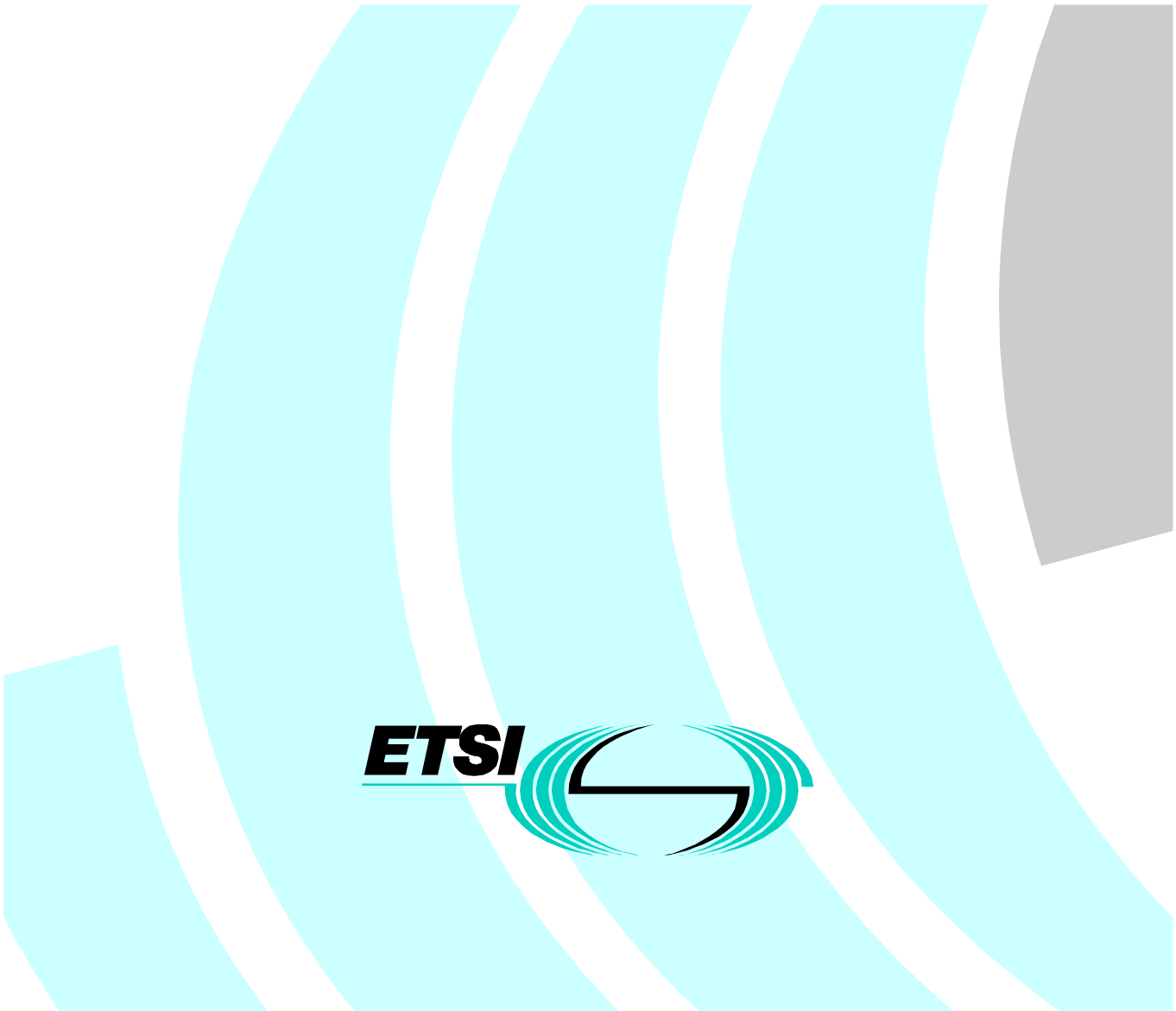
EN 300 292 V1.2.1 (1998-08)

European Standard (Telecommunications series)

Telecommunications Management Network (TMN); Functional specification of call routeing information management on the Operations System/Network Element (OS/NE) interface



Reference
REN/TMN-00034 (2pc00ioo.PDF)

Keywords
Management, addressing, network

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet
secretariat@etsi.fr
http://www.etsi.fr
http://www.etsi.org

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.fr/ipr or http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Telecommunications Management Network (TMN).

National transposition dates	
Date of adoption of this EN:	7 August 1998
Date of latest announcement of this EN (doa):	30 November 1998
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 1999
Date of withdrawal of any conflicting National Standard (dow):	31 May 1999

1 Scope

The present document provides a management information model [12] which covers the management aspects of the "routing and digit analysis" function in an exchange. The scope is further limited to the exchange aspects of circuit switched networks. This model is restricted to the Operations Systems (OSs) to Network Element (Q3) interface (see ITU-T Recommendation M.3010 [7]).

The information to be managed is limited to the signalling systems Digital Subscriber Signalling System No. 1 (DSS1) , Signalling System CCITT No.5 (C5), Signalling System Number 7 (SS No.7) - ISDN User Part (ISUP) only) and Regional Signalling 2 (R2). (SS No.7 with Telephone User Part (TUP) level 4 is not considered.) The information for routing purpose, which needs to be maintained by the manager, depends on the signalling systems used by the exchange. This information model can be applied for exchanges with the known standardized signalling systems DSS 1, SS No. 7, R2, C5. Because of the existence of different signalling systems, not all attributes and objects will be applicable for all exchanges. Information about applicability can be found in the object classes behaviour.

As this model only offers an element management layer view (ie: limited to a switch) of the routing information, and only shows the partial view a switch has of its network environment, and does not show the whole network picture, it does not provide all the information needed for network-wide management application.

The information model covers the management of following aspects:

- incoming digit rebuilding;
- locally originating, locally terminating (up to recognizing that the Directory Number (DN) belongs to the exchange), and transit calls;
- digit analysis;
- circuit end point selection;
- outgoing digit preparation;

as far as they are relevant for routing. It does not cover management of:

- DN portability;
- Cordless Terminal Mobility (CTM);
- Dynamic Routing;

due to lack of stable requirements at the time of writing the present document.

The information model includes entry/exit points (via instances of specific Object Class (OC)) for:

- customer administration (see ITU-T Recommendation Q.824.x [15] or ETS 300 291 [1]);
- Subscriber Controlled Input (SCI) (no standard exists yet);
- Intelligent Network (IN) (no standard exists yet);
- specific treatments as e.g. announcements.

The information model does not cover routing or digit analysis aspects of following topics:

- traffic management (see ITU-T Recommendation Q.823 [14] or I-ETS 300 637 [2]);
- call-control;
- broadband;
- supplementary services;
- IN (Intelligent Network);
- customer administration;

- other services of which the definition is still under study (e.g. tariff management);
- Private Automatic Branch Exchange (PABX) as exchanges or as termination points of subscriber lines (because this is covered by customer administration);
- centrex implementations;
- mobility issues like cellular and personnel mobility;

neither following specific points:

- characterization of non-blockable digits (e.g. emergency numbers);
- characterization of destinations for which carrier dialling is not allowed or ignored e.g. service numbers, emergency calls, specific local calls;
- numbering plans for virtual private networks;
- blocking of national and/or international traffic due to subscriber permission;
- echo suppressor handling depending on selected routing possibility;
- use of propagation delay counter;
- permanent connections.

Because the borders between call processing, digit analysis, routing and traffic management are not always clear, the following rules have been used to differentiate between call processing, digit analysis and routing, and traffic management:

- digit analysis and routing processes are related to the end point selection. If a managed item has no relation with the choice of the end point selection, then this managed item is not included in this model;
- call control processes are related to whether or when a call is required to be routed. These processes do not influence the end point selection;
- the border between traffic management and routing is determined by following conditions:
  - routing management deals with individual calls under normal conditions;
  - traffic management optimizes overall traffic flow in case of overload or network failure.

Modelling described here does not imply any sequencing of call processing activities.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] I-ETS 300 291 (1995): "Network Aspects (NA) - Functional specification of Customer Administration (CA) on the Operations System/Network Element (OS/NE) interface".

[2] I-ETS 300 637 (1996): "Network Aspects (NA) - Functional specification of traffic management on the Network Element/Operation System (NE/OS) interface".

[3] EN 301 098 (V1.1): "Telecommunications Management Network (TMN); Scheduling function; Support object classes ".

[4] ITU-T Recommendation E.164 (1991): "Telephone Network and ISDN Operation, Numbering, Routing and Mobile Service - Numbering Plan for the ISDN Era".

[5] ITU-T Recommendation E.170 (1992): "Traffic Routing".

[6] ITU-T Recommendation E.410 (1992): "Telephone Network And ISDN - Quality Of Service, Network Management And Traffic Engineering - International Network Management - General Information".

[7] ITU-T Recommendation M.3010 (1992): "Maintenance: Telecommunications Management Network - Principles for a Telecommunications Management Network".

[8] ITU-T Recommendation M.3100 (1995): "Generic Network Information Model".

[9] ITU-T Recommendation Q.115 (1993): "Control of Echo Suppressors and Echo Cancellers".

[10] ITU-T Recommendation Q.440 (1988): "(Signalling System R2 - Interregister signalling) General".

[11] ITU-T Recommendation Q.441 (1988): " (Signalling System R2 - Interregister signalling) Signalling code".

[12] ITU-T Recommendation Q.751.1 (1995): "Signalling System No.7 Managed Objects".

[13] ITU-T Recommendation Q.763 (1993): "Specifications of Signalling System No.7 - Formats and Codes of the ISDN User Part of Signalling System No.7".

[14] ITU-T Recommendation Q.823 (1996): "Stage 2 and Stage 3 function specifications for traffic management".

[15] ITU-T Recommendation Q.824.x (1995): "Stages 2 and 3 description for the Q3 interface - Customer administration - Integrated System Digital Network (ISDN) series".

[16] ITU-T Recommendation Q.850 (1993): "Usage of cause and location in the digital subscriber signalling system no 1 and the signalling system no 7 ISDN user part".

[17] ITU-T Recommendation Q.931 (1993): "Digital Subscriber Signalling System No. 1 (DSS 1) - ISDN user-network interface layer 3 specification for basic call control".

[18] ITU-T Recommendation X.720 (1992): "Information technology - Open Systems Interconnection - Structure of management information: management information model".

[19] ITU-T Recommendation X.721 (1992): "Information technology - Open Systems Interconnection - Structure of management information: definition of management information".

[20] ITU-T Recommendation X.746 (1995): "Information technology - Open Systems Interconnection - Systems management scheduling function".

3 Definitions and abbreviations

3.1 Definitions

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

call routing: The process consisting of digit rebuilding, destination selection, routing possibility selection and digit preparation.

circuit: Transmission means which allows communication between two exchanges (Same definition as in ITU-T Recommendation E.410 [6]).

circuit end point: Terminates a circuit.

circuit end point subgroup: Terminates a circuit subgroup or (second definition) a set of circuit end points with common characteristics, i.e. the same signalling characteristics, the same bearer capabilities and other characteristics. All circuits in a circuit end point subgroup shall connect the exchange with the same adjacent exchange.

circuit group: The set of all switched circuits which directly interconnect one exchange with another (same definition as in ITU-T Recommendation E.410 [6]).

circuit subgroup: A set of circuits within a circuit group which are uniquely identifiable for operational or technical reasons (i.e. because they have same signalling characteristics, same bearer capabilities or other common characteristics). A circuit group may consist of one or more circuit subgroups (same definition as in ITU-T Recommendation E.410 [6]).

destination: A country, an area, an exchange or other location, or a special service, in which a terminal point is located from an exchange point of view.

end point: A physical point in an exchange where any connection set-up inside an exchange starts or ends e.g. circuit end point, local destination.

exchange: The aggregate of traffic carrying devices, switching stages, controlling and signalling means at a network node that enables subscriber lines to be interconnected and/or packets to be forwarded as required by individual users.

routing: In the scope of the present document, it has the same meaning as call routing.

routing possibility: Abstraction of possible end points to which the call can be routed.

terminal point: Unique geographical address in a telecommunication network where a connection set-up leaves the network because of the conditions given by the connection set-up initiating subscriber and by the telecommunication network (e.g. subscriber line, PABX access, announcement machine, processor or bytes on a tape or on an optical disc).

treatment: The handling of calls in specific situations (e.g. routing to an announcement for incorrect dialled digits).

3.2 Abbreviations

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

ASN.1	Abstract Syntax Notation One
C5	Signalling System CCITT No.5
CAC	Carrier Access Code
CC	Country Code
CIC	Circuit Identification Code
CTM	Cordless Terminal Mobility
DN	Directory Number
DSS 1	Digital Subscriber Signalling System No. 1
E-R	Entity Relationship
FIFO	First In First Out
IN	Intelligent Network
IPI	ISDN Preferred Indicator
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
LIFO	Last In First Out
NDC	National Destination Code
OC	Object Class
ORM	Object Model for Call Routing Management
OS	Operations System
PABX	Private Automatic Branch Exchange
PCM	Pulse Code Modulation
PSTN	Public Switched Telephone Network
RDN	Relative Distinguished Name
R2	Regional Signalling 2
SCI	Subscriber Controlled Input
SMO	Scheduled Managed Object
SN	Subscriber Number
SO	Scheduler Object
SS No. 7	Signalling System Number 7
TMR	Transmission Medium Requirement
TNS	Transit Network Selection
TUP	Telephone User Part

4 Functional requirements

The Object Model for Call Routing Management (ORM) is a description of an interface which will be restricted by requirements. This clause gives the functional requirements of the routing process itself and will therefore have its influence on the ORM.

General Requirements

R.1 It is required to find the destination based on at least the digit code.

R.2 The routing process can be divided into several phases: digit rebuilding, destination selection, routing possibility selection, digit preparation, exception handling.

Digit Rebuilding

R.3 Digit rebuilding manages the insertion of digits into the digit code (e.g. for prefixing).

R.4 The model shall support digit rebuilding based on incoming circuit subgroup.

R.5 The model shall support digit rebuilding based on nature of address.

R.6 The model shall support digit rebuilding based on group of subscribers.

Destination Selection

R.7 The model shall support the translation of a digit code into a nature of address and vice versa.

R.8 The destination shall be determined by the dialled digits and, in addition, possibly by nature of address, selected carriers or others.

R.9 The model shall support modification of digit codes.

R.10 The model shall support treatment as result of destination selection.

R.11 The model shall support identification of the carrier.

R.12 The model shall support time dependent selection of destination.

R.13 The model shall support destination selection based on incoming circuit subgroup.

R.14 The model shall support destination selection based on group of subscribers.

Routing Possibility Selection

R.15 It shall be possible to handle a call as local or outgoing. Depending on special characteristics, a local call can be changed into an outgoing call in the routing sense. (e.g. a call arriving within the digital exchange will be routed to the PABX either directly or via the analogue exchange. See figure 1).

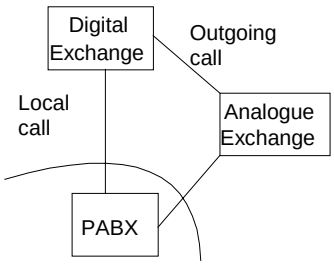


Figure 1: Local call vs outgoing call

R.16 Treatment is needed when certain routing possibility selection criteria are encountered (e.g. when an ISDN Preferred Indicator (IPI)/Transmission Medium Requirement (TMR) is not supported, an announcement has to be triggered).

R.17 Selection of routing possibility is influenced by parameters as signalling capability, bearer capability, presence of echo suppressor on outgoing circuit subgroup, number of satellite links, or others.

R.18 This distribution of traffic on different carriers/destinations has to be possible (by means of network providers or administration):

- on a percentage basis;
- on the proportion of the available outgoing capacity;
- on the proportion of the incoming traffic.

R.19 The model shall support crankback as described in ITU-T Recommendation E.170 [5].

R.20 The model shall support time dependent selection of routing possibility.

R.21 The model shall support routing possibility selection based on incoming circuit subgroup.

R.22 The model shall support routing possibility selection based on group of subscribers.

Digit Preparation

R.23 Digit preparation shall support modification of digit codes based on parameters as e.g. selected routing possibility, incoming or outgoing circuit subgroups.

R.24 The model shall support digit preparation based on incoming circuit subgroup.

R.25 The model shall support digit preparation based on group of subscribers.

Exception Handling

R.26 It shall be possible to associate a treatment with following exceptional conditions: missing database entry for call routing and cause value received during call routing (refer to ITU-T Recommendation Q.850 [16]).

5 Conformance

As a given routing scenario can generally be represented in several ways -as shown in the annexes-, it is possible to claim conformance to this model without having to support all OCs and possible relationships among them.

6 Information model

6.1 Information model overview

Because the routing function has grown independently of the switching systems, manufacturer specific characteristics are modelled optionally (i.e. with conditional packages).

In order to describe the management aspects of routing, the routing function has been divided into four parts:

1) The translation of incoming dialled digits so that they can be processed by digit analysis.

2) The identification of the destination is made by analysis of the digit codes and by means of other information.

3) The selection of a free circuit within a set of suitable circuits on which the call may be progressed. In case the destination is inside the exchange the appropriate terminal point(s) has to be selected.

4) The preparation of the digit string before it is sent to the next exchange.

Exceptional (and error) cases are treated by a fifth part.

Accordingly, five fragments were defined as:

6.1.1 Digit rebuilding fragment

Digit rebuilding is an activity on incoming digits.

It is possible that digits shall be added to or withdrawn from the original digits before analysis. As an example, this is sometimes necessary if R2 signalling is used.

With digit rebuilding the offered digits themselves can be modified. Examples where this can occur are service numbers, emergency numbers.

6.1.2 Destination selection fragment

Other information of the call, combined with the digit codes is obtained in order to determine the call destination.

Information, similar to signalling system call parameters, is stored in an exchange and grouped, so that calls matching these parameters will all be routed to the same destination or handled by alternative actions like announcements. Additionally, for locally originating calls also the nature of address and the called numbering plan might be determined for signalling systems which require this.

6.1.3 Routing possibility selection fragment

For circuit selection, management aspects are covered to correlate destination and additional information with a suitable set of circuits. This correlation includes the traffic assignment rules to circuits within the possible set.

6.1.4 Digit preparation fragment

Digit preparation is an activity on outgoing digits. After selection of a free circuit, digit code might need to be prepared for the adjacent exchange.

6.1.5 Exception handling fragment

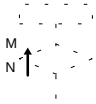
Exception handling associates a treatment with following exceptional conditions: missing database entry for call routing and cause value received during call routing.

6.2 Information model diagrams

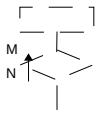
The following information model diagrams have been drawn for the purpose of clarifying the relations between the different OCs of routing management. Three types of diagrams are presented:

- entity Relationship (E-R) Relationship diagrams, showing relations between the different OCs;
- naming hierarchy showing the derivations of names for managed objects (i.e. the different naming paths for instances of managed objects);
- inheritance hierarchy diagram.

Legend:

- Classes and relation in dotted lines 

mean that the class or relation do not belong to this fragment. The functionality represented by it, is covered in another fragment.

- Classes and relation in dashed lines 

mean that the class or relation do not belong to this document. The functionality represented is covered in another standard.

- Relationship cardinality is normally N -> M with N an integer (0..) and M an integer (1..). Other cases are explicitely specified.

- OR means that any or all branches can be present; XOR means that exactly one branch can be present.

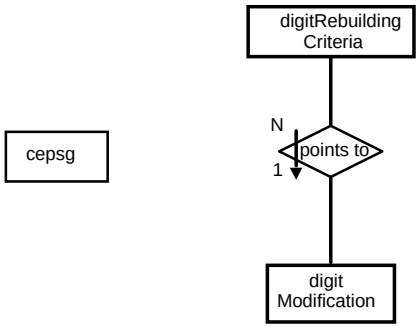
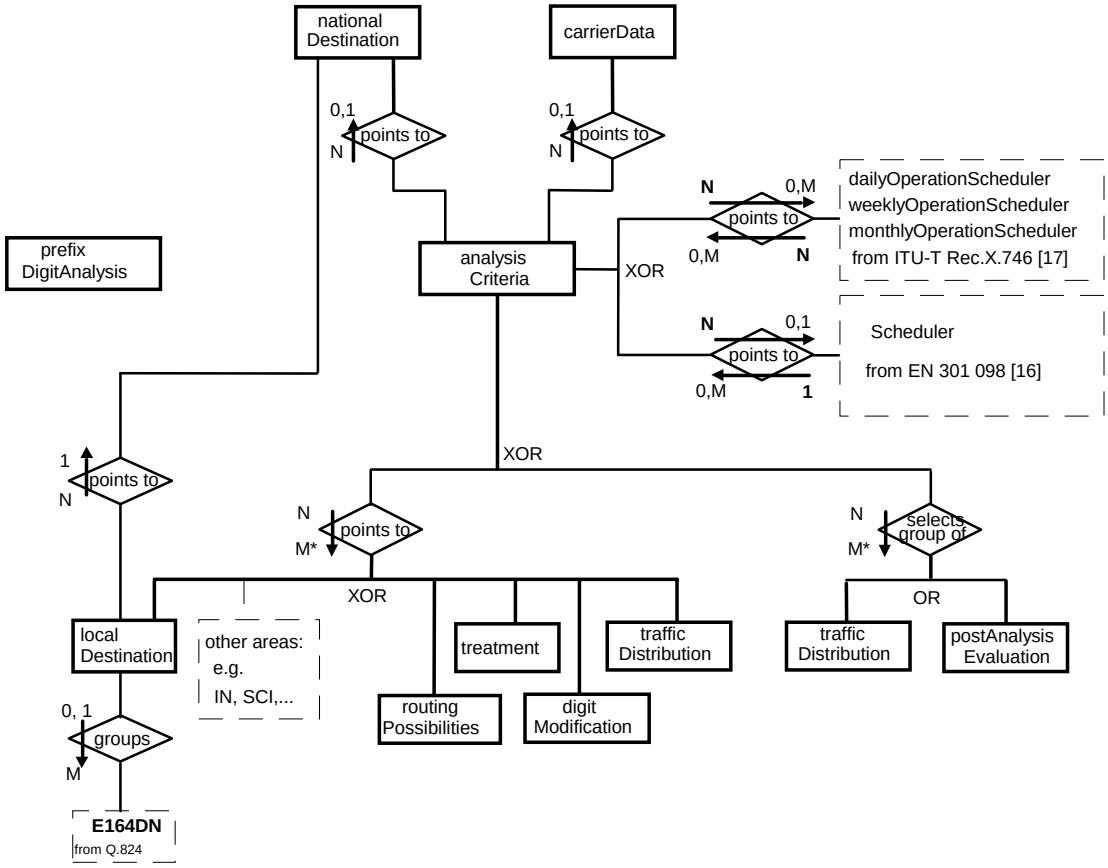
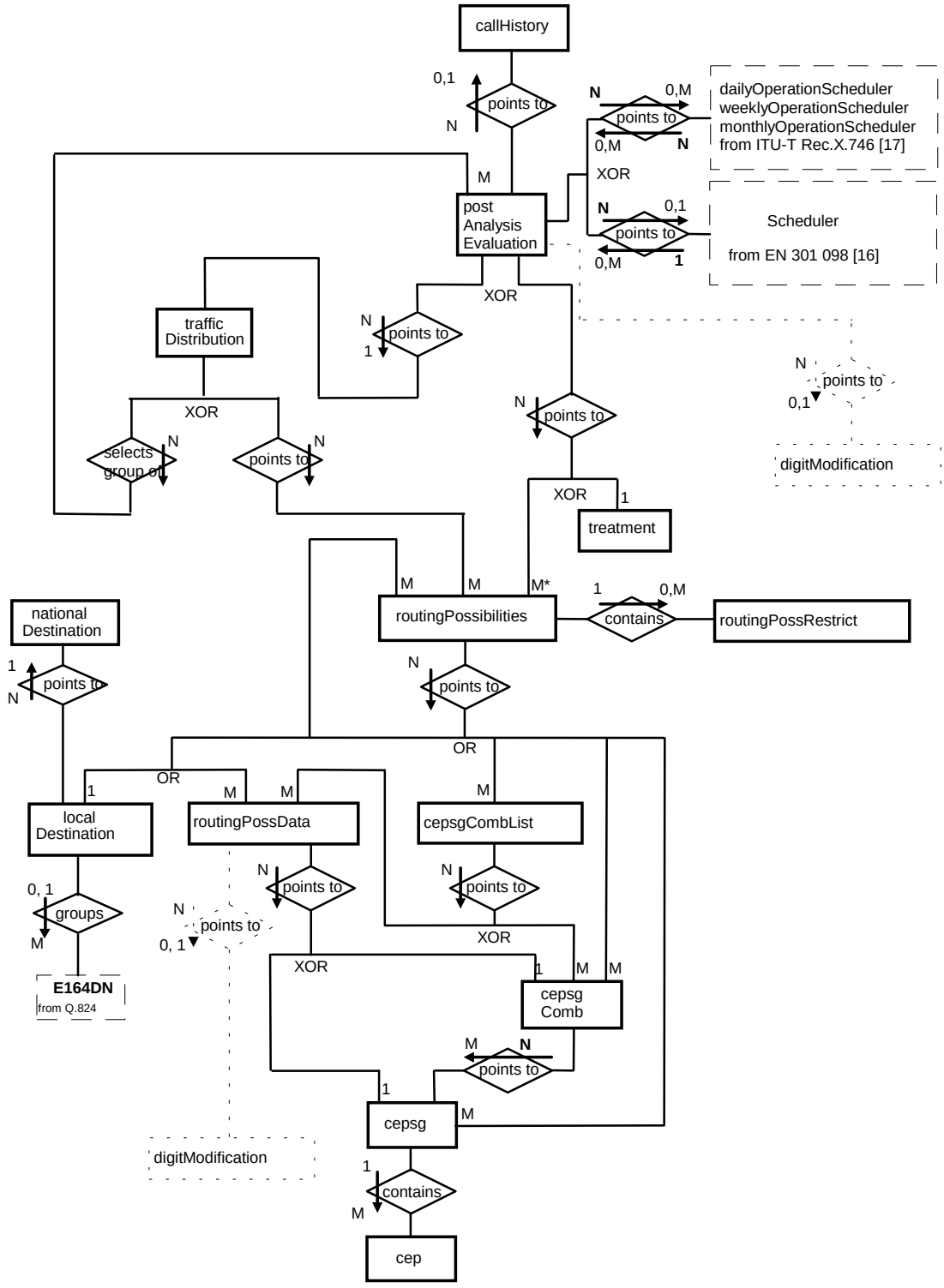


Figure 2 (E-R Diagram): Digit rebuilding fragment



* : M-cardinality because of Time scheduling;
Without Time scheduling: M=1

Figure 3 (E-R Diagram): Destination selection fragment



*: M cardinality because of Time scheduling
Without Time scheduling: M=1

Figure 4 (E-R Diagram): Routing possibility selection fragment

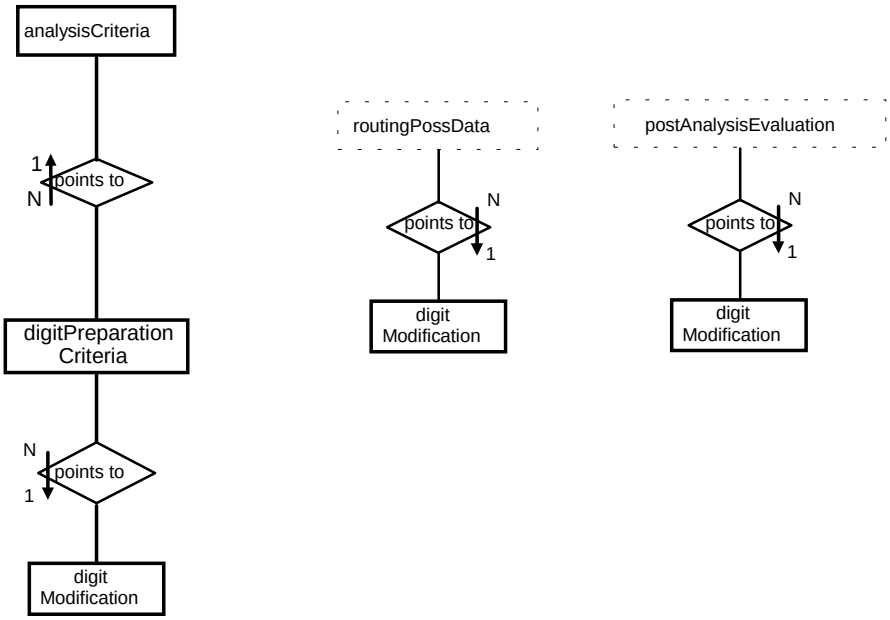


Figure 5 (E-R Diagram): Digit preparation fragment.

