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**Telecommunication Management Network (TMN);  
Functional specification of the usage metering information  
management on the Operations System to Network Element  
(OS/NE) interface**

**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE

**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

**X.400:** c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

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## Foreword

This draft Interim European Telecommunication Standard (I-ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Public Enquiry phase of the ETSI standards approval procedure.

An ETSI standard may be given I-ETS status either because it is regarded as a provisional solution ahead of a more advanced standard, or because it is immature and requires a "trial period". The life of an I-ETS is limited to three years after which it can be converted into an ETS, have its life extended for a further two years, be replaced by a new version, or be withdrawn.

<b>Proposed announcement date</b>	
Date of latest announcement of this I-ETS (doa):	3 months after ETSI publication

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## 1 Scope

This Interim European Telecommunication Standard (I-ETS) specifies the management information model which covers the management aspects of the "usage metering information" function.

The model specified in this I-ETS applies to the Operations system to Network Element (OS/NE) interface.

The scope is further limited to the following priorities assigned for the scope of the work:

- modelling of the requirements for the analogue, digital and Integrated Services Digital Network (ISDN) subscribers;
- modelling of these subscribers requirements in connection with Intelligent Networks (INs).

The scope of this I-ETS is also to give a list of elements needed to provide a complete usage information record to be utilized for charging and itemized billing and accounting. Collected data will be formatted and sent to the specialized centre (OS). The use of this data for other purposes, e.g. statistics, customer care etc. is possible, but out of the scope of this I-ETS.

Usage metering in connection with operator assisted calls is out of the scope of this I-ETS.

NOTE: The modelling of the charging and the billing processes is outside the scope of this I-ETS. Nevertheless, the usage metering record defined in this I-ETS may contain charge information if the calculation of charge is performed by the NE itself.

## 2 Normative references

This I-ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ITU-T Recommendation X.701 (1992): "Information technology - Open Systems Interconnection - Systems management overview".
- [2] ETS 300 403-1 (1994): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".
- [3] ETS 300 356-1 (1994): "Integrated Services Digital Network (ISDN); Signalling System No.7 ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]",
- [4] ETS 300 738 (1996): "Human Factors (HF): Minimum man-machine interface (MMI) to public network based supplementary services".
- [5] ITU-T Recommendation Q.811 (1993): "Lower layer protocol for the Q3 interface".
- [6] ITU-T Recommendation Q.812 (1993): "Upper layer protocol for the Q3 interface".
- [7] ITU-T Recommendation Q.850 (1993): "Use of cause and location in digital subscriber signalling system No. 1 and Signalling System No. 7 ISDN user part"
- [8] ITU-T Recommendation X.710 (1991): "Common management information service definition for CCITT applications".

- [9] ITU-T Recommendation X.711 (1991): "Common management information protocol specification for CCITT applications".
- [10] ITU-T Recommendation X.720 (1992): "Information Processing Systems - Open Systems Interconnection - Structure of management information: Management information model".
- [11] ITU-T Recommendation X.721 (1992): "Information Processing Systems - Open Systems Interconnection - Structure of management information: Definition of management information".
- [12] ITU-T Recommendation X.722 (1992): "Information Processing Systems - Open Systems Interconnection - Structure of management information: Guidelines for the definition of managed objects".
- [13] ITU-T Recommendation X.734 (1992): "Information Processing Systems - Open Systems Interconnection - Systems management: Event report management function".
- [14] ITU-T Recommendation X.735 (1992): "Information Processing Systems - Open Systems Interconnection - Systems management: Log control function".
- [15] ITU-T Recommendation X.742 (1994): "Information Processing Systems - Open Systems Interconnection - Systems Management - Usage Metering Function".
- [16] ITU-T Recommendation X.746 (1994): "Information technology - Open Systems Interconnection - Systems management Scheduling function".
- [17] ETS 300 182 (1993): "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service Digital Subscriber Signalling System No. one (DSS1) protocol".
- [18] ITU-T Recommendation X.730 (1992): "Information technology - Open Systems Interconnection - Systems management: Object management function".
- [19] ITU-T Recommendation M.3100 (1992): "Generic network information model".
- [20] ITU-T Recommendation M.3200 (1992): "TMN management service: overview".
- [21] ITU-T Recommendation X.680 (1993): "Information technology - Open Systems Interconnection - Abstract Syntax Notation one (ASN.1): Specification of basic notation".
- [22] ITU-T Recommendation X.681 (1993): "Information technology - Open Systems Interconnection - Abstract Syntax Notation one (ASN.1): Information object specification".
- [23] ITU-T Recommendation X.682 (1993): "Information technology - Open Systems Interconnection - Abstract Syntax Notation one (ASN.1): Constrains specification".
- [24] ITU-T Recommendation X.683 (1993): "Information technology - Open Systems Interconnection - Abstract Syntax Notation one (ASN.1): Parameterization of ASN.1 specification".
- [25] ITU-T Recommendation X.209 (1988): "Specification of basic encoding rules for Abstract Syntax Notation one (ASN.1)".
- [26] ETS 300 374-1 (1994): "Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1) Core Intelligent Network Application Protocol (INAP)".

[27] ITU-T Recommendation X.733 (1992): "Information Processing Systems - Open Systems Interconnection - Systems management: Alarm Reporting Function".

### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purposes of this I-ETS, the following definitions apply:

**accounting:** Set of functions required for Usage Metering, Charging and Billing.

**counter:** A register whose value is increased in real time for each unit to be accounted for.

**billing:** Administrative function to prepare bills to service customers, to prompt payments, to obtain revenues and to take care of customer reclaims.

**charging administration:** Management function to manage charging functionality, to collect variable data out of NEs and provide information for the billing, accounting and service provisioning.

**charging:** The set of functions needed to determine the amount of charge units to be assigned to the service utilization.

**service subscriber:** Is the legal entity, which has subscribed to a certain service type. It is not necessarily a different party from the service user. (The calling and called parties of a service transaction are service users).

**tariff administration:** Management function to set and manipulate tariff.

**tariff:** A set of data used for the determination of the utilization charges for the used services.

**usage metering:** The abstraction of activities that monitor the utilization of resources, for the purpose of accounting and controlling the recording of usage data.

**usage metering data:** Data which represents usage from which usage metering records may be derived.

**usage metering record:** A data item containing usage information relating to a specific period of resource utilization by a specific user.

**usage:** Quantification of the utilization of a resource from which information may be derived for the purpose of accounting.

**user:** An identifiable entity whose use of resources shall be accounted.

#### 3.2 Abbreviations

For the purposes of this I-ETS, the following abbreviations apply:

ACM	Address Complete Message
AOC	Advice of Charge
ASN.1	Abstract Syntax Notation No.1
CLIP	Calling Line Identity Presentation
DDI	Direct Dialling In
DN	Directory Number
EFD	Event Forwarding Discriminator
FCI	Furnish Charging Information
IAM	Initial Address Message
IN	Intelligent Network
INAP	Intelligent Network Application Protocol
ISDN	Integrated Service Digital Network
ISUP	ISDN User Part
MF	Management Function
MML	Man Machine Language

MOCS	Managed Objects Conformance Statement
MSN	Multiple Subscriber Number
NE	Network Element
NEF	Network Element Function
NPI	Numbering Plan Identification
OS	Operations System
OSF	Operations System Function
PSTN	Public Switching Telephone Network
TMN	Telecommunications Management Network
TON	Type Of Number
UMR	Usage Metering Record
UPT	Universal Personal Telecommunication
VAS	Value Added Service

## 4 General

### 4.1 Requirements for usage metering

The usage measuring function shall fulfil the requirements by which resource utilization is determined so that the data that are gathered may be used for the process of accounting management and the generation of bills. The following requirements should be met:

- the function shall allow sufficient control over the collection of usage data so that the relevant information can be made available when required. A management system should have the capability to access individual usage records almost instantaneously. This feature is required e.g. for real time cost calculation like hot billing;
- a management system shall have a standardized way of obtaining and representing usage information to advise subscribers of their usage and to facilitate exchange of usage information with other suppliers;
- the usage record shall be self-contained, i.e. the interpretation of the record shall not be dependent on the system where the usage record was created;
- several resources may be utilized to provide a service. The function should make it possible to relate usage-records to the resources that are actually used for providing the requested service;
- the function should support a number of conditions for reporting of a usage record. Conditions that will cause the reporting of a usage record are:
  - termination of a service;
  - change of service e.g. due to change of charging conditions;
  - reaching a volume threshold;
  - at regular intervals during a practical service transaction.

### 4.2 Use of usage metering records

#### Subscriber billing

The usage metering data collected from the network elements is employed to determine the network resources utilization charges for the basic and supplementary services utilized by the subscriber. The charges calculated are then combined with the network access (subscription) charges and billed to those customers served by the Operations System Function (OSF).

#### Account settlement management

The settlement of accounts with the operators of other networks for traffic carried, is generally performed on a bulk basis. Accounting information may also be used for settlement of accounts with services provided by services centres and other Value Added Service (VAS) providers. The charges for the various traffic shares may be determined on the basis of the call records generated by the network elements or on the basis of bulk counters (accounting meter records) in the gateway exchanges. For the purpose of this

specification, the management information required is assumed to be derived from usage metering records. The management of bulk meters is outside the scope of this specification.

### Service provision

The usage metering data collected from the network elements may be used to provide statistical information concerning the use of services within the network. In addition, the introduction of new services and/or modifications to the tariffs of existing services may also require the distribution of the appropriate tariff information to the network elements for Advice Of Charge (AOC) purposes. The management of tariff information is outside the scope of this specification.

### Customer administration

The call data collected from the NEs provides a historic record of subscriber activity and may be used for the handling of customer care enquiries such as billing complaints, statistic analysis, detection of abnormal use etc.

## 5 Conceptual model

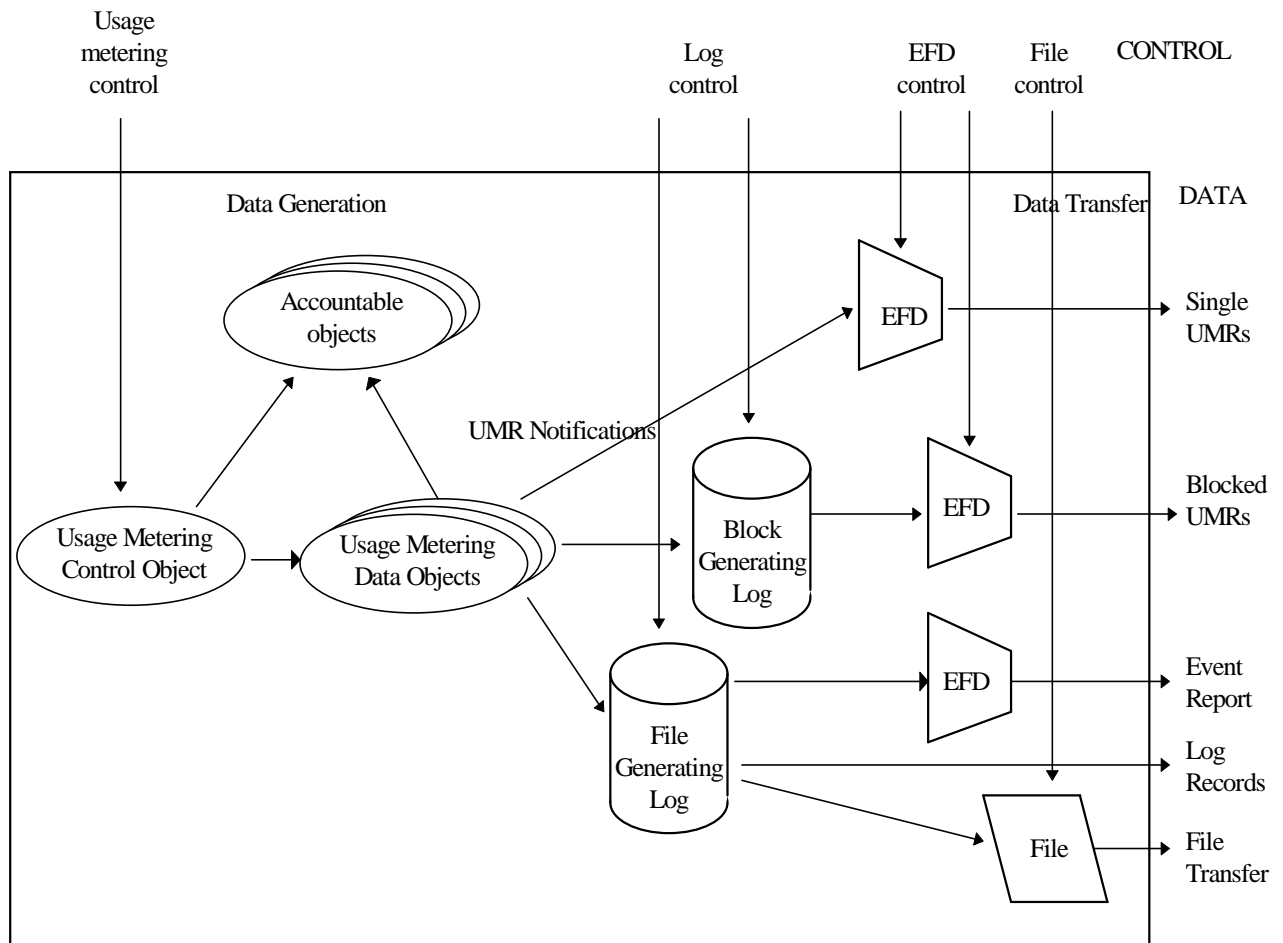


Figure 1: Data collection model

This I-ETS is a specialization of the ITU-T Recommendation X.742 [15]. The ITU-T Recommendation X.742 defines the following object classes to control and collect the usage metering data:

- **Usage metering control object** that is used to control the collection of usage data for one or more accountable objects (resource being used);
- **Usage metering data object** that contains the collected information.

The accountable object may be any resource (logical or physical) for which usage is to be measured. Examples of such resources can be: call attempts, calls, connections, number of protocol data units, etc. The collected usage data is stored in the usageMeteringData object which is contained in the accountable object (representing the resource which usage is being measured). Notifications containing the measured data will be emitted by the usageMeteringData object, upon the occurrence of a reporting trigger, and may be stored in the local log thus forming the usage metering record, or may be transmitted to a remote OS as specified in an event forwarding discriminator. In addition, for efficient transmission, the individual notifications may be grouped into blocks for near real-time usage data reporting. This grouping is accomplished by temporarily storing the UMRs in a blockGeneratingLog and then generating a new notification from that log upon occurrence of a reporting trigger.

UsageMeteringData objects are created and deleted implicitly, that is, they are created and deleted upon the occurrence of defined trigger events and do not have to be explicitly manipulated by a managing system. To support recording data in a usageMeteringData object three sets of triggers are defined:

- Creation Triggers: events that cause creation of a usageMeteringData object, these triggers are defined as part of the control object;
- Termination Triggers: events that cause deletion of a usageMeteringData object, these triggers are defined as part of the data object. Currently the termination triggers are defined implicitly as part of the data object behaviour. Deletion occurs upon completion of usage data collection for that instance of service;
- Data Entry Triggers: events that cause an entry to be made in the usageMeteringData object, these triggers are defined as part of the data object. Currently the data entry triggers are defined as a part of the usage metering data object behaviour and are not configurable via this I-ETS.

An other set of triggers named reporting triggers are also defined as part of the usage metering control object, triggers the emission of UMR notifications.

This I-ETS defines the simpleUsageMeteringControl object class that allows the definition of different types of triggers for usage metering recording. One of the defined reporting triggers requires periodic reporting and can be used to transfer partial service usage data to a log or remote OS for long duration service usage. Another type of trigger is determined by the occurrence of a particular event during usage of the service, e.g. completion of usage.

## 6 Management functions and Services

The TMN management service "Tariff and charging administration" (see ITU-T Recommendation M.3200 [20]) covers those management activities related to the tariffs in the network and to the collection of service usage data.

This I-ETS only covers the management part concerned with the collection of data from the NE. It includes the specification of the data to be collected as well as the mechanisms required for the data transfer of the OS.

The following management functions are required:

- Usage metering control Function;
- Usage metering data Function;
- Real-time UMR reporting Function;
- Near Real-time UMR Reporting Function;
- UMR transfer via the fileGeneratingLog (for bulk billing applications).

This I-ETS defines four new services.

- UM-USAGE-METERING-REPORT;
- UM-BLOCK-RECORD-REPORT;
- UM-FILE-CREATION-ACTION;
- UM-FILE-CREATION-REPORT.

