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SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 – Q3 interface

Specification of TMN applications at the Q3 interface: Call detail recording

ITU-T Recommendation Q.825

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION Q.825

SPECIFICATION OF TMN APPLICATIONS AT THE Q3 INTERFACE: CALL DETAIL RECORDING

Summary

This Recommendation specifies the management functionality and the management information model required to support the management aspects of the "call detail recording" function.

Source

ITU-T Recommendation Q.825 was prepared by ITU-T Study Group 4 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 26th of June 1998.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, the ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation Q.825

SPECIFICATION OF TMN APPLICATIONS AT THE Q3 INTERFACE: CALL DETAIL RECORDING

(Geneva, 1998)

1 Scope

This Recommendation specifies the management functionality and the management information model required to support the management aspects of the "Call Detail Recording" function.

The model applies to the Operations System to Network Element (OS/NE) interface.

The scope of this Recommendation is to support call detail recording for the following services and technologies:

- data collection requirements for the analogue, digital and Integrated Services Digital Network (ISDN) subscribers;
- data collection requirements in connection with Intelligent Networks (IN).

Call detail information may be gathered for two primary purposes:

- Accounting Management: This includes the collection of usage data for calls and call attempts that consume accountable resources. This data are then used for bill rendering and may also be used for market and customer behaviour analysis. Only data collection, data transfer and the control of these processes is in the scope of this Recommendation.
- Analysis Administration: This includes the collection of usage data for calls and call attempts for Quality of Service (QoS), Fraud Investigation or Network Traffic Management (NTM) applications as defined below:
  - Quality of Service: This includes the collection of usage data for calls and call attempts that utilize scarce resources that impact the quality of service perceived by the subscriber, regardless of whether the resource is subject to billing. For this purpose, data may be collected on a sampled basis and information for both successful and failed call attempts is required.
  - Fraud investigation: This includes collection of data on successful and denied service requests in order to determine irregularities in calling patterns to allow both real-time and off-line detection or reconstruction of fraudulent use of network resources.
  - Network traffic management: This includes collection of usage data calls and call attempts and their holding times to allow traffic studies for the purpose of network administration and capacity planning.

The data collection needs for all the above functions are supported by a single record type referred to as a Call Detail Record (CDR). The content of the CDR notification to be sent by the NE can be configured to support the data needs of any of the above applications. In the context of billing and accounting, CDRs will occasionally, for purposes of clarity, be referred to as Usage Metering Records (UMRs).

This Recommendation also defines a set of data 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.

NOTE – The modelling of the charging and the billing processes is outside the scope of this Recommendation. Nevertheless the call detail record defined in this Recommendation may also contain the charge information if the calculation of charge is performed by the NE itself. This calculation may be performed by the NE autonomously or based on information provided by an SCP in an IN environment.

2 Normative references

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

– ITU-T Recommendation M.1400 (1997), *Designations for international networks*.

– ITU-T Recommendation M.3100 (1995), *Generic network information model.*

– ITU-T Recommendation M.3200 (1997), *TMN management service and telecommunications managed areas: Overview.*

– ITU-T Recommendation Q.811 (1997), *Lower layer protocol profiles for the Q3 and X interfaces*.

– ITU-T Recommendation Q.812 (1997), *Upper layer protocol profiles for the Q3 and X interfaces*.

– ITU-T Recommendation Q.850 (1998), *Usage of cause and location in the Digital subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN user part*.

– CCITT Recommendation X.209 (1988), *Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1).*

– ITU-T Recommendation X.680 (1997) | ISO/IEC 8824-1:1998, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

– ITU-T Recommendation X.681 (1997) | ISO/IEC 8824-2-2:1998, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*

– ITU-T Recommendation X.682 (1997) | ISO/IEC 8824-3:1998, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*

– ITU-T Recommendation X.683 (1997) | ISO/IEC 8824-4:1998, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.*

– ITU-T Recommendation X.701 (1997) | ISO/IEC 10040:1998, *Information technology – Open Systems Interconnection – Systems management overview.*

– ITU-T Recommendation X.710 (1997) | ISO/IEC 9595:1998, *Information technology – Open Systems Interconnection – Common Management Information Service.*

– ITU-T Recommendation X.711 (1997) | ISO/IEC 9596-1:1998, *Information technology – Open Systems Interconnection – Common Management Information Protocol: Specification.*

– CCITT Recommendation X.720 (1992) | ISO/IEC 10165-1:1993, *Information technology – Open Systems Interconnection – Structure of management information: Management information model*.

– CCITT Recommendation X.721 (1992) | ISO/IEC 10165-2:1992, *Information technology – Open Systems Interconnection – Structure of management information: Definition of management information.*

– CCITT Recommendation X.722 (1992) | ISO/IEC 10165-4:1992, *Information technology – Open Systems Interconnection – Structure of management information: Guidelines for the definition of managed objects.*

– CCITT Recommendation X.730 (1992) | ISO/IEC 10164-1:1993, *Information technology – Open Systems Interconnection – Systems management: Object management function.*

– CCITT Recommendation X.734 (1992) | ISO/IEC 10164-5:1993, *Information technology – Open Systems Interconnection – Systems management: Event report management function.*

– CCITT Recommendation X.735 (1992) | ISO/IEC 10164-6:1993, *Information technology – Open Systems Interconnection – Systems management: Log control function.*

– ITU-T Recommendation X.742 (1995) | ISO/IEC 10164-10:1995, *Information technology – Open Systems Interconnection – Systems management – Usage metering function for accounting purposes.*

– ITU-T Recommendation X.746 (1995) | ISO/IEC 10164-15:1995, *Information technology – Open Systems Interconnection – Systems management: Scheduling function.*

3 Definitions, symbols and abbreviations

NOTE – When an event is described in terms of an ISUP message, it should be understood that if ISUP is not used an equivalent message or event should be used.

3.1 Definitions

This Recommendation defines the following terms.

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

3.1.2 answered call: A call is considered an answered call when ANM or its equivalent is received.

3.1.3 call detail data: Data collected about significant events of a call or call attempt.

3.1.4 call detail record: A data record containing call detail information relating to a specific call or call attempt instance.

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

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

3.1.7 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.

3.1.8 charging: The set of functions needed to determine the price assigned to the service utilization.

3.1.9 call failures: A call fails when some network conditions do not allow the connection between calling and called parties to be set up or properly maintained. See Recommendation Q.850 for the causes.

3.1.10 service subscriber: It 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.)

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

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

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

3.1.14 usage metering data: Data which represent usage from which usage metering records may be derived.

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

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

3.1.17 user: An identifiable entity whose use of resources must be accounted.

3.2 Symbols

3.3 Abbreviations

This Recommendation uses the following abbreviations.

ACM	Address Complete Message
ANM	Answer Message
AOC	Advice of Charge
ASN.1	Abstract Syntax Notation One
CCO	Configurable Simple Usage Metering Control Object
CDD	Call Detail Data Object
CDR	Call Detail Record
CEP	Circuit End Point
CEPSG	Circuit End Point Sub-group (as defined in Recommendation M.3100)
CLIP	Calling Line Identification Presentation
DDI	Direct-Dialling-In
DN	Directory Number
DPC	Destination Point Code
EFD	Event Forwarding Discriminator
ER	Entity-Relationship
GDMO	Generic Definition for Managed Object Class
IN	Intelligent Network
ISDN	Integrated Services Digital Network
MF	Management Function

MML Man Machine Language

MSC Management Service Component

MSN Multiple Subscriber Number

NE Network Element

NEF Network Element Function block

NPI Numbering Plan Identification

NTM Network Traffic Management

OPC Originating Point Code

OS Operations System

OSF Operations System Function

OSI Open System Interface

QMR Quality Metering Record

QoS Quality of Service

PSTN Public Switched Telephone Network

SCO Simple Usage Metering Control Object

SCP Service Control Point

SMF Service Management Function

TMN Telecommunications Management Network

TON Type of Number

UMR Usage Metering Record

UPT Universal Personal Telecommunication

VAS Value-Added Service

VPN Virtual Private Network

In tables, the following abbreviations will be used:

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

4 General requirements

The call detail recording function shall fulfil the requirements for the measurement of resource utilization, so that the data gathered may be used for the process of accounting management, the generation of bills, and analysis such as QoS, fraud detection, and network traffic management. The following requirements should be met:

– The function must allow sufficient control over the collection of call detail data so that the relevant information can be made available when required. A management system should have the capability to access individual call detail records almost instantaneously. This feature is required, for example, for the support of real-time (or near real time) cost calculation as, for example, in hotel applications.

– A management system shall have a standardized way of obtaining and representing call detail information to advise subscribers of their usage and to facilitate exchange of call detail information with other suppliers.

– The call detail record shall be self-contained, i.e. the interpretation of the record shall not be dependent on the system where the call detail record was created.

– Several resources may be utilized to provide a service. The function should make it possible to relate call detail-records to the resources that are actually used or were required (but unavailable) for providing the requested service.

– For quality of service determination and network management (traffic studies), the application need not collect data on all calls and call attempts but the analysis needs may be met by sampling. The function shall make it possible to specify a flexible sampling rate.

– The function should support a number of trigger conditions for reporting of a call detail record.

  Conditions that will cause the creation of a call detail record for measurement of usage and billing 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;
  • supplementary service input.

  Additional conditions that cause creation of a call detail record for analysis purposes such as quality of service measurement, fraud detection or traffic management are:

  • denial of a service;
  • change of observed service quality;
  • reaching a quality threshold;
  • call failures.

5 TMN management services

The TMN Management Service, "Tariff and Charging Administration", covers those management activities related to the charging of service usage including both the data collection process and the administration of charging data within the network elements. The relationship between this and other management services and activities is illustrated in Figure 1.

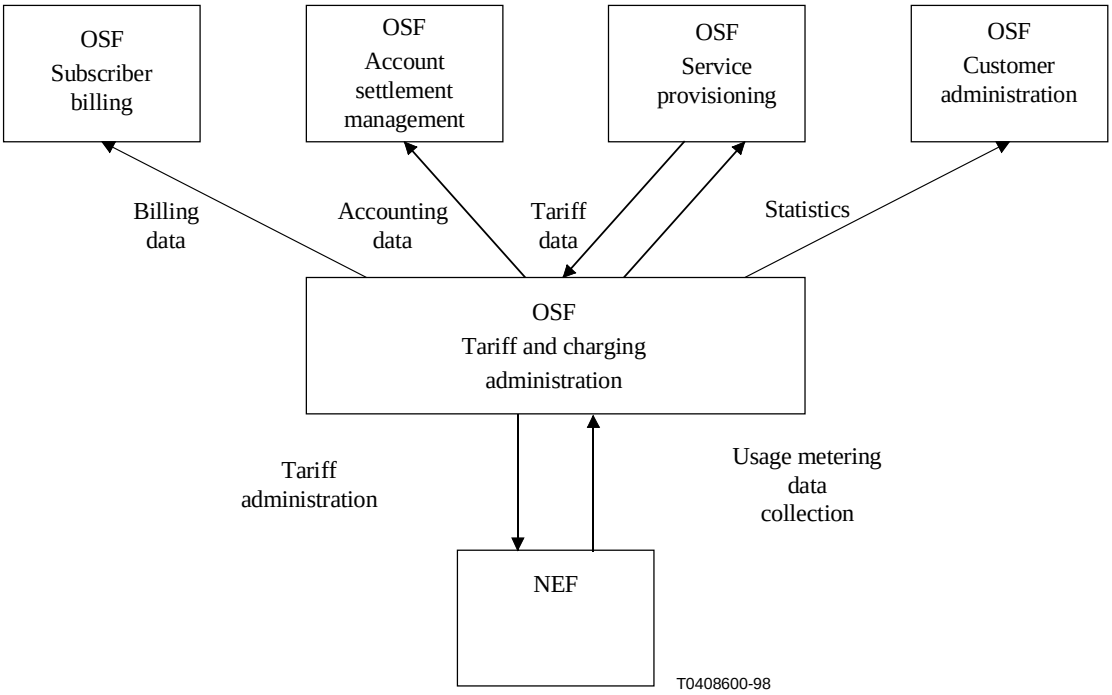


Figure 1/Q.825 – The tariff and charging administration

5.1 Subscriber billing

The call detail 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 may be further processed (e.g. to apply any special discounts) and then combined with the network access (subscription) charges and billed to the customer.

5.2 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 service 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 metre records) in the gateway exchanges. For the purpose of this Recommendation, the management information required is assumed to be derived from call detail records. The management of bulk meters is outside the scope of this Recommendation.

5.3 Service provision

The call detail 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 Recommendation.

5.4 Customer administration

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

5.5 Analysis application

In addition, this Recommendation supports other applications requiring access to call detail records as shown in Figure 2 below. It should be noted that these applications are not intended to be limited and Administrations may use this data for any suitable purpose.

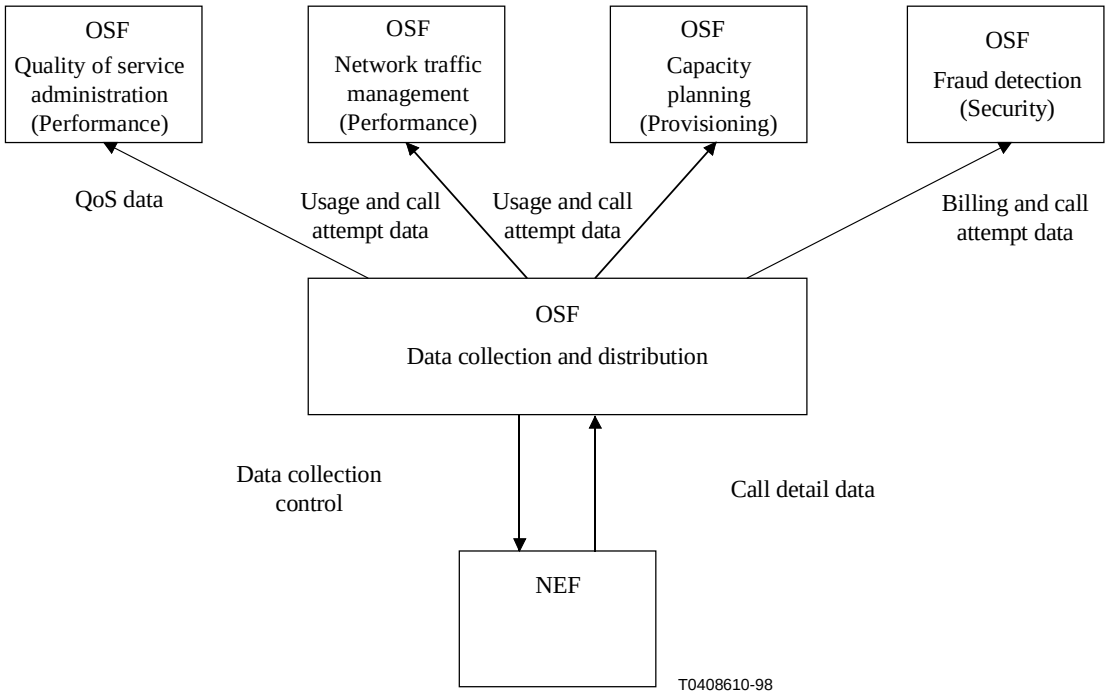


Figure 2/Q.825 – Supported call detail data analysis applications

6 TMN management service components

The TMN management Service "Tariff and charging administration" contains two TMN Management Service Components (TMN-MSC):

1) Tariff Administration.

2) Call detail Data Collection Management.

Component 1, Tariff Administration, is outside the scope of this Recommendation. Component 2, Call Detail Data Collection Management, is relevant for the billing and usage functionality specified in this Recommendation along with Data Collection for Analysis purposes. It includes the specification of the Call Detail Record (CDR) to be generated and collected, as well as the mechanisms required for the transfer of these CDRs to the OS.

In Figure 3, the functionality of the data collection management is illustrated.

