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Contents

Foreword

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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; as identified below:

28.624 State Management Data Definition Integration Reference Point (IRP); Requirements

28.625 State Management Data Definition Integration Reference Point (IRP); Information Service (IS)

28.626 State Management Data Definition Integration Reference Point (IRP); Solution Set (SS) definitions

1 Scope

The present document specifies the Solution Set (SS) definitions for the IRP whose semantics is specified in State Management Data Definition IRP: Information Service (IS) (3GPP TS 28.625 [2]).

This Solution Set definitions specification is related to 3GPP TS 28.625 V11.0.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.
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[1] 3GPP TS 28.623: “Generic Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions”.

[2] 3GPP TS 28.625: "Telecommunication management; State Management Data Definition Integration Reference Point (IRP): Information Service (IS)".

[3] ITU-T Recommendation X.721: "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[4] ITU-T Recommendation M.3100: "Generic network information model".

[5] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Information Service (IS)".

[6] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Solution Set (SS) definitions".

[7] W3C REC-xml11-20060816: "Extensible Markup Language (XML) 1.1 (Second Edition)".

[8] Void.

[9] W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures..

[10] W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.

[11] W3C REC-xml-names-20060816: "Namespaces in XML 1.1 (Second Edition)".

[12] ITU-T Recommendation X.721: "Information technology - Open Systems Interconnection - Structure of management information: Definition of management information".

[13] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions defined in 3GPP TS 32.672 [2] apply, and the following XML terms and definitions apply:

XML file: See definition of [1].

XML document: See definition of [1].

XML declaration: See definition of [1].

XML element: See definition of [1].

empty XML element: See definition of [1].

XML content (of an XML element): See definition of [1].

XML start-tag: See definition of [1].

XML end-tag: See definition of [1].

XML empty-element tag: See definition of [1].

XML attribute specification: See definition of [1].

DTD: See definition of [1].

XML schema: See definition of [1].

XML namespace: See definition of [1].

XML complex type: See definition of [1].

XML element type: See definition of [1].

3.2 Abbreviations

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

CM	Configuration Management
CORBA	Common Object Request Broker Architecture
DTD	Document Type Definition
EDGE	Enhanced Data for GSM Evolution
GERAN	GSM/EDGE Radio Access Network
GSM	Global System for Mobile communication
IDL	Interface Definition Language
IOC	Information Object Class
IRP	Integration Reference Point
IS	Information Service
NE	Network Element
NRM	Network Resource Model
OMG	Object Management Group
SS	Solution Set
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 State Management Data Definition IRP Solution Set definitions:

- 3GPP State Management Data Definition IRP CORBA SS (Annex A)
- 3GPP State Management Data Definition IRP XML definitions (Annex B)

Annex A (normative): CORBA Solution Set

A.1 Architectural Features

The overall architectural feature of State Management Data Definition IRP is specified in 3GPP TS 28.625 [2].

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 [13].

A.2 Mapping

A.2.1 General mapping

None.

A.2.2 Information Object Class (IOC) mapping

Table 1 provides the mapping of the information object classes defined in the IS of the State Management IRP [2] to the equivalent of this CORBA Solution Set.

Table 1: Mapping of IOCs

IOCs defined in State Management Data Definition IRP IS [2]	CORBA SS Method
StateManagementEntity	No mapping applicable for this <<Archetype>> class.

Table 2: Mapping of Attributes

Attributes defined in State Management Data Definition IRP IS [2]	CORBA SS Method attributes	Qualifier
operationalState	OperationalState (ITU-T Recommendation X.721 [3])	M
operationalState	OperationalStateTypeOpt (ITU-T Recommendation X.721 [3])	O
usageState	UsageState (ITU-T Recommandation X.721 [3])	M
usageState	UsageStateTypeOpt (ITU-T Recommandation X.721 [3])	O
administrativeState	AdministrativeState (ITU-T Recommandation X.721 [3])	M
administrativeState	AdministrativeStateTypeOpt (ITU-T Recommandation X.721 [3])	O
alarmStatus	AlarmStatus (ITU-T Recommandation M.3100 [4])	M
alarmStatus	AlarmStatusTypeOpt (ITU-T Recommendation M.3100 [4])	O
proceduralStatus	ProceduralStatus (ITU-T Recommendation X.721 [3])	M
proceduralStatus	ProceduralStatusTypeOpt (ITU-T Recommendation X.721 [3])	O
availabilityStatus	AvailabilityStatus (ITU-T Recommandation X.721 [3])	M
availabilityStatus	AvailabilityStatusTypeOpt (ITU-T Recommandation X.721 [3])	O
controlStatus	ControlStatus (ITU-T Recommandation X.721 [3])	M
controlStatus	ControlStatusTypeOpt (ITU-T Recommandation X.721 [3])	O
standbyStatus	StandbyStatus (ITU-T Recommandation X.721 [3])	M
standbyStatus	StandbyStatusTypeOpt (ITU-T Recommandation X.721 [3])	O
unknownStatus	UnknownStatus (ITU-T Recommendation X.721 [3])	M
unknownStatus	UnknownStatusTypeOpt (ITU-T Recommendation X.721 [3])	O

A.3 Solution Set definitions

A.3.1 IDL definition structure

Clause A.3.2 contains const definitions for State Management Data Definition IRP.

