

**Implementation of
ISO/IEC 10737 : 1994**

**Information technology —
Telecommunications and
information exchange between
systems —
Elements of Management
Information Related to OSI
Transport Layer Standards**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee IST/6, Data communications, upon which the following bodies were represented:

- British Computer Society
- British Telecommunications plc
- CCTA (the Government Centre for Information Systems)
- Digital Equipment Co. Ltd.
- IBM United Kingdom Ltd.
- Institution of Electrical Engineers
- International Computers Limited
- Logica UK Ltd.
- Nine Tiles Computer Systems Ltd.
- Rank Xerox Ltd.

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Implementation of Amendment 1
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Information technology — Telecommunications and
information exchange between systems — Elements of
Management Information Related to OSI Transport Layer
Standards
Amendment 1. NCMS Management

National foreword

In line 1, after 'ISO/IEC 10737 : 1994' insert, 'including Amendment 1'.

AMD 8768/August 1995

ISO text

Insert the attached as appropriate.

AMD 8768/August 1995

INTERNATIONAL STANDARD

ISO/IEC
10737

First edition
1994-10-01

AMENDMENT 1
1994-12-15

Information technology — Telecommunications and information exchange between systems — Elements of Management Information Related to OSI Transport Layer Standards

AMENDMENT 1: NCMS Management

*Technologies de l'information — Télécommunications et échange d'information
entre systèmes — Éléments d'information de gestion concernant les normes de la
couche Transport OSI*

AMENDEMENT 1: Gestion de NCMS



Reference number
ISO/IEC 10737:1994/Amd.1:1994(E)

AVA **Documents**
Document Sharing Hub

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 1 to International Standard ISO/IEC 10737:1994 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

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Introduction

ISO/IEC 10737 specifies the elements of management information relating to OSI Transport Layer service and protocol described in ISO/IEC 8072 and ISO/IEC 8073. However the management information relating to Network Connection Management Subprotocol (NCMS) is not included.

This amendment adds to ISO/IEC 10737 the elements of management information relating to NCMS described in annex B of ISO/IEC 8073.

This amendment has a structure which is similar to that of ISO/IEC 10737 in order to facilitate cross reference between the two documents.

Information technology — Telecommunications and information exchange between systems — Elements of Management Information Related to OSI Transport Layer Standards

AMENDMENT 1: NCMS Management

4 Symbols and Abbreviations

Insert the following symbols and abbreviations after MO:

NC	Network Connection
NCC	Network Connection Control
NCMS	Network Connection Management Subprotocol

5 Elements of Transport Layer Management Information

5.1 Managed Object Hierarchy

5.1.1 Summary of Managed Objects

Add the following new items after item g):

- h) NCMS Protocol Machine management object (ncmsPM, clause 5.9)
- i) NetworkConnection Control managed object (ncc, clause 5.10.1)
- j) NetworkConnection Control Initial Value managed object (nccIV, clause 5.10.2)

Replace figure 1 by the following figure:

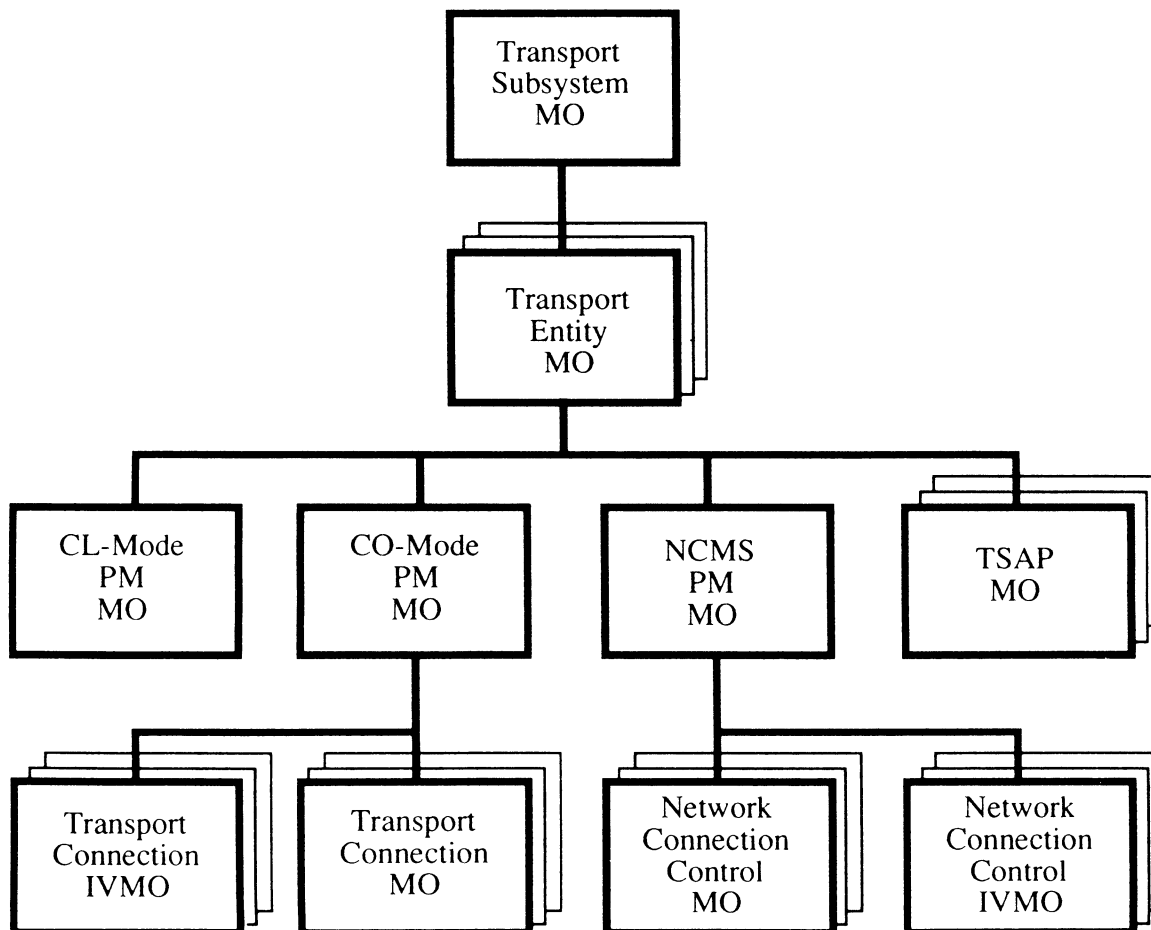


Figure 1-Transport Layer Containment Hierarchy

Add the following new subclause 5.9:

5.9 NCMS Protocol Machine

ncmsPM MANAGED OBJECT CLASS

DERIVED FROM "DMI":top;

CHARACTERIZED BY ncmsPM-P PACKAGE

BEHAVIOUR

commonCreationDeletion-B,

commonStateChange-B,

ncmsPMPackageImportedNotificatuions-B,

ncmsPM-B BEHAVIOR

DEFINED AS

!This managed object class represents the part of transport entity that performs the NCMS protocol.

Only one instance of this managed object class may exist within a TEMO instance.!

;

;

ATTRIBUTES

ncmsPMId GET,

"DMI":administrativeState GET-REPLACE,

"DMI":operationalState GET;

ACTIONS

"GMI":activate,

"GMI":deactivate;

NOTIFICATIONS

"DMI":communicationsAlarm,

ncmsPMPDUHeader,

ncmsPMSourceAddress,

"DMI":objectCreation,

"DMI":objectDeletion,

"DMI":stateChange

;

;

REGISTERED AS{TLM.moi ncmsPM (8)};

--- Behaviours

ncmsPMPackageImportedNotifications-B BEHAVIOUR

DEFINED AS

!The ncmsPM-P package imports communicationsAlarm from DMI, in order to report the failure of NC sharing. The probableCause is set to

TLM.communicationsProtocolError. The ncmsPMPDUHeader and ncmsPMSourceAddress are reported as parameters in the additionalInformation field of the communicationsAlarm.

The significance subparameter of each item of the additionalInformation shall be set to the value 'False' (i.e. not significant) so that a managing system receiving the event will be less likely to reject it. The perceivedSeverity shall be set to Minor.