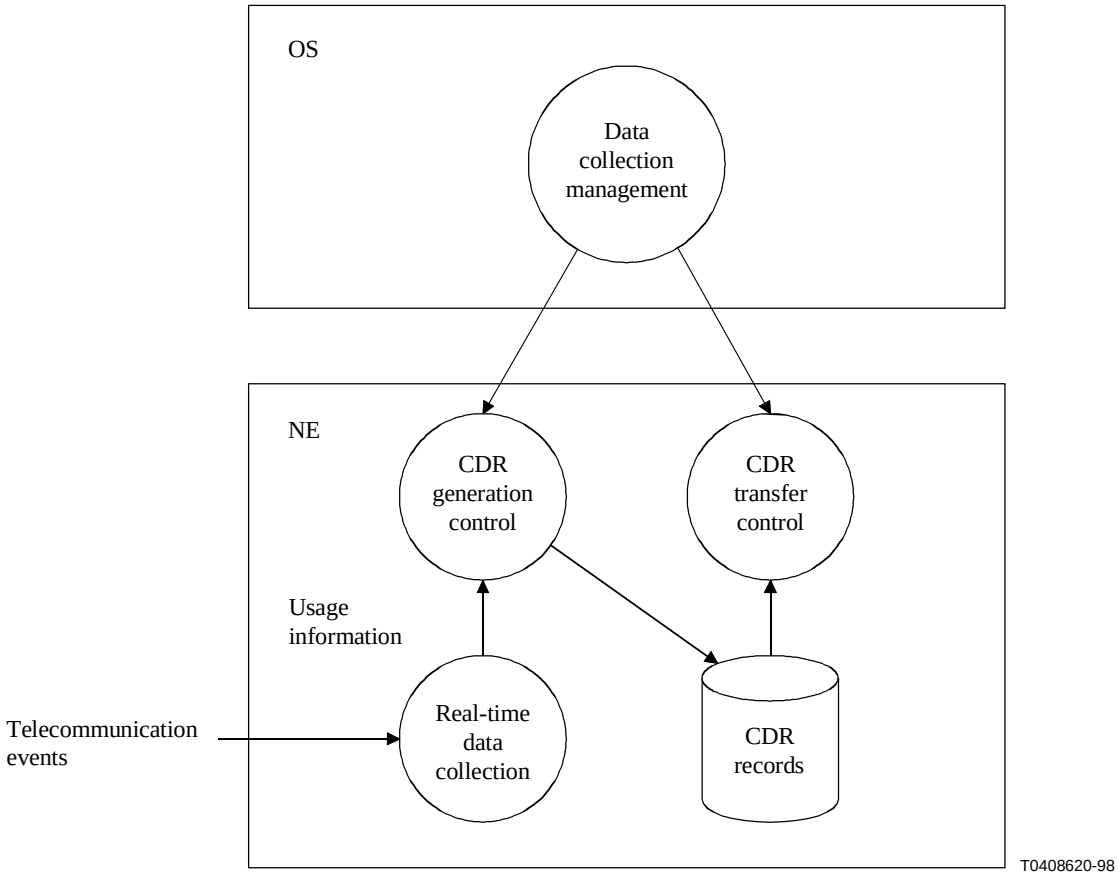


Figure 3/Q.825 – Management service components

6.1 CDR generation control

The generation, intermediate storage and transmission of CDRs consume considerable amounts of network and TMN resources. The CDR generation control permits the OS to configure and optimise both the generation of records within the NEs and the contents of those records according to the needs of the network operator.

6.2 CDR transfer control

The CDRs produced by the NEs must be transmitted to, or collected by, the appropriate OS for subsequent processing.

The CDR transfer control provides mechanisms for the transfer of CDRs, both individually (real-time event reporting) and in bulk (by file transfer), between the NEs and OSs.

7 Conceptual model

The conceptual model as described below is depicted in Figure 4.

The components of the model are designed to be useful for billing, QoS monitoring, fraud investigation, and Network Traffic Management (NTM).

CDR generation

The model consists of simpleUsageMeteringControl object class and configurableSimpleUsageMeteringControl Object class to control the collection of CDRs. The simpleUsageMeteringControl object class is used for usage metering purposes only; whereas the

configurableSimpleUsageMeteringControl object class is used for Analysis purposes. This allows generation of a single set of records/notifications that can be used for both billing and analysis functions. Both object classes define the triggers that will create CDR Data Objects, which generate the CDR notifications. Both object classes define the triggers that will create callDetailData objects. A single set of callDetailData objects (no more than one callDetailData per call and per associated accountable object) are generated. Each callDetailData in turn emits CDR notifications whose contents are controlled by both control objects.

CDR transfer

There are three ways of transferring the CDR notifications (records) to the OS:

1) Real-time Transfer: A single CDR record can be transferred in real-time by filtering with an EFD for immediate notification.

2) Near Real-time Transfer: Blocks of CDRs can be by grouping CDR notifications and storing these notifications first in the Blocked Generation Log. Subsequently, blockRecordNotification is sent out via EFD.

3) Bulk Transfer: CDR notifications are stored in the File Generating Log. Upon OS request, they are transferred to a file for subsequent transfer of the file using a file transfer protocol.

The volume and nature of CDRs available to the manager can be managed through appropriate usage of filtering criteria (i.e. the discriminating construct) in the EFD or log.

This Recommendation is a specialization of Recommendation X.742; it defines the following object classes to control and collect the CDR:

– **Simple Usage Metering Control Object and Configurable Simple Usage Metering Control Object:** used to control the collection of CDR for accountable objects;

– **Call Detail Data** 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 could be: Directory Numbers (DNs), incoming or outgoing trunks and trunk groups (e.g. CEP or CEPSG), etc. callDetailData object is used for collecting usage data from the accountable object associated with the control objects triggers. Notifications containing the measured data will be emitted by the callDetailData object, and may be stored in the local log thus forming the call detail 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 CDRs in a blockGeneratingLog and then generating a new notification from that log at a later time.

callDetailData objects are created and deleted implicitly, that is, they are created and deleted upon the occurrence of defined trigger events and are not explicitly manipulated by a managing system; i.e. a manager cannot perform any operations on instances of this object class. To support recording data in a callDetailData object, two sets of triggers coming from the control objects are defined:

– Creation Triggers: events that cause creation of a callDetailData object. These triggers are defined as part of the control object.

– Termination Triggers: events that cause deletion of a callDetailData object. Currently the termination is implicit as part of the data object behaviour. Deletion occurs upon completion of usage data collection for that instance of service.

CDR notifications are emitted in response to reporting triggers (Recommendation X.742) that are also defined as part of the control objects.

This Recommendation 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. This object class fully supports the requirements for usage metering. If only Usage Metering application is required, then simpleUsageMeteringControl object class shall be used.

If Analysis function is required, then configurableSimpleUsageMeteringControl shall be used. The configurableSimpleUsageMeteringControl object allows sampling rate and allows configuration of all the optional parameters, as defined by configurationMask, to be included in the Call Detail Record Notification. The object class controls the creation of callDetailData objects based on the configurableSimpleUsageMeteringControl creationTriggerList, and the samplingRate. The configurationMask will control the additional data to be included in the CDR notification emitted by the CDR for QoS, Fraud and Network Traffic Management purpose.

When both usage and analysis functions are needed, both configurableSimpleUsageMeteringControl and simpleUsageMeteringControl shall be used. The callDetailData is generated by the earliest event in the creationTriggerList of either object. The sampling rate applies to the rate at which the callDetailData is generated based on the creationTriggerList from the simpleUsageMeteringControl, and enriched by the analysis information as defined by the configurationMask.

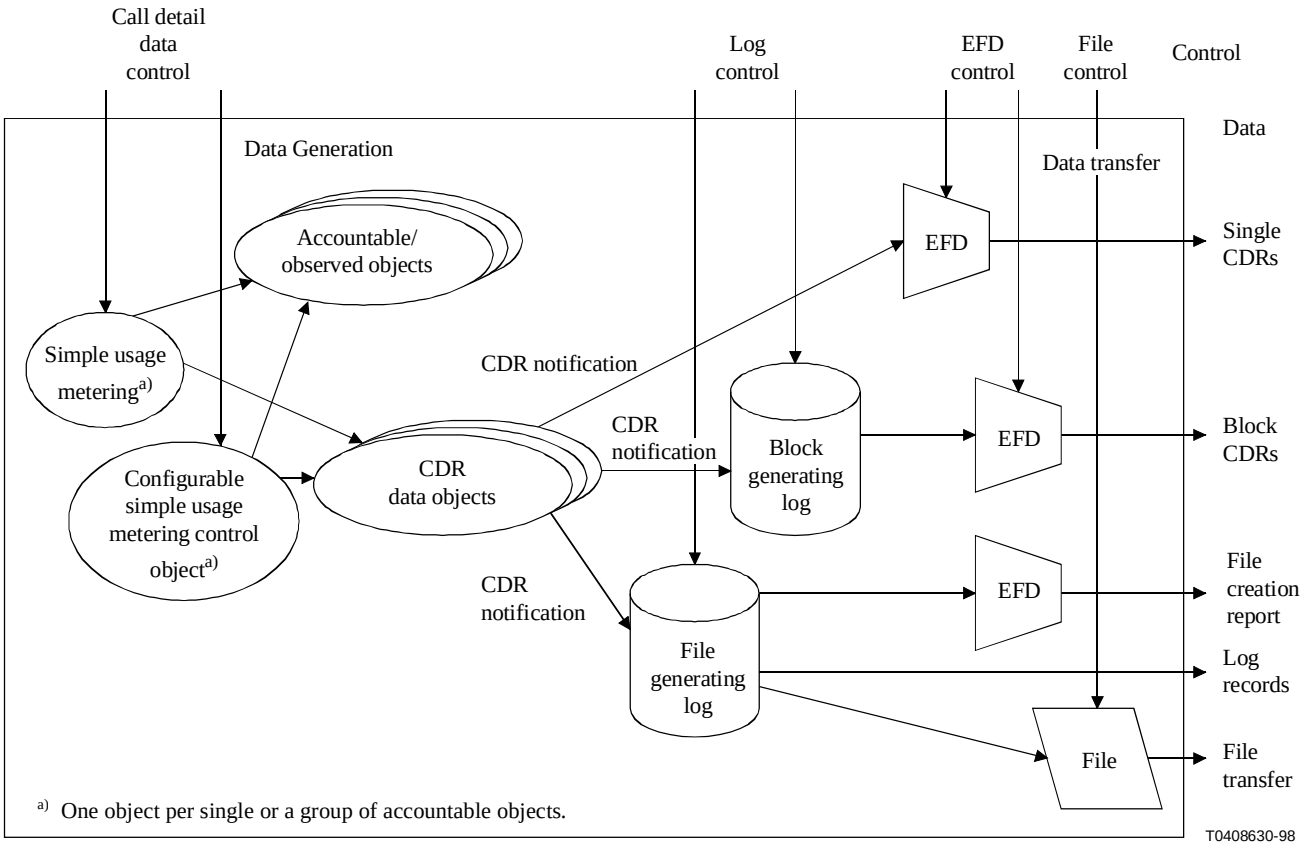


Figure 4/Q.825 – Data collection model

Figure 4 shows how CDRs may be emitted in real-time (use of single CDRs), or near real-time (use of block CDRs) or may be transferred by a file (file transfer). In the case of file transfer, the 'file status information' is an event report indicating that a file has been prepared for transfer.

8 Management functions and Services

This Recommendation defines three new functions. These functions make use of call detail record services defined in Recommendations X.730 (Object Management Function), X.734 (Event Reporting Management Function) and X.735 (Log Control Function).

8.1 Call detail recording control function

This function controls the generation and reporting of call detail records and allows specification of the events and resources whose usage is to be recorded. Only one instance of this function is present for each accountable object.

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 call detail data object which will generate call detail 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 (ANM received), 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, call detail data object will be created resulting in the generation of one or more call detail records. If the creationTriggers list is empty, no CDRs will be generated.

   For applications that do not require all instances of usage to be recorded, a sampling rate may be specified.

2) **Reporting control**: This control allows specification of the conditions under which a CDR notification will be emitted by the call detail 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 (no reporting trigger) means that no partial records will be generated.

To manage the call detail recording control, the operations required are:

– initiate call detail recording;

– terminate call detail recording;

– get call detail recording control data;

– modify call detail recording control data.

8.1.1 Initiate call detail recording

The PT-CREATE service defined in Recommendation X.730 is used to create an instance of the simpleUsageMeteringControl or configurableSimpleUsageMeteringControl object (only one instance is allowed per NE). 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 of the simpleUsageMeteringControl object in response to a PT-CREATE request:

reportingTriggers

This attribute is defined in Recommendation X.742. It is used only for periodic partial record generation. It is defined as a CHOICE of which only "time period" is supported by this Recommendation. If this parameter is not specified, the default value of 30 minutes is used.

accountableObjectReferenceList

This attribute is defined in Recommendation X.742. Object classes which describe accountable resources should be known at design time. This Recommendation makes use of two accountable object classes representing DN and trunk group. However, in the context of this Recommendation, this list may refer to objects representing a group of accountable objects. This is because, for this model to be practical, it must be realized that accountable objects must be defined in some kind of group basis. For example, accountable object might represent all the DNs in the switch.

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

dataObject referenceList

This attribute is defined in Recommendation X.742. The reference list contains pointers to the data objects controlled by the control object, and points to the call detail data. The list is maintained by the NE and cannot be specified as part of the create request, nor can it be queried by the manager.

creationTriggerList

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

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

samplingRate

The sampling rate is expressed as an integer n and will result in every nth callDetailData object being flagged at creation time with the instruction to set the sample bit in the CDR purpose field.

configurationMask

This attribute is a bitmap that allows identification of the optional notification parameters that must be included in notifications generated by callDetailData objects that are under control of this control object.

8.1.2 Terminate call detail recording for usage

The PT-DELETE service defined in Recommendation X.730 is used to delete an instance of the simpleUsageMeteringControl.

8.1.3 Terminate call detail recording for analysis

The PT-DELETE service defined in Recommendation X.730 is used to delete an instance of the configurableSimpleUsageMeteringControl object.

8.1.4 Get call detail control data

The PT-GET service defined in Recommendation X.730 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).

8.1.5 Modify call detail control data

The PT-SET service defined in Recommendation X.730 is used to manage the settable attributes.

8.2 Call detail data function

This function emits the CDR notification for usage selected by the call detail control function. A CDR 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 Call detail recording control function);
– supplementary service.

8.3 CDR transfer

The PT-EVENT-REPORT service defined in Recommendation X.730 is used to report the collected call detail record.

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

8.3.1 Real-time CDR reporting function

This function controls the generation and transmission of notifications from NE to the OS.

In this case, EFD is used to filter on the attributes of the notification and decide whether to send or not an event-report.

For billing purposes, a special field "immediateNotificationForUsageMetering" may be used. The value of this field is controlled by call processing only and may be derived in the NE from a subscriber characteristic or action, or by any other means specific to the implementation. Typically, the use of this field facilitates the selection of CDRs related to hot-billing.

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 CDR reporting are:

– initiation of event report forwarding;
– termination of event report forwarding;
– event forwarding modification;
– retrieval of eventForwardingDiscriminator attributes;
– supplementary service input.

All these operations are defined in the Event Report Systems Management Function (clause 9/X.734).