Clause A.3.3 contains commonly used optional definitions for State Management Data Definition IRP.

Clause A.3.4 contains commonly used definitions for State Management Data Definition IRP.

A.3.2 IDL specification “StateManagementIRPConstDefs.idl”

```
//File:- StateManagementIRPConstDefs.idl
#ifndef _STATE_MANAGEMENT_IRP_CONST_DEFS_IDL_
#define _STATE_MANAGEMENT_IRP_CONST_DEFS_IDL_

#include "CosNotification.idl"
#include "ManagedGenericIRPConstDefs.idl"
#include <StateManagementIRPCommonConstDefs.idl>
#include <StateManagementIRPOptConstDefs.idl>

// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"

/* ## Module: StateManagementIRPConstDefs
This module contains commonly used definitions for State Management IRP
=========================================================================
*/
module StateManagementIRPConstDefs
{
/*
  Constant definitions for state management notifications uses when populating the
  Cos::Structured event.
  The "name" party of the structured event carries the following constant definitions
  appropriate to the state being notified.
  Refer to TS 32.666 regarding how to populate the structured event
*/
   interface AttributeNameValue {
      const string OPERATIONAL_STATE    = "operationalState";
      const string USAGE_STATE          = "usageState";
      const string ADMINISTRATIVE_STATE = "administrativeState";
      const string ALARM_STATUS         = "alarmStatus";
      const string PROCEDURAL_STATUS    = "proceduralStatus";
      const string AVAILABILITY_STATUS  = "availabilityStatus";
      const string CONTROL_STATUS       = "controlStatus";
      const string STANDBY_STATUS       = "standbyStatus";
      const string UNKNOWN_STATUS       = "unknownStatus";
   };


/*
   The following structures provide the new state value,
   and the optional old state value
   The structures are passed in the value part of the cos structured event
*/
   struct OperationalStateOldNewValue{
      StateManagementIRPCommonConstDefs::OperationalState new;
      StateManagementIRPOptConstDefs::OperationalStateTypeOpt old;
   };


   struct UsageStateOldNewValue{
      StateManagementIRPCommonConstDefs::UsageState new;
      StateManagementIRPOptConstDefs::UsageStateTypeOpt old;
   };


   struct AdministrativeStateOldNewValue{
      StateManagementIRPCommonConstDefs::AdministrativeState new;
      StateManagementIRPOptConstDefs::AdministrativeStateTypeOpt old;
   };


   struct AlarmStatusOldNewValue{
      StateManagementIRPCommonConstDefs::AlarmStatus new;
      StateManagementIRPOptConstDefs::AlarmStatusTypeOpt old;
   };


   struct ProceduralStatusOldNewValue{
      StateManagementIRPCommonConstDefs::ProceduralStatusValues new;
      StateManagementIRPOptConstDefs::ProceduralStatusTypeOpt old;
   };


   struct AvailabilityStatusOldNewValue{
```

```
      StateManagementIRPCommonConstDefs::AvailabilityStatusValues new;
      StateManagementIRPOptConstDefs:: AvailabilityStatusTypeOpt old;
   };


   struct ControlStatusOldNewValue{
      StateManagementIRPCommonConstDefs::ControlStatusValues new;
      StateManagementIRPOptConstDefs::ControlStatusTypeOpt old;
   };


   struct StandbyStatusOldNewValue{
      StateManagementIRPCommonConstDefs::StandbyStatus new;
      StateManagementIRPOptConstDefs::StandbyStatusTypeOpt old;
   };


   struct UnknownStatusOldNewValue{
      StateManagementIRPCommonConstDefs::UnknownStatus new;
      StateManagementIRPOptConstDefs::UnknownStatusTypeOpt old;
   };


};
#endif // _STATE_MANAGEMENT_IRP_CONST_DEFS_IDL_
```

