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# 中华人民共和国通信行业标准

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## 2GHz TD-SCDMA 数字蜂窝移动通信网 多媒体广播系统(TD-MBMS) 网络管理技术要求 (第一阶段) 第 3 部分: 基于 CORBA 技术的 网络资源模型设计

2GHz TD-SCDMA digital cellular mobile telecommunication network  
TD-MBMS management technical requirement (Phase 1)  
Part 3: CORBA-based network resource model design

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## 目 次

前 言	II
1 范围	1
2 规范性引用文件	1
3 术语、定义和缩略语	1
3.1 缩略语	1
4 配置网络资源模型设计	2
4.1 通用配置资源模型的 IDL 定义	2
4.2 无线接入网网络资源模型的 IDL 定义	2
4.3 核心网网络资源模型的 IDL 定义	16
5 性能网络资源模型设计	38
5.1 性能管理资源模型的 IDL 定义	38
5.2 数据类型的 IDL 定义	62
6 性能管理接口功能相关的文件	75
6.1 性能测量数据文件的 Schema 定义<measCollec.xsd>	75
6.2 性能测量数据文件的 XML header 定义	91
参考文献	91

## 前 言

《2GHz TD-SCDMA 数字蜂窝移动通信网多媒体广播系统 (TD-MBMS) 网络管理技术要求 (第一阶段)》共分 3 个部分:

- 第 1 部分: 配置网络资源模型;
- 第 2 部分: 性能网络资源模型;
- 第 3 部分: 基于 CORBA 技术的网络资源模型设计。

本部分是第 3 部分。

本部分由中国通信标准化协会提出并归口。

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广东省网络空间安全协会受控资料

# 2GHz TD-SCDMA数字蜂窝移动通信网多媒体广播系统 (TD-MBMS) 网络管理技术要求 (第一阶段) 第3部分: 基于CORBA技术的网络资源模型设计

## 1 范围

本部分规定了2GHz TD-SCDMA数字蜂窝移动通信网多媒体广播系统(TD-MBMS)网络管理接口中采用TD-SCDMA技术的网络资源模型的IDL定义。

本部分适用于2GHz TD-SCDMA数字蜂窝移动通信网多媒体广播系统(TD-MBMS)的网络管理。

## 2 规范性引用文件

下列文件中的条款通过本部分的引用而成为本部分的条款。凡是注日期的引用文件,其随后所有的修改单(不包括勘误的内容)或修订版均不适用于本部分。然而,鼓励根据本部分达成协议的各方研究是否可使用这些文件的最新版本。凡是不注日期的引用文件,其最新版本适用于本部分。

YD/T 1585.3-2006 《2GHz TD-SCDMA数字蜂窝移动通信网网络管理技术要求(第二阶段) 第3部分 基于CORBA技术的网络资源模型设计》。

YD/T 1586.3-2006 《2GHz WCDMA数字蜂窝移动通信网网络管理技术要求(第一阶段) 第3部分 基于CORBA技术的网络资源模型设计》。

## 3 术语、定义和缩略语

### 3.1 缩略语

下列缩略语适用于本部分。

IDL	Interface Definition Language	接口定义语言
CORBA	Common Object Request Broker Architecture	公共对象请求代理体系
NRM	Network Resource Model	网络资源模型
AUC	Authentication Center	鉴权中心
BSC	Base Station Controller	基站控制器
DN	Distinguished Name	可识别名
EIR	Equipment Identity Register	设备身份寄存器
HLR	Home Location Register	归属位置寄存器
MIT	Management Information Tree	管理信息树
MO	Managed Object	管理对象
MOC	Managed Object Class	管理对象类
MOI	Managed Object Instance	管理对象实例
MSC	Mobile Switching Center	移动交换中心
NMS	Network Management System	网络管理系统
STP	Singalling Transfer Point	信令转接点
VLR	Visiting Location Register	拜访位置寄存器

TD-SCDMA	Time Division Synchronous CDMA	时分同步 CDMA
TD-MBMS	TD-SCDMA Multimedia Broadcasting	TD-SCDMA 多媒体广播业务
MBMS	Multimedia Broadcast Multicast Service	多媒体广播组播业务

#### 4 配置网络资源模型设计

注：配置网络资源模型设计中有3类idl文件,这3类文档及其用途如下：

1) xxxNRMDefs.idl, 包括GenericNRMDefs.idl、IMDataDefs.idl、UtranNRMDefs.idl和CoreNRMDefs.idl, 用来定义配置网络资源对象及其属性名称；

2) xxxNRMSystem.idl, 包括GenericNRMSystem.idl、UtranNRMSystem.idl和CoreNRMSystem.idl, 用来定义配置网络资源对象的属性使用的数据类型；

3) xxxNRMPProfile.idl, 包括GenericNRMPProfile.idl、IMDataProfile.idl、UtranNRMPProfile.idl和CoreNRMPProfile.idl, 只是用来描述配置网络资源对象的属性名称及其数据类型的对应关系，实现时并不使用此类idl文件。

##### 4.1 通用配置资源模型的 IDL 定义

见YD/T 1586.3-2006第4.1节中的通用配置资源模型的IDL定义。

##### 4.2 无线接入网网络资源模型的 IDL 定义

见YD/T 1585.3-2006第4.2节中的无线接入网网络资源模型的IDL定义。

###### 4.2.1 UtranNRMDefs

```
//File "UtranNRMDefs.idl"
//The IRP document version number is "UTRAN NRM V1.0"
#ifndef UtranNRMDefs_idl
#define UtranNRMDefs_idl

#include "GenericNRMDefs.idl"

#pragma prefix "3gppsa5.org"

/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module UtranNRMDefs
{
    //Definitions for MO class RncFunction
    interface RncFunction : GenericNRMDefs::ManagedFunction
    {
        const string CLASS = "RncFunction";

        // including all Attribute Names from
        // MO Class GenericNRMDefs::ManagedFunction
    }
}

```

```

// additional Attribute Names is as follows.
//
const string rncFunctionId = "rncFunctionId";
const string rncId = "rncId";
const string mnc = "mnc";
const string mcc = "mcc";
const string maxMbmsContext="maxMbmsContext";
};

//Definitions for MO class NodeBFunction
interface NodeBFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "NodeBFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string nodeBFunctionId = "nodeBFunctionId";
    const string relatedIubLink = "relatedIubLink";
};

//Definitions for MO class IubLink
interface IubLink : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "IubLink";

    // Attribute Names
    //
    const string iubLinkId = "iubLinkId";
    const string relatedNodeB = "relatedNodeB";
    const string relatedUtranCells = "relatedUtranCells";
    const string relatedUtranTDDMCells = "relatedUtranTDDMCells";
};

//Definitions for MO class UtranCell
interface UtranCell : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "UtranCell";

    // Attribute Names
    //

```

```

const string utranCellId = "utranCellId";
const string cId= "cId";
const string localCellId= "localCellId";
const string cellMode ="cellMode";
const string maximumTransmissionPower = "maximumTransmissionPower";
const string uarfcn = "uarfcn";
const string cellParameterId = "cellParameterId";
const string primaryCcpchPower = "primaryCcpchPower";
const string dwPchPower = "dwPchPower";
const string timeSlotList = "timeSlotList";
const string lac = "lac";
const string rac = "rac";
const string sac = "sac";
const string uraList = "uraList";
        const string relatedIubLink = "relatedIubLink";
};
//Definitions for MO class Carrier
interface Carrier : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "Carrier";
    //Attribute Names
    const string carrierId = "carrierId";
    const string uarfcnType = "uarfcnType";
    const string uarfcn = "uarfcn";
    const string timeSlotList = "timeSlotList";
    const string mbmsFlag = "mbmsFlag";
    const string mbmsState = "mbmsState";
    const string mIchCmNum = "mIchCmNum";
    const string mbmsTsNum = "mbmsTsNum";
};

//Definitions for MO class UtranTDDMCell
interface UtranTDDMCell : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "UtranTDDMCell";

    // Attribute Names
    //
    const string utranTDDMCellId = "utranTDDMCellId";
    const string cId= "cId";
    const string localCellId= "localCellId";
    const string cellMode ="cellMode";

```

```

const string carrierNum="carrierNum";
const string maximumTransmissionPowerList = "maximumTransmissionPowerList";
const string uarfcnList = "uarfcnList";
const string cellParameterId = "cellParameterId";
const string primaryCpchPower = "primaryCpchPower";
const string dwPchPower = "dwPchPower";
const string timeSlotList = "timeSlotList";
const string lac = "lac";
const string rac = "rac";
const string sac = "sac";
const string uraList = "uraList";
const string relatedIubLink = "relatedIubLink";
};

//Definitions for MO class UtranRelation
interface UtranRelation : GenericNRMDefs::Top
{
    const string CLASS = "UtranRelation";

    // Attribute Names
    //
const string uranRelationId = "uranRelationId";
const string adjacentCell = "adjacentCell";
const string cellMode = "cellMode";
const string uarfcn = "uarfcn";
const string cellParameterId = "cellParameterId";
const string primaryCpchPower = "primaryCpchPower";
const string lac = "lac";
const string userLabel = "userLabel" ;
};

//Definitions for MO class UtranTDDMRelation
interface UtranTDDMRelation : GenericNRMDefs::Top
{
    const string CLASS = "UtranTDDMRelation";

    // Attribute Names
    //
const string uranTDDMRelationId = "uranTDDMRelationId";
const string adjacentTDDMCell = "adjacentTDDMCell";
const string cellMode = "cellMode";
const string uarfcnList = "uarfcnList";
};

```



```

const string cellParameterId = "cellParameterId";
const string primaryCcpchPower = "primaryCcpchPower";
const string lac = "lac";
const string userLabel = "userLabel" ;
};

//Definitions for MO class ExternalUtranCell
interface ExternalUtranCell : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalUtranCell";

    // Attribute Names
    //
const string externalUtranCellId = "externalUtranCellId";
const string cId = "cId";
const string mnc = "mnc";
const string mcc = "mcc";
const string rncId = "rncId";
const string cellMode ="cellMode";
const string uarfcn = "uarfcn";
const string cellParameterId = "cellParameterId";
const string primaryCcpchPower = "primaryCcpchPower";
const string lac = "lac";
const string rac = "rac";
};

//Definitions for MO class ExternalUtranTDDMCell
interface ExternalUtranTDDMCell : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalUtranTDDMCell";

    // Attribute Names
    //
const string externalUtranTDDMCellId = "externalUtranTDDMCellId";
const string cId = "cId";
const string mnc = "mnc";
const string mcc = "mcc";
const string rncId = "rncId";
const string cellMode ="cellMode";
const string uarfcnList = "uarfcnList";
const string cellParameterId = "cellParameterId";
const string primaryCcpchPower = "primaryCcpchPower";

```

```
const string lac = "lac";
const string rac = "rac";
};

//Defination for MO class GSMRelation
interface GSMRelation: GenericNRMDefs::Top
{
    const string CLASS = "GSMRelation";

    //Attribute Names
    //
    const string gsmRelationId = "gsmRelationId";
    const string adjacentCell = "adjacentCell";
    const string bcchFrequency = "bcchFrequency";
    const string ncc = "ncc";
    const string bcc = "bcc";
    const string lac = "lac";
    const string userLabel = "userLabel";
};

//Defination for MO ExternalGSMCell
interface ExternalGSMCell: GenericNRMDefs::ManagedFunction
{
    const string CLASS = "ExternalGSMCell";

    //Attribute Names
    //
    const string externalGsmCellId = "externalGsmCellId";
    const string cellIdentity = "cellIdentity";
    const string bcchFrequency = "bcchFrequency";
    const string ncc = "ncc";
    const string bcc = "bcc";
    const string lac = "lac";
    const string mcc = "mcc";
    const string mnc = "mnc";
    const string rac = "rac";
    const string racc = "racc";
};
};
#endif
```

## 4.2.2 UtranNRMSystem

```

//File "UtranNRMSystem.idl"
//The IRP document version number is "UTRAN NRM V1.0"
#ifndef UtranNRMSystem_idl
#define UtranNRMSystem_idl

#include "GenericNRMSystem.idl"

module UtranNRMSystem
{
    /**
     * This module adds datatype definitions for types
     * used in the Utran NRM which are not basic datatypes defined
     * already in CORBA and datatypes defined already in
     * GenericNRMSystem.
     */

    union AdjacentCellType switch(boolean)
    {
        case TRUE: GenericNRMSystem::DN utranCell;
        case FALSE: string cellGloableId;
    };
    enum CellModeEnumType
    {
        FDD_mode,
        TDD_mode_1_28Mcps,
        TDD_mode_3_84Mcps
    };
    enum TimeSlotDirectionType
    {
        UL,
        DL
    };
    enum TimeSlotStatusType
    {
        Active,
        Not_Active
    };
    enum mbmsFlagType
    {
        Support,
        NotSupport
    }
}

```

```

};
enum mbmsStateType
{
    Activated,
    Inactive
};
typedef unsigned long uarfcnTypeType;
//0:main_carrier
//1:des_carrier
struct TimeSlotConfigStructType
{
    unsigned short timeSlotId;
    TimeSlotDirectionType timeSlotDirection;
    TimeSlotStatusType timeSlotStatus;
};
typedef sequence<TimeSlotConfigStructType> TimeSlotListConfigStructType;
typedef sequence< unsigned long> UraListType;
typedef sequence<unsigned short> MaximumTransmissionPowerConfigStructType;
typedef sequence<unsigned long> UarfcnConfigStructType;
};
#endif

```

#### 4.2.3 UtranNRMProfile

```

//File "UtranNRMProfile.idl"
//The IRP document version number is "UTRAN NRM V1.0"
#ifndef UtranNRMProfile_idl
#define UtranNRMProfile_idl

#include "GenericNRMSystem.idl"
#include "GenericNRMProfile.idl"
#include "UtranNRMSystem.idl"

//#pragma prefix "3gppsa5.org"

/**
 * This module defines the attribute names and
 * correspondig attribute types for all defined
 * MO class in Utran network. This module is
 * used for reference.
 */
module UtranNRMProfile
{
    interface RncFunction : GenericNRMProfile::ManagedFunction

```

```

{
    readonly attribute GenericNRMSystem::ObjectIdType mcFunctionId;
        attribute unsigned long mcId;
    readonly attribute unsigned long mnc;
    readonly attribute unsigned long mcc;
    readonly attribute unsigned long maxMbmsContext;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface NodeBFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType nodeBFunctionId;
    readonly attribute GenericNRMSystem::DN relatedIubLink;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface IubLink : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType iubLinkId;
        attribute GenericNRMSystem::DN relatedNodeB;
}

```

```

        attribute GenericNRMSystem::DNListType relatedUtranCells;
        attribute GenericNRMSystem::DNListType relatedUtranTDDMCells;
// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
// notifyAckStateChanged
// notifyChangedAlarm
// notifyClearedAlarm
// notifyNewAlarm
// notifyComments
// notifyAlarmListRebuilt
// notifyPotentialFaultyAlarmList
};

interface UtranCell : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType utranCellId;
        attribute unsigned long cId;
        attribute unsigned long localCellId;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
    readonly attribute unsigned short maximumTransmissionPower; //0...50Dbm
    readonly attribute unsigned long uarfcn;
        attribute unsigned short cellParameterId;
    readonly attribute short primaryCpchPower;
    readonly attribute short dwPchPower;
        attribute UtranNRMSystem::TimeSlotListConfigStructType timeSlotList;
    readonly attribute unsigned long lac;
    readonly attribute unsigned long rac;
    readonly attribute unsigned long sac;
    readonly attribute UtranNRMSystem::UraListType uraList;
    readonly attribute GenericNRMSystem::DN relatedIubLink;

// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
// notifyAckStateChanged
// notifyChangedAlarm
// notifyClearedAlarm
// notifyNewAlarm
// notifyComments

```

```

    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface Carrier : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType carrierId;
    readonly attribute UtranNRMSystem::uarfcnTypeType uarfcnType;
    readonly attribute unsigned long uarfcn;
        attribute UtranNRMSystem::TimeSlotConfigStructType timeSlotList;
    readonly attribute UtranNRMSystem::mbmsFlagType mbmsFlag;
        attribute UtranNRMSystem::mbmsStateType mbmsState;
    readonly attribute unsigned short mIchCmNum;
    readonly attribute unsigned short mbmsTsNum;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface UtranTDDMCell : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType utranTDDMCellId;
        attribute unsigned long cId;
        attribute unsigned long localCellId;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
    readonly attribute unsigned short carrierNum;
    readonly attribute UtranNRMSystem::MaximumTransmissionPowerConfigStructType
maximumTransmissionPowerList; //0...50Dbm
    readonly attribute UtranNRMSystem::UarfcnConfigStructType uarfcnList;
        attribute unsigned short cellParameterId;
    readonly attribute short primaryCpchPower;
    readonly attribute short dwPchPower;
        attribute UtranNRMSystem::TimeSlotListConfigStructType timeSlotList;
};

```

```

readonly attribute unsigned long lac;
readonly attribute unsigned long rac;
readonly attribute unsigned long sac;
readonly attribute UtranNRMSystem::UraListType uraList;
readonly attribute GenericNRMSystem::DN relatedIubLink;

// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
// notifyAckStateChanged
// notifyChangedAlarm
// notifyClearedAlarm
// notifyNewAlarm
// notifyComments
// notifyAlarmListRebuilt
// notifyPotentialFaultyAlarmList
};

interface UtranRelation : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType utranRelationId;
    attribute UtranNRMSystem::AdjacentCellType adjacentCell;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
    readonly attribute unsigned long uarfcn; //conditional
    readonly attribute unsigned long cellParameterId; //conditional
    readonly attribute unsigned short primaryCpchPower; //conditional
    readonly attribute unsigned long lac; //conditional
    attribute wstring userLabel;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface UtranTDDMRelation : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType utranTDDMRelationId;
    attribute UtranNRMSystem::AdjacentCellType adjacentTDDMCell;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
    readonly attribute UtranNRMSystem::UarfcnConfigStructType uarfcnList;
};

```



```

    readonly attribute unsigned short cellParameterId;
    readonly attribute short primaryCcpchPower;
    readonly attribute short dwPchPower;
    readonly attribute unsigned long lac;
        attribute wstring userLabel;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