To transmit the real-time billing information, the NE uses the CDR-REPORT service. Table 1 shows the parameters required in the event report. The event reports may be sent 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/Q.825 – CDR-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 Id	U	–
Record Type	M	–
Start Time Stamp	M	–
Participant Information	M	–
Bearer Service	C c9	–
Service User	M	–
Call Identification Number	M	–
Supplementary Service List	C c1	–
Immediate Notification for Usage Metering	U	–
Cause	C c3	–
Data Validity	C c2	
IN Specific Information	C c4	–
Service Specific IN Information List	C c4	–
Partial Generation	C c5	–
Exchange Information	U	–
Related Call Number	U	–
CDR Purpose	U	–
Additional Participant Information	U	–
Calling Party Category	U	–
Calling Party Type	U	–
Charging Information	U	–
Progress	U	–
Access Delivery	U	–
Trunk Group Outgoing	U	–
Trunk Group Incoming	U	–
Network Provider Id	C c6	–
Fallback Bearer Service	C c7	–
Teleservice	U	–
Call Duration	C c8	–
User-to-User Information Counter	U	–

Table 1/Q.825 – CDR-REPORT *(concluded)*

Parameter name	Req/Ind	Resp/Cfm
B-Party Category	U	–
ISUP Preferred	U	–
Network Management Control	U	–
Glare	U	–
Standard Extensions	U	–
Record Extension	U	–
Current Time	–	U
Event Reply	–	–
Errors	–	P
Call Status	U	–
Carrier Id	C c10	–
DPC	U	–
OPC	U	–

c1: This parameter must 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 must be present if the exchange has determined that the data contained in this notification may be inaccurate.

c3: This parameter must be present if the exchange has determined that the call has failed.

c4: This parameter must be present if an IN service is invoked that makes use of this information.

c5: This parameter must be present if this notification only contains information about a part of the call.

c6: This parameter must be present if the exchange supports multiple network providers.

c7: This parameter must be present only if the network is providing the fallback bearer service instead of the bearer service requested by the user.

c8: This parameter must be present in any CDR related to a call [recordType="call"].

c9: This parameter is only for ISDN calls.

c10: This parameter must be present if carrier selection has been applied to the call.

8.3.2 Near Real-time CDR reporting function

To enable the NEF to transfer blocks of CDRs to the OSF 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 have similar syntax to RecordContent except that the choice productions omit information added by the log, i.e. current logging time, managed object class, managed object instance and logRecordId. 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 CDRs reached;
- internal size limit reached.

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

- initiation of CDR Block logging;
  (see 8.3.2.1)
- termination of logging;
  (defined in the Log Control Function in clause 9/X.735)
- modification of log attributes;
  (defined in the Log Control Function in clause 9/X.735)
- retrieval of log attributes;
  (defined in the Log Control Function in clause 9/X.735)
- initiation of event report forwarding;
  (defined in the Event Report Systems Management Function in clause 9/X.734)
- termination of event report forwarding;
  (defined in the Event Report Systems Management Function in clause 9/X.734)
- event forwarding modification;
  (defined in the Event Report Systems Management Function in clause 9/X.734)
- retrieval of eventForwardingDiscriminator attributes;
  (defined in the Event Report Systems Management Function in clause 9/X.734).

NOTE – Other operations on the log described in in clause 9/X.735 (retrieval of log records, deletion of log records) are not allowed.

8.3.2.1 Initiation of CDR Block logging

The PT-CREATE service defined in Recommendation X.730 is used to create an instance of the CDR blockGeneratingLog. The CDR blockGeneratingLog behaves as if it were a log of infinite size derived from the Log described in Recommendation X.735.

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 Recommendation X.735 (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 Recommendations X.735 and X.721. 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 Recommendations X.735 and X.721. It specifies the test conditions which will be used by the log in testing potential log records.

Administrative state: This attribute is inherited from Recommendations X.735 and X.721. 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 CDRs to be included in a blockRecord notification. An internal counter within the blockGeneratingLog counts the number CDRs 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 e.g. every n seconds or minutes. The time period is also reset to zero if another event happens.

8.3.2.2 Transmission of Record Blocks

Block CDRs are sent via the CDR-BLOCK-RECORD REPORT to the OS. The CDR-BLOCK-RECORD REPORT has the parameters shown in Table 2:

Table 2/Q.825 – CDR-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	–	–
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 the CDR-REPORT table, with the Exchange Information parameter optionally moved to the block header.

8.3.3 CDR transfer via file Generating Log

The special "fileGeneratingLog" is derived from the standard log function as defined in Recommendation X.735.

The record notifications generated by the callDetailData object instance are stored locally in the NE using the logging functionality described in Recommendation X.735.

Besides the functions for retrieval and deletion of log entries provided by the Recommendation X.735 log control, the fileGeneratingLog control provides an extra functionality to support retrieval of CDR records by a suitable file transfer protocol. This functionality is supported by providing for the creation of a callDetailRecordFile either by means of create request from the OS or a trigger event internal to the NE. When the file has been created, a notification is emitted allowing managing systems to be notified of the existence of the file. The records are deleted after they have been successfully copied in to the file.

To add to the efficiency of CDR transfer, only stripped records are placed in the created file. These stripped records have similar syntax to RecordContent except that the choice productions omit information added by the log, i.e. current logging time, managed object class, managed object instance and logRecordId.

The presence of more than one OS interested in collection of call detail data may be a practical issue. Call detail data may be requested for different purposes by different OSs at the same time. The possibility of multiple OS's accessing the fileGeneratingLog and callDetailRecordFile 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 CDR logging and CDR file handling are:

– initiation of CDR logging;
– termination of CDR logging;
– modification of log attributes;
– retrieval of log attributes;
– retrieval of log records;
– generation of a CDR file;
– CDR file transfer.

8.3.3.1 Initiation of CDR logging

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

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 in clause 9/X.735 (initiation of logging).

Times of day: This (optional) attribute specifies a list of times at which a callDetailRecordFile should be automatically generated on a daily bases.

Periodic Trigger: This (optional) attribute specifies periodic time intervals at which a callDetailRecordFile should be generated automatically on a continuous basis.

8.3.3.2 Generation of a CDR File

The CDR- FILE -CREATION ACTION is used to generate a callDetailRecordFile containing CDRs collected in the log.

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

Table 3/Q.825 – CDR-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
Current Time	–	U
Action Reply	–	–
Errors	–	P

8.3.3.3 Internal generation of a CDR File

CDR 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 CDR-FILE-CREATION-REPORT may be used to report the existence of this file to external systems. The CDR-FILE-CREATION-REPORT has the following parameters (see Table 4):

Table 4/Q.825 – CDR-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	–
File Size	–	U
Reason For Output	M	–
Current Time	–	U
Action Reply	–	–
Errors	–	P

reason for output: This parameter specifies for which reason the file has been created.

file name: This parameter contains the file name of the generated callDetailRecordFile.

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

8.3.3.4 File transfer

File transfer from the NE is initiated by the OS and, for example, 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 stripped records with the information from the header and including the current logging time and a new logRecordId in the record (manipulation of the header of the log file). Upstream OSs can then use this log like any other fileGeneratingLog.

9 Functional units

See Table 5.

Table 5/Q.825 – Functional units

Functional unit	Managed Object (MO) class	Function (Services)
Call detail Recording	callDetailData	*Internal NE function; i.e. emit notification from Call Detail Data*
Call detail Control for Usage Metering	simpleUsageMeteringControl	Call detail recording 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)
Call detail Control for Analysis purpose	configurableSimpleUsage MeteringControl	Call detail recording 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)
Real-time CDR transfer (It uses the standardized Event Reporting Management Functions as defined in Rec. X.734)	eventForwardingDiscriminator	Real-time CDR reporting Function: – initiation of EFD; (PT-CREATE) – termination of EFD; (PT-DELETE) – EFD modification; (PT-SET) – retrieval of discriminator attributes; (PT-GET)
Near real-time CDR transfer (It uses the standardized Event Reporting Management Functions as defined in Rec. X.734)	blockGeneratingLog eventForwardingDiscriminator	– initiation of CDR block logging; (PT-CREATE) – termination of logging; (PT-DELETE) – modification of log attributes; (PT-SET) – 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)
CDR transfer via file	fileGeneratingLog callDetailLogRecord	– initiation of CDR logging; (PT-CREATE) – termination of CDR logging; (PT-DELETE) – modification of log attributes; (PT-SET) – generation of CDR file; (PT-ACTION) NOTE – For transfer via file, file transfer protocol can be used.
CDR log record retrieval from fileGeneratingLog	fileGeneratingLog callDetailLogRecord	– retrieval of log records; (PT-GET)

9.1 Functional Units (FUs)

a) FU-A: Call Detail Recording – This FU creates CallDetailData object for generation of CDR notification.

b) FU-B: Call Detail Control for Usage Metering – This FU allows to control the criteria for generation of CDRs for Usage Metering purposes.

c) FU-C: Call Detail Control for Analysis Purpose – This FU allows to control the criteria for generation and reporting of CDRs for Analysis purpose.

d) FU-D: Real-time transfer of CDR – This FU allows real-time transfer of CDRs via EFD.

e) FU-E: Near real-time transfer of CDR – This FU allows to log CDRs in blockGeneratingLog, and subsequently transfer them as notification via EFD.

f) FU-F: CDR transfer via File – This FU allows to log CDRs in fileGeneratingLog, generate a CDR file, which can be subsequently transferred via file transfer protocol.

g) FU-G: CDR Log Retrieval from fileGeneratingLog – This FU allows to retrieve callDetailLogRecord from fileGenerationLog.

9.2 Functional units from other Recommendations

This Recommendation also supports the functional units out of the Event Report Management Functional Unit (Recommendation X.734). It corresponds to CDR (near) real-time reporting function unit in Table 5.

9.3 Negotiation of functional units

This Recommendation assigns the following object identifier value:

{ itu-t(0) recommendation(0) q(17) q825(825) informationModel(0) functionalUnitPackage(1)}

as a value of the ASN.1 type FunctionalUnitPackageId defined in Recommendation X.701 to use for negotiating the following functional units:

0 FU-A: Call Detail Recording.

1 FU-B: Call Detail Control for Usage Metering.

2 FU-C: Call Detail Control for Analysis Purpose.

3 FU-D: Real-time transfer of CDR.

4 FU-E: Near real-time transfer of CDR.

5 FU-F: CDR transfer via File.

6 FU-G: CDR Log Retrieval from fileGeneratingLog.

Where the number identifies the bit positions in the BIT STRING assigned to the functional units, and the names reference the functional units as defined above.

Within the Systems management application context, the mechanism for negotiating the functional units is described by Recommendation X.701.

10 Conformance

10.1 Static conformance

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

a) FU-A, Call Detail Recording must be supported (only in Agent).

b) At least one of the following must be supported:

   1) FU-D, Real-time transfer of CDR.

   2) FU-E, Near real-time transfer of CDR.

   3) FU-F, CDR transfer via File.

The managed objects and services that need to be supported are listed in Table 5 and formally described in Annex A.

The implementation shall support:

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

10.2 Dynamic conformance

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

- Recommendation X.730 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

Information model

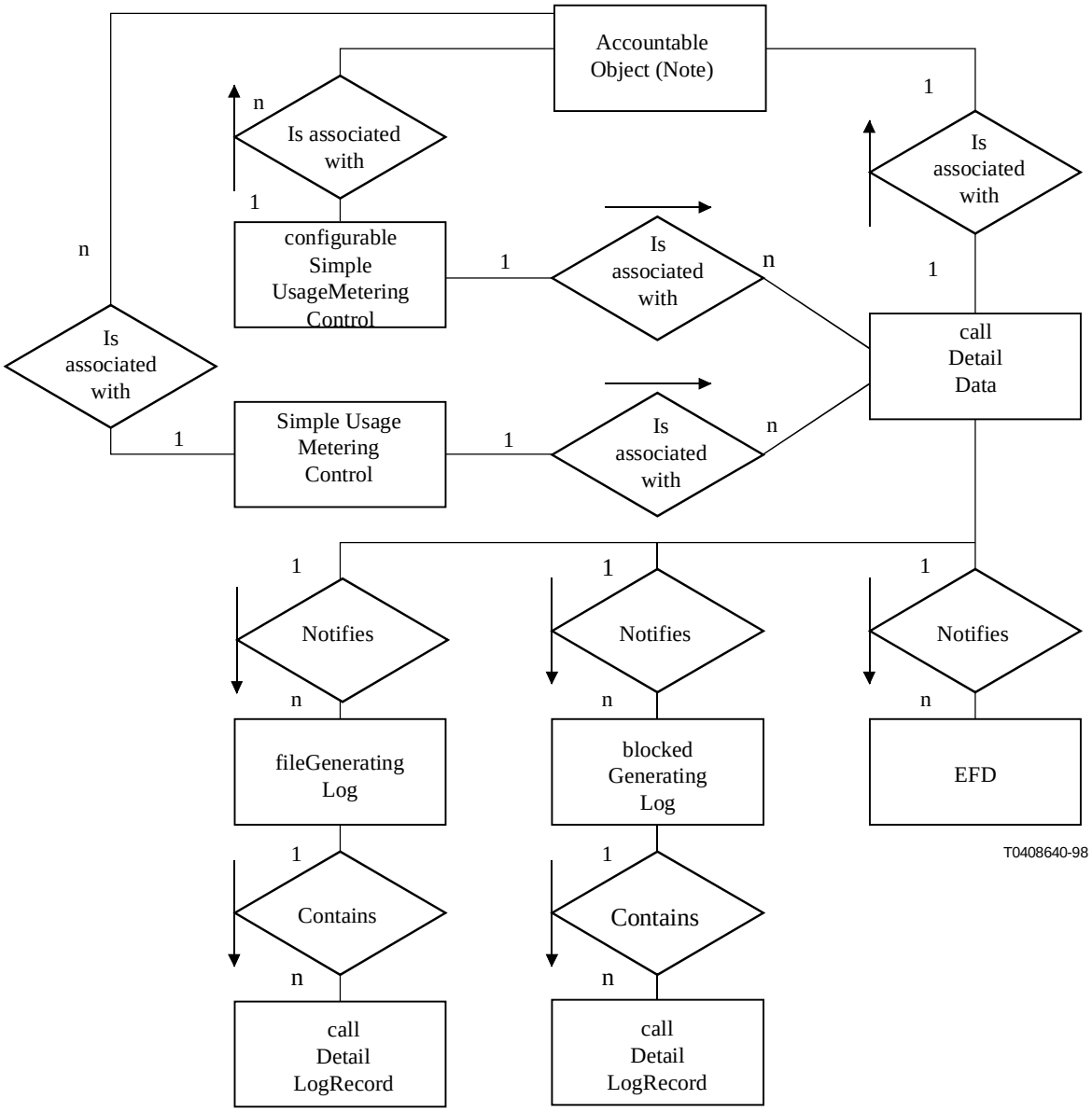
A.1 Overview

This Annex contains the formal description of the information model for this Recommendation. It consists of a simplified Entity-Relationship (ER) model by way of introduction, together with an object model specified in terms of the GDMO templates defined in Recommendation X.722 "Guidelines for the Definition of Managed Objects".

The generation of usage metering records is controlled by the Usage Metering Control object together with the optional triggering objects.

The notifications generated by the Usage Metering Data object presented to the EFD may also be logged locally within the NE. Each managed NE may contain a usage metering record log.

The usage metering record log may contain one or more usage metering log entries each of which in turn contains one or more usage metering record notifications.



NOTE – The accountable object represents a group of network resources for which CDR is to be generated. This Recommendation does not define the accountable object.

Figure A.1/Q.825 – The call detail recording view

A.2 Naming hierarchy

The naming (containment) tree for the objects defined within this Annex is illustrated in Figure A.2 below. It should be noted that all of the object classes are shown relative to the "managedElement".