A subsequent communicationsAlarm with a perceived Severity value of 'Cleared' shall not be generated. No other fields or parameters shall be used, with the exception of further parameters in the additionalInformation field.!

--- Name Bindings

ncmsPM-transportEntity-Management NAME BINDING
SUBORDINATE OBJECT CLASS ncmsPM AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS transportEntity AND SUBCLASSES;
WITH ATTRIBUTE ncmsPMId;
BEHAVIOUR
ncmsPM-transportEntity-B BEHAVIOUR
DEFINED AS
!The name binding that applies when the ncmsPM managed object is explicitly created
by management.!
;
;
CREATE;
DELETE ONLY-IF-NO-CONTAINED-OBJECTS;
REGISTERED AS{TLM.nboi ncmsPM-transportEntity-Management (13)};

ncmsPM-transportEntity-Automatic NAME BINDING
SUBORDINATE OBJECT CLASS ncmsPM AND SUBCLASSES;
NAMED BY
SUPERIOR OBJECT CLASS transportEntity AND SUBCLASSES;
WITH ATTRIBUTE ncmsPMId;
BEHAVIOUR
ncmsPM-transportEntity-B BEHAVIOUR
DEFINED AS
!The name binding that applies when the ncmsPM managed object is created .
The name binding that applies when the ncmsPM managed object can not be explicitly
created by management.!
;
;
REGISTERED AS{TLM.nboi ncmsPM-transportEntity-Automatic (14)};

--- Attribute

ncmsPMId ATTRIBUTE
WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameSyntax;
MATCHES FOR EQUALITY;
BEHAVIOUR
ncmsPMId-B BEHAVIOUR
DEFINED AS
!The attribute that is used in naming instances of the ncms Protocol Machine
managed object class.!
;
;
REGISTERED AS{TLM.aoi ncmsPMId (67)};

--- Parameters

ncmsPMPHeader PARAMETER
 CONTEXT EVENT-INFO;
 WITH SYNTAX TLM.PDUHeaderSyntax;
 BEHAVIOUR ncmsPMPDUHeader-B BEHAVIOUR
 DEFINED AS
 !Header of the PDU that causes the failure of NC sharing.
 Returned in the problemData field of a communicationsAlarm notification.
 ;
 ;
 REGISTERED AS {TLM.proi ncmsPMPDUHeader (8)};

ncmsPMSourceAddress PARAMETER
 CONTEXT EVENT-INFO;
 WITH SYNTAX TLM.SourceAddressSyntax;
 BEHAVIOUR ncmsPMSourceAddress-B BEHAVIOUR
 DEFINED AS
 !Source N-Address.
 Returned in the problemData field of a communicationsAlarm notification.
 ;
 ;
 REGISTERED AS {TLM.proi ncmsPMSourceAddress (9)};

Add the following new subclause 5.10:

5.10 Network Connection Control MO and IVMO

5.10.1 Network Connection Control Managed Object

nccMANAGED OBJECT CLASS

DERIVED FROM "DMI":top;

CHARACTERIZED BY ncc-P PACKAGE

BEHAVIOUR

nccInitialValues-B,

ncc-B BEHAVIOUR

DEFINED AS

!This managed object class represents the management aspect of the information needed to control the network connections by NCMS.

Multiple instances of this managed object class may exist within a NCMSPM MO instance.

This MO is created and deleted as a result of NCMS operation.!

;

;

ATTRIBUTES

nccId GET,

nc-COL GET,

nc-REC GET,

nc-REF GET,

nc-PREF GET,

nc-Right GET,

ncRecoveries GET,

trNCTime GET,

tpdNCTime GET,

tfrNCTime GET,

sourceOfAllocation GET,

"GMI":underlyingConnectionNames GET;

NOTIFICATIONS

"DMI":objectCreation,

"DMI":objectDeletion;

;

;

REGISTERED AS{ TLM.moi ncc (9)};

5.10.2 Network Connection Control Initial Value Managed Object

nccIVMO MANAGED OBJECT CLASS

DERIVED FROM "DMI":top;

CHARACTERIZED BY nccIVMO-P PACKAGE

BEHAVIOUR

use-of-nccInitialValues-B,

nccIVMO-B BEHAVIOUR

DEFINED AS

!This managed object class represents the set of initial values for NCC MO instances.