These services and the use of additional services defined in ITU-T Recommendations X.730 [18] (Object management Function), X. 734 [13] (Event Reporting Management Function) and X.735 [14] (Log Control Function) is described below.

## 6.1 Usage metering control function

This function controls the generation and reporting of usage metering records and allows specification of the events and resources whose usage is to be recorded.

The following control functions are available:

- 1) **Recording Control:** Recording controls allow specification of the event that, if it occurs, will cause creation of a usage data object which will generate usage records. This control function enables the reduction of records collected in a NE. The record generation can be triggered to make a record for events based on several types of criteria such as off-hook (seizure) first digit dialled, ACM received, B-answer, supplementary service invocation and supplementary service input. These criteria may be described in the creationTriggers attributes of the control object. If a potentially recordable call (i.e. a call associated with an identified accountable resource) matches the criteria specified in the creationTriggers attribute, a usage data object will be created resulting in the generation of one or more usage records. If the creationTriggers list is empty, each potentially recordable event leads to the generation of a record.
- 2) **Reporting Control:** This control allows specification of the conditions under which a UMR notification will be omitted by the usage metering data object. The triggers may be events occurring during the life of the service or based on elapsed time since the last notification or start of service. This function covers the need for specification of a partial record interval timer for long hold calls. The timer may take any value within the range of 10 minutes to 24 hours. A value 0 means that no partial records will be generated for long hold calls.

To manage the Usage metering control, the operations required are:

- Initiate usage metering;
- Terminate usage metering;
- Get usage metering control data;
- Modify usage metering control data.

### 6.1.1 Initiate usage metering

The PT-CREATE service defined in ITU-T Recommendation. X.730 [18] is used to create an instance of the simpleUsageMeteringControl object (only one instance is allowed per NE). For the lifetime of the simpleUsageMeteringControl object, data are collected and reported as indicated by the attribute values. The formal description of the attributes can be found in annex A.

The following describes the values that will be assigned to the control attributes in response to a PT-CREATE request:

#### **reporting triggers:**

This attribute is imported from ITU-T Recommendation X.742 [15]. It is defined as a CHOICE of which only "time period" is supported by this I-ETS. If this parameter is not specified, the default value of 30 minutes is used.

#### **accountable object reference list:**

This attribute is imported from ITU-T Recommendation X.742 [15]. Only references to objects belonging to an "accountable object class" are valid. Object classes which describe accountable resources should be known at design time.

The specification of (new or existing) accountable object classes may be operator or manufacturer specific and is outside the scope of this I-ETS.

**data object reference list:**

This attribute is imported from ITU-T Recommendation X.742 [15]. The reference list contains pointers to the data objects controlled by the control object. The list is maintained by the NE and can not be specified as part of the create request.

**creation trigger list:**

This attribute specifies the events leading to the implicit creation of a data object. Triggers can be call related (Seizure **or** first digit received **or** ACM received **or** B-answer received) and non-call related (supplementary service invocation and/or input).

**6.1.2 Terminate usage metering**

The PT-DELETE service defined in ITU-T Recommendation X.730 [18] is used to delete the instance of the simpleUsageMeteringControl object.

**6.1.3 Get usage metering control data**

The PT-GET service defined in ITU-T Recommendation X.730 [18] may be used to retrieve the values of the readable attributes except for the attribute dataObjectReferenceList. The data object reference list is maintained by the NE and changes continually (it contains an entry for each connection of which data are being collected).

**6.1.4 Modify usage metering control data**

The PT-SET service defined in ITU-T Recommendation X.730 [18] is used to manage the settable attributes.

**6.2 Usage metering data function**

This function emits the UMR notification for usage selected by the Usage metering control function. A UMR notification may be sent out if one of the following events occurs during the transaction:

- termination of a service;
- change of service e.g. due to change of charging conditions;
- reaching a volume threshold - this may also be due to NE internal reasons;
- at regular intervals during a practical service transaction - expiration of the periodic timer (defined in the Usage metering control);

The PT-EVENT-REPORT service defined in ITU-T Recommendation X.730 [18] is used to report the collected Usage Metering data.

The formal description of the attributes can be found in annex A.

**6.3 Real-time UMR reporting function**

This function controls the generation and transmission of notifications from NE to the OS. Event reporting will normally be used for hot billing purposes. To simplify the necessary eventForwardingDiscriminator (EFD), a special boolean field "immediate notification" is included in the UMR, which can be screened by the EFD. If the value is TRUE, the UMR is forwarded as an event report. The value of the field may be derived by a subscriber action or by other means specific to the implementation.

The presence of more than one OS interested in real time collection of usage metering data may be a practical issue. "Hot billing" may be requested for different purposes by different OSs at the same time. The possibility of multiple instances of the EFD is therefore not precluded.



The operations required to manage the UMR reporting are:

- initiation of event report forwarding;
- termination of event report forwarding;
- event forwarding modification;
- retrieval of eventForwardingDiscriminator attributes.

All these operations are defined in the Event Report Systems Management Function (ITU-T Recommendation X.734 [13], clause 9).

To transmit the real time billing information the NE uses the UM-USAGE-METERING-REPORT service. Table 1 below shows the parameters required in the event report. The event reports may be send in confirmed or unconfirmed mode. Determination of whether or not a confirmation is required is determined by the mode parameter in the EFD. Confirmations contain no parameters.

Table 1: UM-USAGE-METERING-REPORT

Parameter Name	Req/Ind	Resp/Cfm
Invoke Identifier	P	P
Mode	P	-
Managed Object Class	P	-
Managed Object Instance	P	-
Event Type	P	P
Event Time	U	U
Event Information		
Record Type	M	-
Start Time Stamp	M	-
Participant Information	M	-
Bearer Service	M	-
Service User	M	-
Call Identification Number	M	-
Supplementary Service List	C c1	-
Immediate Notification	U	-
Cause	C c2	-
Data Validity	C c3	
IN Specific Information	C c4	-
IN Service Information List	C c4	-
Partial Generation	C c5	-
Exchange Information	U	-
Related Call Number	U	-
UMR Purpose	U	-
Additional Participant Information	U	-
Calling Party Category	U	-
Calling Party Type	U	-
Charging Information	U	-
Progress	U	-
Access Delivery	U	-
Trunk Group Incoming	U	-
Trunk Group Outgoing	U	-
Network Provider Id	C c6	-
Fallback Bearer Service	C c7	-
Teleservice	U	-
Call Duration	C c8	-
User-to-User Information Counter	U	-
Standard Extensions	U	-
Record Extension	U	-
Current Time	-	U
Event Reply	-	-
Errors	-	P

M = Mandatory, P = Pass-through, U = User Option, c = Conditional

- c1: This parameter shall be present if this is a supplementary service input record or if the user invoked a supplementary service as part of the call.
- c2: This parameter shall be present if the exchange has determined that the connection was unsuccessful.
- c3: This parameter shall be present if the exchange has determined that the data contained in this notification may be inaccurate.
- c4: This parameter shall be present if an IN service is invoked that makes use of this information.
- c5: This parameter shall be present if this notification only contains information about a part of the call.
- c6: This parameter shall be present if the exchange supports multiple network providers.
- c7: This parameter shall be present only if the network is providing the fallback bearer service instead of the bearer service requested by the user.
- c8: This parameter shall be present in any call record.

#### 6.4 Near Real-time UMR reporting function

To enable the NE to transfer blocks of UMRs to the OS with a higher efficiency than the standard EFD, individual notifications may be grouped and transferred as a single unit by first storing these notifications in the `blockGeneratingLog`. To further add to the efficiency only stripped records are sent in the notification. These stripped records are defined as `RecordContent` and do not include information added by the log i.e. current logging time, managed object class, managed object instance and `recordId`. The presence of more than one OS interested in collection of usage metering data may be a practical issue. Usage metering data may be requested for different purposes by different OSs at the same time. The possibility of multiple instances of the `blockGeneratingLog` is therefore not precluded.

Emission of a `blockRecordNotification` (and subsequent emptying of the log) may be triggered by one of the following events:

- maximum time period elapsed;
- maximum number of UMRs reached;
- internal size limit reached.

The operations required to manage the near Real-time UMR reporting are:

- initiation of UMR Block logging;  
(see subclause 6.4.1)
- termination of logging;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- modification of log attributes;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- retrieval of log attributes;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- initiation of event report forwarding;  
(defined in the Event Report Systems Management Function ITU-T Recommendation X.734 [13], clause 9)
- termination of event report forwarding;  
(defined in the Event Report Systems Management Function ITU-T Recommendation X.734 [13], clause 9)
- event forwarding modification;  
(defined in the Event Report Systems Management Function ITU-T Recommendation X.734 [13], clause 9)
- retrieval of `eventForwardingDiscriminator` attributes;  
(defined in the Event Report Systems Management Function ITU-T Recommendation X.734 [13], clause 9).

NOTE: Other operations on the log described in ITU-T Recommendation X.735 [14] clause 9 (retrieval of log records, deletion of log records ) are not allowed.

##### 6.4.1 Initiation of UMR Block logging

The PT-CREATE service defined in ITU-T Recommendation X.730 [18] is used to create an instance of the UMR `blockGeneratingLog`. The UMR `blockGeneratingLog` behaves as if it were a log of infinite size derived from the Log described in ITU-T Recommendation X.735 [14].

If there is an internal implementation specific limit of the length of the `blockGeneratingLog` or notification (buffer size, max. message length, etc.), this may be signalled internally to the `blockGeneratingLog`, which will emit a notification with the trigger cause "internalSizeLimitReached".

The conditional packages from ITU-T Recommendation X.735 [14] (finite log size package, scheduling package and alarm package) are irrelevant.

The formal description of the `blockGeneratingLog` can be found in annex A.

The following describes the values that will be assigned to the attributes in response to a PT-CREATE request:

**Log full action:** This attribute is inherited from ITU-T Recommendation X.735 [14], and X.721 [11]. It specifies the action to be taken when the maximum capacity of the log is reached. Only "wrap" is allowed (infinite log). If this parameter is not specified "wrap" is assumed.

**Discriminator construct:** This attribute is inherited from ITU-T Recommendation X.735 [14] and X.721 [11]. It specifies the test conditions which will be used by the log in testing potential log records. Normally, the discriminator will filter on the "immediateNotification" boolean field in the usageMeteringRecordNotification.

**Administrative state:** This attribute is inherited from ITU-T Recommendation X.735 [14] and X.721 [11]. It specifies the administrative state in which the log is to be created. The log may be created in a Unlocked or Locked state. If no administrative state is specified, the Unlocked state is assumed.

**Packages:** none of the inherited conditional packages will be instantiated.

**Maximum Block size:** This maxBlockSize attribute specifies the maximum number of UMRs to be included in a blockRecord notification. An internal counter within the blockGeneratingLog counts the number of UMRs currently in the log. If the value maxBlockSize is reached, a "blockRecordNotification" is emitted, the contained records are deleted and the internal counter is reset to zero. The internal counter is also reset to zero if another notification triggering event happens.

**Maximum Time Period:** The maxTimeInterval attribute specifies the maximum amount of time that is allowed to elapse prior to generation of a blockRecordNotification. That means, that the block transfer is triggered periodically i. e. every n seconds. The time period is also reset to zero if another event happens.

#### 6.4.2 Transmission of Record Blocks

Block UMRs are sent via the UM-BLOCK-RECORD-REPORT to the OS. The UM-BLOCK-RECORD-REPORT has the parameters shown in table 2:

Table 2: UM-BLOCK-RECORD-REPORT

Parameter Name	Req/Ind	Resp/Cfm
Invoke Identifier	P	P
Mode	P	-
Managed Object Class	P	-
Managed Object Instance	P	-
Event Type	P	P
Event Time	U	U
Event Information		
Block Header Record	O	-
Usage Records	M	-
Current Time	-	U
Event Reply	-	-
Errors	-	P

**blockHeaderRecord:** This parameter carries information that is common to all records in the block or pertains to the record as a whole, such information consists of exchangeInfo, reasonForOutput, a sequenceNumber and managementExtensions.

**usageRecords:** This parameter consists of a sequence of records. The content of each record is the set of parameters specified in table 1, with the Exchange Information parameter optionally moved to the block header.

## 6.5 UMR transfer via file Generating Log

The special "fileGeneratingLog" is derived from the standard log function as defined in ITU-T Recommendation X.735 [14].

The record notifications generated by the simpleUsageMeteringData object instance are stored locally in the NE using the logging functionality described in ITU-T Recommendation X.735 [14].

Besides the functions for retrieval and deletion of log entries provided by the ITU-T Recommendation X.735 [14] the fileGeneratingLog control provides an extra functionality to support retrieval of UMR records by a suitable file transfer protocol. This functionality is supported by providing for the creation of a UsageMeteringRecordFile either by means of create request from the OS or a trigger event internal to the NE. When the file has been created initiated by the NE a notification is emitted allowing managing systems to be notified of the existence of the file. The records copied to the file can be retained in the log until explicitly deleted by a managing system. This allows for persistence of usage data until the integrity of the received usage data has been verified. Automatic deletion of the contained records may be specified as a parameter of the file creation action for OS initiated file creation requests or by a configuration attribute in the log for file creation initiated by the NE.

To add to the efficiency of UMR transfer, only stripped records are placed in the created file. These stripped records are defined as RecordContent and do not include information added by the log i.e. current logging time, managed object class, managed object instance and recordId.

The presence of more than one OS interested in collection of usage metering data may be a practical issue. Usage Metering Data may be requested for different purposes by different OSs at the same time. The possibility of multiple OSs accessing the fileGeneratingLog and UsageMeteringRecordFile is therefore not precluded.

For the internal creation triggers, the filename is created automatically by the NE and the file name is communicated to the OS through a notification (UM-FILE-CREATION-REPORT). In case of the action from the OS, a specific filename can be given, which overrides the automatic file naming.

The operations required to manage UMR logging and UMR file handling are:

- initiation of UMR logging;  
(see subclause 6.5.1)
- termination of UMR logging;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- modification of log attributes;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- retrieval of log attributes;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- retrieval of log records;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- deletion of log records;  
(defined in the Log Control Function ITU-T Recommendation X.735 [14], clause 9)
- generation of a UMR file;  
(see subclause 6.5.2)
- UMR file transfer;  
(see subclause 6.5.3).

### 6.5.1 Initiation of UMR logging

The PT-CREATE service defined in ITU-T Recommendation X.730 [18] is used to create an instance of the fileGeneratingLog. The fileGeneratingLog is derived from the Log described in ITU-T Recommendation X.735. [14]

The formal description of the fileGeneratingLog can be found in annex A.

The following describes the values that will be assigned to the attributes in response to a PT-CREATE request:

**Inherited attributes:** For the values of the inherited attributes and conditional packages: see ITU-T Recommendation X.735 [14] Clause 9 (initiation of logging).

**automatic record deletion:** This attribute specifies if the UMRs are deleted from the log when they have been copied into a UsageMeteringRecordFile due to an internal file creation trigger. If not specified this attribute is set to "True".

**Times of day:** This attribute specifies a list of times at which a UsageMeteringRecordFile should be automatically generated on a daily basis.

### 6.5.2 Generation of a UMR File

The UM-CREATE-FILE-ACTION is used to generate a usageMeteringRecordFile containing UMRs collected in the log.

Table 3 describes the parameters that are supported in the action information and in the action result.

**Table 3: UM-FILE-CREATION-ACTION**

Parameter Name	Req/Ind	Resp/Cfm
Invoke Identifier	P	P
Mode	P	-
Managed Object Class	P	-
Managed Object Instance	P	-
Action Type	P	P
Action Information		
File Name	U	M
Lowest Record Id	U	-
Delete Records	U	-
File Size	-	U
Current Time	-	U
Action Reply	-	-
Errors	-	P

**lowest record id:** This parameter describes from which log record id onwards the UMRs should be copied in the file. If omitted, all logged UMRs will be copied.

**delete records:** This parameter indicates if the records should be deleted from the log automatically after being copied in the UsageMeteringRecordFile. If omitted, records will NOT be deleted.

**file name:** This parameter contains the file name of the generated usageMeteringRecordFile.

**file size:** This optional parameter indicates the size in octets of the generated UsageMeteringRecordFile.

### 6.5.3 Internal generation of a UMR File

UMR files may be generated by the fileGeneratingLog due to internal file creation triggers. The internal file creation trigger events can be one of the following:

- daily absolute times;
- internal size limit reached;
- If there is an internal implementation specific limit of the length of a file or Log (buffer size, max. message length, etc.), this may be signalled internally to the Log, which may create a new file with the file trigger cause "internalSizeLimitReached".