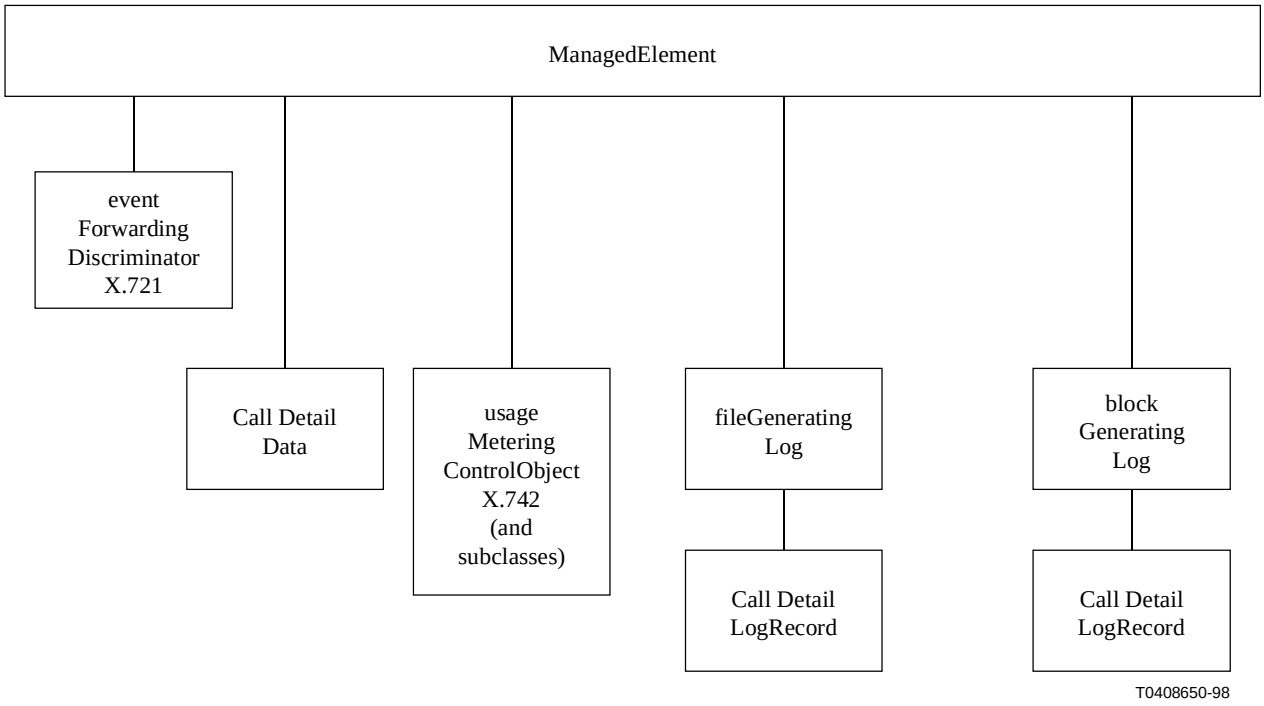


Figure A.2/Q.825 – The naming tree

A.3 Inheritance

The inheritance tree for this specification is illustrated in Figure A.3. The object classes "log", "logRecord", "eventLogRecord", and "eventForwardingDiscriminator" are defined in Recommendation X.721.

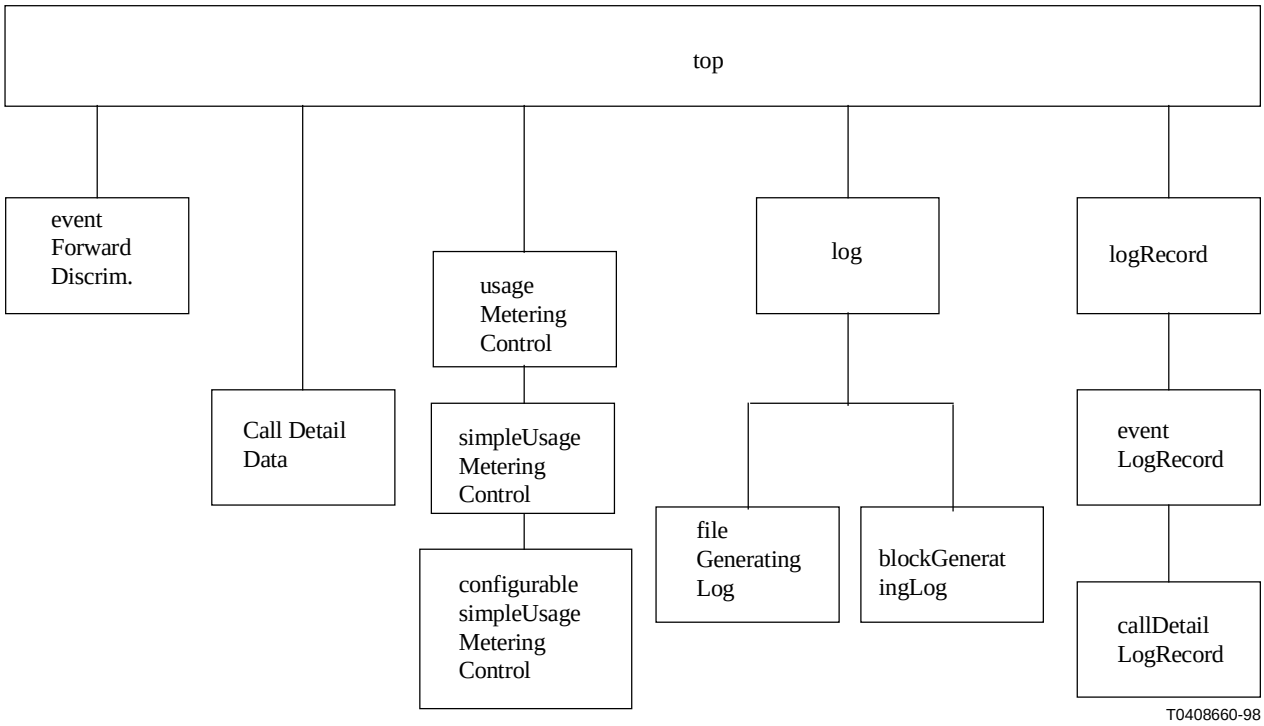


Figure A.3/Q.825 – The inheritance tree

A.4 Managed object classes

A.4.1 Block Generating Log

This managed object class is a subclass of the "Log" class described in Recommendation X.735 and defined in Recommendation X.721 and therefore inherits all of the properties of the "log" class.

```
blockGeneratingLog MANAGED OBJECT CLASS
  DERIVED FROM      "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":log;
  CHARACTERIZED BY
    blockGeneratingLogPkg PACKAGE
      BEHAVIOUR
        blockGeneratingLogBhv 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 blocking-log stores all records that satisfy its
            discriminator construct. The log provides the value (sequence
            number) for the 'recordId' (field of CDR). An instance of this log
            emits the block record 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
              blocking log itself overflowing.
           Upon emitting the block record notification all records stored in
           the blocking log are deleted and the log is ready to store new
           records. Because of the self-emptying nature of this log, any
           log-full action may be selected and the behavior of the log will not
           change.";;
      ATTRIBUTES
        maxBlockSize GET-REPLACE,
        maxTimeInterval GET-REPLACE;
      NOTIFICATIONS
        blockRecordNotification;;;
REGISTERED AS {q825ObjectClass 1};
```

A.4.2 Call detail data

```
callDetailData MANAGED OBJECT CLASS
  DERIVED FROM      "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":top;
  CHARACTERIZED BY
    callDetailDataPackage PACKAGE
      BEHAVIOUR
        callDetailDataBehaviour BEHAVIOUR
          DEFINED AS
            "This managed object class emits the CDR notification for
            telecommunication events selected by the control object. (The
            selection is made based on either one or the combination of the
            simpleUsageMeteringControl object and
            configurableSimpleUsageMeteringControl object. No management
            operations are permitted on this object class. A CDR notification is
            sent out if one of the following events occurs:
            – 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;
            – supplementary service input.
            Additional conditions that cause call detail record notification for
```

```
            analysis purposes such as quality of service measurement, fraud
            detection or traffic management are:
            – denial of a service;
            – change of observed service quality;
            – reaching a quality threshold;
            – call failures
            ";;
        ATTRIBUTES
          callDetailDataId GET;
        NOTIFICATIONS
          callDetailRecordNotification;;;
REGISTERED AS {q825ObjectClass 2};
```

A.4.3 Call Detail Log Record

This managed object class is a subclass of the "eventLogRecord" class described in Recommendation X.735 and defined in Recommendation X.721 and therefore inherits all of the properties of both the "logRecord" and the "eventLogRecord" classes.

```
callDetailLogRecord MANAGED OBJECT CLASS
  DERIVED FROM      "ITU-T Rec. X.721 : 1992":eventLogRecord;
  CHARACTERIZED BY
    callDetailLogRecordPackage PACKAGE
      BEHAVIOUR
        callDetailLogRecordBehaviour BEHAVIOUR
          DEFINED AS
            "This object class describes the layout of a log record created for
            each single call detail record notification";;
      ATTRIBUTES
        recordType GET,
        startTimeStamp GET,
        serviceUser GET,
        callIdentificationNumber GET;;;
  CONDITIONAL PACKAGES
    accessDeliveryPackage  PRESENT IF  "this parameter was present in the
      received notification",
    accountCodeInputPackage  PRESENT IF  "this parameter was present in
      the received notification",
    bearerServicePackage  PRESENT IF  "this parameter was present in the
      received notification",
    b-PartyCategoryPackage  PRESENT IF  "this parameter was present in
      the received notification",
    calledPartyNumberPackage  PRESENT IF  "this parameter was present in
      the received notification",
    callingPartyCategoryPackage  PRESENT IF  "this parameter was present
      in the received notification",
    callingPartyNumberPackage  PRESENT IF  "this parameter was present in
      the received notification",
    callingPartyNumberNotScreenedPackage  PRESENT IF  "this parameter was
      present in the received notification",
    callingPartyTypePackage  PRESENT IF  "this parameter was present in
      the received notification",
    callStatusPackage  PRESENT IF  "this parameter was present in the
      received notification",
    carrierIdPackage  PRESENT IF  "this parameter was present in the
      received notification",
    causePackage  PRESENT IF  "this parameter was present in the received
      notification",
    cDRPurposePackage  PRESENT IF  "this parameter was present in the
      received notification",
```

chargedDirectoryNumberPackage PRESENT IF "this parameter was present in the received notification",
chargedParticipantPackage PRESENT IF "this parameter was present in the received notification",
chargingInformationPackage PRESENT IF "this parameter was present in the received notification",
conversationTimePackage PRESENT IF "this parameter was present in the received notification",
dataValidityPackage PRESENT IF "this parameter was present in the received notification",
dPCPackage PRESENT IF "this parameter was present in the received notification",
durationTimeACMPackage PRESENT IF "this parameter was present in the received notification",
durationTimeB-AnswerPackage PRESENT IF "this parameter was present in the received notification",
durationTimeNoB-AnswerPackage PRESENT IF "this parameter was present in the received notification",
exchangeInfoPackage PRESENT IF "this parameter was present in the received notification",
fallbackBearerServicePackage PRESENT IF "this parameter was present in the received notification",
glarePackage PRESENT IF "this parameter was present in the received notification",
immediateNotificationForUsageMeteringPackage PRESENT IF "this parameter was present in the received notification",
iNPackage PRESENT IF "this parameter was present in the received notification",
iSUPPreferredPackage PRESENT IF "this parameter was present in the received notification",
networkManagementControlsPackage PRESENT IF "this parameter was present in the received notification",
networkProviderIdPackage PRESENT IF "this parameter was present in the received notification",
oPCPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific1AdditionalNumberPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific1NumberPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific2AdditionalNumberPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific2NumberPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific3AdditionalNumberPackage PRESENT IF "this parameter was present in the received notification",
operatorSpecific3NumberPackage PRESENT IF "this parameter was present in the received notification",
originalCalledNumberPackage PRESENT IF "this parameter was present in the received notification",
partialGenerationPackage PRESENT IF "this parameter was present in the received notification",
percentageToBeBilledPackage PRESENT IF "this parameter was present in the received notification",
personalUserIdPackage PRESENT IF "this parameter was present in the received notification",
physicalLineCodePackage PRESENT IF "this parameter was present in the received notification",
progressPackage PRESENT IF "this parameter was present in the received notification",

```
    queueInfoPackage  PRESENT IF  "this parameter was present in the
      received notification",
    receivedDigitsPackage  PRESENT IF  "this parameter was present in the
      received notification",
    recordIdPackage  PRESENT IF  "this parameter was present in the
      received notification",
    recordExtensionsPackage  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",
    relatedCallNumberPackage  PRESENT IF  "this parameter was present in
      the received notification",
    serviceSpecificINInformationPackage  PRESENT IF  "this parameter was
      present in the received notification",
    standardExtensionsPackage  PRESENT IF  "this parameter was present in
      the received notification",
    supplementaryServicePackage  PRESENT IF  "this parameter was present
      in the received notification",
    teleservicePackage  PRESENT IF  "this parameter was present in the
      received notification",
    trunkGroupIncomingPackage  PRESENT IF  "this parameter was present in
      the received notification",
    trunkGroupOutgoingPackage  PRESENT IF  "this parameter was present in
      the received notification",
    uUInfoPackage  PRESENT IF  "this parameter was present in the
      received notification";
REGISTERED AS {q825ObjectClass 3};
```

A.4.4 Configurable Simple Usage Metering Control Object

```
configurableSimpleUsageMeteringControl MANAGED OBJECT CLASS
  DERIVED FROM       simpleUsageMeteringControl;
  CHARACTERIZED BY
    configurableSimpleUsageMeteringControlPackage PACKAGE
      BEHAVIOUR
        configurableSimpleUsageMeteringControlBehaviour BEHAVIOUR
          DEFINED AS
            "This object class is used if Analysis function is required.
            configurableSimpleUsageMeteringControl object allows sampling rate
            and allows configuration of all the optional parameters, as defined
            by configurationMask, to be included in the Call Detail
            Notification. The object class controls the creation of call Detail
            Data objects based on the creationTriggerList, and the samplingRate.

            The configurationMask together will control the additional data to
            be included in the CDR notification emitted by the CDR object for
            QoS, Fraud and Traffic Network Management purpose. The
            characteristic additional is with reference to the data already
            included in the notification for the purpose of usage metering";;
      ATTRIBUTES
        samplingRate GET-REPLACE,
        configurationMask GET-REPLACE;;;
REGISTERED AS {q825ObjectClass 4};
```

A.4.5 File Generating Log

This managed object class is a subclass of the "Log" class described in Recommendation X.735 and defined in Recommendation X.721 and therefore inherits all of the properties of the "log" class.

```
fileGeneratingLog MANAGED OBJECT CLASS
  DERIVED FROM      "ITU-T Rec. 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 log provides the value
            (sequence number) for the 'recordId' (field of the CDR). The action
            create file is used to generate the file to be exchanged. The file
            created consists of a concatenation of the content of the call
            detail records; i.e. the call detail records without the record
            overhead (Record Id, Managed Object Class and Instance and Logging
            Time). To avoid duplication of CDRs, logging of blockedRecord
            notifications emitted by the blocking log should be excluded by
            configuration of the file generating log's discriminator construct.
            Files may also be created due to internal trigger events. One such
            internal trigger is based on time of day. The records are deleted
            after successful copying of the records to the file.";;
      ACTIONS
        createFile;;;
  CONDITIONAL PACKAGES
    dailyTriggeringPackage  PRESENT IF  "if the file creation is to be
      triggered on a daily basis [time(s) of day]",
    periodicTriggeringPackage  PRESENT IF  "if the file creation is to be
      triggered on a periodic basis",
    fileCreationNotificationPackage  PRESENT IF  "if the file creation is
      triggered using any one of the scheduling mechanisms in the daily,
      weekly and monthly triggering methods or an internal mechanism.";
REGISTERED AS {q825ObjectClass 5};
```

A.4.6 Simple Usage Metering Control Object

```
simpleUsageMeteringControl MANAGED OBJECT CLASS
  DERIVED FROM      "ITU-T Rec. X.742 | ISO/IEC 10164-10 : 1995":usageMeteringControlObject;
  CHARACTERIZED BY
    simpleUsageMeteringControlObjectPackage PACKAGE
      BEHAVIOUR
        usageMeteringControlBehaviour BEHAVIOUR
          DEFINED AS
            "simpleUsageMeteringControl object class 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. This object class fully
            supports the requirements for usage metering. If only Usage Metering
            application is required, then simpleUsageMeteringControl object
            class shall be used. This object class controls the generation of
            CDRs in the NE. CDRs are actually produced if the transaction
            fulfils the conditions defined in the creationTriggerList attribute.
            If the creationTriggerList is empty, no CDR will be generated. The
            value of the time period in reportingTriggers defines the time
```

```
            interval between partial records. No attribute value change
            notification is sent by this object when data object reference list is changed and
            no attribute change value reflects this data object reference list.";;
        ATTRIBUTES
          creationTriggerList
            DEFAULT VALUE Q825-CDR-ASN1Module.defaultCreationTrigger
           GET-REPLACE,
          "ITU-T Rec. X.742 | ISO/IEC 10164-10 : 1995":reportingTriggers
            REPLACE-WITH-DEFAULT
            DEFAULT VALUE Q825-CDR-ASN1Module.reportingTriggersDefault
            PERMITTED VALUES Q825-CDR-ASN1Module.PermittedReportingTriggers
           GET-REPLACE ADD-REMOVE;;;
REGISTERED AS {q825ObjectClass 6};
```

