCodeCurrentList = "slsCodeCurrentList";
      const string linkTpStatus = "linkTpStatus";
      const string maxCapacitySL = "maxCapacitySL";
      const string userLabel = "userLabel";
      const string signLinkType = "signLinkType";
   };

   /**
    *  Definitions for MO class SignRouteSetNePart
    */
   interface SignRouteSetNePart: GenericNetworkResourcesNRMDefs::Top
   {
      const string CLASS = "SignRouteSetNePart";

      // Attribute Names
      //
      const string signRouteSetNePartId = "signRouteSetNePartId";
      const string destinationPc = "destinationPc";
      const string userLabel = "userLabel";
      const string loadsharingInformationRouteSetNePart = "loadsharingInformationRouteSetNePart";
   };


   /**
    *  Definitions for abstract MO class SignRouteNePart
    *
    */
   interface SignRouteNePart: GenericNetworkResourcesNRMDefs::Top
   {
      const string CLASS = "SignRouteNePart";

      // Attribute Names
      //
      const string signRouteNePartId = "signRouteNePartId";
      const string signLinkSetTpPointer = "signLinkSetTpPointer";
      const string fixedPriority = "fixedPriority";
      const string userLabel = "userLabel";
   };
/**
    *  Definitions for MO class M3UAEntity
    *
```

```
       */
    interface M3UAEntity: GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "M3UAEntity";
         // Attribute Names
         //
         const string m3UAEntityId = "m3UAEntityId";
         const string m3UAEntityPointCode = "m3UAEntityPointCode";
         const string m3UAEntityType = "m3UAEntityType";
         const string networkIndicator = "networkIndicator";
         const string pointCodeLength = "pointCodeLength";
      };

      /**
       *  Definitions for MO class M3UALinkSetTp
       */
      interface M3UALinkSetTp: GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "M3UALinkSetTp";
         // Attribute Names
         //
          const string m3UALinkSetTPId = "m3UALinkSetTPId";
          const string adjPc = "adjPc";
          const string trafficMode = "trafficMode";
      };

      /**
       *  Definitions for MO class M3UALinkTp
       */
      interface M3UALinkTp: GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "M3UALinkTp";
         // Attribute Names
         //
         const string m3UALinkTpId = "m3UALinkTpId";
         const string m3UALinkTPState = "m3UALinkTPState";
         const string sCTPAssocLocalAddr = "sCTPAssocLocalAddr";
         const string sCTPAssocRemoteAddr = "sCTPAssocRemoteAddr";
      };
      /**
       *  Definitions for MO class M3UARouteSetNePart
       */
      interface M3UARouteSetNePart: GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "M3UARouteSetNePart";

         // Attribute Names
         const string m3UARouteSetNePartId = "m3UARouteSetNePartId";
         const string destinationPc = "destinationPc";
         const string m3UARouteNePartm3UALinkSetTP = "m3UARouteNePartm3UALinkSetTP";
      };