When a file is created due to an internal trigger the UM-FILE-CREATION-REPORT may be used to report the existence of this file to external systems. The UM-FILE-CREATION-REPORT has the parameters defined in table 4:

**Table 4: UM-FILE-CREATION-REPORT**

Parameter Name	Req/Ind	Resp/Cfm
Invoke Identifier	P	P
Mode	P	-
Managed Object Class	P	-
Managed Object Instance	P	-
Event Type	P	P
Event Time	U	U
Event Information		
File Name	M	-
Reason For Output	M	-
Current Time	-	U
Action Reply	-	-
Errors	-	P

### 6.5.3 File transfer

File transfer from the NE is initiated by the OS and in the TMN environment, uses FTAM.

If the receiving OS is an intermediate OS that makes data available to other OSs that data can be stored in its original record format, by expanding the UMR records with the event log record information, including the current logging time and a new recordId in the record. Upstream OSs can then manipulate this log like any other fileGeneratingLog.

## 7 Functional units

**Table 5: Functional units**

Functional unit	Managed Object (MO) Class	Function (Services)
Usage metering control	simpleUsageMeteringControl usageMeteringData	Usage metering control Function: - initiate usage metering; (PT-CREATE) - terminate usage metering; (PT-DELETE) - Get usage metering control data; (PT-GET) - Modify usage metering control data; (PT-SET)
<i>This is the standardized Event Reporting management function. The functional units are defined in ITU-T Recommendation X.734 [13]:</i> - event report Management functional unit. - monitor event report management functional unit.	eventForwardingDiscriminat or	Real-time UMR reporting Function: - initiation of event report forwarding; (PT-CREATE) - termination of event report forwarding; (PT-DELETE) - event forwarding modification; (PT-SET) - retrieval of discriminator attributes; (PT-GET)  Near Real-time UMR Reporting Function: - initiation of event report forwarding; (PT-CREATE) - termination of event report forwarding; (PT-DELETE) - event forwarding modification; (PT-SET) - retrieval of discriminator attributes(PT-GET)
UMR blockGeneratingLog control	blockGeneratingLog usageMeteringLogRecord	Near Real-time UMR Reporting Function: - initiation of UMR Block logging; (PT-CREATE) - termination of logging; (PT-DELETE) - modification of log attributes; (PT-SET) - retrieval of log attributes; (PT-GET)
UMR file log control	fileGeneratingLog usageMeteringLogRecord	UMR transfer via the fileGeneratingLog: - initiation of UMR logging; (PT-CREATE) - termination of UMR logging; (PT-DELETE) - modification of log attributes; (PT-SET) - retrieval of log attributes; (PT-GET)
UMR log record retrieve	usageMeteringLogRecord	UMR transfer via the fileGeneratingLog: - retrieval of log records; (PT-GET)
UMR log record delete	usageMeteringLogRecord	UMR transfer via the fileGeneratingLog: - deletion of log records; (PT-DELETE)
UMR file creation	fileGeneratingLog	UMR transfer via the fileGeneratingLog: - generation of a UMR file; (PT-ACTION)
Usage metering agent	simpleUsageMeteringControl usageMeteringData eventForwardingDiscriminat or and/or blockGeneratingLog usageMeteringLogRecord	- transmit real-time report (UM-USAGE-METERING-REPORT) - transmit near real-time report (UM-BLOCK-RECORD-REPORT)
Usage metering monitor		-receive real-time report (UM-USAGE-METERING-REPORT) -receive near real-time report (UM-BLOCK-RECORD-REPORT)

### 7.1 Functional units

1. Usage metering control: this functional unit allows a manager to control for which accountable objects usage data is collected and reported.
2. UMR blockGeneratingLog control: this functional unit allows a manager to create a special blockGeneratingLog to batch UMRs for a short time before they are being issued as "blockRecordNotification"s.
3. UMR file log control: this functional unit allows a manager to create (delete/modify) a special UMR log called fileGeneratingLog to store UMRs.
4. UMR log record retrieve: this functional unit allows a manager to retrieve UMRs from a fileGeneratingLog.



5. UMR log record delete: this functional unit allows a manager to delete UMRs from a fileGeneratingLog.
6. UMR file creation: this functional unit allows a manager to create a UMR file from a fileGeneratingLog.
7. Usage metering agent: this functional unit is used by the NE to transmit both UMR- and UMR block -reports.
8. Usage metering monitor: this functional unit is used by the OS to receive both UMR- and UMR block -reports.

## 7.2 Functional units from other Recommendations

This I-ETS also supports the functional units out of the Event Report Management Functional Unit ( ITU-T Recommendation X.734) [13].

## 7.3 Negotiation of Functional units

This I-ETS assigns the following object identifier value:

**{ccitt(0) identified-organization(4) etsi(0) usageMeteringInformationManagement(43321) informationModel(0) functionalUnitPackage(1)}**

as a value of the ASN.1 type FunctionalUnitPackageld defined in ITU-T Recommendation X.701 [1] to use for negotiating the following functional units:

1. Usage metering control;
2. UMR blockGeneratingLog control;
3. UMR file log control;
4. UMR log record retrieve;
5. UMR log record delete;
6. UMR file creation;
7. Usage metering agent;
8. Usage metering Monitor.

Where the number identifies the bit positions in the BIT STRING assigned to the functional units, and the names referencing the functional units are defined in subclause 7.1 of this I-ETS.

Within the Systems management application context, the mechanism for negotiating the functional units is described by ITU-T Recommendation X.701 [1].

## 8 Conformance

### 8.1 Static conformance

An implementation claiming conformance in either a manager or an agent role shall at least support the following capabilities:

- Capability to control data generation and notification, implying support of the functional unit usage metering control. It should be defined in the Managed Objects Conformance Statement (MOCS) which managed object classes are supported as accountable objects.
- Capability to transfer data from the NE to the OS, by one or more of the following means:
  - real time UMR reporting, implying support of the functional units defined in ITU-T Recommendation X.734 [13] (Event Reporting management), usage metering agent and usage metering monitor.
  - near real-time UMR reporting, implying support of the functional unit UMR blockGeneratingLog control and the functional units defined in ITU-T Recommendation X.734 [13] (Event Reporting management), usage metering agent and usage metering monitor.
  - UMR logging and retrieval of log records, implying support of the functional units UMR file log control, UMR log record retrieve and UMR log record delete.
  - UMR logging and retrieval through file transfer, implying support of the functional units UMR file log control, UMR file creation and the appropriate file transfer capability.

The managed objects and services that need to be supported are formally described in annex A.

The implementation shall support:

- Q3 interface as defined in ITU Recommendations Q.811 [5] and Q.812 [6];
- transfer syntax derived from the basic encoding rules specified in ITU Recommendation X.209 [25];
- for the data types referenced by the definitions for which support is claimed.

### 8.2 Dynamic conformance

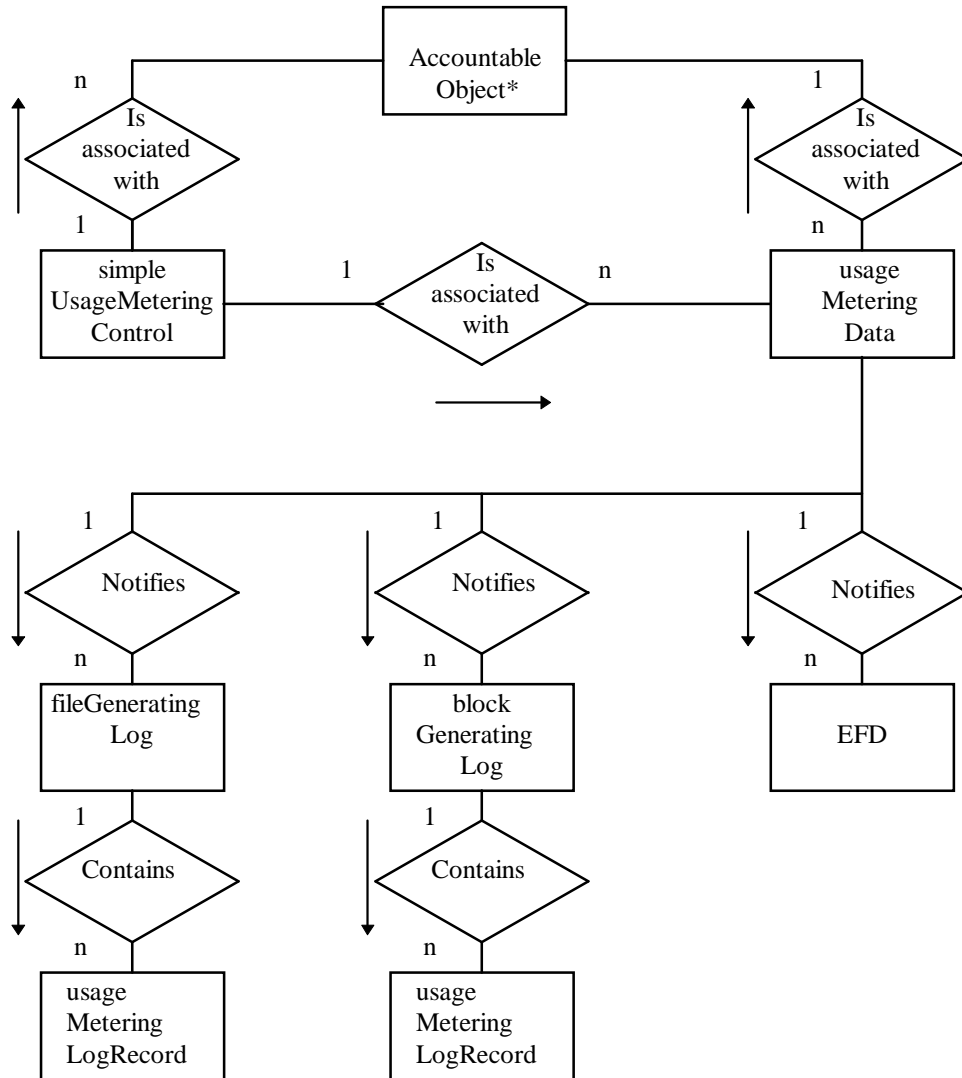
The system shall, in the role(s) for which conformance is claimed, support the elements of procedure defined in:

- ITU Recommendation X.730 [18] for the PT-GET, PT-CREATE, PT-DELETE, PT-SET, PT-EVENT-REPORT, PT-ACTION, object creation reporting, object deletion reporting and attribute change reporting services.

**Annex A (normative): Information model**

**A.1 Overview**

This annex contains the formal description of the information model for this specification. It consists of a simplified Entity-Relationship (ER) diagram, a naming tree, an inheritance tree and an object model specified in ITU-T Recommendation X.722 [12] templates.

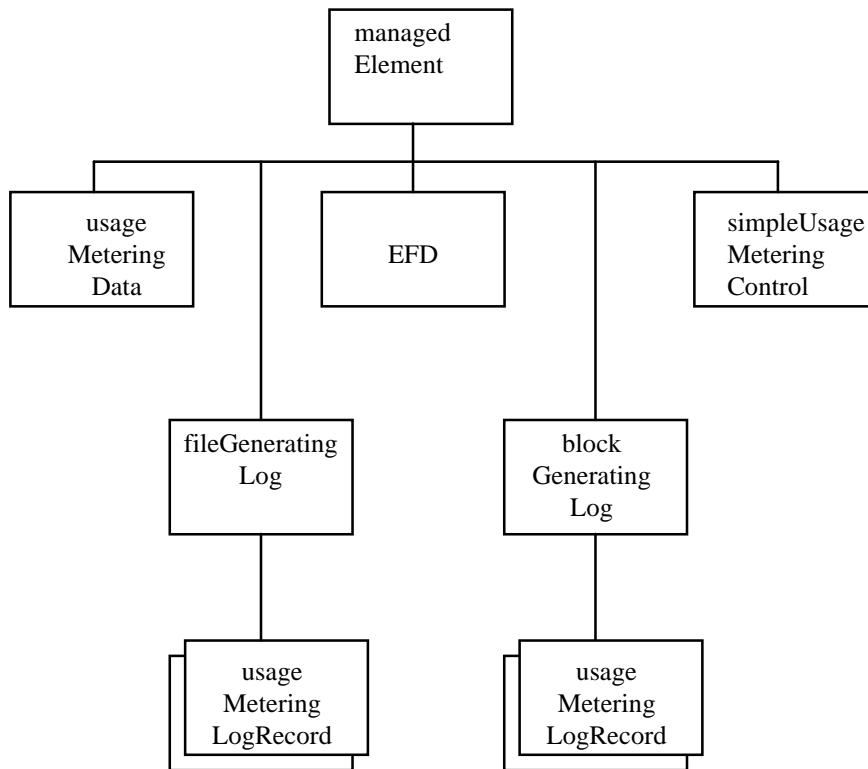


\* NOTE: An accountable object is not a real object class, it is a place holder for the object classes identified as accountable objects in the Managed Object Conformance Statements (MOCS tables).

**Figure A.1: The usage metering recording view**

## A.2 Naming hierarchy

The naming (containment) tree for the objects defined within this I-ETS is illustrated in figure A.2.



**Figure A.2: The naming tree**

### A.3 Inheritance

The inheritance tree for this specification is illustrated in figure A.3.

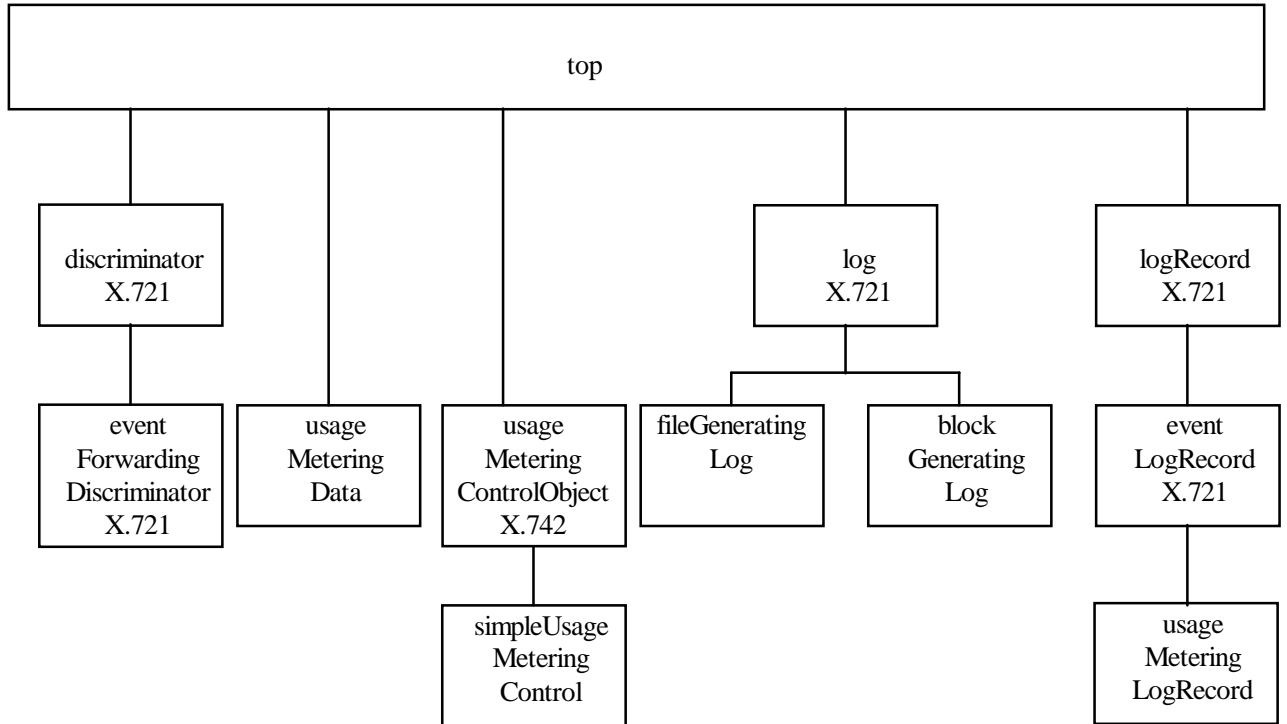


Figure A.3: The Inheritance Tree

## A.4 Managed object classes

### A.4.1 Usage Metering Log record

This managed object class is a subclass of the "eventLogRecord" class described in ITU-T Recommendation X.735 [14] and defined in ITU-T Recommendation X.721 [11] and therefore inherits all of the properties of both the "logRecord" and eventLogRecord" classes.