A.5 Packages

A.5.1 Access Delivery Package

```
accessDeliveryPackage PACKAGE
        ATTRIBUTES
        accessDelivery GET;
REGISTERED AS {q825Package 1};
```

A.5.2 Account Code Input Package

```
accountCodeInputPackage PACKAGE
        ATTRIBUTES
        accountCodeInput GET;
REGISTERED AS {q825Package 2};
```

A.5.3 b-Party Category Package

```
b-PartyCategoryPackage PACKAGE
        ATTRIBUTES
        b-PartyCategory GET;
REGISTERED AS {q825Package 3};
```

A.5.4 Bearer Service Package

```
bearerServicePackage PACKAGE
        ATTRIBUTES
        bearerService GET;
REGISTERED AS {q825Package 58};
```

A.5.5 CDR Purpose Package

```
cDRPurposePackage PACKAGE
        ATTRIBUTES
        cDRPurpose GET;
REGISTERED AS {q825Package 10};
```

A.5.6 Call Status Package

```
callStatusPackage PACKAGE
        ATTRIBUTES
        callStatus GET;
REGISTERED AS {q825Package 59};
```

A.5.7 Called Party Number Package

```
calledPartyNumberPackage PACKAGE
        ATTRIBUTES
        calledPartyNumber GET;
REGISTERED AS {q825Package 4};
```

A.5.8 Calling Party Category Package

```
callingPartyCategoryPackage PACKAGE
        ATTRIBUTES
        callingPartyCategory GET;
REGISTERED AS {q825Package 5};
```

A.5.9 Calling Party Number Not Screened Package

```
callingPartyNumberNotScreenedPackage PACKAGE
        ATTRIBUTES
        callingPartyNumberNotScreened GET;
REGISTERED AS {q825Package 7};
```

A.5.10 Calling Party Number Package

```
callingPartyNumberPackage PACKAGE
        ATTRIBUTES
        callingPartyNumber GET;
REGISTERED AS {q825Package 6};
```

A.5.11 Calling Party Type Package

```
callingPartyTypePackage PACKAGE
        ATTRIBUTES
        callingPartyType GET;
REGISTERED AS {q825Package 8};
```

A.5.12 Carrier Id Package

```
carrierIdPackage PACKAGE
        ATTRIBUTES
        carrierId GET;
REGISTERED AS {q825Package 60};
```

A.5.13 Cause Package

```
causePackage PACKAGE
        ATTRIBUTES
        cause GET;
REGISTERED AS {q825Package 9};
```

A.5.14 Charged Directory Number Package

```
chargedDirectoryNumberPackage PACKAGE
        ATTRIBUTES
        chargedDirectoryNumber GET;
REGISTERED AS {q825Package 11};
```

A.5.15 Charged Participant Package

```
chargedParticipantPackage PACKAGE
        ATTRIBUTES
        chargedParticipant GET;
REGISTERED AS {q825Package 13};
```

A.5.16 Charging Information Package

```
chargingInformationPackage PACKAGE
        ATTRIBUTES
        chargingInformation GET;
REGISTERED AS {q825Package 12};
```

A.5.17 Conversation Time Package

```
conversationTimePackage PACKAGE
        ATTRIBUTES
        conversationTime GET;
REGISTERED AS {q825Package 14};
```

A.5.18 DPC Package

```
dPCPackage PACKAGE
        ATTRIBUTES
        dPC GET;
REGISTERED AS {q825Package 61};
```

A.5.19 Daily Triggering Package

```
dailyTriggeringPackage PACKAGE
        ATTRIBUTES
        timesOfDay GET-REPLACE;
REGISTERED AS {q825Package 15};
```

A.5.20 Data Validity Package

```
dataValidityPackage PACKAGE
        ATTRIBUTES
        dataValidity GET;
REGISTERED AS {q825Package 16};
```

A.5.21 Duration Time ACM Package

```
durationTimeACMPackage PACKAGE
        ATTRIBUTES
        durationTimeACM GET;
REGISTERED AS {q825Package 17};
```

A.5.22 Duration Time B-answer Package

```
durationTimeB-AnswerPackage PACKAGE
        ATTRIBUTES
        durationTimeB-Answer GET;
REGISTERED AS {q825Package 19};
```

A.5.23 Duration Time No B-answer Package

```
durationTimeNoB-AnswerPackage PACKAGE
        ATTRIBUTES
        durationTimeNoB-Answer GET;
REGISTERED AS {q825Package 20};
```

A.5.24 Exchange Info Package

```
exchangeInfoPackage PACKAGE
        ATTRIBUTES
        exchangeInfo GET;
REGISTERED AS {q825Package 21};
```

A.5.25 Fallback Bearer Service Package

```
fallbackBearerServicePackage PACKAGE
        ATTRIBUTES
        fallbackBearerService GET;
REGISTERED AS {q825Package 22};
```

A.5.26 File Creation Notification Package

```
fileCreationNotificationPackage PACKAGE
        NOTIFICATIONS
        fileCreationNotification;
REGISTERED AS {q825Package 23};
```

A.5.27 Glare Package

```
glarePackage PACKAGE
        ATTRIBUTES
        glare GET;
REGISTERED AS {q825Package 24};
```

A.5.28 IN Package

```
iNPackage PACKAGE
        ATTRIBUTES
                iNServiceInformationList GET,
        iNSpecificInformation GET;
REGISTERED AS {q825Package 27};
```

A.5.29 ISUPPreferred Package

```
iSUPPreferredPackage PACKAGE
        ATTRIBUTES
        iSUPPreferred GET;
REGISTERED AS {q825Package 28};
```

A.5.30 Immediate Notification for Usage MeteringPackage

```
immediateNotificationForUsageMeteringPackage PACKAGE
        ATTRIBUTES
        immediateNotificationForUsageMetering GET;
REGISTERED AS {q825Package 25};
```

A.5.31 Network Management Controls Package

```
networkManagementControlsPackage  PACKAGE
        ATTRIBUTES
        networkManagementControls GET;
REGISTERED AS {q825Package 29};
```

A.5.32 Network Provider Id Package

```
networkProviderIdPackage PACKAGE
        ATTRIBUTES
        networkProviderId GET;
REGISTERED AS {q825Package 30};
```

A.5.33 OPC Package

```
oPCPackage PACKAGE
        ATTRIBUTES
                oPC GET;
REGISTERED AS {q825Package 62};
```

A.5.34 Operator Specific1 Additional Number Package

```
operatorSpecific1AdditionalNumberPackage PACKAGE
        ATTRIBUTES
                operatorSpecific1AdditionalNumber GET;
REGISTERED AS {q825Package 31};
```

A.5.35 Operator Specific1 Number Package

```
operatorSpecific1NumberPackage PACKAGE
        ATTRIBUTES
                operatorSpecific1Number  GET;
REGISTERED AS {q825Package 32};
```

A.5.36 Operator Specific2 Additional Number Package

```
operatorSpecific2AdditionalNumberPackage PACKAGE
        ATTRIBUTES
        operatorSpecific2AdditionalNumber   GET;
REGISTERED AS {q825Package 33};
```

A.5.37 Operator Specific2 Number Package

```
operatorSpecific2NumberPackage PACKAGE
        ATTRIBUTES
        operatorSpecific2Number  GET;
REGISTERED AS {q825Package 34};
```

A.5.38 Operator Specific3 Additional Number Package

```
operatorSpecific3AdditionalNumberPackage     PACKAGE
        ATTRIBUTES
                operatorSpecific3AdditionalNumber GET;
REGISTERED AS {q825Package 35};
```

A.5.39 Operator Specific3 Number Package

```
operatorSpecific3NumberPackage PACKAGE
        ATTRIBUTES
                operatorSpecific3Number GET;
REGISTERED AS {q825Package 36};
```

A.5.40 Original Called Number Package

```
originalCalledNumberPackage PACKAGE
        ATTRIBUTES
                originalCalledNumber GET;
REGISTERED AS {q825Package 37};
```

A.5.41 Partial Generation Package

```
partialGenerationPackage PACKAGE
        ATTRIBUTES
                partialGeneration GET;
REGISTERED AS {q825Package 38};
```

A.5.42 Percentage To Be Billed Package

```
percentageToBeBilledPackage PACKAGE
        ATTRIBUTES
                percentageToBeBilled GET;
REGISTERED AS {q825Package 39};
```

A.5.43 Periodic Triggering Package

```
periodicTriggeringPackage PACKAGE
        ATTRIBUTES
                periodicTrigger GET-REPLACE;
REGISTERED AS {q825Package 40};
```

A.5.44 Personal User Id Package

```
personalUserIdPackage PACKAGE
        ATTRIBUTES
                personalUserId GET;
REGISTERED AS {q825Package 41};
```

A.5.45 Physical Line Code Package

```
physicalLineCodePackage PACKAGE
        ATTRIBUTES
                physicalLineCode GET;
REGISTERED AS {q825Package 42};
```

A.5.46 Progress Package

```
progressPackage PACKAGE
        ATTRIBUTES
                progress GET;
REGISTERED AS {q825Package 43};
```

A.5.47 Queue Info Package

```
queueInfoPackage PACKAGE
        ATTRIBUTES
                queueInfo GET;
REGISTERED AS {q825Package 44};
```

A.5.48 Received Digits Package

```
receivedDigitsPackage PACKAGE
        ATTRIBUTES
                receivedDigits GET;
REGISTERED AS {q825Package 45};
```

A.5.49 Record Extensions Package

```
recordExtensionsPackage PACKAGE
        ATTRIBUTES
                recordExtensions GET;
REGISTERED AS {q825Package 46};
```

A.5.50 Record Id Package

```
recordIdPackage PACKAGE
        ATTRIBUTES
                recordId GET;
REGISTERED AS {q825Package 63};
```

A.5.51 Redirecting Number Package

```
redirectingNumberPackage        PACKAGE
ATTRIBUTES
        redirectingNumber GET;
REGISTERED AS {q825Package 48};
```

A.5.52 Redirection Number Package

```
redirectionNumberPackage PACKAGE
        ATTRIBUTES
                redirectionNumber GET;
REGISTERED AS {q825Package 49};
```

A.5.53 Related Call Number Package

```
relatedCallNumberPackage PACKAGE
        ATTRIBUTES
                relatedCallNumber GET;
REGISTERED AS {q825Package 47};
```

A.5.54 Service specific IN information Package

```
serviceSpecificINInformationPackage PACKAGE
        ATTRIBUTES
                serviceSpecificINInformation GET;
REGISTERED AS {q825Package 50};
```

A.5.55 Standard Extensions Package

```
standardExtensionsPackage PACKAGE
        ATTRIBUTES
                standardExtensions GET;
REGISTERED AS {q825Package 51};
```

A.5.56 Supplementary Service Package

```
supplementaryServicePackage PACKAGE
        ATTRIBUTES
                supplementaryServices GET;
REGISTERED AS {q825Package 52};
```

A.5.57 Teleservice Package

```
teleservicePackage PACKAGE
        ATTRIBUTES
                teleservice GET;
REGISTERED AS {q825Package 54};
```

A.5.58 Trunk Group Incoming Package

```
trunkGroupIncomingPackage PACKAGE
        ATTRIBUTES
                trunkGroupIncoming GET;
REGISTERED AS {q825Package 55};
```

A.5.59 Trunk Group Outgoing Package

```
trunkGroupOutgoingPackage PACKAGE
        ATTRIBUTES
                trunkGroupOutgoing GET;
REGISTERED AS {q825Package 56};
```

A.5.60 User-to-User Info Package

```
uUInfoPackage PACKAGE
        ATTRIBUTES
                uUInfo GET;
REGISTERED AS {q825Package 57};
```

A.6 Attributes

A.6.1 Access Delivery

```
accessDelivery        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 1};
```

A.6.2 Account Code Input

```
accountCodeInput ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.AccountCodeInput;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        accountCodeInputBehaviour BEHAVIOUR
        DEFINED AS "This information element shall contain the code to which accounting is to be referred and
        input by the subscriber. Examples of use are authorisation code, PI, bank account, PV code or credit card
        number to be used for billing.";;
REGISTERED AS {q825Attribute  2};
```

A.6.3 Additional Participant Info

```
additionalParticipantInfo ATTRIBUTE
        WITH ATTRIBUTE SYNTAX    Q825-CDR-ASN1Module.AdditionalParticipantInfo;
        MATCHES FOR EQUALITY;
REGISTERED AS {q825Attribute 78};
```

A.6.4 B-party Category

```
b-PartyCategory ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.B-PartyCategory;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        b-PartyCategoryBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the called subscriber category.";;
REGISTERED AS {q825Attribute 5};
```

A.6.5 Bearer Service

```
bearerService        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module. 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. This attribute exists only for ISDN calls.";;
REGISTERED AS {q825Attribute  4};
```

A.6.6 CDR Purpose

```
cDRPurpose ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CDRPurpose;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        cDRPurposeBehaviour 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 {q825Attribute 13};
```

A.6.7 Call Detail Data Identifier

```
callDetailDataId  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CallDetailDataId;
        BEHAVIOUR
        callDetailDataIdBehaviour BEHAVIOUR
        DEFINED AS "This attribute uniquely identifies the callDetailData object.";;
REGISTERED AS {q825Attribute 70};
```

A.6.8 Call Duration

```
callDuration ATTRIBUTE
        WITH ATTRIBUTE SYNTAX    Q825-CDR-ASN1Module.CallDuration;
        MATCHES FOR EQUALITY;
REGISTERED AS {q825Attribute 79};
```

A.6.9 Call Identification Number

```
callIdentificationNumber  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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. If a global call
        reference is received through signalling, this can be used as call identification number thus allowing the
        correlation of CDRs generated for the same call in different NEs. If no global call reference is signalled in
        the network, the call identification will only have local significance.";;
REGISTERED AS {q825Attribute 6};
```

A.6.10 Call Status

```
callStatus  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CallStatus;
        BEHAVIOUR
        callStatusBehaviour BEHAVIOUR
        DEFINED AS "This attribute identifies whether the call is answered or not. A call is  considered answered
        if ANM or its equivalent has been received.";;
REGISTERED AS {q825Attribute 73};
```

A.6.11 Called Party Number

```
calledPartyNumberATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CalledPartyNumber;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        calledPartyNumberBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the telephone number of the called subscriber if the CDR is
        generated due to a call.
        If the CDR 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.";;
REGISTERED AS {q825Attribute 9};
```

A.6.12 Calling Party Category

```
callingPartyCategory        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.";;
REGISTERED AS {q825Attribute 7};
```

A.6.13 Calling Party Number

callingPartyNumber ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 CDR 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 CDR is generated is indicated by the redirecting number.";;
REGISTERED AS {q825Attribute 8};

A.6.14 Calling Party Number Not Screened

callingPartyNumberNotScreened ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CallingPartyNumberNotScreened;
MATCHES FOR EQUALITY;
BEHAVIOUR
callingPartyNumberNotScreenedBehaviour BEHAVIOUR
DEFINED AS "This attribute contains an additional user-provided, not screened telephone number of the calling party if the CDR 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.";;
REGISTERED AS {q825Attribute 10};

A.6.15 Calling Party Type

callingPartyType ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.
The Calling party Type is defined as:
– Analogue;
– Customer link (2 Mbit/s PSTN digital access);
– Basic Access;
– Primary Rate Access;";;
REGISTERED AS {q825Attribute 11};

A.6.16 Carrier Id

carrierId ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.CarrierId;
BEHAVIOUR
carrierIdBehaviour BEHAVIOUR
DEFINED AS "This attribute contains the carrier Id to which the call is sent.";;
REGISTERED AS {q825Attribute 74};