Multiple instances of this managed object class may exist within a NCMSPM MO instance.

The relationship between instances of NCC MO and NCCIV MO is not specified in this standard.!

;

;

ATTRIBUTES

nccIVMOId GET,

nc-COL REPLACE-WITH-DEFAULT GET-REPLACE,

nc-REC REPLACE-WITH-DEFAULT GET-REPLACE,

nc-PREF REPLACE-WITH-DEFAULT GET-REPLACE,

nc-Right REPLACE-WITH-DEFAULT GET-REPLACE,

ttrNCTime REPLACE-WITH-DEFAULT GET-REPLACE,

tpdNCTime REPLACE-WITH-DEFAULT GET-REPLACE,

tfrNCTime REPLACE-WITH-DEFAULT GET-REPLACE;

;

;

REGISTERED AS{TLM.moi nccIVMO(10)};

--- NCC INITIAL VALUES BEHAVIOUR

nccInitialValues-B BEHAVIOUR

DEFINED AS

!When an instance of the NCC MO is created using the ncc-ncmsPM name binding, the initial values for some of the attributes of the NCC MO may be supplied by an instance of the NCC IVMO. The means by which an instance(if any) of the NCC IVMO are identified are a local matter.!

;

--- USE OF NCC INITIAL VALUES BEHAVIOUR

use-of-nccInitialValues-B BEHAVIOUR

DEFINED AS

!The creation of an instance of the NCC MO using the ncc-ncmsPM name binding may reference an instance of NCC IVMO. When this occurs, some of the initial values of the attributes of the instance of NCC MO may be supplied by the values of the attributes in the specified instance of the NCC IVMO.

However any such value may be overridden by a value supplied by local means(for example across an internal interface). Where values are supplied by the IVMO, the initial values of an attribute of NCC MO shall be the value of the corresponding attribute in the NCC IVMO(that is, which has the same attribute template label).!

;

--- Name Binding

```
ncc-ncmsPM NAME BINDING
  SUBORDINATE OBJECT CLASS ncc AND SUBCLASSES;
  NAMED BY
    SUPERIOR OBJECT CLASS ncmsPM AND SUBCLASSES;
  WITH ATTRIBUTE nccId;
  BEHAVIOUR
    ncc-ncmsPM-B BEHAVIOUR
  DEFINED AS
    !The name binding that applies when the ncc managed object is created and deleted.!
  ;
;
CREATE WITH-REFERENCE-OBJECT;
DELETE;
REGISTERED AS{TLM.nboi ncc-ncmsPM (15)};
```

```
nccIVMO-ncmsPM NAME BINDING
  SUBORDINATE OBJECT CLASS nccIV AND SUBCLASSES;
  NAMED BY
    SUPERIOR OBJECT CLASS ncmsPM AND SUBCLASSES;
  WITH ATTRIBUTE nccIVMOId;
  BEHAVIOUR
    nccIVMO-ncmsPM-B BEHAVIOUR
  DEFINED AS
    !The name binding that applies when the nccIV managed object is created and deleted.!
  ;
;
CREATE WITH-REFERENCE-OBJECT;
DELETE;
REGISTERED AS{TLM.nboi nccIV-ncmsPM(16)};
```

--- Attribute

```
nccId ATTRIBUTE
  WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameType;
  MATCHES FOR EQUALITY;
  BEHAVIOUR
    nccId-B BEHAVIOUR
  DEFINED AS
    !The attribute that is used in naming instances of the network connection control
    managed object class.!
  ;
;
REGISTERED AS{TLM.aoi nccId (68)};
```

nccIVMOld ATTRIBUTE

WITH ATTRIBUTE SYNTAX ASN1DefinedTypesModule.NameType;

MATCHES FOR EQUALITY;

BEHAVIOUR

nccIVMOld-B BEHAVIOUR

DEFINED AS

!The attribute that is used in naming instances of the network connection control
initial value managed object class.!