usageMeteringLogRecord MANAGED OBJECT CLASS

DERIVED FROM "Recommendation X.721 | ISO/IEC 10165-2: 1992": eventLogRecord;

CHARACTERIZED BY

usageMeteringLogRecordPackage PACKAGE

BEHAVIOUR

usageMeteringLogRecordBehaviour BEHAVIOUR

DEFINED AS "This object class describes the layout of a log record created for each single usage metering record notification";;

ATTRIBUTES

recordType GET,

startTimeStamp GET,

bearerService GET,

serviceUser GET,

callIdentificationNumber GET;;;

CONDITIONAL PACKAGES

dataValidityPackage

PRESENT IF "this parameter was present in the received notification",

networkProviderIdPackage

PRESENT IF "this parameter was present in the received notification",

callingPartyNumberPackage

PRESENT IF "this parameter was present in the received notification",

calledPartyNumberPackage

PRESENT IF "this parameter was present in the received notification",

redirectingNumberPackage

PRESENT IF "this parameter was present in the received notification",

redirectionNumberPackage

PRESENT IF "this parameter was present in the received notification",

originalCalledNumberPackage

PRESENT IF "this parameter was present in the received notification",

callingPartyNumberNotScreenedPackage

PRESENT IF "this parameter was present in the received notification",

operatorSpecific1NumberPackage

PRESENT IF "this parameter was present in the received notification",

operatorSpecific2NumberPackage

PRESENT IF "this parameter was present in the received notification",

operatorSpecific3NumberPackage

PRESENT IF "this parameter was present in the received notification",

supplementaryServiceListPackage

PRESENT IF "this parameter was present in the received notification",

immediateNotificationPackage

PRESENT IF "this parameter was present in the received notification",

causePackage

PRESENT IF "this parameter was present in the received notification",

iNPackage

PRESENT IF "this parameter was present in the received notification",

partialGenerationPackage

PRESENT IF "this parameter was present in the received notification",

exchangeInfoPackage

PRESENT IF "this parameter was present in the received notification",

relatedCallNumberPackage

PRESENT IF "this parameter was present in the received notification",

uMRPurposePackage

PRESENT IF "this parameter was present in the received notification",

physicalLineCodePackage

PRESENT IF "this parameter was present in the received notification",

```

receivedDigitsPackage
PRESENT IF "this parameter was present in the received notification",
operatorSpecific1AdditionalNumberPackage
PRESENT IF "this parameter was present in the received notification",
operatorSpecific2AdditionalNumberPackage
PRESENT IF "this parameter was present in the received notification",
operatorSpecific3AdditionalNumberPackage
PRESENT IF "this parameter was present in the received notification",
callingPartyCategoryPackage
PRESENT IF "this parameter was present in the received notification",
callingPartyTypePackage
PRESENT IF "this parameter was present in the received notification",
chargingInformationPackage
PRESENT IF "this parameter was present in the received notification",
progressPackage
PRESENT IF "this parameter was present in the received notification",
accessDeliveryPackage
PRESENT IF "this parameter was present in the received notification",
trunkGroupOutgoingPackage
PRESENT IF "this parameter was present in the received notification",
trunkGroupIncomingPackage
PRESENT IF "this parameter was present in the received notification",
fallbackBearerServicePackage
PRESENT IF "this parameter was present in the received notification",
teleservicePackage
PRESENT IF "this parameter was present in the received notification",
conversationTimePackage
PRESENT IF "this parameter was present in the received notification",
durationTimeACMPackage
PRESENT IF "this parameter was present in the received notification",
durationTimeB-ansPackage
PRESENT IF "this parameter was present in the received notification",
durationTimeNoB-ansPackage
PRESENT IF "this parameter was present in the received notification",
uUInfoCountersPackage
PRESENT IF "this parameter was present in the received notification",
standardExtensionsPackage
PRESENT IF "this parameter was present in the received notification",
recordExtensionsPackage
PRESENT IF "this parameter was present in the received notification";
REGISTERED AS {managedObjectClass 1};

```

#### A.4.2 File Generating Log

This managed object class is a subclass of the "Log" class described in ITU-T Recommendation X.735 [14] and defined in ITU-T Recommendation X.721 [11] and therefore inherits all of the properties of the "log" class.

```

fileGeneratingLog MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721 | ISO/IEC 10165-2: 1992": log;
CHARACTERIZED BY
fileGeneratingLogPkg PACKAGE
BEHAVIOUR
fileGeneratingLogBhv BEHAVIOUR
DEFINED AS "This log is used to create files that can be exchanged using an appropriate file
transfer protocol. The action create file is used to generate the file to be exchanged. The file
created consists of a concatenation of stripped record,; i.e. the usage metering records without
the log overhead (Log Record Id, Managed Object Class and Instance and Logging Time). The
layout of the file is defined in the ASN1 module as UsageMeteringRecordFile. The firstRecordId
and LastRecordId included in the file header and trailer are the same as the Log Record Id
allocated by the log and contained in the Log record overhead (Log Record Id).
To avoid duplication of UMRs, logging of blockRecord notifications emitted by the block
generating log should be excluded by configuration of the fileGeneratingLog's discriminator

```

construct. Files may also be created due to internal trigger events. One such internal trigger is based on time of day. When files are created due to such internal triggers the corresponding records in the log will be deleted automatically if the automaticRecordDeletion attribute is set to true.";;

#### ATTRIBUTES

automaticRecordDeletion GET-REPLACE, DEFAULT VALUE TRUE;

#### ACTIONS

createFile;;;

#### CONDITIONAL PACKAGES

dailyTriggeringPackage

PRESENT IF "if the file creation is to be triggered on a daily basis",

fileCreationNotificationPackage

PRESENT IF "if the file creation is triggered using the daily scheduling mechanism triggering method or an internal mechanism.";

REGISTERED AS {managedObjectClass 2};

### A.4.3 Block generating log

This managed object class is a subclass of the "Log" class described in ITU-T Recommendation X.735 [14] and defined in ITU-T Recommendation X.721 [11] and therefore inherits all of the properties of the "log" class.

#### blockGeneratingLog MANAGED OBJECT CLASS

DERIVED FROM "Recommendation X.721 | ISO/IEC 10165-2: 1992": log;

#### CHARACTERIZED BY

blockGeneratingLogPackage PACKAGE

BEHAVIOUR blockGeneratingLogBehavior BEHAVIOUR

DEFINED AS "This log is considered to be infinite and therefore it does not have to instantiate the finite-log size package from its superclass log. The blockGeneratingLog stores all records that satisfy its discriminator construct. An instance of this log emits the blockRecord Notification when any of the following events occurs:

- the number of records in the log becomes equal to the maximum block size,
- the time interval elapsed since the first record currently contained in the log exceeds the value maxTimeInterval attribute,
- an internal system limitation has been exceeded, including the block generating log itself overflowing.

Upon emitting the blockRecordNotification all records stored in the block generating log are deleted and the log is ready to store new event records. Because of the self-emptying nature of this log, any of the inherited log-full action may be selected and the behaviour of the log will not change.";;

#### ATTRIBUTES

maxBlockSize GET-REPLACE,

maxTimeInterval GET-REPLACE;

#### NOTIFICATIONS

blockRecordNotification;;;

REGISTERED AS {managedObjectClass 3};

### A.4.4 Simple Usage Metering Control

#### simpleUsageMeteringControl MANAGED OBJECT CLASS

DERIVED FROM "Recommendation X.742 | ISO/IEC 10164-10: 1995": usageMeteringControlObject;

#### CHARACTERIZED BY

simpleUsageMeteringControlPackage PACKAGE

BEHAVIOUR usageMeteringControlBehaviour BEHAVIOUR

#### DEFINED AS

"This object class controls the generation of UMRs in the NE. See subclause 6.1 for details";;

#### ATTRIBUTES

creationTriggerList GET-REPLACE ADD-REMOVE;;;

REGISTERED AS {managedObjectClass 4};



#### A.4.5 Usage metering data

This managed object class emits notifications that permit the NE to transmit usage metering records to the OS.

A UMR notification is sent out if one of the following events occurs:

- change or termination of the service;
- expiration of the periodic timer (defined in the usage metering control object);
- NE internal reasons e.g. reaching a volume threshold (this may also be manufacture specific).

```
usageMeteringData MANAGED OBJECT CLASS
DERIVED FROM "Recommendation X.721 | ISO/IEC 10165-2: 1992": top;
CHARACTERIZED BY
usageMeteringDataPackage PACKAGE
  BEHAVIOUR usageMeteringDataBehaviour BEHAVIOUR
  DEFINED AS
    "This object class defines the notifications for the usage records. During normal operation the
    usefulness of the GET capability on the attributes is questionable, due to the normal short
    lifetime of a call. For test purposes with a controlled call lifetime the use is more relevant.";;
  ATTRIBUTES
    usageMeteringDataId          GET,
    "Recommendation X.742 | ISO/IEC 10164-10: 1995":accountableObjectReference    GET;
  NOTIFICATIONS
    usageMeteringRecordNotification;;
REGISTERED AS {managedObjectClass 5};
```

### A.5 Packages

#### A.5.1 File Creation Notification Package

```
fileCreationNotificationPackage PACKAGE
  NOTIFICATIONS
    fileCreationNotification;
REGISTERED AS {package 1};
```

#### A.5.2 Daily Triggering Package

```
dailyTriggeringPackage PACKAGE
  ATTRIBUTES
    timesOfDay          GET-REPLACE ADD-REMOVE;
REGISTERED AS {package 2};
```

#### A.5.3 Data Validity Package

```
dataValidity Package PACKAGE
  ATTRIBUTES
    dataValidity          GET;
REGISTERED AS {package 3};
```

#### A.5.4 Network Provider Id Package

```
networkProviderIdPackage PACKAGE
  ATTRIBUTES
    networkProviderId          GET;
REGISTERED AS {package 4};
```

**A.5.5 Calling Party Number Package**

callingPartyNumberPackage PACKAGE  
ATTRIBUTES  
callingPartyNumber GET;  
REGISTERED AS {package 5};

**A.5.6 Called Party Number Package**

calledPartyNumberPackage PACKAGE  
ATTRIBUTES  
calledPartyNumber GET;  
REGISTERED AS {package 6};

**A.5.7 Redirecting Number Package**

redirectingNumberPackage PACKAGE  
ATTRIBUTES  
redirectingNumber GET;  
REGISTERED AS {package 7};

**A.5.8 Redirection Number Package**

redirectionNumberPackage PACKAGE  
ATTRIBUTES  
redirectionNumber GET;  
REGISTERED AS {package 8};

**A.5.9 Original Called Number Package**

originalCalledNumberPackage PACKAGE  
ATTRIBUTES  
originalCalledNumber GET;  
REGISTERED AS {package 9};

**A.5.10 Calling Party Number Not Screened Package**

callingPartyNumberNotScreenedPackage PACKAGE  
ATTRIBUTES  
callingPartyNumberNotScreened GET;  
REGISTERED AS {package 10};

**A.5.11 Operator Specific1 Number Package**

operatorSpecific1NumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific1Number GET;  
REGISTERED AS {package 11};

**A.5.12 Operator Specific2 Number Package**

operatorSpecific2NumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific2Number GET;  
REGISTERED AS {package 12};

**A.5.13 Operator Specific3 Number Package**

operatorSpecific3NumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific3Number GET;  
REGISTERED AS {package 13};

**A.5.14 Supplementary Service List Package**

supplementaryServiceListPackage PACKAGE  
ATTRIBUTES  
supplementaryServiceList GET;  
REGISTERED AS {package 14};

**A.5.15 immediateNotification Package**

immediateNotificationPackage PACKAGE  
ATTRIBUTES  
immediateNotification GET;  
REGISTERED AS {package 15};

**A.5.16 Cause Package**

causePackage PACKAGE  
ATTRIBUTES  
cause GET;  
REGISTERED AS {package 16};

**A.5.17 IN Package**

iNPackage PACKAGE  
ATTRIBUTES  
iNServiceInformationList GET  
iNSpecificInformation GET;  
REGISTERED AS {package 17};

**A.5.18 Partial Generation Package**

partialGenerationPackage PACKAGE  
ATTRIBUTES  
partialGeneration GET;  
REGISTERED AS {package 18};

**A.5.19 Exchange Info Package**

exchangeInfoPackage PACKAGE  
ATTRIBUTES  
exchangeInfo GET;  
REGISTERED AS {package 19};

**A.5.20 Related Call Number Package**

relatedCallNumberPackage PACKAGE  
ATTRIBUTES  
relatedCallNumber GET;  
REGISTERED AS {package 20};

**A.5.21 UMR Purpose Package**

uMRPurposePackage PACKAGE  
ATTRIBUTES  
uMRPurpose GET;  
REGISTERED AS {package 21};

**A.5.22 Physical Line Code Package**

physicalLineCodePackage PACKAGE  
ATTRIBUTES  
physicalLineCode GET;  
REGISTERED AS {package 22};

**A.5.23 Received Digits Package**

receivedDigitsPackage PACKAGE  
ATTRIBUTES  
receivedDigits GET;  
REGISTERED AS {package 23};

**A.5.24 Operator Specific1 Additional Number Package**

operatorSpecific1AdditionalNumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific1AdditionalNumber GET;  
REGISTERED AS {package 24};

**A.5.25 Operator Specific2 Additional Number Package**

operatorSpecific2AdditionalNumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific2AdditionalNumber GET;  
REGISTERED AS {package 25};

**A.5.26 Operator Specific3 Additional Number Package**

operatorSpecific3AdditionalNumberPackage PACKAGE  
ATTRIBUTES  
operatorSpecific3AdditionalNumber GET;  
REGISTERED AS {package 26};

**A.5.27 Calling Party Category Package**

callingPartyCategoryPackage PACKAGE  
ATTRIBUTES  
callingPartyCategory GET;  
REGISTERED AS {package 27};

**A.5.28 Calling Party Type Package**

callingPartyTypePackage PACKAGE  
ATTRIBUTES  
callingPartyType GET;  
REGISTERED AS {package 28};

**A.5.29 Charging Information Package**

chargingInformationPackage PACKAGE  
ATTRIBUTES  
chargingInformation GET;  
REGISTERED AS {package 29};

**A.5.30 Progress Package**

progressPackage PACKAGE  
ATTRIBUTES  
progress GET;  
REGISTERED AS {package 30};

**A.5.31 Access Delivery Package**

accessDeliveryPackage PACKAGE  
ATTRIBUTES  
accessDelivery GET;  
REGISTERED AS {package 31};

**A.5.32 Trunk Group Outgoing Package**

trunkGroupOutgoingPackage PACKAGE  
ATTRIBUTES  
trunkGroupOutgoing GET;  
REGISTERED AS {package 32};

**A.5.33 Trunk Group Incoming Package**

trunkGroupIncomingPackage PACKAGE  
ATTRIBUTES  
trunkGroupIncoming GET;  
REGISTERED AS {package 33};

**A.5.34 Fallback Bearer Service Package**

fallbackBearerServicePackage PACKAGE  
ATTRIBUTES  
fallbackBearerService GET;  
REGISTERED AS {package 34};

**A.5.35 Teleservice Package**

teleservicePackage PACKAGE  
ATTRIBUTES  
teleservice GET;  
REGISTERED AS {package 35};

**A.5.36 Conversation Time Package**

conversationTimePackage PACKAGE  
ATTRIBUTES  
conversationTime GET;  
REGISTERED AS {package 36};

**A.5.37 Duration Time ACM Package**

durationTimeACMPackage PACKAGE  
ATTRIBUTES  
durationTimeACM GET;  
REGISTERED AS {package 37};

**A.5.38 Duration Time B-Answer Package**

durationTimeB-AnswerPackage PACKAGE  
ATTRIBUTES  
durationTimeB-Answer GET;  
REGISTERED AS {package 38};

**A.5.39 Duration Time No B-Answer Package**

durationTimeNoB-AnswerPackage PACKAGE  
ATTRIBUTES  
durationTimeNoB-Answer GET;  
REGISTERED AS {package 39};

#### A.5.40 User to User Info Counters Package

```
uUInfoCountersPackage    PACKAGE
  ATTRIBUTES
  uUInfoCounters          GET;
REGISTERED AS {package 40};
```

#### A.5.41 Standard Extensions Package

```
standardExtensionsPackage PACKAGE
  ATTRIBUTES
  standardExtensions      GET;
REGISTERED AS {package 41};
```

#### A.5.42 Record Extensions Package

```
recordExtensionsPackage  PACKAGE
  ATTRIBUTES
  recordExtensions        GET;
REGISTERED AS {package 42};
```