A.6.17 Cause

```
cause  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.Cause;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        causeBehaviour BEHAVIOUR
        DEFINED AS "This attribute indicates the cause and location value for the termination of the call. For
        ISDN/ISUP, it will contain ITU-T Recommendation Q.850 cause values (sent or received). For analogue
        call, or intra-switch call, the agent will provide the best mapping corresponding to the cause value of
        Q.850.";;
REGISTERED AS {q825Attribute 12};
```

A.6.18 Charged Directory Number

```
chargedDirectoryNumber  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ChargedDirectoryNumber;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        chargedDirectoryNumberBehaviour BEHAVIOUR
        DEFINED AS "This information element shall contain the charged directory number in the case where the
        number cannot be indicated by the charged participant element.";;
REGISTERED AS {q825Attribute 14};
```

A.6.19 Charged Participant

```
chargedParticipant  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ChargedParticipant;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        chargedParticipantBehaviour BEHAVIOUR
        DEFINED AS "This information element shall contain the participant, i.e. calling, called, redirecting,
        redirection or original called party, to be charged for the usage.";;
REGISTERED AS {q825Attribute 16};
```

A.6.20 Charging Information

```
chargingInformation        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 15};
```

A.6.21 Configuration Mask

```
configurationMask ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ConfigurationMask;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        configurationMaskBehaviour 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 {q825Attribute 17};
```

A.6.22 Conversation Time

```
conversationTime    ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ConversationTime;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        conversationTimeBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the time consumption from B-answer or equivalent. The call is
        considered terminated when communication between the parties is no longer possible.";;
REGISTERED AS {q825Attribute 18};
```

A.6.23 Creation Trigger List

```
creationTriggerListATTRIBUTE
WITH ATTRIBUTE SYNTAX    Q825-CDR-ASN1Module.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  Call Detail data objects. Triggers can be call related (Seizure or first digit or ACM received or
        ANM received) and non-call related (supplementary service invocation and/or input). When multiple
        triggers are present, the recording process is activated by the first recordable event";;
REGISTERED AS {q825Attribute  19};
```

A.6.24 DPC

```
dPC ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.PointCode;
        BEHAVIOUR
        dPCBehaviour BEHAVIOUR
        DEFINED AS "This attribute is used for analysis purpose. It contains the destination point code.";;
REGISTERED AS {q825Attribute  75};
```

A.6.25 Data Validity

```
dataValidity ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 CDR is not reliable. This indication enables the OS to take the necessary actions on the collected
        CDRs.";;
REGISTERED AS {q825Attribute 20};
```

A.6.26 Duration Time Until ACM

```
durationTimeACM ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.DurationTimeACM;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        durationTimeACMBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the time consumption from seizure time until received ACM. This
        attribute is only included if ACM is received.";;
REGISTERED AS {q825Attribute  23};
```

A.6.27 Duration Time B-Answer

```
durationTimeB-Answer    ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.DurationTimeANM;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        durationTimeB-AnswerBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the time consumption from the seizure time until received B-
        Answer. This attribute is included if B-Answer is received.";;
REGISTERED AS {q825Attribute 21};
```

A.6.28 Duration Time No B-Answer

```
durationTimeNoB-Answer          ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.DurationTimeNoANM;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        durationTimeNoB-AnswerBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the time consumption from the seizure time to termination time
        when no B-Answer is received.";;
REGISTERED AS {q825Attribute  22};
```

A.6.29 Exchange Info

```
exchangeInfo ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 CDR 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 CDR when new software releases, that affect the CDR
        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 {q825Attribute 25};
```

A.6.30 Fallback Bearer Service

```
fallbackBearerService       ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 provided when, in the case of fallback, the
        bearer service is not identical to the initial requested service.";;
REGISTERED AS {q825Attribute 26};
```

A.6.31 Glare

```
glare ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.Glare;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        glareBehaviour BEHAVIOUR
        DEFINED AS "This attribute indicates if a glare condition was encountered even if it does not cause the
        call to fail.";;
REGISTERED AS {q825Attribute 27};
```

A.6.32 IN Service Information List

```
iNServiceInformationList  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.INServiceInformationList;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        iNSpecificInformationListBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains information about the use of one or more IN service. Information
        about the use of more than one supplementary 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).";;
REGISTERED AS {q825Attribute 31};
```

A.6.33 IN Specific Information

```
iNSpecificInformation       ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.INSpecificInfo;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        iNSpecificInformationBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains information about the use of one IN service.";;
REGISTERED AS {q825Attribute 32};
```

A.6.34 ISUP Preferred

```
iSUPPreferred ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ISUPPreferred;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        iSUPPreferredBehaviour BEHAVIOUR
        DEFINED AS "This attribute indicates if an ISUP preference was requested. For ISUP, this attribute
        contains the ISUP Preference Indicator field of Forwarding Call Call Indicator parameter defined in
        ITU-T Recommendation Q.763. If  ISUP is not used this attribute is set not applicable.";;
REGISTERED AS {q825Attribute 33};
```

A.6.35 Immediate Notification for Usage Metering

```
immediateNotificationForUsageMetering ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ImmediateNotification;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        immediateNotificationForUsageMeteringBehaviour BEHAVIOUR
        DEFINED AS "This attribute shall contain an indication that the record requires immediate data transfer
        to the OS. This standard does not specify if this indication is due to a subscriber action or contained in the
        user data. This attribute may be used to define the filter of an event forwarding discriminator.";;
REGISTERED AS {q825Attribute 28};
```

A.6.36 Max Block Size

```
maxBlockSize ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.MaxBlockSize;
        MATCHES FOR EQUALITY, ORDERING;
        BEHAVIOUR
        maxBlockSizeBehaviour BEHAVIOUR
        DEFINED AS "The value of this attribute specifies the maximum number of CDRs 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 {q825Attribute 34};
```

A.6.37 Max Time Interval

```
maxTimeInterval  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 must be
        emitted. This value, therefore, specifies the maximum latency with which near-real-time CDR 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 {q825Attribute 35};
```

A.6.38 Network Management Controls

```
networkManagementControls ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.NetworkManagementControls;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        networkManagementControlsBehaviour BEHAVIOUR
        DEFINED AS "This attribute indicates which Traffic Network Management control has affected the call.
        This means that calls which are blocked by a traffic control will be taken into account. A call is affected by
        a Traffic Network Management control if the normal call routing process has been altered by a Traffic
        Network Management control.";;
REGISTERED AS {q825Attribute 36};
```

A.6.39 Network Provider ID

```
networkProviderId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.NetworkProviderId;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        networkProviderIdBehaviour BEHAVIOUR
        DEFINED AS "This attribute indicates the network provider for whom the CDR is generated. This
        information is only necessary in the case of multiple providers.";;
REGISTERED AS {q825Attribute 37};
```

A.6.40 OPC

```
oPC ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.PointCode;
        BEHAVIOUR
        oPCBehaviour BEHAVIOUR
        DEFINED AS "This attribute is used for analysis purpose. It contains the originating point code of the
        failed call.";;
REGISTERED AS {q825Attribute 76};
```

A.6.41 Operator Specific1 Additional Number

```
operatorSpecific1AdditionalNumber     ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 38};
```

A.6.42 Operator Specific1 Number

```
operatorSpecific1Number  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 39};
```

A.6.43 Operator Specific2 Additional Number

```
operatorSpecific2AdditionalNumber  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 40};
```

A.6.44 Operator Specific2 Number

```
operatorSpecific2Number  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.OperatorSpecific1Number;
        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 {q825Attribute  41};
```

A.6.45 Operator Specific3 Additional Number

```
operatorSpecific3AdditionalNumber  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 42};
```

A.6.46 Operator Specific3 Number

```
operatorSpecific3Number  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 43};
```

A.6.47 Original Called Number

```
originalCalledNumber  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 44};
```

A.6.48 Partial Generation

```
partialGeneration  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.PartialGeneration;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        partialGenerationBehaviour BEHAVIOUR
        DEFINED AS "This attribute is included if the CDR 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 {q825Attribute  45};
```

A.6.49 Participant Info

```
participantInfo ATTRIBUTE
        WITH ATTRIBUTE SYNTAX    Q825-CDR-ASN1Module.ParticipantInfo;
        MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {q825Attribute 77};
```

A.6.50 Percentage To Be Billed

```
percentageToBeBilled  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.PercentageToBeBilled;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        percentageToBeBilledBehaviour BEHAVIOUR
        DEFINED AS "This information element shall contain the percentage to be billed in the case where normal
        billing rules are not followed.";;
REGISTERED AS {q825Attribute 46};
```

A.6.51 Periodic Trigger

```
periodicTrigger      ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.Period;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        periodicTriggerBehaviour BEHAVIOUR
        DEFINED AS "This attribute defines the periodic interval at which the file should be created.";;
REGISTERED AS {q825Attribute 47};
```

A.6.52 Personal User Identification

```
personalUserId      ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.PersonalUserId;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        personalUserIdBehaviour BEHAVIOUR
        DEFINED AS "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.";;
REGISTERED AS {q825Attribute 48};
```

A.6.53 Physical Line Code

```
physicalLineCode   ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 49};
```

A.6.54 Progress

```
progress      ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.";;
REGISTERED AS {q825Attribute  50};
```

A.6.55 Queue Info

```
queueInfo ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.QueueInfo;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        queueInfoBehaviour BEHAVIOUR
        DEFINED AS "Queue information is stored in connection with IN calls to record usage of queueing
        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 queueing.";;
REGISTERED AS {q825Attribute  51};
```

A.6.56 Received Digits

```
receivedDigits        ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 52};
```

A.6.57 Record Extensions

```
recordExtensions  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.";;
REGISTERED AS {q825Attribute 53};
```

A.6.58 Record Id

```
recordId ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.RecordId;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        recordIdBehaviour BEHAVIOUR
        DEFINED AS "This attribute is used for audit trail purposes to check if all logged CDRs are transferred to
        the OS. It is a sequential number.";;
REGISTERED AS {q825Attribute 80};
```

A.6.59 Record Type

```
recordType  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.RecordType;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        recordTypeBehaviour BEHAVIOUR
        DEFINED AS "This information element indicates the type of the CDR and it also indicates the way some
        of the CDR elements are used.";;
REGISTERED AS {q825Attribute 54};
```

A.6.60 Redirecting Number

redirectingNumber ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 {q825Attribute 82};

A.6.61 Redirection Number

redirectionNumber ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.RedirectionNumber;
MATCHES FOR EQUALITY;
BEHAVIOUR
redirectionNumberBehaviour BEHAVIOUR
DEFINED AS "This attribute contains the telephone number of the party that the call must be forwarded to. This is the information, when using ISUP, that is sent in the backward direction indicating the number towards which the call must 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 {q825Attribute 56};

A.6.62 Related Call Number

relatedCallNumber ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.RedirectionNumber;
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 {q825Attribute 57};

A.6.63 Sampling Rate

samplingRate ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.Integer;
MATCHES FOR EQUALITY;
BEHAVIOUR
samplingRateBehaviour BEHAVIOUR
DEFINED AS "This attribute indicates that every n-th callDetailData will be flagged for analysis purpose and all subsequent CDRs emitted will indicate Analysis in the cDRPurpose.";;
REGISTERED AS {q825Attribute 58};

A.6.64 Service Specific IN Information

serviceSpecificINInformation ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.ServiceSpecificINInformation;
MATCHES FOR EQUALITY;
BEHAVIOUR
serviceSpecificINInformationBehaviour BEHAVIOUR
DEFINED AS "This information element shall contain the information provided by the IN-service-script to enable the billing of new services. This field contains a set of 'management extensions' as defined in ITU-T Recommendation X.721.";;
REGISTERED AS {q825Attribute 59};

A.6.65 Service User

serviceUser ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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 CDR 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 {q825Attribute 60};

A.6.66 Standard Extensions

standardExtensions ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.";;
REGISTERED AS {q825Attribute 61};

A.6.67 Start Time Stamp

startTimeStamp ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.StartTimeStamp;
MATCHES FOR EQUALITY;
BEHAVIOUR
startTimeStampBehaviour BEHAVIOUR
DEFINED AS "This attribute contains a time stamp either the seizure time for an un-answered call (when the exchange is ready to receive digit) or the answer time for an answered call. For transit calls the start time stamp (seizure) will relate to the first message received e.g. IAM.
If the CDR 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 and second and centisecond.
For partial outputs the start date time is the end time when the previous output was made.";;
REGISTERED AS {q825Attribute 62};

A.6.68 Supplementary services

supplementaryServices ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.SupplementaryServices;
MATCHES FOR EQUALITY;
BEHAVIOUR
supplementaryServicesBehaviour BEHAVIOUR
DEFINED AS "This attribute contains information about the use of one or more supplementary services. Information about the use of one or more supplementary service is only possible in connection with a call record type. Each supplementary service is included as a SEQUENCE OF SupplementaryService.
Each SupplementaryService construct contains relevant information about the use of a supplementary service. The attribute contains a service code identifying the supplementary service and an 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.

For each service code information is provided indicating the action taken. The 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 CDR 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.";;

REGISTERED AS {q825Attribute 63};

A.6.69 Teleservice

teleservice ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.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.
This information element is only relevant in connection with ISDN.";;
REGISTERED AS {q825Attribute 66};

A.6.70 Times of Day

timesOfDay ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.TimesOfDay;
MATCHES FOR EQUALITY;
BEHAVIOUR
timesOfDayBehaviour BEHAVIOUR
DEFINED AS "This attribute specifies the times at which the log will automatically generate a file." ;;
REGISTERED AS {q825Attribute 67};

A.6.71 Trunk Group Incoming

trunkGroupIncoming ATTRIBUTE
WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.TrunkGroupIncoming;
MATCHES FOR EQUALITY;
BEHAVIOUR
trunkGroupIncomingBehaviour BEHAVIOUR
DEFINED AS "This attribute contains the symbolic name of the trunk that is used by the incoming call as seen by the NE. If the calling subscriber is a local subscriber then this information element is not relevant.";;
REGISTERED AS {q825Attribute 68};

A.6.72 Trunk Group Outgoing

```
trunkGroupOutgoing      ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.TrunkGroupOutgoing;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        trunkGroupOutgoingBehaviour BEHAVIOUR
        DEFINED AS "This attribute contains the symbolic name of the trunk that is used by the outgoing call as
        seen from the NE. If the called subscriber is a local subscriber then this information is not relevant.";;
REGISTERED AS {q825Attribute  69};
```

A.6.73 User-to-User Info

```
uUInfo  ATTRIBUTE
        WITH ATTRIBUTE SYNTAX Q825-CDR-ASN1Module.UUInfo;
        MATCHES FOR EQUALITY;
        BEHAVIOUR
        uUInfoBehaviour BEHAVIOUR
        DEFINED AS "This attribute shall contain the User-to-User info data counter. The counter shall indicate
        the total number of octets or elements 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 {q825Attribute  81};
```

A.7 Actions

A.7.1 Create File

```
createFile                      ACTION
BEHAVIOUR
createFileBhv       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. 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 response contains the name and size of the created file.";;
MODE CONFIRMED;
WITH REPLY SYNTAX  Q825-CDR-ASN1Module.CreateFileResponse;
REGISTERED AS {q825Action 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
blockRecordNotificationBhv      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 the content of the call detail records
        currently contained in the blockingLog; i.e. the call detail records without the record overhead (Log
        Record Id, Managed Object Class and Instance and Logging Time).";;
WITH INFORMATION SYNTAX         Q825-CDR-ASN1Module.BlockRecordInfo;
REGISTERED AS {q825Notification 1};
```

A.8.2 Call Detail Record Notification

```
callDetailRecordNotification NOTIFICATION
BEHAVIOUR
    callDetailRecordReportBehaviour BEHAVIOUR
      DEFINED AS
        "This notification is issued to transmit a call detail record. The immediate notification may be used by the
        Event Forwarding Discriminator to select records requiring real time handling by the OS. Remaining
        attributes can be used to further filter the information in the record content.";;
  WITH INFORMATION SYNTAX Q825-CDR-ASN1Module.RecordContent
    AND ATTRIBUTE IDS
      recordType                        recordType,
      startTimeStamp                    startTimeStamp,
      participantInfo                   participantInfo,
      bearerService                     bearerService,
      serviceUser                       serviceUser,
      callIdentificationNumber          callIdentificationNumber,
      supplementaryServices             supplementaryServices,
      immediateNotificationForUsageMetering   immediateNotificationForUsageMetering,
      cause                             cause,
      iNSpecificInformation             iNSpecificInformation,
      partialGeneration                 partialGeneration,
      exchangeInfo                      exchangeInfo,
      relatedCallNumber                 relatedCallNumber,
      cDRPurpose                        cDRPurpose,
      additionalParticipantInfo         additionalParticipantInfo,
      callingPartyCategory              callingPartyCategory,
      callingPartyType                  callingPartyType,
      chargingInformation               chargingInformation,
      progress                          progress,
      accessDelivery                    accessDelivery,
      trunkGroupOutgoing                trunkGroupOutgoing,
      trunkGroupIncoming                trunkGroupIncoming,
      fallbackBearerService             fallbackBearerService,
      teleservice                       teleservice,
      callDuration                      callDuration,
      uUInfo                            uUInfo,
      standardExtensions                standardExtensions,
      recordExtensions                  recordExtensions,
      b-PartyCategory                   b-PartyCategory,
      iSUPPreferred                     iSUPPreferred,
      networkManagementControls         networkManagementControls,
      glare                             glare,
      recordId                          recordId,
      dataValidaty                      dataValidity,
      callStatus                        callStatus,
      carrierId                         carrierId,
      dPC                               dPC,
      oPC                               oPC;
REGISTERED AS {q825Notification 2};
```

NOTE – The ASN.1 type references in the AND ATTRIBUTES IDS clause refers to all of the records that include this name.