;

;

REGISTERED AS{TLM.aoi nccIVMOld (69)};

nc-COL ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.NC-COLSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

nc-COL-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the collision algorithm as defined in ANNEX B of ISO/IEC 8073.
In NCCIV managed object, indicates the collision algorithm to be used. In NCC managed object,
indicates the collision algorithm in use.!

;

;

REGISTERED AS{TLM.aoi nc-COL (70)};

nc-PREF ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.NC-PREFSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

nc-PREF-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the preference the initiator has to keep the network connection
as defined in ANNEX B of ISO/IEC 8073.

In NCCIV managed object, indicates the preference to be used.

In NCC managed object, indicates the preference in use.!

;

;

REGISTERED AS{TLM.aoi nc-PREF (71)};

nc-REC ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.NC-RECSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

nc-REC-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the recovery optimization option as defined in ANNEX B of ISO/IEC 8073.

In NCCIV managed object, indicates the recovery optimization option to be used.

In NCC managed object, indicates the recovery optimization option in use.!

;

;

REGISTERED AS{TLM.aoi nc-REC (72)};

nc-REF ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.NC-REFSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

nc-REF-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the nc-reference as defined in ANNEX B of ISO/IEC 8073.!

;

REGISTERED AS{TLM.aoi nc-REF (73)};

ncRecoveries ATTRIBUTE

DERIVED FROM "GMI":nonwrapping64BitCounter;

BEHAVIOUR

ncRecoveries-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the total number of network connection successful recoveries.!

;

REGISTERED AS{TLM.aoi ncRecoveries (74)};

nc-Right ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.NC-RightSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

nc-Right-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the type of right of use as defined in ANNEX B of ISO/IEC 8073.

In NCCIV managed object, indicates the type of right of use to be used. Namely, the value "my-side" means "SA", "remote-side" means "RA" and "both-sides" means "RR".

In NCC managed object, indicates the type of right of use in use.!

;

REGISTERED AS{TLM.aoi networkConnectionRight (75)};

sourceOfAllocation ATTRIBUTE

WITH ATTRIBUTE SYNTAX TLM.SourceOfAllocationSyntax;

MATCHES FOR EQUALITY;

BEHAVIOUR

sourceOfAllocation-B BEHAVIOUR

DEFINED AS

!The attribute that indicates the transport entity that established the network connection at the first time during the life time of an NC reference.!

;

REGISTERED AS{TLM.aoi sourceOfAllocation (76)};

```
tfrNCTime ATTRIBUTE
  DERIVED FROM "GMI":timer;
  BEHAVIOUR
    tfrNCTime-B BEHAVIOUR
    DEFINED AS
      !Value of the TFR-NC timer as defined in ANNEX B of ISO/IEC 8073.!
    ;
  ;
REGISTERED AS{TLM.aoi tfrNCTime (77)};
```

```
tpdNCTime ATTRIBUTE
  DERIVED FROM "GMI":timer;
  BEHAVIOUR
    tpdNCTime-B BEHAVIOUR
    DEFINED AS
      !Value of the TPD-NC timer as defined in ANNEX B of ISO/IEC 8073.!
    ;
  ;
REGISTERED AS{TLM.aoi tpdNCTime (78)};
```

```
ttrNCTime ATTRIBUTE
  DERIVED FROM "GMI":timer;
  BEHAVIOUR
    ttrNCTime-B BEHAVIOUR
    DEFINED AS
      !Value of the TTR-NC timer as defined in ANNEX B of ISO/IEC 8073.!
    ;
  ;
REGISTERED AS{TLM.aoi ttrNCTime (79)};
```

6 ASN.1 Module

6.2 Other Definitions

Add the following definitions:

NC-COLSyntax::=ENUMERATED{nc-COL0(0)}

NC-PREFSyntax::=ENUMERATED{ highest(0),
medium(1),
lowest(3)}

NC-RECSyntax::=ENUMERATED{pleaseDoNotRecover(0),
pleaseRecover(1)}

NC-REFSyntax::=INTEGER

NC-RightSyntax::=ENUMERATED{ my-side(1),
remote-side(2),
both-sides(3)}

SourceOfAllocationSyntax::=ENUMERATED{ local(0),
remote(1)}

Annex A (normative)