### A.6 Attributes

#### A.6.1 Usage metering data identifier

```
usageMeteringDataId ATTRIBUTE
  WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.UsageMeteringDataId;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
  usageMeteringDataIdBehaviour BEHAVIOUR
  DEFINED AS "This attribute uniquely identifies the usageMeteringData object.";;
REGISTERED AS {attribute 1};
```

#### A.6.2 Times of Day

```
timesOfDay ATTRIBUTE
  WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.TimesOfDay;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
  timesOfDayBehaviour BEHAVIOUR
  DEFINED AS "This attribute specifies the times of the day at which the log will automatically
generate a file.";;
REGISTERED AS {attribute 2};
```

#### A.6.3 Automatic Record Deletion

```
automaticRecordDeletion ATTRIBUTE
  WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.AutomaticRecordDeletion;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
  automaticRecordDeletionsBehaviour BEHAVIOUR
  DEFINED AS "This attribute specifies whether the records in the log that were copied to the
created file are to be deleted automatically. This attribute applies only when the file is created
due to an internal file creation trigger. For files created in response to an OS action the
parameter in the action overrides.";;
REGISTERED AS {attribute 3};
```

**A.6.4 Max Block Size**

maxBlockSize ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.MaxBlockSize;

MATCHES FOR EQUALITY, ORDERING;

BEHAVIOUR

maxBlockSizeBehaviour BEHAVIOUR

DEFINED AS "The value of this attribute specifies the maximum number of UMRs that may be contained in the blockRecordNotification emitted by the blockGeneratingLog. If the value "0" is entered, it means that this output trigger is not used.";;

REGISTERED AS {attribute 4};

**A.6.5 Max time interval**

maxTimeInterval ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.MaxTimeInterval;

MATCHES FOR EQUALITY, ORDERING;

BEHAVIOUR

maxTimeIntervalBehaviour BEHAVIOUR

DEFINED AS "The value of this attribute specifies the maximum time interval that may elapse from receipt of the first record currently in the log to the time at which a blockRecordNotification shall be emitted. This value, therefore, specifies the maximum latency with which near-real-time UMR data will be transmitted to the upstream system. If the value "0" is entered, it means that this output trigger is not used.";;

REGISTERED AS {attribute 5};

**A.6.6 Creation Trigger List**

creationTriggerList ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CreationTriggerList;

MATCHES FOR EQUALITY, SET-INTERSECTION;

BEHAVIOUR

creationTriggerListBehaviour BEHAVIOUR

DEFINED AS " This attribute consists of a list of values that specify the conditions that will lead to the creation of usage metering data objects. Triggers can be call related (Seizure or first digit or ACM received or B-answer received) and non-call related (supplementary service invocation and/or input). ";;

REGISTERED AS {attribute 6};

**A.6.7 Data Validity**

dataValidity ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.DataValidity;

MATCHES FOR EQUALITY;

BEHAVIOUR

dataValidityBehaviour BEHAVIOUR

DEFINED AS " This attribute indicates that the NE is having problems and that the content of the generated UMR is not reliable. This indication enables the OS to take the necessary actions on the collected UMRs. ";;

REGISTERED AS {attribute 7};

**A.6.8 Network Provider Id**

networkProviderId ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.NetworkProviderId;

MATCHES FOR EQUALITY;

BEHAVIOUR

networkProviderIdBehaviour BEHAVIOUR

DEFINED AS " This information element indicates the network provider for whom the UMR is generated. This information is only necessary in the case of multiple providers. ";;

REGISTERED AS {attribute 8};

**A.6.9 Record Type**

recordType ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.RecordType;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 recordTypeBehaviour BEHAVIOUR  
 DEFINED AS " This information element indicates the type of the UMR and it also indicates the way some of the following information elements are used. ";;  
 REGISTERED AS {attribute 9};

**A.6.10 Start Time Stamp**

startTimeStamp ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.StartTimeStamp;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 startTimeStampBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains a time stamp for the start of the call. The start time is defined as either the seizure time for a non-answered call, when the exchange is ready for receiving digits or for an answered call, the time when a call is answered, i.e. the receipt of an answer message. For transit calls the start time stamp (seizure) will relate to the first message received e.g. IAM.  
 If the UMR is generated by an event concerning a supplementary service not related to a call, then this information element contains the time stamp for that event.  
 Date and time values shall be derived from the exchange clock. This attribute includes year, month, day, hour, minute, second and centisecond.  
 For partial outputs the start date time is the end time when the previous output was made.";;  
 REGISTERED AS {attribute 10};

**A.6.11 Calling Party Number**

callingPartyNumber ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CallingPartyNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 callingPartyNumberBehaviour BEHAVIOUR  
 DEFINED AS "This attribute contains the telephone number of the calling party. The calling party will, for non UPT calls be identical to the calling party user. For call type calls and when subscribing to either MSN or DDI the information element indicates the screened and verified number for transfer towards the called subscriber. This attribute contains the default number if the exchange is requested to use that number for transfer towards the called subscriber. If the UMR is generated due to an event concerning a supplementary service then this attribute contains the telephone number of the subscriber that caused the event.  
 It should be noted that in the case of an exchange with a diverted call, the subscriber for which the UMR is generated is indicated by the redirecting number.";;  
 REGISTERED AS {attribute 11};

**A.6.12 Called Party Number**

calledPartyNumberATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CalledPartyNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 calledPartyNumberBehaviour BEHAVIOUR  
 DEFINED AS "This attribute contains the telephone number of the called subscriber if the UMR is generated due to a call.



If the UMR is generated due to activation or invocation of the diversion supplementary service, then attribute contains the telephone number of the diverted - to number. In special cases this attribute may contain the translated number. This would be the case when abbreviated dialling is used. As an option, this information element may also include information to indicate the Numbering Plan Identification (NPI) and the Type Of Number (TON) of the called party number. In ETS 300 403-1[2] the different NPI-values and possible TON-values are defined. ";; REGISTERED AS {attribute 12};

#### A.6.13 Redirecting Number

redirectingNumber ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.RedirectingNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 redirectingNumberBehaviour BEHAVIOUR  
 DEFINED AS "This attribute contains the telephone number of the party who has redirected the call. This is the information, when using ISUP, that is sent in the forward direction when a call is redirected, indicating the number from which the call was diverted. This number is identical to the original called number for a single diversion. In the case of a diverted call the Service User will be indicated by the redirecting number. ";;  
 REGISTERED AS {attribute 13};

#### A.6.14 Redirection Number

redirectionNumber ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.RedirectionNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 redirectionNumberBehaviour BEHAVIOUR  
 DEFINED AS "This attribute contains the telephone number of the party that the call shall be forwarded to. This is the information, when using ISUP, that is sent in the backward direction indicating the number towards which the call shall be re-routed or has been forwarded. The redirection number is identical to the diverted to number which can be either a forwarded to number or a deflected to number. ";;  
 REGISTERED AS {attribute 14};

#### A.6.15 Original Called Number

originalCalledNumber ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OriginalCalledNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 originalCalledNumberBehaviour BEHAVIOUR  
 DEFINED AS " This information element shall contain the telephone number of the original called party. This is the information, when using ISUP, that is sent in the forward direction when a call is redirected and identifies the original called party. ";;  
 REGISTERED AS {attribute 15};

#### A.6.16 Calling Party Number Not Screened

callingPartyNumberNotScreened ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CallingPartyNumberNotScreened;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 callingPartyNumberNotScreenedBehaviour BEHAVIOUR  
 DEFINED AS "This attribute contains the user-provided, not screened telephone number of the calling party if the UMR is generated due to a call. This attribute is relevant in connection with users subscribing to the special arrangement according to e.g. the CLIP supplementary service. The purpose of this attribute if provided, is to enable the user to designate the bill to specific calls.";;  
 REGISTERED AS {attribute 16};

**A.6.17 Operator Specific1 Number**

operatorSpecific1Number ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific1Number;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific1NumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined participant information and is used  
when the elements defined elsewhere are not adequate. ";;  
REGISTERED AS {attribute 17};

**A.6.18 Operator Specific2 Number**

operatorSpecific2Number ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific2Number;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific2NumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined participant information and is used  
when the elements defined elsewhere are not adequate. ";;  
REGISTERED AS {attribute 18};

**A.6.19 Operator Specific3 Number**

operatorSpecific3Number ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific3Number;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific3NumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined participant information and is used  
when the elements defined elsewhere are not adequate. ";;  
REGISTERED AS {attribute 19};

**A.6.20 Bearer service**

bearerService ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.BearerService;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
bearerServiceBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains the bearer capability information for a call or an event  
concerning a supplementary service. The bearer service coding shall be based on  
ETS 300 403-1 [2]. The bearer service allocated to PSTN is "audio 3,1 kHz.";;  
REGISTERED AS {attribute 20};

**A.6.21 Service User**

serviceUser ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ServiceUser;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
serviceUserBehaviour BEHAVIOUR  
DEFINED AS "This attribute provides information of the party whose use of resources has  
been accounted for. The information provided in this element is a pointer to the party number  
provided elsewhere in the record. In the case where e.g. the UMR is generated on a transit  
exchange and no calling party number is available, this element will indicate that the service user  
is unknown. ";;  
REGISTERED AS {attribute 21};

**A.6.22 Call Identification Number**

callIdentificationNumber ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CallIdentificationNumber;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 callIdentificationNumberBehaviour BEHAVIOUR  
 DEFINED AS "An identification number that identifies the call. All records produced for the same call have the same call identification number.  
 With the call identification number it is possible to link partial outputs, outputs due to supplementary services during the call and to discriminate between simultaneous call establishments. It should be stressed that the call identification value only has local (exchange) significance.";;  
 REGISTERED AS {attribute 22};

**A.6.23 Supplementary service List**

supplementaryServiceList ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.SupplementaryServiceList;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 supplementaryServiceBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains relevant information about the use of one or more supplementary services. For each recorded service this attribute contains a service code identifying the supplementary service and in addition information about the action taken. An optional time stamp is provided for time dependent charging of supplementary services. The time stamp is a duration time relative to the startTimeStamp and is recorded in centisecond. The supplementary service codes shall be based on prETS 300 738 [4].  
 For each service code information is provided indicating the action taken. Following actions are defined:  
 - Provision of supplementary service;  
 - Withdrawal of supplementary service;  
 - Registration of supplementary service;  
 - Erasure of supplementary service;  
 - Activation of supplementary service;  
 - Deactivation of supplementary service;  
 - Invocation of supplementary service;  
 - Disabling of supplementary service;  
 - Interrogation of supplementary service.

If provided by the network, actions can be made on supplementary service by the operator. In such a case the service user element in the UMR will indicate the operator as the initiator of the action.

In the case of functional signalling on ISDN further information of the supplementary service usage is provided by the optional functional information field. This field contains a set of "management extensions" as defined by ITU-T Recommendation X.721 [11].

REGISTERED AS {attribute 23};

**A.6.24 Immediate notification**

This attribute may be used to define the filter of an event forwarding discriminator.

immediateNotification ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ImmediateNotification;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 immediateNotificationBehaviour BEHAVIOUR  
 DEFINED AS " This attribute shall contain an indication that the record requires immediate data transfer to the OS. This I-ETS does not specify if this indication is due to a subscriber action or contained in the user data. ";;  
 REGISTERED AS {attribute 24};

**A.6.25 Cause**

cause ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.Cause;

MATCHES FOR EQUALITY;

BEHAVIOUR

causeBehaviour BEHAVIOUR

DEFINED AS " This attribute indicates the cause and location value for the termination of the call. The location value shall indicate the origin of the cause value. Cause and location values are defined in ITU-T Recommendation Q.850 [7]. For PSTN the values for call failure shall correspond to the ISDN cause values. Cause and location values can be used for statistical purposes or for determining whether the subscriber should be charged with call attempt charge or not. In the case this information is not included in the UMR it is assumed that the call is successful. ";

REGISTERED AS {attribute 25};

**A.6.26 iNServiceInformationList**

iNServiceInformationList ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.iNServiceInformationList;

MATCHES FOR EQUALITY;

BEHAVIOUR

iNServiceInformationListBehaviour BEHAVIOUR

DEFINED AS " This attribute contains information about the use of one or more IN services. Information about the use of more than one service is only possible in connection with a call record type. For each service this attribute contains the IN service code, possible queue information and additional information (OCTET STRING).

Queue information is stored in connection with IN calls to record usage of queuing resources.

This information element is present only if the call was queued during its treatment by the IN and contains the time when the call was queued and the duration of the queuing.

The service information is made available in the Core INAP FCI according to ETS 300 374-1[26].";

REGISTERED AS {attribute 26};

**A.6.27 IN Specific Information**

iNSpecificInformation ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.iNSpecificInformation;

MATCHES FOR EQUALITY;

BEHAVIOUR

iNSpecificInformationBehaviour BEHAVIOUR

DEFINED AS " This attribute contains information about the user of the IN service. The user information is identified by one or more of the following.

personalUserId

This element has only relevance when UPT calls are made. It is a network requirement that the provided international personal User Identity is unique and verified by the network

chargedParticipant

This information element shall indicate one of the participants, i.e. calling, called, redirecting, redirection or original called party, etc. to be charged for the usage.

chargedDirectoryNumber

This information element shall contain the charged directory number in the case where the number can not be indicated by the charged participant element.

percentageToBeBilled

This information element shall contain the percentage to be billed in the case where normal billing rules are not followed.

accountCodeInput

This information element shall contain the code to which accounting is to be referred and input by the subscriber. Examples of use are authorization code, PIN, bank account, VPN code or credit card number to be used for billing.";;

REGISTERED AS {attribute 27};

#### A.6.28 Partial Generation

partialGeneration ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.PartialGeneration;

MATCHES FOR EQUALITY;

BEHAVIOUR

partialGenerationBehaviour BEHAVIOUR

DEFINED AS "This attribute is included if the UMR output is partial. Included in the element is a field indicating the partial record number and the reason for partial output.

The partial record number, is a sequential number which consecutively numbers the partial records in a specific call. ";;

REGISTERED AS {attribute 28};

#### A.6.29 Exchange Info

exchangeInfo ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ExchangeInfo;

MATCHES FOR EQUALITY;

BEHAVIOUR

exchangeInfoBehaviour BEHAVIOUR

DEFINED AS " This attribute contains the exchange identity. By means of the exchange identity it is always possible to identify the exchange where a specific UMR was

generated. In addition to the identity of the exchange, additional information can be added to indicate the program version of the originator. This information is provided to assist in interpreting the UMR when new software releases, that affect the UMR format, are introduced in the network. When all records to be transferred originate from the same exchange, this information can optionally be provided in the file header.";;

REGISTERED AS {attribute 29};

#### A.6.30 Related Call Number

relatedCallNumber ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.RelatedCallNumber;

MATCHES FOR EQUALITY;

BEHAVIOUR

relatedCallNumberBehaviour BEHAVIOUR

DEFINED AS "This attribute contains the Call identification number of an associated call record. This number is used for associating different call records generated in the same exchange.";;

REGISTERED AS {attribute 30};

#### A.6.31 UMR Purpose

uMRPurpose ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.UMRPurpose;

MATCHES FOR EQUALITY;

BEHAVIOUR

uMRPurposeBehaviour BEHAVIOUR

DEFINED AS "This attribute provides information to the OS on the reason for triggering of the record. In most networks the OS will be aware of the triggering conditions of the network and hence this information will not be required.";;

REGISTERED AS {attribute 31};

**A.6.32 Physical Line Code**

physicalLineCode ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.PhysicalLineCode;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
physicalLineCodeBehaviour BEHAVIOUR  
DEFINED AS "This information element shall be used to identify the physical line used by the calling subscriber. This element is used for customer care purposes and is only relevant in the case where multiple lines are used by a common directory number.";;  
REGISTERED AS {attribute 32};

**A.6.33 Received Digits**

receivedDigits ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ReceivedDigits;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
receivedDigitsBehaviour BEHAVIOUR  
DEFINED AS "This attribute contains the digits dialled by the subscriber or sent by the subscriber terminal. Normally this information is only included for customer care purposes. It should however be noted that the use of functional signalling in ISDN as well as requirements to restrict this information, will require operator or manufacturer specific coding of this element. Alternatively functional information should be included in the supplementary service field.";;  
REGISTERED AS {attribute 33};

**A.6.34 Operator Specific1 Additional Number**

operatorSpecific1AdditionalNumber ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific1AdditionalNumber;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific1AdditionalNumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined additional participant information and is used when the elements defined elsewhere are not adequate.";;  
REGISTERED AS {attribute 34};