```

```

interface ExternalUtranCell : GenericNRMProfile::ManagedFunction

```

```

{
    readonly attribute GenericNRMSystem::ObjectIdType externalUtranCellId;
        attribute unsigned long cId;
        attribute unsigned long mcc;
        attribute unsigned long mnc;
        attribute unsigned long mcId;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
        attribute unsigned long uarfcn;
        attribute unsigned long cellParameterId;
        attribute unsigned short primaryCcpchPower;
        attribute unsigned long lac;
        attribute unsigned long rac;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

```

```

interface ExternalUtranTDDMCell : GenericNRMProfile::ManagedFunction

```

```

{
    readonly attribute GenericNRMSystem::ObjectIdType externalUtranTDDMCellId;
        attribute unsigned long cId;
        attribute unsigned long mcc;
        attribute unsigned long mnc;
        attribute unsigned long mcId;
    readonly attribute UtranNRMSystem::CellModeEnumType cellMode;
    readonly attribute UtranNRMSystem::UarfcnConfigStructType uarfcnList;
        attribute unsigned long cellParameterId;

```

```

        attribute unsigned short primaryCcpchPower;
        attribute unsigned long lac;
        attribute unsigned long rac;

// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
};
interface GsmRelation: GenericNRMPProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType gsmRelationId;
        attribute GenericNRMSystem::DN adjacentCell;
    readonly attribute UtranNRMSystem::AdjacentCellType bcchFrequency;
    readonly attribute unsigned long ncc;
    readonly attribute unsigned long bcc;
    readonly attribute unsigned long lac;
        attribute wstring userLabel;

// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
};

interface ExternalGSMCell: GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType externalGsmCellId;
        attribute unsigned long cellIdentity;
        attribute short bcchFrequency;
        attribute unsigned long ncc;
        attribute unsigned long bcc;
        attribute unsigned long lac;
        attribute unsigned long mcc;
        attribute unsigned long mnc;
        attribute unsigned long rac;
        attribute unsigned long racc;

// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange

```

```
};
};
#endif
```

### 4.3 核心网网络资源模型的 IDL 定义

见引用文献[2]4.3中的核心网网络资源模型的IDL定义。

#### 4.3.1 CoreNRMDefs

```
//File "CoreNRMDefs.idl"
//The IRP document version number is "CN NRM V1.0"
#ifndef CoreNRMDefs_idl
#define CoreNRMDefs_idl

#include "GenericNRMDefs.idl"

#pragma prefix "3gppsa5.org"

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

module CoreNRMDefs
{
//Definitions for MO class MscFunction

interface MscFunction : GenericNRMDefs::ManagedFunction
{
const string CLASS = "MscFunction";

// including all Attribute Names from
// MO Class GenericNRMDefs::ManagedFunction
// additional Attribute Names is as follows.
//
const string mscFunctionId = "mscFunctionId";
const string mscNumber = "mscNumber";
const string mscType = "mscType";
const string mscCapacity = "mscCapacity";
const string maxMscBHCA = "maxMscBHCA";
const string controlledRncList = "controlledRncList";
const string maxNum2MPort = "maxNum2MPort";
const string num2MCircuits = "num2MCircuits";
const string relatedIwf = "relatedIwf";
const string mccList = "mccList";
const string mncList = "mncList";
```

```

const string lacList = "lacList";
const string sacList = "sacList";
const string gcaList = "gcaList";
const string mscId = "mscId"; };

//Definitions for MO class GmscFunction

interface GmscFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "GmscFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string mscFunctionId = "gmscFunctionId";
    const string mscNumber = "mscNumber";
};

//Definitions for MO class HlrFunction

interface HlrFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "HlrFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string hlrFunctionId = "hlrFunctionId";
    const string hlrNumber = "hlrNumber";
    const string maxNumImsi = "maxNumImsi";
    const string rangeOfImsi = "rangeOfImsi";
    const string maxNumMsisdn = "maxNumMsisdn";
    const string rangeOfMsisdn = "rangeOfMsisdn";
    const string maxNumPdpAddress = "maxNumPdpAddress";
};

//Definitions for MO class VlrFunction

interface VlrFunction : GenericNRMDefs::ManagedFunction
{

```

```
const string CLASS = "VlrFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
const string vlrFunctionId = "vlrFunctionId";
const string vlrNumber = "vlrNumber";
const string maxNumImsi = "maxNumImsi";
};

//Definitions for MO class AucFunction

interface AucFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "AucFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
const string aucFunctionId = "aucFunctionId";
const string maxNumImsi = "maxNumImsi";
};

//Definitions for MO class EirFunction

interface EirFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "EirFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
const string eirFunctionId = "eirFunctionId";
const string eirNumber = "eirNumber";
const string maxNumImei = "maxNumImei";
};

//Definitions for MO class SmsIwmscFunction
```

```

interface SmsIwmscFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "SmsIwmscFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string smsIwmscFunctionId = "smsIwmscFunctionId";
};

//Definitions for MO class SmsGmscFunction

interface SmsGmscFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "SmsGmscFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string smsGmscFunctionId = "smsGmscFunctionId";
};

//Definitions for MO class IwfFunction

interface IwfFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "IwfFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string iwfunctionId = "iwfunctionId";
    const string iwfcapacity = "iwfcapacity";
};

//Definitions for MO class CircuitEndPointSubgroup

interface CircuitEndPointSubgroup : GenericNRMDefs::Top
{

```

```

const string CLASS = "CircuitEndPointSubgroup";

// Attribute Names
//
const string circuitEndPointSubgroupId = "circuitEndPointSubgroupId";
const string numOfCircuits = "numOfCircuits";
const string circuitDirectionality = "circuitDirectionality";
const string transmissionCharacteristics = "transmissionCharacteristics";
const string userLabel = "userLabel";
const string signallingInfoOfFarEnd = "signallingInfoOfFarEnd";
};

//Definitions for MO class ObservedDestination

interface ObservedDestination : GenericNRMDefs::Top
{
    const string CLASS = "ObservedDestination";

    // Attribute Names
    //
    const string observedDestinationId = "observedDestinationId";
    const string destinationCode = "destinationCode";
    const string destinationType = "destinationType";
};

//Definitions for MO class SgsnFunction

interface SgsnFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "SgsnFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string sgsnFunctionId = "sgsnFunctionId";
    const string sgsnNumber = "sgsnNumber";
    const string switchingCapacity = "switchingCapacity";
    const string userCapacity = "userCapacity";
    const string pdpNbrSupported = "pdpNbrSupported";
    const string mccList = "mccList";
    const string mncList = "mncList";
};

```

```

const string lacList = "lacList";
const string racList = "racList";
const string sacList = "sacList";
const string sgsnId = "sgsnId";
const string mbmsCapacity = "mbmsCapacity";
const string maxMbmsContext = "maxMbmsContext";
};

//Definitions for MO class GgsnFunction

interface GgsnFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "GgsnFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
    const string ggsnFunctionId = "ggsnFunctionId";
    const string ggsnNumber = "ggsnNumber";
    const string switchingCapacity = "switchingCapacity";
    const string pdpNbrSupported = "pdpNbrSupported";
    const string mbmsCapacity = "mbmsCapacity";
    const string maxMbmsContext = "maxMbmsContext";
};

//Definitions for MO class GgsnApn

interface GgsnApn : GenericNRMDefs::Top
{
    const string CLASS = "GgsnApn";

    // Attribute Names
    //
    const string ggsnApnId = "ggsnApnId";
    const string accessPointName = "accessPointName";
    const string transAccess = "transAccess";
    const string maxPdpContextNum = "maxPdpContextNum";
    const string maxBitRate = "maxBitRate";
    const string pushSwitch = "pushSwitch";
    const string pushGreSwitch = "pushGreSwitch";
    const string dnsMode = "dnsMode";
};

```



```
};

//Definitions for MO class GgsnApnAddrPool

interface GgsnApnAddrPool : GenericNRMDefs::Top
{
    const string CLASS = "GgsnApnAddrPool";

    // Attribute Names
    //
    const string ggsnApnAddrPoolId = "ggsnApnAddrPoolId";
    const string addrType = "addrType";
    const string addrSegList = "addrSegList";
};

//Definitions for MO class IpRouteTable

interface IpRouteTable : GenericNRMDefs::Top
{
    const string CLASS = "IpRouteTable";

    // Attribute Names
    //
    const string ipRouteTableId = "ipRouteTableId";
    const string userLabel = "userLabel";
};

//Definitions for MO class IpRouteTableItem

interface IpRouteTableItem : GenericNRMDefs::Top
{
    const string CLASS = "IpRouteTableItem";

    // Attribute Names
    //
    const string ipRouteTableItemId = "ipRouteTableItemId";
    const string ipRouteDest = "ipRouteDest";
    const string ipRouteNextHop = "ipRouteNextHop";
    const string ipRouteAge = "ipRouteAge";
    const string ipRouteMask = "ipRouteMask";
    const string ipRouteProto = "ipRouteProto";
};
```

```
const string numOfHops = "numOfHops";
const string ipRouteMetric1 = "ipRouteMetric1";
const string ipRouteMetric2 = "ipRouteMetric2";
const string ipRouteMetric3 = "ipRouteMetric3";
const string ipRouteMetric4 = "ipRouteMetric4";
const string ipRouteMetric5 = "ipRouteMetric5";
const string ipRouteType = "ipRouteType";
};

//Definitions for MO class IpTransTable

interface IpTransTable : GenericNRMDefs::Top
{
    const string CLASS = "IpTransTable";

    // Attribute Names
    //
    const string ipTransTableId = "ipTransTableId";
    const string userLabel = "userLabel";
};

//Definitions for MO class IpTransTableItem

interface IpTransTableItem : GenericNRMDefs::Top
{
    const string CLASS = "IpTransTableItem";

    // Attribute Names
    //
    const string ipTransTableItemId = "ipTransTableItemId";
    const string phyAddress = "phyAddress";
    const string ipAddress = "ipAddress";
    const string mappingType = "mappingType";
};

//Definitions for MO class IpAddrTable

interface IpAddrTable : GenericNRMDefs::Top
{
    const string CLASS = "IpAddrTable";

    // Attribute Names
```

```

//
const string ipAddrTableId = "ipAddrTableId";
const string userLabel = "userLabel";
};

//Definitions for MO class IpAddrTableItem

interface IpAddrTableItem : GenericNRMDefs::Top
{
    const string CLASS = "IpAddrTableItem";

    // Attribute Names
    //
const string ipAddrTableItemId = "ipAddrTableItemId";
const string ipAdEntAddr = "ipAdEntAddr";
const string ipAdEntNetMask = "ipAdEntNetMask";
const string ipAdEntBcastAddr = "ipAdEntBcastAddr";
const string ipAdEntReasmMaxSize = "ipAdEntReasmMaxSize";
const string ipAdEntSubnetworkType = "ipAdEntSubnetworkType";
};

//Definitions for MO class BgFunction

interface BgFunction : GenericNRMDefs::ManagedFunction
{
    const string CLASS = "BgFunction";

    // including all Attribute Names from
    // MO Class GenericNRMDefs::ManagedFunction
    // additional Attribute Names is as follows.
    //
const string bgFunctionId = "bgFunctionId";
};
};
#endif

```

#### 4.3.2 CoreNRMSystem

```

//File "CoreNRMSystem.idl"
//The IRP document version number is "CN NRM V1.0"
#ifndef CoreNRMSystem_idl
#define CoreNRMSystem_idl

```

```

#include "GenericNRMSystem.idl"

// #pragma prefix "3gppsa5.org"

module CoreNRMSystem
{
    /**
     * This module adds datatype definitions for types
     * used in the Core NRM which are not basic datatypes defined
     * already in CORBA and datatypes defined already in
     * GenericNRMSystem.
     */

    enum MscTypeType
    {
        TMSC1, //0
        TMSC2, //1
        MSCVLR, //2
        MSC //3
    };

    struct RangeOfImsiType
    {
        string startImsi;
        string endImsi;
    };

    typedef sequence<RangeOfImsiType> RangeOfImsiInHlrType;
    struct RangeOfMsisdnType
    {
        string startMsisdn;
        string endMsisdn;
    };

    typedef sequence<RangeOfMsisdnType> RangeOfMsisdnInHlrType;
    enum CircuitDirectionalityType
    {
        OnewayOut, //0
        OnewayIn, //1
        Twoway //2
    };

    typedef octet TransmissionCharacteristicsType;
    //From right to left,

```

```

//the first bit denotes opticalFiberCable, 1 means support, 0 means not support;
//the second bit denotes coaxialCable, 1 means support, 0 means not support;
//the third bit denotes analogMicrowave, 1 means support, 0 means not support;
//the fourth bit denotes digitMicrowave, 1 means support, 0 means not support;
//the fifth bit denotes satellite, 1 means support, 0 means not support;
//the sixth bit denotes mixedGroup, 1 means support, 0 means not support;
//the seventh bit denotes transOthers, 1 means support, 0 means not support;
//the eighth bit is meaningless.

typedef char DestCodeElementType;
    // the possible value for DestCodeElementType are:
    // '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '0',
    // 'A', 'B', 'C', 'D', 'E', 'F', '*', '#'
typedef string DestCodeType; //a string type formed from DestCodeElementType
typedef sequence<DestCodeType> DestinationCodeList;
enum DestType
{
    International_dest,
    National_dest,
    Local_dest,
    Other_dest
};
typedef octet NatureOfAddressType;
//only 0 and 1 can occur in the string, it is of BITSTRING type.
enum DestinationTypeChoiceType
{
    NatureOfAddressChoice,
    DestTypeChoice
};
union DestinationTypeType switch(DestinationTypeChoiceType)
{
    case NatureOfAddressChoice : NatureOfAddressType natureOfAddress;
    case DestTypeChoice : DestType dest;
};
typedef GenericNRMSSystem::DN ObjectType;
typedef sequence<ObjectType> ControllRncListType;
struct RelatedCircuitEPSubgroupType
{
    unsigned long priority;
    GenericNRMSSystem::DN circuitEPSubgroup;
};
typedef sequence<RelatedCircuitEPSubgroupType> RelatedCircuitEPSubgroupListType;

```

```

struct RouteType
{
    string routeNo;
    RelatedCircuitEPSubgroupListType circuitEPSubgroupList;
};

enum TransAccessType
{
    Transparent, //0, and the default value
    NonTransparent //1
};

enum PushSwitchType
{
    UnSupport, //0
    Support //1
};

union PushGreSwitchType switch (PushSwitchType)
{
    case Support: boolean pushGreSwitch;
};

enum DnsModeType
{
    LocalSetPriority,
    RadiusAppointPriority
};

enum AddrTypeType
{
    Dynamic, //0
    Static //1
};

struct AddrSegType
{
    string begingIp; //IP Address
    unsigned long segLen;
};

typedef sequence<AddrSegType> AddrSegListType;
typedef unsigned short IpRouteProtoType; //1...16
const IpRouteProtoType other_Proto=1;
const IpRouteProtoType local_Proto=2;
const IpRouteProtoType netmgmt_Proto=3;
const IpRouteProtoType icmp_Proto=4;

```

```

const IpRouteProtoType egp_Proto=5;
const IpRouteProtoType ggp_Proto=6;
const IpRouteProtoType hello_Proto=7;
const IpRouteProtoType rip_Proto=8;
const IpRouteProtoType isIs_Proto=9;
const IpRouteProtoType esIs_Proto=10;
const IpRouteProtoType ciscoIgrp_Proto=11;
const IpRouteProtoType bbnSpfIgp_Proto=12;
const IpRouteProtoType ospf_Proto=13;
const IpRouteProtoType bgp_Proto=14;
const IpRouteProtoType idpr_Proto=15;
const IpRouteProtoType ciscoEigrp_Proto=16;
typedef unsigned short NumOfHopsType; //1...16
typedef unsigned short IpRouteTypeType; //1...4
const IpRouteTypeType other_RouteType=1;
const IpRouteTypeType reject_RouteType=2;
const IpRouteTypeType local_RouteType=3;
const IpRouteTypeType remote_RouteType=4;
typedef unsigned short MappingTypeType; //1...4
const MappingTypeType other_MappingType=1;
const MappingTypeType invalid_MappingType=2;
const MappingTypeType dynamic_MappingType=3;
const MappingTypeType static_MappingType=4;
typedef unsigned short SubnetworkTypeType; //1...3
const SubnetworkTypeType other_SubnetworkType=1;
const SubnetworkTypeType PDN_SubnetworkType=2;
const SubnetworkTypeType PSCoreNetwork_SubnetworkType=3;

typedef sequence<string> StringSetType;
typedef unsigned long ULongType;
typedef sequence< ULongType > ULongSetType;
};
#endif

```

#### 4.3.3 CoreNRMPProfile

```

//File "CoreNRMPProfile.idl"
//The IRP document version number is "CN NRM V1.0"
#ifndef CoreNRMPProfile_idl
#define CoreNRMPProfile_idl

#include "GenericNRMPProfile.idl"
#include "GenericNRMDefs.idl"

```

```

#include "CoreNRMSystem.idl"

// #pragma prefix "3gppsa5.org"

/**
 * This module defines the attribute names and
 * correspondig attribute types for all defined
 * MO class in core network. This module is
 * used for reference.
 */
module CoreNRMPProfile
{
    interface MscFunction : GenericNRMPProfile::ManagedFunction
    {
        readonly attribute GenericNRMSystem::ObjectIdType mscFunctionId;
        readonly attribute GenericNRMSystem::ISDNAddrStringType mscNumber;
        readonly attribute CoreNRMSystem::MscTypeType mscType;
        readonly attribute unsigned long mscCapacity;
        readonly attribute unsigned long maxMscBHCA;
        attribute CoreNRMSystem::ControllRncListType controlledRncList;
        readonly attribute unsigned long maxNum2MPort;
        readonly attribute unsigned long num2MCircuits;
        readonly attribute string relatedIwf;
        readonly attribute CoreNRMSystem::ULongSetType mccList;
        readonly attribute CoreNRMSystem::ULongSetType mncList;
        attribute CoreNRMSystem::ULongSetType lacList;
        attribute CoreNRMSystem::ULongSetType sacList;
        attribute CoreNRMSystem::ULongSetType gcaList;
        attribute unsigned long mscId;

        // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
        // notifyAckStateChanged
        // notifyChangedAlarm
        // notifyClearedAlarm
        // notifyNewAlarm
        // notifyComments
        // notifyAlarmListRebuilt
        // notifyPotentialFaultyAlarmList
    };
};