A.8.3 File Creation Notification

```
fileCreationNotification          NOTIFICATION
BEHAVIOUR
fileCreationNotificationBhv              BEHAVIOUR
        DEFINED AS "This notification is emitted whenever the fileGenerating Log creates a new file in order to
        let the managing system know that the file is available for retrieval.";;
WITH INFORMATION SYNTAX      Q825-CDR-ASN1Module.FileCreationInfo;
REGISTERED AS {q825Notification 3};
```

A.9 Name bindings

The name binding for simple usage metering control object class and configurable simple usage metering control object class and its subclasses is derived from Recommendation X.742. The name binding of the accountable object is to be defined during the implementation.

```
blockGeneratingLog-managedElement NAME BINDING
  SUBORDINATE OBJECT CLASS blockGeneratingLog AND SUBCLASSES;
  NAMED BY SUPERIOR OBJECT CLASS "ITU-T Rec. M.3100: 1995":managedElement AND
    SUBCLASSES;
  WITH ATTRIBUTE "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":logId;
  CREATE WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE DELETES-CONTAINED-OBJECTS;
REGISTERED AS {q825NameBinding 3};

callDetailData-managedElement NAME BINDING
  SUBORDINATE OBJECT CLASS callDetailData AND SUBCLASSES;
  NAMED BY SUPERIOR OBJECT CLASS "ITU-T Rec. M.3100: 1995":managedElement AND
  SUBCLASSES;
  WITH ATTRIBUTE callDetailDataId;
  BEHAVIOUR
    callDetaildata BEHAVIOUR
        DEFINED AS
        "callDetailData objects are created and deleted implicitly, that is, they are created and deleted upon the
        occurrence of defined trigger events and are not explicitly manipulated by a managing system; i.e. a
        manager cannot perform any operations on instances of this object class. To support recording data in a
        callDetailData object two sets of triggers coming from the control objects are defined:
        – Creation Triggers: events that cause creation of a callDetailData object,  these triggers are defined as
          part of the control object.
        – Termination Triggers: events that cause deletion of a callDetailData object. Currently the termination is
          implicit as part of the data object behaviour. Deletion occurs upon completion of usage data collection
          for that instance of service.
        CDR notifications are emitted in response to reporting triggers (ITU-T  Recommendation X.742) that are
        also defined as part of the control objects.";;
REGISTERED AS {q825NameBinding 5};

callDetailLogRecord-blockGeneratingLog NAME BINDING
  SUBORDINATE OBJECT CLASS callDetailLogRecord AND SUBCLASSES;
  NAMED BY SUPERIOR OBJECT CLASS blockGeneratingLog AND SUBCLASSES;
  WITH ATTRIBUTE "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":logRecordId;
  BEHAVIOUR
    callDetailLogRecordToblockGenerationLog BEHAVIOUR
        DEFINED AS
        "instance of this managed class will be created automatically when the blockGeneratingLog receives a
        callDetailNotification matching the discriminating construct. The records are automatically deleted after
        the notification is emitted.";;
REGISTERED AS {q825NameBinding 1};
```

```
callDetailLogRecord-fileGeneratingLog NAME BINDING
  SUBORDINATE OBJECT CLASS callDetailLogRecord AND SUBCLASSES;
  NAMED BY SUPERIOR OBJECT CLASS fileGeneratingLog AND SUBCLASSES;
  WITH ATTRIBUTE "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":logRecordId;
  BEHAVIOUR
    callDetailLogRecordToFileGenerationLog BEHAVIOUR
        DEFINED AS
        "instance of this managed class will be created automatically when the fileGeneratingLog receives a
        callDetailNotification matching the discriminating construct. The records are automatically deleted after
        the records are copied to the file.";;
REGISTERED AS {q825NameBinding 2};

fileGeneratingLog-managedElement NAME BINDING
  SUBORDINATE OBJECT CLASS fileGeneratingLog AND SUBCLASSES;
  NAMED BY SUPERIOR OBJECT CLASS "ITU-T Rec. M.3100: 1995":managedElement AND
   SUBCLASSES;
  WITH ATTRIBUTE "ITU-T Rec. X.721 | ISO/IEC 10165-2 : 1992":logId;
  CREATE WITH-AUTOMATIC-INSTANCE-NAMING;
  DELETE DELETES-CONTAINED-OBJECTS;
REGISTERED AS {q825NameBinding 4};
```

A.10 ASN.1 defined types module

```
Q825-CDR-ASN1Module {itu-t(0) recommendation(0) q(17) q825(825) asn1Modules(2) q825ASN1Module(0)}
DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- EXPORTS  everything
IMPORTS
ObjectInstance FROM CMIP-1 { joint-iso-ccitt ms(9) cmip(1) modules(0) protocol(3) }
--see Rec. X.711
NameType FROM ASN1DefinedTypesModule {ccitt recommendation m gnm(3100) informationModel(0)
asn1Modules(2) asn1DefinedTypesModule(0)}
-- see Rec. M.3100
ManagementExtension FROM
Attribute-ASN1Module { joint-iso-ccitt ms(9) smi(3) part2(2) asn1Module(2) 1}
--see Rec. X.721
PointCode FROM MTPDefinedTypesModule { itu-t recommendation q(17) omap(751) mtp(1)
informationModel(0) mtpDefinedTypesModule(0) }
--see Rec. Q.751.1
ReportingTriggers FROM Schedule-ASN1Module { joint-iso-ccitt ms(9) function(2) part15(15) modules (1)};
--see Rec. X.742
-- OBJECT IDENTIFIERS
q825-InformationModel OBJECT IDENTIFIER ::= {itu-t(0) recommendation(0) q(17) q825(825)
informationModel(0)}
q825ObjectClass OBJECT IDENTIFIER ::= {q825-InformationModel managedObjectClass(3)}
q825Package OBJECT IDENTIFIER ::= {q825-InformationModel package(4)}
q825NameBinding OBJECT IDENTIFIER ::= {q825-InformationModel nameBinding(5)}
q825Attribute OBJECT IDENTIFIER ::= {q825-InformationModel attribute(6)}
q825Action OBJECT IDENTIFIER ::= {q825-InformationModel action(7)}
q825Notification OBJECT IDENTIFIER ::= {q825-InformationModel notification(8)}

--      DEFAULT VALUE DEFINITION
defaultCreationTrigger CreationTriggerList::={}
--      Supporting productions
Integer ::= INTEGER
-- 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,
    extensions                  [3]  ManagementExtensions      OPTIONAL }

-- FILE CONTENTS

FileHeaderRecord       ::=  SEQUENCE {
    productionDateTime          StartDateTime,
    exchangeInfo                ExchangeInfo,
    fileName                    FileName,
    reasonForOutput             ReasonForOutput,
    firstRecordId               RecordId               OPTIONAL,
-- Present if the requested first record id is different from what was requested in the created file request
    extensions                  ManagementExtensions   OPTIONAL}

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

-- USAGE METERING RECORDS

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

CallRecord             ::=  SET    {
    recordType              [0]  RecordType,
    startTimeStamp          [1]  StartTimeStamp,
    participantInfo         [2]  ParticipantInfo,
    bearerService           [3]  BearerService,
    serviceUser             [4]  ServiceUser,
    callIdentificationNumber [6]  CallIdentificationNumber,
    supplementaryServices   [5]  SupplementaryServices   OPTIONAL,
    immediateNotificationForUsageMetering [7] ImmediateNotification OPTIONAL,
    cause                   [8]  Cause                   OPTIONAL,
    iNSpecificInfo          [9]  INSpecificInfo          OPTIONAL,
    partialGeneration       [10] PartialGeneration       OPTIONAL,
    exchangeInfo            [11] ExchangeInfo            OPTIONAL,
    relatedCallNumber       [12] RelatedCallNumber       OPTIONAL,
    cDRPurpose              [13] CDRPurpose              OPTIONAL,
    additionalParticipantInfo [14] AdditionalParticipantInfo OPTIONAL,
    callingPartyCategory    [15] CallingPartyCategory    OPTIONAL,
    callingPartyType        [16] CallingPartyType        OPTIONAL,
    chargingInformation     [17] ChargingInformation     OPTIONAL,
    progress                [18] Progress                OPTIONAL,
    accessDelivery          [19] AccessDelivery          OPTIONAL,
    trunkGroupOutgoing      [20] TrunkGroupOutgoing      OPTIONAL,
    trunkGroupIncoming      [21] TrunkGroupIncoming      OPTIONAL,
    fallbackBearerService   [22] FallbackBearerService   OPTIONAL,
    teleservice             [23] Teleservice             OPTIONAL,
    callDuration            [24] CallDuration            OPTIONAL,
    uUInfo                  [25] UUInfo                  OPTIONAL,
    standardExtensions      [26] StandardExtensions      OPTIONAL,
    recordExtensions        [30] RecordExtensions        OPTIONAL,
    b-PartyCategory         [31] B-PartyCategory         OPTIONAL,
    iSUPPreferred           [32] ISUPPreferred           OPTIONAL,
```

```
        networkManagementControls   [33]  NetworkManagementControls      OPTIONAL,
        glare                       [34]  Glare                          OPTIONAL,
        recordId                    [35]  RecordId                       OPTIONAL,
        dataValidity                [36]  DataValidity                   OPTIONAL,
        callStatus                  [37]  CallStatus                     OPTIONAL,
        carrierId                   [38]  CarrierId                      OPTIONAL,
        dPC                         [39]  PointCode                      OPTIONAL,
        oPC                         [40]  PointCode                      OPTIONAL
        }

SupplServiceInputRecord             ::=   CallRecord
        (WITH COMPONENTS {
        recordType                  PRESENT,
        startTimeStamp              PRESENT,
        participantInfo             PRESENT,
        bearerService               PRESENT,
        serviceUser                 PRESENT,
        callIdentificationNumber    PRESENT,
        supplementaryServices       PRESENT,
        immediateNotificationForUsageMetering   OPTIONAL,
        cause                                   OPTIONAL,
        iNSpecificInfo                          OPTIONAL,
        exchangeInfo                            OPTIONAL,
        cDRPurpose                              OPTIONAL,
        additionalParticipantInfo               OPTIONAL,
        callingPartyCategory                    OPTIONAL,
        callingPartyType                        OPTIONAL,
        chargingInformation                     OPTIONAL,
        standardExtensions                      OPTIONAL,
        recordExtensions                        OPTIONAL,
        recordId                                OPTIONAL })

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.

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.
--      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
--                    00000     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}

BearerService                   ::=     SEQUENCE {
                capability      ENUMERATED {
                        speech (0),
                        audio3dot1kHZ (1),
                        uni64 (2),
                        uni64withT-A (3),
                        multipleRate (4),
                        packetModeB-Ch (5) },
                multiplier INTEGER (2..30) OPTIONAL}
--      Multiplier present only if capability = multipleRate

B-PartyCategory                 ::=     BIT STRING(SIZE(8))

CallStatus                      ::=      ENUMERATED {
                        answered        (0),
                        notanswered             (1) }

CallDuration                            ::=     SET {
        conversationTime        [0]     ConversationTime        OPTIONAL,
        durationTimeACM         [1]     DurationTimeACM         OPTIONAL,
        durationTimeB-ans       [2]     DurationTimeANM         OPTIONAL,
        durationTimeNoANM       [3]     DurationTimeNoANM       OPTIONAL }

CalledPartyNumber                       ::=     Number

CallIdentificationNumber        ::=     OCTET STRING
--      Octet string identifying the call.

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

CallingPartyNumber                      ::=     Number
CallingPartyNumberNotScreened           ::=     Number
```

```
CallingPartyType                ::=     ENUMERATED {
                analogue (0),
                customerLink (1),       --      2Mbit/s PSTN digital access
                basicAccess (2),
                primaryRateAccess (3) }
CarrierId                               ::=     VisibleString (SIZE(1..11))
Cause                                   ::=     SEQUENCE {
                causeValue              CauseValue,
                location                Location}

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

CDRPurpose                              ::=     BIT STRING {
                        usagemetering (0),
                        analysis (1) }  (SIZE(2) )

ChargedDirectoryNumber                          ::=     Number

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

ChargedParticipant              ::=     ParticipantType

ConfigurationMask       ::=     BIT STRING {
                exchangeInfo                    (0),
                relatedCallNumber               (1),
                additionalParticipantInfo       (2),
                callingPartyCategory            (3),
                callingPartyType                (4),
                progress                        (5),
                accessDelivery                  (6),
                trunkGroupOutgoing              (7),
                trunkGroupIncoming              (8),
                teleservice                     (9),
                standardExtensions              (10),
                recordExtensions                (11),
                b-partyCategory                 (12),
                iSUPPrefferred                  (13),
                networkManagementControls       (14),
                glare                           (15)    }

ConversationTime                ::=     Duration

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

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

CreationTriggerList                             ::=     SET OF CreationTrigger

CreationTrigger                 ::=     ENUMERATED   {
                seizure(0),
                firstDigitReceived(1),
```

```
            aCMReceived(2),
            aNMReceived(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 {
            possibleduplicated (0),
            requireddatamissing (1),
            other               (2) }

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

DurationTimeACM                 ::=     Duration

DurationTimeANM         ::=     Duration  --fix to match reference syntax

DurationTimeNoANM               ::=     Duration  --fix to match reference syntax

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}

Glare                   ::=     BOOLEAN
ImmediateNotification   ::=     BOOLEAN

INServiceInformationList        ::=     SEQUENCE OF INServiceInformation

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

INSpecificInfo          ::=     SET {
        personalUserId                  [0] PersonalUserId                  OPTIONAL,
        chargedParticipant              [1] ChargedParticipant              OPTIONAL,
        chargedDirectoryNumber          [2] ChargedDirectoryNumber          OPTIONAL,
        percentageToBeBilled            [3] PercentageToBeBilled            OPTIONAL,
        accountCodeInput                [4] AccountCodeInput                OPTIONAL,
        iNServiceCode                   [5] INServiceCode                   OPTIONAL,
        queueInfo                       [6] QueueInfo                       OPTIONAL,
        serviceSpecificINInformation    [7] ServiceSpecificINInformation    OPTIONAL }
```

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

ISUPPreferred                   ::=     ENUMERATED {
                preferred       (0),
                notrequired     (1),
                required        (2),
                notapplicable   (3)}

Location                        ::=     INTEGER {
                user (0),
                localUserPrivateNetwork (1),
                localUserPublicNetwork (2),
                transitNetwork (3),
                remoteUserPublicNetwork (4),
                remoteUsePrivateNetwork (5),
                internationalNetwork (7),
                beyondInterworkPoint (10) }
--      See  ITU-T Recommendation Q.850, 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.