A.3.3 IDL specification “StateManagementIRPOptConstDefs.idl”

```
//File:-StateManagementIRPOptConstDefs.idl
#ifndef _STATE_MANAGEMENT_IRP_OPT_CONST_DEFS_IDL_
#define _STATE_MANAGEMENT_IRP_OPT_CONST_DEFS_IDL_

#include "CosNotification.idl"
#include "ManagedGenericIRPConstDefs.idl"
#include "StateManagementIRPCommonConstDefs.idl"
// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"

/* ## Module: StateManagementIRPOptConstDefs
This module contains commonly used optional definitions for State Management IRP
================================================================================
*/
module StateManagementIRPOptConstDefs
{

   /*
   Definition of Operational State based on X.721 [3], if optional.
   */
   union OperationalStateTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::OperationalState operational_state;
   };

   /*
   Definition of Usage State based on X.721 [3], if optional.
   */
   union UsageStateTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::UsageState usage_state;
   };

   /*
   Definition of Administrative State based on X.721 [3], if optional.
   */
   union AdministrativeStateTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::AdministrativeState administrative_state;
   };

   /*
   Definition of Alarm Status based on M.3100 [4], if optional.
   */
   union AlarmStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::AlarmStatus alarm_status;
   };

   /*
   Definition of Procedural Status based on X.721 [3], if optional.
   */
   union ProceduralStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::ProceduralStatus procedural_status;
   };

   /*
   Definition of Availability Status based on X.721 [3], if optional.
   */
   union AvailabilityStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::AvailabilityStatus availability_status;
   };

   /*
   Definition of Control Status based on X.721 [3], if optional.
   */
   union ControlStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::ControlStatus control_status;
   };

   /*
```

```
   Definition of Standby Status based on X.721 [3], if optional.
   */
   union StandbyStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::StandbyStatus standby_status;
   };

   /*
   Definition of Unknown Status based on X.721 [3], if optional.
   */
   union UnknownStatusTypeOpt switch(boolean)
   {
      case TRUE: StateManagementIRPCommonConstDefs::UnknownStatus unknown_status;
   };

};
#endif // _STATE_MANAGEMENT_IRP_OPT_CONST_DEFS_IDL_
```

A.3.4 IDL specification "StateManagementIRPCommonConstDefs.idl"

```
//File: StateManagementIRPCommonConstDefs.idl
#ifndef _STATE_MANAGEMENT_IRP_COMMON_CONST_DEFS_IDL_
#define _STATE_MANAGEMENT_IRP_COMMON_CONST_DEFS_IDL_

// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"

/* Module: StateManagementIRPCommonConstDefs
This module contains commonly used definitions for State Management IRP
=========================================================================
*/
module StateManagementIRPCommonConstDefs
{
   /*
   Definition of Operational State based on X.721 [3], if mandatory.
   */
   enum OperationalState
   {
      Disabled, Enabled
   };

   /*
   Definition of Usage State based on X.721 [3], if mandatory.
   */
   enum UsageState
   {
      Idle, Active, Busy
   };

   /*
   Definition of Administrative State based on X.721 [3], if mandatory.
   */
   enum AdministrativeState
   {
      Locked, Unlocked, ShuttingDown
   };

   /*
   Definition of Alarm Status based on M.3100 [4], if mandatory.
   */
   enum AlarmStatus
   {
      CLEARED, INDETERMINATE, WARNING, MINOR, MAJOR, CRITICAL
   };

   /*
   Definition of Procedural Status based on X.721 [3], if mandatory.
   */
   enum ProceduralStatusValues
   {
      InitializationRequired, NotInitialized, Initializing, Reporting,
      Terminating
   };
   typedef sequence <ProceduralStatusValues,5> ProceduralStatus;

   /*
   Definition of Availability Status based on X.721 [3], if mandatory.
   */
   enum AvailabilityStatusValues
   {
      InTest, Failed, PowerOff, OffLine, OffDuty, Dependency, Degraded,
      NotInstalled, LogFull
   };
   typedef sequence <AvailabilityStatusValues,9> AvailabilityStatus;

   /*
   Definition of Control Status based on X.721 [3], if mandatory.
   */
   enum ControlStatusValues
   {
      SubjectToTest, PartOfServicesLocked, ReservedForTest, Suspended
   };
```

```
   typedef sequence <ControlStatusValues,4> ControlStatus;

   /*
   Definition of Standby Status based on X.721 [3], if mandatory.
   */
   enum StandbyStatus
   {
      HotStandby, ColdStandby, ProvidingService
   };

   /*
   Definition of Unknown Status based on X.721 [3], if mandatory
   (if switch is TRUE then value equal to TRUE implies "unknown status").
   */
   union UnknownStatus switch(boolean)
   {
      case TRUE: boolean value;
   };

};
#endif //_STATE_MANAGEMENT_IRP_COMMON_CONST_DEFS_IDL_
```

Annex B (normative): XML definitions

This annex specifies the XML file format definition for the Bulk Configuration Management IRP IS [5] for the IRP whose semantics is specified in State Management Data Definition IRP: Information Service (IS) (3GPP TS 28.625 [2]).

The XML file formats are based on XML [7], XML Schema [9][10]and XML Namespace [11] standards.

B.1 Architectural features

The overall architectural feature of State Management IRP is specified in 3GPP TS 28.625 [2].