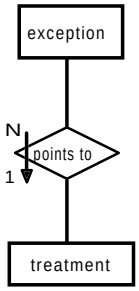


Figure 6 (E-R Diagram): Exception handling fragment

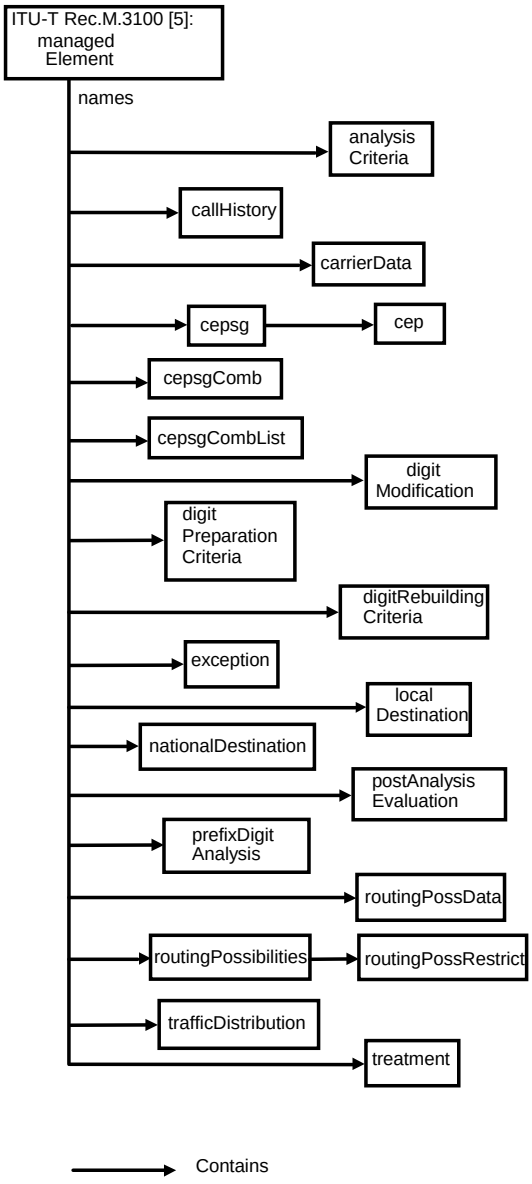


Figure 7: Naming relations

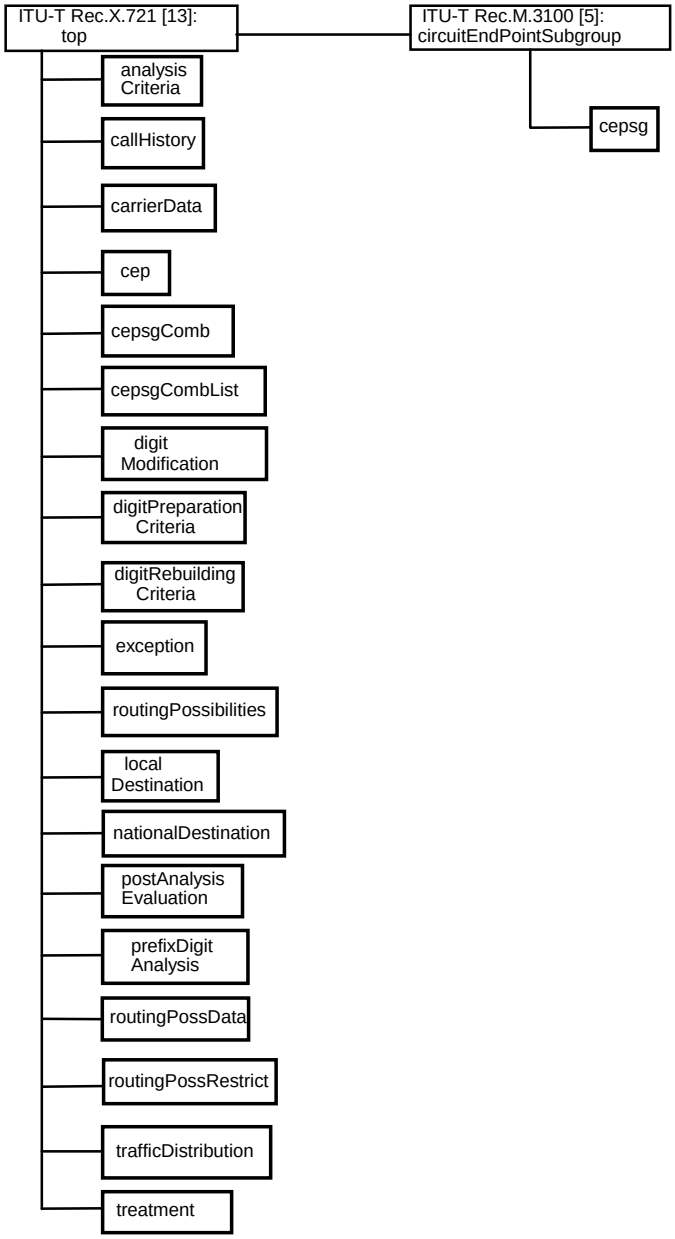


Figure 8: Inheritance tree

7 Information model description

In this clause the OCs of the information model are described. For OCs description the following table is used.

Table 1: OC's generic description

Object Class: "Object class name"			
Attributes	M/C	Value Set	Operation
Actions	M/C		
Notifications	M/C		

The column M/C indicates whether the information presented by the attributes/actions/notifications is mandatory(M) or conditional(C).

The column "Value Set" indicates whether the attribute is single-valued or set-valued (see ITU-T Recommendation X.720 [18], subclause 5.1.2.2).

The column "Operation" indicates the operations possible on the attribute.

Combination of key-attributes value shall be unique among all instances of a given OC. An asterisque '*' following an attribute name indicates a key attribute.

Important notice:

The conflict resolution that shall occur when several instances of a given OC match a specific call is out of the scope of the present document.

7.1 analysisCriteria

The OC analysisCriteria describes the management information needed to make a selection among possible destinations.

For certain calls, e.g. service numbers and originating calls of virtual private networks, it is possible that initial digits need to be modified before the destination can be identified. The destination associated with this new digit string can then be determined by another instance of OC analysisCriteria.

Table 2: AnalysisCriteria description

Object Class: analysisCriteria			
Attributes	M/C	Value Set	Operation
analysisCriteriaId	M	Single	GET
destinationCode*	M	Single	GET-REPLACE
analysisOrigin*	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
activeDestination	M	Single	GET SET-BY-CREATE
	C		REPLACE
callingPartyCategory*	C	Single	REPLACE-WITH-DEFAULT GET-REPLACE
nationalDestinationInstance*	C	Single	GET SET-BY-CREATE
destinationType*	C	Single	GET SET-BY-CREATE
extSchedulingAttribute	C	Set	GET-REPLACE ADD-REMOVE
"ITU-T Recommendation X.746 [20]": externalSchedulerName	C	Single	GET-REPLACE
numberOfDigits*	C	Single	GET SET-BY-CREATE
carrierDataInstance*	C	Single	GET SET-BY-CREATE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC analysisCriteria:

- analysisCriteriaId;

  This attribute is the object identifier attribute (Relative Distinguished Name (RDN)) of OC analysisCriteria.

- destinationCode;

  This attribute characterizes a destination by specifying the Country Code (CC), or/and area code, or/and exchange identifying code, or/and individual line number etc. to which the call can be routed.

- analysisOrigin;

  This attribute identifies the originForAnalysis group value.originForAnalysis can be defined in e.g. incoming or two-ways cepsg or in subscriber data as described in Customer Administration Model. An instance of the OC analysisCriteria being independent of the analysis origin gets the value anyOrigin.

- activeDestination;

  This attribute either references an object instance or selects a group of instances via a label. If scheduling is supported, then this attribute contains the target, which is currently selected by the Scheduler Object (SO). This attribute is read only in case of a scheduler being connected, otherwise read/write.

- callingPartyCategory;

This attribute identifies the calling party category (according ITU-T Recommendation Q.763 [13] or ITU-T Recommendation Q.440 [10], ITU-T Recommendation Q.441 [11]) which have to be considered for routing purposes. Calling party categories include operator, test or normal subscriber call.

- nationalDestinationInstance;

  This attribute identifies the instance of OC nationalDestination which is applicable if the destinationCode value has to be assigned unambiguously to a national destination.

- destinationType;

  This attribute indicates the type of destination.

- extSchedulingAttribute;

  This attribute provides the scheduling information in the Scheduled Managed Object (SMO), if external scheduling is supported as in EN 301 098 [3].

- externalSchedulerName;

  This attribute is used in the SMO for referencing the external SO's. (see ITU-T Recommendation X.746 [20])

- numberOfDigits;

  This attribute indicates the number of digits in the digit string. The existence of multiple analysisCriteria instances with different values for this attribute allows the administration of variable length digit strings that shall be routed to the same destination. It also allows the specification of a destination that depends not only on the leading digits as indicated in the attribute destinationCode, but also on the length of the digit string. In this way digit strings with identical leading digits, but with different lengths can be routed to different destinations.

  When a specific number of digits is specified, this number cannot be smaller than the number of digits in the digit string as specified in the destinationCode attribute.

- carrierDataInstance.

  This attribute allows the selection of destinations depending on the dialled or assigned carrier code of the call.

7.2 callHistory

This OC describes criteria and/or restrictions related to the history of a call, e.g. the number of satellite links. It can be used, for example, to restrict the propagation delay.

Table 3: callHistory description

Object Class: callHistory			
Attributes	M/C	Value Set	Operation
callHistoryId	M	Single	GET
echoSuppressor*	C	Single	GET-REPLACE
numberOfSatLinks*	C	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": createDeleteNotificationsPackage	M		
"ITU-T Recommendation M.3100 [8]": attributeValueChangeNotificationPackage	C		

The following attributes describe the OC callHistory:

- callHistoryId;

  This attribute is the object identifier attribute (RDN) of OC callHistory.

- echoSuppressor;

  This attribute reflects whether an echo suppressor is required or not depending on whether an echo suppressor has already been included. If an echo suppressor is required, then cepsgs of suitable capability need to be identified, if the exchange does not provide the use of echo control devices inserted from a common pool (see ITU-T Recommendation Q.115 [9]).

- numberOfSatLinks.

  This attribute represents the number of satellite links in the history of the call. The number of hops allowed for a certain call can be limited. In general, the limitation values for telephony are zero or one, for data no limitations are present.

7.3 carrierData

This OC represents -via the carrier code- carriers that can be used in the exchange for call routing purposes.

Table 4: carrierData description

Object Class: carrierData			
Attributes	M/C	Value Set	Operation
carrierDataId	M	Single	GET
carrierCode*	M	Single	GET SET-BY-CREATE
ownCac	M	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC carrierData:

- carrierDataId;

  This attribute is the object identifier attribute (RDN) of OC carrierData.

- carrierCode;

  This attribute describes the unambiguous carrier specific code that identifies a carrier. It can be dialled by a subscriber or supplied by the exchange.

- ownCac.

  This attribute describes whether the Carrier Access Code (CAC) identifies the network where the exchange is located.

7.4 cep

This OC describes a circuit end point.

One cep belongs only to one set of circuit end points, the cepsg (circuit end point subgroup).

Table 5: cep description

Object Class: cep			
Attributes	M/C	Value Set	Operation
cepId	M	Single	GET
"ITU-T Recommendation X.721 [19]": administrativeState	M	Single	GET-REPLACE
ctpbInstance*	M	Single	GET SET-BY-CREATE
circuitNumber	M	Single	GET SET-BY-CREATE
officeEquipment*	C	Single	GET SET-BY-CREATE
cic	C	Single	GET SET-BY-CREATE
Notifications			
"ITU-T Recommendation M.3100 [8]": createDeleteNotificationsPackage	M		
"ITU-T Recommendation X.721 [19]": stateChange	M		

The following attributes describe the OC cep:

- cepId;

  This attribute is the object identifier attribute (RDN) of OC cep.

- administrativeState;

  This attribute indicates whether the circuit end point subgroup is administratively permitted to carry traffic (value 'unlocked') or not (value 'locked').

- ctpbInstance;

  This attribute points to an instance of OC "ITU-T Recommendation M.3100 [8]": connectionTerminationPointBidirectional which has the channelNumber attribute.

- circuitNumber;

  This attribute indicates the logical circuit end point number within the containing circuit end point subgroup.

- officeEquipment;

  This attribute references the physical equipment the circuit end point is associated with. If the inst choice is used, it references an instance of OC "ITU-T Recommendation M.3100 [8]": circuitPack. If the string choice is used, the value is technology specific.

- cic.

  This attribute indicates the Circuit Identification Code (CIC) of the circuit which is terminated by the circuit end point. This attribute is applicable if SS No. 7 is used.

7.5 cepsg

This OC represents a circuit end point subgroup. An instance of cepsg has directionality one-way incoming, one-way outgoing or two-way. This OC is in fact a subclass of OC circuitEndPointSubgroup registered in ITU-T Recommendation M.3100 [8] as M3100ObjectClass 31.

Table 6: cepsg description

Object Class: cepsg			
Attributes	M/C	Value Set	Operation
"ITU-T Recommendation M.3100 [8]": transmissionCharacteristics	M	Single	REPLACE
"ITU-T Recommendation M.3100 [8]": labelOfFarEndExchange	M	Single	REPLACE
"ITU-T Recommendation X.721 [19]": administrativeState	M	Single	GET-REPLACE
assocSignRouteSetNePart	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
boundaryCrossing	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
prefixDigits	C	Single	REPLACE-WITH-DEFAULT GET-REPLACE
searchMethod	C	Single	GET-REPLACE
originForRebuilding	C	Single	GET-REPLACE
originForAnalysis	C	Single	GET-REPLACE
originForRouting	C	Single	GET-REPLACE
originForPreparation	C	Single	GET-REPLACE
termForPreparation	C	Single	GET-REPLACE
languageDigitProc	C	Single	REPLACE-WITH-DEFAULT GET-REPLACE
prefTrafficDirect	C	Single	GET-REPLACE
suppressOwnCac	C	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation X.721 [19]": stateChange	M		

The following attributes describe the OC cepsg:

- transmissionCharacteristics;

  This attribute is inherited from OC "ITU-T Recommendation M.3100 [8]": circuitEndPointSubgroup. Operation REPLACE is added here.

- labelOfFarEndExchange;

  This attribute is inherited from OC "ITU-T Recommendation M.3100 [8]": circuitEndPointSubgroup. Operation REPLACE is added here.

- administrativeState;

  This attribute - defined in ITU-T Recommendation X.721 [19] - indicates whether the circuit end point subgroup is administratively permitted to carry traffic (value 'unlocked') or not (value 'locked').

- assocSignRouteSetNePart;

  This attribute references a sigSetNePart instance (ITU-T Recommendation Q.751.1 [12]) which represents the signalling point of the adjacent exchange connected by the cepsg. The attribute references no object instance (default value) for non SS No.7 procedures.

- boundaryCrossing;

  This attribute indicates whether the circuit end point subgroup contains only circuit end points terminating circuits which cross international or organisational boundaries. The default value is 'national'.

- prefixDigits;

This attribute defines the digit string which has to be inserted in front of the destination code arriving at the exchange. An empty digit string, which is the default value, means that no digits have to be inserted. The attribute is only applicable for circuit end point subgroups which have directionality incoming or two-way.

- searchMethod;

  The attribute is applicable if the circuit end point subgroup has directionality one-way outgoing or two-way.

  This attribute describes the method to select idle circuits within a circuit end point subgroup. The following algorithms are defined for that purpose:

  - **fifoEvenElseLifoOdd**: The idle circuits are distributed in two lists. One list contains only idle circuits with even CICs, the other list contains only idle circuits with odd CICs. The circuits of the even CIC list are first choice, the circuits of the odd CIC list are selected if the even CIC list is empty. The First In First Out (FIFO) method is used for the even CIC list, the Last In First Out (LIFO) method is used for the odd CIC list.

  - **fifoOddElseLifoEven**: The idle circuits are distributed in two lists. One list contains only idle circuits with even CICs, the other list contains only idle circuits with odd CICs. The circuits of the odd CIC list are first choice, the circuits of the even CIC list are selected if the odd CIC list is empty. The FIFO method is used for the odd CIC list, the LIFO method is used for the even CIC list.

  - **fifoEvenGrpElseLifoOddGrp** (for Pulse Code Modulation (PCM) 30 circuits): The idle circuits are distributed in two lists. One list contains only idle circuits with an even value of the integer part of the expression CIC divided by 16, the other list contains only idle circuits with an odd value for the integer part of the expression CIC divided by 16. The circuits of the even group CIC list are first choice, the circuits of the odd group CIC list are selected if the even group CIC list is empty. The FIFO method is used for the even group CIC list, the LIFO method is used for the even group CIC list.

  - **fifoOddGrpElseLifoEvenGrp** (for PCM 30 circuits): The idle circuits are distributed in two lists. One list contains only idle circuits with an even value of the integer part of the expression CIC divided by 16, the other list contains only idle circuits with an odd value for the integer part of the expression CIC divided by 16. The circuits of the odd group CIC list are first choice, the circuits of the even group CIC list are selected if the odd group CIC list is empty. The FIFO method is used for the odd group CIC list, the LIFO method is used for the even group CIC list.

  - **fifo**: This algorithm uses only one list for the idle circuits. The FIFO method is used to select the circuits.

  - **forwardSequential**: This algorithm selects the idle circuit with the lowest circuit/CIC number.

  - **backwardSequential**: This algorithm selects the idle circuit with the highest circuit/CIC number.

  - **forwardOddElseBackwardEven**: This algorithm selects the idle circuit with the lowest odd circuit/CIC number. If no idle circuit with an odd circuit/CIC number is available, it selects the idle circuit with the highest even circuit/CIC number.

  - **forwardEvenElseBackwardOdd**: This algorithm selects the idle circuit with the lowest even circuit/CIC number. If no idle circuit with an even circuit/CIC number is available, it selects the idle circuit with the highest odd circuit/CIC number.

  - **forwardCyclic**: This algorithm selects the idle circuit with the lowest circuit/CIC number that is larger than the circuit/CIC number of the previously selected circuit. If no such idle circuit exists, it selects the idle circuit/CIC with the lowest circuit/CIC number that is less than the circuit/CIC number of the previously selected circuit.

  - **backwardCyclic**: This algorithm selects the idle circuit with the highest circuit/CIC number that is less than the circuit/CIC number of the previously selected circuit. If no such idle circuit exists, it selects the idle circuit/CIC with the highest circuit/CIC number that is larger than the circuit/CIC number of the previously selected circuit.

  - **random**: This algorithm selects an idle circuit at random.

- originForRebuilding, originForAnalysis, originForRouting, originForPreparation;

These attributes are applicable if the circuit end point subgroup has directionality incoming or two-way. They represent the origin groups to which circuit end point subgroups belong to. This grouping can influence digit rebuilding, digit analysis, call routing, digit preparation, respectively.

- termForPreparation;

  This attribute is applicable if the circuit end point subgroup has directionality outgoing or two-way. It represents the group to which circuit end point subgroup belong to. This grouping can influence digit preparation.

- languageDigitProc;

  This attribute indicates whether the language digit has to be extracted from the transmitted digit string for incoming calls and has to be included into the transmitted digit string for outgoing calls on the position specified by the signalling systems R2 or C5 for international transit or terminating traffic. The default value is FALSE. The attribute is applicable if one of these signalling systems is used.

- prefTrafficDirect;

  This attribute specifies for circuit end point subgroups with directionality two-way the preferred traffic direction in case of seizure conflicts. If two exchanges at the end of a circuit subgroup try to seize the same circuit, then this attribute determines how to resolve the conflict.

  - incoming: the incoming seizure is preferred for this circuit endpoint subgroup;

  - outgoing: the outgoing seizure is preferred for this circuit endpoint subgroup;

  - outgoingFirstChoiceList: the outgoing seizure is preferred for this circuit endpoint subgroup, if the seizure is performed on a circuit endpoint of the first choice list. This value can only be used if the attribute searchMethod indicates an algorithm that uses a first choice list.

  Otherwise the incoming seizure is preferred.

- suppressOwnCac.

  This attribute describes whether the own CAC shall be suppressed; i.e. whether the Transit Network Selection (TNS) parameter will be suppressed and/or whether CAC will be taken out of digit string. This attribute is applicable if the possibility to administer suppression of own carrier codes has to be provided and if the circuit end point subgroup has directionality one-way incoming or two-way.

7.6 cepsgComb

This OC describes a set of cepsgs for which a certain algorithm is used to assign traffic to a circuit end point subgroup (of the traffic offered to the set). This includes the detailed information how the traffic is distributed over the elements in the set. The instances of the OC cepsg, which are used in an instance of the OC cepsgComb can be of different characteristics, but shall be of the directionality outgoing or two-way.

Three algorithms are identified to assign traffic to the set of cepsgs:

- the sequential algorithm;

  For the sequential algorithm, the cepsgs are ordered in a list. The sequential algorithm starts searching for an available cepsg always at the first element of the list.

- the cyclic algorithm;

  For the cyclic algorithm the cepsgs are also ordered in a list. The cyclic algorithm remembers the cepsg found in the previous search (for another call) and starts searching for an available cepsg beginning with the next element in the list.

- the "proportional bidding" algorithm.

  Traffic is distributed over "rows" according to a certain assigned percentage. Every "row" consists of cepsgs of an ordered list. If a call is assigned to a "row", then the search for an available cepsg will be done in a sequential way within the ordered list (see table 7). The sum of "rows" percentage shall be 100 %.

Table 7: Example of proportional bidding

ROW: percentage	cepsgCombSelection ----> descending "priority"
"ROW 1": 50 %	cepsgId="a", cepsgId="c", cepsgId="f"
"ROW 2": 30 %	cepsgId="f", cepsgId="g", cepsgId="i"
"ROW 3": 20 %	cepsgId="c", cepsgId="i", cepsgId="g"

It is also possible that each row consists of a list of all the cepsgIds of the cepsgComb but each time in a shifted permutation (see table 8), or with a common overflow (see table 9).

Table 8: Example of proportional bidding with overflow

ROW:percentage	cepsgCombSelection ----> descending "priority"
"ROW 1": 50 %	cepsgId="a", cepsgId="c", cepsgId="f"
"ROW 2": 30 %	cepsgId="c", cepsgId="f", cepsgId="a"
"ROW 3": 20 %	cepsgId="f", cepsgId="a", cepsgId="c"

Table 9: Example of proportional bidding with common overflow

ROW:percentage	cepsgCombSelection ----> descending "priority"
"ROW 1": 50 %	cepsgId="a", cepsgId="d", cepsgId="e"
"ROW 2": 30 %	cepsgId="b", cepsgId="d", cepsgId="e"
"ROW 3": 20 %	cepsgId="c", cepsgId="d", cepsgId="e"

Table 10: cepsgComb description

Object Class: cepsgComb			
Attributes	M/C	Value Set	Operation
cepsgCombId	M	Single	GET
cepsgCombSelection	M	Set/Single	GET-REPLACE
usedAlgorithm	M	Single	GET-REPLACE
"ITU-T Recommendation M.3100 [8]": userLabel	C	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC cepsgComb:

- cepsgCombId;

  This attribute is the object identifier attribute (RDN) of OC cepsgComb.

- cepsgCombSelection;

  If the sequential or cyclic algorithms are used, this attribute gives the ordered list of cepsgs belonging to this cepsgComb. If the proportional bidding algorithm is used, this attribute gives the percentage value and the ordered cepsg list, for every "row".

- usedAlgorithm;

  This attribute describes the algorithm that is used: sequential, cyclic or proportional bidding.

- userLabel.

  This attribute assigns a user friendly name to a cepsgComb object instance. This attribute is defined in ITU-T Recommendation M.3100 [8] subclause 5.54.

7.7 cepsgComblist

This OC describes a set of instances of OC cepsgComb or routingPossData for which a certain algorithm is used to assign traffic to a member of the set.

Table 11: cepsgComblist description

Object Class: cepsgCombList			
Attributes	M/C	Value Set	Operation
cepsgCombListId	M	Single	GET
cepsgCombListSelection	M	Set/Single	GET-REPLACE
usedAlgorithm	M	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC cepsgCombList:

- cepsgCombListId;

  This attribute is the object identifier attribute (RDN) of OC cepsgCombList.

- cepsgCombListSelection;

  This attribute gives a list of instances on which the selection algorithm found in the attribute usedAlgorithm is to apply. These instances can be instances of OC routingPossData or of OC cepsgComb.

- usedAlgorithm.

  This attribute describes the algorithm that is used: sequential, cyclic or proportional bidding.

7.8 digitModification

The OC digitModification defines how a sequence of digits is to be modified. The cases in which the sequence of digits is to be modified are described by the OCs digitRebuildingCriteria, routingPossData, analysisCriteria, postAnalysisEvaluation and digitPreparationCriteria.

Digit codes modification triggered by instances of OC digitRebuildingCriteria is used, for example, to insert digits into the digit string, which arrives at the exchange, and so to define a new digit sequence. The new digit sequence is used as input for the OC analysisCriteria.

For the OCs analysisCriteria and postAnalysisEvaluation, digit string modification is used, for example, to replace or suppress digits. If necessary, the resulting digit string can be further analysed to determine the ultimate destination.

For the OCs digitPreparationCriteria and routingPossData, the digits can be prepared before they are sent to the next (adjacent) exchange.

Table 12: digitModification description

Object Class: digitModification			
Attributes	M/C	Value Set	Operation
digitModificationId	M	Single	GET
digitSuppress	M	Set	GET-REPLACE ADD-REMOVE
digitCombReplace	M	Set	GET-REPLACE ADD-REMOVE
digitCombInsert	M	Set	GET-REPLACE ADD-REMOVE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC digitModification:

- digitModificationId;

  This attribute is the object identifier attribute (RDN) of OC digitModification.

- digitSuppress, digitCombReplace, digitCombInsert.

  These three attributes define which sequence of digits needs to be suppressed, to be replaced (and by which digit string) or to be inserted (and at which position in the digit string), respectively.

  All three attributes work independently on the same digit string, that has to be modified. Therefore, no precedence is defined for suppression, replacement and insertion. Each attribute is set-valued in order to allow multiple operations of the same kind on the same digit string. Double insertion at one position is not allowed. For the replace and suppress activities, the integer value of the endPosition shall be greater than the startPosition.

7.9 digitPreparationCriteria

The OC digitPreparationCriteria provides the management information for digit preparation for the next exchange. If the attributes preparationOrigin, preparationTerm, analysisCriteriaInstance match with information from a call then the identified instance of OC digitModification is applicable.

Table 13: digitPreparationCriteria description

Object Class: digitPreparationCriteria			
Attributes	M/C	Value Set	Operation
digitPreparationCriteriaId	M	Single	GET
preparationOrigin*	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
preparationTerm*	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
analysisCriteriaInstance*	M	Single	GET-REPLACE
digitModificationInstance	M	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC digitPreparationCriteria:

- digitPreparationCriteriaId;

  This attribute is the object identifier attribute (RDN) of OC digitPreparationCriteria.

- preparationOrigin;

  This attribute identifies a group of instances of the OC cepsg (directionality: incoming or two-way) or of subscribers. The corresponding grouping attribute in OC cepsg is originForPreparation. The corresponding grouping attribute for subscribers is the responsibility of customer administration area. An instance of the OC digitPreparationCriteria that is independent of the digit preparation origin gets the default value anyOrigin.

- preparationTerm;

  This attribute identifies a group of instance of the OC cepsg (directionality: outgoing or two-way) or of subscribers. The corresponding grouping attribute in OC cepsg is termForPreparation. The corresponding grouping attribute for subscriber is the responsibility of customer administration area. An instance of the OC digitPreparationCriteria that is independent of the digit preparation termination gets the default value anyTerm.

- analysisCriteriaInstance;

  This attribute indicates the instance of OC analysisCriteria which has to match.

- digitModificationInstance.

  This attribute identifies the instance of OC digitModification which is applicable if key-attributes match with call information.

7.10 digitRebuildingCriteria

The OC digitRebuildingCriteria provides management information for the digit code rebuilding process before the digits are analysed by OC analysisCriteria. This part of the digit rebuilding is independent of incoming digits.

If information, extracted from a call, matches with the attributes rebuildingOrigin, natureOfAddress and calledNumberingPlan then the digit codes will be modified according to the instance of OC digitModification, addressed by the attribute digitModificationInstance.

Table 14: digitRebuildingCriteria description

Object Class: digitRebuildingCriteria			
Attributes	M/C	Value Set	Operation
digitRebuildingCriteriaId	M	Single	GET
rebuildingOrigin*	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
natureOfAddress*	M	Single	GET-REPLACE
calledNumberingPlan*	M	Single	GET-REPLACE
digitModificationInstance	M	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC digitRebuildingCriteria:

- digitRebuildingCriteriaId;

  This attribute is the object identifier attribute (RDN) of OC digitRebuildingCriteria.

- rebuildingOrigin;

  This attribute identifies a group of instances of the OC cepsg (directionality: incoming or two-way) or of subscribers. The corresponding grouping attribute in OC cepsg is originForRebuilding. The corresponding grouping attribute for subscribers is the responsibility of customer administration area. An instance of the OC digitRebuildingCriteria that is independent of the digit rebuilding origin gets the default value anyOrigin.

- natureOfAddress;

  This attribute identifies the natureOfAddress that has to be considered for digit rebuilding process. Possible values are defined by ITU-T Recommendation Q.763 [13] (e.g. national, international or local).

- calledNumberingPlan;

  This attribute identifies the value of called numbering plan that has to be considered for digit rebuilding process. Possible values are defined by ITU-T Recommendation Q.763 [13] (e.g. Integrated Services Digital Network (ISDN)/Public Switched Telephone Network (PSTN), data, telex, and operator specific values).

- digitModificationInstance.

  This attribute identifies the instance of OC digitModification which is applicable if key-attributes match with call information.

7.11 exception

The OC exception provides management information to handle exception situations (e.g. of call routing). It applies if:

- a particular instance of an OC is required but not available;

  The specific OC type is given by the attribute matchesIf. In case of successful routing the OC exception will not be used.

- a particular cause value is received or generated.

  The specific cause is given by the attribute matchesIf and has been defined in the Cause Indicator Field defined in ITU-T Recommendation Q.850 [16].

Table 15: Exception description

Object Class: exception			
Attributes	M/C	Value Set	Operation
exceptionId	M	Single	GET
matchesIf*	M	Set	GET-REPLACE ADD-REMOVE
treatmentInstance	M	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC exception:

- exceptionId;

  This attribute is the object identifier attribute (RDN) of OC exception.

- matchesIf;

  This attribute gives the cause values and/or the OC types for which the instance of OC exception is applicable. A particular cause value or OC type shall not appear in different instances of the OC exception.

- treatmentInstance.

  This attribute identifies the treatment which applies if an instance of this OC matches.

7.12 localDestination

The OC localDestination represents the grouping of DNs of an exchange (e.g. DNs of local subscribers, PABXs).

Table 16: localDestination description

Object Class: localDestination			
Attributes	M/C	Value Set	Operation
localDestinationId	M	Single	GET
nationalDestinationInstance	M	Single	GET SET-BY-CREATE
initialSubscriberCodes	M	Single	GET-REPLACE
excludedSubscriberCodes	C	Set	GET-REPLACE ADD-REMOVE
Actions			
modifyNumberingScheme	M		
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC localDestination:

- localDestinationId;

  This attribute is the object identifier attribute (RDN) of OC localDestination.

- nationalDestinationInstance;

  This attribute identifies the instance of OC nationalDestination which is applicable.

- initialSubscriberCodes;

  This attribute contains the codes, which characterize the initial digits of a Subscriber Number (SN) (refer to ITU-T Recommendation E.164 [4]).

  A DN belongs to this local destination,

  - if the DN is member of the local area defined by the nationalDestinationInstance;

  - if an initial digit string part of the SN part of the DN (SN part see ITU-T RecommendationE.164 [4]) matches with one of the codes of this attribute;

  - if it is not excluded by attribute excludedSubscriberCodes.

- excludedSubscriberCodes.

This attribute is present if it is necessary to exclude DNs from the local destination. It contains the codes, which characterize the initial digits of a SN (refer to ITU-T Recommendation E.164 [4]). It is possible to specify with this attribute entire SNs explicitly or only initial strings of SNs.