**A.6.35 Operator Specific2 Additional Number**

operatorSpecific2AdditionalNumber ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific2AdditionalNumber;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific2AdditionalNumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined additional participant information and is used when the elements defined elsewhere are not adequate.";;  
REGISTERED AS {attribute 35};

**A.6.36 Operator Specific3 Additional Number**

operatorSpecific3AdditionalNumber ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.OperatorSpecific3AdditionalNumber;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
operatorSpecific3AdditionalNumberBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains operator defined additional participant information and is used when the elements defined elsewhere are not adequate.";;  
REGISTERED AS {attribute 36};

### A.6.37 Calling Party Category

callingPartyCategory ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CallingPartyCategory;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
callingPartyCategoryBehaviour BEHAVIOUR  
DEFINED AS "This attribute contains the calling subscriber category. This information may also be related to the redirecting party for a forwarded call in accordance to the definition and use of this information in ETS 300 356-1 [3].";  
REGISTERED AS {attribute 37};

### A.6.38 Calling Party Type

callingPartyType ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.CallingPartyType;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
callingPartyTypeBehaviour BEHAVIOUR  
DEFINED AS " This information element shall contain the calling subscriber type. This information may also be related to the redirecting party for a forwarded call in accordance to the definition and use of calling party in ETS 300 356-1 [3].  
The Calling party Type is defined as:  
Analogue;  
Customer link (2Mbit/s PSTN digital access);  
Basic Access;  
Primary Rate Access;";  
REGISTERED AS {attribute 38};

### A.6.39 Charging information

chargingInformation ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ChargingInformation;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
chargingInformationBehaviour BEHAVIOUR  
DEFINED AS " This attribute contains the charging information generated by an NE which is capable of charging. This information can either be passed on to the billing application or in the case where the NE calculates charging information for presentation to the user, this information can be used to compare the values generated by the off-line charging application. The attribute contains the charged amount either in recorded currency or call charge units.";  
REGISTERED AS {attribute 39};

### A.6.40 Progress

progress ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.Progress;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
progressBehaviour BEHAVIOUR  
DEFINED AS " This attribute describes an event which has occurred during the life of a call. The attribute contains a location value as well as the progress description. Progress information can be used e.g. for determining whether the subscriber shall be charged for the use of a supplementary service towards a non-ISDN user. Only the Progress indicator received from the far end is of relevance and should be used. In the case where more than one value is received only the last Progress indicator is used. The location and progress description values are defined in ETS 300 403-1. [2]";  
REGISTERED AS {attribute 40};

**A.6.41 Access delivery**

accessDelivery ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.AccessDelivery;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 accessDeliveryBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the Access delivery information which indicates if the call has been delivered to the called subscriber. Normally the value is derived from the ISUP signalling. In the case of local calls, where no ISUP signalling is used, a similar value shall be adopted. Access delivery can be used for statistical purposes or to determine whether the charged subscriber should be charged with call attempt charge or not.";;  
 REGISTERED AS {attribute 41};

**A.6.42 Trunk group outgoing**

trunkGroupOutgoing ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.TrunkGroupOutgoing;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 trunkGroupOutgoingBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the symbolic name of the trunk that is used by the calling subscriber if the called subscriber is not a local subscriber.";;  
 REGISTERED AS {attribute 42};

**A.6.43 Trunk group incoming**

trunkGroupIncoming ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.TrunkGroupIncoming;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 trunkGroupIncomingBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the symbolic name of the trunk that is used towards the called subscriber. If the calling subscriber is a local subscriber then this information element is not relevant.";;  
 REGISTERED AS {attribute 43};

**A.6.44 Fallback Bearer service**

fallbackBearerService ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.FallbackBearerService;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 fallbackbearerServiceBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the fallback bearer capability information for a call or an event concerning a supplementary service. This indicator is only be provided when, in the case of fallback, the bearer service is not identical to the initial requested service. The bearer service coding shall be based on ETS 300 403-1 [2].";  
 REGISTERED AS {attribute 44};

**A.6.45 Teleservice**

teleservice ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.Teleservice;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 teleserviceBehaviour BEHAVIOUR  
 DEFINED AS " This information element shall contain the high layer compatibility information for a call or an event concerning a supplementary service. The coding shall be based on ETS 300 403-1 [2].  
 This information element is only relevant in connection with ISDN.";;  
 REGISTERED AS {attribute 45};



**A.6.46 Conversation time**

conversationTime ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.ConversationTime;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 conversationTimeBehaviour BEHAVIOUR  
 DEFINED AS " This attribute is only valid for answered calls. If no partial records are generated this attribute contains the time consumption from B-answer to termination time. For partial call records the first record contains the time consumption from B-answer until reporting time. The intermediate partial records contain the time consumption since the previous reporting. The final partial record contains the time consumption from the previous reporting until termination time. The call is considered terminated when communication between the parties is no longer possible.";;  
 REGISTERED AS {attribute 46};

**A.6.47 Duration Time ACM**

durationTimeACM ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.DurationTimeACM;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 durationTimeACMBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the time consumption from the seizure time until ACM is received. This attribute is not included if no ACM is received. In the case of a terminating exchange the event ACM received will occur when the ACM is normally generated. This is either when a B-subscriber port is free (early ACM) or when a B-subscriber terminal is free (late ACM). The choice between early and late ACM is a network option in the terminating network. For local calls a corresponding time shall be used.";;  
 REGISTERED AS {attribute 47};

**A.6.48 Duration Time B-Answer**

durationTimeB-Answer ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.DurationTimeB-Answer;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 durationTimeB-AnswerBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the time consumption from seizure time until received B-Answer. This attribute is only included if B-Answer is received.";;  
 REGISTERED AS {attribute 48};

**A.6.49 Duration time No B-Answer**

durationTimeNoB-Answer ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.DurationTimeNoB-Answer;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 durationTimeNoB-AnswerBehaviour BEHAVIOUR  
 DEFINED AS " This attribute contains the time consumption from seizure time to termination time. This attribute is only included if no B-Answer is received.";;  
 REGISTERED AS {attribute 49};

**A.6.50 User To User Info Counters**

uUInfoCounters ATTRIBUTE  
 WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.UUInfoCounters;  
 MATCHES FOR EQUALITY;  
 BEHAVIOUR  
 uUInfoCountersBehaviour BEHAVIOUR  
 DEFINED AS " This attribute shall contain the User To User info counters. The counters shall indicate the total number of octets and/or messages transmitted or received by the

subscriber using the User to user signalling supplementary service. Separate counters can be assigned to the 3 different User to user signalling services. ";;  
REGISTERED AS {attribute 50};

### A.6.51 Standard Extensions

standardExtensions ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.StandardExtensions;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
standardExtensionBehaviour BEHAVIOUR  
DEFINED AS " This attribute shall contain standardized extensions that are added to the standard usage metering record. This field contains a set of "management extensions" as defined in ITU-T Recommendation X.721 [11].";;  
REGISTERED AS {attribute 51};

### A.6.52 Record Extensions

recordExtensions ATTRIBUTE  
WITH ATTRIBUTE SYNTAX ASN1UsageMeteringModule.RecordExtensions;  
MATCHES FOR EQUALITY;  
BEHAVIOUR  
recordExtensionBehaviour BEHAVIOUR  
DEFINED AS " This attribute shall contain information elements that network operators and/ or manufacturers have added to the standard usage metering record. This information element contains a set of "management extensions" as defined in ITU-T Recommendation X.721[11].";;  
REGISTERED AS {attribute 52};

## A.7 Actions

### A.7.1 Create File

createFile ACTION  
BEHAVIOUR  
createFileBehaviour BEHAVIOUR  
DEFINED AS " Receipt of this action causes the creation of a file containing the concatenated content of the specified event records. If no parameters are specified in the action then the file is created from all the records currently contained in the log. Optionally the action may specify the lowest record number that is to be contained in the file. For logs where the record number has wrapped, the record time is used to determine that this has occurred and the "wrapped" records shall be included in the created file.  
The action argument may also specify that the records contained in the log should be deleted upon successful creation of the file.  
The action response contains the name and size of the created file." ;;  
MODE CONFIRMED;  
WITH INFORMATION SYNTAX ASN1UsageMeteringModule.CreateFileArgument;  
WITH REPLY SYNTAX ASN1UsageMeteringModule.CreateFileResponse;  
REGISTERED AS { action 1};

## A.8 Notifications

Unless otherwise stated, all notifications shall be sent via the M-EVENT-REPORT operation in confirmed mode.

### A.8.1 Block record Notification

blockRecordNotification NOTIFICATION  
BEHAVIOUR  
blockRecordNotificationBehaviour BEHAVIOUR  
DEFINED AS "This notification is emitted whenever one of the triggering events described in the object class template occurs. The notification consists of a concatenation of stripped records,;

i.e. the usage metering records without the log overhead (Record Id, Managed Object Class and Instance and Logging Time).";;  
 WITH INFORMATION SYNTAX ASN1UsageMeteringModule.BlockRecordInfo;  
 REGISTERED AS {notification 1};

### A.8.2 File Creation Notification

fileCreationNotification NOTIFICATION  
 BEHAVIOUR  
 fileCreationNotificationBehaviour BEHAVIOUR  
 DEFINED AS " This notification is emitted whenever the fileGeneratingLog creates a new file in order to let the managing system know that the file is available for retrieval.";;  
 WITH INFORMATION SYNTAX ASN1UsageMeteringModule.FileCreationInfo;  
 REGISTERED AS {notification 2};

### A.8.3 Usage metering record notification

usageMeteringRecordNotification NOTIFICATION  
 BEHAVIOUR  
 usageMeteringRecordNotificationBehaviour BEHAVIOUR  
 DEFINED AS  
 "This notification is issued to transmit a usage metering record. The "immediate notification" may be used by the Call Forwarding Discriminator to select records requiring real time handling by the OS.";;  
 WITH INFORMATION SYNTAX ASN1UsageMeteringModule.RecordContent;  
 REGISTERED AS {notification 3};

## A.9 Name bindings

blockGeneratingLog-managedElement NAME BINDING  
 SUBORDINATE OBJECT CLASS blockGeneratingLog;  
 NAMED BY SUPERIOR OBJECT CLASS  
 "Recommendation M.3100 | 1992": managedElement AND SUBCLASSES;  
 WITH ATTRIBUTE "Recommendation X.721 | ISO/IEC 10165-2: 1992": logId;  
 CREATE;  
 DELETE DELETES-CONTAINED-OBJECTS;  
 REGISTERED AS {nameBinding 1};

fileGeneratingLog-managedElement NAME BINDING  
 SUBORDINATE OBJECT CLASS fileGeneratingLog;  
 NAMED BY SUPERIOR OBJECT CLASS  
 "Recommendation M.3100 | 1992": managedElement AND SUBCLASSES;  
 WITH ATTRIBUTE "Recommendation X.721 | ISO/IEC 10165-2: 1992": logId;  
 CREATE;  
 DELETE DELETES-CONTAINED-OBJECTS;  
 REGISTERED AS {nameBinding 2};

simpleUsageMeteringControl-managedElement NAME BINDING  
 SUBORDINATE OBJECT CLASS simpleUsageMeteringControl;  
 NAMED BY SUPERIOR OBJECT CLASS  
 "Recommendation M.3100 | 1992": managedElement AND SUBCLASSES;  
 WITH ATTRIBUTE "Recommendation X.742 | ISO/IEC 10164-10: 1995": controlObjectId;  
 CREATE;  
 DELETE DELETES-CONTAINED-OBJECTS;  
 REGISTERED AS {nameBinding 3};

usageMeteringData-managedElement NAME BINDING  
 SUBORDINATE OBJECT CLASS usageMeteringData;  
 NAMED BY SUPERIOR OBJECT CLASS  
 "Recommendation M.3100 | 1992": managedElement AND SUBCLASSES;  
 WITH ATTRIBUTE usageMeteringDataId;  
 CREATE;  
 DELETE DELETES-CONTAINED-OBJECTS;

REGISTERED AS {nameBinding 4};

-

usageMeteringLogRecord-fileGeneratingLog NAME BINDING  
SUBORDINATE OBJECT CLASS usageMeteringLogRecord; AND SUBCLASSES;  
NAMED BY SUPERIOR OBJECT CLASS fileGeneratingLog  
WITH ATTRIBUTE "Recommendation X.721 | ISO/IEC 10165-2: 1992": logId;  
CREATE;  
DELETE DELETES-CONTAINED-OBJECTS;  
REGISTERED AS {nameBinding 5};

usageMeteringLogRecord-blockGeneratingLog NAME BINDING  
SUBORDINATE OBJECT CLASS usageMeteringLogRecord; AND SUBCLASSES;  
NAMED BY SUPERIOR OBJECT CLASS blockGeneratingLog  
WITH ATTRIBUTE "Recommendation X.721 | ISO/IEC 10165-2: 1992": logId;  
CREATE;  
DELETE DELETES-CONTAINED-OBJECTS;  
REGISTERED AS {nameBinding 6};

**A.10 ASN.1 defined types module**

-- For a better understanding of this module please refer to the definitions of record types and record elements given in annex B.

**-- Rules of extensibility**

-- The following types will be indicated as being extensible:

-- ENUMERATED;

-- named INTEGER;

-- named BIT STRING;

-- tagged SET;

-- tagged SEQUENCE;

-- tagged CHOICE;

-- Under the rules of extensibility new enumeration's (for ENUMERATED types), new bit name

-- assignments (for named BIT STRING types), new named numbers (for named INTEGER types), and

-- new tagged elements (for tagged SET, SEQUENCE, and CHOICE types) may be added in future

-- versions of this Recommendation.

-- When processing information in a System Management Protocol (SMAP) PDU, the accepting SMAP

-- machine shall ignore:

-- enumeration's not recognized;

-- unrecognized named numbers;

-- unrecognized named bits;

-- unrecognized tagged elements of sets, sequences, and choices.

```
ASN1UsageMeteringModule {ccitt(0) identified-organization(4) etsi(0)
    usageMeteringInformationManagement (43321) informationModel(0) asn1Module(2)
    asn1UsageMeteringModule(0)} -- Note. temporary module number used.
```

```
DEFINITIONS IMPLICIT TAGS ::=
```

```
BEGIN
```

```
-- EXPORTS everything
```

```
IMPORTS
```

```
ManagementExtension FROM Attribute-ASN1Module { joint-iso-ccitt ms(9) smi (3) part2 (2)
    asn1Module(1) 1 }
```

```
---see ITU-T Recommendation X.721 [11]
```

```
NameType FROM ASN1DefinedTypesModule {ccitt(0) recommendation(0) m(13) gnm(3100)
    informationModel(0) asn1Modules(2) asn1DefinedTypesModule(0)};
```

```
---see ITU-T Recommendation M.3100 [19]
```

**-- OBJECT IDENTIFIERS**

```
informationModel OBJECT IDENTIFIER ::= { ccitt(0) identified-organization(4) etsi(0)
    usageMeteringInformationManagement(43321) informationModel(0)}
```

```
managedObjectClass OBJECT IDENTIFIER ::= {informationModel managedObjectClass(3)}
```

```
package OBJECT IDENTIFIER ::= {informationModel package(4)}
```

```
nameBinding OBJECT IDENTIFIER ::= {informationModel nameBinding(6)}
```

```
attribute OBJECT IDENTIFIER ::= {informationModel attribute(7)}
```

```
action OBJECT IDENTIFIER ::= {informationModel action(9)}
```

```
notification OBJECT IDENTIFIER ::= {informationModel notification(10)}
```

```
behaviour OBJECT IDENTIFIER ::= {informationModel behaviour(11)}
```

**-- BLOCK CONTENTS**

```
BlockRecordInfo ::= SEQUENCE {
    blockHeaderRecord [0] BlockHeaderRecord OPTIONAL,
    usageRecords [1] SEQUENCE OF RecordContent }
```

```
BlockHeaderRecord ::= SEQUENCE {
    exchangeInfo [0] ExchangeInfo OPTIONAL,
    sequenceNumber [1] SequenceNumber,
    reasonForOutput [2] ReasonForOutput OPTIONAL,
    blockExtensions [3] ManagementExtensions OPTIONAL }
```