```



```
interface GmscFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType mscFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType mscNumber;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface HlrFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType hlrFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType hlrNumber;
    readonly attribute unsigned long maxNumImsi;
        attribute CoreNRMSystem::RangeOfImsiInHlrType rangeOfImsi;
    readonly attribute unsigned long maxNumMsisdn;
        attribute CoreNRMSystem::RangeOfMsisdnInHlrType rangeOfMsisdn;
    readonly attribute unsigned long maxNumPdpAddress;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};
```

```

interface VlrFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType vlrFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType vlrNumber;
    readonly attribute unsigned long maxNumImsi;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface AucFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType aucFunctionId;
    readonly attribute unsigned long maxNumImsi;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface EirFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType eirFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType eirNumber;
    readonly attribute unsigned long maxNumImei;
}

```

```
// The following notifications may be sent from this MO,
// notifyObjectCreation
// notifyObjectDeletion
// notifyAttributeValueChange
// notifyAckStateChanged
// notifyChangedAlarm
// notifyClearedAlarm
// notifyNewAlarm
// notifyComments
// notifyAlarmListRebuilt
// notifyPotentialFaultyAlarmList
};

interface SmsIwmscFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType smsIwmscFunctionId;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface SmsGmscFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType smsGmscFunctionId;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
```

```

        // notifyNewAlarm
        // notifyComments
        // notifyAlarmListRebuilt
        // notifyPotentialFaultyAlarmList
};

interface IwfFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType iwFunctionId;
    readonly attribute unsigned long iwCapacity;

    // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
        // notifyAckStateChanged
        // notifyChangedAlarm
        // notifyClearedAlarm
        // notifyNewAlarm
        // notifyComments
        // notifyAlarmListRebuilt
        // notifyPotentialFaultyAlarmList
};

interface CircuitEndPointSubgroup : GenericNRMPProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType circuitEndPointSubgroupId;
    readonly attribute unsigned long numOfCircuits;
    readonly attribute CoreNRMSystem::CircuitDirectionalityType circuitDirectionality;
    readonly attribute CoreNRMSystem::TransmissionCharacteristicsType
        transmissionCharacteristics;
        attribute string userLabel;
        attribute GenericNRMSystem::SignallingInfoType signallingInfoOfFarEnd;

    // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
        // notifyAckStateChanged
        // notifyChangedAlarm
        // notifyClearedAlarm
        // notifyNewAlarm

```

```

        // notifyComments
        // notifyAlarmListRebuilt
        // notifyPotentialFaultyAlarmList
};

interface ObservedDestination : GenericNRMPProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType observedDestinationId;
    readonly attribute CoreNRMSystem::DestCodeType destinationCode;
    readonly attribute CoreNRMSystem::DestinationTypeType destinationType;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface SgsnFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType sgsnFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType sgsnNumber;
    readonly attribute unsigned long switchingCapacity;
    readonly attribute unsigned long userCapacity;
    readonly attribute unsigned long pdpNbrSupported;
    readonly attribute CoreNRMSystem::StringSetType mccList;
    readonly attribute CoreNRMSystem::ULongSetType mncList;
        attribute CoreNRMSystem::ULongSetType lacList;
        attribute CoreNRMSystem::ULongSetType sacList;
        attribute CoreNRMSystem::ULongSetType racList;
        attribute unsigned long sgsnId;
    readonly attribute float mbmsCapacity;
    readonly attribute unsigned long maxMbmsContext;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments

```

```

        // notifyAlarmListRebuilt
        // notifyPotentialFaultyAlarmList
};

interface GgsnFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType ggsnFunctionId;
    readonly attribute GenericNRMSystem::ISDNAddrStringType ggsnNumber;
    readonly attribute unsigned long switchingCapacity;
    readonly attribute unsigned long pdpNbrSupported;
    readonly attribute float mbmsCapacity;
    readonly attribute unsigned long maxMbmsContext;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};

interface GgsnApn : GenericNRMPProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ggsnApnId;
    readonly attribute string accessPointName;
    readonly attribute CoreNRMSystem::TransAccessType transAccess;
    readonly attribute unsigned long maxPdpContextNum; // the default value is 0
    readonly attribute unsigned long maxBitRate; // the default value is 0
    readonly attribute CoreNRMSystem::PushSwitchType pushSwitch;
    readonly attribute CoreNRMSystem::PushGreSwitchType pushGreSwitch;
    readonly attribute CoreNRMSystem::DnsModeType dnsMode;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

```

```

interface GgsnApnAddrPool : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ggsnApnAddrPoolId;
    readonly attribute CoreNRMSystem::AddrTypeType addrType;
    readonly attribute CoreNRMSystem::AddrSegListType addrSegList;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface IpRouteTable : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipRouteTableId;
    attribute string userLabel;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface IpRouteTableItem : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipRouteTableItemId;
    readonly attribute string ipRouteDest; //IP Address
    readonly attribute string ipRouteNextHop; //IP Address
    readonly attribute unsigned long ipRouteAge;
    readonly attribute string ipRouteMask;
    readonly attribute CoreNRMSystem::IpRouteProtoType ipRouteProto;
    readonly attribute CoreNRMSystem::NumOfHopsType numOfHops;
    readonly attribute unsigned long ipRouteMetric1;
    readonly attribute unsigned long ipRouteMetric2;
    readonly attribute unsigned long ipRouteMetric3;
    readonly attribute unsigned long ipRouteMetric4;
    readonly attribute unsigned long ipRouteMetric5;
    readonly attribute CoreNRMSystem::IpRouteTypeType ipRouteType;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation

```

```

    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface IpTransTable : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipTransTableId;
        attribute string userLabel;

    // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
};

interface IpTransTableItem : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipTransTableItemId;
        attribute string phyAddress; // MAC Address
        attribute string ipAddress; // IP Address
        attribute CoreNRMSystem::MappingType mappingType;

    // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
};

interface IpAddrTable : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipAddrTableId;
        attribute string userLabel;

    // The following notifications may be sent from this MO,
        // notifyObjectCreation
        // notifyObjectDeletion
        // notifyAttributeValueChange
};

interface IpAddrTableItem : GenericNRMProfile::Top
{
    readonly attribute GenericNRMSystem::ObjectIdType ipAddrTableItemId;

```



```

    readonly attribute string ipAdEntAddr; // IP Address
    readonly attribute string ipAdEntNetMask; // IP Address
    readonly attribute string ipAdEntBcastAddr; // IP Address
    readonly attribute unsigned long ipAdEntReasmMaxSize;
    readonly attribute CoreNRMSystem::SubnetworkTypeType ipAdEntSubnetworkType;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
};

interface BgFunction : GenericNRMPProfile::ManagedFunction
{
    readonly attribute GenericNRMSystem::ObjectIdType bgFunctionId;

    // The following notifications may be sent from this MO,
    // notifyObjectCreation
    // notifyObjectDeletion
    // notifyAttributeValueChange
    // notifyAckStateChanged
    // notifyChangedAlarm
    // notifyClearedAlarm
    // notifyNewAlarm
    // notifyComments
    // notifyAlarmListRebuilt
    // notifyPotentialFaultyAlarmList
};
};
#endif

```

## 5 性能网络资源模型设计

### 5.1 性能管理资源模型的 IDL 定义

见引用文献[1]5.1中的性能管理资源模型IDL定义。

TDSCDMANRMMMeasurementDefs.idl

```

//File "TDSCDMANRMMMeasurementDefs.idl"
#ifdef TDSCDMANRMMMeasurementDefs_idl
#define TDSCDMANRMMMeasurementDefs_idl

// #pragma prefix "3gppsa5.org"

```

```

/**
 * This module defines measurementType names constants
 */
module TDSCDMANRMMeasurementDefs
{
//for Core Network CS Domain
//MSC measurement
module mscBasicMeasurement
{
//get routing information from HLR
const string attGetRoutingInfo = "attGetRoutingInfo";
const string succGetRoutingInfo = "succGetRoutingInfo";
//imsi attach and detach
const string attImsiAttachs = "attImsiAttachs";
const string succImsiAttachs = "succImsiAttachs";
const string failImsiAttachsPerCause = "failImsiAttachsPerCause";
const string nbrImsiDetachs= "nbrImsiDetachs";
//location update
const string attLocationUpdatesIntraMsc= "attLocationUpdatesIntraMsc";
const string succLocationUpdatesIntraMsc= "succLocationUpdatesIntraMsc";
const string failLocationUpdatesIntraMscPerCause= "failLocationUpdatesIntraMscPerCause";
const string attLocationUpdatesInterMsc= "attLocationUpdatesInterMsc";
const string succLocationUpdatesInterMsc= "succLocationUpdatesInterMsc";
const string failLocationUpdatesInterMscPerCause= "failLocationUpdatesInterMscPerCause";
//originating and terminating sms via MSC
const string attOrigSmsCs = "attOrigSmsCs";
const string succOrigSmsCs = "succOrigSmsCs";
const string failOrigSmsCsPerCause = "failOrigSmsCsPerCause";
const string attTermSsmsCs = "attTermSsmsCs";
const string succTermSmsCs = "succTermSmsCs";
const string failTermSmsCsPerCause = "failTermSmsCsPerCause";
//incoming handover inter MSC
const string attIncHosInterMsc = "attIncHosInterMsc";
const string succIncHosInterMsc = "succIncHosInterMsc";
//outgoing handover inter MSC
const string attOutHosInterMsc = "attOutHosInterMsc";
const string succOutHosInterMsc = "succOutHosInterMsc";
//subsequent handover to MSCa
const string attSubsequentHosToMsca = "attSubsequentHosToMsca";
const string succSubsequentHosToMsca = "succSubsequentHosToMsca";
//subsequent handover to MSCc
const string attSubsequentHosToMsc = "attSubsequentHosToMsc";

```

```

const string succSubsequentHosToMsc = "succSubsequentHosToMsc";
//external handover
const string attExternalHos = "attExternalHos";
const string attExternalHosPerCause = "attExternalHosPerCause";
const string failExternalHosWithReconn = "failExternalHosWithReconn";
const string failExternalHosWithLossOfConn = "failExternalHosWithLossOfConn";
//paging
const string attPageReqsPerLa = "attPageReqsPerLa";
const string succPageReqsPerLa = "succPageReqsPerLa";
const string attRepageReqsPerLa = "attRepageReqsPerLa";
};

module mscQos
{
const string meanDurOfCallSetup = "meanDurOfCallSetup";
const string meanDurOfCallAssignGsm = "meanDurOfCallAssignGsm";
const string meanDurOfCallRabAssignUmts = "meanDurOfCallRabAssignUmts";
const string meanDurOfLuService = "meanDurOfLuService";
const string meanCallDur = "meanCallDur";
const string meanDurOfTrunkSeizure = "meanDurOfTrunkSeizure";
};

//MSC exchange measurement
module mobileTrafficFlow
{
//GSM originating call
const string attOrigCallsGsm = "attOrigCallsGsm";
const string succOrigCallsGsm = "succOrigCallsGsm";
const string ansOrigCallsGsm = "ansOrigCallsGsm";
const string failOrigCallsGsmPerCause = "failOrigCallsGsmPerCause";
const string attOrigCallTrafficGsm = "attOrigCallTrafficGsm";
const string succOrigCallTrafficGsm = "succOrigCallTrafficGsm";
const string ansOrigCallTrafficGsm = "ansOrigCallTrafficGsm";
//WCDMA originating call
const string attOrigCallsUmts = "attOrigCallsUmts";
const string succOrigCallsUmts = "succOrigCallsUmts";
const string ansOrigCallsUmts = "ansOrigCallsUmts";
const string failOrigCallsUmtsPerCause = "failOrigCallsUmtsPerCause";
const string attOrigCallTrafficUmts = "attOrigCallTrafficUmts";
const string succOrigCallTrafficUmts = "succOrigCallTrafficUmts";
const string ansOrigCallTrafficUmts = "ansOrigCallTrafficUmts";
//internal call

```

```
const string attInternalCalls = "attInternalCalls";
const string succInternalCalls = "succInternalCalls";
const string ansInternalCalls = "ansInternalCalls";
const string failInternalCallsPerCause = "failInternalCallsPerCause";
const string attInternalCallTraffic = "attInternalCallTraffic";
const string succInternalCallTraffic = "succInternalCallTraffic";
const string ansInternalCallTraffic = "ansInternalCallTraffic";
//GSM terminating call
const string attTermCallsGsm = "attTermCallsGsm";
const string succTermCallsGsm = "succTermCallsGsm";
const string ansTermCallsGsm = "ansTermCallsGsm";
const string failTermCallsGsmPerCause = "failTermCallsGsmPerCause";
const string attTermCallTrafficGsm = "attTermCallTrafficGsm";
const string succTermCallTrafficGsm = "succTermCallTrafficGsm";
const string ansTermCallTrafficGsm = "ansTermCallTrafficGsm";
//WCDMA terminating call
const string attTermCallsUmts = "attTermCallsUmts";
const string succTermCallsUmts = "succTermCallsUmts";
const string ansTermCallsUmts = "ansTermCallsUmts";
const string failTermCallsUmtsPerCause = "failTermCallsUmtsPerCause";
const string attTermCallTrafficUmts = "attTermCallTrafficUmts";
const string succTermCallTrafficUmts = "succTermCallTrafficUmts";
const string ansTermCallTrafficUmts = "ansTermCallTrafficUmts";
//incoming call
const string attIncCalls = "attIncCalls";
const string succIncCalls = "succIncCalls";
const string ansIncCalls = "ansIncCalls";
const string failIncCallsPerCause = "failIncCallsPerCause";
const string attIncCallTraffic = "attIncCallTraffic";
const string succIncCallTraffic = "succIncCallTraffic";
const string ansIncCallTraffic = "ansIncCallTraffic";
//outgoing call
const string attOutCalls = "attOutCalls";
const string succOutCalls = "succOutCalls";
const string ansOutCalls = "ansOutCalls";
const string failOutCallsPerCause = "failOutCallsPerCause";
const string attOutCallTraffic = "attOutCallTraffic";
const string succOutCallTraffic = "succOutCallTraffic";
const string ansOutCallTraffic = "ansOutCallTraffic";
//transit call
const string attTransCalls = "attTransCalls";
const string succTransCalls = "succTransCalls";
```

```

const string ansTransCalls= "ansTransCalls";
const string failTransCallsPerCause = "failTransCallsPerCause";
const string attTransCallTraffic = "attTransCallTraffic";
const string succTransCallTraffic = "succTransCallTraffic";
const string ansTransCallTraffic = "ansTransCallTraffic";
//originating outgoing call
const string attOrigOutCalls = "attOrigOutCalls";
const string succOrigOutCalls= "succOrigOutCalls";
const string ansOrigOutCalls= "ansOrigOutCalls";
const string failOrigOutCallsPerCause = "failOrigOutCallsPerCause";
const string attOrigOutCallTraffic = "attOrigOutCallTraffic";
const string succOrigOutCallTraffic = "succOrigOutCallTraffic";
const string ansOrigOutCallTraffic = "ansOrigOutCallTraffic";
//terminating incoming call
const string attTermIncCalls = "attTermIncCalls";
const string succTermIncCalls= "succTermIncCalls";
const string ansTermIncCalls= "ansTermIncCalls";
const string failTermIncCallsPerCause = "failTermIncCallsPerCause";
const string attTermIncCallTraffic = "attTermIncCallTraffic";
const string succTermIncCallTraffic = "succTermIncCallTraffic";
const string ansTermIncCallTraffic = "ansTermIncCallTraffic";
//abnormal call
const string nbrCallsBlockedByLoadShedding = "nbrCallsBlockedByLoadShedding";
const string nbrCallsBlockedByInternalCongestion = "nbrCallsBlockedByInternalCongestion";
const string nbrCallsBlockedByOutCircuitBusy= "nbrCallsBlockedByOutCircuitBusy";
};

//MSC circuit end point subgroup measurement
module circuitEndpointSubGroup
{
    //outgoing circuit end subgroup
    const string outBids= "outBids";
    const string succOutSeizures= "succOutSeizures";
    const string succOutCalls = "succOutCalls";
    const string ansOutCalls = "ansOutCalls";
    const string failOutCallsByOverflow = "failOutCallsByOverflow";
    const string failOutCallsByUserBusy = "failOutCallsByUserBusy";
    const string failOutCallsByNoAns = "failOutCallsByNoAns";
    const string failOutCallsByUnallNum = "failOutCallsByUnallNum";
    const string failOutCallsByCongestion = "failOutCallsByCongestion";
    const string succOutSeizureTraffic = "succOutSeizureTraffic";
    const string ansOutCallTraffic = "ansOutCallTraffic";

```

```

//incoming circuit end subgroup
const string succIncSeizures = "succIncSeizures";
const string succIncCalls = "succIncCalls";
const string ansIncSeizures = "ansIncSeizures";
const string failIncCallsByUserBusy = "failIncCallsByUserBusy";
const string failIncCallsByNoAns = "failIncCallsByNoAns";
const string failIncCallsByUnallNum = "failIncCallsByUnallNum";
const string failIncCallsByCongestion = "failIncCallsByCongestion";
const string succIncSeizureTraffic = "succIncSeizureTraffic";
const string ansIncSeizureTraffic = "ansIncSeizureTraffic";
const string nbrAvailTrunks = "nbrAvailTrunks";
};

```

```

//MSC No.7 signalling measurement

```

```

module mtp3SignallingLinkTP

```

```

{
    const string durSigLinkOutOfService= "durSigLinkOutOfService";
    const string nbrSigLinkOutOfService= "nbrSigLinkOutOfService";
    const string nbrSentMsus = "nbrSentMsus";
    const string nbrSentSifsAndSios = "nbrSentSifsAndSios";
    const string nbrRecvedMsus = "nbrRecvedMsus";
    const string nbrRecvedSifsAndSios = "nbrRecvedSifsAndSios";
};

```

```

module mtp3SignallingLinkSetTP

```

```

{
    const string nbrSigLinkSetOutOfService= "nbrSigLinkSetOutOfService";
    const string durSigLinkSetOutOfService= "durSigLinkSetOutOfService";
    const string nbrAvailSiglinks= "nbrAvailSiglinks";
};