A DN is excluded from this local destination:

- if the DN is member of the local area defined by the nationalDestinationInstance attribute; and
- if an initial digit string part of the SN part of the DN matches with one of the codes of this attribute (excludedSubscriberCodes).

The following action is defined for the OC localDestination:

- modifyNumberingScheme.

  This action operation modifies data of OC localDestination instance and the DN instances which belong to it. This action does not change the implicit relationship between the DNs and the local destination: a DN that belonged/did not belong to the local destination before the action belongs/does not belong to it after the action is executed on the localDestination instance.

7.13 nationalDestination

The OC nationalDestination describes the national destinations codes (refer to ITU-T Recommendation E.164 [4]) that are supported in the exchange.

Table 17: nationalDestination description

Object Class: nationalDestination			
Attributes	M/C	Value Set	Operation
nationalDestinationId	M	Single	GET
nationalDestinationCode*	M	Single	GET SET-BY-CREATE
Notifications			
"ITU-T Recommendation M.3100 [8]": createDeleteNotificationsPackage	M		

The following attributes describe the OC nationalDestination:

- nationalDestinationId;

  This attribute is the object identifier attribute (RDN) of OC nationalDestination.

- nationalDestinationCode.

  This attribute describes a National Destination Code (NDC).

7.14 postAnalysisEvaluation

The OC postAnalysisEvaluation evaluates additional call characteristics to the ones analysed in the OC analysisCriteria.

Table 18: postAnalysisEvaluation description

Object Class: postAnalysisEvaluation			
Attributes	M/C	Value Set	Operation
postAnalysisEvaluationId	M	Single	GET
destinationGroupLabel*	M	Single	GET-REPLACE
callHistoryInstance*	M	Single	GET-REPLACE
routingOrigin*	M	Single	REPLACE-WITH-DEFAULT GET-REPLACE
callingPartyCategory*	C	Single	GET-REPLACE
reqBearerCapability*	C	Single	GET-REPLACE
reqSignCapability*	C	Single	GET-REPLACE
digitModificationInstance	C	Single	GET-REPLACE
trafficDistributionInstance	C	Single	GET-REPLACE
schedulingAttribute	C	Set	GET-REPLACE ADD-REMOVE
"ITU-T Recommendation X.746 [20]": externalSchedulerName	C	Single	GET-REPLACE
activeRoutingPossibilities	C	Single	GET
	C		REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC postAnalysisEvaluation:

- postAnalysisEvaluationId;

  This attribute is the object identifier attribute (RDN) of OC postAnalysisEvaluation.

- destinationGroupLabel;

  This attribute determines the destination group to which this instance belongs to. To make this instance of OC postAnalysisEvaluation applicable, this attribute has to match the group selected by the instance of OC analysisCriteria or of OC trafficDistribution.

- callHistoryInstance;

  This attribute points to an instance of OC callHistory.

- routingOrigin;

  This attribute identifies a group of instances of the OC cepsg (directionality: incoming or two-way) or of subscribers. The corresponding grouping attribute in OC cepsg is originForRouting. The corresponding grouping attribute for subscribers is the responsibility of customer administration area. An instance of the OC postAnalysisEvaluation that is independent of the routing origin gets the default value anyOrigin.

- callingPartyCategory;

  This attribute identifies the calling party category (according ITU-T Recommendation Q.763 [13] or ITU-T Recommendation Q.440 [10], ITU-T Recommendation Q.441 [11]) which have to be considered for routing purposes. Calling party categories include operator, test or normal subscriber call.

- reqBearerCapability;

- reqSignCapability;

These two attributes, respectively Required Bearer Capability and Required Signalling Capability, describe the required characteristics of the outgoing termination point subgroup to be used for determining the routing of the call. If SS No. 7 is used then the reqSignCapability is given by the ISDN User Part (ISUP) Preference indicator. Other signalling systems may have other values. Possible values are, e.g. ISUP Preferred, any signalling capability (defined in ITU-T Recommendation Q.763 [13]).

These two attributes are conditional because they are not necessary in situation where only one signalling system (e.g. ISUP) is used for circuits.

- digitModificationInstance;

  This attribute points to an instance of OC digitModification if digit manipulation is needed.

- trafficDistributionInstance;

  This attribute points to an instance of OC trafficDistribution.

- schedulingAttribute;

  This attribute provides a set of indexes with associated object instances. When an external scheduler indicates that a specific index is valid, the corresponding object instance in the scheduling attribute replaces the object instance in the attribute activeRoutingPossibilities.

- externalSchedulerName;

  This attribute is used in the SMO for referencing the external SO (see ITU-T Recommendation X.746 [20] subclause 8.4.11).

- activeRoutingPossibilities.

  This attribute -which is instantiated if trafficDistributionInstance attribute is not present- contains the value of the instance of OC routingPossibilities which is applicable (or also treatment instance when required). activeRoutingPossibilities attribute is updated if a new index is selected by the scheduling mechanism. REPLACE operation is added to the GET operation when no scheduling attributes are instantiated.

7.15 prefixDigitAnalysis

The OC prefixDigitAnalysis is necessary when destination type is required by OC analysisCriteria and when this information cannot be derived from other means (e.g. ISUP nature of address). It can also indicate the presence of a carrier code in the received digits e.g. when it is not signalled separately (TNS field).

Table 19: prefixDigitAnalysis description

Object Class: prefixDigitAnalysis			
Attributes	M/C	Value Set	Operation
prefixDigitAnalysisId	M	Single	GET
prefixCode*	M	Single	GET-REPLACE
destinationType	C	Single	GET SET-BY-CREATE
carrierCodePresent	C	Single	GET SET-BY-CREATE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC prefixDigitAnalysis:

- prefixDigitAnalysisId;

  This attribute is the object identifier attribute (RDN) of OC prefixDigitAnalysis.

- prefixCode;

  This attribute represents the leading dialled digits which are necessary to determine destination type and/or carrier.

- destinationType;

  This attribute indicates the values of destinationType. Possible values are related to the values defined by ITU-T Recommendation Q.763 [13] and ITU-T Recommendation Q.931 [17].

- carrierCodePresent.

  This attribute indicates by its presence or absence, whether or not carrier code is present in the digit string.

7.16 routingPossData

The OC routingPossData contains information that is applicable for the routing possibility that is using this OC instance.

Table 20: routingPossData description

Object Class: routingPossData			
Attributes	M/C	Value Set	Operation
routingPossDataId	M	Single	GET
trafficCategory	M	Single	GET-REPLACE
cepsgCombOrCepsgInstance	M	Single	GET SET-BY-CREATE
languageDigit	C	Single	GET SET-BY-CREATE
suppressCac	C	Single	GET-REPLACE
digitModificationInstance	C	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC routingPossData:

- routingPossDataId;

  This attribute is the object identifier attribute (RDN) of OC routingPossData.

- trafficCategory;

  This attribute describes the traffic category (national, international transit or international terminating) that applies to the call.

- cepsgCombOrCepsgInstance;

  This attribute determines the cepsg instance or the cepsgComb instance this routingPossData points to.

- languageDigit;

  This attribute describes which language digit has to be used, if the language digit for a call was not fixed yet. In cepsg the language digit will then be fixed depending on this language digit.

- suppressCac;

This attribute describes whether a CAC has to be suppressed or not i.e. that no TNS field will be sent and/or that CAC will be taken out of the digits string.

- digitModificationInstance.

  This attribute determines the digitModification instance applicable to this routingPossData instance.

7.17 routingPossibilities

Instances of this class are results of digitAnalysis, of postAnalysisEvaluation or traffic distribution. This class provides routing possibilities, on which call traffic has to be distributed. There are routing possibilities to other exchanges or to local destinations and there are additional alternatives (e.g. announcement machines, test equipment) In case of crankback (refer to ITU-T Recommendation E.170 [5]), it is possible to restrict the routing possibilities.

Table 21: routingPossibilities description

Object Class: routingPossibilities			
Attributes	M/C	Value Set	Operation
routingPossibilitiesId	M	Single	GET
routingPossibilitiesSelection	M	Set/Single	GET-REPLACE
usedAlgorithm	M	Single	GET-REPLACE
crankbackAdminState	C	Single	REPLACE-WITH-DEFAULT GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		
"ITU-T Recommendation M.3100 [8]": stateChange	C		

The following attributes describe the OC routingPossibilities:

- routingPossibilitiesId;

  This attribute is the object identifier attribute (RDN) of OC routingPossibilities.

- routingPossibilitiesSelection;

  This attribute gives a list of instances on which the selection algorithm found in the attribute usedAlgorithm is to apply. These instances can be instances

  of OC routingPossData or

  of OC localDestination or

  of OC cepsgCombList or

  of OC cepsgComb or

  of OC cepsg or

  of OC routingPossibilities.

- usedAlgorithm;

  This attribute describes the algorithm used to select a member within the list described by attribute routingPossibilitiesSelection. Three algorithms are identified: sequential, cyclic and proportional (refer to OC cepsgComb, subclause 7.6).

- crankbackAdminState.

  This attribute describes whether crankback has to be performed (unlocked) or not (locked).

7.18 routingPossRestrict

The OC routingPossRestrict stores the data needed for crankback or other data influencing selection of individual targets. For more information about crankback refer to ITU-T Recommendation E.170 [5].

Table 22: routingPossRestrict description

Object Class: routingPossRestrict			
Attributes	M/C	Value Set	Operation
routingPossRestrictId	M	Single	GET
skipGroupSignal1	C	Set	GET-REPLACE ADD-REMOVE
skipGroupSignal2	C	Set	GET-REPLACE ADD-REMOVE
Notifications	M/C		
"ITU-T Recommendation M.3100 [8]": createDeleteNotificationsPackage	M		
"ITU-T Recommendation M.3100 [8]": attributeValueChangeNotificationPackage	C		

The following attributes describe the OC routingPossRestrict:

- routingPossRestrictId;

  This is the object identifier attribute (RDN) of OC routingPossRestrict.

- skipGroupSignal1;

  This attribute lists routing possibilities (e.g. routingPossData, cepsg) that have to be skipped if signal1 (refer to ITU-T Recommendation E.170 [5]) arrives from a cepsg reachable via one of these routing possibilities.

- skipGroupSignal2.

  This attribute lists routing possibilities (e.g. routingPossData, cepsg) that have to be skipped if signal2 (refer to ITU-T Recommendation E.170 [5]) arrives from a cepsg reachable via one of these routing possibilities.

7.19 trafficDistribution

The OC trafficDistribution provides management data needed to distribute traffic according to percentage values determined by available outgoing capacity, incoming traffic load or operator command.

The OC trafficDistribution points to instances contained in selectedInstances attribute according to algorithm detailed in inputCriteriaDataForAlgorithm and to traffic data given by attribute trafficDistributionData. destinationGroupLabel represents the destination group this instance belongs to.

Table 23: trafficDistribution description

Object Class: trafficDistribution			
Attributes	M/C	Value Set	Operation
trafficDistributionId	M	Single	GET
inputCriteriaDataForAlgorithm	M	Single	GET-REPLACE
trafficDistributionData	M	Single	GET
selectedInstances	M	Single	GET-REPLACE
destinationGroupLabel*	C	Single	GET-REPLACE
Notifications			
"ITU-T Recommendation M.3100 [8]": objectManagementNotificationsPackage	M		

The following attributes describe the OC trafficDistribution:

- trafficDistributionId;

  This attribute is the object identifier attribute (RDN) of OC trafficDistribution.

- inputCriteriaDataForAlgorithm;

  The attribute defines the criteria and data which are used to calculate the data (e.g. percentage values assigned to a carrier) applied by the distribution algorithm. Examples for corresponding criteria are "fixed percentage quota", "available outgoing circuit subgroup capacity" or "amount of incoming traffic".

- trafficDistributionData;

  This attribute lists - for the proportional (without overflow) algorithm - the current valid percentage values on which the distribution of call bids is performed. This attribute is read-only and might be updated during lifetime of the instance automatically, depending on the inputCriteriaForAlgorithm attribute. The userLabel components (carrier names) are present in this attribute, depending on the presence of these userLabels in the inputCriteriaDataForAlgorithm attribute.

  The initial value of the trafficDistributionData attribute is derived at creation of this instance or at modification time of the attribute inputCriteriaDataForAlgorithm from the value of the attribute inputCriteriaDataForAlgorithm.

- selectedInstances;

  This attribute references object instances with an ordered list.

- destinationGroupLabel.

  This attribute determines the destination group to which this instance belongs to. To make this instance of OC trafficDistribution applicable, this attribute has to match the group selected by the instance of OC analysisCriteria. This attribute is present if the relationship 'selects group of' (see E-R diag.2) is used.

7.20 treatment

This OC represents treatments e.g. announcements which are applied in specific situations such as:

- a specific instance of OC analysisCriteria;

  e.g. for certain "invalid" combinations of digits, an announcement may be applied.

- a specific instance of OC postAnalysisEvaluation;

  If, e.g. a certain destination (temporarily) can be reached for only a limited set of bearer capabilities, an announcement can be used to inform why the other requested bearer capabilities are not supported.

- a cause;

  A cause is a reason why the call is not forwarded.

- a specific instance of OC exception.

  An exception occurs when none of the criterion type of object instances matches for a specific call.

The specific treatment is not part of the standard and is system dependent. Therefore each system provider has to subclass this OC to add its own specific treatments.

Table 24: treatment description

Object Class: treatment			
Attributes	M/C	Value Set	Operation
treatmentId	M	Single	GET
Notifications			
"ITU-T Recommendation M.3100 [8]": createDeleteNotificationsPackage	M		

The following attribute describes the OC treatment:

- treatmentId

  This is the object identifier attribute (RDN) of OC treatment.

8 OC definitions

This clause contains the formal OC definitions.

8.1 Managed OC definitions

8.1.1 analysisCriteria

```
analysisCriteria MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        analysisCriteriaPackage PACKAGE
            BEHAVIOUR
                analysisCriteriaPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value combination of attributes (key-attributes) destinationCode, callingPartyCategory,
analysisOrigin, nationalDestinationInstance, destinationType, numberOfDigits, carrierDataInstance
shall be unique among all instances of this object class.";;
            ATTRIBUTES
                analysisCriteriaId
                    GET,
                destinationCode
                    GET-REPLACE,
                analysisOrigin
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultAnalysisOrigin
                    GET-REPLACE,
                activeDestination
                    GET
                    SET-BY-CREATE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        callingPartyCategoryPackage
            PRESENT IF "calling party category has to be evaluated.",
        nationalDestinationInstancePackage PACKAGE
            ATTRIBUTES
                nationalDestinationInstance
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 1};
PRESENT IF "the destinationCode value has to be assigned unambiguously to a national destination.",
        destinationTypePackage
PRESENT IF "the destination type has to be used to unambiguously identify the destination in
addition to destinationCode.",
        extSchedulingPackage PACKAGE
            BEHAVIOUR
                extSchedulingPackageBeh BEHAVIOUR
                    DEFINED AS
"This package is used in the SMO to enable external scheduling e.g. as with OC multiScheduler from
EN 301 098 [3].";;
            ATTRIBUTES
                extSchedulingAttribute
                    GET-REPLACE;
            REGISTERED AS {package 2};
```

```
PRESENT IF "external index scheduling is used for the attribute activeDestination.",
        externalSchedulerPackage
PRESENT IF "external scheduling by a SO is supported.",
        activeDestinationPackage PACKAGE
            BEHAVIOUR
                activeDestinationPackageBeh BEHAVIOUR
                    DEFINED AS
"This package allows to perform a REPLACE operation additionally to the GET operation on the
activeDestination attribute, in case the scheduling packages are not instantiated.";;
            ATTRIBUTES
                activeDestination
                    REPLACE;
            REGISTERED AS {package 3};
PRESENT IF "no scheduling is used",
        numberOfDigitsPackage PACKAGE
            ATTRIBUTES
                numberOfDigits
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 4};
PRESENT IF "an instance supports it",
        carrierDataInstancePackage PACKAGE
            ATTRIBUTES
                carrierDataInstance
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 5};
PRESENT IF "carrier dependent analysis is required and the carrier code is not part of the
destination code";
REGISTERED AS {managedObjectClass 1};
```

8.1.2 callHistory

```
callHistory MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        callHistoryPackage PACKAGE
            BEHAVIOUR
                callHistoryPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value combination of attributes (key-attributes) echoSuppressor, numberOfSatLinks shall be unique
among all instances of this object class.";;
            ATTRIBUTES
                callHistoryId
                    GET;;,
        "ITU-T Recommendation M.3100":createDeleteNotificationsPackage;
    CONDITIONAL PACKAGES
        echoSuppressorPackage PACKAGE
            ATTRIBUTES
                echoSuppressor
                    GET-REPLACE;
            REGISTERED AS {package 6};
PRESENT IF "an instance supports it",
        numberOfSatLinksPackage PACKAGE
            ATTRIBUTES
                numberOfSatLinks GET-REPLACE;
            REGISTERED AS {package 7};
PRESENT IF "an instance supports it",
        "ITU-T Recommendation M.3100":attributeValueChangeNotificationPackage
PRESENT IF "an instance supports it";
REGISTERED AS {managedObjectClass 2};
```

8.1.3 carrierData

```
carrierData MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        carrierDataPackage PACKAGE
            BEHAVIOUR
                carrierDataPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value of attribute (key-attribute) carrierCode shall be unique among all instances of this object
class.";;
            ATTRIBUTES
                carrierDataId
                    GET,
                carrierCode
                    GET
                    SET-BY-CREATE,
                ownCac
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
REGISTERED AS {managedObjectClass 3};
```

8.1.4 cep

```
cep MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        cepPackage PACKAGE
            BEHAVIOUR
                cepPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0.";;
            ATTRIBUTES
                cepId
                    GET,
                "ITU-T Recommendation X.721":administrativeState
                    GET-REPLACE,
                ctpbInstance
                    GET
                    SET-BY-CREATE,
                circuitNumber
                    GET
                    SET-BY-CREATE;;,
        "ITU-T Recommendation M.3100":createDeleteNotificationsPackage,
        "ITU-T Recommendation M.3100":stateChangeNotificationPackage;
    CONDITIONAL PACKAGES
        cicPackage PACKAGE
            ATTRIBUTES
                cic
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 8};
                    PRESENT IF "SS No. 7 is used for signalling.",
        officeEquipmentPackage PACKAGE
            BEHAVIOUR
                officeEquipmentPackageBeh BEHAVIOUR
                    DEFINED AS
"Value of attribute (key-attribute) officeEquipment shall be unique among all instances of this
object class ";;
            ATTRIBUTES
                officeEquipment
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 9};
PRESENT IF "an instance supports it.";
REGISTERED AS {managedObjectClass 4};
```

8.1.5 cepsg

```
cepsg MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation M.3100":circuitEndPointSubgroup;
    CHARACTERIZED BY
        cepsgPackage PACKAGE
            BEHAVIOUR
                cepsgPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0.
This OC represents a set of circuit end points with similar characteristics. A circuit end point
subgroup can be of type one-way incoming, one-way outgoing, or two-way. For type two-way,
conditional packages incomingCepsgPackage and outgoingCepsgPackage have both to be instantiated";;
            ATTRIBUTES
                "ITU-T Recommendation M.3100":transmissionCharacteristics
                    REPLACE,
                "ITU-T Recommendation M.3100":labelOfFarEndExchange
                    REPLACE,
                "ITU-T Recommendation X.721":administrativeState
                    GET-REPLACE,
                assocSignRouteSetNePart
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultAssocSignRouteSetNePart
                    GET-REPLACE,
                boundaryCrossing
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultBoundaryCrossing
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":stateChangeNotificationPackage;
    CONDITIONAL PACKAGES
        incomingCepsgPackage PACKAGE
            ATTRIBUTES
                prefixDigits
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultPrefixDigits
                    GET-REPLACE;
            REGISTERED AS {package 10};
PRESENT IF "the circuit end point subgroup is of type incoming or two-way",
        outgoingCepsgPackage PACKAGE
            ATTRIBUTES
                searchMethod
                    GET-REPLACE;
            REGISTERED AS {package 11};
PRESENT IF "the circuit end point subgroup is of type outgoing or two-way",
        originForRebuildingPackage PACKAGE
            ATTRIBUTES
                originForRebuilding
                    GET-REPLACE;
            REGISTERED AS {package 12};
PRESENT IF "the circuit end point subgroup is of type incoming or two-way and if origin dependent
digit rebuilding is required.",
        originForAnalysisPackage PACKAGE
            ATTRIBUTES
                originForAnalysis
                    GET-REPLACE;
            REGISTERED AS {package 13};
PRESENT IF "the circuit end point subgroup is of type incoming or two-way and if origin dependent
digit analysis is required.",
        originForRoutingPackage PACKAGE
            ATTRIBUTES
                originForRouting
                    GET-REPLACE;
            REGISTERED AS {package 14};
PRESENT IF "the circuit end point subgroup is of type incoming or two-way and if origin dependent
call routing is required.",
        originForPreparationPackage PACKAGE
            ATTRIBUTES
                originForPreparation
                    GET-REPLACE;
            REGISTERED AS {package 15};
PRESENT IF "the circuit end point subgroup is of type incoming or two-way and if origin dependent
digit preparation is required.",
        termForPreparationPackage PACKAGE
            ATTRIBUTES
                termForPreparation
                    GET-REPLACE;
            REGISTERED AS {package 16};
PRESENT IF "the circuit end point subgroup is of type outgoing or two-way and if outgoing cepsg
dependent digit preparation is required.",
        specificSignSystemPackage PACKAGE
            ATTRIBUTES
                languageDigitProc
```

```
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultLanguageDigitProc
                    GET-REPLACE;
            REGISTERED AS {package 17};
PRESENT IF "one of the signalling systems R2 or C5 is used.",
        twowayCepsgPackage PACKAGE
            ATTRIBUTES
                prefTrafficDirect
                    GET-REPLACE;
            REGISTERED AS {package 18};
PRESENT IF "the circuit end point subgroup is of type two-way.",
        carrierPackage PACKAGE
            ATTRIBUTES
                suppressOwnCac GET-REPLACE;
            REGISTERED AS {package 19};
PRESENT IF "the option to administer suppression of own carrier has to be provided and if the
circuit end point subgroup is of type incoming or two-way.";
REGISTERED AS {managedObjectClass 5};
```

8.1.6 cepsgComb

```
cepsgComb MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        cepsgCombPackage PACKAGE
            BEHAVIOUR
                cepsgCombPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                cepsgCombId
                    GET,
                cepsgCombSelection
                    GET-REPLACE,
                usedAlgorithm
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        userLabelPackage PACKAGE
            ATTRIBUTES
                "ITU-T Recommendation M.3100":userLabel
                    GET-REPLACE;
            REGISTERED AS {package 20};
PRESENT IF "an instance supports it.";
REGISTERED AS {managedObjectClass 6};
```

8.1.7 cepsgCombList

```
cepsgCombList MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        cepsgCombListPackage PACKAGE
            BEHAVIOUR
                cepsgCombListPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                cepsgCombListId
                    GET,
                cepsgCombListSelection
                    GET-REPLACE,
                usedAlgorithm
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
REGISTERED AS {managedObjectClass 7};
```

8.1.8 digitModification

```
digitModification MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        digitModificationPackage PACKAGE
            BEHAVIOUR
                digitModificationPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                digitModificationId
                    GET,
                digitSuppress
                    GET-REPLACE
                    ADD-REMOVE,
                digitCombReplace
                    GET-REPLACE
                    ADD-REMOVE,
                digitCombInsert
                    GET-REPLACE
                    ADD-REMOVE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
REGISTERED AS {managedObjectClass 8};
```

8.1.9 digitPreparationCriteria

```
digitPreparationCriteria MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        digitPreparationCriteriaPackage PACKAGE
            BEHAVIOUR
                digitPreparationCriteriaPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value combination of attributes (key-attributes) preparationOrigin, preparationTerm and
analysisCriteriaInstance shall be unique among all instances of this object class.";;
            ATTRIBUTES
                digitPreparationCriteriaId
                    GET,
                preparationOrigin
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultPreparationOrigin
                    GET-REPLACE,
                preparationTerm
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultPreparationTerm
                    GET-REPLACE,
                analysisCriteriaInstance
                    GET-REPLACE,
                digitModificationInstance
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
REGISTERED AS {managedObjectClass 9};
```

8.1.10 digitRebuildingCriteria

```
digitRebuildingCriteria MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        digitRebuildingCriteriaPackage PACKAGE
            BEHAVIOUR
                digitRebuildingCriteriaPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value combination of attributes (key-attributes) rebuildingOrigin, natureOfAddress and
calledNumberingPlan shall be unique among all instances of this object class.";;
            ATTRIBUTES
                digitRebuildingCriteriaId
                    GET,
                rebuildingOrigin
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultRebuildingOrigin
                    GET-REPLACE,
                natureOfAddress
                    GET-REPLACE,
                calledNumberingPlan
                    GET-REPLACE,
                digitModificationInstance
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
```

```
REGISTERED AS {managedObjectClass 10};
```

8.1.11 exception

```
exception MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        exceptionPackage PACKAGE
            BEHAVIOUR
                exceptionPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Any particular set-element value of attribute (key-attribute) matchesIf shall be unique among all
instances of this object class.";;
            ATTRIBUTES
                exceptionId
                    GET,
                matchesIf
                    GET-REPLACE
                    ADD-REMOVE,
                treatmentInstance
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
REGISTERED AS {managedObjectClass 11};
```

8.1.12 localDestination

```
localDestination MANAGED OBJECT CLASS
    DERIVED FROM        "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        localDestinationPackage PACKAGE
            BEHAVIOUR
                localDestinationPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                localDestinationId
                    GET,
                nationalDestinationInstance
                    GET
                    SET-BY-CREATE,
                initialSubscriberCodes
                    GET-REPLACE;
            ACTIONS
                modifyNumberingScheme ACTION
                    BEHAVIOUR
                        modifyNumberingSchemeBeh BEHAVIOUR
                            DEFINED AS
"This action operation modifies data of OC localDestination instance and the DN instances which
belong to it. This action does not change the implicit relationship between the DNs and the local
destination: a DN that belonged/did not belong to the local destination before the ACTION
belongs/does not belong to it after the ACTION is executed on the localDestination instance. To keep
this relationship, the initialSubscriberCodes attribute is a SEQUENCE OF i.o. a SET OF value.
Information components (see ASN1TypeModule definitions):
    newNationalDestInstance:
This component describes the value for the new local area code for the localDestination instance. If
the excludedSubscriberCodesPackage is present, the members of the excludedSubscriberCodes attribute
have to be adapted accordingly in their digit string part, representing the local area code. The
local area code related attribute parts of the DNs of OC E164DN, which belong to the local
destination, have to be updated accordingly.
    newInitialSubscriberCodes:
This component describes the new value of the attribute initialSubscriberCodes in the addressed
object instance of the OC localDestination. The initial subscriber code related attribute parts of
the DNs of OC E164DN, which belong to the local destination, have to be updated accordingly. The
newInitialSubscriberCodes component must contain the same number of elements as the
initialSubscriberCodes attribute of the addressed object instance.
Reply component:
All attribute values of the local destination instance after the execution of the ACTION
operation.";;
                    MODE CONFIRMED;
                    WITH INFORMATION SYNTAX
                        ASN1TypeModule.ModifyNumberingSchemeInfo;
                    WITH REPLY SYNTAX
                        ASN1TypeModule.ModifyNumberingSchemeReply;
                REGISTERED AS {action 1};;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        excludedSubscriberCodesPackage PACKAGE
            ATTRIBUTES
                excludedSubscriberCodes
                    GET-REPLACE
                    ADD-REMOVE;
```

```
            REGISTERED AS {package 21};
PRESENT IF "it is necessary to exclude DNs from the local destination.";
REGISTERED AS {managedObjectClass 12};
```

8.1.13 nationalDestination

```
nationalDestination MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        nationalDestinationPackage PACKAGE
            BEHAVIOUR
                nationalDestinationPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value of attribute (key-attribute) nationalDestinationCode shall be unique among all instances of
this object class.";;
            ATTRIBUTES
                nationalDestinationId
                    GET,
                nationalDestinationCode
                    GET
                    SET-BY-CREATE;;,
        "ITU-T Recommendation M.3100":createDeleteNotificationsPackage;
REGISTERED AS {managedObjectClass 13};
```

8.1.14 postAnalysisEvaluation

```
postAnalysisEvaluation MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        postAnalysisEvaluationPackage PACKAGE
            BEHAVIOUR
                postAnalysisEvaluationPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value combination of attributes (key-attributes) destinationGroupLabel, callHistoryInstance,
routingOrigin, reqBearerCapability, reqSignCapability and callingPartyCategory shall be unique among
all instances of this object class.";;
            ATTRIBUTES
                postAnalysisEvaluationId
                    GET,
                destinationGroupLabel
                    GET-REPLACE,
                callHistoryInstance
                    GET-REPLACE,
                routingOrigin
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultRoutingOrigin
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        callingPartyCategoryPackage
            PRESENT IF "calling party category has to be evaluated.",
        requiredCapabilitiesPackage PACKAGE
            BEHAVIOUR
                requiredCapabilitiesPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                reqBearerCapability
                    GET-REPLACE,
                reqSignCapability
                    GET-REPLACE;
            REGISTERED AS {package 22};
PRESENT IF "an instance requires it.",
        digitModificationInstancePackage
            ATTRIBUTE
                digitModificationInstance
                    GET-REPLACE;
            REGISTERED AS {package 23};
            PRESENT IF "digit codes modification is needed.",
        trafficDistributionInstancePackage PACKAGE
            BEHAVIOUR
                trafficDistributionInstancePackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                trafficDistributionInstance
                    GET-REPLACE;
            REGISTERED AS {package 24};
PRESENT IF "activeRoutingPossibilitiesPackage is not instantiated and if this instance of OC
postAnalysisEvaluation shall not be referred by any instances of OC trafficDistribution.",
```

```
        schedulingAttributePackage PACKAGE
            BEHAVIOUR
                schedulingAttributePackageBeh BEHAVIOUR
                    DEFINED AS
"This package is used in the SMO to enable external scheduling e.g. as with OC
timeControlledSelector from EN 301 098 [3].";;
            ATTRIBUTES
                schedulingAttribute
                    GET-REPLACE;
            REGISTERED AS {package 25};
PRESENT IF "external index scheduling is used for the activeRoutingPossibilities attribute.",
        externalSchedulerPackage
PRESENT IF "external scheduling by a SO is supported.",
        activeRoutingPossibilitiesPackage PACKAGE
            BEHAVIOUR
                activeRoutingPossibilitiesPackageBeh BEHAVIOUR
                    DEFINED AS
"This attribute contains the value of the instance of OC routingPossibilities which is applicable
(or also treatment instance when required).";;
            ATTRIBUTES
                activeRoutingPossibilities
                    GET;
            REGISTERED AS {package 26};
PRESENT IF "trafficDistributionInstancePackage is not instantiated.",
        replaceActiveRoutingPossibilitiesPackage PACKAGE
            BEHAVIOUR
                replaceActiveRoutingPossibilitiesPackageBeh BEHAVIOUR
                    DEFINED AS
"This package allows to perform a REPLACE operation additionally to the GET operation on the
activeRoutingPossibilities attribute, in case the scheduling packages are not instantiated.";;
            ATTRIBUTES
                activeRoutingPossibilities
                    REPLACE;
            REGISTERED AS {package 27};
PRESENT IF "activeRoutingPossibilitiesPackage is instantiated and if scheduling packages are not
instantiated.";
REGISTERED AS {managedObjectClass 14};
```