Allocation of Object Identifiers

Add the following objectclass Identifiers :

ncmsPM (8)
ncc (9)
nccIVMO (10)

Add the following parameter Identifiers:

ncmsPMPDUHeader (8)
ncmsPMSourceAddress(9)

Add the following namebinding Identifiers:

ncmsPM-transportEntity-Automatic (14)
ncc-ncmsPM (15)
nccIVMO-ncmsPM (16)

Add the following attribute Identifiers:

ncmsPMId (67)
nccId (68)
nccIVMOId (69)
nc-COL (70)
nc-PREF (71)
nc-REC (72)
nc-REF(73)
ncRecoveries (74)
networkConnectionRight (75)
sourceOfAllocation (76)
tfrNCTime (77)
tpdNCTime (78)
ttrNCTime (79)

Annex B (informative)

Shorthand Description of Managed Objects

Replace figure B.1 by the following figure:

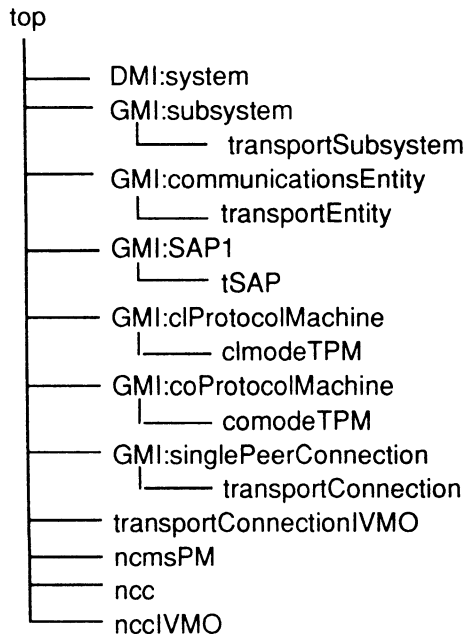


Figure B.1

Add the short hand description of NCMS PM MO, NCC MO and NCCIV MO:

MANAGED OBJECT CLASS ncmsPM DERIVED FROM (DMI:top)
 CONTAINED IN (transportEntity)
 ncmsPMId ATTRIBUTE (G)
 DMI:administrativeState ATTRIBUTE (G,R)
 DMI:operationalState ATTRIBUTE (G)
 GMI:activate ACTION
 GMI:deactivate ACTION
 DMI:communicationsAlarm NOTIFICATION
 DMI:objectCreation NOTIFICATION
 DMI:objectDeletion NOTIFICATION
 DMI:stateChange NOTIFICATION
 END MANAGED OBJECT CLASS ncmsPM

MANAGED OBJECT CLASS ncc DERIVED FROM (DMI:top)
CONTAINED IN (ncmsPM)
 nccId ATTRIBUTE (G)
 nc-COL ATTRIBUTE (G)
 nc-REC ATTRIBUTE (G)
 nc-REF ATTRIBUTE (G)
 nc-PREF ATTRIBUTE (G)
 nc-Right ATTRIBUTE (G)
 ncRecoveries ATTRIBUTE (G)
 ttrNCTime ATTRIBUTE (G)
 tpdNCTime ATTRIBUTE (G)
 tfrNCTime ATTRIBUTE (G)
 sourceOfAllocation ATTRIBUTE (G)
 GMI:underlyingConnectionName ATTRIBUTE (G)
 DMI:objectCreation NOTIFICATION
 DMI:objectDeletion NOTIFICATION
END MANAGED OBJECT CLASS ncc

MANAGED OBJECT CLASS nccIVMO DERIVED FROM (DMI:top)
CONTAINED IN (ncmsPM)
 nccIVMOId ATTRIBUTE (G)
 nc-COL ATTRIBUTE (G,R,RWD)
 nc-REC ATTRIBUTE (G,R,RWD)
 nc-REF ATTRIBUTE (G,R,RWD)
 nc-PREF ATTRIBUTE (G,R,RWD)
 nc-Right ATTRIBUTE (G,R,RWD)
 ttrNCTime ATTRIBUTE (G,R,RWD)
 tpdNCTime ATTRIBUTE (G,R,RWD)
 tfrNCTime ATTRIBUTE (G,R,RWD)
END MANAGED OBJECT CLASS nccIVMO