```

```

module mtp3bSignallingLinkTP

```

```

{
    const string durSigLinkOutOfService= "durSigLinkOutOfService";
    const string nbrSigLinkOutOfService= "nbrSigLinkOutOfService";
    const string nbrSentMsus = "nbrSentMsus";
    const string nbrSentSifsAndSios = "nbrSentSifsAndSios";
    const string nbrRecvedMsus = "nbrRecvedMsus";
    const string nbrRecvedSifsAndSios = "nbrRecvedSifsAndSios";
};

```

```

module mtp3bSignallingLinkSetTP

```

```

{
    const string nbrSigLinkSetOutOfService= "nbrSigLinkSetOutOfService";
    const string durSigLinkSetOutOfService= "durSigLinkSetOutOfService";
    const string nbrAvailSiglinks= "nbrAvailSiglinks";
};

//MSC observed destination measurement
module observedDestination
{
    const string bids= "bids";
    const string nbrNoAvailCircuits= "nbrNoAvailCircuits";
    const string succCalls = "succCalls";
    const string ansCalls = "ansCalls";
    const string succCallTraffic = "succCallTraffic";
    const string ansCallTraffic = "ansCallTraffic";
};

//VLR measurement
module vlrBasicMeasurement
{
    //identification request to PVLR
    const string attIdentReqsToPVlr= "attIdentReqsToPVlr";
    const string succIdentReqsToPVlr= "succIdentReqsToPVlr";
    //location update
    const string attLusIntraVlr= "attLusIntraVlr";
    const string succLusIntraVlr= "succLusIntraVlr";
    const string attLusInterVlr= "attLusInterVlr";
    const string succLusInterVlr= "succLusInterVlr";
    //request for authentication set to HLR
    const string attReqsForAuthSetsSentToHlr= "attReqsForAuthSetsSentToHlr";
    const string succRecvedAuthSetsFromHlr= "succRecvedAuthSetsFromHlr";
    const string succReqAuthSetWithQuintupletsFromHlr= "succReqAuthSetWithQuintupletsFromHlr";
    const string succReqAuthSetWithTripletsFromHlr= "succReqAuthSetWithTripletsFromHlr";
    //subscriber data administration
    const string succInsertSubsData= "succInsertSubsData";
    const string succDelSubsData= "succDelSubsData";
    //provide roaming number to HLR
    const string attProvideRoamingNumber= "attProvideRoamingNumber";
    const string succProvideRoamingNumber= "succProvideRoamingNumber";
};

module vlrSubscriberData

```

```

{
    const string nbrCurrentSubsInVlrPerHlr= "nbrCurrentSubsInVlrPerHlr";
    const string nbrCurrentSubsWithPowerOnInVlr = "nbrCurrentSubsWithPowerOnInVlr";
    const string nbrRoamingSubs= "nbrRoamingSubs";
    const string nbrRoamingSubsInternational= "nbrRoamingSubsInternational";
};

//HLR measurement
module hlrBasicMeasurement
{
    const string attGetRoutingInfo= "attGetRoutingInfo";
    const string succGetRoutingInfo = "succGetRoutingInfo";
    const string attProvideRoamingNumber = "attProvideRoamingNumber";
    const string succProvideRoamingNumber = "succProvideRoamingNumber";
    const string attLocationUpdates = "attLocationUpdates";
    const string succLocationUpdates = "succLocationUpdates";
    const string attCancelLocation = "attCancelLocation";
    const string succCancelLocation = "succCancelLocation";
    const string attInsertSubsData = "attInsertSubsData";
    const string succInsertSubsData = "succInsertSubsData";
    const string attDeleteSubsData = "attDeleteSubsData";
    const string succDeleteSubsData = "succDeleteSubsData";
    const string attSendAuthInfo = "attSendAuthInfo";
    const string succSendAuthInfo = "succSendAuthInfo";
    const string nbrReset = "nbrReset";
    const string attRestoreData = "attRestoreData";
    const string succRestoreData = "succRestoreData";
};

module hlrSubscriberData
{
    const string nbrCurrentSubsWithPowerOnInHlrPerVlr = "nbrCurrentSubsWithPowerOnInHlrPerVlr";
    const string nbrCurrentSubsInHlr = "nbrCurrentSubsInHlr";
    const string nbrCurrentMsisdnInHlr = "nbrCurrentMsisdnInHlr";
};

module hlrSmServiceMeasurement
{
    const string attSendRoutingInfoForSm = "attSendRoutingInfoForSm";
    const string succSendRoutingInfoForSm = "succSendRoutingInfoForSm";
    const string nbrAlertServiceCentre= "nbrAlertServiceCentre";
    const string nbrInformServiceCenter= "nbrInformServiceCenter";
};

```



```
    const string nbrReadyForSm= "nbrReadyForSm";
};

module hlrSupplementServiceMeasurement
{
    const string attRegisterSs = "attRegisterSs";
    const string succRegisterSs = "succRegisterSs";
    const string attEraseSs = "attEraseSs";
    const string succEraseSs = "succEraseSs";
    const string attActSs = "attActSs";
    const string succActSs = "succActSs";
    const string attDeactSs = "attDeactSs";
    const string succDeactSs = "succDeactSs";
};

module hlrInServiceMeasurement
{
    const string attAnyTimeInterrogation = "attAnyTimeInterrogation";
    const string succAnyTimeInterrogation = "succAnyTimeInterrogation";
    const string attAnyTimeSubsInterrogation = "attAnyTimeSubsInterrogation";
    const string succAnyTimeSubsInterrogation = "succAnyTimeSubsInterrogation";
    const string attAnyTimeModification = "attAnyTimeModification";
    const string succAnyTimeModification = "succAnyTimeModification";
    const string nbrNoteSubsDataModified = "nbrNoteSubsDataModified";
};

module hlrPacketServiceMeasurement
{
    const string attSendRoutingInfoForGprs = "attSendRoutingInfoForGprs";
    const string succSendRoutingInfoForGprs = "succSendRoutingInfoForGprs";
    const string nbrFailReport= "nbrFailReport";
    const string nbrNoteMsPresentForGprs= "nbrNoteMsPresentForGprs";
    const string attUpdateGprsLocation = "attUpdateGprsLocation";
    const string succUpdateGprsLocation = "succUpdateGprsLocation";
};

module hlrLocationServiceMeasurement
{
    const string attSendRoutingInfoForLcs = "attSendRoutingInfoForLcs";
    const string succSendRoutingInfoForLcs = "succSendRoutingInfoForLcs";
};
```

```

//EIR measurement
module eirBasicMeasurement
{
    const string nbrCurrentWhiteSubsInEir= "nbrCurrentWhiteSubsInEir";
    const string nbrCurrentBlackSubsInEir= "nbrCurrentBlackSubsInEir";
    const string nbrCurrentGreySubsInEir= "nbrCurrentGreySubsInEir";
};
//for Core Network PS Domain
//SGSN measurement
module sessionManagementMeasurement
{
    //active PDP context by MS
    const string attActPdpContextMs= "attActPdpContextMs";
    const string succActPdpContextMs= "succActPdpContextMs";
    const string failActPdpContextMsPerCause = "failActPdpContextMsPerCause";

    //active PDP context by network
    const string attActPdpContextNetwork= "attActPdpContextNetwork";
    const string succActPdpContextNetwork= "succActPdpContextNetwork";
    const string failActPdpContextNetworkPerCause= "failActPdpContextNetworkPerCause";

    //active dynamic PDP context by MS
    const string attActPdpContextDynMs= "attActPdpContextDynMs";
    const string succActPdpContextDynMs= "succActPdpContextDynMs";

    //number of subscriber with actived PDP context
    const string meanSubsWithActPdpContext= "meanSubsWithActPdpContext";
    const string maxSubsWithActPdpContext= "maxSubsWithActPdpContext";

    //mean number of acti ed PDP context
    const string meanActPDPContext= "meanActPDPContext";
    const string maxActPdpContext= "maxActPdpContext";

    //deactive PDP context by SGSN
    const string attDeactPdpContextSgsn= "attDeactPdpContextSgsn";
    const string succDeactPdpContextSgsn= "succDeactPdpContextSgsn";

    //deactive PDP context by MS
    const string attDeactPdpContextMs= "attDeactPdpContextMs";
    const string succDeactPdpContextMs= "succDeactPdpContextMs";

    //deactive PDP context by GGSN

```

```

const string attDeactPdpContextGgsn= "attDeactPdpContextGgsn";
const string succDeactPdpContextGgsn= "succDeactPdpContextGgsn";

//active secondary PDP context
const string attActSecondPdpContext= "attActSecondPdpContext";
const string succActSecondPdpContext= "succActSecondPdpContext";

//modify PDP context by MS
const string attModPdpContextMs= "attModPdpContextMs";
const string succModPdpContextMs= "succModPdpContextMs";

//modify PDP context by SGSN
const string attModPdpContextSgsn= "attModPdpContextSgsn";
const string succModPdpContextSgsn= "succModPdpContextSgsn";

//update PDP context by GGSN
const string attUpdPdpContextGgsn= "attUpdPdpContextGgsn";
const string succUpdPdpContextGgsn= "succUpdPdpContextGgsn";

//update PDP context by SGSN
const string attUpdPdpContextSgsn= "attUpdPdpContextSgsn";
const string succUpdPdpContextSgsn= "succUpdPdpContextSgsn";

//MBMS Session by SGSN
const string AttMbmsSessionStart = "AttMbmsSessionStart";
const string SuccMbmsSessionStart = "SuccMbmsSessionStart";
const string FailMbmsSessionStart = "FailMbmsSessionStart";
const string AttMbmsSessionStop = "AttMbmsSessionStop";
const string SuccMbmsSessionStop = "SuccMbmsSessionStop";
const string NbrActiveSession= "NbrActiveSession";

//MBMS Traffic
const string TraMbmsGn = "TraMbmsGn";
const string TraMbmsIups = "TraMbmsIups";

};

module subscriberManagementMeasurement
{
    //subscriber state
    const string meanStandbySubs= "meanStandbySubs";
    const string maxStandbySubs= "maxStandbySubs";

```

```

const string meanReadySubs= "meanReadySubs";
const string maxReadySubs= "maxReadySubs";
const string meanPmmIdleSubs= "meanPmmIdleSubs";
const string maxPmmIdleSubs= "maxPmmIdleSubs";
const string meanPmmConnectedSubs= "meanPmmConnectedSubs";
const string maxPmmConnectedSubs= "maxPmmConnectedSubs";

//number of attached subscribers
const string meanAttachedSubsPerRa = "meanAttachedSubsPerRa";
const string maxAttachedSubsPerRa= "maxAttachedSubsPerRa";
};

module mobileManagementMeasurement
{
    //GPRS attach
    const string attGprsAttachGsm= "attGprsAttach";
    const string succGprsAttach= "succGprsAttach";
    const string failGprsAttachPerCause= "failGprsAttachPerCause";

    //combined GPRS/IMSI attach
    const string attCombiAttach= "attCombiAttach";
    const string succCombiAttach= "succCombiAttach";
    const string failCombiAttachPerCause= "failCombiAttachPerCause";

    //GPRS attach with IMSI already attached
    const string attGprsAttachWithImsiAttached= "attGprsAttachWithImsiAttached";
    const string succGprsAttachWithImsiAttached= "succGprsAttachWithImsiAttached";
    const string failGprsAttachWithImsiAttachedPerCause= "failGprsAttachWithImsiAttached
PerCause";

    //GPRS detach by MS
    const string attGprsDetachMs= "attGprsDetachMs";
    //combined GPRS/IMSI detach by MS
    const string attCombiDetachMs= "attCombiDetachMs";
    //IMSI detach by MS
    const string attImsiDetachMs= "attImsiDetachMs";
    //GPRS detach by SGSN
    const string attGprsDetachSgsn= "attGprsDetachSgsn";
    const string succGprsDetachSgsn= "succGprsDetachSgsn";
    //GPRS detach by HLR
    const string attGprsDetachHlr= "attGprsDetachHlr";
    //intra-SGSN routing area update

```

```
const string attIntraSgsnRaUpdate= "attIntraSgsnRaUpdate";
const string succIntraSgsnRaUpdate= "succIntraSgsnRaUpdate";
const string failIntraSgsnRaUpdatePerCause= "failIntraSgsnRaUpdatePerCause";

//combined RA/LA intra SGSN routing area update
const string attCombiIntraSgsnRaUpdate= "attCombiIntraSgsnRaUpdate";
const string succCombiIntraSgsnRaUpdate= "succCombiIntraSgsnRaUpdate";
const string failCombiIntraSgsnRaUpdatePerCause= "failCombiIntraSgsnRaUpdatePerCause";

//inter SGSN routing area update
const string attInterSgsnRaUpdate= "attInterSgsnRaUpdate";
const string succInterSgsnRaUpdate= "succInterSgsnRaUpdate";
const string failInterSgsnRaUpdatePerCause= "failInterSgsnRaUpdatePerCause";

//combined RA/LA inter SGSN routing area update
const string attCombiInterSgsnRaUpdate= "attCombiInterSgsnRaUpdate";
const string succCombiInterSgsnRaUpdate= "succCombiInterSgsnRaUpdate";
const string failCombiInterSgsnRaUpdatePerCause= "failCombiInterSgsnRaUpdatePerCause";

//PS paging
const string nbrPsPagingGsm= "nbrPsPagingGsm";
const string nbrPsPagingNoRspGsm= "nbrPsPagingNoRspGsm";
const string nbrPsPagingUmts= "nbrPsPagingUmts";
const string nbrPsPagingNoRspUmts= "nbrPsPagingNoRspUmts";
};

module sgsnRelocationMeasurement
{
    //inter SGSN relocation
    const string attInterSgsnReloc= "attInterSgsnReloc";
    const string succInterSgsnReloc= "succInterSgsnReloc";
    //inter SGSN combined relocation and hard handover
    const string attInterSgsnCombiReloc= "attInterSgsnCombiReloc";
    const string succInterSgsnCombiReloc= "succInterSgsnCombiReloc";
    //intra SGSN relocation
    const string attIntraSgsnReloc= "attIntraSgsnReloc";
    const string succIntraSgsnReloc= "succIntraSgsnReloc";
    //intra SGSN combined relocation and hard handover
    const string attIntraSgsnCombiReloc= "attIntraSgsnCombiReloc";
    const string succIntraSgsnCombiReloc= "succIntraSgsnCombiReloc";
};
```

```
module sgsnInterSystemHandoverMeasurement
{
    //intra SGSN handover from GSM to UMTS
    const string attIntraSgsnHoGsmToUmts= "attIntraSgsnHoGsmToUmts";
    const string succIntraSgsnHoGsmToUmts= "succIntraSgsnHoGsmToUmts";
    //intra SGSN handover from UMTS to GSM
    const string attIntraSgsnHoUmtsToGsm= "attIntraSgsnHoUmtsToGsm";
    const string succIntraSgsnHoUmtsToGsm= "succIntraSgsnHoUmtsToGsm";
    //inter SGSN handover from GSM to UMTS
    const string attInterSgsnHoGsmToUmts= "attInterSgsnHoGsmToUmts";
    const string succInterSgsnHoGsmToUmts= "succInterSgsnHoGsmToUmts";
    //inter SGSN handover from UMTS to GSM
    const string attInterSgsnHoUmtsToGsm= "attInterSgsnHoUmtsToGsm";
    const string succInterSgsnHoUmtsToGsm= "succInterSgsnHoUmtsToGsm";
};

module mapServiceMeasurement
{
    //request authentication set
    const string attReqAuthSetHlr= "attReqAuthSetHlr";
    const string succReqAuthSetWithQuintupletsHlr= "succReqAuthSetWithQuintupletsHlr";
    const string succReqAuthSetWithTripletsHlr= "succReqAuthSetWithTripletsHlr";
    const string succReqAuthSetWithEmptyRspHlr= "succReqAuthSetWithEmptyRspHlr";
    //GPRS update location
    const string attUpdateGprsLocationHlr= "attUpdateGprsLocationHlr";
    const string succUpdateGprsLocationHlr= "succUpdateGprsLocationHlr";
    //insert and delete subscriber data
    const string attInsertSubsDataHlr= "attInsertSubsDataHlr";
    const string attDeleteSubsDataHlr= "attDeleteSubsDataHlr";
};

module securityManagementMeasurement
{
    //P-TMSI reallocate
    const string attPtmsiRealloc= "attPtmsiRealloc";
    const string succPtmsiRealloc= "succPtmsiRealloc";

    //authentication request
    const string attAuthReq= "attAuthReq";
    const string succAuthReq= "succAuthReq";

    //identity request
```

```

const string attIdentReq= "attIdentReq";
const string succIdentReq= "succIdentReq";

//security mode setup
const string attSecMode= "attSecMode";
const string succSecMode= "succSecMode";
};

module gtpInGnGpMeasurement
{
    //number of incoming and outgoing signalling packets
    const string nbrIncGtpCSigPkts= "nbrIncGtpCSigPkts";
    const string nbrOutGtpCSigPkts= "nbrOutGtpCSigPkts";

    //number of octets of incoming and outgoing signalling packets
    const string nbrIncGtpCSigOcts= "nbrIncGtpCSigOcts";
    const string nbrOutGtpCSigOcts= "nbrOutGtpCSigOcts";

    //number of abnormal signalling packets
    const string nbrOutGtpCSigPktsOverflow= "nbrOutGtpCSigPktsOverflow";
    const string nbrIncGtpCSigPktsError= "nbrIncGtpCSigPktsError";

    //number of incoming and outgoing data packets
    const string nbrIncGtpUDDataPkts= "nbrIncGtpUDDataPkts";
    const string nbrOutGtpUDDataPkts= "nbrOutGtpUDDataPkts";

    //number of octets of incoming and outgoing data packets
    const string nbrIncGtpUDDataOcts= "nbrIncGtpUDDataOcts";
    const string nbrOutGtpUDDataOcts= "nbrOutGtpUDDataOcts";

    //number of abnormal data packets
    const string nbrOutGtpUDDataPktsOverflow= "nbrOutGtpUDDataPktsOverflow";
    const string nbrIncGtpUDDataPktsError= "nbrIncGtpUDDataPktsError";
};

module shortMessageServiceMeasurement
{
    //originating short messages
    const string attOrigSmsPs= "attOrigSmsPs";
    const string succOrigSmsPs= "succOrigSmsPs";

    //terminating short messages