8.1.15 prefixDigitAnalysis

```
prefixDigitAnalysis MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        prefixDigitAnalysisPackage PACKAGE
            BEHAVIOUR
                prefixDigitAnalysisPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0
Value of attribute (key-attribute) prefixCode shall be unique among all instances of this object
class.";;
            ATTRIBUTES
                prefixDigitAnalysisId
                    GET,
                prefixCode
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        destinationTypePackage
PRESENT IF "the destination type has to be derived from the prefixCode.",
        carrierCodePresentPackage PACKAGE
            BEHAVIOUR
                carrierCodePresentPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                carrierCodePresent
                    INITIAL VALUE ASN1TypeModule.initialCarrierCodePresent
                    GET;
            REGISTERED AS {package 28};
PRESENT IF "the presence of a carrier code in prefixCode has to be indicated.";
REGISTERED AS {managedObjectClass 15};
```

8.1.16 routingPossData

```
routingPossData MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        routingPossDataPackage PACKAGE
            BEHAVIOUR
                routingPossDataPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                routingPossDataId
                    GET,
                trafficCategory
                    DEFAULT VALUE ASN1TypeModule.defaultTrafficCategory
                    GET-REPLACE,
                cepsgCombOrCepsgInstance
                    GET
                    SET-BY-CREATE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        operatorLanguagePackage PACKAGE
            BEHAVIOUR
                operatorLanguagePackageBeh BEHAVIOUR
                    DEFINED AS
"Characterises the operator language.";;
            ATTRIBUTES
                languageDigit
                    GET
                    SET-BY-CREATE;
            REGISTERED AS {package 29};
PRESENT IF "signalling system supports it and if it is needed on this routing possibility.",
        suppressCacPackage PACKAGE
            ATTRIBUTES
                suppressCac
                    GET-REPLACE;
            REGISTERED AS {package 30};
PRESENT IF "the option to administer suppression of CAC has to be provided.",
        digitModificationInstancePackage PACKAGE
            ATTRIBUTES
                digitModificationInstance
                    GET-REPLACE;
            REGISTERED AS {package 31};
PRESENT IF "digit string modification is needed for the instance of OC routingPossData.";
REGISTERED AS {managedObjectClass 16};
```

8.1.17 routingPossibilities

```
routingPossibilities MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        routingPossibilitiesPackage PACKAGE
            BEHAVIOUR
                routingPossibilitiesPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                routingPossibilitiesId
                    GET,
                routingPossibilitiesSelection
                    GET-REPLACE,
                usedAlgorithm
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        crankbackAdminStatePackage PACKAGE
            ATTRIBUTES
                crankbackAdminState
                    REPLACE-WITH-DEFAULT
                    DEFAULT VALUE ASN1TypeModule.defaultCrankbackAdminState
                    GET-REPLACE;
            NOTIFICATIONS
                "ITU-T Recommendation X.721":stateChange;
            REGISTERED AS {package 32};
PRESENT IF " locking-unlocking of crankback is needed.";
REGISTERED AS {managedObjectClass 17};
```

8.1.18 routingPossRestrict

```
routingPossRestrict MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        routingPossRestrictPackage PACKAGE
            BEHAVIOUR
                routingPossRestrictPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                routingPossRestrictId
                    GET;;,
        "ITU-T Recommendation M.3100":createDeleteNotificationsPackage;
    CONDITIONAL PACKAGES
        skipGroupSignal1Package PACKAGE
            BEHAVIOUR
                skipGroupSignal1Beh BEHAVIOUR
                    DEFINED AS
"It is not allowed that a routing possibility is present in different instances of OC
routingPossRestrict contained in the same instance of OC routingPossibilities.";;
            ATTRIBUTES
                skipGroupSignal1
                    GET-REPLACE
                    ADD-REMOVE;
            REGISTERED AS {package 33};
PRESENT IF "crankback with one or two signals (see ITU-T Recommendation E.170 [5]) is supported",
        skipGroupSignal2Package PACKAGE
            BEHAVIOUR
                skipGroupSignal2Beh BEHAVIOUR
                    DEFINED AS
"It is not allowed that a routing possibility is present in different instances of OC
routingPossRestrict contained in the same instance of OC routingPossibilities.";;
            ATTRIBUTES
                skipGroupSignal2
                    GET-REPLACE
                    ADD-REMOVE;
            REGISTERED AS {package 34};
PRESENT IF "crankback with two signals (see ITU-T Recommendation E.170 [5]) is supported",
        "ITU-T Recommendation M.3100":attributeValueChangeNotificationPackage;
            PRESENT IF "an instance supports it";
REGISTERED AS {managedObjectClass 18};
```

8.1.19 trafficDistribution

```
trafficDistribution MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        trafficDistributionPackage PACKAGE
            BEHAVIOUR
                trafficDistributionPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0.
The number of list elements in attributes trafficDistributionData, selectedInstances and
inputCriteriaDataForAlgorithm has to be identical. The data with corresponding list positions in
these attributes belong together.
The sum of the percentage values within each of the attributes trafficDistributionData and
inputCriteriaDataForAlgorithm has to be 100 %.
The trafficDistributionData attribute is derived from the value of the inputCriteriaDataForAlgorithm
attribute at creation of the instance or modification of the attribute
inputCriteriaDataForAlgorithm. Modification of the userLabels in the attribute
inputCriteriaDataForAlgorithm triggers an update of userLabel specified in the attribute
trafficDistributionData. It does not trigger an update of the percentage values contained in the
trafficDistributionData
Component of attribute inputCriteriaDataForAlgorithm being:
- out: causes percentage calculation from outgoing circuit subgroup capacity for the component
'percentage' of attribute trafficDistributionData;
- perc: causes transfer of percentage value for component 'percentage' of attribute
trafficDistributionData
- inc: causes transfer of percentage value, periodical recalculation of percentage values according
to the incoming carried traffic on specified incoming circuit subgroups after defined intervals for
component 'percentage' of attribute trafficDistributionData.
The attribute selectedInstances references instances of OC routingPossibilities or (exclusive or) OC
postAnalysisEvaluation (this last choice is possible, if this instance shall not be referred by any
instances of OC postAnalysisEvaluation). All referenced instances of this attribute belong to the
same OC. ";;
            ATTRIBUTES
                trafficDistributionId
                    GET,
                inputCriteriaDataForAlgorithm
                    GET-REPLACE,
                trafficDistributionData
```

```
                    GET,
                selectedInstances
                    GET-REPLACE;;,
        "ITU-T Recommendation M.3100":objectManagementNotificationsPackage;
    CONDITIONAL PACKAGES
        destinationGroupLabelPackage PACKAGE
            BEHAVIOUR
                destinationGroupLabelBeh BEHAVIOUR
                    DEFINED AS
"Value of attribute (key-attribute) destinationGroupLabel shall be unique among all instances of
this object class.";;
            ATTRIBUTES
                destinationGroupLabel
                    GET-REPLACE;
            REGISTERED AS {package 35};
PRESENT IF "the relationship 'selects group of' (see E-R diag.2) is used.";
REGISTERED AS {managedObjectClass 19};
```

8.1.20 treatment

```
treatment MANAGED OBJECT CLASS
    DERIVED FROM    "ITU-T Recommendation X.721":top;
    CHARACTERIZED BY
        treatmentPackage PACKAGE
            BEHAVIOUR
                treatmentPackageBeh BEHAVIOUR
                    DEFINED AS
"See subclause 7.0";;
            ATTRIBUTES
                treatmentId
                    GET;;,
        "ITU-T Recommendation M.3100":createDeleteNotificationsPackage;
REGISTERED AS {managedObjectClass 20};
```

8.2 Reused packages definitions

8.2.1 callingPartyCategoryPackage

```
callingPartyCategoryPackage PACKAGE
    ATTRIBUTES
        callingPartyCategory
            REPLACE-WITH-DEFAULT
            DEFAULT VALUE ASN1TypeModule.defaultCallingPartyCategory
            GET-REPLACE;
REGISTERED AS {package 36};
```

8.2.2 destinationTypePackage

```
destinationTypePackage PACKAGE
    BEHAVIOUR
        destinationTypePackageBeh BEHAVIOUR
            DEFINED AS
"Characterises unambiguously the type of destination.";;
    ATTRIBUTES
        destinationType
            GET
            SET-BY-CREATE;
REGISTERED AS {package 37};
```

8.2.3 externalSchedulerPackage

```
externalSchedulerPackage PACKAGE
    BEHAVIOUR
        externalSchedulerPackageBeh BEHAVIOUR
            DEFINED AS
"This package is used in the SMO for reference to the external SO's.";;
    ATTRIBUTES
        "ITU-T Recommendation X.746":externalSchedulerName
            GET-REPLACE;
REGISTERED AS {package 38};
```

8.3 Attributes definitions

8.3.1 activeDestination

```
activeDestination ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ActiveDestination;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        activeDestinationBeh BEHAVIOUR
            DEFINED AS
"This attribute either references an object instance or selects a group of instances via a label.";;
REGISTERED AS {attribute 1};
```

8.3.2 activeRoutingPossibilities

```
activeRoutingPossibilities ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        activeRoutingPossibilitiesBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC routingPossibilities or of OC treatment.";;
REGISTERED AS {attribute 2};
```

8.3.3 analysisCriteriaId

```
analysisCriteriaId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 3};
```

8.3.4 analysisCriteriaInstance

```
analysisCriteriaInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstanceOrNull;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        analysisCriteriaInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC analysisCriteria.";;
REGISTERED AS {attribute 4};
```

8.3.5 analysisOrigin

```
analysisOrigin ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Origin;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 5};
```

8.3.6 assocSignRouteSetNePart

```
assocSignRouteSetNePart ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstanceOrNull;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        assocSignRouteSetNePartBeh BEHAVIOUR
            DEFINED AS
"Identifies the SS No. 7 signalling resource (ITU-T Recommendation Q.751.1: signRouteSetNePart).";;
REGISTERED AS {attribute 6};
```

8.3.7 boundaryCrossing

```
boundaryCrossing ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.BoundaryCrossing;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        boundaryCrossingBeh BEHAVIOUR
            DEFINED AS
"This attribute indicates whether the circuit end point subgroup contains only circuit end points
terminating circuits which cross international or organisational boundaries. ";;
REGISTERED AS {attribute 7};
```

8.3.8 calledNumberingPlan

```
calledNumberingPlan ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.CalledNumberingPlan;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 8};
```

8.3.9 callHistoryId

```
callHistoryId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 9};
```

8.3.10 callHistoryInstance

```
callHistoryInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstanceOrNull;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        callHistoryInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC callHistory.";;
REGISTERED AS {attribute 10};
```

8.3.11 callingPartyCategory

```
callingPartyCategory ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.CallingPartyCategory;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 11};
```

8.3.12 carrierCode

```
carrierCode ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.CarrierCode;
    MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
    BEHAVIOUR
        carrierCodeBeh BEHAVIOUR
            DEFINED AS
"This attribute describes the unambiguous carrier specific code used to distinguish from other
carriers. It can be dialled by the customer or supplied by the exchange.";;
REGISTERED AS {attribute 12};
```

8.3.13 carrierCodePresent

```
carrierCodePresent ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.CarrierCodePresent;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 13};
```

8.3.14 carrierDataId

```
carrierDataId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 14};
```

8.3.15 carrierDataInstance

```
carrierDataInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        carrierDataInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute references an instance of the OC carrierData. It allows the selection of
destinations depending on the dialled or assigned carrier code of the call.";;
REGISTERED AS {attribute 15};
```

8.3.16 cepId

```
cepId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 16};
```

8.3.17 cepsgCombId

```
cepsgCombId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 17};
```

8.3.18 cepsgCombListId

```
cepsgCombListId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 18};
```

8.3.19 cepsgCombListSelection

```
cepsgCombListSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SelectionForAlgorithm;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        cepsgCombListSelectionBeh BEHAVIOUR
            DEFINED AS
"This attribute gives a list of instances on which an algorithm is to apply. These instances can be
instances of OC routingPossData or of the OC cepsgComb.";;
REGISTERED AS {attribute 19};
```

8.3.20 cepsgCombOrCepsgInstance

```
cepsgCombOrCepsgInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        cepsgCombOrCepsgInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC cepsgComb or to an instance of OC cepsg (beside it
remains possible for this attribute to point to other OCs as e.g. test equipment).";;
REGISTERED AS {attribute 20};
```

8.3.21 cepsgCombSelection

```
cepsgCombSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SelectionForAlgorithm;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        cepsgCombSelectionBeh BEHAVIOUR
            DEFINED AS
"This attribute gives a list of instances of OC cepsg on which an algorithm is to apply.";;
REGISTERED AS {attribute 21};
```

8.3.22 cic

```
cic ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Cic;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        cicBeh BEHAVIOUR
            DEFINED AS
"This attribute indicates the circuit identification code (CIC) of a circuit and is applicable for
SS No.7.";;
REGISTERED AS {attribute 22};
```

8.3.23 circuitNumber

```
circuitNumber ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.CircuitNumber;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        circuitNumberBeh BEHAVIOUR
            DEFINED AS
"This attribute indicates the logical circuit end point number within the containing circuit end
point subgroup.";;
REGISTERED AS {attribute 23};
```

8.3.24 crankbackAdminState

```
crankbackAdminState ATTRIBUTE
    DERIVED FROM  "ITU-T Recommendation X.721":administrativeState;
    BEHAVIOUR
        crankbackAdminStateBeh BEHAVIOUR
            DEFINED AS
"This attribute describes whether crankback is locked or unlocked.";;
REGISTERED AS {attribute 24};
```

8.3.25 ctpbInstance

```
ctpbInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        ctpbInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC ITU-T Recommendation M.3100:
connectionTerminationPointBidirectional which has the channelNumber attribute.";;
REGISTERED AS {attribute 25};
```

8.3.26 destinationCode

```
destinationCode ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.DestinationCode;
    MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
    BEHAVIOUR
        destinationCodeBeh BEHAVIOUR
            DEFINED AS
"This attribute characterises a destination of a call by specifying the country code, or/and area
code, or/and exchange identifying code, or/and individual line number etc.";;
REGISTERED AS {attribute 26};
```

8.3.27 destinationGroupLabel

```
destinationGroupLabel ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        destinationGroupLabelBeh BEHAVIOUR
            DEFINED AS
"This attribute specifies - via a label - the destination group the instance belongs to";;
REGISTERED AS {attribute 27};
```

8.3.28 destinationType

```
destinationType ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.DestinationType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        destinationTypeBeh BEHAVIOUR
            DEFINED AS
"This attribute indicates the type of destination as a named integer value. The destinationType is
either derived from the called party number information element (nature of address indicator in
ITU-T Recommendation Q.763 or type of number in ITU-T Recommendation Q.931) or determined by the
prefix digit analysis.";;
REGISTERED AS {attribute 28};
```

8.3.29 digitCombInsert

```
digitCombInsert ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.DigitCombInsert;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {attribute 29};
```

8.3.30 digitCombReplace

```
digitCombReplace ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.DigitCombReplace;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {attribute 30};
```

8.3.31 digitModificationId

```
digitModificationId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 31};
```

8.3.32 digitModificationInstance

```
digitModificationInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        digitModificationInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC digitModification.";;
REGISTERED AS {attribute 32};
```

8.3.33 digitPreparationCriteriaId

```
digitPreparationCriteriaId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 33};
```

8.3.34 digitRebuildingCriteriaId

```
digitRebuildingCriteriaId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 34};
```

8.3.35 digitSuppress

```
digitSuppress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.DigitSuppress;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {attribute 35};
```

8.3.36 echoSuppressor

```
echoSuppressor ATTRIBUTE
    WITH ATTRIBUTE SYNTAX   ASN1TypeModule.YesNo;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 36};
```

8.3.37 exceptionId

```
exceptionId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 37};
```

8.3.38 excludedSubscriberCodes

```
excludedSubscriberCodes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ExcludedSubscriberCodes;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {attribute 38};
```

8.3.39 extSchedulingAttribute

```
extSchedulingAttribute ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ExtSchedulingAttribute;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        extSchedulingAttributeBeh BEHAVIOUR
            DEFINED AS
"This attribute provides the scheduling information in the SMO, for external index scheduling as in
EN 301 098[3].";;
REGISTERED AS {attribute 39};
```

8.3.40 initialSubscriberCodes

```
initialSubscriberCodes ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.InitialSubscriberCodes;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 40};
```

8.3.41 inputCriteriaDataForAlgorithm

```
inputCriteriaDataForAlgorithm ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.InputCriteriaDataForAlgorithm;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 41};
```

8.3.42 languageDigit

```
languageDigit ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.LanguageDigit;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        languageDigitBeh BEHAVIOUR
            DEFINED AS
"This attribute describes the operator language.";;
REGISTERED AS {attribute 42};
```

8.3.43 languageDigitProc

```
languageDigitProc ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.YesNo;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        languageDigitProcBeh BEHAVIOUR
            DEFINED AS
"This attribute indicates whether the language digit has to be extracted from the transmitted digit
string for incoming calls and has to be included into the transmitted digit string for outgoing
calls on the position specified by the signalling systems R2 or C5 for international transit or
terminating traffic. The attribute is applicable if the circuit end point subgroup is of type
incoming or two-way and one of the above signalling systems is used.";;
REGISTERED AS {attribute 43};
```

8.3.44 localDestinationId

```
localDestinationId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 44};
```

8.3.45 matchesIf

```
matchesIf ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.MatchesIf;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
REGISTERED AS {attribute 45};
```

8.3.46 nationalDestinationCode

```
nationalDestinationCode ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NationalDestinationCode;
    MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
    BEHAVIOUR
        nationalDestinationCodeBeh BEHAVIOUR
            DEFINED AS
"This attribute describes the NDC; its size is limited as described in
ITU-T Recommendation E.164 [4] or any successor document.";;
REGISTERED AS {attribute 46};
```

8.3.47 nationalDestinationId

```
nationalDestinationId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 47};
```

8.3.48 nationalDestinationInstance

```
nationalDestinationInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        nationalDestinationInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute references an instance of OC nationalDestination.";;
REGISTERED AS {attribute 48};
```

8.3.49 natureOfAddress

```
natureOfAddress ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NatureOfAddress;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 49};
```

8.3.50 numberOfDigits

```
numberOfDigits ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NumberOfDigits;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 50};
```

8.3.51 numberOfSatLinks

```
numberOfSatLinks ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NumberOfSatLinks;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 51};
```

8.3.52 officeEquipment

```
officeEquipment ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.OfficeEquipment;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        officeEquipmentBeh BEHAVIOUR
            DEFINED AS
" This attribute references the physical equipment the circuit end point is associated with. If the
inst choice is used, it references an instance of  OC ITU-T Recommendation M.3100: circuitPack. If
the string choice is used, the value is technology specific.";;
REGISTERED AS {attribute 52};
```

8.3.53 originForAnalysis

```
originForAnalysis ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        originForAnalysisBeh BEHAVIOUR
            DEFINED AS
"This attribute determines the group assigned to the circuit end point subgroup for digit analysis
purpose.";;
REGISTERED AS {attribute 53};
```

8.3.54 originForPreparation

```
originForPreparation ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        originForPreparationBeh BEHAVIOUR
            DEFINED AS
"This attribute determines the group assigned to the incoming circuit end point subgroup for digit
preparation purpose.";;
REGISTERED AS {attribute 54};
```

8.3.55 originForRebuilding

```
originForRebuilding ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        originForRebuidingBeh BEHAVIOUR
            DEFINED AS
"This attribute determines the group assigned to the circuit end point subgroup for digit rebuilding
purpose.";;
REGISTERED AS {attribute 55};
```

8.3.56 originForRouting

```
originForRouting ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        originForRoutingBeh BEHAVIOUR
            DEFINED AS
"This attribute determines the group assigned to the circuit end point subgroup for post-analysis
evaluation purpose.";;
REGISTERED AS {attribute 56};
```

8.3.57 ownCac

```
ownCac ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.OwnCac;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        ownCacBeh BEHAVIOUR
            DEFINED AS
" This attribute describes whether the carrier access code identifies the network where the exchange
is located.";;
REGISTERED AS {attribute 57};
```

8.3.58 postAnalysisEvaluationId

```
postAnalysisEvaluationId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 58};
```

8.3.59 prefixCode

```
prefixCode ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.PrefixCode;
    MATCHES FOR EQUALITY, SUBSTRINGS;
REGISTERED AS {attribute 59};
```

8.3.60 prefixDigitAnalysisId

```
prefixDigitAnalysisId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 60};
```

8.3.61 prefixDigits

```
prefixDigits ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.PrefixDigits;
    MATCHES FOR EQUALITY, SUBSTRINGS;
    BEHAVIOUR
        prefixDigitsBeh BEHAVIOUR
            DEFINED AS
"This attribute defines the digits which have to be inserted in front of the dialled digits. An
empty string means that no digits have to be inserted. The attribute is present if the circuit end
point subgroup is of type incoming or two-way.";;
REGISTERED AS {attribute 61};
```

8.3.62 prefTrafficDirect

```
prefTrafficDirect ATTRIBUTE
WITH ATTRIBUTE SYNTAX  ASN1TypeModule.PrefTrafficDirect;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 62};
```

8.3.63 preparationOrigin

```
preparationOrigin ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Origin;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 63};
```

8.3.64 preparationTerm

```
preparationTerm ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Term;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 64};
```

8.3.65 rDNId

```
rDNId ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY, ORDERING, SUBSTRINGS;
    BEHAVIOUR
        rDNIdBeh BEHAVIOUR
            DEFINED AS
"If the string choice for the syntax is used, matching on substrings is permitted. If the number
choice for the syntax is used, then matching on ordering is permitted.";;
REGISTERED AS {attribute 65};
```

8.3.66 rebuildingOrigin

```
rebuildingOrigin ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Origin;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 66};
```

8.3.67 reqBearerCapability

```
reqBearerCapability ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ReqBearerCapability;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 67};
```

8.3.68 reqSignCapability

```
reqSignCapability ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ReqSignCapability;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 68};
```

8.3.69 routingOrigin

```
routingOrigin ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.Origin;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 69};
```

8.3.70 routingPossDataId

```
routingPossDataId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 70};
```

8.3.71 routingPossibilitiesId

```
routingPossibilitiesId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 71};
```

8.3.72 routingPossibilitiesSelection

```
routingPossibilitiesSelection ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SelectionForAlgorithm;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        routingPossBeh BEHAVIOUR
            DEFINED AS
"This attribute gives a list of instances on which an algorithm is to apply. These instances can be
instances of OC routingPossData or of OC localDestination or of OC cepsgComb or of OC cepsg or of OC
routingPossibilities. ";;
REGISTERED AS {attribute 72};
```

8.3.73 routingPossRestrictId

```
routingPossRestrictId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 73};
```

8.3.74 schedulingAttribute

```
schedulingAttribute ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SchedulingAttribute;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        schedulingAttributeBeh BEHAVIOUR
            DEFINED AS
"This attribute provides the scheduling information in the SMO, for external index scheduling as in
EN 301 098[3].";;
REGISTERED AS {attribute 74};
```

8.3.75 searchMethod

```
searchMethod ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SearchMethod;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        searchMethodBeh BEHAVIOUR
            DEFINED AS
"detailed under searchMethod in subclause 7.0";;
REGISTERED AS {attribute 75};
```

8.3.76 selectedInstances

```
selectedInstances ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SelectedInstances;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        selectedInstancesBeh BEHAVIOUR
            DEFINED AS
"This attribute references object instances with an ordered list. Instances are of OC
routingPossibilities or postAnalysisEvaluation. All referenced instances of this attribute belong to
the same OC.";;
REGISTERED AS {attribute 76};
```

8.3.77 skipGroupSignal1

```
skipGroupSignal1 ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SkipGroup;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
    BEHAVIOUR
        skipGroupSignal1Beh BEHAVIOUR
            DEFINED AS
"This attribute lists routing possibilities (e.g. routingPossData, cepsg) that have to be skipped if
signal1 (refer to ITU-T Recommendation E.170 [5]) arrives from a cepsg reachable via one of these
routing possibilities.";;
REGISTERED AS {attribute 77};
```

8.3.78 skipGroupSignal2

```
skipGroupSignal2 ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SkipGroup;
    MATCHES FOR EQUALITY, SET-COMPARISON, SET-INTERSECTION;
    BEHAVIOUR
        skipGroupSignal2Beh BEHAVIOUR
            DEFINED AS
"This attribute lists routing possibilities (e.g. routingPossData, cepsg) that have to be skipped if
signal2 (refer to ITU-T Recommendation E.170 [5]) arrives from a cepsg reachable via one of these
routing possibilities.";;
REGISTERED AS {attribute 78};
```

8.3.79 suppressCac

```
suppressCac ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.SuppressCac;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        suppressCacBeh BEHAVIOUR
            DEFINED AS
"This attribute describes whether a CAC has to be suppressed or not.";;
REGISTERED AS {attribute 79};
```

8.3.80 suppressOwnCac

```
suppressOwnCac ATTRIBUTE
    DERIVED FROM  suppressCac;
    BEHAVIOUR
        suppressOwnCacBeh BEHAVIOUR
            DEFINED AS
"This attribute describes whether the network's own CAC has to be suppressed or not.";;
REGISTERED AS {attribute 80};
```

8.3.81 termForPreparation

```
termForPreparation ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.NameType;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        termForPreparationBeh BEHAVIOUR
            DEFINED AS
"This attribute determines the group assigned to the outgoing circuit end point subgroup for digit
preparation purpose.";;
REGISTERED AS {attribute 81};
```

8.3.82 trafficCategory

```
trafficCategory ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.TrafficCategory;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        trafficCategoryBeh BEHAVIOUR
            DEFINED AS
"This attribute describes the traffic category that is assigned to the call. This attribute is not
the same as the parameter calling party's category of ITU-T Recommendation Q.763.
The Abstract Syntax Notation One (ASN.1) type TrafficCategory comprises the following values:
- nationalTraffic: This value is used for traffic that does not cross international boundaries and
when no other specific value of the ASN.1 type TrafficCategory is appropriate.
- internationalTransitTraffic: This value is used for traffic that crosses international boundaries
and when the adjacent exchange serves as international transit exchange for the traffic.
- internationalTerminatingTraffic: This value is used for traffic that crosses international
boundaries and when the adjacent exchange serves as an international terminating exchange.";;
REGISTERED AS {attribute 82};
```

8.3.83 trafficDistributionData

```
trafficDistributionData ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.TrafficDistributionData;
    MATCHES FOR EQUALITY;
REGISTERED AS {attribute 83};
```

8.3.84 trafficDistributionId

```
trafficDistributionId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 84};
```

8.3.85 trafficDistributionInstance

```
trafficDistributionInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        trafficDistributionInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC trafficDistribution.";;
REGISTERED AS {attribute 85};
```

8.3.86 treatmentId

```
treatmentId ATTRIBUTE
    DERIVED FROM  rDNId;
REGISTERED AS {attribute 86};
```

8.3.87 treatmentInstance

```
treatmentInstance ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.ObjectInstance;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        treatmentInstanceBeh BEHAVIOUR
            DEFINED AS
"This attribute points to an instance of OC treatment.";;
REGISTERED AS {attribute 87};
```

8.3.88 usedAlgorithm

```
usedAlgorithm ATTRIBUTE
    WITH ATTRIBUTE SYNTAX  ASN1TypeModule.UsedAlgorithm;
    MATCHES FOR EQUALITY;
    BEHAVIOUR
        usedAlgorithmBeh BEHAVIOUR
            DEFINED AS
"This attribute describes the algorithm used to select a member within a list.";;
REGISTERED AS {attribute 88};
```

8.4 Name bindings

8.4.1 analysisCriteria-managedElement

```
analysisCriteria-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS analysisCriteria
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        analysisCriteriaId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 1};
```

8.4.2 callHistory-managedElement

```
callHistory-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS callHistory
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        callHistoryId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 2};
```

8.4.3 carrierData-managedElement

```
carrierData-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS carrierData
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        carrierDataId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 3};
```

8.4.4 cep-cepsg

```
cep-cepsg NAME BINDING
    SUBORDINATE OBJECT CLASS cep
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS
        "ITU-T Recommendation M.3100":circuitEndPointSubgroup
        AND SUBCLASSES;
    WITH ATTRIBUTE
        cepId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 4};
```

8.4.5 cepsg-managedElement

```
cepsg-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS cepsg
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        "ITU-T Recommendation M.3100":circuitEndPointSubgroupId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 5};
```

8.4.6 cepsgComb-managedElement

```
cepsgComb-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS cepsgComb
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        cepsgCombId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 6};
```

8.4.7 cepsgCombList-managedElement

```
cepsgCombList-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS cepsgCombList
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        cepsgCombListId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 7};
```

8.4.8 digitModification-managedElement

```
digitModification-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS digitModification
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        digitModificationId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 8};
```

8.4.9 digitPreparationCriteria-managedElement

```
digitPreparationCriteria-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS digitPreparationCriteria
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        digitPreparationCriteriaId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 9};
```

8.4.10 digitRebuildingCriteria-managedElement

```
digitRebuildingCriteria-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS digitRebuildingCriteria
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        digitRebuildingCriteriaId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 10};
```

8.4.11 exception-managedElement

```
exception-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS exception
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        exceptionId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 11};
```

8.4.12 localDestination-managedElement

```
localDestination-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS localDestination
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        localDestinationId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 12};
```

8.4.13 nationalDestination-managedElement

```
nationalDestination-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS nationalDestination
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        nationalDestinationId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 13};
```