## -- FILE CONTENTS

```
UsageMeteringRecordFile ::= SEQUENCE{
    header      FileHeaderRecord,
    body        SEQUENCE OF RecordContent ,
    trailer     Trailer      OPTIONAL}
```

```
FileHeaderRecord ::= SEQUENCE{
    productionDateTime [0] StartDateTime,
    exchangeInfo       [1] ExchangeInfo,
    fileName            [2] FileName,
    reasonForOutput    [3] ReasonForOutput,
    firstRecordId      [4] RecordId,
    fileHeaderExtensions [5] ManagementExtensions OPTIONAL}
```

```
Trailer ::= SEQUENCE{
    numberOfRecords [0] INTEGER,
    lastRecordId    [1] RecordId }
```

## -- USAGE METERING RECORDS

```
RecordContent ::= CHOICE {
    callRecord [0] CallRecord,
    supplServiceInputRecord [1] SupplServiceInputRecord,
    standardAdditionalRecordTypes [2] ManagementExtensions,
    additionalRecordTypes [3] ManagementExtensions }
```

```
CallRecord ::= SEQUENCE {
    recordType [0] RecordType,
    startTimeStamp [1] StartTimeStamp,
    participantInfo [2] ParticipantInfo,
    bearerService [3] BearerService,
    serviceUser [4] ServiceUser,
    callIdentificationNumber [6] CallIdentificationNumber,
    dataValidity [7] DataValidity OPTIONAL,
    networkProviderId [8] NetworkProviderId OPTIONAL,
    supplementaryServiceList [9] SupplementaryServiceList OPTIONAL,
    immediateNotification [10] ImmediateNotification OPTIONAL,
    cause [11] Cause OPTIONAL,
    iNServiceInformationList [12] INServiceInformationList OPTIONAL,
    iNSpecificInformation [13] INSpecificInformation OPTIONAL,
    partialGeneration [14] PartialGeneration OPTIONAL,
    exchangeInfo [15] ExchangeInfo OPTIONAL,
    relatedCallNumber [16] RelatedCallNumber OPTIONAL,
    uMRPurpose [17] UMRPurpose OPTIONAL,
    additionalParticipantInfo [18] AdditionalParticipantInfo OPTIONAL,
    callingPartyCategory [19] CallingPartyCategory OPTIONAL,
    callingPartyType [20] CallingPartyType OPTIONAL,
    chargingInformation [21] ChargingInformation OPTIONAL,
    progress [22] Progress OPTIONAL,
    accessDelivery [23] AccessDelivery OPTIONAL,
    trunkGroupOutgoing [24] TrunkGroupOutgoing OPTIONAL,
    trunkGroupIncoming [25] TrunkGroupIncoming OPTIONAL,
    fallbackBearerService [26] FallbackBearerService OPTIONAL,
    teleservice [27] Teleservice OPTIONAL,
    callDuration [28] CallDuration OPTIONAL,
    uUInfo [29] UUInfo OPTIONAL,
    standardExtensions [30] StandardExtensions OPTIONAL,
    recordExtensions [31] RecordExtensions OPTIONAL }
```

```
SupplServiceInputRecord ::= CallRecord
(WITH COMPONENTS {
  recordType          PRESENT,
  startTimeStamp      PRESENT,
  participantInfo      PRESENT,
  bearerService       PRESENT,
  serviceUser         PRESENT,
  callIdentificationNumber PRESENT,
  dataValidity        OPTIONAL,
  networkProviderId   OPTIONAL,
  supplementaryServiceList PRESENT,
  immediateNotification OPTIONAL,
  cause               OPTIONAL,
  iNServiceInformationList OPTIONAL,
  iNSpecificInformation OPTIONAL,
  exchangeInfo        OPTIONAL,
  uMRPurpose          OPTIONAL,
  additionalParticipantInfo OPTIONAL,
  callingPartyCategory OPTIONAL,
  callingPartyType    OPTIONAL,
  chargingInformation OPTIONAL,
  standardExtensions  OPTIONAL,
  recordExtensions    OPTIONAL })
```

-- Supporting productions

```
AccessDelivery ::= BIT STRING {
  setupMessageGenerated (0)} (SIZE(8))
-- Bit 0 (setupMessageGeneration) has the following meaning:
-- 0 No set-up message generated
-- 1 Set-up message generated
-- Bit 1 to 7 are not used.
-- See ETS 300 356-1 [3].
```

```
AccountCodeInput ::= OCTET STRING (SIZE (1..18))
-- This type is used to represent information, which is provided by the subscriber necessary for
-- use by some services. Coding is in accordance with Generic digits ETS 300 356-1 [3].
-- a) bits 876: Encoding scheme
-- 000 BCD even (even number of digits)
-- 001 BCD odd (odd number of digits)
-- 010 IA5 character
-- 011 Binary coded
-- 100
-- ... spare
-- 111
--
-- b) bits 54321: Type of digits
-- 0000 reserved for account code
-- 00001 reserved for authorization code
-- 00010 reserved for private network travelling class mark
-- 00011 reserved for business communication
-- 00100
-- ... spare for international use
-- 01111
-- 10000
-- ... spare for national use
-- 11111
--
-- c) Digits:
-- Coding in accordance to the coding scheme and type of digits.
```

```

AdditionalParticipantInfo ::= SET {
physicalLineCode [0] PhysicalLineCode OPTIONAL,
receivedDigits [1] ReceivedDigits OPTIONAL,
operatorSpecific1AdditionalNumber [2] OperatorSpecific1AdditionalNumber OPTIONAL,
operatorSpecific2AdditionalNumber [3] OperatorSpecific2AdditionalNumber OPTIONAL,
operatorSpecific3AdditionalNumber [4] OperatorSpecific3AdditionalNumber OPTIONAL}

```

```

Amount ::= SEQUENCE {
currencyAmount [0] NumberOfUnits,
multiplier [1] Multiplier}

```

```
AutomaticRecordDeletion ::= BOOLEAN
```

```

BearerService ::= SEQUENCE {
capability ENUMERATED {
speech (0),
audio3dot1kHz (1),
uni64 (2),
uni64withT-A (3),
multipleRate (4),
packetModeB-Ch (5),
all (6) },
multiplier INTEGER (2..30) OPTIONAL}
-- Multiplier present only if capability = multipleRate

```

```

CallDuration ::= SET {
conversationTime [0] ConversationTime OPTIONAL,
durationTimeACM [1] DurationTimeACM OPTIONAL,
durationTimeB-Answer [2] DurationTimeB-Answer OPTIONAL,
durationTimeNoB-Answer [3] DurationTimeNoB-Answer OPTIONAL }

```

```
CalledPartyNumber ::= Number
```

```

CallIdentificationNumber ::= OCTET STRING (SIZE(4))
-- 4 byte number identifying the call.

```

```

CallingPartyCategory ::= BIT STRING(SIZE(8))
-- See ETS 300 356-1 [3] subclause 3.9.

```

```
CallingPartyNumber ::= Number
```

```
CallingPartyNumberNotScreened ::= Number
```

```

CallingPartyType ::= ENUMERATED {
analogue (0),
customerLink (1), -- 2Mbit/s PSTN digital access
basicAccess (2),
primaryRateAccess (3) }

```

```

Cause ::= SEQUENCE {
causeValue CauseValue,
location Location}

```

```

CauseValue ::= BIT STRING (SIZE(8))
-- Coded according to ITU-T Recommendation Q.850 [7]: Table 1/Q.850

```

```
ChargedDirectoryNumber ::= Number
```

```

ChargingInformation ::= CHOICE {
recordedCurrency [0] RecordedCurrency,
recordedUnitsList [1] RecordedUnitsList,
freeOfCharge [2] NULL,
chargeInfoNotAvailable [3] NULL}

```



```
-- Charging information provided is related to the recorded charges for the usage at the time of
-- UMR generation, see ETS 300 182. [17] AOC-E.

ChargedParticipant      ::= ParticipantType
ConversationTime       ::= Duration

Count                  ::= OCTET STRING (SIZE (1..3))
-- A maximum 3 byte counter.

CreateFileArgument     ::= SEQUENCE {
    fileName            VisibleString OPTIONAL,
    lowestRecordID     INTEGER OPTIONAL,
-- if omitted all records in the log are used to create the file
    deleteRecords     BOOLEAN DEFAULT FALSE}

CreateFileResponse     ::= SEQUENCE {
    fileName            VisibleString,
    fileSize           INTEGER OPTIONAL }
-- number of octets in file

CreationTriggerList    ::= SET OF CreationTrigger

CreationTrigger        ::= ENUMERATED{
    seizure              (0),
    firstDigitReceived  (1),
    aCMReceived         (2),
    b-AnswerReceived    (3),
    supplementaryServiceInvocation (4),
    supplementaryServiceInput (5)}
-- ACMreceived is defined as the receipt of ACM for an external call. In the case of a terminating
-- exchange the event ACM received will occur when the ACM is normally generated. This is either --
-- when a B-subscriber port is free (early ACM) or when a B-subscriber terminal is free (late ACM).
-- The choice between early and late ACM is a network option in the terminating network. For local
-- calls a corresponding time shall be used.";;

DataValidity          ::= ENUMERATED{
    unreliableData      (0)}

Duration              ::= OCTET STRING (SIZE(1..3))
-- Duration in centiseconds. Maximum value in centiseconds is approx. 46 hours.

DurationTimeACM       ::= Duration

DurationTimeANM       ::= Duration

DurationTimeNoANM     ::= Duration

ExchangeInfo          ::= SET {
    exchangeID         [0] ExchangeID OPTIONAL,
    softwareVersion    [1] SoftwareVersion OPTIONAL}

ExchangeID            ::= VisibleString (SIZE (1..11))

FallbackBearerService ::= BearerService

FileName              ::= NameType

FileCreationInfo      ::= SEQUENCE{
    fileName           FileName,
    reasonForOutput    ReasonForOutput}

ImmediateNotification ::= BOOLEAN
```

INServiceInformationList ::= SEQUENCE OF INServiceInformation

INServiceInformation ::= SEQUENCE {  
    iServiceCode [0] INServiceCode,  
    queueInfo [1] QueueInfo OPTIONAL,  
    serviceSpecificINInformation [2] OCTET STRING OPTIONAL }

INSpecificInformation ::= SET {  
    INpersonalUserId [0] PersonalUserId OPTIONAL,  
    chargedParticipant [1] ChargedParticipant OPTIONAL,  
    chargedDirectoryNumber [2] ChargedDirectoryNumber OPTIONAL,  
    percentageToBeBilled [3] PercentageToBeBilled OPTIONAL,  
    accountCodeInput [4] AccountCodeInput OPTIONAL }

INServiceCode ::= OCTET STRING (SIZE (2))

Location ::= INTEGER {  
    user (0),  
    localUserPrivateNetwork (1),  
    localUserPublicNetwork (2),  
    transitNetwork (3),  
    remoteUserPublicNetwork (4),  
    remoteUsePrivateNetwork (5),  
    internationalNetwork (7),  
    beyondInterworkPoint (10) }

-- See ITU-T Recommendation Q.850 [7]: subclause 2.2.3

MaxBlockSize ::= INTEGER (0..32767)

MaxTimeInterval ::= INTEGER (0..32767)

-- time interval in seconds.

ManagementExtensions ::= SET OF ManagementExtension

-- A set of network/manufacturer specific extensions.

NetworkProviderId ::= VisibleString (SIZE (1..11))

Multiplier ::= ENUMERATED {  
    oneThousandth (0),  
    oneHundredth (1),  
    oneTenth (2),  
    one (3),  
    ten (4),  
    hundred (5),  
    thousand (6) }

Number ::= OCTET STRING (SIZE (1 .. 14))

-- This type is used to represent a number for addressing purposes. The used coding is similar to  
-- that used for numbers in ETS 300 356-1 [3]. It is composed of

-- a) one octet for odd/even indicator and nature of address indicator

-- b) one octet for numbering plan indicator

-- c) digits of the address encoded as TBCD String

-- a)

-- bits 8: Odd/even indicator  
-- 0 even number of address signals  
-- 1 odd number of address signals

-- bits 7654321: Natur of address indicator

-- 0000000 spare  
-- 0000001 subscriber number  
-- 0000010 unknown  
-- 0000011 national (significant) number  
-- 0000100 international number

```
--          0000101  }
--          to      }   spare
--          1101111  }
--          1110000  }
--          to      }   reserved for national use
--          1111110  }
--          1111111  }   spare
```

b)

```
--          bits 765: numbering plan indicator
--          000      spare
--          001      ISDN(Telephony) Number Plan (Rec CCITT E.164)
--          010      spare
--          011      data numbering plan (ITU-T Recommendation X.121)
--          100      telex numbering plan (ITU-T Recommendation F.69)
--          101      reserved for national use
--          110      reserved for national use
--          111      spare
```

```
--          c) The following octets representing digits of an address encoded as a TBCD-STRING.
--          TBCD-STRING ::= OCTET STRING
--          This type (Telephony Binary Coded Decimal String) is used to represent digits from 0
--          through 9, *, #, a, b, c, two digits per octet, each digit encoded 0000 to 1001 (0 to 9), 1010 (*),
--          1011(#), 1100 (a), 1101 (b) or 1110 (c); 1111 (end of pulsing signal-ST); 0000 is used as a filler
--          when there is an odd number of digits.
--          The most significant address signal is sent first. Subsequent address signals are sent in
--          successive 4-bit fields.
```

NumberOfUnits ::= INTEGER (0..16777215)

OperatorSpecific1AdditionalNumber ::= VisibleString

OperatorSpecific2AdditionalNumber ::= VisibleString

OperatorSpecific3AdditionalNumber ::= VisibleString

OperatorSpecific1Number ::= Number

OperatorSpecific2Number ::= Number

OperatorSpecific3Number ::= Number

OriginalCalledNumber ::= Number

ParticipantId ::= CHOICE {

callingPartyNumber	[0]	CallingPartyNumber,
calledPartyNumber	[1]	CalledPartyNumber,
redirectingNumber	[2]	RedirectingNumber,
redirectionNumber	[3]	RedirectionNumber,
originalCalledNumber	[4]	OriginalCalledNumber,
callingPartyNumberNotScreened	[5]	CallingPartyNumberNotScreened,
operatorSpecific1Number	[6]	OperatorSpecific1Number,
operatorSpecific2Number	[7]	OperatorSpecific2Number,
operatorSpecific3Number	[8]	OperatorSpecific3Number}

ParticipantInfo ::= SET OF ParticipantId

ParticipantType ::= ENUMERATED {

callingPartyNumber	(0),
calledPartyNumber	(1),
redirectingNumber	(2),
redirectionNumber	(3),
originalCalledNumber	(4),
callingPartyNumberNotScreened	(5),

```

operatorSpecific1Number      (6),
operatorSpecific2Number      (7),
operatorSpecific3Number      (8),
operator                      (9),
unknown                      (10)}

```

PartialRecordNumber ::= BIT STRING (SIZE (8))

-- A sequential number in the range 0-255 indicating the partial record generated for the same call

```

PartialGeneration ::= SET {
  partialRecordNumber [0] PartialRecordNumber,
  partialRecordReason [1] PartialRecordReason}

```

```

PartialRecordReason ::= ENUMERATED {
  timeLimit          (0),
  serviceChange      (1),
  overflow            (2),
  networkInternalReasons (3),
  lastUMR            (4)
}

```

PercentageToBeBilled ::= INTEGER (0..99)

PersonalUserId ::= OCTET STRING (SIZE (1 .. 10))

-- This type is used to represent the Personal User Id. For UMT the Personal User Id is defined according to E.212 as a International Mobil Station Identity (IMSI). Accordingly only numerical characters (0-9) are used.

-- The PersonalNumber type does however not exclude the use of other formats. These formats can be indicated in the numbering plan indicator.

-- The type is composed of:

-- a) one octet for odd/even indicator and numbering plan indicator

-- b) digits of the address encoded as TBCD String

-- a)

```

-- bits 8:      Odd/even indicator
-- 0           even number of address signals
-- 1           odd number of address signals
-- bits 765: numbering plan indicator
-- 000         E.212 (IMSEI)
-- 001         ISDN(Telephony) Number Plan (Rec CCITT E.164)
-- 010         spare
-- 011         spare
-- 100         spare

```

-- b) The following octets representing the personal number encoded as a TBCD-STRING.

TBCD-STRING ::= OCTET STRING

-- This type (Telephony Binary Coded Decimal String) is used to represent digits from 0 through 9, \*, #, a, b, c, two digits per octet, each digit encoded 0000 to 1001 (0 to 9), 1010 (\*), 1011(#), 1100 (a), 1101 (b) or 1110 (c); 1111 (end of pulsing signal-ST); 0000 is used as a filler when there is an odd number of digits.

-- The most significant address signal is sent first. Subsequent address signals are sent in successive 4-bit fields.