      /**
       *  Definitions for abstract MO class M3UARouteNePart
       *
       */
      interface M3UARouteNePart: GenericNetworkResourcesNRMDefs::ManagedFunction
      {
         const string CLASS = "M3UARouteNePart";
         // Attribute Names
         //
         const string m3UARouteNePartId = "m3UARouteNePartId";
         const string m3UALinkSetTPId = "m3UALinkSetTPId";
         const string fixedPriority = "fixedPriority";
      };
};
#endif // _STN_NETWORK_RESOURCES_IRP_DEFS_IDL_
```

Annex B (normative): XML Definitions

This annex contains the XML Definitions for the Generic NRM IRP as it applies to Itf-N, in accordance with STN NRM IRP Information Service (TS 32.742 [9]).

B.1 Architectural features

The overall architectural feature of STN IRP is specified in 3GPP TS 32.742 [9].
This clause specifies features that are specific to the Schema definitions.

B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [10].

B.2 Mapping

B.2.1 General mapping

An IOC maps to an XML element of the same name as the IOC's name in the IS. An IOC attribute maps to a sub-element of the corresponding IOC's XML element, and the name of this sub-element is the same as the attribute's name in the IS.

B.2.2 Information Object Class (IOC) mapping

Not present in the current version of this specification.

B.3 Solution Set definitions

B.3.1 XML definition structure

The overall description of the file format of configuration data XML files is provided by 3GPP TS 32.616 [3].

Annex B.3.3 defines the NRM-specific XML schema `stnNrm.xsd` for the STN Network Resources IRP NRM defined in 3GPP TS 32.742 [9].

XML schema `stnNrm.xsd` explicitly declares NRM-specific XML element types for the related NRM.

The definition of those NRM-specific XML element types complies with the generic mapping rules defined in 3GPP TS 32.616 [3].

B.3.2 Graphical Representation

Not present in the current version of this specification.

B.3.3 XML schema "`stnNrm.xsd`"

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<!--
  3GPP TS 32.746 STN Network Resources IRP
  Bulk CM Configuration data file NRM-specific XML schema
  stnNrm.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.746#stnNrm"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:xn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.626#genericNrm"
  xmlns:stn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.746#stnNrm"
>
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.626#genericNrm"
  />

  <!-- STN Network Resources IRP NRM attribute related XML types -->

  <simpleType name="networkIndicator">
    <restriction base="string">
      <enumeration value="International"/>
      <enumeration value="Spare"/>
      <enumeration value="National"/>
      <enumeration value="NationalSpare"/>
    </restriction>
  </simpleType>

  <simpleType name="pointCodeLength">
    <restriction base="string">
      <enumeration value="BITS_24"/>
      <enumeration value="BITS_14"/>
    </restriction>
  </simpleType>

  <simpleType name="spType">
    <restriction base="string">
      <enumeration value="SEP"/>
      <enumeration value="STP"/>
      <enumeration value="STEP"/>
    </restriction>
  </simpleType>

  <complexType name="slsCodeList">
    <sequence>
      <element name="slsCode" minOccurs="0" maxOccurs="16">
        <simpleType>
          <restriction base="integer">
            <minInclusive value="0"/>
            <maxInclusive value="15"/>
          </restriction>
        </simpleType>
      </element>
    </sequence>
  </complexType>

  <simpleType name="linkTpStatusElementType">
    <restriction base="string">
      <enumeration value="deactivated"/>
      <enumeration value="failed"/>
      <enumeration value="localBlocked"/>
      <enumeration value="remoteBlocked"/>
      <enumeration value="localInhibited"/>
      <enumeration value="remoteInhibited"/>
    </restriction>
  </simpleType>
  <complexType name="linkTpStatusType">
    <sequence minOccurs="0" maxOccurs="6">
      <element name="linkTpStatusElement" type="stn:linkTpStatusElementType"/>
    </sequence>
  </complexType>
  <simpleType name="signLinkType">
    <restriction base="string">
      <enumeration value="ST_64K"/>
```

```
      <enumeration value="ST_2M"/>
    </restriction>
  </simpleType>
  <simpleType name="m3UAEntityTypeType">
    <restriction base="string">
      <enumeration value="M3UA_AS"/>
      <enumeration value="SG"/>
    </restriction>
  </simpleType>
  <simpleType name="m3UALinkTPStateType">
   <restriction base="string">
      <enumeration value="UNESTABLISH"/>
      <enumeration value="ESTABLISHED"/>
      <enumeration value="INACTIVE"/>
      <enumeration value="ACTIVE"/>
    </restriction>
  </simpleType>
  <simpleType name="IPAddrTypeType">
   <restriction base="string">
      <enumeration value="IPv4"/>
      <enumeration value="IPv6"/>
    </restriction>
  </simpleType>
  <complexType name="sCTPAssocAddrType">
    <sequence minOccurs="0" maxOccurs="unbounded">
      <element name="IPAddrType" type="stn:IPAddrTypeType"/>
      <element name="IPAddr" type="string"/>
    </sequence>
  </complexType>
  <simpleType name="trafficModeType">
    <restriction base="string">
      <enumeration value="Override"/>
      <enumeration value="LoadShare"/>
      <enumeration value="Broadcast"/>
    </restriction>
  </simpleType>
<!-- STN Network Resources IRP NRM class associated XML elements -->

  <element name="MtpSignPoint" substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
                <all>
                  <element name="pointCode" type="unsignedLong"/>
                  <element name="networkIndicator" type="stn:networkIndicator"/>
                  <element name="pointCodeLength" type="stn:pointCodeLength"/>
                  <element name="spType" type="stn:spType"/>
                  <element name="userLabel" type="string"/>
                </all>
              </complexType>
            </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="stn:SignLinkSetTp"/>
              <element ref="stn:SignRouteSetNePart"/>
              <element ref="xn:VsDataContainer"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <element name="SignLinkSetTp">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
                <all>
                  <element name="adjPc" type="unsignedLong"/>
                  <element name="userLabel" type="string"/>
                  <element name="maxCapacityLS" type="float"/>
                </all>
              </complexType>
```

```
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="stn:SignLinkTp"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="SignLinkTp">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="slCode" type="integer"/>
                <element name="slsCodeNormalList" type="stn:slsCodeList" minOccurs="0"/>