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

NetworkManagementControls       ::=     ENUMERATED {
                acc                     (0),
                adc                     (1),
                cancelFrom              (2),
                cancelRerouted          (3),
                cancelTo                (4),
                destinationCodeControl  (5),
                scr                     (6),
                skip                    (7),
                tarfrom                 (8),
                tarto                   (9)}

NetworkProviderId               ::=     VisibleString (SIZE(1..11))
Number                          ::=     OCTET STRING (SIZE (1 .. 14))
--      This type is used to represent a number for addressing purposes. It is composed of:
--      a)      one octet for odd/even indicator and nature of address indicator:
--              bits  8:        Odd/even indicator
--                    0         even number of address signals
--                    1         odd number of address signals

--              bits  7654321:  Nature 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)  one octet for numbering plan indicator:
--          bits 765:           numbering plan indicator
--               000            spare
--               001            ISDN (Telephony) Number Plan (ITU-T Recommendation 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)  digits of the address encoded as TBCD String:
--      The following octets representing digits of an address encoded as a TBCD-STRING.
--      TBCD-STRING         ::=     OCTETSTRING
--      This type (Telephony Binary Coded Decimal String) is used to represent dig its 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),
--      This is used for long duration calls.
                serviceChange           (1),
                overflow                (2),
                networkInternalReasons  (3),
                lastCDR                 (4),
                timeChange              (5)}

Period                          ::=     INTEGER (0..512) --  Elapsed time in minutes

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 an International Mobile 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:
--              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 (ITU-T Recommendation E.164)
--                    010     spare
--                    011     spare
--                    100     spare
--      b)    digits of the address encoded as TBCD String:
--      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) }

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:
--              bits  8:    Odd/even indicator
--                    0     even number of address signals
--                    1     odd number of address signals
--      b)  digits of the address encoded as TBCD String
--      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                ::=     Count
--The record Id is a sequence number that is incremented for each logged CDR,
--it is generated by the log

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

RedirectionNumber               ::=     Number

RelatedCallNumber               ::=     CallIdentificationNumber
```

```
ServiceSpecificINInformation    ::=    ManagementExtensions

ServiceUser                     ::=    ParticipantType

SequenceNumber                  ::=    Count
-- The record block sequence number is incremented for each block generation

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.

SupplementaryServices   ::=    SEQUENCE OF SupplementaryService

SupplementaryService    ::=    SEQUENCE {
            supplementaryServiceCode    SupplementaryServiceCode,
            supplementaryAction         SupplementaryAction,
            supplementarytimestamp      Duration                OPTIONAL,
            functionalInformation       ManagementExtensions    OPTIONAL }

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

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))

TrunkGroupIncoming              ::=    TrunkGroupId
TrunkGroupOutgoing              ::=    TrunkGroupId

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

```
TimesOfDay                  ::=   OCTET STRING (SIZE(2))
--      HHmm (Hours, Minutes)
--      each field one digit, two digits per octet, the digits o through 9 encoded as
--      0000 to 1001 "hstring", 1st digit in the LSB

CallDetailDataId            ::=   NameType


UUInfo                      ::=   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}
```

--Subtype to use with permitted values for reporting triggers from usage metering

```
PermittedReportingTriggers ::= ReportingTriggers ((WITH COMPONENT( WITH COMPONENTS {periodic
PRESENT} )) (SIZE(0..1)))
```

-- Default value for subtyped attribute

```
reportingTriggersDefault  PermittedReportingTriggers ::= { periodic : minutes : 30 }


END   -- of Q.825-CDR-ASN1Module
```

ANNEX B

Call Detail Records

B.1 General

This Annex includes a specification of the record types and the information elements valid for inclusion in the CDR. To enable for a more flexible formatting of the CDR, dynamic encoding rules shall be adopted. The rules imply that the CDR 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 CDR. 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 the purpose of this Recommendation:

- 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 8.1. It should be noted that the absence of certain trigger criteria could 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 CDRs is outlined in 8.1.

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 identification number (see Recommendation Q.931) 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 time stamp.

B.2 Record contents

Table B.1 describes the contents of each of the record types defined in this specification.

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

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 clarification of doubt, optional does not mean that the parameter is not supported by the network element.

Table B.1/Q.825 – 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	C	M
call identification number	M	M
record Id	O	O
data Validity	C	C
networkProvidedId	C	C
supplementary services	C	M
immediate notification	C	C
cause	C	C
IN specific info • personal user identification • charged participant • charged directory number • percentage to be billed • account code input • IN service code • queue info • service specific IN information	C	C
partial generation	C	–
exchange Info	O	O
related call number	O	–
CDR 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

Table B.1/Q.825 – Contents of the record types *(concluded)*

Information element	Call	Supplementary service input
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 ANM • duration time no ANM	O	–
user-to-user info counter	O	–
standard extensions	O	O
record extensions	O	O
call status	O	–
CarrierId	C	–
DPC	O	–
OPC	O	–

APPENDIX I

Alternative ASN.1 definitions

I.1 Definition of ASN.1 modules for use of 1994 version of ASN.1

The use of the 1994 version of ASN.1 (Recommendations X.680, X.681, X.682 and X.683) is illustrated by providing an ASN.1 module, ASN1DefinedTypesModuleNew, which defines the data types that are affected by the new notation in a way similar to the way they are defined in the ASN1DefinedTypesModule module in A.10.

```
ASN1DefinedTypesModuleNew {ccitt(0) identified-organisation(4) etsi(0)
usageMeteringInformationManagement(43321) informationModel(0) asn1Modules(2)
ASN1DefinedTypesModuleNew(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:
-- 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.
```

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
-- ASN1DefinedTypesModule 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
-- ASN1DefinedTypesModule
-- 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
-- ASN1DefinedTypesModule module

ServiceSpecificINInformation ::= INSTANCE OF MANAGEMENT-EXTENSION ({AllowedServiceSpecificINInformations})

-- The AllowedServiceSpecificINInformations is the constraint that allows only certain types to be set as
-- ServiceSpecificINInformation.

ServiceSpecificINInformations ::= SET OF ServiceSpecificINInformation

-- TheServiceSpecificINInformations type is to be used in the CallRecord type of
-- ASN1DefinedTypesModule 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
-- ASN1DefinedTypesModule 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
-- ASN1DefinedTypesModule module
-- Usually the constraint on the type to be used for extensions is not known and must 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 ASN1DefinedTypesModuleNew
```

I.2 Rules of extensibility

NOTE – This paragraph substitutes the paragraph on rules of extensibility at the start of A.10.

Recommendation X.680, Amendment 1, shall be used to extend the following types defined in ASN1UsageInformationModule module:

- CallRecord.
- RecordContent.
- AdditionalParticipantInfo.
- CreationTrigger.
- INSpecificInfo.
- ParticipantId.
- ParticipantType.
- PartialRecordReason.
- ReasonForOutput.
- StartTimeStamp.
- TimeDuration.
- CDRPurpose.

I.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 Annex is, for instance, to be used to collect usage information from ATM switches. An ATM connection record is standardized in an TMSwitchASN1Module in another document. The definition of this type in that document should be done as follows:

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

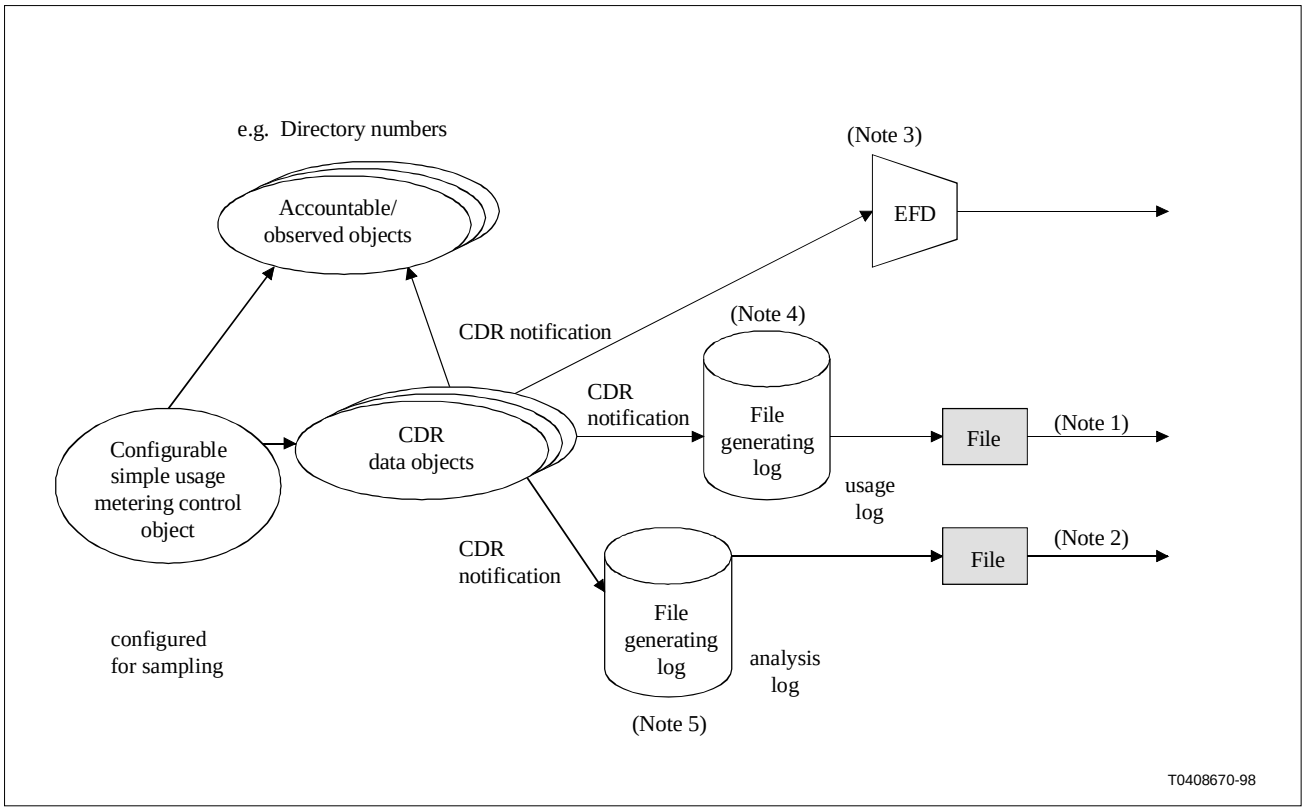
ExampleATMConnectionRecordType OBJECT IDENTIFIER ::=
{ATMSwitchASN1Module ExampleATMConnectionRecordType(0) }
-- This object identifier uniquely identifies type ExampleATMConnectionRecord.
...
ExampleATMConnectionRecord ::= *-- Type definition*
...

When the usage metering information management model with a ManagementExtension is used, the object identifier ExampleATMConnectionRecordType should be used so that the ANY DEFINED BY clause in the Management Extension unambiguously determines the ExampleATMConnectionRecord type.
The ExampleATMConnectionRecord must be specified in the Protocol Implementation Conformance Statement (PICS) of the information model at the time of implementation.

APPENDIX II

Application of the model

Figure II.1 shows a typical configuration that can be used to generate files for analysis purposes on a sample basis and billing usage records for only successful calls. Note that this configuration will collect records at the specified sample rate for both complete and failed calls, generate usage records for only completed successful calls and generate real-time bills for successful calls. All other CDR notifications will be discarded and not logged.



NOTE 1 – The file will contain records for all successful calls.
NOTE 2 – The file will contain records for all flagged calls.
NOTE 3 – Log's discriminator construct set to check for sampling bit.
NOTE 4 – Log's discriminator construct set to check for absence of cause parameter.
NOTE 5 – EFD configured to check for presence of immediate notification and absence of cause.

Figure II.1/Q.825

APPENDIX III

Examples of the use of Call Detail Records

Table III.1 – Example of a transit exchange record for accounting allocation

Parameter name	
Event Information	
Record Type	Call Record
Start Time Stamp	M
Participant Information	M
Bearer Service	M
Service User	M
Call Identification Number	M
Supplementary Service List	O
Immediate Notification for Usage Metering	–
DPC	–
OPC	–
Call Status	–
Carrier Id	–
Cause	–
Data Validity	–
IN Specific Information	–
Service Specific IN Information List	–
Partial Generation	
Exchange Information	U
Related Call Number	U
CDR Purpose	U
Additional Participant Information	U
Calling Party Category	–
Calling Party Type	–
Charging Information	–
Progress	–
Access Delivery	–
Trunk Group Incoming	xxxxx
Trunk Group Outgoing	yyyyy
Network Provider Id	–
Fallback Bearer Service	–
Teleservice	–
Call Duration	C
User-to-User Information Counter	U
Standard Extensions	U
Record Extension	U

APPENDIX IV

Application of CDR (for information only)

Table IV.1 shows how a given CDR may be used for QoS (Quality of Service), Network Management (NM) and Fraud investigation (Fraud). The last column explains how the QoS, NM, Fraud requirements are covered by the model presented in Recommendation Q.825.

Table IV.1/Q.825 – Application of CDR to the quality of service, network management and fraud investigation

CDR content & derived information	QoS	NM	Fraud	Covered in Q.825 ?
1) A-party number	X	X	X	Yes
2) A-party category	X		X	Yes
3) B-party number	X	X	X	Yes
4) B-party category	X		X	Yes
5) Incoming Circuit ID	X	X	X	No, but Trunk Group ID
6) Outgoing Circuit ID	X	X	X	No, but Trunk Group ID
7) Date for start of charging	X		X	No, not needed as per Q.4/2
8) Time for start of charging	X		X	No, not needed as per Q.4/2
9) Time for end of charging	X		X	No, not needed as per Q.4/2
10) Charge duration	X		X	No, not needed as per Q.4/2
11) Tariff Class	X		X	No, not a unique identifiable field
12) Exchange ID	X	X	X	Yes
13) Fault codes (Cong., Tech fault, COTF, etc.)	X	X	X	Yes, partly in Cause field
14) Answer	X	X	X	Yes
15) Station Busy	X	X	X	Yes, in Cause field (Rec. Q.850)
16) ISUP preferred/ISUP required	X		X	Yes
17) ISDN user-network information	X		X	No
18) Bearer capability	X			Yes
19) Cause values TUP & ISUP (NNC, ADI, UNN, etc.)	X	X	X	Yes, in Cause field (Rec. Q.850)
20) User-to-User	X		X	Yes
21) Holding time	X		X	Yes
22) Actual Conversation Time	X			Yes
23) ISDN flag	X		X	Derivable from Bearer Services, and Supplementary Service
24) Network management controls	X		X	Yes
25) Glare (dual seizure)	X			Yes
26) CLI	X		X	Yes
27) All Trunks Busy	X			Yes, in Cause field (Rec. Q.850)
28) Vacant Codes	X			Yes, in Cause field (Rec. Q.850)

Table IV.1/Q.825 – Application of CDR to the quality of service, network management and fraud investigation *(concluded)*

CDR content & derived information	QoS	NM	Fraud	Covered in Q.825 ?
29) Closed user group	X			Derivable from ParticipationInfo
30) Ringing abandoned call	X		X	Yes, through causeValue
31) G4 FAX	X			No
32) Non-circuit related traffic (MAP, OMAP, INAP, etc.)	X			No, Rec. Q.752 covers it
33) Incoming trunk group		X	X	Yes
34) Outgoing trunk group		X	X	Yes
35) Date and Time of Incoming BID		X	X	Not needed as per SG 2 liaison
36) Failed due to ISUP Preference Indicator		X		No, not recognizable as a unique call failure cause
37) Failed due to Transmission Requirements		X		Yes, through causeValue
38) Service Type (Rec. E.412)		X	X	Derivable, supplementaryService or bearerService
39) Internal Congestion		X		Yes, in Cause field (Rec. Q.850)
40) External Congestion		X		Yes, in Cause field (Rec. Q.850)
41) Subscriber faults		X		Yes, in Cause field (Rec. Q.850)
42) Other (Vendor specific)				Open

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