This clause specifies features that are specific to the XML Schema definitions.

B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [5].

B.2 Mapping

The mapping is 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 [6].

Clause B.3.2 defines the XML schema `stateManagementIRP.xsd` for the State Management IRP: Information Service (IS) defined in 3GPP TS 28.625 [2].

The definition of the XML element types complies with the generic mapping rules defined in 3GPP TS 32.616 [6].

B.3.2 XML schema "stateManagementIRP.xsd"

```
<?xml version="1.1" encoding="UTF-8"?>
<!--
  3GPP TS 28.626 State Management IRP
  Bulk CM Configuration data file XML schema
  stateManagementIRP.xsd
-->
<schema
  targetNamespace=
    "http://www.3gpp.org/ftp/specs/archive/28_series/28.626#stateManagementIRP"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:sm=
    "http://www.3gpp.org/ftp/specs/archive/28_series/28.626#stateManagementIRP"
>
  <!-- State Management IRP related XML types -->
  <simpleType name="operationalStateType">
    <restriction base="string">
      <enumeration value="enabled"/>
      <enumeration value="disabled"/>
    </restriction>
  </simpleType>
  <simpleType name="usageStateType">
    <restriction base="string">
      <enumeration value="idle"/>
      <enumeration value="active"/>
      <enumeration value="busy"/>
    </restriction>
  </simpleType>
  <simpleType name="administrativeStateType">
    <restriction base="string">
      <enumeration value="locked"/>
      <enumeration value="unlocked"/>
      <enumeration value="shuttingDown"/>
    </restriction>
  </simpleType>
  <simpleType name="alarmStatusType">
    <restriction base="string">
      <enumeration value="cleared"/>
      <enumeration value="indeterminate"/>
      <enumeration value="warning"/>
      <enumeration value="minor"/>
      <enumeration value="major"/>
      <enumeration value="critical"/>
    </restriction>
  </simpleType>
  <simpleType name="proceduralStatusElementType">
    <restriction base="string">
      <enumeration value="initializationRequired"/>
      <enumeration value="notInitialized "/>
      <enumeration value="initializing"/>
      <enumeration value="reporting"/>
      <enumeration value="terminating"/>
    </restriction>
  </simpleType>
  <complexType name="proceduralStatusType">
    <sequence minOccurs="0" maxOccurs="5">
      <element name="proceduralStatusElement" type="sm:proceduralStatusElementType"/>
    </sequence>
  </complexType>
  <simpleType name="availabilityStatusElementType">
    <restriction base="string">
      <enumeration value="inTest"/>
      <enumeration value="failed"/>
      <enumeration value="powerOff"/>
      <enumeration value="offLine"/>
      <enumeration value="offDuty"/>
      <enumeration value="dependency"/>
      <enumeration value="degraded"/>
      <enumeration value="notInstalled"/>
      <enumeration value="logFull"/>
    </restriction>
  </simpleType>
  <complexType name="availabilityStatusType">
    <sequence minOccurs="0" maxOccurs="9">
```

```
      <element name="availabilityStatusElement" type="sm:availabilityStatusElementType"/>
    </sequence>
  </complexType>
  <simpleType name="controlStatusElementType">
    <restriction base="string">
      <enumeration value="subjectToTest"/>
      <enumeration value="partOfServicesLocked"/>
      <enumeration value="reservedForTest"/>
      <enumeration value="suspended"/>
    </restriction>
  </simpleType>
  <complexType name="controlStatusType">
    <sequence minOccurs="0" maxOccurs="4">
      <element name="controlStatusElement" type="sm:controlStatusElementType"/>
    </sequence>
  </complexType>
  <simpleType name="standbyStatusType">
    <restriction base="string">
      <enumeration value="hotStandby"/>
      <enumeration value="coldStandby"/>
      <enumeration value="providingService"/>
    </restriction>
  </simpleType>
  <simpleType name="unknownStatusType">
    <restriction base="boolean">
      <pattern value="true"/>
      <pattern value="false"/>
    </restriction>
  </simpleType>
  <element name="operationalState" type="sm:operationalStateType"/>
  <element name="usageState" type="sm:usageStateType"/>
  <element name="administrativeState" type="sm:administrativeStateType"/>
  <element name="alarmStatus" type="sm:alarmStatusType"/>
  <element name="proceduralStatus" type="sm:proceduralStatusType"/>
  <element name="availabilityStatus" type="sm:availabilityStatusType"/>
  <element name="controlStatus" type="sm:controlStatusType"/>
  <element name="standbyStatus" type="sm:standbyStatusType"/>
  <element name="unknownStatus" type="sm:unknownStatusType"/>
</schema>
```

Annex C (Informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2014-06	SA#64	SP-140332	001	-	upgrade XSD	11.0.0	11.1.0
		SP-140358	002	-	remove the feature support statements		

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