                <element name="slsCodeCurrentList" type="stn:slsCodeList"/>
                <element name="linkTpStatus" type="stn:linkTpStatusType"/>
                <element name="maxCapacitySL" type="integer"/>
                <element name="userLabel" type="string"/>
                <element name="signLinkType" type="stn:signLinkType"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>
<element name="SignRouteSetNePart">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="destinationPc" type="unsignedLong"/>
                <element name="userLabel" type="string"/>
                <element name="loadsharingInformationRouteSetNePart" type="string"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="stn:SignRouteNePart"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="SignRouteNePart">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="signLinkSetTpPointer" type="xn:dn"/>
                <element name="fixedPriority" type="unsignedLong"/>
                <element name="userLabel" type="string"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
```

```
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>
<!-- M3UA Network Resources IRP NRM class associated XML elements -->
  <element name="M3UAEntity" substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
          <sequence>
            <element name="m3UAEntityPointCode" type="unsignedLong"/>
            <element name="m3UAEntityType" type="stn:m3UAEntityTypeType"/>
            <element name="networkIndicator" type="stn:networkIndicator"/>
            <element name="pointCodeLength" type="stn:pointCodeLength"/>
            <element name="userLabel" type="string"/>
           </sequence>
              </complexType>
                        </element>
                        <choice minOccurs="0" maxOccurs="unbounded">
                            <element ref="stn:M3UALinkSetTp"/>
                            <element ref="stn:M3UALinkTp"/>
                            <element ref="stn:M3UARouteSetNePart"/>
                            <element ref="stn:M3UARouteNePart"/>
                            <element ref="xn:VsDataContainer"/>
                        </choice>
                    </sequence>
                </extension>
            </complexContent>
        </complexType>
    </element>
    <element name="M3UALinkSetTp">
        <complexType>
            <complexContent>
                <extension base="xn:NrmClass">
                    <sequence>
                        <element name="attributes" minOccurs="0">
                            <complexType>
                                <all>
                                    <element name="adjPc" type="unsignedLong"/>
                                    <element name="trafficMode" type="stn:trafficModeType"/>
                                    <element name="userLabel" type="string"/>
                                </all>
                            </complexType>
                        </element>
                        <choice minOccurs="0" maxOccurs="unbounded">
                            <element ref="stn:M3UALinkTp"/>
                            <element ref="xn:VsDataContainer"/>
                        </choice>
                    </sequence>
                </extension>
            </complexContent>
        </complexType>
    </element>
    <element name="M3UALinkTp">
        <complexType>
            <complexContent>
                <extension base="xn:NrmClass">
                    <sequence>
                        <element name="attributes" minOccurs="0">
                            <complexType>
                                <all>
                                    <element name="m3UALinkTPState" type="stn:m3UALinkTPStateType"
/>
                                    <element name="sCTPAssocLocalAddr" type="stn:sCTPAssocAddrType"
/>
                                    <element name="sCTPAssocRemoteAddr" type="stn:sCTPAssocAddrType"
minOccurs="0"/>
                                    <element name="userLabel" type="string"/>
                                </all>
                            </complexType>
                        </element>
                        <choice minOccurs="0" maxOccurs="unbounded">
                            <element ref="xn:VsDataContainer"/>
                        </choice>
```

```
                    </sequence>
                </extension>
            </complexContent>
        </complexType>
    </element>
    <element name="M3UARouteSetNePart">
        <complexType>
            <complexContent>
                <extension base="xn:NrmClass">
                    <sequence>
                        <element name="attributes" minOccurs="0">
                            <complexType>
                                <all>
                                    <element name="destinationPc" type="unsignedLong"/>
                                    <element name="m3UARouteNePartm3UALinkSetTP" type="xn:dn"/>
                                    <element name="userLabel" type="string"/>
                                </all>
                            </complexType>
                        </element>
                        <choice minOccurs="0" maxOccurs="unbounded">
                            <element ref="stn:M3UARouteNePart"/>
                            <element ref="xn:VsDataContainer"/>
                        </choice>
                    </sequence>
                </extension>
            </complexContent>
        </complexType>
    </element>
    <element name="M3UARouteNePart">
        <complexType>
            <complexContent>
                <extension base="xn:NrmClass">
                    <sequence>
                        <element name="attributes" minOccurs="0">
                            <complexType>
                                <all>
                                    <element name="m3UALinkSetTPId" type="string"/>
                                    <element name="fixedPriority" type="unsignedLong"/>
                                    <element name="userLabel" type="string"/>
                                </all>
                            </complexType>
                        </element>
                        <choice minOccurs="0" maxOccurs="unbounded">
                            <element ref="xn:VsDataContainer"/>
                        </choice>
                    </sequence>
                </extension>
            </complexContent>
        </complexType>
    </element>
</schema>
```

Annex C (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Cat**	**Old**	**New**
05-2010	SA-48	SP-100279	--	--	Presentation to SA for information and approval	--	--	1.0.0
06-2010	SA-48	--	--	--	Publication	--	1.0.0	10.0.0
10-2010	SA-49	SP-100489	001	--	Correction of STN NRM IRP XML Definitions	F	10.0.0	10.1.0

History

Document history		
V10.1.0	May 2011	Publication