```

```

const string attTermSmsPs= "attTermSmsPs";
const string succTermSmsPs= "succTermSmsPs";

//MS present for short message
const string attSmsMsPresentPs= "attSmsMsPresentPs";
const string succSmsMsPresentPs= "succSmsMsPresentPs";

//memory available for short message
const string attSmsMemoryAvaiPs= "attSmsMemoryAvaiPs";
const string succSmsMemoryAvailPs= "succSmsMemoryAvailPs";
};

//GGSN measurement
module ggsnThroughputMeasurement
{
    //number of incoming and outgoing data packets in Gn/Gp interface
    const string nbrIncDataPktsGnGp= "nbrIncDataPktsGnGp";
    const string nbrOutDataPktsGnGp= "nbrOutDataPktsGnGp";
    const string nbrIncDataOctsGnGp= "nbrIncDataOctsGnGp";
    const string nbrOutDataOctsGnGp= "nbrOutDataOctsGnGp";
    //number of incoming and outgoing signalling packets in Gn/Gp interface
    const string nbrIncSigPktsGnGp= "nbrIncSigPktsGnGp";
    const string nbrOutSigPktsGnGp= "nbrOutSigPktsGnGp";
    const string nbrIncSigOctsGnGp= "nbrIncSigOctsGnGp";
    const string nbrOutSigOctsGnGp= "nbrOutSigOctsGnGp";
    //number of incoming and outgoing data packets in Gi interface
    const string nbrOutDataPktsGi= "nbrOutDataPktsGi";
    const string nbrIncDataPktsGi= "nbrIncDataPktsGi";
    const string nbrOutDataOctsGi= "nbrOutDataOctsGi";
    const string nbrIncDataOctsGi= "nbrIncDataOctsGi";

    //MBMS Session by GGSN
    const string AttMbmsSessionStart= "AttMbmsSessionStart";
    const string SuccMbmsSessionStart= "SuccMbmsSessionStart";
    const string FailMbmsSessionStart= "FailMbmsSessionStart";
    const string AttMbmsSessionStop= "AttMbmsSessionStop";
    const string SuccMbmsSessionStop= "SuccMbmsSessionStop";
    const string NbrActiveSession= "NbrActiveSession";

    //MBMS Traffic
    const string TraMbmsGi= "TraMbmsGi";
    const string TraMbmsGtpGn= "TraMbmsGtpGn";

```



```

};

//GGSN APN measurement
module apnSessionManagementMeasurement
{
    //active PDP context
    const string attActPdpContext= "attActPdpContext";
    const string succActPdpContext= "succActPdpContext";
    const string failActPdpContextUmtsPerCause = "failActPdpContextUmtsPerCause";
    //active dynamic PDP context
    const string attDynActPdpContext= "attDynActPdpContext";
    const string succDynActPdpContext= "succDynActPdpContext";
    //active PDP context with QoS parameter
    const string succActPdpContextQos= "succActPdpContextQos";
    //fail to active PDP context because of no resource available
    const string failActPdpContextNoResource= "failActPdpContextNoResource";
    //deactive PDP context by MS
    const string attDeactPdpContextMs= "attDeactPdpContextMs";
    const string succDeactPdpContextMs= "succDeactPdpContextMs";
    //Deactive PDP context by GGSN
    const string attDeactPdpContextGgsn= "attDeactPdpContextGgsn";
    const string succDeactPdpContextGgsn= "succDeactPdpContextGgsn";
    //number of actived PDP context by GGSN
    const string nbrActPdpContexts= "nbrActPdpContexts";
    const string meanActPdpContexts= "meanActPdpContexts";
    const string maxActPdpContexts= "maxActPdpContexts";
};

module apnThroughputMeasurement
{
    const string nbrIncDataPktsGnGp = "nbrIncDataPktsGnGp";
    const string nbrOutDataPktsGnGp = "nbrOutDataPktsGnGp";
    const string nbrIncDataOctsGnGp = "nbrIncDataOctsGnGp";
    const string nbrOutDataOctsGnGp = "nbrOutDataOctsGnGp";
    const string nbrIncSigPktsGnGp = "nbrIncSigPktsGnGp";
    const string nbrOutSigPktsGnGp = "nbrOutSigPktsGnGp";
    const string nbrIncSigOctsGnGp = "nbrIncSigOctsGnGp";
    const string nbrOutSigOctsGnGp = "nbrOutSigOctsGnGp";
    const string nbrOutDataPktsGi = "nbrOutDataPktsGi";
    const string nbrIncDataPktsGi = "nbrIncDataPktsGi";
    const string nbrOutDataOctsGi = "nbrOutDataOctsGi";
};

```

```

        const string nbrIncDataOctsGi = "nbrIncDataOctsGi";
    };

//for Utran Network
//RNC measurement
module rabAssignmentMeas
{
    //assignment RAB
    const string attRabAssignEstabCsPerType= "attRabAssignEstabCsPerType";
    const string succRabAssignEstabCsPerType= "succRabAssignEstabCsPerType";
    const string failRabAssignEstabCsPerCause= "failRabAssignEstabCsPerCause";
    const string attRabAssignEstabPsPerType= "attRabAssignEstabPsPerType";
    const string succRabAssignEstabPsPerType= "succRabAssignEstabPsPerType";
    const string failRabAssignEstabPsPerCause= "failRabAssignEstabPsPerCause";
};

module rabReleaseRequestMeas
{
    const string nbrRncRelCsRabPerCause= "nbrRncRelCsRabPerCause";
    const string nbrRncRelPsRabPerCause= "nbrRncRelPsRabPerCause";
};

module iuConnectionMeas
{
    //establish Iu connection
    const string attRncEstabCsIuConn= "attRncEstabCsIuConn";
    const string attRncEstabPsIuConn= "attRncEstabPsIuConn";
    //request to release Iu connection
    const string nbrRncRelCsIuConnPerCause= "nbrRncRelCsIuConnPerCause";
    const string nbrRncRelPsIuConnPerCause= "nbrRncRelPsIuConnPerCause";
    //release Iu connection
    const string attRelCsIuConnPerCause = "attRelCsIuConnPerCause";
    const string attRelPsIuConnPerCause= "attRelPsIuConnPerCause";
};

module iuInterfaceMeas
{
    //Iu interface reset
    const string nbrResetCsByRncPerCause= "nbrResetCsByRncPerCause";
    const string nbrResetPsByRncPerCause= "nbrResetPsByRncPerCause";
    const string nbrResetCsByCnPerCause= "nbrResetCsByCnPerCause";
    const string nbrResetPsByCnPerCause= "nbrResetPsByCnPerCause";
    //Iu interface reset resource
    const string nbrResetResCsByRncPerCause= "nbrResetResCsByRncPerCause";
    const string nbrResetResPsByRncPerCause= "nbrResetResPsByRncPerCause";
};

```

```

const string nbrResetResCsByCnPerCause= "nbrResetResCsByCnPerCause";
const string nbrResetResPsByCnPerCause= "nbrResetResPsByCnPerCause";
//Iu interface overload control
const string nbrOverloadControlCsByRnc= "nbrOverloadControlCsByRnc";
const string nbrOverloadControlPsByRnc= "nbrOverloadControlPsByRnc";
const string nbrOverloadControlCsByCn= "nbrOverloadControlCsByCn";
const string nbrOverloadControlPsByCn= "nbrOverloadControlPsByCn";
//Iu interface error indication
const string nbrErrorIndCsByRncPerCause= "nbrErrorIndCsByRncPerCause";
const string nbrErrorIndPsByRncPerCause= "nbrErrorIndPsByRncPerCause";
const string nbrErrorIndCsByCnPerCause= "nbrErrorIndCsByCnPerCause";
const string nbrErrorIndPsByCnPerCause= "nbrErrorIndPsByCnPerCause";
};
module mncBHOMeas
{
    const string attBho = "attBho";
    const string succBho = "succBho";
    const string failBhoPerCause = "failBhoPerCause";
};
module mncHHOMeas
{
    const string attHho= "attHho";
    const string succHho = "succHho";
    const string failHhoPerCause= "failHhoPerCause";
};
module mncRelocationMeas
{
    const string relocAttPrep= "relocAttPrep";
    const string relocSuccPrep= "relocSuccPrep";
    const string relocFailPrepCause= "relocFailPrepCause";
    const string relocSucc= "relocSucc";
};
module mncInterSystemHOMeas
{
    //relocation in RAT
    const string attRelocPrepOutRATHOCSPerCause= "attRelocPrepOutRATHOCSPerCause";
    const string failRelocPrepOutRATHOCSPerCause= "failRelocPrepOutRATHOCSPerCause";
    const string succRelocPrepOutRATHOCS = "succRelocPrepOutRATHOCS";
    //CS inter system handover from 3G to 2G
    const string iRATHOAttOutCS= "iRATHOAttOutCS";
    const string iRATHOFailOutCSCause= "iRATHOFailOutCSCause";
    const string iRATHOSuccOutCS= "iRATHOSuccOutCS";
};

```

```

//CS inter system handover from 2G to 3G
const string iRATHOAttIncCS= "iRATHOAttIncCS";
const string iRATHOFailIncCSCause= "iRATHOFailIncCSCause";
const string iRATHOSuccIncCS= "iRATHOSuccIncCS";
//PS inter system handover from 3G to 2G
const string iRATHOAttOutPSUTRAN= "iRATHOAttOutPSUTRAN";
const string iRATHOFailOutPSUTRANCause= "iRATHOFailOutPSUTRANCause";
const string iRATHOSuccOutPSUTRAN= "iRATHOSuccOutPSUTRAN";
const string iRATHOSuccOutPSUE= "iRATHOSuccOutPSUE";
//PS inter system handover from 2G to 3G
const string iRATHOAttIncPS= "iRATHOAttIncPS";
const string iRATHOSuccIncPS= "iRATHOSuccIncPS";
};

//MBMS Measurement
module MBMS
{
const string AttIuMbmsStart= "AttIuMbmsStart";
const string SuccMbmsSessionStart= "SuccMbmsSessionStart";
const string FailMbmsSessionStart= "FailMbmsSessionStart";
const string AttMbmsSessionStop= "AttMbmsSessionStop";
const string SuccMbmsSessionStop= "SuccMbmsSessionStop";
const string NbrActiveSession= "NbrActiveSession";
const string nbrChangeOverTx= "nbrChangeOverTx";
const string PsRlcUserTrafficOct= "PsRlcUserTrafficOct";
const string AttRbSetup= "AttRbSetup";
const string SuccRbSetup= "SuccRbSetup";

};

//No.7 signalling measurement
module signallingPointTP
{
const string nbrUsrUnavailRx= "nbrUsrUnavailRx";
const string nbrUsrUnavailTx= "nbrUsrUnavailTx";
const string nbrTraTx= "nbrTraTx";
const string nbrTraRx= "nbrTraRx";
const string nbrMsuDropRteErr= "nbrMsuDropRteErr";
};

module signallingLinkTP
{
const string nbrChangeOverTx= "nbrChangeOverTx";
const string nbrChangeOverRx= "nbrChangeOverRx";
};

```

```

const string nbrChangeOverAckTx= "nbrChangeOverAckTx";
const string nbrChangeOverAckRx= "nbrChangeOverAckRx";
const string nbrChangeBackTx= "nbrChangeBackTx";
const string nbrChangeBackRx= "nbrChangeBackRx";
const string nbrChangeBackAckTx= "nbrChangeBackAckTx";
const string nbrChangeBackAckRx= "nbrChangeBackAckRx";
const string nbrLnkInhDenTx= "nbrLnkInhDenTx";
const string nbrLnkInhDenRx= "nbrLnkInhDenRx";
const string nbrLnkForceUninhTx= "nbrLnkForceUninhTx";
const string nbrLnkForceUninhRx= "nbrLnkForceUninhRx";
const string nbrLnkLocInhTstTx= "nbrLnkLocInhTstTx";
const string nbrLnkLocInhTstRx= "nbrLnkLocInhTstRx";
const string nbrLnkRmtInhTstTx= "nbrLnkRmtInhTstTx";
const string nbrLnkRmtInhTstRx= "nbrLnkRmtInhTstRx";
const string nbrLnkConOrdTx= "nbrLnkConOrdTx";
const string nbrLnkConOrdRx= "nbrLnkConOrdRx";
const string nbrLnkConAckTx= "nbrLnkConAckTx";
const string nbrLnkConAckRx= "nbrLnkConAckRx";
const string nbrLnkTstRx= "nbrLnkTstRx";
const string nbrLnkTstTx= "nbrLnkTstTx";
const string nbrLnkTstAckRx= "nbrLnkTstAckRx";
const string nbrLnkTstAckTx= "nbrLnkTstAckTx";
const string nbrTxDrop= "nbrTxDrop";
const string nbrTxCongDrop= "nbrTxCongDrop";
const string nbrSifOctTx= "nbrSifOctTx";
const string nbrSifOctRx= "nbrSifOctRx";
const string nbrSioOctTx= "nbrSioOctTx";
const string nbrSioOctRx= "nbrSioOctRx";
const string nbrMsuTx= "nbrMsuTx";
const string nbrMsuRx= "nbrMsuRx";
const string nbrCong1= "nbrCong1";
const string nbrCong2= "nbrCong2";
const string nbrCong3= "nbrCong3";
const string durSigLinkOutOfService= "durSigLinkOutOfService";
const string durLnkCong= "durLnkCong";
const string nbrLnkErrPduRx= "nbrLnkErrPduRx";
};
module signallingLinkSetTP
{
    const string durLnkSetUnav= "durLnkSetUnav";
};

```

```

//UtranCell or UtranTDDMCell measurement
module cellRrcConnectionMeas
{
    const string rrcAttConnEstabCause= "rrcAttConnEstabCause";
    const string rrcFailConnEstabCause= "rrcFailConnEstabCause";
    const string rrcSuccConnEstabCause= "rrcSuccConnEstabCause";
    const string rrcAttConnReEstab= "rrcAttConnReEstab";
    const string rrcFailConnReEstabCause= "rrcFailConnReEstabCause";
    const string rrcSuccConnReEstab= "rrcSuccConnReEstab";
    const string rrcAttConnRelDCCHCause= "rrcAttConnRelDCCHCause";
    const string rrcAttConnRelCCCHCause= "rrcAttConnRelCCCHCause";
};

module hHOIntraRNCIntraFreMeas
{
    const string attOutHHOIntraRNCIntraFreCell = "attOutHHOIntraRNCIntraFreCell";
    const string succOutHHOIntraRNCIntraFreCell = "succOutHHOIntraRNCIntraFreCell";
    const string failOutHHOIntraRNCIntraFreCellPerCause = "failOutHHOIntraRNCIntraFreCell
PerCause";
};

module hHOIntraRNCInterFreMeas
{
    const string attOutHHOIntraRNCInterFreCell = "attOutHHOIntraRNCInterFreCell";
    const string succOutHHOIntraRNCInterFreCell = "succOutHHOIntraRNCInterFreCell";
    const string failOutHHOIntraRNCInterFreCellPerCause =
"failOutHHOIntraRNCInterFreCellPerCause";
};

module bHOIntraRNCIntraFreMeas
{
    const string attOutHHOIntraRNCIntraFreCell = " attOutHHOIntraRNCIntraFreCell ";
    const string succOutHHOIntraRNCIntraFreCell = " succOutHHOIntraRNCIntraFreCell ";
    const string failOutHHOIntraRNCIntraFreCellPerCause = "
failOutHHOIntraRNCIntraFreCellPerCause ";
};

module bHOIntraRNCInterFreMeas
{
    const string attOutBHOIntraRNCInterFreCell = " attOutBHOIntraRNCInterFreCell ";
    const string succOutHHOIntraRNCInterFreCell = " succOutHHOIntraRNCInterFreCell ";
    const string failOutHHOIntraRNCInterFreCellPerCause = "

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failOutHHOIntraRNCInterFreCellPerCause ";
};

module hHOInterRNCIntraFreMeas
{
    const string attOutBHOInterRNCIntraFreCell = " attOutBHOInterRNCIntraFreCell ";
    const string succOutBHOInterRNCIntraFreCell = " succOutBHOInterRNCIntraFreCell ";
    const string failOutBHOInterRNCIntraFreCellPerCause = " failOutBHOInterRNCIntraFreCell
PerCause ";
};

module hHOInterRNCInterFreMeas
{
    const string attOutBHOInterRNCInterFreCell = " attOutBHOInterRNCInterFreCell ";
    const string succOutBHOInterRNCInterFreCell = " succOutBHOInterRNCInterFreCell ";
    const string failOutBHOInterRNCInterFreCellPerCause = "
failOutBHOInterRNCInterFreCellPerCause ";
};

module hHOInterSystemMeas
{
    const string attRelocPrepOutRATHOCSPerCause = " attRelocPrepOutRATHOCSPerCause ";
    const string failRelocPrepOutRATHOCSPerCause=" failRelocPrepOutRATHOCSPerCause ";
    const string succRelocPrepOutRATHOCS = " succRelocPrepOutRATHOCS ";
    const string iRATHOAttOutCS = " iRATHOAttOutCS ";
    const string iRATHOFailOutCSPerCause = " iRATHOFailOutCSPerCause ";
    const string iRATHOSuccOutCS = " iRATHOSuccOutCS ";
    const string iRATHOAttIncCS = " iRATHOAttIncCS ";
    const string iRATHOFailIncCSPerCause = " iRATHOFailIncCSPerCause ";
    const string iRATHOSuccIncCS = " iRATHOSuccIncCS ";
    const string iRATHOAttOutPSUTRAN = " iRATHOAttOutPSUTRAN ";
    const string iRATHOFailOutPSUTRANPerCause = " iRATHOFailOutPSUTRANPerCause ";
    const string iRATHOSuccOutPSUTRAN = " iRATHOSuccOutPSUTRAN ";
    const string iRATHOSuccOutPSUE = " iRATHOSuccOutPSUE ";
    const string iRATHOAttIncPS = " iRATHOAttIncPS ";
    const string iRATHOSuccIncPS = " iRATHOSuccIncPS ";
};

module cellDCAMeas
{
    const string attDCA = "attDCA";
    const string failDCAPerCause = "failDCAPerCause";
}