8.4.14 postAnalysisEvaluation-managedElement

```
postAnalysisEvaluation-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS postAnalysisEvaluation
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        postAnalysisEvaluationId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 14};
```

8.4.15 prefixDigitAnalysis-managedElement

```
prefixDigitAnalysis-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS prefixDigitAnalysis
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        prefixDigitAnalysisId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 15};
```

8.4.16 routingPossData-managedElement

```
routingPossData-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS routingPossData
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        routingPossDataId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 16};
```

8.4.17 routingPossRestrict-routingPossibilities

```
routingPossRestrict-routingPossibilities NAME BINDING
    SUBORDINATE OBJECT CLASS routingPossRestrict
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS routingPossibilities
        AND SUBCLASSES;
    WITH ATTRIBUTE
        routingPossRestrictId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 17};
```

8.4.18 routingPossibilities-managedElement

```
routingPossibilities-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS routingPossibilities
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        routingPossibilitiesId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 18};
```

8.4.19 trafficDistribution-managedElement

```
trafficDistribution-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS trafficDistribution
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        trafficDistributionId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 19};
```

8.4.20 treatment-managedElement

```
treatment-managedElement NAME BINDING
    SUBORDINATE OBJECT CLASS treatment
        AND SUBCLASSES;
    NAMED BY SUPERIOR OBJECT CLASS "ITU-T Recommendation M.3100":managedElement
        AND SUBCLASSES;
    WITH ATTRIBUTE
        treatmentId;
    CREATE
        WITH-REFERENCE-OBJECT,
        WITH-AUTOMATIC-INSTANCE-NAMING;
    DELETE ;
REGISTERED AS {nameBinding 20};
```

8.5 ASN.1 type definitions

```
ASN1TypeModule { ccitt(0) identified-organisation (4) etsi(0) callRoutingInformationManagement(292)
informationModel(0) asn1Module(2) asn1TypeModule(0)}
DEFINITIONS ::=
BEGIN

IMPORTS
ObjectClass, ObjectInstance, Attribute
FROM CMIP-1 {joint-iso-ccitt ms (9) cmip (1) module(0) protocol (3)}
AdministrativeState
FROM Attribute-ASN1Module {joint-iso-ccitt ms (9) smi(3) part2(2) asn1Module(2) 1}
NameType
FROM ASN1DefinedTypesModule {ccitt recommendation m gnm(3100) informationModel(0) asn1Modules(2)
asn1DefinedTypesModule (0)};

informationModel    OBJECT IDENTIFIER::={ccitt (0) identified-organisation (4) etsi (0)
call-routing-information-management (292) informationModel (0)}
standardSpecificExtension   OBJECT IDENTIFIER::={informationModel standardSpecificExtension(0)}
managedObjectClass  OBJECT IDENTIFIER::={informationModel managedObjectClass(3)}
package OBJECT IDENTIFIER::={informationModel package(4)}
nameBinding OBJECT IDENTIFIER::={informationModel nameBinding(6)}
attribute   OBJECT IDENTIFIER::={informationModel attribute(7)}
action  OBJECT IDENTIFIER::={informationModel action(9)}
notification    OBJECT IDENTIFIER::={informationModel notification(10)}

-- default values
defaultAnalysisOrigin   Origin  ::= anyOrigin: NULL
defaultAssocSignRouteSetNePart  ObjectInstanceOrNull    ::= null: NULL
defaultBoundaryCrossing BoundaryCrossing    ::= national
defaultCallingPartyCategory CallingPartyCategory    ::= anyCategory: NULL
defaultCrankbackAdminState  AdministrativeState ::= unlocked
defaultLanguageDigitProc    YesNo   ::= FALSE
defaultPrefixDigits PrefixDigits    ::= ""
defaultPreparationOrigin    Origin  ::= anyOrigin: NULL
defaultPreparationTerm  Term    ::= anyTerm: NULL
defaultRebuildingOrigin Origin  ::= anyOrigin: NULL
defaultRoutingOrigin    Origin  ::= anyOrigin: NULL
defaultTrafficCategory  TrafficCategory ::= nationalTraffic

-- initial value
initialCarrierCodePresent   CarrierCodePresent  ::= NULL

-- ASN.1 Types
ActiveDestination           ::= CHOICE {
        destination                 [0] ObjectInstance,
        destinationGroup            [1] DestinationGroup }
BoundaryCrossing            ::= INTEGER {
        national                        (0),
        international               (1)}
CalledNumberingPlan     ::= BIT STRING (SIZE(4))
-- Value according ITU-T Recommendation Q.763
CallingPartyCategory        ::= CHOICE {
        anyCategory             [0] NULL,
        definedCategory         [1] BIT STRING(SIZE(8)),
-- Values of 'definedCategory' according ITU-T Recommendation Q.763
        extendedCategory        [2] OBJECT IDENTIFIER}
CarrierCode                 ::= IA5String(FROM("0".."9"|"A".."F"))
CarrierCodePresent          ::= NULL
Cic                             ::= INTEGER
CircuitNumber                   ::= INTEGER
DestinationCode             ::= IA5String(FROM("0".."9"|"A".."F"))
DestinationGroup            ::= SEQUENCE{
        objectClass             [0] ObjectClass OPTIONAL,
        label                           [1] NameType}
DestinationType             ::= INTEGER {
```

```
        international               (0),
        national                        (1),
        local                           (2),
        other                           (3) }
DigitComb                       ::= IA5String(FROM("0".."9"|"A".."F"))
DigitCombInsert             ::= SET OF SEQUENCE {
        startPosition               [0] INTEGER,
        combination             [1] DigitComb }
DigitCombReplace            ::= SET OF SEQUENCE {
        startPosition               [0] INTEGER,
        endPosition             [1] INTEGER,
        combination             [2] DigitComb }
DigitSuppress                   ::= SET OF SEQUENCE {
        startPosition               [0] INTEGER,
        endPosition             [1] INTEGER }
ExcludedSubscriberCodes::= SET OF IA5String(FROM("0".."9"|"A".."F"))
ExtSchedulingAttribute      ::= SET OF SEQUENCE {
        objectOrGroup           [0] CHOICE {
                                        destination         [0] ObjectInstance,
                                        destinationGroup    [1] DestinationGroup},
        index                       [1] INTEGER }
IncCepsg                        ::= ObjectInstance
-- instances of OC cepsg for one-way incoming or two-way direction
InitialSubscriberCodes      ::= SEQUENCE OF IA5String(FROM("0".."9"|"A".."F"))
InputCriteriaDataForAlgorithm   ::= CHOICE {
        out                         [0] SEQUENCE OF SEQUENCE {
                                        outCepsgs           SET OF OutCepsg,
                                        userLabel           GraphicString OPTIONAL},
        perc                        [1] SEQUENCE OF SEQUENCE {
                                        percentage          INTEGER(0..100),
                                        userLabel           GraphicString OPTIONAL},
        inc                         [2] SEQUENCE OF SEQUENCE {
                                        incCarriedCallsQuota    SEQUENCE{
                                            incCepsgs           SET OF IncCepsg,
                                            percentage          INTEGER (0..100)},
                                        userLabel           GraphicString OPTIONAL}}
InstanceOrName          ::= CHOICE {
        objectInstance          [0] ObjectInstance,
        symbolic                    [1] NameType}
LanguageDigit           ::= INTEGER {
        french                      (1),
        english                     (2),
        german                      (3),
        russian                     (4),
        spanish                     (5)} (0..15)
-- the number of the language corresponds to the language numbers in the calling party's
-- category field in ITU-T Recommendation Q.763
MatchesIf                   ::= SET OF CHOICE {
        criteria                        [0] ObjectClass,
        cause                       [1] BIT STRING}
-- causes as defined in ITU-T Recommendation Q.850
ModifyNumberingSchemeInfo ::= SEQUENCE {
        newNationalDestInstance     [0] ObjectInstance              OPTIONAL,
        newInitialSubscriberCodes   [1] InitialSubscriberCodes  OPTIONAL }
ModifyNumberingSchemeReply  ::= SET OF Attribute
NationalDestinationCode ::= IA5String(FROM("0".."9"))
-- size is limited as in ITU-T Recommendation E.164 [4] or any successor document
NatureOfAddress     ::= BIT STRING (SIZE(7))
-- Value according ITU-T Recommendation Q.763
NumberOfDigits          ::= INTEGER
NumberOfSatLinks        ::= INTEGER
ObjectInstanceOrNull    ::= CHOICE {
        objectInstance          [0] ObjectInstance,
        null                            [1] NULL}
-- Definition similar to PointerOrNull from ITU-T Recommendation M.3100 [8]
ObjectInstances         ::= SET OF ObjectInstance
OfficeEquipment         ::= CHOICE {
        string                          [0] PrintableString,
        inst                            [1] ObjectInstance}
Origin                      ::= CHOICE {
        anyOrigin                   [0] NULL,
        namedOrigin             [1] NameType,
        extendedOrigin          [2] OBJECT IDENTIFIER}
OutCepsg                    ::= ObjectInstance
-- instance of OC cepsg for out/bothway direction
OwnCac                      ::= BOOLEAN
PrefixCode                  ::= IA5String(FROM("0".."9"|"A".."F"|"*"|"#"))
PrefixDigits                    ::= IA5String (FROM("0".."9"|"A".."F"))
PrefTrafficDirect           ::= INTEGER {
        incoming                    (1),
        outgoing                    (2),
        outgoingFirstChoice     (3) }
ReqBearerCapability     ::= INTEGER {
```

```
        speech                      (0),
        r64kbitsUnrestricted        (1),
        r56kbitsDigitalRestricted(2),
        r3point1kHzAudio        (3),
        r7kHzAudio              (4),
        r64kbitPref                 (5) }
ReqSignCapability       ::= INTEGER {
        isupRequired                (0),
        isupPreferred               (1),
        anySignalling               (2) }
SchedulingAttribute     ::= SET OF SEQUENCE {
        object                      [0] ObjectInstance,
        index                           [1] INTEGER}
SearchMethod            ::= INTEGER {
    fifoEvenElseLifoOdd (0),    -- priority for idle list with even CIC
    fifoOddElseLifoEven (1),    -- priority for idle list with odd CIC
    fifoEvenGrpElseLifoOddGrp   (2),    -- priority for idle list with even group CIC
    fifoOddGrpElseLifoEvenGrp   (3),    -- priority for idle list with odd group CIC
    fifo    (4),    -- FIFO method for idle list
    forwardSequential   (5),    -- idle circuit with lowest CIC
    backwardSequential  (6),    -- idle circuit with highest CIC
    forwardOddElseBackwardEven  (7),    -- lowest odd CIC or highest even CIC
    forwardEvenElseBackwardOdd  (8),    -- lowest even CIC or highest odd CIC
    forwardCyclic   (9),    -- cyclic search ascending order of CICs
    backwardCyclic  (10),   -- cyclic search descending order of CICs
    random  (11)}   -- random idle circuit
SelectedInstances       ::= SEQUENCE OF CHOICE{
        routingPossibilitiesInstance        [0] ObjectInstance,
        postAnalysisEvaluationGroup [1] DestinationGroup}
SelectionForAlgorithm   ::= CHOICE {
        ordered                     [0] SEQUENCE OF ObjectInstance,
        proportional                [1] SET OF SEQUENCE {
                                            percentage  [0] INTEGER(0..100),
                                            list                [1] SEQUENCE OF ObjectInstance}}
SkipGroup                   ::= ObjectInstances
-- list of instances of OCs localDestination, routingPossData, cepsgComb, cepsg,
routingPossibilities.
SuppressCac             ::= BOOLEAN
Term                            ::= CHOICE {
        anyTerm                 [0] NULL,
        namedTerm               [1] NameType}
TrafficCategory         ::= INTEGER{
        nationalTraffic                         (0),
        internationalTransitTraffic         (1),
        internationalTerminatingTraffic (2) }
TrafficDistributionData ::= SEQUENCE OF SEQUENCE {
        percentage                  [0] INTEGER(0..100),
        userLabel                   [1] GraphicString OPTIONAL}
UsedAlgorithm           ::= INTEGER {
        sequential                  (0),
        cyclic                          (1),
        proportionalBidding     (2) }
YesNo                       ::= BOOLEAN
END
```

8.6 Cross reference list

This list gives a cross reference between each attribute and the managed OCs in which it is used for their definition.

Table 2: Cross reference list

Attribute Label	Registered as attribute #	Used in managedObjectClass #
activeDestination	1	0
activeRoutingPossibilities	2	0
analysisCriteriaId	3	0
analysisCriteriaInstance	4	0
analysisOrigin	5	0
assocSignRouteSetNePart	6	0
boundaryCrossing	7	0
calledNumberingPlan	8	0
cfieldallHistoryId	9	0
callHistoryInstance	10	0
callingPartyCategory	11	0, 0
carrierCode	12	0
carrierCodePresent	13	0
carrierDataId	14	0
carrierDataInstance	15	0
cepId	16	0
cepsgCombId	17	0
cepsgCombListId	18	0
cepsgCombListSelection	19	0
cepsgCombOrCepsgInstance	20	0
cepsgCombSelection	21	0
cic	22	0
circuitNumber	23	0
crankbackAdminState	24	0
ctpbInstance	25	0
destinationCode	26	0
destinationGroupLabel	27	0, 0
destinationType	28	0, 0
digitCombInsert	29	0

(continued)

Table 2 (continued): Cross reference list

Attribute Label	Registered as attribute #	Used in managedObjectClass #
digitCombReplace	30	0
digitModificationId	31	0
digitModificationInstance	32	0, 0, 0, 0
digitPreparationCriteriaId	33	0
digitRebuildingCriteriaId	34	0
digitSuppress	35	0
exceptionId	36	0
echoSuppressor	37	0
excludedSubscriberCodes	38	0
extSchedulingAttribute	39	0
initialSubscriberCodes	40	0
inputCriteriaDataForAlgorithm	41	0
languageDigit	42	0
languageDigitProc	43	0
localDestinationId	44	0
matchesIf	45	0
nationalDestinationCode	46	0
nationalDestinationId	47	0
nationalDestinationInstance	48	0, 0
natureOfAddress	49	0
numberOfDigits	50	0
numberOfSatLinks	51	0
officeEquipment	52	0
originForAnalysis	53	0
originForPreparation	54	0
originForRebuilding	55	0
originForRouting	56	0
ownCac	57	0
postAnalysisEvaluationId	58	0
prefixCode	59	0
prefixDigitAnalysisId	60	0
prefixDigits	61	0
prefTrafficDirect	62	0
preparationOrigin	63	0
preparationTerm	64	0
rDNId	65	
rebuildingOrigin	66	0

(continued)

Table 2 (concluded): Cross reference list

Attribute Label	Registered as attribute #	Used in managedObjectClass #
reqBearerCapability	67	0
reqSignCapability	68	0
routingOrigin	69	0
routingPossDataId	70	0
routingPossibilitiesId	71	0
routingPossibilitiesSelection	72	0
routingPossRestrictId	73	0
schedulingAttribute	74	0
searchMethod	75	0
selectedInstances	76	0
skipGroupSignal1	77	0
skipGroupSignal2	78	0
suppressCac	79	0
suppressOwnCac	80	0
termForPreparation	81	0
trafficCategory	82	0
trafficDistributionData	83	0
trafficDistributionId	84	0
trafficDistributionInstance	85	0
treatmentId	86	0
treatmentInstance	87	0
usedAlgorithm	88	0, 0, 0

Annex A (informative): OC configuration examples

A.1 Introduction

This annex illustrates how to use the OCs of the present document for routing information management. It shows that it is possible to solve one routing scenario with different configurations of OCs and relations between them.

Among all possibilities described in the standard itself, different solutions are shown by means of the E-R diagrams showing only the relevant relations between objects classes.

In the scenarios below, instances of OCs are illustrated within exchange 'A'. Only successful cases are considered.

A.2 Scenario 1

Call from a local subscriber to a local subscriber.

A.2.1 First solution

The digit rebuilding fragment, the digit preparation fragment, the routing possibility selection fragment and the exception handling fragment are not needed.

With the help of the OC analysisCriteria the exchange will recognize a local destination. The call will be routed to the local subscriber administration, which analyzes the total dialled digit code to identify the corresponding subscriber.

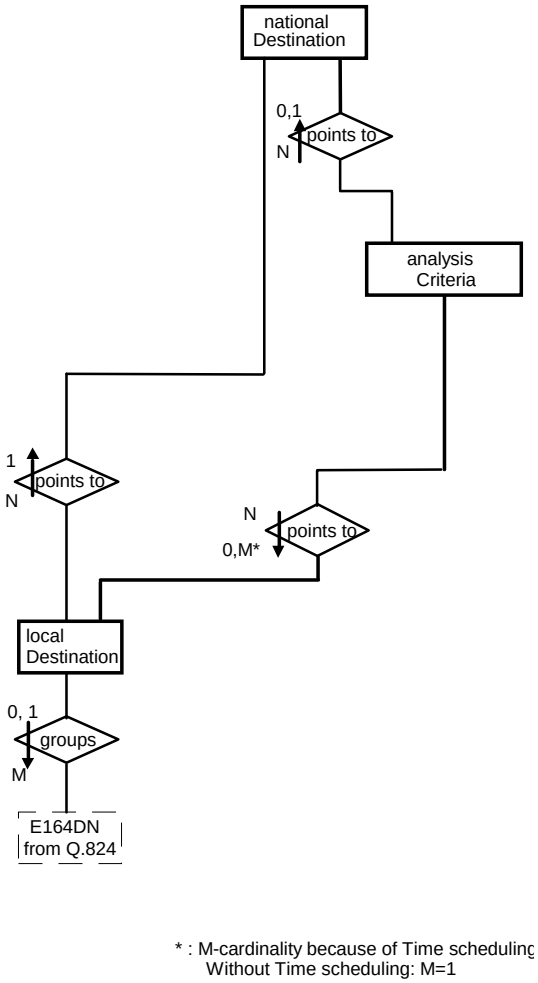


Figure A.1 (E-R Diagram 2): Destination selection fragment

A.2.2 Second solution

For this scenario, the call from a local subscriber to another local subscriber, only E-R diagrams 2 and 3 are relevant.

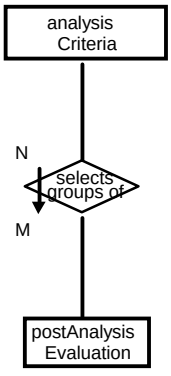


Figure A.2 (E-R Diagram 2): Destination selection fragment

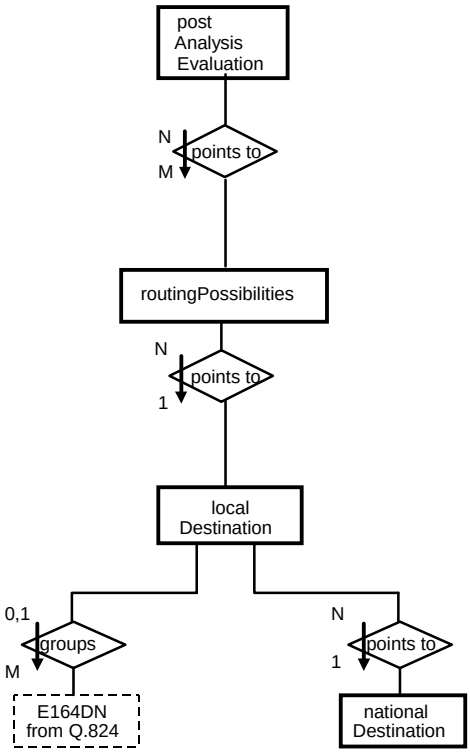


Figure A.3 (E-R Diagram 3): Routing possibility selection fragment

A.3 Scenario 2

Call incoming exchange 'A' via cepsg to be directed to destination (for this example 'D') via exchange 'B' or via exchange 'C'.

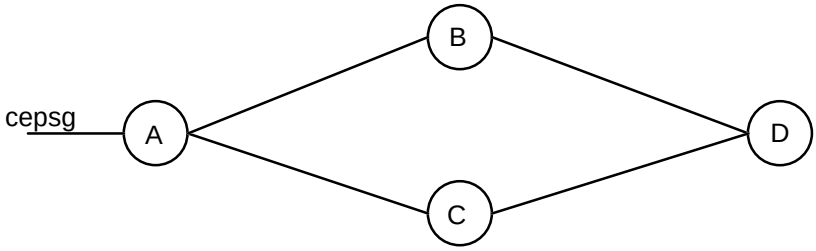


Figure A.4: Scenario 2 "Routing processing"

A.3.1 First solution

In the digit rebuilding fragment the called digit code can be modified due to the nature of address of the call set-up request. It is also possible to insert a digit due to the cepsg via which the call set-up request arrives in the exchange.

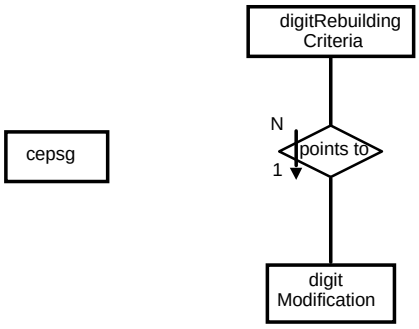


Figure A.5 (E-R Diagram 1): Digit rebuilding fragment

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The call will be handled by the OC postAnalysisEvaluation to evaluate e.g. routing origin and calling party category.

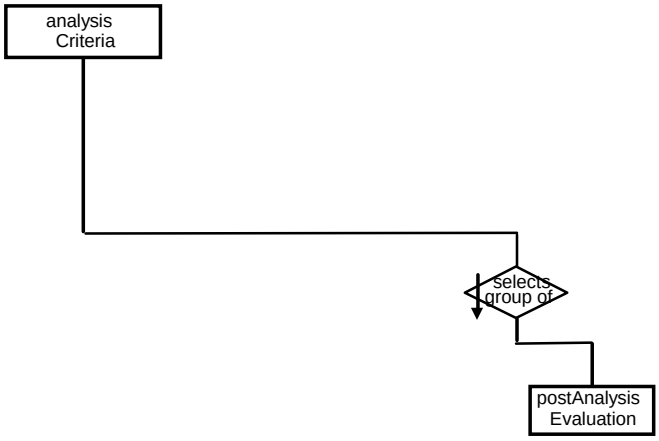


Figure A.6 (E-R Diagram 2): Destination selection fragment

The result of the analysis by the help of the OC postAnalysisEvaluation will be an instance of the OC routingPossibilities, which offers a list of instances either of the OC cepsgCombList or of the OC cepsgComb or of the OC cepsg. Hence, if the first selected instance of the list is not available the remaining instances in the list are to be checked, whether they are available. The process of the routing possibilities selection shall be continued via circuit endpoint subgroups (OC cepsg) down to the circuit endpoints (OC cep).

The exchanges B and C can be associated either to two respective instances of OC cepsgCombList or to two respective instances of OC cepsgComb or to two respective instances of OC cepsg.

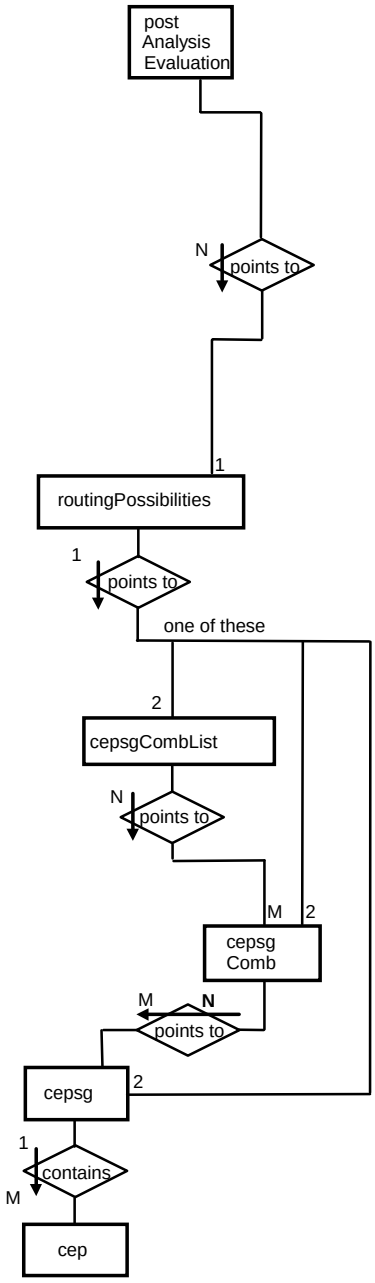


Figure A.7 (E-R Diagram 3): Routing possibility selection fragment

In the digit preparation fragment the called digit code can be modified either due to the incoming and the finally outgoing circuit endpoint subgroup (OC digitPreparationCriteria) or just after the post analysis evaluation.

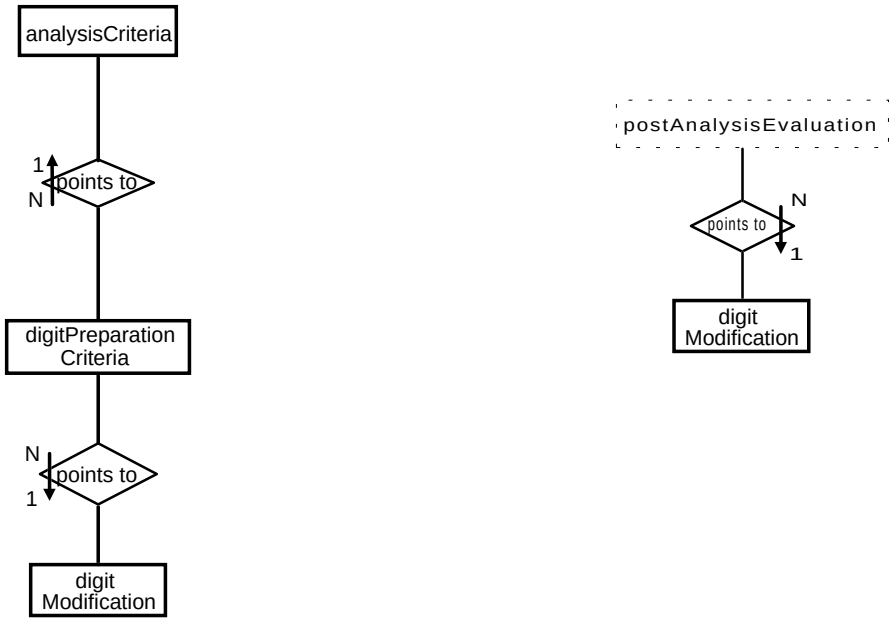


Figure A.8 (E-R Diagram 4): Digit preparation fragment

The exception handling fragment is not needed for a successful call.

A.3.2 Second solution

If no insertion of digits is needed before the digit analysis has to start, then no OC of the „digit rebuilding" fragment has to be administered.

With the help of the OC analysisCriteria, the exchange will recognize that the call shall not be routed to a local destination. The call will be handled by the OC routingPosssibilities afterwards, to select a way (routing possibility) to exchange 'D' via exchange 'B' or exchange 'C'.

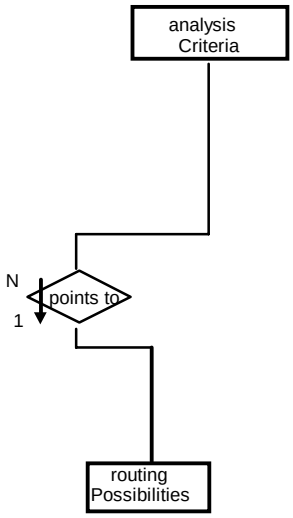


Figure A.9 (E-R Diagram 2): Destination selection fragment

The instance of the OC routingPossibilities determines the sequence of the different routing possibilities from exchange 'A' to exchange 'D' via exchange 'B' or 'C'. The number of routing possibilities depends on the number of circuit subgroups from exchange 'A' to exchange 'B' and 'C' and whether these circuit subgroups are combined to circuit subgroup clusters or not. If no circuit subgroups are combined to circuit subgroup clusters, then the E-R diagram below can be further simplified. The OC cepsgComb is not required in that case. For every routing possibility an instance of the OC routingPossData provides additional information (e.g. handling of nature of address indicator), if call processing selects this routing possibility.

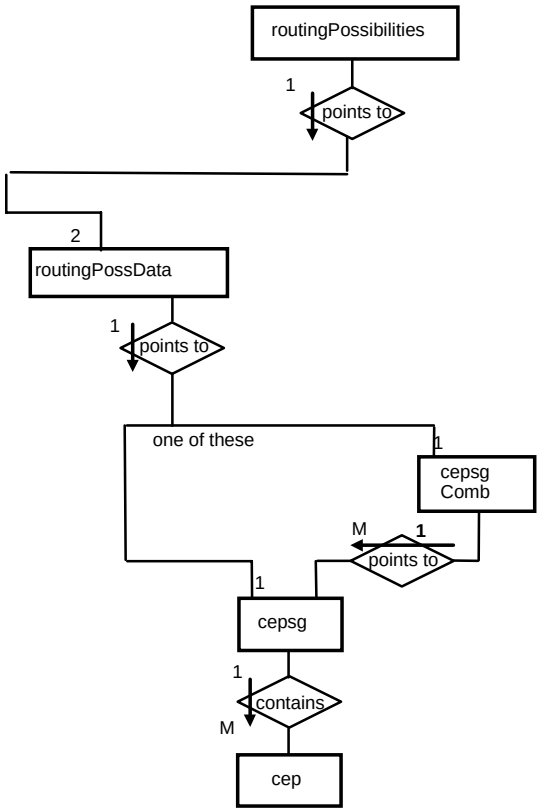


Figure A.10 (E-R Diagram 3): Routing possibility selection fragment

If no modification of the called digits for the next exchange 'B' or 'C' is required (usual case), then no OC of the digit preparation fragment (E-R diagram 4) has to be administered.

The "exception handling" fragment (E-R diagram 5) is not needed for a successful call.

A.3.3 Third solution

E-R diagram 1 shows that the possibility exists for adding prefix digits in front of the incoming digit string on the incoming circuit subgroup.

E-R diagram 2 shows that the system always uses a link to OC postAnalysisEvalution from OC analysisCriteria.

E-R diagram 3 shows that alternative routes are implemented via a linked-list mechanism that creates a chain of instances of OC routingPossibilities.

E-R diagram 4 shows that the possibility exists to manipulate the digits that are sent out on the outgoing circuit.

E-R diagram 5 is not applicable for this scenario.

