ETSI TS 132 436 V18.0.0 (2024-05)

**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Performance measurement:
Abstract Syntax Notation 1 (ASN.1) file format definition
(3GPP TS 32.436 version 18.0.0 Release 18)**

Reference
RTS/TSGS-0532436vi00

Keywords
GSM,LTE,UMTS

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Sous-Préfecture de Grasse (06) N° w061004871

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Contents

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

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

TS 32.432: "Performance measurement; File format definition";

TS 32.435: "Performance measurement; eXtensible Markup Language (XML) file format definition";

TS 32.436: "Performance measurement; Abstract Syntax Notation 1 (ASN.1) file format definition".

The present document is part of a set of specifications, which describe the requirements and information model necessary for the standardised Operation, Administration and Maintenance (OA&M) of a multi-vendor 3G PLMN.

During the lifetime of a PLMN, its logical and physical configuration will undergo changes of varying degrees and frequencies in order to optimise the utilisation of the network resources. These changes will be executed through network configuration management activities and/or network engineering, see 3GPP TS 32.600 [4].

Many of the activities involved in the daily operation and future network planning of a PLMN network require data on which to base decisions. This data refers to the load carried by the network and the grade of service offered. In order to produce this data performance measurements are executed in the NEs, which comprise the network. The data can then be transferred to an external system, e.g. an Operations System (OS) in TMN terminology, for further evaluation. The purpose of the present document and the other related 3GPP TSs listed above is to describe the mechanisms involved in the collection of the data.

1 Scope

The present document defines the ASN.1 file format definition for performance measurement results collection whose semantics is defined in 3GPP TS 32.432 [5].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.102: "Telecommunication management; Architecture".

[3] 3GPP TS 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".

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

[5] 3GPP TS 32.432: "Performance Measurement: File format definition".

[6] ITU-T Recommendation X.680: "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

network Element Manager (EM): provides a package of end-user functions for management of a set of closely related types of Network Elements. These functions can be divided into two main categories:

- Element Management Functions for management of Network Elements on an individual basis. These are basically the same functions as supported by the corresponding local terminals.
- Sub-Network Management Functions that are related to a network model for a set of Network Elements constituting a clearly defined sub-network, which may include relations between the Network Elements. This model enables additional functions on the sub-network level (typically in the areas of network topology presentation, alarm correlation, service impact analysis and circuit provisioning).

Network Manager (NM): provides a package of end-user functions with the responsibility for the management of a network, mainly as supported by the EM(s) but it may also involve direct access to the Network Elements. All communication with the network is based on open and well-standardised interfaces supporting management of multi-vendor and multi-technology Network Elements.

Operations System (OS): generic management system, independent of its location level within the management hierarchy.

3.2 Abbreviations

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

3G	3rd Generation
ASN.1	Abstract Syntax Notation 1
BER	Basic Encoding Rules
EM	Element Manager
GSM	Global System for Mobile communications
IRP	Integration Reference Point
NE	Network Element
NM	Network Manager
PM	Performance Management

4 Mapping

Table 4.1 maps the file content items in the 3GPP TS 32.432 [5] to those used in the ASN.1 (see [6]) file format definitions.

Table 4.1 Mapping of File Content Items to ASN.1 types

File Content Item	ASN.1 Type	Description
measDataCollection	MeasDataCollection	
measFileHeader	MeasFileHeader	
measData	MeasData	
measFileFooter	MeasFileFooter	
fileFormatVersion	FileFormatVersion	
senderName	SenderName	For ASN.1 format, the string may be empty (i.e. string size =0) in case the DN is not configured in the sender.
senderType	SenderType	
vendorName	VendorName	
collectionBeginTime	CollectionBeginTime	
neId	NEId	
neUserName	NEUserName	
neDistinguishedName	NEDistinguishedName	
neSoftwareVersion	NESoftwareVersion	
measInfo	MeasInfo	
measInfoId	MeasInfoId	
measTimeStamp	MeasTimeStamp	
jobId	JobId	
granularityPeriod	GranularityPeriod	
reportingPeriod	ReportingPeriod	
measTypes	MeasTypes	
measValues	MeasValues	
measObjInstId	MeasObjInstId	
measResults	MeasResults	
suspectFlag	SuspectFlag	
timeStamp	TimeStamp	ASN.1 GeneralizedTime format.

5 ASN.1 file format definition

The ASN.1 file format definitions implement the measurement result structure and parameters defined in clauses 5.2 and 5.3 of 3GPP TS 32.401 [3].