```

```

};
module cellCodeResMeas
{
    const string dLMaxCodeResUsedPerSF = "dLMaxCodeResUsedPerSF";
    const string uLMaxCodeResUsedPerSF = "uLMaxCodeResUsedPerSF";
    const string dLMeanCodeResUsedPerSF = "dLMeanCodeResUsedPerSF";
    const string uLMeanCodeResUsedPerSF = "uLMeanCodeResUsedPerSF";
};
module cellRFMeas
{
    const string dLMaxTimeslotTCPPerTS = "dLMaxTimeslotTCPPerTS";
    const string uLMaxTimeslotRTWPPerTS = "uLMaxTimeslotRTWPPerTS";
    const string dLMeanTimeslotTCPPerTS = "dLMeanTimeslotTCPPerTS";
    const string uLMeanTimeslotRTWPPerTS = "uLMeanTimeslotRTWPPerTS";
    const string uLMaxTimeslotISCPPerTS = " uLMaxTimeslotISCPPerTS ";
    const string uLMeanTimeslotISCPPerTS = " uLMeanTimeslotISCPPerTS ";
};

module radioLinkOfIubMeas
{
    const string rLAttSetup = " rLAttSetup ";
    const string rLFailureSetupPerCause = " rLFailureSetupPerCause ";
    const string rLAttAddition = " rLAttAddition ";
    const string rLFailureAdditionPerCause = " rLFailureAdditionPerCause ";
    const string rLRecfgPrePare = " rLRecfgPrePare ";
    const string rLRecfgPrePareFalurePerCause = " rLRecfgPrePareFalurePerCause ";
    const string rLRecfgCommit = " rLRecfgCommit ";
    const string rLRecfgCancel = " rLRecfgCancel ";
    const string rLFailureIndPerCause = " rLFailureIndPerCause ";
    const string rLRestoreInd = " rLRestoreInd ";
    const string rLDeletionReq = " rLDeletionReq ";
    const string rLDeletionSucc = " rLDeletionSucc ";
};

//UtranRelation or UtranTDDMRRelation measurement
module hHOIntraFreMeas
{
    const string attOutHHOIntraFreUtranRlt = " attOutHHOIntraFreUtranRlt ";
    const string succOutHHOIntraFreUtranRlt = " succOutHHOIntraFreUtranRlt ";
    const string failOutHHOIntraFreUtranRlt = " failOutHHOIntraFreUtranRlt ";
};
module hHOInterFreMeas

```



```

{
    const string attOutHHOInterFreUtranRlt = " attOutHHOInterFreUtranRlt ";
    const string succOutHHOInterFreUtranRlt = " succOutHHOInterFreUtranRlt ";
    const string failOutHHOInterFreUtranRltPerCause= " failOutHHOInterFreUtranRltPerCause ";
};
module bHOIntraFreMeas
{
    const string attOutBHOIntraFreUtranRlt = " attOutBHOIntraFreUtranRlt ";
    const string succOutBHOIntraFreUtranRlt = " succOutBHOIntraFreUtranRlt ";
    const string failOutBHOIntraFreUtranRltPerCause = " failOutBHOIntraFreUtranRltPerCause ";
};
module bHOInterFreMeas
{
    const string attOutBHOInterFreUtranRlt = " attOutBHOInterFreUtranRlt ";
    const string succOutBHOInterFreUtranRlt = " succOutBHOInterFreUtranRlt ";
    const string failOutBHOInterFreUtranRltPerCause = " failOutBHOInterFreUtranRltPerCause ";
};
};
#endif

```

## 5.2 数据类型的 IDL 定义

### TDSCDMANRMMMeasurementSystem.idl

```

//File "TDSCDMANRMMMeasurementSystem.idl"
#ifndef TDSCDMANRMMMeasurementSystem_idl
#define TDSCDMANRMMMeasurementSystem_idl

// #pragma prefix "3gppsa5.org"

/**
 * This module defines type definitions for performance measurements
 */
module TDSCDMANRMMMeasurementSystem
{

    typedef unsigned long TDSCDMAMeasurementType1;
    typedef float TDSCDMAMeasurementType2;

    // The following RANAP causes are defined in the section 9.2.1.4 of 3GPP TS 25.413
    typedef unsigned short RANAPCause;

    //Radio Network Layer Cause. Value range is 1 - 64.
    const RANAPCause rabPreempted = 1;
    const RANAPCause trelocoverallExpiry = 2;

```

```
const RANAPCause trelocprepExpiry = 3;
const RANAPCause treloccompleteExpiry = 4;
const RANAPCause tqueingExpiry = 5;
const RANAPCause relocationTriggered = 6;
const RANAPCause trelocallocExpiry = 7;
const RANAPCause unableToEstablishDuringRelocation = 8;
const RANAPCause unknownTargetRnc = 9;
const RANAPCause relocationCancelled = 10;
const RANAPCause successfulRelocation = 11;
const RANAPCause requestedCipheringAndOrIntegrityProtectionAlgorithmsNotSupported = 12;
const RANAPCause conflictWithAlreadyExistingIntegrityProtectionAndOrCipheringInformation=13;
const RANAPCause failureInTheRadioInterfaceProcedure = 14;
const RANAPCause releaseDueToUtranGeneratedReason = 15;
const RANAPCause userInactivity_RANAP = 16;
const RANAPCause timeCriticalRelocation = 17;
const RANAPCause requestedTrafficClassNotAvailable = 18;
const RANAPCause invalidRABParametersValue = 19;
const RANAPCause requestedMaximumBitRateNotAvailable = 20;
const RANAPCause requestedGuaranteedBitRateNotAvailable = 21;
const RANAPCause requestedTransferDelayNotAchievable = 22;
const RANAPCause invalidRabParametersCombination = 23;
const RANAPCause conditionViolationForSduParameters = 24;
const RANAPCause conditionViolationForTrafficHandlingPriority = 25;
const RANAPCause conditionViolationForGuaranteedBitRate = 26;
const RANAPCause userPlaneVersionsNotSupported = 27;
const RANAPCause iuUpFailure = 28;
const RANAPCause relocationFailureInTargetCnRncOrTargetSystem = 29;
const RANAPCause invalidRabId = 30;
const RANAPCause noRemainingRab = 31;
const RANAPCause interactionWithOtherProcedure = 32;
const RANAPCause requestedMaximumBitRateForDlNotAvailable = 33;
const RANAPCause requestedMaximumBitRateForUlNotAvailable = 34;
const RANAPCause requestedGuaranteedBitRateForDlNotAvailable = 35;
const RANAPCause requestedGuaranteedBitRateForUlNotAvailable = 36;
const RANAPCause repeatedIntegrityCheckingFailure = 37;
const RANAPCause requestedRequestTypeNotSupported = 38;
const RANAPCause requestSuperseded = 39;
const RANAPCause releaseDueToUeGeneratedSignallingConnectionRelease = 40;
const RANAPCause resourceOptimisationRelocation = 41;
const RANAPCause requestedInformationNotAvailable = 42;
const RANAPCause relocationDesirableForRadioReasons = 43;
const RANAPCause relocationNotSupportedInTargetRncOrTargetSystem = 44;
```

```

const RANAPCause directedRetry = 45;
const RANAPCause radioConnectionWithUeLost = 46;
const RANAPCause rncUnableToEstablishAllRfcs = 47;
const RANAPCause decipheringKeysNotAvailable = 48;
const RANAPCause dedicatedAssistanceDataNotAvailable = 49;
const RANAPCause relocationTargetNotAllowed = 50;
const RANAPCause locationReportingCongestion = 51;
//const RANAPCause reduceLoadInServingCell = 52;
//const RANAPCause noRadioResourcesAvailableInTargetCell = 53;
//const RANAPCause geranIuModeFailure = 54;
//const RANAPCause accessRestrictedDueToSharedNetworks = 55;
//const RANAPCause incomingRelocationNotSupportedDueToPuesbineFeature = 56;

//Transport Layer Cause. Value range is 65 - 80.
const RANAPCause signallingTransportResourceFailure = 65;
const RANAPCause iuTransportConnectionFailedToEstablish = 66;

//NAS Cause. Value range is 81 - 96.
const RANAPCause userRestrictionStartIndication = 81;
const RANAPCause userRestrictionEndIndication = 82;
const RANAPCause normalRelease = 83;

//Protocol Cause. Value range is 97 - 112.
const RANAPCause transferSyntaxError_RANAP = 97;
const RANAPCause semanticError_RANAP = 98;
const RANAPCause messageNotCompatibleWithReceiverState_RANAP = 99;
const RANAPCause abstractSyntaxErrorReject_RANAP = 100;
const RANAPCause abstractSyntaxErrorIgnoreAndNotify_RANAP = 101;
const RANAPCause abstractSyntaxErrorFalselyConstructedMessage_RANAP = 102;

//Miscellaneous Cause. Value range is 113 - 128.
const RANAPCause operationAndMaintenanceIntervention_RANAP = 113;
const RANAPCause noResourceAvailable = 114;
const RANAPCause unspecifiedFailure = 115;
const RANAPCause networkOptimisation = 116;

//Non-standard Cause. Value range is 129 - 256. Cause value 256 shall not be used.

// The following RNSAP causes are defined in the section 9.2.1.5 of 3GPP TS 25.423
typedef unsigned short RNSAPCause;

```

```
//Radio Network Layer Cause.
const RNSAPCause unknownCid_RNSAP = 1;
const RNSAPCause cellNotAvailable_RNSAP = 2;
const RNSAPCause powerLevelNotSupported_RNSAP = 3;
const RNSAPCause ulScramblingCodeAlreadyInUse = 4;
const RNSAPCause dlRadioResourcesNotAvailable_RNSAP = 5;
const RNSAPCause ulRadioResourcesNotAvailable_RNSAP = 6;
const RNSAPCause measurementNotSupportedForTheObject_RNSAP = 7;
const RNSAPCause combiningResourcesNotAvailable_RNSAP = 8;
const RNSAPCause combiningNotSupported_RNSAP = 9;
const RNSAPCause reconfigurationNotAllowed = 10;
const RNSAPCause requestedConfigurationNotSupported_RNSAP = 11;
const RNSAPCause synchronisationFailure = 12;
const RNSAPCause requestedTxDiversityModeNotSupported_RNSAP = 13;
const RNSAPCause measurementTemporarilyNotAvailable_RNSAP = 14;
const RNSAPCause unspecified_RNL_RNSAP = 15;
const RNSAPCause invalidCmSettings = 16;
const RNSAPCause reconfigurationCfnNotElapsed_RNSAP = 17;
const RNSAPCause numberOfDLCodesNotSupported_RNSAP = 18;
const RNSAPCause dedicatedTransportChannelTypeNotSupported_RNSAP = 19;
const RNSAPCause dlSharedChannelTypeNotSupported = 20;
const RNSAPCause ulSharedChannelTypeNotSupported = 21;
const RNSAPCause commonTransportChannelTypeNotSupported_RNSAP = 22;
const RNSAPCause ulSpreadingFactorNotSupported = 23;
const RNSAPCause dlSpreadingFactorNotSupported = 24;
const RNSAPCause cmNotSupported_RNSAP = 25;
const RNSAPCause transactionNotSupportedByDestinationNodeB = 26;
const RNSAPCause rIAlreadyActivatedAllocated_RNSAP = 27;
const RNSAPCause numberOfULCodesNotSupported_RNSAP = 28;
const RNSAPCause cellReservedForOperatorUse = 29;
const RNSAPCause dpcModeChangeNotSupported_RNSAP = 30;
const RNSAPCause informationTemporarilyNotAvailable_RNSAP = 31;
const RNSAPCause informationProvisionNotSupportedForTheObject_RNSAP = 32;
//const RNSAPCause powerBalancingStatusNotCompatible_RNSAP = 33;
//const RNSAPCause delayedActivationNotSupported_RNSAP = 34;
//const RNSAPCause rITimingAdjustmentNotSupported_RNSAP = 35;
const RNSAPCause unknownRnti = 36;

//Transport Layer Cause.
const RNSAPCause transportResourceUnavailable_RNSAP = 37;
const RNSAPCause unspecified_TL_RNSAP = 38;
```

```

//Protocol Cause.
const RNSAPCause transferSyntaxError_RNSAP = 39;
const RNSAPCause abstractSyntaxErrorReject_RNSAP = 40;
const RNSAPCause abstractSyntaxErrorIgnoreAndNotify_RNSAP = 41;
const RNSAPCause messageNotCompatibleWithReceiverState_RNSAP = 42;
const RNSAPCause semanticError_RNSAP = 43;
const RNSAPCause unspecified_Protocol_RNSAP = 44;
const RNSAPCause abstractSyntaxErrorFalselyConstructedMessage_RNSAP = 45;

//Miscellaneous Cause.
const RNSAPCause controlProcessingOverload_RNSAP = 46;
const RNSAPCause hardwareFailure_RNSAP = 47;
const RNSAPCause operationAndMaintenanceIntervention_RNSAP = 48;
const RNSAPCause notEnoughUserPlaneProcessingResources_RNSAP = 49;
const RNSAPCause Unspecified_Misc_RNSAP = 50;

// The following NBAP causes are defined in the section 9.2.1.6 of 3GPP TS 25.433
typedef unsigned short NBAPCause;

//Radio Network Layer Cause.
const NBAPCause unknownCid_NBAP = 1;
const NBAPCause cellNotAvailable_NBAP = 2;
const NBAPCause powerLevelNotSupported_NBAP = 3;
const NBAPCause dlRadioResourcesNotAvailable_NBAP = 4;
const NBAPCause ulRadioResourcesNotAvailable_NBAP = 5;
const NBAPCause rIAlreadyActivatedAllocated_NBAP = 6;
const NBAPCause nodeBResourcesUnavailable = 7;
const NBAPCause measurementNotSupportedForTheObject_NBAP = 8;
const NBAPCause combiningResourcesNotAvailable_NBAP = 9;
const NBAPCause requestedConfigurationNotSupported_NBAP = 10;
const NBAPCause synchronizationFailure = 11;
const NBAPCause priorityTransportChannelEstablished = 12;
const NBAPCause sibOriginationInNodeBNotSupported = 13;
const NBAPCause requestedTxDiversityModeNotSupported_NBAP = 14;
const NBAPCause unspecified_RNL_NBAP = 15;
const NBAPCause bcchSchedulingError = 16;
const NBAPCause measurementTemporarilyNotAvailable_NBAP = 17;
const NBAPCause invalidCmSetting = 18;
const NBAPCause reconfigurationCfnNotElapsed_NBAP = 19;
const NBAPCause numberOfDICodesNotSupported_NBAP = 20;
const NBAPCause scpichNotSupported = 21;
const NBAPCause combiningNotSupported_NBAP = 22;