PhysicalLineCode ::= VisibleString

```

Progress ::= SEQUENCE {
  description ProgressDescription,
  location     Location }

```

```

ProgressDescription ::= INTEGER {
  notEndToEndISDN      (1),
  nonISDNDestination  (2),
  nonISDNOrigination   (3),
  returnedToISDN      (4),
}

```

```
interworkingServiceChange (5),
inBandInfo (8) }
-- See ETS 300 403-1 [2]

QueueInfo ::= SEQUENCE{
    queueTimeStamp [0] StartDateTime,
    queueDuration [1] Duration}

ReasonForOutput ::= ENUMERATED {
    absoluteTimeEvent (0),
    maxBlockSizeReached (1),
    maxTimeIntervalElapsed (2),
    internalSizeLimitReached(3),
    oSAction (4)}

ReceivedDigits ::= OCTET STRING (SIZE (1 .. 18))
-- This type is used to represent digits input by the subscriber. It is composed of
-- a) one octet for odd/even indicator
-- b) digits of the address encoded as TBCD String
-- a)
-- bits 8: Odd/even indicator
-- 0 even number of address signals
-- 1 odd number of address signals
--
-- b) The following octets representing the received digits encoded as a TBCD-STRING.
-- TBCD-STRING ::= OCTET STRING
-- This type (Telephony Binary Coded Decimal String) is used to represent digits from 0
-- through 9, *, #, a, b, c, two digits per octet, each digit encoded 0000 to 1001 (0 to 9), 1010 (*),
-- 1011(#), 1100 (a), 1101 (b) or 1110 (c); 1111 (end of pulsing signal-ST); 0000 is used as a filler
-- when there is an odd number of digits.
-- The most significant address signal is sent first. Subsequent address signals are sent in
-- successive 4-bit fields.

RecordedCurrency ::= CHOICE {
    currency [0] IA5String (SIZE (1..10)),
    amount [1] Amount }

RecordExtensions ::= ManagementExtensions

RecordedUnitsList ::= SEQUENCE SIZE (1.. 32) OF RecordedUnits

RecordedUnits ::= SEQUENCE{
    units CHOICE {
        recordedNumberOfUnits [0] NumberOfUnits,
        notAvailable [1] NULL },
    recordedTypeOfUnits INTEGER(1..16) OPTIONAL }

RecordId ::= INTEGER

RecordType ::= INTEGER {
    call (0),
    supplServiceInputRecord(1) }

RedirectingNumber ::= Number

RedirectionNumber ::= Number

RelatedCallNumber ::= CallIdentificationNumber

ServiceUser ::= ParticipantType
```

```

SequenceNumber ::= Count
-- The record block sequence number is incremented by one for each block generation. This
-- number is locally generated by the exchange.

SoftwareVersion ::= VisibleString (SIZE(1..12))

StandardExtensions ::= ManagementExtensions

StartTimeStamp ::= CHOICE {
    answerTime [0] StartDateTime,
    seizureTime [1] StartDateTime,
-- For calls a choice between seizure time or answer time
-- is dependent on the occurrence of a B-answer (ANM).
    partialTime [2] StartDateTime,
-- Partial time is used for partial records.
    eventTime [3] StartDateTime}
-- Event time is used in connection with supplementary service input records.

StartDateTime ::= OCTET STRING (SIZE(7))
-- YYMMDDHHmmSSCC (Year, Month, Day, Hour, Minute, Second, Centisecond),
-- each field one digit, two digits per octet, the digits 0 through 9, encoded as
-- 0000 to 1001 "hstring". 1st digit in the LSB.

SupplementaryServiceList ::= SEQUENCE OF SupplementaryService

SupplementaryService ::= SEQUENCE {
    supplementaryServiceCode [0] SupplementaryServiceCode,
    supplementaryAction [1] SupplementaryAction,
    supplementaryTimeStamp [2] Duration OPTIONAL,
    functionalInformation [3] OCTET STRING OPTIONAL }

SupplementaryServiceCode ::= OCTET STRING (SIZE (2))
-- see prETS 300 738 [4]

SupplementaryAction ::= ENUMERATED {
    provision (0),
    withdrawal (1),
    registration (2),
    erasure (3),
    activation (4),
    deactivation (5),
    invocation (6),
    disabling (7),
    interrogation (8)}

Teleservice ::= BIT STRING (SIZE(8))
-- See ETS 300 403-1 [2]

TrunkGroupIncoming ::= TrunkGroupId

TrunkGroupOutgoing ::= TrunkGroupId

TrunkGroupId ::= SEQUENCE {
    trunkGroupId [0] NameType,
    trunkId [1] NameType OPTIONAL,
    pCMIId [2] NameType OPTIONAL,
    channelNumber [3] INTEGER OPTIONAL}

TimesOfDay ::= SET OF SEQUENCE {
    hour INTEGER (0..23),
    minute INTEGER (0..59)}

UsageMeteringDataId ::= NameType

```

```
UMRPurpose ::= ENUMERATED {
    billing (0),
    accounting (1),
    billingAndAccounting (2),
    operatorSpecific1 (3),
    operatorSpecific2 (4),
    operatorSpecific3 (5)}

UUInfoCounters ::= SET {
    uu1Info [0] UUxInfo OPTIONAL,
    uu2Info [1] UUxInfo OPTIONAL,
    uu3Info [2] UUxInfo OPTIONAL}

UUxInfo ::= SET {
    receivedMessages [0] Count OPTIONAL,
    transmittedMessages [1] Count OPTIONAL,
    receivedOctets [2] Count OPTIONAL,
    transmittedOctets [3] Count OPTIONAL}

END -- end of ASN1DefinedTypesModule
```

## **Annex B (normative): Usage Metering Records**

### **B.1 General**

This clause includes a specification of the record types and the information elements valid for inclusion in the UMR. To enable for a more flexible formatting of the UMR, dynamic encoding rules shall be adopted. The rules imply that the UMR and each information element has a tag and length parameter for identifying the type and length of the information.

The main advantage of this approach is that only relevant data is generated. To enhance this feature it shall be possible using MML commands to control the number of information elements in the UMR. The control of the number of information elements is not included in this specification.

#### **B.1.1 Use of Record types**

As the records may be generated under different conditions and therefore may also include different information elements, specific record types have been defined. The following two record types are defined for this I-ETS:

- Call;
- Supplementary service input record;

Two extra types are however provided so that standardized (standardAdditionalTypes) or operator specific (additionalRecordTypes) types can be added. The record type may have impact on the way the OS interprets the information elements included in the record. The control to select from the potential recordable events, the events for which a record should be generated, is outlined in subclause 6.1. It should be noted that the absence of certain trigger criteria can lead to the exclusion of a record type as generation is dependent on the criteria selected.

#### **B.1.2 Partial records**

In order to increase the security of the recording process and to simplify post-processing, it may be desirable to generate a sequence of call records to describe the service usage. In the case of connections of extended duration, loss of a single record may result in an unacceptable loss of revenue. If a record is only produced after extended duration, employment of credit checking by the billing system will be impossible. The periodic timer provided for the generation of partial UMRs is outlined in subclause 6.1.

All of the records defined in this specification are of variable length and some are potentially unlimited in size. However, due to internal limitations in the NEF, partial records may be required to circumvent internal resource limitations.

All partial records for the same call shall contain the same call reference and shall be ordered via a running sequence number. The time stamps involved shall apply to the individual partial records rather than the call as a whole i.e. the "end" time stamp (StartTimeStamp + duration) of a record shall coincide with the "start" time stamp of the next. Each time a new partial record is created the reason for partial generation may be included in the partial generation element. The partial records generated may repeat each of the non-varying fields contained in the initial record. Alternatively, a reduced partial record may be generated which includes only those fields required to identify the initial record together with the field(s) that actually change.

#### **B.1.3 Use of supplementary services**

There are basically two kinds of supplementary service actions, call related and non-call related. The non-call related action is recorded in the supplementary service input type record. For the call related supplementary action the call record type is used. Supplementary services that are not time or duration dependent for charging will not include the optional timestamp.



## B.2 Record contents

The following table describes the contents of each of the record types defined in this specification.

It should be noted that the elements are ordered in the UMR as indicated in the table. The mandatory elements are grouped in the first part of the UMR and will therefore be easy to recognize as a fixed part of the record. To enable the OS to access and retrieve the UMR data elements from the fileGeneratingLog, each of the above elements are defined as attributes in clause A.6. For a description of the elements please refer to the defined by statements of that subclause.

Each element in the table contains the name of the information element and a key indicating whether or not the field is mandatory. The key has the following meaning:

- This element is not relevant for this record type.
- M This element is mandatory and always present.
- C This element is only available under certain conditions. Under these conditions the field is mandatory.
- O This element is optional and configurable either via additional TMN management functions or using MML commands. For the avoidance of doubt, optional does not mean that the parameter is not supported by the network element.

Table B.1: Contents of the record types

Information element	Call	Supplementary Service Input
record type	M	M
start time stamp	M	M
participant Info - calling party number - called party number - redirecting number - redirection number - original called number - calling party number not screened - operator specific1 number - operator specific2 number - operator specific3 number	M	M
bearer service	M	M
service User	M	M
call identification number	M	M
data Validity	C	C
networkProviderId	C	C
supplementary service List	C	M
immediate notification	C	C
cause	C	C
IN Service Information List - IN service code - queue info - service specific IN information	C	C
iN Specific information - personal user identification - charged participant - charged directory number - percentage to be billed - account code input	C	C
partial generation	C	-
exchange Info	O	O
related call number	O	-
uMR purpose	O	O
additional participant Information - physical line code - received digits - operator specific1 additional number - operator specific2 additional number - operator specific3 additional number	O	O
calling party category	O	O
calling party type	O	O
charging information	O	O
progress	O	-
access delivery	O	-
trunk group outgoing	O	-
trunk group incoming	O	-
fallback bearer service	O	-
teleservice	O	-
call Duration - conversation time - duration time ACM - duration time B-Answer - duration time No B-Answer.	C	-
user to user data counter	O	-
standard extensions	O	O
record extensions	O	O

## Annex C (informative): Alternative ASN.1 definitions

(This annex does not form an integral part of this I-ETS).

### C.1 Definition of ASN.1 modules for use of 1994 version of ASN.1

The use of the 1994 version of ASN.1 (ITU-T Recommendations X.680 [21], X.681[22], X.682 [23] and X.683 [24]) is illustrated by providing an ASN.1 module, ASN1UsageMeteringModuleNew, which defines the data types that are affected by the new notation in a way similar to the way they are defined in the ASN1UsageMeteringModule module in clause A.10.

```
ASN1UsageMeteringModuleNew {ccitt(0) identified-organization(4) etsi(0)
usageMeteringInformationManagement(43321) informationModel(0) asn1Modules(2)
ASN1UsageMeteringModuleNew(1)}
```

```
DEFINITIONS IMPLICIT TAGS::=
```

```
BEGIN
```

```
-- EXPORTS everything
```

```
-- The following ASN.1 provides the means for extending records, record types, IN specific information
-- and record block information. The Management Extension type is redefined using the useful
-- information object class type TYPE-IDENTIFIER. The construct is equivalent to ITU-T Recommendation
X.721 [11]:
```

```
-- Attribute -ASN1Module ManagementExtension type and does not use the ANY DEFINED BY construct
-- which is not supported any more by ITU-T Recommendation X.680 [21].
```

```
MANAGEMENT-EXTENSION ::= TYPE-IDENTIFIER
```

```
AdditionalRecordType ::= INSTANCE OF MANAGEMENT-EXTENSION
({AllowedAdditionalRecordTypes})
```

```
-- The AllowedAdditionalRecordTypes is the constraint that allows only certain types to be set as
-- AdditionalRecordType.
```

```
AdditionalRecordTypes ::= SET OF AdditionalRecordType
```

```
-- The AdditionalRecordTypes type is to be used in the RecordContent type of
-- ASN1UsageMeteringModule module.
```

```
BlockExtension ::= INSTANCE OF MANAGEMENT-EXTENSION ({AllowedBlockExtensions})
```

```
-- The AllowedBlockExtensions is the constraint that allows only certain types to be set as BlockExtension.
```

```
BlockExtensions ::= SET OF BlockExtension
```

```
-- The BlockExtensions type is to be used in the BlockHeaderRecord type of
-- ASN1UsageMeteringModule
-- module
```

```
FileHeaderExtension ::= INSTANCE OF MANAGEMENT-EXTENSION
({AllowedFileHeaderExtensions})
```

```
-- The AllowedFileHeaderExtensions is the constraint that allows only certain types to be set as
FileHeaderExtension.
```

```
FileHeaderExtensions ::= SET OF FileHeaderExtension
```

```
-- The FileHeaderExtensions type is to be used in the FileHeaderRecord type of
-- ASN1UsageMeteringModule
-- module
```

```
RecordExtension ::= INSTANCE OF MANAGEMENT-EXTENSION ({AllowedRecordExtensions})
```

-- The AllowedRecordExtensions is the constraint that allows only certain types to be set as  
-- RecordExtension

RecordExtensions ::= SET OF RecordExtension

-- The RecordExtensions type is to be used in the CallRecord type of  
-- ASN1UsageMeteringModule module

StandardAdditionalRecordType ::= INSTANCE OF MANAGEMENT-EXTENSION  
({AllowedStandardAdditionalRecordTypes})

-- The AllowedStandardAdditionalRecordTypes is the constraint that allows only certain types to be set as  
-- StandardAdditionalRecordType.

StandardAdditionalRecordTypes ::= SET OF StandardAdditionalRecordType

-- TheStandardAdditionalRecordTypes type is to be used in the RecordContent type of  
-- ASN1UsageMeteringModule module.

StandardExtension ::= INSTANCE OF MANAGEMENT-EXTENSION  
({AllowedStandardExtensions})

-- The AllowedStandardExtensions is the constraint that allows only certain types to be  
-- set as StandardExtension.

StandardExtensions ::= SET OF StandardExtension

-- TheStandardExtensions type is to be used in the CallRecord type of  
-- ASN1UsageMeteringModule module

-- Usually the constraint on the type to be used for extensions is not known and shall be specified  
-- at implementation time (in the Protocol Implementation Conformance Statement, PICS).  
-- However in the case of standard extensions the allowed types for the constraint may be already  
-- defined.

-- Example:

-- TypeA and TypeB types are to be used as a constraint to StandardAdditionalRecordTypes.

-- The AllowedStandardAdditionalRecordType will be then:

-- AllowedStandardAdditionalRecordTypes STANDARD-EXTENSION ::= {

-- { TypeA IDENTIFIED BY objectIdentifierA } |

-- { TypeB IDENTIFIED BY objectIdentifierB } }

-- where objectIdentifierA and objectIdentifierB are the OBJECT IDENTIFIER values associated

-- to TypeA and TypeB respectively.

END -- End of ASN1UsageMeteringModuleNew

## C.2 Rules of extensibility

NOTE: This clause substitutes the paragraph on rules of extensibility at the beginning of  
clause A.10.

ITU-T Recommendation X.680 [21] Amendment 1 shall be used when applicable to extend all the types  
defined in ASN1UsageInformationModule module.

## C.3 Use of Management Extension

The use of Management Extensions requires the definition of an object identifier that uniquely refers to the  
type being used for the extension. This definition avoids any ambiguity when receiving the type at the Q3  
interface.

EXAMPLE: The information model defined in this I-ETS is, for instance, to be used to collect usage information from ATM switches. An ATM connection record is standardized in an ATMSwitchASN1Module in another document. The definition of this type in that document should be done as follows:

```
ATMSwitchASN1Module { ccitt(0) identified-organization(4) etsi(0) ATMSwitchStandard(XXX)
informationModel(0) asn1Module(2) ATMSwitchASN1Module(0) }
```

DEFINITIONS ....

...

```
ExampleATMConnectionRecordId OBJECT IDENTIFIER ::=
{ATMSwitchASN1Module ExampleATMConnectionRecordType(0) }
-- This object identifier uniquely identifies type ExampleATMConnectionRecord.
```

...

```
ExampleATMConnectionRecord ::= -- Type definition
```

...

When the usage metering information management model with a ManagementExtension is used, the object identifier ExampleATMConnectionRecordId should be used so that the ANY DEFINED BY clause in the Management Extension unambiguously determines the ExampleATMConnectionRecord type.

The ExampleATMConnectionRecord shall be specified in the Protocol Implementation Conformance Statement (PICS) of the information model at the time of implementation.

.

## History

Document history	
December 1996	Public Enquiry PE 120: 1996-12-16 to 1997-04-11