For ASN.1 formatted files, BER encoding rules shall apply. Embedded comments are integral parts of the standard format; i.e. any implementation-claiming conformance to this annex shall also conform to the comments.

```
PM-File-Description
DEFINITIONS AUTOMATIC TAGS::= BEGIN

MeasDataCollection::= SEQUENCE
    {
    measFileHeader      MeasFileHeader,
    measData                SEQUENCE OF MeasData,
    measFileFooter      MeasFileFooter
    }

MeasFileHeader::= SEQUENCE
    {
    fileFormatVersion           PrintableString (SIZE (0..15)),
    senderName                      PrintableString (SIZE (0..400)),
    senderType                      SenderType,
    vendorName                      PrintableString (SIZE (0..32)),
    collectionBeginTime     TimeStamp,
    ...
    }
-- The sole purpose of the ellipsis notation used in the file header is to facilitate inter-release
compatibility, vendor specific additions are not allowed in implementations claiming conformance to
the TS. However, it is acknowledged that this feature does enable the use of non-standard extensions
to the file header without loosing compatibility to the file format specified in the present
document.

SenderType::= PrintableString (SIZE (0..8))

TimeStamp::= GeneralizedTime

MeasData::= SEQUENCE
    {
    nEId                NEId,
    measInfo        SEQUENCE OF MeasInfo
    }

NEId::= SEQUENCE
    {
    nEUserName                      PrintableString (SIZE (0..64)),
    nEDistinguishedName     PrintableString (SIZE (0..400)),
    nESoftwareVersion           PrintableString (SIZE (0..64)) OPTIONAL
    }

MeasInfo::= SEQUENCE
    {
    measTimeStamp                   TimeStamp,
    granularityPeriod           INTEGER,
    measTypes                           SEQUENCE OF MeasType,
    measValues                      SEQUENCE OF MeasValue
    reportingPeriod             INTEGER OPTIONAL,
    jobId                               INTEGER OPTIONAL,
    measInfoId                      PrintableString (SIZE (0..64)) OPTIONAL,
    }

MeasType::= PrintableString (SIZE (1..64))

MeasValue::= SEQUENCE
    {
    measObjInstId       MeasObjInstId,
    measResults         SEQUENCE OF MeasResult,
    suspectFlag         BOOLEAN DEFAULT FALSE
    }

MeasObjInstId::= PrintableString (SIZE (0..400))

-- The size of the concatenated measObjInstId and neDistinguishedName must not exceed 400.

MeasResult::= CHOICE
    {
```

```
        iValue  INTEGER,
        rValue  REAL,
        noValue NULL,
        ...
    }

-- Normal values are INTEGERs and REALs. The NULL value is reserved to indicate that the measurement
item is not applicable or could not be retrieved for the object instance. The sole purpose of the
ellipsis notation used in the MeasResult choice is to facilitate inter-release compatibility in case
the choice needs to be extended in future releases.

MeasFileFooter::= TimeStamp

END
```

Annex A (informative): Example of ASN.1 Measurement Report File

For readability, a kind of pseudo ASN.1 was used instead of the BER encoding.

```
MeasDataCollection ::= {
    measFileHeader {
        fileFormatVersion ::= "32.436 V6.1",
        senderName ::=
"DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,MeContext=MEC-Gbg-
1,ManagedElement=RNC-Gbg-1",
        senderType ::= "RNC",
        vendorName ::= "Company NN",
        collectionBeginTime ::= 20000301140000
    },
    measData {
        nEId {
            nEUserName ::= "RNC Telecomville",
            nEDistinguishedName ::=
"DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,MeContext=MEC-Gbg-
1,ManagedElement=RNC-Gbg-1",
            nESoftwareVersion ::= "2.1"
        },
        measInfo {
       measInfoId ::= Category A
            measTimeStamp ::= 20000301141430,
            jobId ::= "1231",
            granularityPeriod ::= 900,
            reportingPeriod ::= 1800,
            measTypes {
                "attTCHSeizures",
                "succTCHSeizures",
                "attImmediateAssignProcs",
                "succImmediateAssignProcs"
            },
            measValues {
                {
                    measObjInstId ::= "RncFunction=RF-1,UtranCell=Gbg-997",
                    measResults {
                        iValue ::= 234,
                        iValue ::= 345,
                        iValue ::= 567,
                        iValue ::= 789
                    },
                    suspectFlag ::= FALSE
                },
                {
                    measObjInstId ::= "RncFunction=RF-1,UtranCell=Gbg-998",
                    measResults {
                        iValue ::= 890,
                        iValue ::= 901,
                        iValue ::= 123,
                        iValue ::= 234
                    },
                    suspectFlag ::= FALSE
                },
                {
                    measObjInstId ::= "RncFunction=RF-1,UtranCell=Gbg-999",
                    measResults {
                        iValue ::= 456,
                        iValue ::= 567,
                        iValue ::= 678,
                        iValue ::= 789
                    },
                    suspectFlag ::= TRUE
                }
            }
        }
    },
    measFileFooter ::= 20000301141500
}
```

Annex B (informative): Change history

Change history								
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Cat**	**Old**	**New**
2004-09	SA-25	SP-040580	--	--	Draft created based on 32.401 V6.1.0 and submitted to SA#25 for Information	--	1.0.0	
2004-12	SA-26	SP-040788	--	--	Submitted to SA#26 for Approval	--	2.0.0	6.0.0
2005-09	SA-29	SP-050585	0001	--	Enhance PM ASN.1 file with measInfo	C	6.0.0	7.0.0
2008-12	SA-42	--	--	--	Upgrade to Release 8	--	7.0.0	8.0.0
2009-12	SA-46	--	--	--	Upgrade to Release 9	--	8.0.0	9.0.0
2011-03	-	-	-	-	Update to Rel-10 version (MCC)	--	9.0.0	10.0.0
2012-09	SA-57	-	-	-	Automatic upgrade from previous Release version 10.0.0	-	10.0.0	11.0.0
2014-10	-	-	-	-	Update to Rel-12 version (MCC)		11.0.0	**12.0.0**
2016-01	-	-	-	-	Update to Rel-13 version (MCC)		12.0.0	**13.0.0**
2017-04	SA#75	-	-	-	Promotion to Release 14 without technical change		13.0.0	**14.0.0**

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2018-06						Update to Rel-15 version (MCC)	15.0.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	**16.0.0**
2022-04	-	-	-	-	-	Update to Rel-17 version (MCC)	**17.0.0**
2024-04	-	-	-	-	-	Update to Rel-18 version (MCC)	**18.0.0**

History

Document history		
V18.0.0	May 2024	Publication