```

```
const NBAPCause ulSfNotSupported = 23;
const NBAPCause dlSfNotSupported = 24;
const NBAPCause commonTransportChannelTypeNotSupported_NBAP = 25;
const NBAPCause dedicatedTransportChannelTypeNotSupported_NBAP = 26;
const NBAPCause downlinkSharedChannelTypeNotSupported = 27;
const NBAPCause uplinkSharedChannelTypeNotSupported = 28;
const NBAPCause cmNotSupported_NBAP = 29;
const NBAPCause txDiversityNoLongerSupported = 30;
const NBAPCause unknownLocalCellId = 31;
const NBAPCause numberOfUICodesNotSupported_NBAP = 32;
const NBAPCause informationTemporarilyNotAvailable_NBAP = 33;
const NBAPCause informationProvisionNotSupportedForTheObject_NBAP = 34;
const NBAPCause cellSynchronisationNotSupported = 35;
const NBAPCause cellSynchronisationAdjustmentNotSupported = 36;
const NBAPCause dpcModeChangeNotSupported_NBAP = 37;
const NBAPCause ipdlAlreadyActivated = 38;
const NBAPCause ipdlNotSupported = 39;
const NBAPCause ipdlParametersNotAvailable = 40;
const NBAPCause frequencyAcquisitionNotSupported = 41;
//const NBAPCause powerBalancingStatusNotCompatible_NBAP = 42;
//const NBAPCause requestedTypeOfBearerRearrangementNotSupported = 43;
//const NBAPCause signallingBearerRearrangementNotSupported = 44;
//const NBAPCause bearerRearrangementNeeded = 45;
//const NBAPCause delayedActivationNotSupported_NBAP = 46;
//const NBAPCause rITimingAdjustmentNotSupported_NBAP = 47;

//Transport Layer Cause.
const NBAPCause transportResourceUnavailable_NBAP = 48;
const NBAPCause unspecified_TL_NBAP = 49;

//Protocol Cause.
const NBAPCause transferSyntaxError_NBAP = 50;
const NBAPCause abstractSyntaxErrorReject_NBAP = 51;
const NBAPCause abstractSyntaxErrorIgnoreAndNotify_NBAP = 52;
const NBAPCause messageNotCompatibleWithReceiverState_NBAP = 53;
const NBAPCause semanticError_NBAP = 54;
const NBAPCause Unspecified_Protocol_NBAP = 55;
const NBAPCause abstractSyntaxErrorFalselyConstructedMessage_NBAP = 56;

//Miscellaneous Cause.
const NBAPCause controlProcessingOverload_NBAP = 57;
const NBAPCause hardwareFailure_NBAP = 58;
```

```
const NBAPCause operationAndMaintenanceIntervention_NBAP = 59;
const NBAPCause notEnoughUserPlaneProcessingResources_NBAP = 60;
const NBAPCause unspecified_Misc_NBAP = 61;

// The following cell update causes are defined in the section 10.3.3.3 of 3GPP TS 25.331.
typedef unsigned short CellUpdateCause;
const CellUpdateCause cellReselection = 1;
const CellUpdateCause periodicalCellUpdate = 2;
const CellUpdateCause uplinkDataTransmission = 3;
const CellUpdateCause pagingResponse = 4;
const CellUpdateCause reenteredServiceArea = 5;
const CellUpdateCause radioLinkFailure = 6;
const CellUpdateCause rlcUnrecoverableError = 7;

// The following establishment causes are defined in the section 10.3.3.11 of 3GPP TS 25.331
typedef unsigned short EstablishmentCause;
const EstablishmentCause originatingConversationalCall = 1;
const EstablishmentCause originatingStreamingCall = 2;
const EstablishmentCause originatingInteractiveCall = 3;
const EstablishmentCause originatingBackgroundCall = 4;
const EstablishmentCause originatingSubscribedTrafficCall = 5;
const EstablishmentCause terminatingConversationalCall = 6;
const EstablishmentCause terminatingStreamingCall = 7;
const EstablishmentCause terminatingInteractiveCall = 8;
const EstablishmentCause terminatingBackgroundCall = 9;
const EstablishmentCause emergencyCall = 10;
const EstablishmentCause interRatCellReselection = 11;
const EstablishmentCause interRatCellChangeOrder = 12;
const EstablishmentCause registration = 13;
const EstablishmentCause detach = 14;
const EstablishmentCause originatingHighPrioritySignalling = 15;
const EstablishmentCause originatingLowPrioritySignalling = 16;
const EstablishmentCause callReestablishment = 17;
const EstablishmentCause terminatingHighPrioritySignalling = 18;
const EstablishmentCause terminatingLowPrioritySignalling = 19;
const EstablishmentCause terminatingCauseUnknown = 20;

// The following failure causes are defined in the section 10.3.3.13 of 3GPP TS 25.331
typedef unsigned short FailureCause;
const FailureCause configurationUnsupported = 1;
const FailureCause physicalChannelFailure_Failure = 2;
const FailureCause incompatibleSimultaneousReconfiguration = 3;
```

```
const FailureCause protocolError_Failure = 4;
const FailureCause compressedModeRuntimeError = 5;
const FailureCause cellUpdateOccurred = 6;
const FailureCause invalidConfiguration = 7;
const FailureCause configurationIncomplete = 8;
const FailureCause unsupportedMeasurement = 9;

// The following rejection causes are defined in the section 10.3.3.31 of 3GPP TS 25.331
typedef unsigned short RejectionCause;
const RejectionCause congestion_Reject = 1;
const RejectionCause unspecified_Reject = 2;

// The following release causes are defined in the section 10.3.3.32 of 3GPP TS 25.331
typedef unsigned short ReleaseCause;
const ReleaseCause normalEvent = 1;
const ReleaseCause preemptiveRelease = 2;
const ReleaseCause congestion_Release = 3;
const ReleaseCause reestablishmentReject = 4;
const ReleaseCause userInactivity_Release = 5;
const ReleaseCause directedSignallingConnectionReestablishment = 6;
const ReleaseCause unspecified_Release = 7;

// The following inter-RAT change failure causes are defined in the section 10.3.8.5 of 3GPP TS 25.331
typedef unsigned short InterRatChangeFailureCause;
const InterRatChangeFailureCause configurationUnacceptable_IRATChange = 1;
const InterRatChangeFailureCause physicalChannelFailure_IRATChange = 2;
const InterRatChangeFailureCause protocolError_IRATChange = 3;
const InterRatChangeFailureCause unspecified_IRATChange = 4;

// The following inter-RAT handover failure causes are defined in the section 10.3.8.6 of 3GPP TS 25.331
typedef unsigned short InterRatHandoverFailureCause;
const InterRatHandoverFailureCause configurationUnacceptable_IRATHo = 1;
const InterRatHandoverFailureCause physicalChannelFailure_IRATHo = 2;
const InterRatHandoverFailureCause protocolError_IRATHo = 3;
const InterRatHandoverFailureCause interRatProtocolError = 4;
const InterRatHandoverFailureCause unspecified_IRATHo = 5;

//The following call failure causes are used in the category "mobileTrafficFlow".
typedef unsigned short CallFailureCause;
const CallFailureCause callingPartAuthFail = 1;
const CallFailureCause callingPartCipherModeFail = 2;
```



```

const CallFailureCause interfaceABusy = 3;
const CallFailureCause callingPartAssignFail = 4;
const CallFailureCause exchangeCongestion = 5;
const CallFailureCause userEarlyRelease = 6;
const CallFailureCause calledPartAssignFail = 7;
const CallFailureCause calledPartDetermineBusy = 8;
const CallFailureCause userUnreachable = 9;
const CallFailureCause alertingEarlyRelease = 10;
const CallFailureCause outCircuitOverflow = 11;
const CallFailureCause calledPartBusy = 12;
const CallFailureCause noAnswer = 13;

//The following Imsi attach failure causes are defined in the section 10.5.3.6 of 3GPP TS 24.008
typedef unsigned short ImsiAttachFailureCause;
const ImsiAttachFailureCause imsiUnknownInHLR_Imsi = 2;
const ImsiAttachFailureCause illegalMS_Imsi = 3;
const ImsiAttachFailureCause imsiUnknownInVLR = 4;
const ImsiAttachFailureCause imeiNotAccepted = 5;
const ImsiAttachFailureCause illegalME_Imsi = 6;
const ImsiAttachFailureCause plmnNotAllowed_Imsi = 11;
const ImsiAttachFailureCause locationAreaNotAllowed_Imsi = 12;
const ImsiAttachFailureCause roamingNotAllowedInThisLocationArea_Imsi = 13;
const ImsiAttachFailureCause noSuitableCellsInLocationArea_Imsi = 15;
const ImsiAttachFailureCause networkFailure_Imsi = 17;
const ImsiAttachFailureCause macFailure_Imsi = 20;
const ImsiAttachFailureCause synchFailure_Imsi = 21;
const ImsiAttachFailureCause congestion_Imsi = 22;
const ImsiAttachFailureCause gsmAuthenticationUnacceptable_Imsi = 23;
const ImsiAttachFailureCause serviceOptionNotSupported_Imsi = 32;
const ImsiAttachFailureCause requestedServiceOptionNotSubscribed_Imsi = 33;
const ImsiAttachFailureCause serviceOptionTemporarilyOutOfOrder_Imsi = 34;
const ImsiAttachFailureCause callCannotBeIdentified = 38;
const ImsiAttachFailureCause failRetryUponEntryIntoANewCell_Imsi = 48;
//value range 48 - 63 is used to retry upon entry into a new cell;
const ImsiAttachFailureCause semanticallyIncorrectMessage_Imsi = 95;
const ImsiAttachFailureCause invalidMandatoryInformation_Imsi = 96;
const ImsiAttachFailureCause messageTypeNon_existentOrNotImplemented_Imsi = 97;
const ImsiAttachFailureCause messageTypeNotCompatibleWithTheProtocolState_Imsi = 98;
const ImsiAttachFailureCause informationElementNon_existentOrNotImplemented_Imsi = 99;
const ImsiAttachFailureCause conditionalIeError_Imsi = 100;
const ImsiAttachFailureCause messageNotCompatibleWithTheProtocolState_Imsi = 101;
const ImsiAttachFailureCause protocolError_Imsi = 111; // unspecified

```

```

//The following activate PDP context MS failure causes are defined in the section 10.5.6.6 of 3GPP TS 24.008.
typedef unsigned short ActPdpContextMsFailureCause;
const ActPdpContextMsFailureCause operatorDeterminedBarring_Ms = 8;
const ActPdpContextMsFailureCause llcOrSndcpFailure= 25;
const ActPdpContextMsFailureCause insufficientResources = 26;
const ActPdpContextMsFailureCause unknownOrMissingAccessPointName = 27;
const ActPdpContextMsFailureCause unknownPdpAddressOrPdpType_Ms = 28;
const ActPdpContextMsFailureCause userAuthenticationFailed_Ms = 29;
const ActPdpContextMsFailureCause activationRejectedByGgsn = 30;
const ActPdpContextMsFailureCause activationRejected = 31; //unspecified
const ActPdpContextMsFailureCause serviceOptionNotSupported_Ms = 32;
const ActPdpContextMsFailureCause requestedServiceOptionNotSubscribed_Ms = 33;//redefined
const ActPdpContextMsFailureCause serviceOptionTemporarilyOutOfOrder_Ms = 34;//redefined
const ActPdpContextMsFailureCause nsapiAlreadyUsed = 35;
const ActPdpContextMsFailureCause regularPdpContextDeactivation = 36;
const ActPdpContextMsFailureCause qosNotAccepted = 37;
const ActPdpContextMsFailureCause networkFailure_Ms = 38;
const ActPdpContextMsFailureCause reactivationRequested = 39;
const ActPdpContextMsFailureCause featureNotSupported = 40;
const ActPdpContextMsFailureCause semanticErrorInTheTftOperation_Ms = 41;
const ActPdpContextMsFailureCause syntacticalErrorInTheTftOperation = 42;
const ActPdpContextMsFailureCause unknownPdpContext = 43;
const ActPdpContextMsFailureCause semanticErrorsInPacketFilters_Ms= 44;
const ActPdpContextMsFailureCause syntacticalErrorInPacketFilters= 45;
const ActPdpContextMsFailureCause PdpContextWithoutTftAlreadyActivated_Ms = 46;
const ActPdpContextMsFailureCause InvalidTransactionIdentifierValue = 81;
const ActPdpContextMsFailureCause semanticallyIncorrectMessage_Ms = 95;
//const ActPdpContextMsFailureCause invalidMandatoryInformation_Ms = 96;//redefined
const ActPdpContextMsFailureCause messageTypeNon_existentOrNotImplemented_Ms = 97;
const ActPdpContextMsFailureCause messageTypeNotCompatibleWithTheProtocolState_Ms = 98;
const ActPdpContextMsFailureCause informationElementNon_existentOrNotImplemented_Ms= 99;
const ActPdpContextMsFailureCause conditionalIEError_Ms = 100;
const ActPdpContextMsFailureCause messageNotCompatibleWithTheProtocolState_Ms = 101;
const ActPdpContextMsFailureCause protocolError_Ms = 111; // unspecified

```

//The following activate PDP context UMTS failure causes are defined in the section 7.7.1 of 3GPP TS 29.060. and 3GPP TS 32.215.

```

typedef unsigned short ActPdpContextUtmsFailureCause;
const ActPdpContextUtmsFailureCause non_existent = 192;
const ActPdpContextUtmsFailureCause invalidMessageFormat = 193;
const ActPdpContextUtmsFailureCause imsiNotKnown = 194;
const ActPdpContextUtmsFailureCause msIsGprsDetached = 195;

```

```

const ActPdpContextUtmsFailureCause msIsNotGprsResponding = 196;
const ActPdpContextUtmsFailureCause msRefuses = 197;
const ActPdpContextUtmsFailureCause versionNotSupported = 198;
const ActPdpContextUtmsFailureCause noResourcesAvailable = 199;
const ActPdpContextUtmsFailureCause serviceNotSupported = 200;
const ActPdpContextUtmsFailureCause mandatoryIeIncorrect = 201;
const ActPdpContextUtmsFailureCause mandatoryIeMissing = 202;
const ActPdpContextUtmsFailureCause optionalIeIncorrect = 203;
const ActPdpContextUtmsFailureCause systemFailure = 204;
const ActPdpContextUtmsFailureCause roamingRestriction = 205;
const ActPdpContextUtmsFailureCause p_tmsiSignatureMismatch = 206;
const ActPdpContextUtmsFailureCause gprsConnectionSuspended = 207;
const ActPdpContextUtmsFailureCause authenticationFailure = 208;
const ActPdpContextUtmsFailureCause userAuthenticationFailed_Utms = 209;
const ActPdpContextUtmsFailureCause contextNotFound = 210;
const ActPdpContextUtmsFailureCause allDynamicPdpAddressesAreOccupied = 211;
const ActPdpContextUtmsFailureCause noMemoryIsAvailable = 212;
const ActPdpContextUtmsFailureCause relocationFailure = 213;
const ActPdpContextUtmsFailureCause unknownMandatoryExtensionHeader = 214;
const ActPdpContextUtmsFailureCause semanticErrorInTheTftOperation_Utms = 215;
const ActPdpContextUtmsFailureCause syntacticErrorInTheTftOperation = 216;
const ActPdpContextUtmsFailureCause semanticErrorsInPacketFilters_Utms = 217;
const ActPdpContextUtmsFailureCause syntacticErrorsInPacketFilters = 218 ;
const ActPdpContextUtmsFailureCause missingOrUnknownApn = 219;
const ActPdpContextUtmsFailureCause unknownPdpAddressOrPdpType_Utms = 220;
const ActPdpContextUtmsFailureCause pdpContextWithoutTftAlreadyActivated_Utms = 221;
//const ActPdpContextUtmsFailureCause apnAccessDenied_noSubscription = 222;
//value range 222-240 is for future use;
//value range 241-255 is reserved for GPRS charging protocol use;
const ActPdpContextUtmsFailureCause requestRelatedToPossiblyDuplicatedPacketsAlreadyFulfilled=252;
const ActPdpContextUtmsFailureCause requestAlreadyFulfilled = 253;
const ActPdpContextUtmsFailureCause sequenceNumbersOfReleasedOrCancelledPacketsIeIncorrect=254;
const ActPdpContextUtmsFailureCause requestNotFulfilled = 255;

//The following GPRS attach failure causes are defined in the section 10.5.5.14 of 3GPP TS 24.008
typedef unsigned short gprsAttathFailureCause;
const gprsAttathFailureCause imsiUnknownInHLR_Gprs = 2;
const gprsAttathFailureCause illegalMS_Gprs = 3;
const gprsAttathFailureCause illegalME_Gprs = 6;
const gprsAttathFailureCause gprsServicesNotAllowed = 7;
const gprsAttathFailureCause gprsServicesAndNon_GprsServicesNotAllowed = 8;
const gprsAttathFailureCause msIdentityCannotBeDerivedByTheNetwork = 9;

```

```

const gprsAttathFailureCause implicitlyDetached = 10;
const gprsAttathFailureCause plmnNotAllowed_Gprs = 11;
const gprsAttathFailureCause locationAreaNotAllowed_Gprs = 12;
const gprsAttathFailureCause roamingNotAllowedInThisLocationArea_Gprs = 13;
const gprsAttathFailureCause noSuitableCellsInLocationArea_Gprs = 15;
const gprsAttathFailureCause mscTemporarilyNotReachable_Gprs=16;
const gprsAttathFailureCause networkFailure_Gprs = 17;
const gprsAttathFailureCause macFailure_Gprs = 20;
const gprsAttathFailureCause synchFailure_Gprs = 21;
const gprsAttathFailureCause congestion_Gprs = 22;
const gprsAttathFailureCause gsmAuthenticationUnacceptable_Gprs = 23;
const gprsAttathFailureCause NoPdpContextActivated = 40;

//value range 48 - 63 is used to retry upon entry into a new cell;
const gprsAttathFailureCause semanticallyIncorrectMessage_Gprs = 95;
const gprsAttathFailureCause invalidMandatoryInformation_Gprs = 96;
const gprsAttathFailureCause messageTypeNon_existentOrNotImplemented_Gprs = 97;
const gprsAttathFailureCause messageTypeNotCompatibleWithTheProtocolState_Gprs = 98;
const gprsAttathFailureCause informationElementNon_existentOrNotImplemented_Gprs = 99;
const gprsAttathFailureCause conditionalIeError_Gprs = 100;
const gprsAttathFailureCause messageNotCompatibleWithTheProtocolState_Gprs = 101;
const gprsAttathFailureCause protocolError_Gprs = 111; // unspecified

```

// The following originating and terminating SMS failure causes are defined in the section 8.2.5.4 of 3GPP TS 24.011

```

typedef unsigned short smsFailureCause;
// Cause values in a mobile originating SM_transfer attempt failure
const smsFailureCause unassignedOrUnallocatedNumber = 1;
const smsFailureCause operatorDeterminedBarring_Sms = 8;
const smsFailureCause callBarred = 10;
const smsFailureCause reserved = 11;
const smsFailureCause shortMessageTransferRejected = 21;
const smsFailureCause destinationOutOfOrder = 27;
const smsFailureCause unidentifiedSubscriber = 28;
const smsFailureCause facilityRejected = 29;
const smsFailureCause unknownSubscriber = 30;
const smsFailureCause networkOutOfOrder = 38;
const smsFailureCause temporaryFailure = 41;
const smsFailureCause congestion_Sms = 42;
const smsFailureCause resourcesUnavailable = 47; //unspecified
const smsFailureCause requestedFacilityNotSubscribed = 50;
const smsFailureCause requestedFacilityNotImplemented = 69;

```

```

const smsFailureCause invalidShortMessageTransferReferenceValue = 81;
const smsFailureCause semanticallyIncorrectMessage_Sms = 95;
const smsFailureCause invalidMandatoryInformation_Sms = 96;
const smsFailureCause messageTypeNon_existentOrNotImplemented_Sms = 97;
const smsFailureCause messageNotCompatibleWithShortMessageProtocolState = 98;
const smsFailureCause informationElementNon_existentOrNotImplemented_Sms = 99;
const smsFailureCause protocolError_Sms = 111; //unspecified
const smsFailureCause interworking = 127; //unspecified
// Cause values in a mobile terminating SM_transfer attempt failure
const smsFailureCause memoryCapacityExceeded = 22;
//const smsFailureCause invalidShortMessageTransferReferenceValue = 81; //redefined
//const smsFailureCause semanticallyIncorrectMessage_Sms = 95; //redefined
//const smsFailureCause invalidMandatoryInformation_Sms = 96; //redefined
//const smsFailureCause messageTypeNon_existentOrNotImplemented_Sms = 97; //redefined
//const smsFailureCause messageNotCompatibleWithShortMessageProtocolState = 98; //redefined
//const smsFailureCause informationElementNon_existentOrNotImplemented_Sms = 99; //redefined
//const smsFailureCause protocolError_Sms = 111; //unspecified //redefined

typedef unsigned short CauseType;
const CauseType sum = 0;
const CauseType other = 65535;
const CauseType noResponse = 65534;
struct CausePairType
{
    CauseType cause;
    unsigned long value;
};
typedef sequence<CausePairType> TDSCDMAMeasurementType3;

typedef unsigned short TrafficClass;
const TrafficClass conversational = 1;
const TrafficClass streaming = 2;
const TrafficClass interactive = 3;
const TrafficClass background = 4;
struct ClassPairType
{
    TrafficClass class;
    unsigned long value;
};
typedef sequence<ClassPairType> TDSCDMAMeasurementType4;
typedef string LocationAreaIdentificationType;
//LocationAreaIdentificationType is composed of MCC, MNC and LAC;

```

```

struct LocationAreaMeasurementType
{
    LocationAreaIdentificationType LocationAreaIdentification;
    unsigned long value;
};
typedef sequence<LocationAreaMeasurementType> TDSCDMAMeasurementType5;

typedef string RoutingAreaIdentificationType;
// RoutingAreaIdentificationType is composed of LAI and RAC;
struct RoutingAreaMeasurementType
{
    RoutingAreaIdentificationType RoutingAreaIdentification;
    unsigned long value;
};
typedef sequence<RoutingAreaMeasurementType> TDSCDMAMeasurementType6;
};

#endif