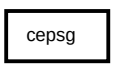


Figure A.11 (E-R Diagram 1): Digit rebuilding fragment

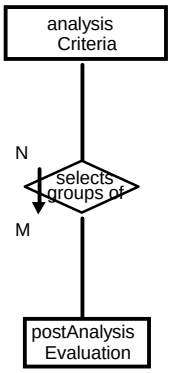


Figure A.12 (E-R Diagram 2): Destination selection fragment

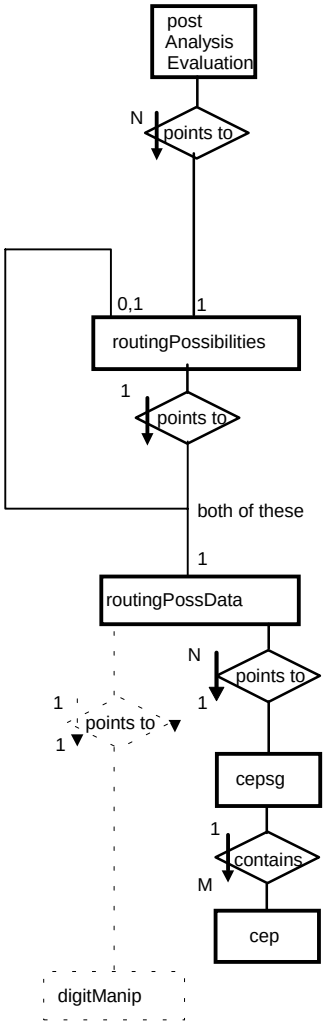


Figure A.13 (E-R Diagram 3): Routing possibility selection fragment

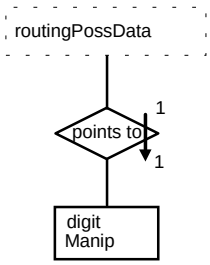


Figure A.14 (E-R Diagram 4): Digit preparation fragment

A.4 Scenario 3

Call incoming via cepsg in exchange 'A' to a destination outside this exchange with traffic distribution based on carriers, routingPossibilities selection based on required bearer capability.

A.4.1 First solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be repeated in this example. It works in analogy to first solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The next step handles the post analysis evaluation with the help of the OC postAnalysisEvaluation.

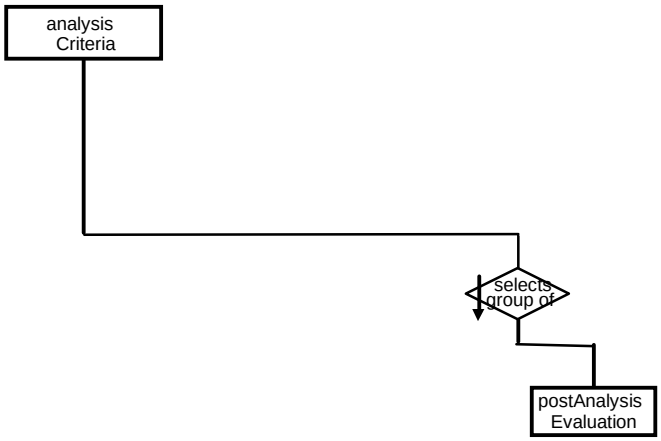


Figure A.15 (E-R Diagram 2): Destination selection fragment

In the Routing Possibilities Selection Fragment, the call will e.g. market dependently be handled first by the OC postAnalysisEvaluation to evaluate routing origin, bearer capability and calling party category and then the traffic distribution to distribute the traffic among different carriers. The remaining steps are the usual routing possibilities selection procedure.

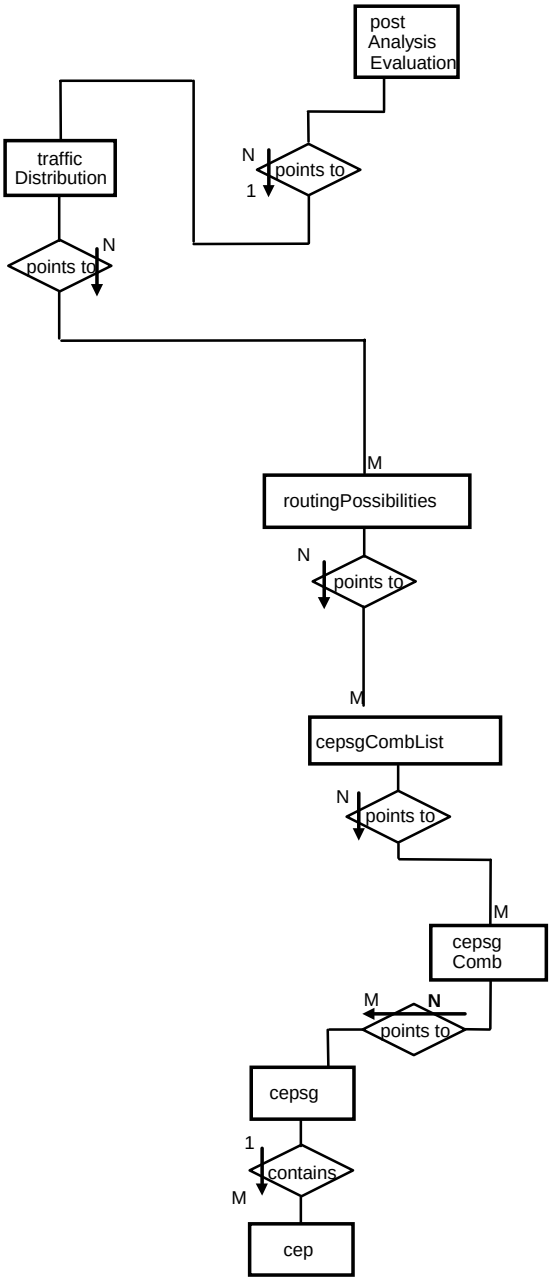


Figure A.16 (E-R Diagram 3): Routing possibility selection fragment

A.4.2 Second solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be repeated in this example. It works in analogy to first solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The next step handles the traffic distribution on carriers by the help of the OC traffic distribution. This choice is depending on the market requirements.

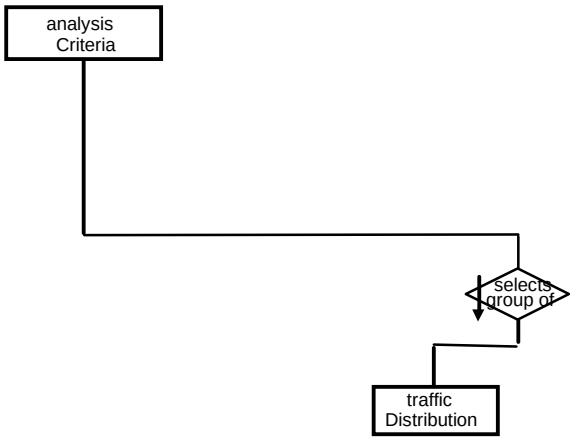


Figure A.17 (E-R Diagram 2): Destination selection fragment

In the Routing Possibilities Selection Fragment, the call will e.g. market dependently be handled first by the traffic distribution to distribute the traffic among different carriers and then by the OC postAnalysisEvaluation to evaluate routing origin, bearer capability and calling party category. The remaining steps are the usual routing possibilities selection procedure.

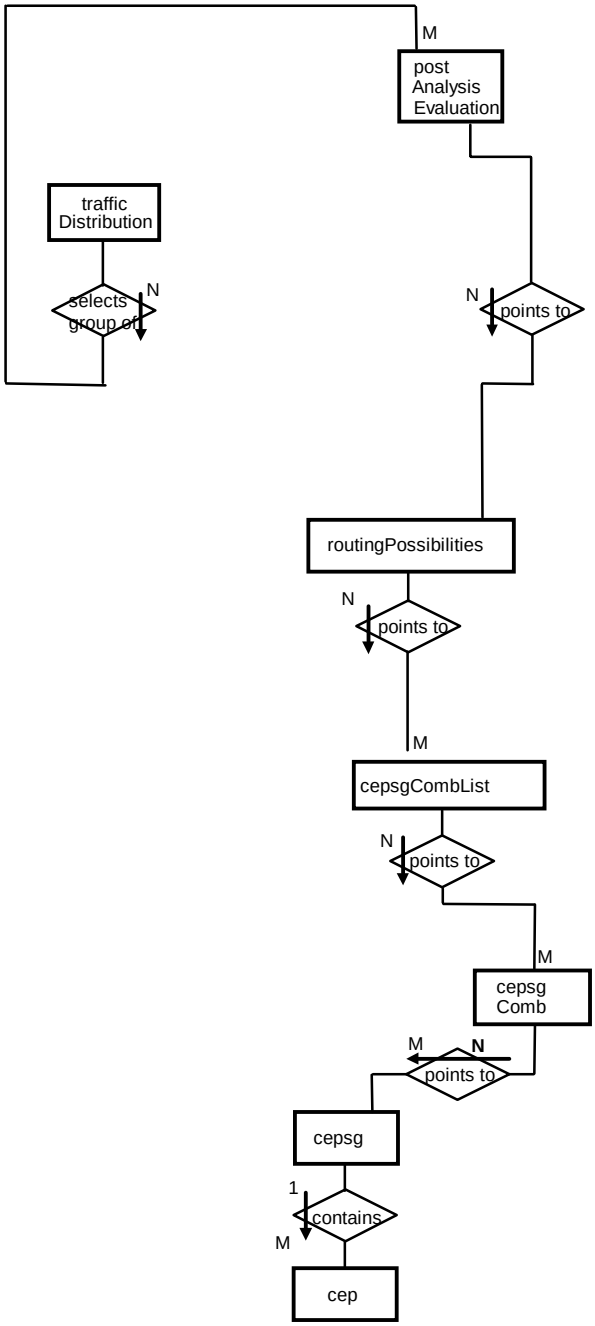


Figure A.18 (E-R Diagram 3): Routing possibility selection fragment

A.4.3 Third solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be repeated in this example. It works in analogy to second solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. As result of the digit analysis, a group of postAnalysisEvaluation instances is preselected. The routing of a call depending on the bearer capability follows in the next step.

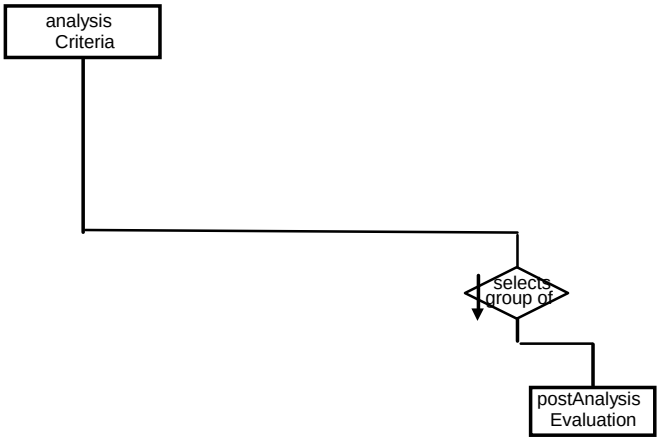


Figure A.19 (E-R Diagram 2): Destination selection fragment

In the Routing Possibility Selection Fragment, the required bearer capability of the call will be used to screen all postAnalysisEvaluation instances, preselected by the Destination Selection Fragment. The postAnalysisEvaluation instance which matches the required bearer capability selects an instance of the OC trafficDistribution. With the help of this instance, the traffic is distributed among different carriers which offer their routingPossibilities. The remaining steps are the usual routing possibilities selection procedures.

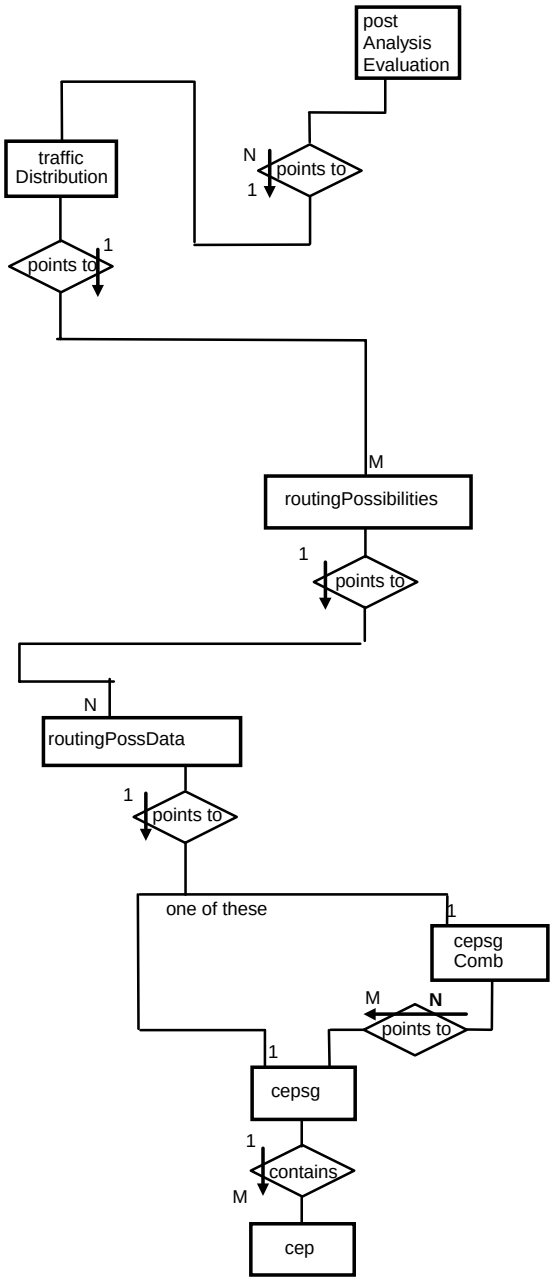


Figure A.20 (E-R Diagram 3): Routing possibility selection fragment

A.4.4 Fourth solution

The digit rebuilding fragment and digit preparation fragment are not repeated in this example. It works on analogy with solution 3 of scenario 2.

E-R diagram 2 shows that the system uses a link to OC trafficDistribution from OC analysisCriteria. For this system, proportional bidding is implemented in the same way as traffic distribution based on carriers (see scenario 3).

E-R diagram 3 shows that alternative routes are implemented via a linked-list mechanism that creates a chain of instances of OC routingPossibilities. The diagram also shows the trafficDistribution that is used for proportional bidding. The overflow mechanism is again implemented via a linked-list of instances of OC routingPossibilities.

E-R diagram 5 is not applicable for this scenario.

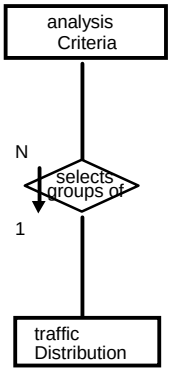


Figure A.21 (E-R Diagram 2): Destination selection fragment

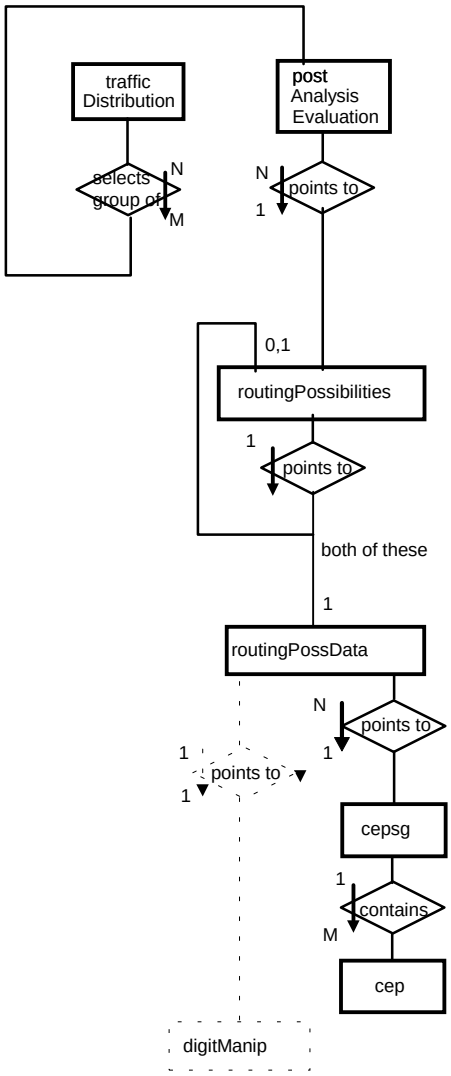
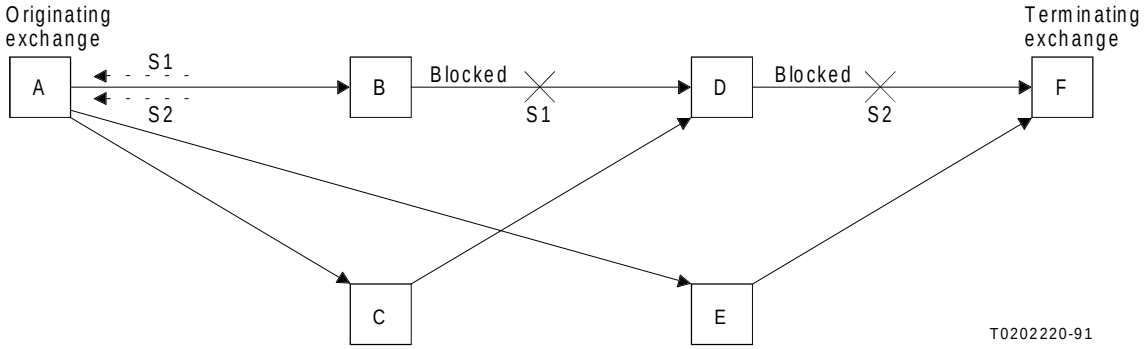


Figure A.22 (E-R Diagram 3): Routing possibility selection fragment

A.5 Scenario 4

Crankback processing (see figure 4 imported from ITU-T Recommendation E.170 [5] picture 4).



Note – Blocking from B to D activates signal S1 to A. Blocking from D to F activates signal S2 to A.

Figure A.23: Scenario "Crankback processing"

A.5.1 Solution

The E-R diagrams of the fragments "digit rebuilding", destination selection", "digit preparation" and "exception handling" are not influenced by the requirements of scenario 4.

The OC routingPossibilities determines for exchange "A" the sequence of the selectable routing possibilties from exchange "A" to exchange "F" via the transit exchanges "B", "C", "D" and "E".

According to the figure of scenario 4, the following sequence can be selected:

Routing possibility 1: "A" ==> "B" (==> "D" ==> "F");

Routing possibility 2: "A" ==> "C" (==> "D" ==> "F");

Routing possibility 3: "A" ==> "E" (==> "F").

The OC routingPossRestrict excludes those routing possibilities of the containing instance of OC routingPossibilities, which may not be used in the re-routing case in exchange "A", if signal S1 or signal S2 is received in exchange "A".

Excluded routing possibilities, if signal S1 is received in exchange "A":

Routing possibility 1: "A" ==> "B" (==> "D" ==> "F").

Excluded routing possibilities, if signal S2 is received in exchange "A":

Routing possibility 1: "A" ==> "B" (==> "D" ==> "F");

Routing possibility 2: "A" ==> "C" (==> "D" ==> "F").

The remaining steps are the usual routing possibilities selection procedures.

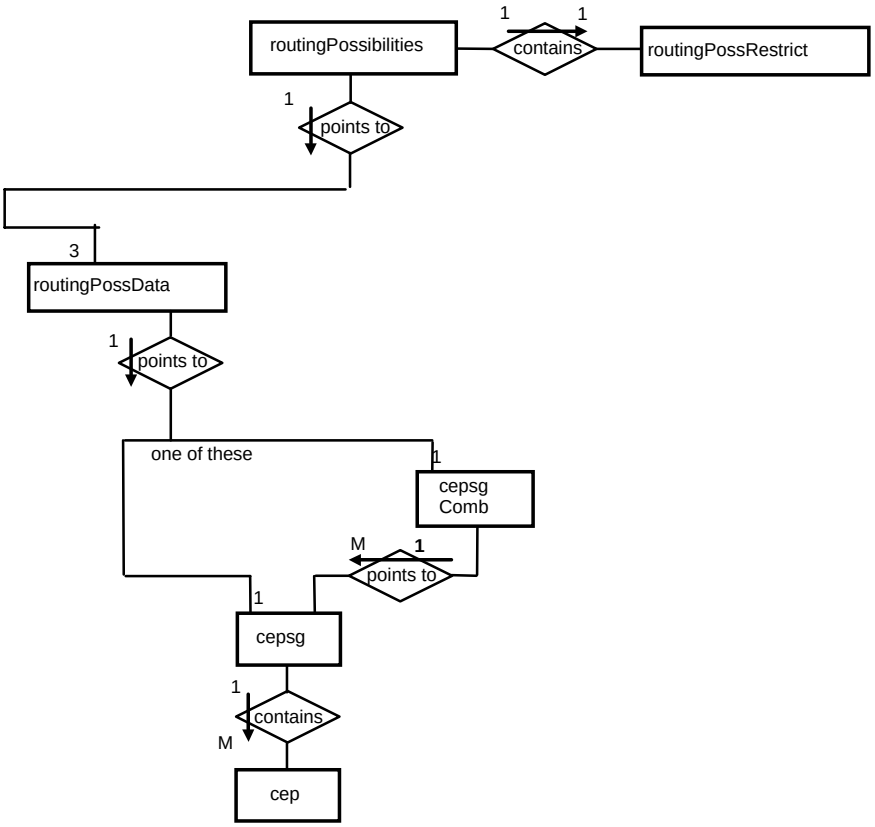


Figure A.24 (E-R Diagram 3): Routing possibility selection fragment

A.6 Scenario 5

Call incoming exchange "A" via cepsg with for example destination "D" with proportional bidding so that 50 % of the traffic is diverted via exchange "B" and 50 % via exchange "C".

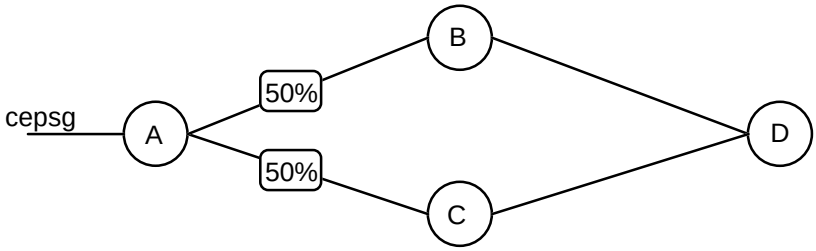


Figure A.25: Scenario 5 "Diverting processing"

A.6.1 First solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be repeated in this example. It works in analogy to first solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The call will be handled by the OC postAnalysisEvaluation to evaluate routing origin and calling party category.

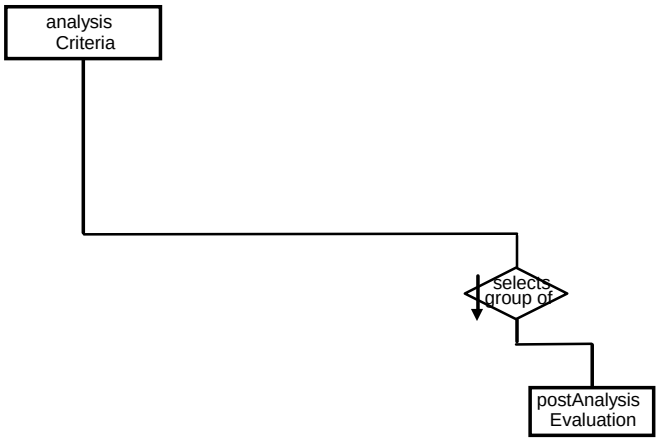


Figure A.26 (E-R Diagram 2): Destination selection fragment

The result of the analysis by the help of the OC postAnalysisEvaluation will be an instance of the OC routingPossibilities. The remaining routing process continues in the usual way. The proportional bidding algorithm can be realized on the level of the OC routingPossibilities, of the OC cepsgCombList or of the OC cepsgComb.

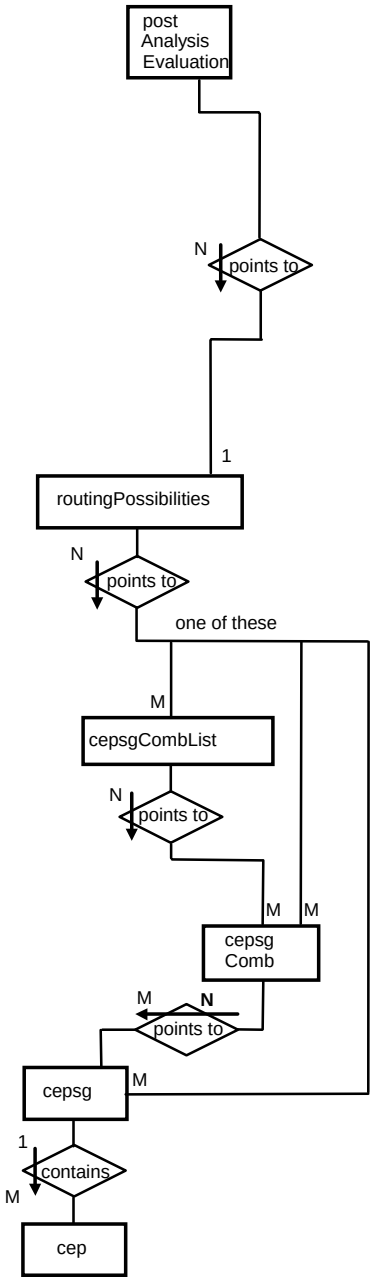


Figure A.27 (E-R Diagram 3): Routing possibility selection fragment

A.6.2 Second solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be considered in this example. It works in analogy to second solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. As result of the analysis is a trafficDistribution instance.

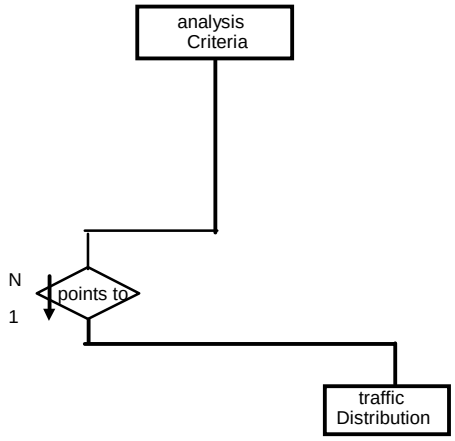


Figure A.28 (E-R Diagram 2): Destination selection fragment

The proportional bidding algorithm will be executed in the OC trafficDistribution.

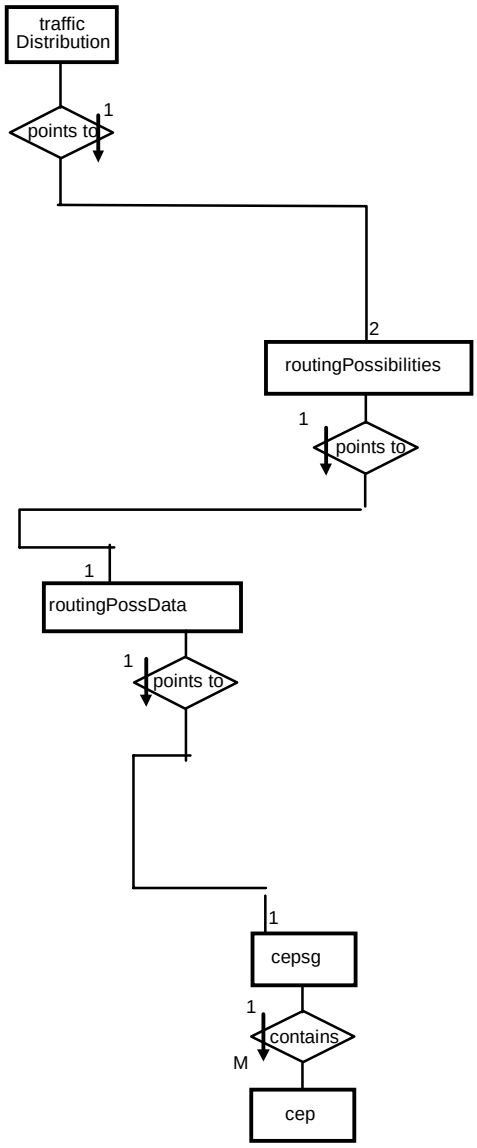


Figure A.29 (E-R Diagram 3): Routing possibility selection ffragment

A.6.3 Third solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be considered in this example. It works in analogy to second solution for scenario 2.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The call will be handled by the OC routingPossibilities afterwards, to select a way (routing possibility) to exchange "D" via exchange "B" or exchange "C" by 50 %.

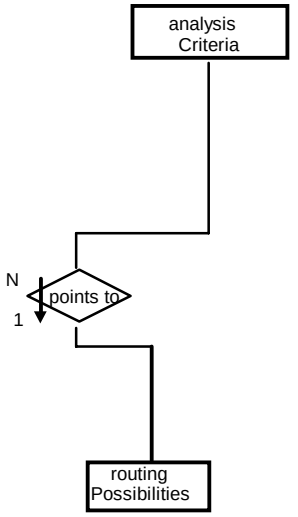


Figure A.30 (E-R Diagram 2): Destination selection fragment

The proportional bidding algorithm will be executed in the OC routingPossibilities.

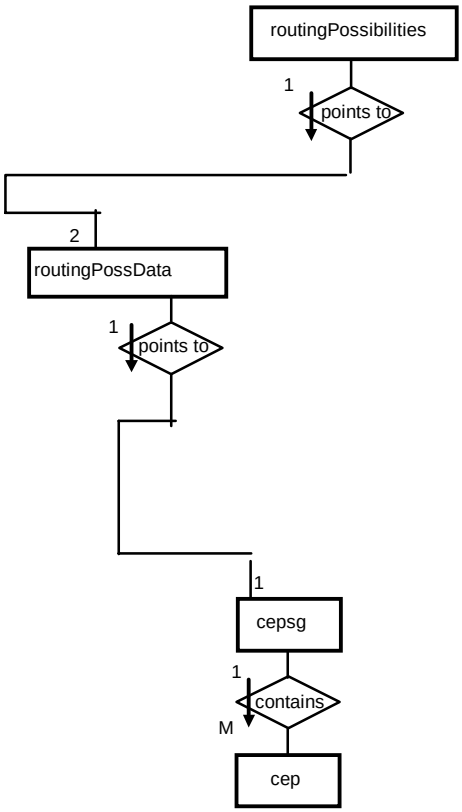


Figure A.31 (E-R Diagram 3): Routing possibility selection fragment

A.6.4 Fourth solution

The digit rebuilding fragment, digit preparation fragment and exception handling fragment shall not be considered in this example. It works in analogy to second solution for scenario.