Annex C (informative)

Examples of the use of relationships

Add the following figure :

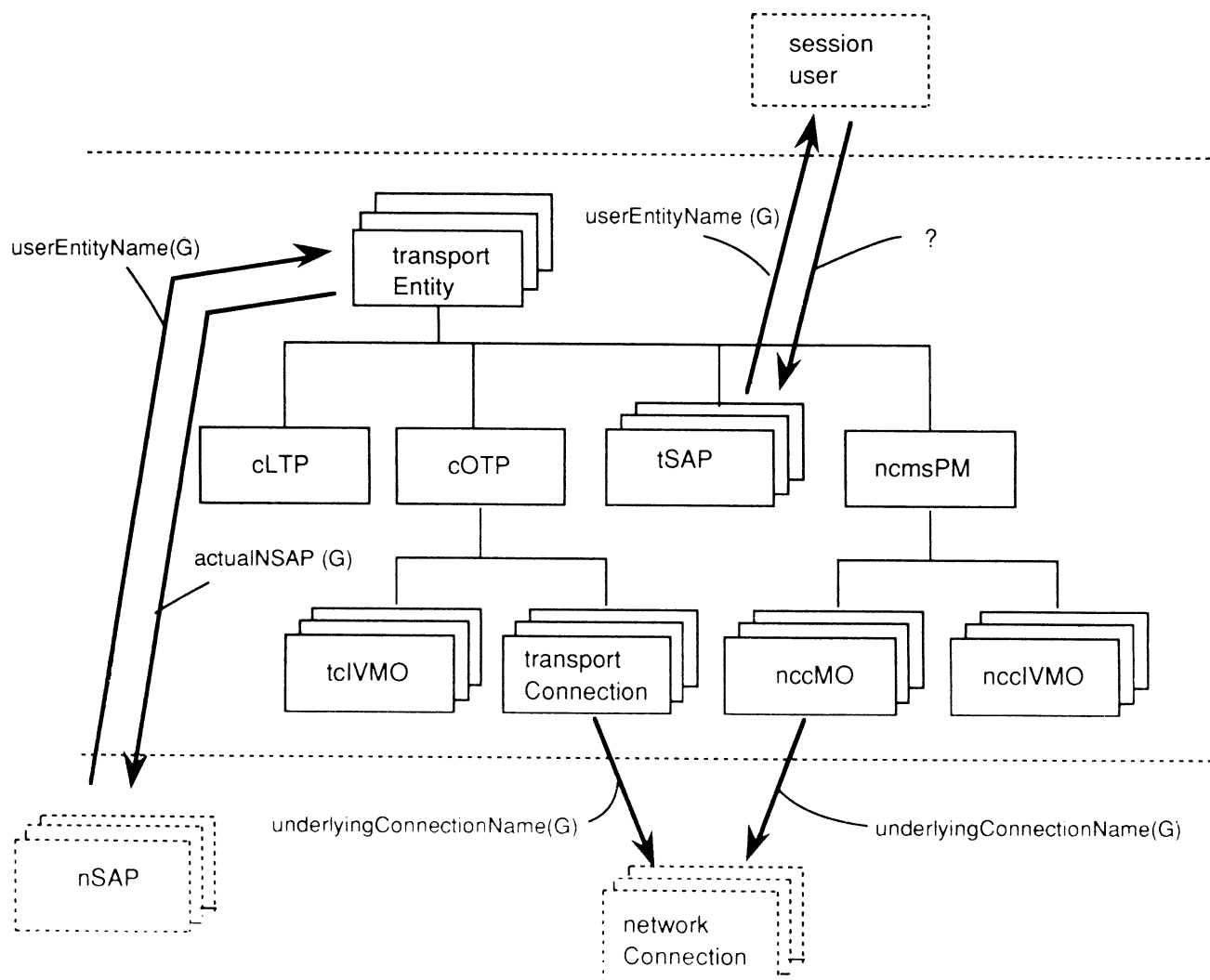


Figure C.3 - COTP using NCMS over CONS