```

## 6 性能管理接口功能相关的文件

### 6.1 性能测量数据文件的 Schema 定义<measCollec.xsd>

见引用文献[2]6.2中性能数据schema的定义。

版本号：PM FILE V1.0

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- Measurement collection data file XML schema measCollec.xsd -->
<schema targetNamespace="http://latest/nmc-omc/cmNrm.doc#measCollec" elementFormDefault="qualified"
xmlns="http://www.w3.org/2001/XMLSchema" xmlns:mc="http://latest/nmc-omc/cmNrm.doc#measCollec">
    <!-- Measurement collection data file root XML element -->
    <element name="measCollecFile">
        <complexType>
            <sequence>
                <element name="fileHeader">
                    <complexType>
                        <sequence>
                            <element name="fileSender">
                                <complexType>
                                    <attribute name="localDn" type="string" use="optional"/>
                                    <attribute name="elementType" type="string" use="optional"/>
                                </complexType>
                            </element>
                            <element name="measCollec">
                                <complexType>

```

```

        <attribute name="beginTime" type="dateTime" use="required"/>
    </complexType>
</element>
</sequence>
<attribute name="fileFormatVersion" type="string" use="required"/>
<attribute name="vendorName" type="string" use="optional"/>
<attribute name="dnPrefix" type="string" use="optional"/>
</complexType>
</element>
<element name="measData" minOccurs="0" maxOccurs="unbounded">
    <complexType>
        <sequence>
            <element name="managedElement">
                <complexType>
                    <attribute name="localDn" type="string" use="optional"/>
                    <attribute name="userLabel" type="string" use="optional"/>
                    <attribute name="swVersion" type="string" use="optional"/>
                </complexType>
            </element>
            <element name="measInfo" minOccurs="0" maxOccurs="unbounded">
                <complexType>
                    <sequence>
                        <element name="job" minOccurs="0">
                            <complexType>
                                <attribute name="jobId" type="string" use="required"/>
                            </complexType>
                        </element>
                        <element name="granPeriod">
                            <complexType>
                                <attribute name="duration" type="duration" use="required"/>
                                <attribute name="endTime" type="dateTime" use="required"/>
                            </complexType>
                        </element>
                        <element name="repPeriod" minOccurs="0">
                            <complexType>
                                <attribute name="duration" type="duration" use="required"/>
                            </complexType>
                        </element>
                    </sequence>
                </complexType>
            </element>
            <choice>
                <element name="measTypes">
                    <simpleType>
                        <list itemType="mc:measName"/>
                    </simpleType>
                </element>
            </choice>
        </sequence>
    </complexType>
</element>

```

```

</simpleType>
</element>
<element name="measType" minOccurs="0" maxOccurs="unbounded">
  <complexType>
    <simpleContent>
      <extension base="mc:measName">
        <attribute name="p" type="positiveInteger" use="required"/>
      </extension>
    </simpleContent>
  </complexType>
</element>
</choice>
<element name="measValue" minOccurs="0" maxOccurs="unbounded">
  <complexType>
    <sequence>
      <choice>
        <element name="measResults">
          <simpleType>
            <list itemType="mc:measResultType"/>
          </simpleType>
        </element>
        <element name="r" minOccurs="0" maxOccurs="unbounded">
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            <simpleContent>
              <extension base="mc:measResultType">
                <attribute name="p" type="positiveInteger"
use="required"/>
              </extension>
            </simpleContent>
          </complexType>
        </element>
      </choice>
      <element name="suspect" type="boolean" minOccurs="0"/>
    </sequence>
    <attribute name="measObjLdn" type="string" use="required"/>
  </complexType>
</element>
</sequence>
</complexType>
</element>
</sequence>
</complexType>

```



```

</element>
<element name="fileFooter">
  <complexType>
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      <element name="measCollec">
        <complexType>
          <attribute name="endTime" type="dateTime" use="required"/>
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      </element>
    </sequence>
  </complexType>
</element>
</sequence>
</complexType>
</element>
</sequence>
</complexType>
</element>
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    <pattern
value="(mscBasicMeasurement.failImsiAttachsPerCause.|mscBasicMeasurement.failLocationUpdatesIntraMscPerCause.|mscBasicMeasurement.failLocationUpdatesInterMscPerCause.|mscBasicMeasurement.failOrigSmsCsPerCause.|mscBasicMeasurement.failTermSmsCsPerCause.|mscBasicMeasurement.attExternalHosPerCause.|mscBasicMeasurement.attPageReqsPerLa.|mscBasicMeasurement.succPageReqsPerLa.|mscBasicMeasurement.attRepageReqsPerLa.|mobileTrafficFlow.failOrigCallsGsmPerCause.|mobileTrafficFlow.failOrigCallsUmmtsPerCause.|mobileTrafficFlow.failInternalCallsPerCause.|mobileTrafficFlow.failTermCallsGsmPerCause.|mobileTrafficFlow.failTermCallsUmmtsPerCause.|mobileTrafficFlow.failIncCallsPerCause.|mobileTrafficFlow.failOutCallsPerCause.|mobileTrafficFlow.failTransCallsPerCause.|mobileTrafficFlow.failOrigOutCallsPerCause.|mobileTrafficFlow.failTermIncCallsPerCause.|vlrSubscriberData.nbrCurrentSubsInVlrPerHlr.|hlrSubscriberData.nbrCurrentSubsWithPowerOnInHlrPerVlr.|sessionManagementMeasurement.failActPdpContextMsPerCause.|sessionManagementMeasurement.failActPdpContextNetworkPerCause.|subscriberManagementMeasurement.meanAttachedSubsPerRa.|subscriberManagementMeasurement.maxAttachedSubsPerRa.|mobileManagementMeasurement.failGprsAttachPerCause.|mobileManagementMeasurement.failCombiAttachPerCause|mobileManagementMeasurement.failGprsAttachWithImsiAttachedPerCause.|mobileManagementMeasurement.failIntraSgsnRaUpdatePerCause.|mobileManagementMeasurement.failCombiIntraSgsnRaUpdatePerCause.|mobileManagementMeasurement.failInterSgsnRaUpdatePerCause.|mobileManagementMeasurement.failCombiInterSgsnRaUpdatePerCause.|apnSessionManagementMeasurement.failActPdpContextUmmtsPerCause.|rabAssignmentMeas.attRabAssignEstabCsPerType.|rabAssignmentMeas.succRabAssignEstabCsPerType.|rabAssignmentMeas.failRabAssignEstabCsPerCause.|rabAssignmentMeas.attRabAssignEstabPsPerType.|rabAssignmentMeas.succRabAssignEstabPsPerType.|rabAssignmentMeas.failRabAssignEstabPsPerCause.|rabReleaseRequestMeas.nbrRncRelCsRabPerCause.|rabReleaseRequestMeas.nbrRncRelPsRabPerCause.|iuConnectionMeas.nbrRncRelCsIuConnPerCause.|iuConnectionMeas.nbrRncRelPsIuConnPerCause.|iuConnectionMeas.attRelCsIuConnPerCause.|iuConnectionMeas.attRelPsIuConnPerCause.|iuInterfaceMeas.nbrResetCsByRncPerCause.|iuInterfaceMeas.nbrResetPsByRncPerCause.|iuInterfaceMeas.nbrResetCsByCnPerCause.|iuInterfaceMeas.nbrResetP

```

```

sByCnPerCause.|iuInterfaceMeas.nbrResetResCsByRncPerCause.|iuInterfaceMeas.nbrResetResPsByRncPer
Cause.|iuInterfaceMeas.nbrResetResCsByCnPerCause.|iuInterfaceMeas.nbrResetResPsByCnPerCause.|iuInter
faceMeas.nbrErrorIndCsByRncPerCause.|iuInterfaceMeas.nbrErrorIndPsByRncPerCause.|iuInterfaceMeas.nb
rErrorIndCsByCnPerCause.|iuInterfaceMeas.nbrErrorIndPsByCnPerCause.|rncBHOMEas.failBhoPerCause.|rn
cHHOMEas.failHhoPerCause.|rncRelocationMeas.relocFailPrepCause.|rncInterSystemHOMEas.attRelocPrep
OutRATHOCSPerCause.|rncInterSystemHOMEas.failRelocPrepOutRATHOCSPerCause.|rncInterSystemHO
Meas.iRATHOFailOutCSCause.|rncInterSystemHOMEas.iRATHOFailIncCSCause.|rncInterSystemHOMEas.i
RATHOFailOutPSUTRANCause.|MBMS.NbrActiveSession.|MBMS.PsRlcUserTrafficOct.|MBMS.FailMbms
SessionStart.|MBMS.FailMbmsSessionStart.|MBMS.FailMbmsSessionStart.|cellRrcConnectionMeas.rrcAttCo
nnEstabCause.|cellRrcConnectionMeas.rrcFailConnEstabCause.|cellRrcConnectionMeas.rrcSuccConnEstabC
ause.|cellRrcConnectionMeas.rrcFailConnReEstabCause.|cellRrcConnectionMeas.rrcAttConnRelDCCHCause
.|cellRrcConnectionMeas.rrcAttConnRelCCCHCause.|hHOIntraRNCIntraFreMeas.failOutHHOIntraRNCIntra
FreCellPerCause.|hHOIntraRNCInterFreMeas.failOutHHOIntraRNCInterFreCellPerCause.|bHOIntraRNCIntra
FreMeas.failOutHHOIntraRNCIntraFreCellPerCause.|bHOIntraRNCInterFreMeas.failOutHHOIntraRNCInter
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Cause.|hHOInterSystemMeas.failRelocPrepOutRATHOCSPerCause.|hHOInterSystemMeas.iRATHOFailOut
CSPerCause.|hHOInterSystemMeas.iRATHOFailIncCSPerCause.|hHOInterSystemMeas.iRATHOFailOutPSU
TRANPerCause.|cellCodeResMeas.dLMaxCodeResUsedPerSF.|cellCodeResMeas.uLMaxCodeResUsedPerSF
.|cellCodeResMeas.dLMeanCodeResUsedPerSF.|cellCodeResMeas.uLMeanCodeResUsedPerSF.|cellDCAME
as.failDCAPerCause.|cellRFMeas.dLMaxTimeslotTCPPerTS.|cellRFMeas.uLMaxTimeslotRTWPPERTS.|cell
RFMeas.dLMeanTimeslotTCPPerTS.|cellRFMeas.uLMeanTimeslotRTWPPERTS.|cellRFMeas.uLMaxTimeslo
tISCPPerTS.|cellRFMeas.uLMeanTimeslotISCPPerTS.|radioLinkOfIubMeas.rIFailureSetupPerCause.|radioLi
nkOfIubMeas.rIFailureAdditionPerCause.|radioLinkOfIubMeas.rIRecfgPrePareFailurePerCause.|radioLinkOfI
ubMeas.rIFailureIndPerCause.|hHOIntraFreMeas.failOutHHOIntraFreUtranRlt.|hHOInterFreMeas.failOutHH
OInterFreUtranRltPerCause.|bHOIntraFreMeas.failOutBHOIntraFreUtranRltPerCause.|bHOInterFreMeas.fail
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    <enumeration value="mscBasicMeasurement.nbrImsiDetachs"/>
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```

```
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```

```
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```

```

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<enumeration value="mtp3SignallingLinkTP.nbrSentSifsAndSios"/>
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<enumeration value="mtp3bSignallingLinkSetTP.nbrSigLinkSetOutOfService"/>
<enumeration value="mtp3bSignallingLinkSetTP.durSigLinkSetOutOfService"/>
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<enumeration value="observedDestination.nbrNoAvailCircuits"/>
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<enumeration value="observedDestination.ansCalls"/>
<enumeration value="observedDestination.succCallTraffic"/>

```

```

<enumeration value="observedDestination.ansCallTraffic"/>
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<enumeration value="vlrBasicMeasurement.succLusIntraVlr"/>
<enumeration value="vlrBasicMeasurement.attLusInterVlr"/>
<enumeration value="vlrBasicMeasurement.succLusInterVlr"/>
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<enumeration value="vlrBasicMeasurement.succRecvedAuthSetsFromHlr"/>
<enumeration value="vlrBasicMeasurement.succReqAuthSetWithQuintupletsFromHlr"/>
<enumeration value="vlrBasicMeasurement.succReqAuthSetWithTripletsFromHlr"/>
<enumeration value="vlrBasicMeasurement.succInsertSubsData"/>
<enumeration value="vlrBasicMeasurement.succDelSubsData"/>
<enumeration value="vlrBasicMeasurement.attProvideRoamingNumber"/>
<enumeration value="vlrBasicMeasurement.succProvideRoamingNumber"/>
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<enumeration value="vlrSubscriberData.nbrRoamingSubs"/>
<enumeration value="vlrSubscriberData.nbrRoamingSubsInternational"/>
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<enumeration value="hlrBasicMeasurement.succSendAuthInfo"/>
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<enumeration value="hlrBasicMeasurement.attRestoreData"/>
<enumeration value="hlrBasicMeasurement.succRestoreData"/>
<enumeration value="hlrSubscriberData.nbrCurrentSubsInHlr"/>
<enumeration value="hlrSubscriberData.nbrCurrentMsisdnInHlr"/>
<enumeration value="hlrSmServiceMeasurement.attSendRoutingInfoForSm"/>
<enumeration value="hlrSmServiceMeasurement.succSendRoutingInfoForSm"/>
<enumeration value="hlrSmServiceMeasurement.nbrAlertServiceCentre"/>
<enumeration value="hlrSmServiceMeasurement.nbrInformServiceCenter"/>
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```

```

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<enumeration value="hlrInServiceMeasurement.attAnyTimeModification"/>
<enumeration value="hlrInServiceMeasurement.succAnyTimeModification"/>
<enumeration value="hlrInServiceMeasurement.nbrNoteSubsDataModified"/>
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<enumeration value="hlrPacketServiceMeasurement.succSendRoutingInfoForGprs"/>
<enumeration value="hlrPacketServiceMeasurement.nbrFailReport"/>
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<enumeration value="eirBasicMeasurement.nbrCurrentBlackSubsInEir"/>
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<enumeration value="sessionManagementMeasurement.succDeactPdpContextMs"/>
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```

```

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<enumeration value="mobileManagementMeasurement.succCombiAttach"/>
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<enumeration value="mobileManagementMeasurement.attCombiDetachMs"/>
<enumeration value="mobileManagementMeasurement.attImsiDetachMs"/>
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<enumeration value="mobileManagementMeasurement.attInterSgsnRaUpdate"/>
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```



```

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<enumeration value="securityManagementMeasurement.attAuthReq"/>
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```

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<enumeration value="shortMessageServiceMeasurement.attSmsMsPresentPs"/>
<enumeration value="shortMessageServiceMeasurement.succSmsMsPresentPs"/>
<enumeration value="shortMessageServiceMeasurement.attSmsMemoryAvaiPs"/>
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<enumeration value="signallingLinkTP.nbrLnkForceUninhTx"/>
<enumeration value="signallingLinkTP.nbrLnkForceUninhRx"/>
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<enumeration value="signallingLinkTP.nbrLnkRmtInhTstRx"/>
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<enumeration value="MBMS.AttMbmsSessionStop"/>
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<enumeration value="radioLinkOfIubMeas.rlRecfgCommit"/>
<enumeration value="radioLinkOfIubMeas.rlRecfgCancel"/>
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<enumeration value="hHOIntraFreMeas.succOutHHOIntraFreUtranRlt"/>
<enumeration value="hHOInterFreMeas.attOutHHOInterFreUtranRlt"/>

```

```

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    <enumeration value="bHOIntraFreMeas.attOutBHOIntraFreUtranRlt"/>
    <enumeration value="bHOIntraFreMeas.succOutBHOIntraFreUtranRlt"/>
    <enumeration value="bHOInterFreMeas.attOutBHOInterFreUtranRlt"/>
    <enumeration value="bHOInterFreMeas.succOutBHOInterFreUtranRlt"/>
  </restriction>
</simpleType>
<simpleType name="measName">
  <union memberTypes="mc:measNameWithSubCounter mc:measNameWithoutSubCounter"/>
</simpleType>
<simpleType name="measResultType">
  <union memberTypes="decimal">
    <simpleType>
      <restriction base="string">
        <enumeration value="NIL"/>
      </restriction>
    </simpleType>
  </union>
</simpleType>
</schema>

```

## 6.2 性能测量数据文件的 XML header 定义

在实际性能测量数据文件中应该使用下面的XML header定义：

```

<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="MeasDataCollection.xsl"?>
<measCollecFile
  xmlns=
http://www.3gpp.org/ftp/specs/latest/rel-6/32\_series/32401-600.zip - measCollec"
http://latest/nmc-omc/cmNrm.doc#measCollec "
>

```

## 参 考 文 献

- [1] 3GPP TS 32.401 Telecommunication management; Performance Management (PM); Concept and requirements.
- [2] 3GPP TS 32.403 Telecommunication management; Performance Management (PM); Performance measurements -UMTS and combined UMTS/GSM.
- [3] 3GPP TS 25.413 Technical Specification Group Radio Access Network; UTRAN Iu interface RANAP signaling.
- [4] 3GPP TS 25.423 Technical Specification Group Radio Access Network; UTRAN Iur interface RNSAP signaling.
- [5] 3GPP TS 25.433 Technical Specification Group Radio Access Network; UTRAN Iub interface NBAP signaling.
- [6] 3GPP TS 25.331 Technical Specification Group Radio Access Network; Radio Resource Control (RRC); Protocol Specification.
- [7] 3GPP TS 24.008 Technical Specification Group Core Network; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3.
- [8] 3GPP TS 29.060 Technical Specification Group Core Network; General Packet Radio Service (GPRS); GPRS Tunneling Protocol (GTP) across the Gn and Gp interface.
- [9] 3GPP TS 32.215 Telecommunication management; Charging management; Charging data description for the Packet Switched (PS) domain.
- [10] 3GPP TS 24.011 Technical Specification Group Core Network; Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface.
-

广东省网络空间安全协会受控资料

中华人民共和国  
通信行业标准  
2GHz TD-SCDMA 数字蜂窝移动通信网  
多媒体广播系统(TD-MBMS)网络管理技术要求(第一阶段)  
第3部分:基于CORBA技术的网络资源模型设计

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