With the help of the OC analysisCriteria the exchange will recognize that the call shall not be routed to a local destination. The call will be handled by the OC routingPossibilities afterwards.

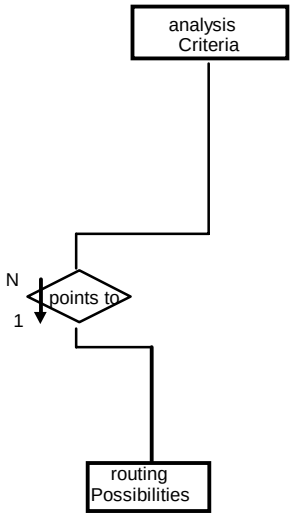


Figure A.32 (E-R Diagram 2): Destination selection fragment

The proportional bidding algorithm will be executed in the OC cepsgComb.

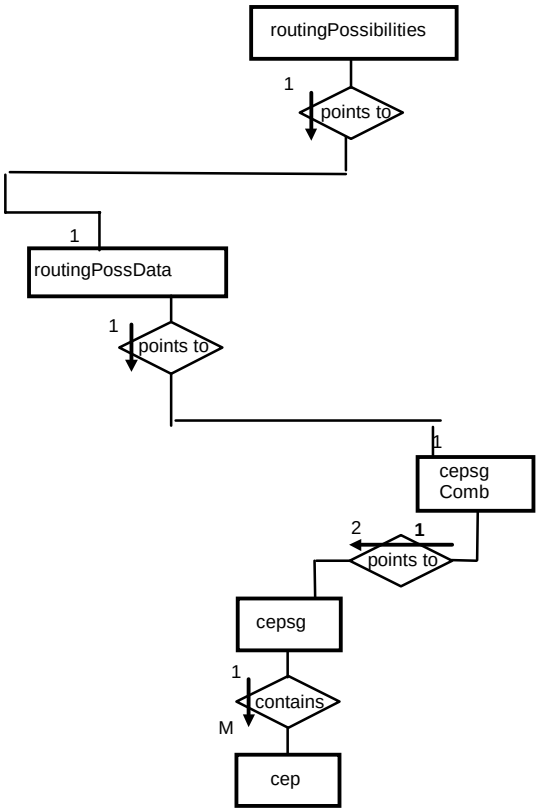


Figure A.33 (E-R Diagram 3): Routing possibility selection fragment

Annex B (informative): Object instance configuration examples

B.1 Introduction

This annex gives, in given situation and interpretation, a representation of used object instances with their links.

B.2 Example 1: illustrates bearer capability dependent routing

This example outlines call routing of calls in exchange "A" which originate in exchange "A", "O", "P" or "Q" and terminate in exchange "B", "C" or "D".

Topology as described below:

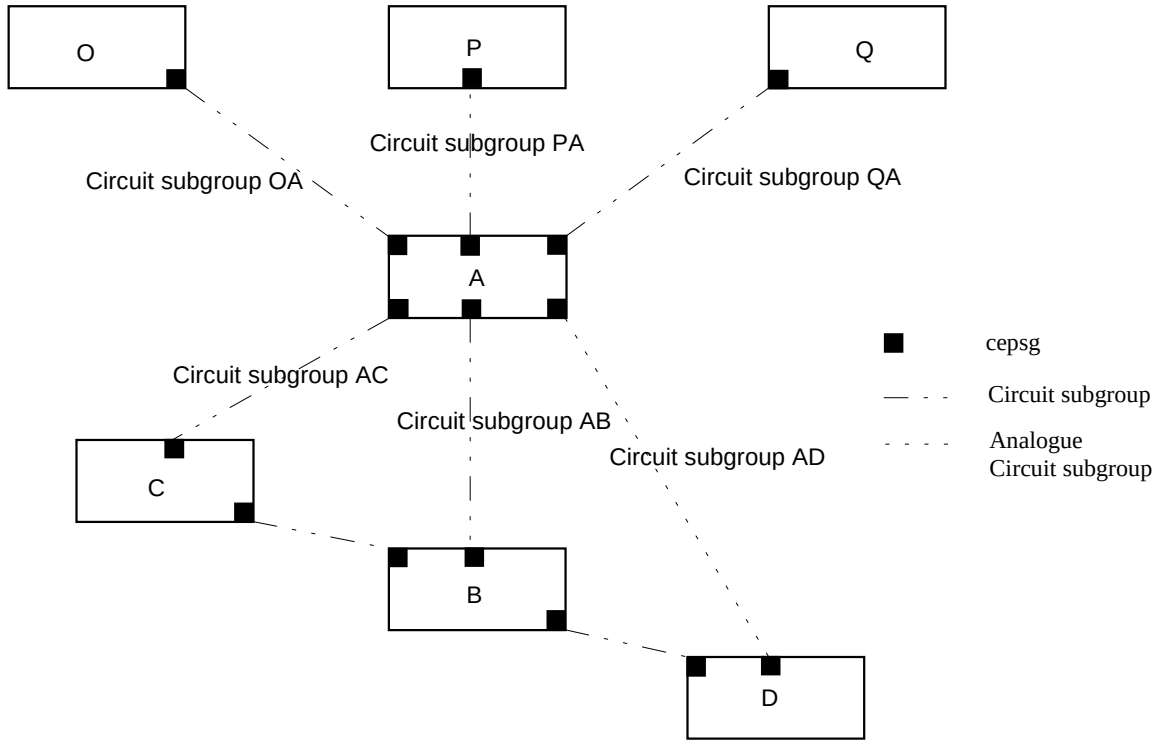


Figure B.1: Bearer capability dependent routing

with assumptions:

1) Circuit subgroups "AC", "AB", "CB", "BD" can support any bearer capability.

2) Circuit subgroup "AD" is an analogue line, only capable of supporting the bearer capability "r3point1kHzAudio" and "speech".

3) Exchange "A" requires special routing to the exchange "D" dependent on the required bearer capability of the call.

4) Routing requirements from the network provider as follows:

Table B.1: Routing requirements

Calls from/to	Required Bearer capability	Routed via/to
"A" to "B"		first choice: "AB" second choice: "AC"-->"CB"
"A" to "C"		first choice: "AC" second choice: "AB"-->"BC"
"A" to "D"	r3point1kHzAudio or speech	first choice: "AD" second choice: "AB"-->"BD"
"A" to "D"	r64kbitsUnrestricted	first choice: "AB"-->"BD" second choice: "AC"-->"CB"-->"BD"
"A" to "D"	others than above	announcement

B.2.1 First solution

The system shown here uses the "label" method to link analysisCriteria instances with postAnalysisEvalution instances. Overflow during routing is done with a linked-list mechanism for the routePossibilities instances.

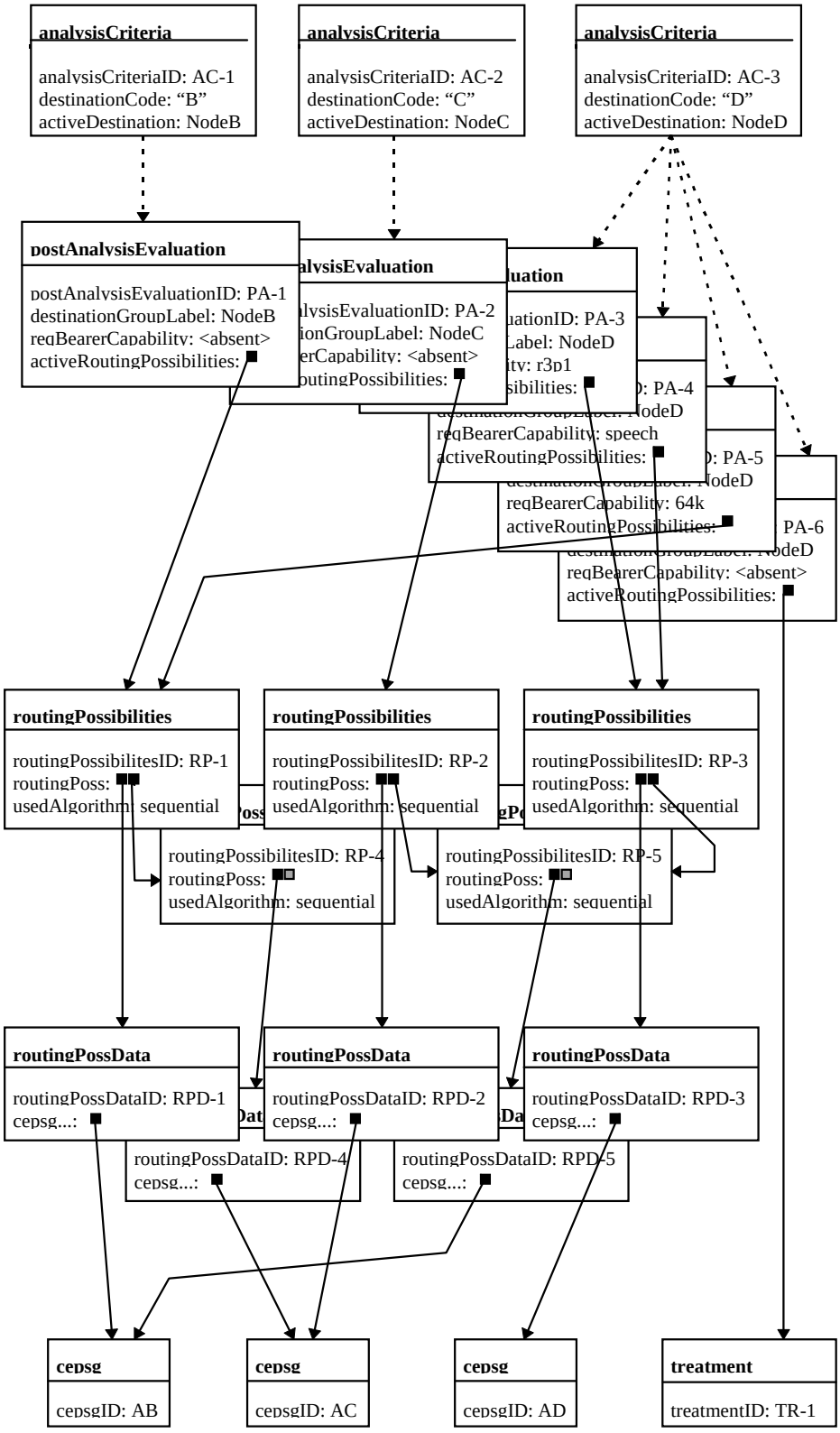


Figure B.2: "Label"method routing as first solution

B.2.2 Second solution

The representation shown here uses the "label" method to link analysisCriteria instances with postAnalysisEvaluation instances where the bearer capability shall be evaluated and the "pointer" method to link analysisCriteria instances with routingPossibilities instances when it is not. The postAnalysisEvaluation instances provide the selection of a suitable routing possibility list (OC routingPossibilities) according the required and available bearer capability. Overflow during routing is done by defining all applicable routing possibilities within one routingPossibilities instance.

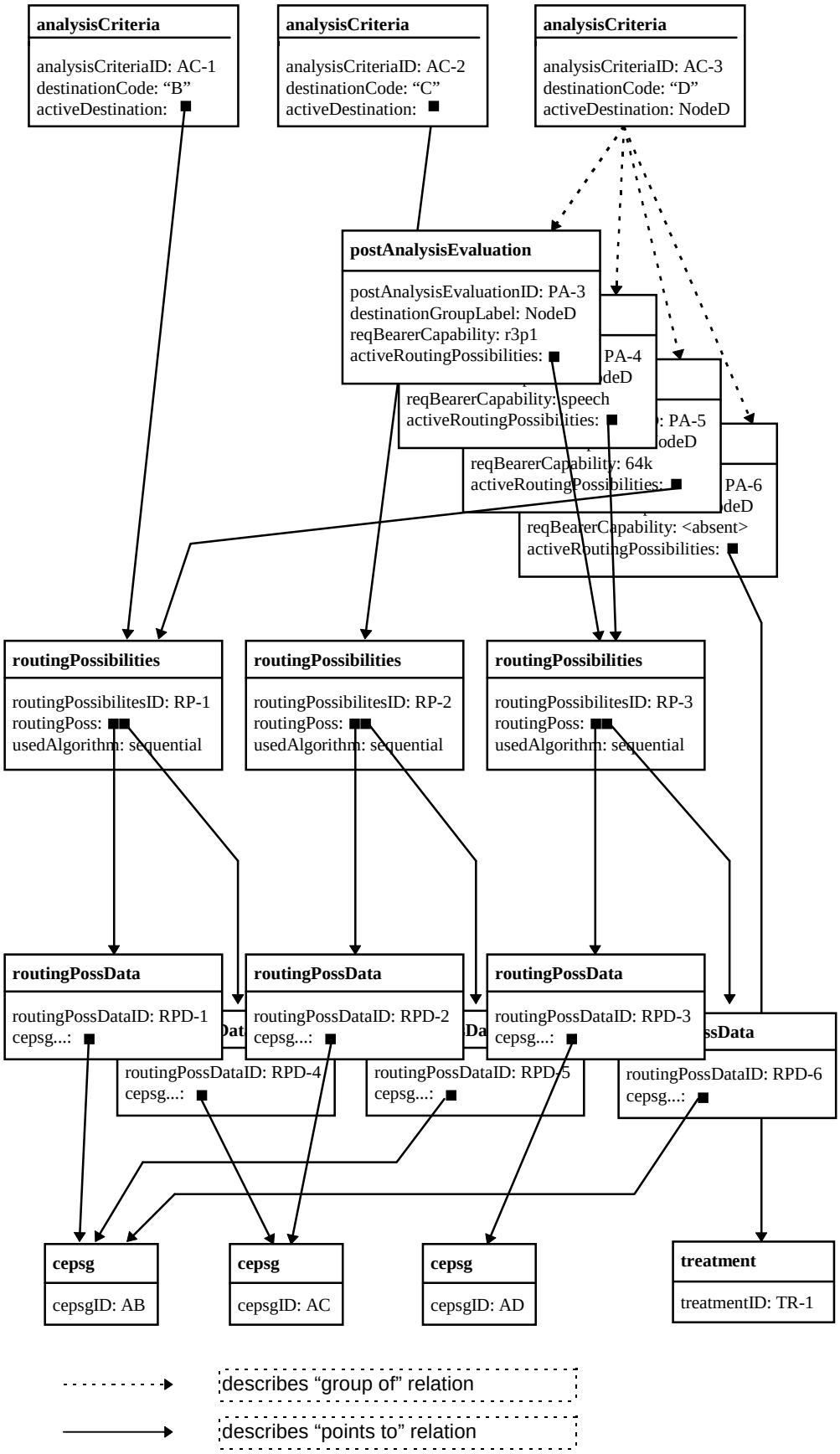


Figure B.3: Label and pointer" method as second solution

B.2.3 Third solution

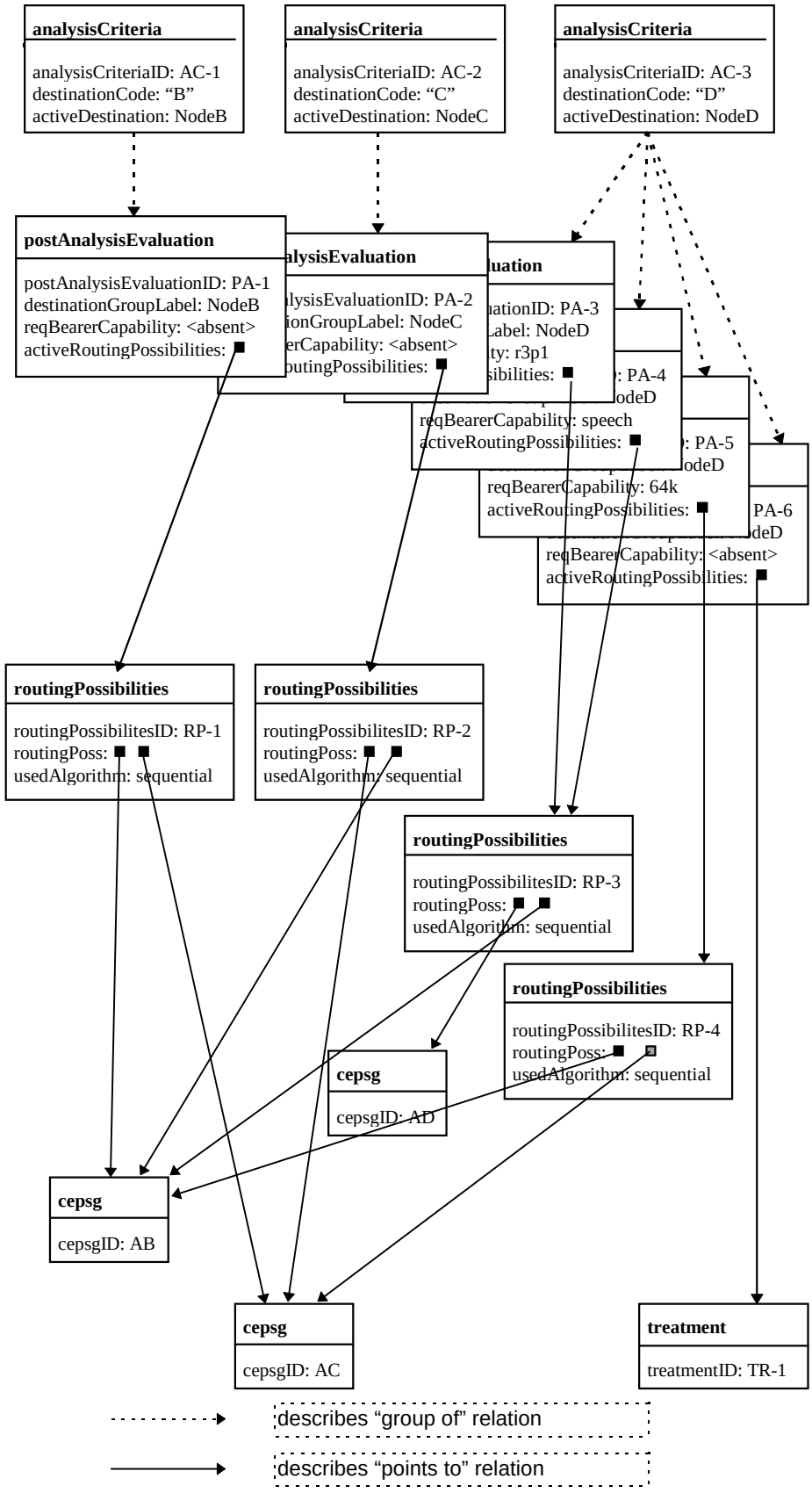


Figure B.4: "Label and pointer" method as third solution

Supposed that the exchange D shall be reached with the bearer capability 64 kbit/s unrestricted, then the following instances are concerned in exchange A.

When the digit string arrives in exchange A, then one instance of the OC analysisCriteria can be found matching this string. The value of the attribute activeDestination of this instance identifies a group of instances of the OC postAnalysisEvaluation.

The instances of this group differ from each other by different values of the attribute reqBearerCapability. The bearer capability 64 kbit/s matches on the instance with the identifier PA-5. The instance PA-5 of the OC postAnalysisEvaluation points to the instance RP-4 of the OC routingPossibilities, which says that the selection algorithm on the routing possibilities listed in the attribute routingPoss shall be sequential with fixed start.

B.3 Example 2: illustrates origin dependent routing

Topology as described below:

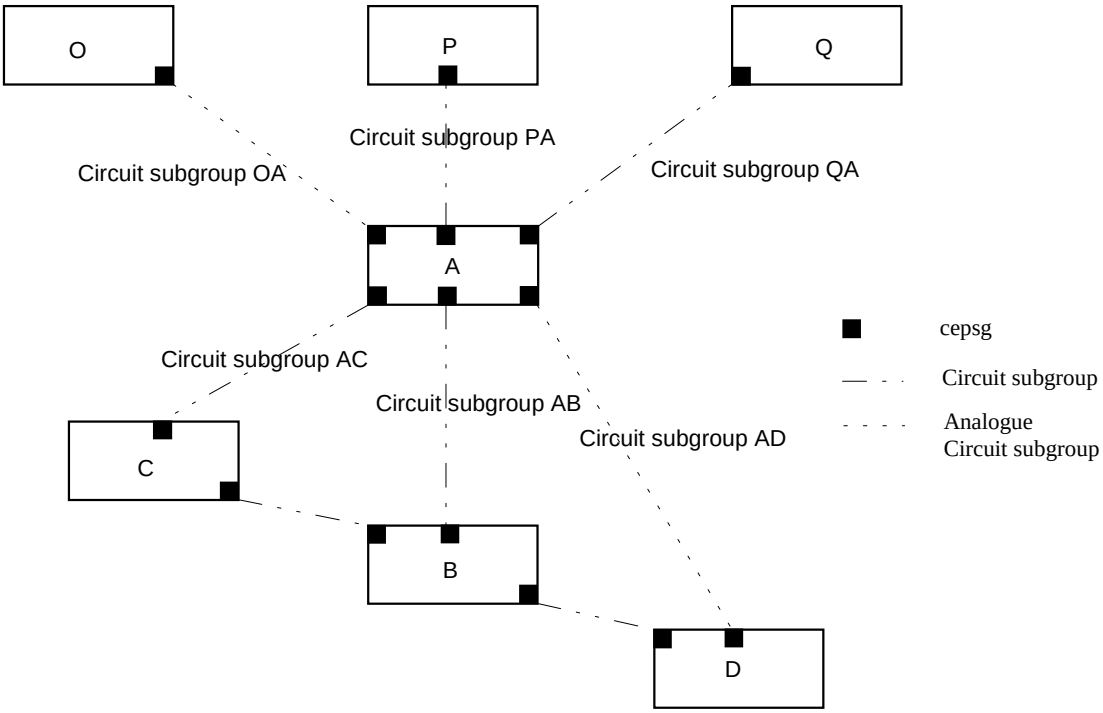


Figure B.5: Origin dependent routing

with assumptions:

1) Circuit subgroup "OA" is an analog line, only capable of supporting the required bearer capability "r3point1kHzAudio" or "speech".

2) Circuit subgroup "AD" is an analog line, only capable of supporting the required bearer capability "r3point1kHzAudio" or "speech".

3) All other subgroup support all bearer capabilities.

4) Bearer capability supported by incoming or outgoing cepsg result in the following routing requirements:

Table B.2: Routing requirements

Calls from/to	Routed via/to
"O" to "B"	first choice: "AB" second choice: "AD"-->"DB"
"O" to "C"	first choice: "AC" second choice: "AB"-->"BC"
"O" to "D"	first choice: "AD" second choice: "AB"-->"BD"
"P","Q" to "B"	first choice: "AB" second choice: "AC"-->"CB"
"P","Q" to "C"	first choice: "AC" second choice: "AB"-->"BC"
"P","Q" to "D"	first choice: "AB"-->"BD" second choice: "AC"-->"CD"

B.3.1 First solution

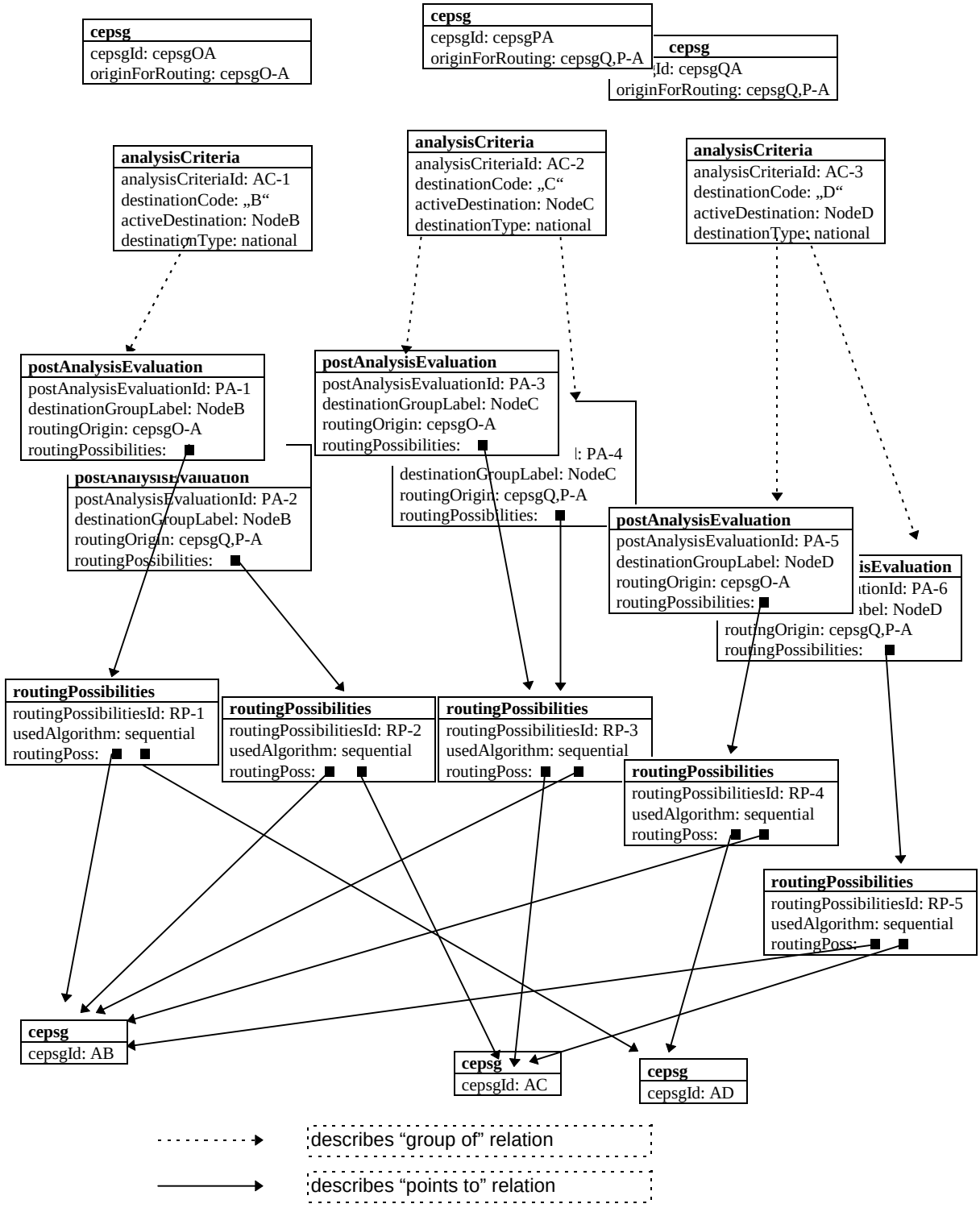


Figure B.6: First solution of origin dependent routing

Supposed that there is a call set-up arriving at exchange A originating in exchange O, which is destined for exchange D.

When the digit string arrives in exchange A, then one instance of the OC analysisCriteria, identified by the analysisCriteriaId AC-3 can be found matching this string. The value of the attribute activeDestination of this instance identifies a group of instances (PA-5, PA-6) of the OC postAnalysisEvaluation. The instances of this group differ from each other by different values of the attribute routingOrigin. For the reason that the circuit endpoint subgroup, via which the call is arriving, belongs to cepsgO-A, the only matching instance of the OC postAnalysisEvaluation is the instance PA-5. The instance PA-5 of the OC postAnalysisEvaluation points to the instance RP-4 of the OC routingPossibilities, which says that the selection algorithm on the routing possibilities listed in the attribute shall be sequential with fixed start.

The routing possibilities, which are found in the attribute routingPoss of the instance RP-4 are a list of two circuit endpoint subgroups with cepsgId equal to AD or AB. The sequential selection algorithm with the fixed start cepsgId AD forces that always the circuit endpoint subgroup AD shall be accessed first to get a free circuit endpoint to exchange D. Only if all circuit endpoints of the circuit endpoint subgroup AD are found busy, then the circuit endpoint subgroup AB shall be accessed to find a free circuit endpoint to exchange B. Exchange B has to provide a connection to exchange D by itself.

B.3.2 Second solution

The representation shown here uses the "pointer" method to link analysisCriteria instances with routingPossibilities instances. This configuration of instances routes in exchange "A" any call, coming from the exchanges "O", "P" or "Q" according the requirements of the network operator (see table above).

Supposed there is a call set-up arriving at exchange "A" originating exchange "O", which is destinated for exchange "D".

The call that arrives in exchange "A" uses the circuit subgroup OA. Due to the data of the circuit endpoint subgroup in exchange "A" the call characteristic orig1 is assigned to the call. Only the object instance of the OC analysisCriteria, identified by the analysisCriteriaId AC-3, matches with the call characteristics. The attribute activeDestination of this instance identifies exactly one instance of the OC routingPossibilities with routingPossibilitiesId RP-3.

The routingPossibilities, which are found in the attribute routingPoss of the instance RP-3, lead via intermediate routingPossData instances to circuit endpoint subgroups with cepsgId equal to AB or AD. The sequential selection algorithm of the routingPossibilities instance RP-3 forces that always the circuit endpoint subgroup AD shall be accessed first to get a free circuit endpoint to exchange D. Only if all circuit end points of the circuitendpoint subgroup AD are found busy, then the circuit endpoint subgroup AB shall be accessed be accessed to find a free bcircuit endpoint to exchange B. Exchange B has to provide a connection to exchange D by itself.

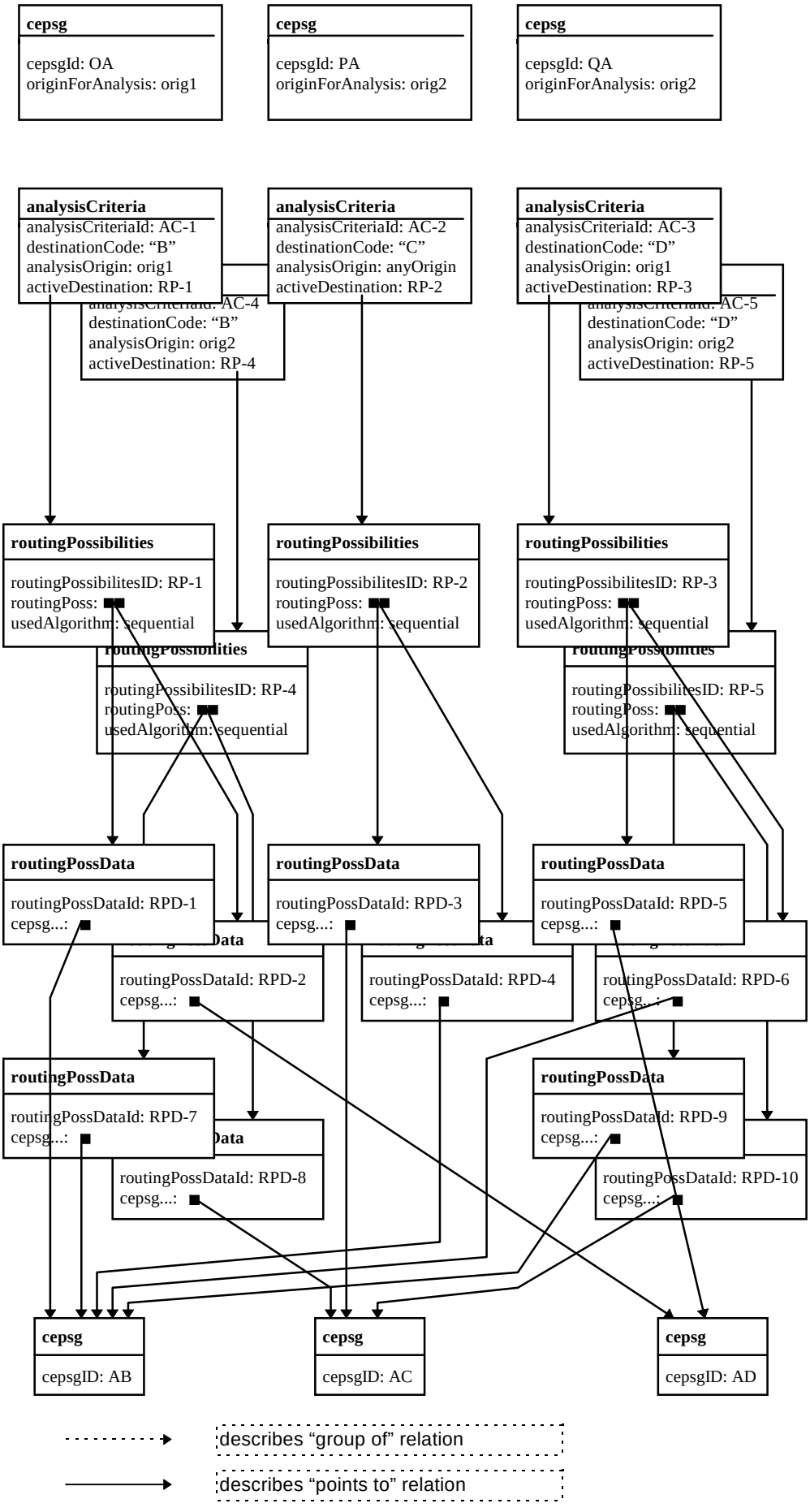


Figure B.7: Second solution of origin dependent routing

B.4 Example 3: illustrates proportional bidding

Topology as described below:

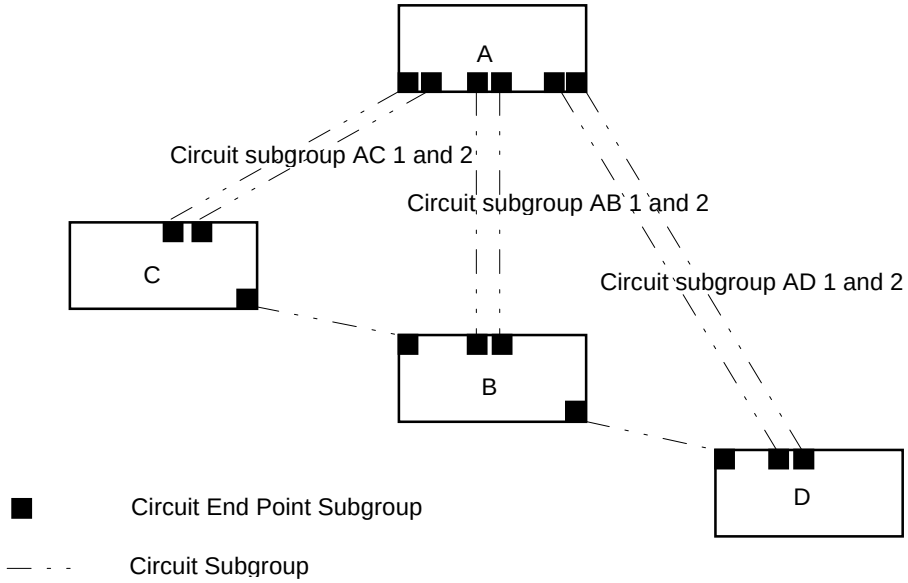


Figure B.8: Proportional binding

with assumptions:

1) Connections A-B, A-C, A-D consist of 2 circuit end point subgroups.

2) Calls from A to B only are considered.

Table B.3: Possible choices

first choice	second choice
AB1, AB2, sequential	proportional bidding 50 % via C AC1, AC2, cyclic
	proportional bidding 50 % via D AD1, AD2, cyclic

B.4.1 First solution

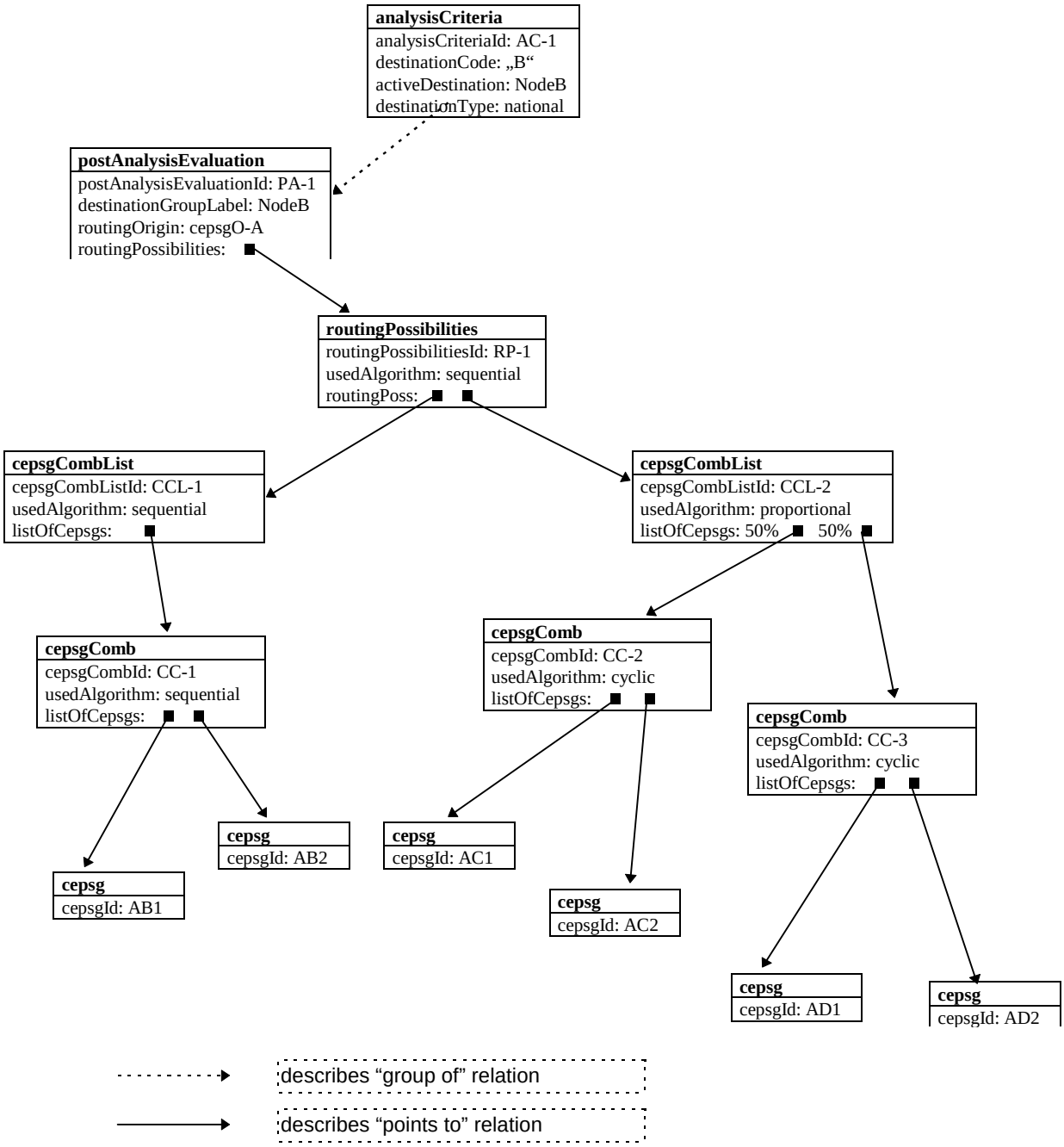


Figure B.9: First solution of propotionnal binding

Supposed that there is a call set-up arriving at exchange A, which is destined for exchange B, the analysis of the incoming dialled digits shall lead to the instance RP-1 of the OC routingPossibilities:

The instance RP-1 gives two groups of exchanges, via which the call can be routed. The one group consists only of the target exchange B, represented by the instance CCL-1 of the OC cepsgCombList, and the other group consists of the exchanges C and D, represented by the instance CCL-2 of the OC cepsgCombList.

Supposed that the direct connection to exchange B is blocked, i.e. routing via the instance CCL-1 is not possible, then the call traffic is distributed in equal parts to the exchanges C and D, represented by the instance CC-2 and CC-3 of the OC cepsgComb, respectively. This distribution is an example for the proportional bidding selection algorithm.

Supposed that the considered call set-up request is assigned to the instance CC-2, the call set-up request will be continued by a sequential selection algorithm with cyclic start over the two instances AC or AC2 of the OC cepsg.

B.5 Example 4

Usual local call. The call remains within one area.

Assumption: Subscriber 1 in local area 1, identified by areacode 321, is calling the subscriber 2 with local DN 43562 in local area 1.

B.5.1 First solution

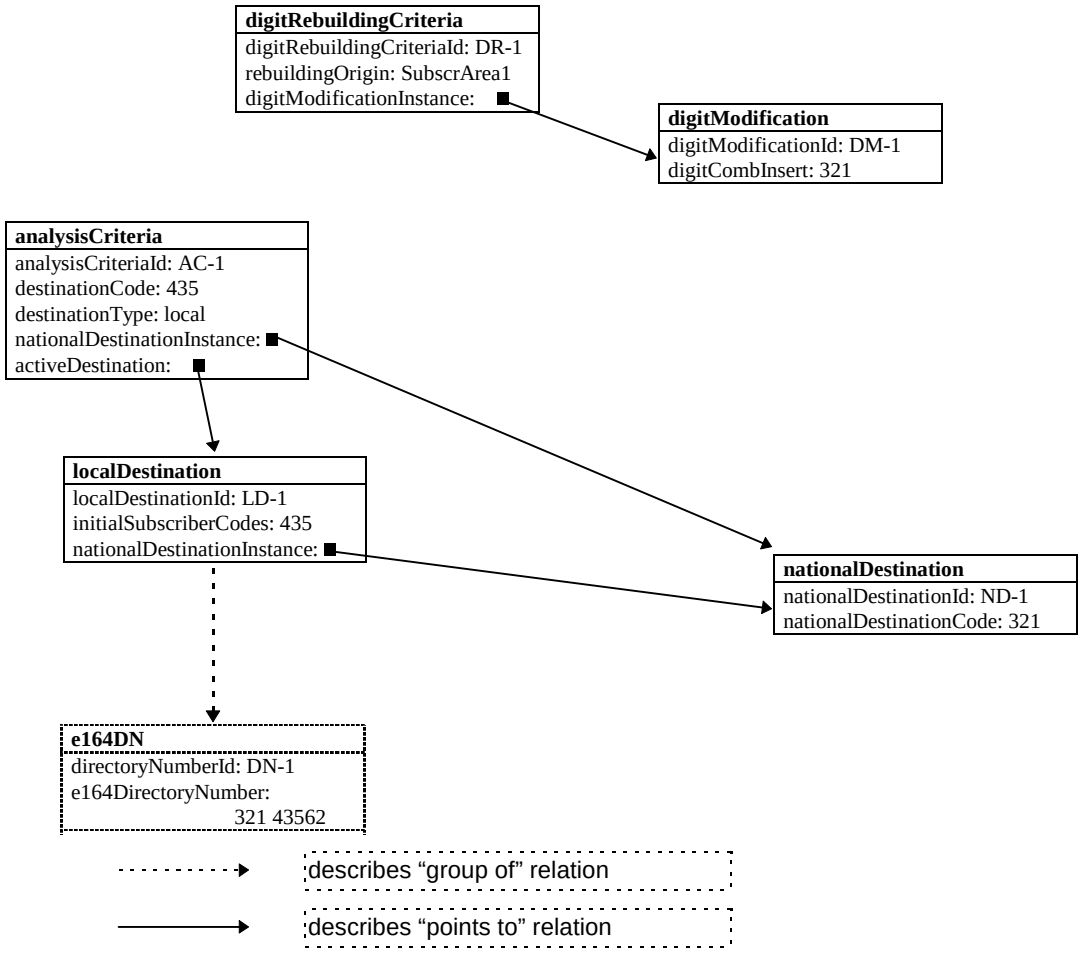


Figure B.10: First solution of usual local call

In the case that subscriber 1 does not dial the area code of the DN of subscriber 2, then digit rebuilding will insert the missing area code. That is, an instance DR-1 of the OC digitRebuildingCriteria will match depending on the subscriber's origin and will point to a corresponding instance DM-1 of the OC digitModification, where the area code can be found, which has to be inserted at the beginning of the incoming digit string.

Afterwards an instance AC-1 of the OC analysisCriteria fits to the conditions given by the dialled and modified subscriber code and given by some other criteria. This instance AC-1 points to an instance ND-1 of the OC nationalDestination and to one instance LD-1 of the OC localDestination.

The instance LD-1 contains the initial digits of the SN of the dialled E164 DN and points to the same instance ND-1 of the OC nationalDestination as the instance AC-1 does. The instance ND-1 contains the national area code of subscriber B as attribute value (here identical to subscriber A). The further processing of the call set-up request is handled by the customer administration area. The entry point to the customer administration is the e164DN instance of the subscriber.

B.5.2 Second solution

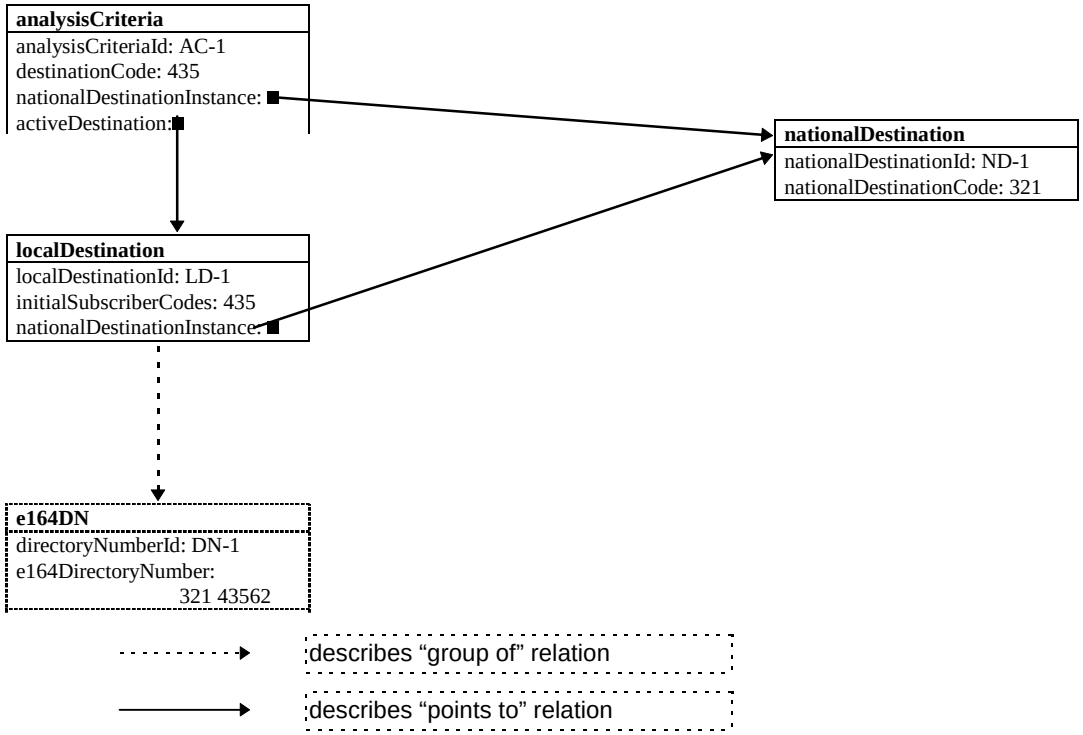


Figure B.11: Second solution of usual local call

In the case that subscriber 1 does not dial the area code of the DN of subscriber 2 (no national prefix is dialled), then a system automatically associates the area code 321 to the call.

In the case that subscriber 1 dials the area code of the DN of subscriber 2 (the dialled number starts with a national prefix e.g. 0), then a system can "separate" the area code 321 from the dialled digits with the national destination instance.

In both cases the system knows the national destination and the SN.

The instance AC-1 matches exactly to the characteristics of the call (national destination and initial string of SN) and leads via localDestination LD-1 and directory number DN-1 of subscriber B.

The further processing of the call set-up request is handled by the customer administration area. The entry point to the customer administration is the e164DN instance of the subscriber.

B.6 Example 5

Multiple areas exchange.

Assumption: Subscriber A and subscriber B have the same area code, e.g. '333'

Subscriber A' and Subscriber B' have the same area code, '111', being different from the area code of the subscribers A and B. Subscriber B and B' have the same SN, e.g. '5252'

B.6.1 First solution

a) Subscriber A and Subscriber A' dial the code '5252' without area code. Subscriber A has to reach subscriber B, and subscriber A' has to reach subscriber B':

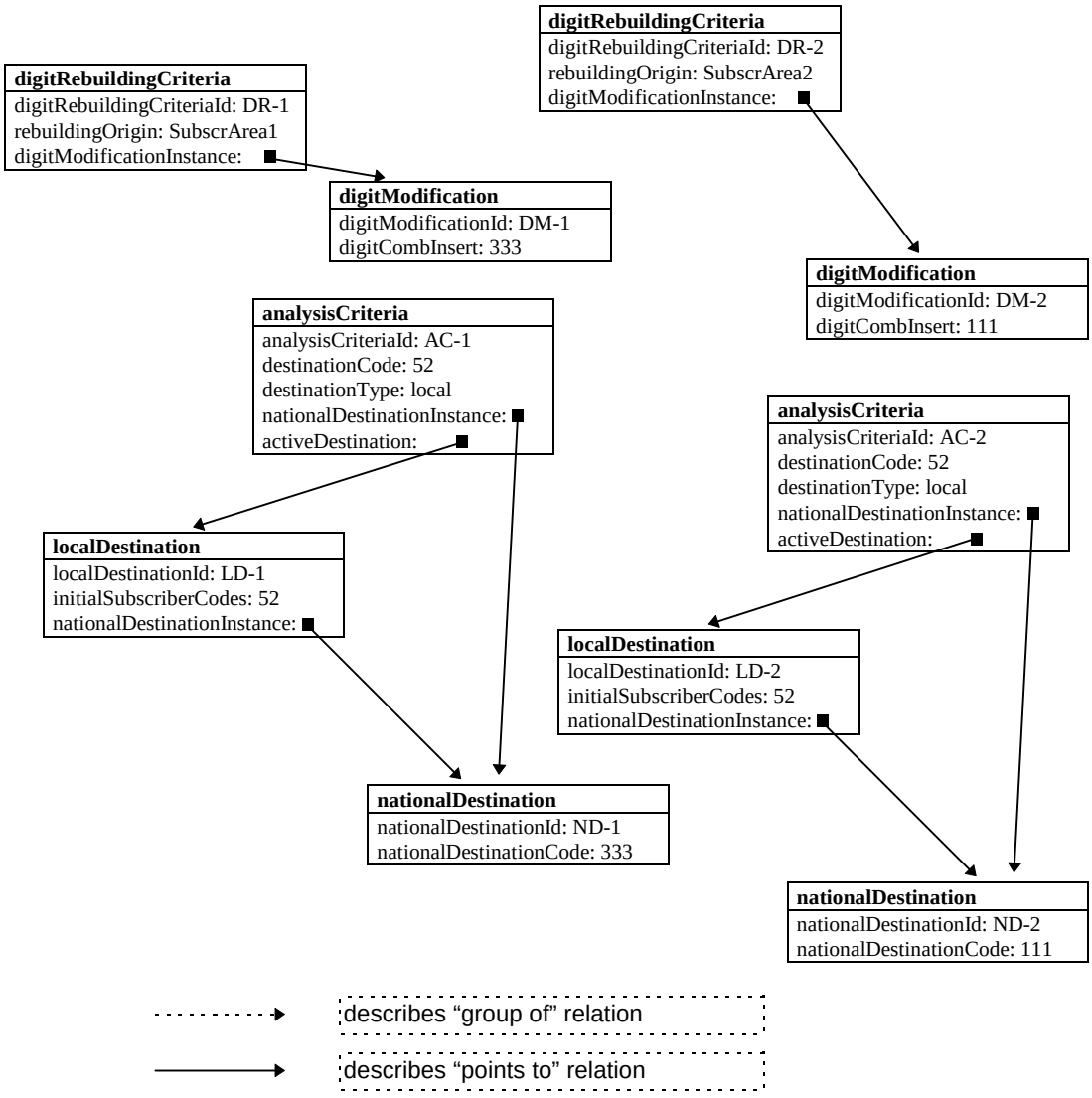


Figure B.12: First solution of dialing w/o area code

In the case that subscriber A does not dial the area code, then digit rebuilding will insert the missing area code '333', and if subscriber A' does not dial the area code, then digit rebuilding will insert the missing area code '111'. That is, an instance DR-1 or DR-2 of the OC digitRebuildingCriteria will match depending on the subscriber's origin and will point to a corresponding instance DM-1 or DM-2 of the OC digitModification, where the area code can be found, which has to be inserted at the beginning of the incoming digit string, respectively.

Afterwards an instance AC-1 or AC-2 of the OC analysisCriteria fits to the conditions given by the dialled and modified subscriber code and given by some other criteria. This instance AC-1 or AC-2 points to an instance ND-1 or ND-2 of the OC nationalDestination and to one instance LD-1 or LD-2 of the OC localDestination, respectively.

The instance LD-1 and LD-2 contain the initial digits of the SN of the dialled E164 DN, respectively, and point to the corresponding instances ND-1 or ND-2 of the OC nationalDestination. The instance ND-1 contains the national area code of the subscriber B as attribute value, the instance ND-2 contains the national area code of the subscriber B' as attribute value. The further processing of the call set-up request is handled by the customer administration area.

b) Subscriber A dials e.g. the code '111 5252' of subscriber B'. Subscriber A has to reach subscriber B'. The configuration used for this scenario is an extract from a):

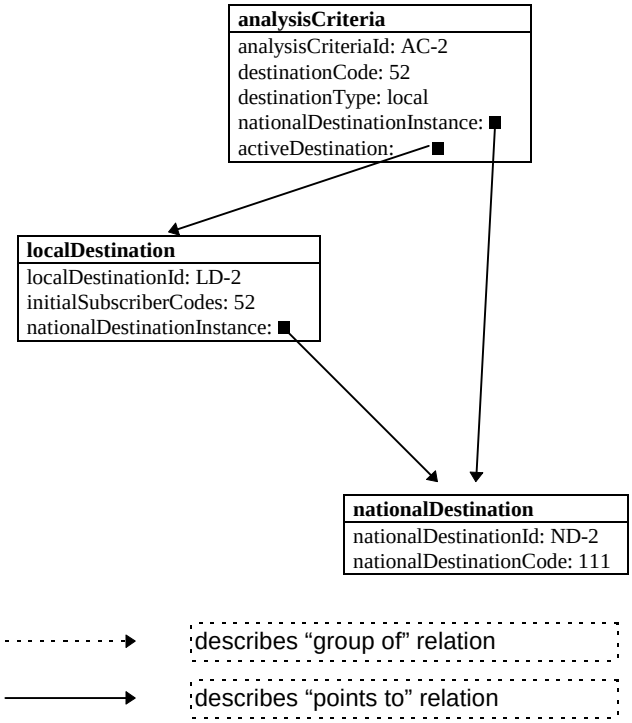


Figure B.13: Dialling with area code

Digit rebuilding need not be done, because subscriber A dials the area code of the DN of subscriber B', which belongs to another local area as subscriber A.

An instance AC-2 of the OC analysisCriteria fits to the conditions given by the dialled subscriber code and by some other criteria, e.g. the analysis origin of subscriber A. This instance AC-2 points to an instance ND-2 of OC nationalDestination and to one instance LD-2 of OC localDestination.

The instance LD-2 contains the initial digits of the SN of the dialled E164 DN and points to the same instance ND-2 of OC nationalDestination as the instance AC-2 does. The instance ND-2 contains the national area code of subscriber B' as attribute value. The further processing of the call set-up request is handled by the customer administration.

B.6.2 Second solution

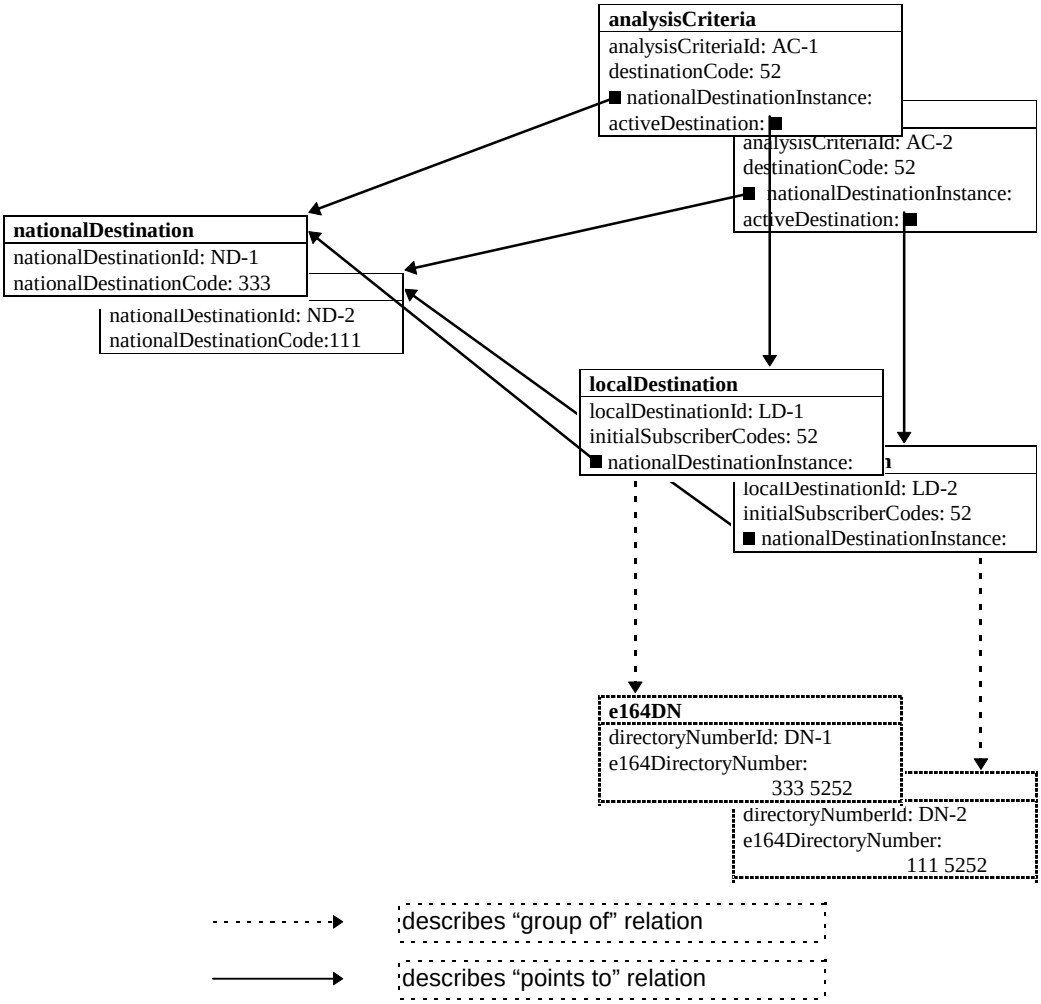


Figure B.14: Second solution of dialing w/o area code

a) Subscriber A and Subscriber A' dial the code '5252' without area code. Subscriber A has to reach subscriber B, and subscriber A' has to reach subscriber B':

Subscriber A dials 5252 and reaches subscriber B.

As subscriber A only dials 5252 without a national prefix (e.g. 0), a system associates automatically the own area code 333 to the call. The call with the characteristics of the dialled code 5252 and the assigned area code 333 matches with analysisCriteria instance AC-1 (the national destination instance and the initial subscriber code is matching) and leads via localdestination LD-1 and directory number DN-1 to subscriber B.

Subscriber A' dials 5252 and reaches subscriber B'.

As subscriber A' only dials 5252 without a national prefix (e.g. 0), a system associates automatically the own area code 111 to the call. The call with the characteristics of the dialled code 5252 and the assigned area code 111 matches with analysisCriteria instance AC-2 (the national destination instance and the initial subscriber code is matching) and leads via localdestination LD-2 and directory number DN-2 to subscriber B'.

b) Subscriber A dials e.g. the code '0111 5252' of subscriber B'. Subscriber A has to reach subscriber B':

As the subscriber A dials a number with a national prefix (in this example 0), a system can separate the area code from the SN in the dialled digit code by checking the nationalDestination instance ND-1 and ND-2. In this case ND-2 is matching, with the result that the call is for a subscriber with SN 5252 in the local area ND-2 (with area code 111). The call to local area ND-2 with SN 5252 matches with analysisCriteria AC-2 (the national destination instance and the initial subscriber code is matching) but not with AC-1. The analysisCriteria instance AC-2 leads via localDestination LD-2 and directory number DN-2 to the subscriber B'.

Bibliography

- I-ETS 300 293 (1993): "Telecommunications management Network (TMN); Generic managed objects".
- ITU-T Recommendation Q.764 (1993): "Signalling System No.7 - ISDN user part Signalling Procedures".

History

Document history				
V1.2.1	October 1997	Public Enquiry	PE:	1997-10-17 to 1998-02-17
V1.2.1	May 1998	Vote	V 9830:	1998-05-18 to 1998-07-31
V1.2.1	August 1998	Publication		

ISBN 2-7437-2488-9
Dépôt légal : Aout 1998